



Australian Guide to Implementing Food Traceability

Seafood





Australian Guide to Implementing Food Traceability: **Seafood**

Introduction



Welcome message

Seafood is one of the most traded food commodities in the world. It has a complex supply chain not just domestically, but globally, and the industry has experienced further pressures as a result of the impacts of COVID-19 and climate change. Despite these challenges, the Australian Bureau of Agricultural and Resource Economics and Science (ABARES) Australian Fisheries and Aquaculture Outlook.

<u>2023</u> anticipates the seafood sector can expect sustained growth over the next five years.

The key drivers for traceability in the seafood market are an expanding market, fraud risks, sustainability reporting, shifting consumer behaviour, and efficiency of operations management. The premium value of seafood makes it a target for fraudulent activities in both import and domestic markets, with incorrect labelling of species and country of origin a particular concern. There is also a high level of vulnerability to fraud at the foodservices level where adherence to accepted fish names and country of origin is considered to be weaker than in other parts of the supply chain.

Imported products are particularly vulnerable due to the high level of processing and value adding authentication is challenging without recourse to laboratory methods such as DNA, elemental or isotope based verification. Undetected mislabelling can lead to health risks to consumers, create biosecurity issues, and contribute to the targeting of endangered species. ABARES estimates the cost to the Australian seafood industry from product fraud is \$75-\$135 million (includes molluscs and crustaceans). Trust in the product is critical to the domestic consumption of seafood.

Traceability systems can also enable organisations to optimise their production processes, boosting efficiency and ultimately reducing resource and product wastage. There are advantages for growers, producers, processors, manufacturers, wholesalers, freight transport suppliers, retailers, food service, importers and exporters of food. The benefits relate to the flow of information between businesses, the fulfilment of regulatory compliance, addressing the issue of product counterfeiting, meeting market requirements, and claiming the premium associated with Australia's high quality seafood products and integrity frameworks.

Through its <u>National Agricultural Traceability</u> <u>Strategy</u>, the Australian Government is looking to provide a high-level framework for traceability of Australian Agrifood. This Guide is aligned both to the government's national approach to strengthening agricultural traceability and to the <u>Global Dialogue of Seafood Traceability (GDST)</u> <u>Standards</u>. The GDST is the leading industry forum for the promotion of digital seafood traceability and owner of the industry's global interoperability standards, based on the <u>GS1</u> <u>Global data standards</u>. There is no shortage of technology and information system applications available to support the traceability journey for food businesses. However, the missing link is knowing what events to record, what data to collect, and what to share with others in the product supply chain to create visibility. Knowing how to achieve interoperability between business systems so data can flow is the foundation of supply chain visibility. This Guide explains how this can be achieved at a pace and with a focus that can match the priorities so important to business.

Deakin University's Food Traceability Laboratory is committed to bringing product-specific guides to industry, test these in real supply chains and deliver the knowledge that will grow capability in the industry. We trust that industry will find the *Australian Guide to Implementing Traceability: Seafood* a useful resource in moving towards end-to-end supply chain traceability.

David Downie

Chair, Deakin University Implementing Food Traceability Laboratory.

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We wish to thank the many individuals, companies and industry bodies that have contributed to the development of this Guide and in particular the Woolworths Group who have funded its development. Woolworths and other industry sponsors have provided resources and been generous with their time.

The Australian Guides to Implementing Food Traceability

This Guide is one of a series produced as part of the Implementing Food Traceability Program led by Deakin University's Food Traceability Laboratory.

Australian food businesses have a reputation for producing safe, quality food, and businesses put in place measures and systems that enable them to comply with a range of requirements covering food safety, biosecurity, food labelling, food transport as well as industry codes and buver specifications. As companies respond to climate change, geopolitical unrest and the impact of the COVID 19 pandemic, there is heightened concern about health and the environmental and the social impact of food production, driving a demand for more information about how and where a product was made. End consumers and enterprise to enterprise (E2E) buyers who want to verify product claims now demand more details about the product and the circumstances of its production, formation and distribution.

The AGIFT series of guides provide businesses with a user-friendly "how to" for tackling traceability across a complete food supply chain. The aim of each *Australian Guide to Implementing Traceability (AGIFT)*, is to assist businesses to share data securely and safely through the use of global data standards and data security protocols. It means that partners working together will be able to achieve endto-end traceability at a pace and in priority processes and events along the chain that all agree are important to business success. Each Guide is designed to work with varying scale of enterprise, from small growers selling at a local produce market through to large scale operations and exporters. Importantly, the Australian Guides to Implementing Food Traceability address protection of your data and best practices in cybersecurity, privacy, and data sharing.

The Deakin Food Traceability Laboratory partnership

The Implementing Food Traceability Program is an initiative of the Deakin University Food Traceability Laboratory. The Lab is a consortium of industry, government and academia dedicated to improving Australian food supply chains and tackling issues that require partnership. It is convened by Deakin University's Centre for Regional and Rural Futures.

As of October 2023, the Deakin University Food Traceability Laboratory partners are:

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Australia's seafood industry

The seafood industry in Australia provides employment for almost 26,000 people in fisheries and aquaculture, associated seafood processing and indirectly through flow-in business activity in other sectors.

Seafood is one of the most traded food commodities in the world, with a complex supply chain both domestically and globally.

Australia's seafood industry involves both wild caught and farmed animals, consisting of fish, crustaceans, molluscs and other seafood products. Estimates from the <u>Australian Bureau of Agricultural</u> <u>and Resources Economics and Sciences (ABARES)</u> indicate that in 2022-23, Australia will produce over AUD 3.4 billion worth of seafood.¹

See Figure 1 (below) for the production value of different aspects of the seafood market in Australia.

Figure 1: Australian seafood production value,

actual and forecast to 2026



Aquaculture and wild catch

Around \$2 billion of the value of production is from aquaculture, outstripping wild caught animals to represent over 60 percentof production.

Figure 2: Aquaculture production value, 2021-2026



Source: ABARES, 2022

Seafood Export and Import

Australia exports AUD 1.3 billion in value of the seafood fished and farmed in this country, with rock lobster, abalone, southern bluefin tuna, Atlantic salmon, and prawns dominant export species. Key markets have been China and Hong Kong SAR, Japan and US, however the focus is now on diversifying export markets (see Figure 3 below).

Figure 3: Australian seafood export value, actual and projected, 2006 - 2026



Despite the importance of Australian seafood exports to the profitability of the industry, Australia is a net importer of seafood, importing around two thirds of the seafood consumed in Australia, sourcing from 97 countries. In 2019–20 Australia imported seafood valued at \$2.1 billion from 97 countries (see Figure 4, below).

Figure 4: Australian Seafood Imports by Country 2019-2



Source: FRDC

¹ In 2020–21 AUD \$1.2 billion represented 67 million kilograms of export grade seafood. Prices fluctuate with demand.



The structure of Australia's seafood industry

An analysis of Australia's seafood industry by IBISWorld indicates the industry is considered a mature industry which directly employs almost 26,000 people.

Table 1: Seafood industry segments - business and employment figures

Segment	Businesses	Employment 2021
Fishing	4,250	5,044
Aquaculture	998	5,699
Seafood Processing	219	2,140
Fish & Seafood Wholesaling	834	5,113
Fresh meat, fish, poultry retailing Note: seafood retailing = 14.3% of sales	4,447 (95% employ <19 staff	25,764

Source: IBISWorld Industry Reports, 2021

With the exception of the aquaculture segment, the industry is quite fragmented and dominated by small and medium enterprises (SMEs). It is notable that over 60 percent of Australian consumers purchase their seafood from major supermarket outlets, a highly concentrated sector.

Seafood Supply Chains

Seafood is imported, farmed or caught within a country's waters and depending on the desired end product, seafood may go through various types of processing. Primary processing includes cutting, filleting, de-boning, gutting and packaging the seafood. Secondary processing can include canning, smoking or brining the seafood.

After processing, the seafood is usually taken to a distribution centre for export or domestic

distribution to retail, manufacturing and foodservice. Live, chilled and frozen seafood is usually transported by road or airfreight in refrigerated or frozen conditions. Processed and packaged seafood can be transported in ambient conditions by road and sea.

The seafood supply chain can be segmented into three key movements, referred to as 'flows' in the <u>Seafood Supply Chain Benchmarking Report</u> prepared for the Department of Infrastructure, Transport, Regional Development and Communications in August 2021.

- FLOW 1: Imported chilled and frozen products
- FLOW 2: Movement of imported processed products
- FLOW 3: Movement of domestically caught or produced seafood to port for export or to domestic consumers.

Figure 5 below shows a typical seafood value chain (country agnostic).

Figure 5: Common seafood product flows.



Source: Department of Infrastructure, Transport, Regional Development and Communications, 2021.

Australia's seafood supply chain transports c.340 kilotons (kt) of seafood annually (including salmon, barramundi, prawns and other fish) in a variety of forms including fresh/chilled, frozen and tinned. Australian seafood is known internationally for its quality, as most high-value seafood is exported to international markets, with domestic consumption supplemented by imports. Seafood is moved large distances in Australia (c.1,800km on average), due to the significant distances between key fishing areas and major urban centres. Road freight rates are estimated to be AUD c.\$0.33 (2021) per tonne-km (tkm).

Traceability and Australian seafood

Traceability of seafood is a concern for both industry and government in Australia, driven by trade access and environmental sustainability developments. The Australian Government has invested \$68.4 million into Australia's agricultural traceability systems, working with industry to develop a national approach to strengthening traceability. The aim is to achieve a common vision for Australia's agricultural traceability ecosystem, showing consumers and the countries Australia exports to that our products are safe, clean and sustainable along the length of our supply chain. <u>The National Agricultural Traceability Strategy</u> aims to outline a common and enduring approach to coordination of current and emerging traceability risks, with a draft strategy published for industry input in November 2022.

<u>The National Agricultural Traceability Strategy</u> <u>2023-2033</u> outlines the following objectives:

- Improve tracking and tracing capabilities to advance export opportunities, commodity confidence and biosecurity and food safety responses
- Align regulatory management frameworks to reduce regulatory burden and streamline government interactions
- Coordinate a data-led, adaptable, traceable ecosystem to sustain and promote efficient market access
- Deliver a national interoperable digital infrastructure to reduce interface costs
- Meet new and emerging product claim requirements and changing market demands to remain competitive and enhance trust
- Strengthen national and international collaboration and partnerships on traceability to protect Brand Australia, influence international trends, and demonstrate our world class systems
- Build a strong collaborative education, research, and development agenda to lift our understanding of, and responses to, risks and opportunities
- Establish clear governance for future proof traceability initiatives to create transparent accountability.

A discussion paper developed by the Fisheries Research and Development Corporation (FRDC) in 2021, outlined why traceability is important to the seafood industry, identifying barriers to adoption, describing traceability elements, systems and technologies, and recommending actions and risks going forward. Priorities one, three and four focused on building worldclass traceability systems – systems that will provide confidence and assurance of Australian product(s) sold from catch/farm through to the end consumer both domestically and internationally.

The Department of Agriculture, Fisheries and Forestry (DAFF) <u>National Fisheries Plan</u> presents a shared vision to grow Australia's fishing and seafood sectors in a sustainable way. It does this by outlining initiatives and targets to be achieved by 2030 across nine priority areas. The plan outlines the need for traceability under three key priorities:

- **1.** Adapting to a changing environment
- 2. Promoting public trust and understanding
- **3.** Promoting sustainable fisheries and market access internationally.

In 2022, the Australian Government released its <u>National Biosecurity Strategy</u> with traceability identified as a vital part of preparedness and detection of biosecurity threats for Australian export and import of Agrifood products.

State agencies have also supported traceability initiatives and enhanced regulation.

Northern Territory	labelling of imported seafood in foodservice since 2008
NSW	Seafood traceability
	Traceabilityresearch and quality assurance
Queensland	<u>Trade and Investment QLD</u> <u>Strategy 2022-26</u>
	QDAF formation of QTAG
	Fishing and Aquaculture
South Australia	<u>Seafood Growth Strategy</u> <u>2021 - 2031</u>
Tasmania	Tasmanian Primary Produce Traceability Strategy
Victoria	Licensing and seafood safety in wild catch and aquaculture
	Fish transporters, receivers, wholesalers, processors, Importers and exporters traceability requirements
Western Australia	<u>Traceability Learning</u> Journeys

Industry Developments

In 2017, the World Wildlife Fund (WWF) conducted a series of workshops in Australia to develop an Australian Seafood Traceability Statement. The outcome was an industry-led commitment towards traceability across the Seafood supply chain, a commitment to traceability systems that can reliably identify the species, where it came from and how it was produced. Key traceability elements relating to the species, source (wild caught or farmed), origin and date of landing/ harvest were identified as essential data for traceability. Australia's Seafood Traceability Statementis opposite.

Australian Seafood Traceability Statement



A "traceable" seafood product is one that can be tracked back through the supply chain to its source, be that a fishery or aquaculture operation, including all transformations of that product. There are many reasons why people may seek seafood traceability, including: improved food safety; business efficiency; product auditing; avoiding mislabelling or fraud; combatting illegal, unregulated, and unreported (IUU) fishing; concern about human rights in supply chains; ensuring ecologically sustainable practices; marketing and promotion. Regardless of the reasons, seafood traceability is a key part of the solution.

At a minimum, seafood traceability systems will:

- provide access to reliable information sufficient to demonstrate compliance of the seafood product with all relevant national and international legal requirements;
- provide traceability from the origin of production through to the point of final sale, while protecting commercial confidentiality;
- · allow for credible and transparent supply chain verification and auditing mechanisms; and,
- provide the following Key Data Elements across the supply chain.

Source	Wild-caught	Aquaculture
Species	Scientific name Australian Standard Fish Name	Scientific name Australian Standard Fish Name
Origin	Country Fishery Producer (usually vessel)	Country State (province) Producer (usually farm)
Production	Date of landing	Date of harvest

To improve seafood traceability, systems should move towards:

- digital recording, tracking and tracing of seafood data in standard formats;
- full chain inter-operability between businesses throughout the supply chain;
- independent verification and auditing; and,
- providing consumers and stakeholders additional information to make informed seafood choices.

Source: World Wildlife Fund, 2017

In 2020, a <u>Tuna 2020 Traceability Declaration</u> was adopted by the Global Tuna Alliance, and in early 2021, the <u>Statement on Traceability</u> <u>and Port State Measures</u> was released in an effort to reduce illegal, unreported and unregulated fishing.

The Global Dialogue on Seafood Traceability

(GDST) is an international, business-to-business platform established in 2017 to create the first-ever global industry standards for seafood traceability. The GDST was convened and facilitated by World Wildlife Fund (WWF) and the Institute of Food Technologists (IFT).

The GDST <u>Guide to the GDST Standards and</u> <u>Materials V 1.1</u> states that:

"Reliable and affordable seafood traceability has become a "musthave" for any company seeking to remain competitive in today's global seafood industry. Whether for meeting company social responsibility policies or for addressing core operational issues such as supply chain visibility and risk management, there is a daily need for rapid access to verifiable information about product origins across the sector".

Source: Global Dialogue on Seafood Traceability

Traceability in the Australian seafood industry is relevant for businesses across the entire seafood supply chain ecosystem.

 Wild caught fisheries: being able to share with customers and consumers proof that the animal was harvested from sustainable fisheries and handled in a manner that does

- not compromise food safety
- Seafood exporters: diversifying international markets and complying with traceability requirements (e.g. EU catch certificate, Japan Certificate of Legal Catch, US Food and Drug Administration Food Traceability Rule, UK catch certificate, processing statement and proof of storage)
- Aquaculture operations: to support market premium status and sustainable production
- Seafood wholesale and distribution: to demonstrate responsible sourcing and monitoring handling of seafood products
- Seafood importers: to confirm that seafood consumed in Australia does not come from illegal, unreported or unregulated fisheries and is safe for consumption
- *Retailers*: sourcing product that is produced or caught in circumstances consistent with commitments to global ESG targets and accountable to end consumer expectations of sustainable seafood.

A 2019 survey of seafood consumers undertaken by the Fisheries Research and Development Corporation (FRDC) indicates consumers are increasingly interested in product information. Trust in the product is critical to the domestic consumption of seafood. The consumer information that can be addressed by traceability includes species verification, location and time of catch, wild catch and farming practices, sustainability, frozen or fresh status, and shelf life.

About the Australian Guide to Implementing Food Traceability: Seafood

Purpose of the Guide

The Australian Guide to Implementing Food Traceability: Seafood has been developed to assist companies to identify the critical tracking events and key data elements required to track their products from across the length of their supply chain. It will assist businesses in domestic and international supply chains to identify what information is required, how to structure that information to align with global data standards and how to safely share that data with others in their supply chain, to create traceability and support value capture. Mandatory "one back: one forward" recording of the product details provides information on who sold or handled the product prior to arrival at a business and who the business is supplying next.

The aim of standardising what information is required and how that data is used to identify, capture and share traceable events, is to enable disparate enterprise systems to "talk" to each other with the minimum cost and maximum value capture.

The designers have incorporated the following principles in developing the Australian Guide to Implementing Traceability: Seafood.

• The Guide is designed to work with businesses of all sizes, from small growers selling at a local produce market through to large scale operations and exporters.

- The Guide is technology agnostic, it is based on existing systems and technologies but also allows for the emergence of new technologies, networks and systems.
- Information in the Guide has been structured so that data your business needs to share can flow through your supply chain seamlessly; interoperability is the touchstone.
- The Guide is standards-based, GS1 and GDST global data standards and other international standards adopted by industry, most of which are already ISO recognised.

The Australian Guide to Implementing Food Traceability: Seafood has been structured in modules which cover common events and transactions and can be accessed separately. Each module covers the typical participants, their roles, the Critical Tracking Events (CTEs) and Key Data Elements (KDEs) for traceability. Each module includes regulatory requirements that are associated with traceability and required record keeping.

The Australian Guide to Implementing Food Traceability: Seafood covers on-farm production and wild harvest operations, packing, processing, distribution, transport, supply to retail, foodservice, import and export of fresh produce and end consumer information.

Development of the Guide is supported by a Steering Group with representatives from the seafood Industry.

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Who can use this Guide?

Businesses this Guide has been prepared for include:

- Agricultural suppliers (bait, feedstock, veterinary, materials, chemicals)
- Animal stock suppliers (fingerlings, spat, spawn, brood stock)
- Farm infrastructure and equipment suppliers (cages, netting, GPS devices, pumps, fishing gear)
- Aquaculture operations
- Initial processors and further processors
- Seafood Wholesalers

- Packaging suppliers
- Food manufacturers
- Food safety technicians
- Quality assurance personnel
- Storage facilities, cold storage
- Exporters
- Importers
- Transport operators
- Cargo Terminal Operators
- Shipping and air lines
- Warehouse operators
- Pallet and tub suppliers
- Container yards
- IT companies
- Food retailers
- Foodservice.

Tracking and tracing at the supply chain level

Food Standards Australia New Zealand (FSANZ) defines traceability as:

"... the ability to track any food through all stages of production, processing, and distribution (including importation and at retail). Traceability should mean that movements can be traced one step backwards and one step forward at any point in the supply chain. For food processing businesses, traceability should extend to being able to identify the source of all food inputs such as raw materials, additives, other ingredients, and packaging."

The <u>Global Food Traceability Centre</u> defines traceability as the systematic ability to trace the path of food ingredients and/or finished products throughout their entire lifecycle, using previously captured and stored records. These records catalogue key data elements (KDEs) at critical tracking events (CTEs).

Traceability may be achieved along a supply chain by combining the one-up/one down information from individual businesses. However, it may not constitute a visibility capability for that particular supply chain. The data may be required to be held for regulatory purposes but not necessarily shared with other businesses in the chain to create visibility of the product. Gaining visibility along the entire supply chain can improve speed and accuracy of food recalls by having a complete set of information on where the product has been, who has handled the product, unique identification of the product (what) and when it was produced, transformed. aggregated and disaggregated as it is physically moved along the supply chain.

Critical Tracking Events (CTEs) and Key Data Elements (KDEs)

Critical Tracking Events (CTEs) are defined as the events recorded throughout the supply chain that are essential for achieving food traceability.

A *Critical Tracking Event* (CTE) is any occurrence involving an item at a specific location and time associated with collection and storage of data useful for associating the item (or related items) to the specific occurrence at a later time and is determined to be necessary for identifying the actual path of an item through the supply chain.

The concept of Critical Tracking Events in an agrifood supply chain allows unique traceability data to remain separate from proprietary commercial data.

For each node, aggregation, de-aggregation, transfer and transformation of the product it will cover:

A unique location - the "where"

- Unique identification of the parties involved
 the "who"
- A unique item identification the "what"
- A time and date stamp the "when".

The Global Food Traceability Centre provides the following information on Critical Tracking Events.

"The CTE approach is a bottom-up approach that is inherently secure in terms of data ownership, data access and proprietary information protection. The CTE approach recognizes that each operator knows their own operations best and provides complete latitude as to how to collect CTE traceability data. The CTE approach shifts focus from the food product itself to the events that manipulate the product in the supply chain. As each operator handles a food product (harvests, creates, receives, minales, aggregates, palletises, depalletises, relocates, ships, etc.) its actions are viewed as events that occur at specific locations, dates and times. Some of these events are critical to the ultimate traceability of the product. Therefore, those events are deemed to be "critical tracking events.

Since a CTE is essential to ultimately tracking the item in the supply chain, CTE traceability requires a commitment from operators to collect, store and make retrievable, CTE data from every CTE within their operation. Implementation of CTE traceability does not interfere with any existing business processes. However, it requires a commitment by operators to collect, store and make available for retrieval a minimal set of data that is inherently secure through abstraction, separation and restricted accessibility. Operators can choose the most appropriate manner to collect data from manual entry to sophisticated automated scanners. Once CTE data are captured and available for query, investigators will no longer need to stop at each node in the supply chain in order to learn where to go next. CTE based traceability promises to areatly accelerate the rate of trace back investigations as well as the precision and speed of recalls."

Source: Global Food Traceability Centre

A Key Data Element (KDE) is a data input required to successfully trace a product and/or its ingredients through all relevant CTEs.

In terms of data content, these can be categorised into three distinct areas:

- Master data relates to locations, businesses, products (input materials, outputs) and their associated attribute data such as addresses, functions, descriptions, packaging configurations etc. These details will be stored in product master data files and retrieved each time a traceable item is scanned or looked up for ordering etc. or a location referenced
- Transaction data that consist of trade transactions, triggering or confirming the execution of a function within a business process. Transaction data is usually captured and stored in internal systems

Figure 6: The traceability process



Source: Deakin University Food Traceability Laboratory

 Visibility event data that captures the movement of a product through the supply chain detailing when and where a specific event occurred. Visibility data is usually made accessible across the whole supply chain. It makes it possible to track and trace goods with live data along the process.

The end-to-end process for export can be seen in the diagram above (Figure 6).

How does the Guide work?

The Australian Guide to Implementing Food traceability: Seafood describes how to create supply chain traceability in the seafood industry through using data standards for interoperability with specific reference to seafood. The Guide is developed in modules to enable businesses along a seafood supply chain to focus on achieving traceability within their particular area of responsibility, achieving an understanding of the data required to complete supply chain level traceability in that area. Supply chain partners can select a module related to priorities in their business strategy or in areas where they wish to improve traceability in their supply chain e.g. export or freight transport.

Collaboration is the basis of supply chain level traceability, so partners working together will need to consider their resources and commitment to working through the modules to build the full capability.

The modules cover:

- 1. Seafood introduction
- 2. Seafood production wild caught and aquaculture
- 3. Seafood freight transport
- 4. Processing and manufacturing of seafood products
- 5. Wholesale and distribution of seafood
- 6. Seafood retailing
- 7. Seafood in foodservice
- 8. Seafood import
- 9. Seafood export
- **10.** Consumer information
- 11. Ethical labour
- 12. Data standards for seafood traceability
- 13. Cybersecurity, privacy and data sharing.

In each module, you will find a description of the key processes and events that relate to supply chain level traceability. Within each of these processes, we identify tracking events that are considered critical, or that are required by regulators, related to traceability. For each critical tracking event, we then indicate what data points are relevant to be stored within enterprise systems and then separately, shared with supply chain partners.

For each of these sharable data, we show how to capture the data and how to format the data to standards that allow flow between systems of permissioned supply chain partners safely.

Each module contains useful links so you can quickly check regulatory requirements or the detail of a particular data standard for your solution provider or in-house IT team.

The interoperability between technologies and IT systems

You may be dealing with a range of technologies being used across the seafood supply chains your business interacts with, from suppliers of inputs, government and industry platforms, customer ordering and delivery systems, in addition to operational systems and messaging within your own enterprise.

Regardless of the technology or software used, the Guide focus is on the data you will need to collect and share.

We have a Solution Provider Reference Group experienced in food traceability advising us on how current and emerging technologies and software will use the data standards and framework.

We are not developing a platform or software. Our interest is in the interoperability between systems through using common language for data. This Guide uses Global Dialogue on Seafood Traceability Standards (GDST) which builds on the GS1 global data standards. The GDST standards were developed in response to two major barriers to traceability: differing demands from governments, NGOs and retailers etc and the difficulty of a diverse range of often incompatible information management systems. GDST is one of the world's largest industry forums and was convened and supported by two leading international NGOs: WWF and the Institute of Food Technologists (Global Food Traceability Centre).

GS1 is the global data standards body for supply chains. GS1 Australia is collaborating in this program to provide data standards for these guides. The standards are already used in Australian and international food supply chains to form the basis of interoperability. The GS1 supply chain standards are accredited as International Standards Organisation (ISO) standards.

Does the Guide duplicate my existing accreditations?

You may have achieved accreditation under an industry code or standard, such as the Marine Stewardship Council or the Best Aquaculture Practices Farm standard. Data you collect for these audits that relate to traceability are likely to be part of your traceability key data elements. The Guide will include these industry codes and accreditations. By digitising your traceability data using the Guide, you can accelerate your compliance and audit practices for these important certifications.





Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Production



Seafood Production

This module covers activities that generally take place in the fishery area or aquaculture farm production area. In this module, these processes and activities are:

- 1. Establishment
- 2. Planning and preparation
- 3. Aquatic animal stocking and growth
- 4. Farm inputs and monitoring
- 5. Catch and Harvesting
- 6. Provenance verification
- 7. Post-harvest handling initial processing
- 8. Sale and dispatch.

1. Establishment

The establishment of *unique identifiers* for production location, its ownership and the production business entity are fundamental to traceability. These identifiers provide the common link across the participants in the full supply chain and are collectively referred to as "Master Data" due to their frequency of use.

Master data relates to locations, businesses, products (input materials, outputs) and their associated attribute data such as addresses, functions, descriptions, packaging configurations etc. These details will be stored in product master data files and retrieved each time a traceable item is scanned or looked up for ordering or a location is referenced.

Regulators often mandate Establishment data. It can be required for local, state, or national government responsibilities, such as ensuring the property can be located in the circumstance of a biosecurity threat such as a disease outbreak, or that facilities on board vessels and on aquaculture sites are fit for purpose and maintain safe food systems.

Seafood operations benefit from being able to identify sites where products are grown, in order to make a better assessment of productivity, such as matching the site to inputs and yields. Being able to distinguish specific areas such as fisheries where quotas apply and catch is taken, purse seine nets, pens, oyster leases, support provenance and sustainable agriculture values and telling the story of the product to end consumers.

Tasks related to Establishment

a) Create master data to standardise business, location, and asset identifiers

Business identifiers

Business identifiers may include:

- Australian Business Number (ABN)- The ABN is a unique 11-digit identifier issued by the Australian Business Register (ABR) which is operated by the Australian Taxation Office (ATO).
- Name and address Human readable and required for labelling on products.
- Food business operator approval/licence number
- Vessel name and registration number
- Export Establishment Licence number.

Unique Company prefix

GS1 global supply chain data standards offer a unique company prefix which is a component of product identification e.g. barcodes, QR codes. This unique company identifier is a alobal identifier.

Operating Licenses/Fishery Access Licenses

Licences contain details linking the fishing or aquaculture operation to locations where the operator has approved access and the species being harvested or farmed e.g. abalone lease. An aquaculture licence and commercial fishing licence is required in each state and territory.

For seafood exporters preparing or storing products, an <u>Approved Arrangement</u> must be in place and the premises registered as an export establishment (for further details see the Seafood Export module). The Export Establishment number or Export Licence number is an identifier that is displayed and used on packaging.

Identifiers for supplier businesses

Inputs to the business such as equipment, on-farm infrastructure, chemicals, veterinary chemicals, packaging require identification to trace inputs and their suppliers. Interfaces between businesses are increasingly digitised and transactions between businesses are commonly automated, making the use of identifiers vital to transactions.

Location identifiers

The location of aquaculture business operations as well as specific locations of hatcheries, grow-

out leases, pens, tanks can be identified using a global location number (GLN). This unique location code can also apply to the location of suppliers. As this code has global application, international suppliers can be identified in the instance of biosecurity or health risk tracing.

GPS coordinates or fishery codes are commonly used to identify fishing grounds or home ports where vessels are located. For Commonwealth fisheries and some state fisheries, depending on vessel size, vessel tracking equipment is required to be installed and active while at sea, transmitting location data to fisheries management authorities.

Commercial Fishing Vessel identifiers

Mandated vessel identifiers depend on the Commonwealth or state jurisdiction in which fishing takes place, the size of the vessel and whether the fishing operator has access to quota fisheries or specific species fisheries. Fishing vessels are required to be registered by state authorities and larger vessels operating in Commonwealth waters are encouraged to register under the Australian flag.

Unique identifiers in use for domestic commercial fishing vessels include:

- Vessel registration number
- Hull Identification Number
- Australian Builders Plate.

Other asset identifiers

Assets such as pallets or tubs that are owned or leased by a business can be traced using serialised shipping container codes as unique identifiers. Storage facilities, plant and equipment across multiple sites may be allocated unique identifiers that are useful in tracing animals, biosecurity incursions and contaminants.

b) Permits and licences

Commonwealth fisheries licenses and permits are managed by the <u>Australian Fisheries</u> <u>Management Authority</u>. Statutory Fishing Rights, Fishing Permits and Receiver Permits are required to access these fisheries, specify catch and species quotas, use of registered vessels, and fishing gear under the Fisheries Management Act 1991.

For state and territory fisheries management authorities, licenses must be held for both wild catch and aquaculture operations. Aquaculture licences may specify:

- The area within which the aquaculture activity is authorised
- The species
- Type of equipment or infrastructure
- Environmental management requirements
- Translocation procedures
- Waste management requirements
- Records and reporting requirements
- Biosecurity requirements
- Other conditions.

A fishing license provides authority to access fish in specific fisheries and to catch or ranch specific species. It also specifies approved fishing gear the holder can use. For wild catch licenses, a unique code is allocated to the primary fishing vessel and tender/trans-shipment boats used to transfer catch.

c) Food Safety Accreditation

Legislation covering Commonwealth Food Safety are:

- Food Standards Australia New Zealand Act 1991
- Food Standards Australia New Zealand Regulations 1994
- Imported Food Control Act 1992.

Food safety standards are defined in Commonwealth legislation and administered through Food Safety Australia and New. Zealand (FSANZ) Food Standards Code as Australia's food safety authority. FSANZ, as an agency of the Health portfolio, manages food safety standards for food labelling, product recall, storage and handling and food safety in emergencies. Safe Seafood Australia has developed guidance on how to comply with this standard.

Specific standards related to **traceability** are detailed in:

- Standard 1.2.2 Food Identification Requirements, for labelling food
- Standard 3.2.2 Food Safety Practices and General Requirements, for food receipt and food recall
- Primary production and processing Standards 4.2.1 to 4.2.6.

"You should know the details about the food on your premises including where it came from and where it goes.

- When receiving food only acceptit if you can identify it and the supplier's name and address in Australia keep these details.
- If you manufacture, supply wholesale, or import food you must have a food recall system in place so if there is a food safety problem, you know exactly what product should be recalled, how much and from where.
- If you label food products you need to include the food's name, lot identification and supplier name and address in Australia or New Zealand.
- If you're a primary producer or processor you must meet the specific requirements of your commodity under the relevant standard in the Code.

You should be able to trace all the inputs you use (including all ingredients, packaging, etc.) and the customers that receive your product. Have a strong traceability system that includes:

- procedures for identifying producers, suppliers, customers and productscontact details of your suppliers and a list of what they supply
- contact details of your customers and a list of what you supply them
- dates of transactions and deliveries
- batch numbers or lot identifiers
- quantities of products supplied or received
- any other records relating to production that are relevant to your business."

Source: Food Standards Australia and New Zealand

State and territory food safety authorities each have requirements for food safety to implement the food standards code, requiring preparation of a Food Safety/Food Safety Management Plan prior to issuing licenses to operate wild catch and aquaculture operations. Regular audits and inspections are part of compliance activities.

State laws covering food safety requirements are as follows:

- ACT Food Act 2001 and Food Regulations 2002
- NSW Food Act 2003 and Food Regulation 2015
- NT Food Act 2004
- QLD Food Act 2004 and Food Regulation 2006, Food Production (Safety) Act 2000, Food Production (Safety) Regulation 2014
- SA Food Act 2001 and Food Regulations 2002
- TAS Food Act 2003 and Food Regulations 2012
- VIC Food Act 1984
- WA Food Act 2008 and Food Regulations 2009.

Food safety regulatory activities including premises inspection are also delegated to local councils. For example, in Queensland, the role of local government is to:

- Enforce food safety requirements in food businesses for matters such as licences, food handling practice, foreign objects in food
- Manage applications, renewals, suspensions and cancellations of food business licences
- Accredit food safety programs
- Investigate and respond to food safety complaints for matters they enforce
- Inspect any food business in their area regardless of whether the food business is licensed or not.

Before applying for a business licence, seafood producers are required to complete food safety accreditation. This includes businesses harvesting, processing, and storing seafood products, including fishing vessels that hold catch.

Participants

- Aquaculture business owner
- Vessel owner
- Fishing or aquaculture operations manager
- Global Location Number (GLN) Issuing Agency – in this case GS1 Australia
- Food Safety authority in each state
- Department of Agriculture, Fisheries and Forestry (DAFF) for Authorised Arrangement licensing of premises for prescribed export products and Seafood Imports.
- State Fishery management agency
- State business licensing/accreditation
 agency
- Local Council.

2. Planning and preparation

Growers able to demonstrate how they manage risk in the growing environment can readily respond to end consumer information requests and achieve certification under quality assurance programs.

The existence of plans and operating procedures (including certification and audit details) underpin product assurance. Preparation of a Farm Biosecurity Plan, Property Risk Assessment or Food Safety Management Plan enable hazard identification, risk management planning and training of staff to be put in place. For specific animal health and biosecurity planning, see the <u>AquaWatch</u> and <u>DiseaseWatch</u> guidance material and templates produced by the <u>Department of Agriculture</u>, <u>Fisheries and Forestry</u>.

By recording inputs to the growing environment, it's possible to trace product claims and authenticate compliance with regulatory requirements for documentation of chemical usage applied to the growing environment. Recording of supplier details and application to the growing environment supports the speed and accuracy of product recalls.

Industry Assurance Programs

The <u>Global Seafood Alliance</u> (GSA) has created the <u>Best Aquaculture Practices</u> (BAP) certification, which covers hatcheries, farms, feed and processing activities in aquaculture. This certification has also been recognised globally by the Global Food Safety Initiative and is equivalent to the ISO 22000 standard for food safety. GSA also holds the <u>Best Seafood</u> <u>Practices</u> certification for wild catch supply chains.

The <u>Marine Stewardship Council</u> (MSC) provides a certification for sustainable wild caught seafood. The <u>Fisheries</u> and <u>Chain and Custody</u> standards from MSC support traceability and apply along the supply chain. The <u>Aquaculture</u> <u>Stewardship Council</u> (ASC) provides a certification for aquaculture operations which includes traceability requirements.



Retail supplier standards

Supplier requirements relate to Business-to-Business (B2B) customer pre-qualification and standards. Commonly certification by third parties are required alongside specific supply chain traceability obligations associated with retail supply programs. Work is underway to streamline retailer requirements into one standard for seafood with responsible sourcing as the impetus.

Tasks related to traceability

- 1. Prepare a property risk assessment
- 2. Prepare a Biosecurity Plan
- 3. Certification with industry standards and supplier requirements
- 4. Conduct regular audit/inspection to update operating procedures.

Participants

- Production Manager aquaculture (marine, coastal, land-based and near on-shore) and wild catch
- Environmental Health & Safety Manager
- Quality Manager
- Quality Consultant
- Compliance Specialist
- Materials Manager
- Materials Specialist
- Administrative Staff
- Operations Staff
- Risk Auditor
- Risk Inspector
- Biosecurity Auditor
- Biosecurity Inspector
- Natural Resource Management Agency
- Environmental Protection Agency
- Biosecurity Agency.

3. Aquatic animal stocking and growth

In aquaculture or captive growth of animals, stock for breeding may be captured from wild, purchased from an off-site hatchery, or bred in on-site facilities. These activities are regulated, requiring an authority to access wild stock fisheries and relocate brood stock.

Import and translocation of aquatic animals during their growth period

Movement of animals between grow sites as fry, fingerlings, juveniles for stocking and grow out requires authorisation from fisheries agencies.

The National policy guidelines for the translocation of live aquatic animals (2020) states:

"Aquatic animal translocation must be controlled because the spread of diseases and pests in open aquatic environments is difficult to manage and often irreversible. Translocation of species that may interbreed with local populations can alter genetic make-up, particularly within isolated populations that may have limited genetic exchange with other populations. Genetic status and differences between populations may not be understood and, even if they are, potential impacts of translocation on population genetics can be difficult to predict."

Animal identification

Identification of the aquatic animal species and origin, creates the source/origin for the product that can be shared through the chain of custody of the product through to the end consumer. A unique identity that can be associated with the origin location can move with the product along the food supply chain, allowing it to be tracked at various points, including when it is further transformed through to consumption.

This process provides identification of animals born or brought to the farm and identification of variety, quantity, supplier, certification, date of receival and location in grow out, production unit and ranching sites. Where it is unrealistic for individual products to be uniquely identified, batch/lot numbers and pond/culture unit/ dropper/raceway identification is required for industry assurance certification audit. Each production cycle and production unit require unique identification, recording of its size and volume.

Comingling of certified supplier animals with non-certified should be avoided, so the identity of stock and location on farm is vital.

Tasks related to traceability

- Identification of aquatic animals born on or brought to the farm e.g. hatchery lots, brood stock
- 2. Recording of source, variety, quantity, and date of receipt of inputs to growth of the animals
- Identification of individual animals or lots of spats/fingerlings allocated to pens, ponds.

Participants

- Property Owner
- Producer
- Production Manager
- State biosecurity agency.

4. Farm inputs and monitoring

Records for monitoring and managing the growth of aquatic animals in the production site are usually held in *Farm Records*, which may be kept in electronic farm management systems or paper-based records. Recording inputs to growth includes materials such as veterinary chemicals, water quality additives, animal feed, other agricultural chemicals.

Traceability of inputs to the growth of farmed aquatic animals include source and usage of:

- Feedstock
- Water
- Chemicals used in the grow environment and for individual animals.

Data on *withholding periods* in relation to the use of a chemical product is critical to traceability. A withholding period is the minimum period that needs to elapse between the last use of the product and the harvesting of animals. This is recorded to ensure that product residues fall to or below the maximum limit that the <u>Australian Pesticides and Veterinary</u> <u>Medicines Authority</u> (APVMA) permits.

Import of fishing or aquaculture feed or bait, processed or live, requires an application through the <u>Biosecurity Import Conditions</u> system (BICON).



Tasks related to traceability

- 1. Record purchase, receipt and application of inputs to the growth of the product
- 2. Record supply and usage of treatments to water and animals
- 3. Monitor and report disease incursion.

Participants

- Property Owner/Producer
- Production Manager
- Environmental Health & Safety Manager
- Quality Manager/Quality Specialist
- Compliance Specialist
- Administrative Staff
- Operations Staff
- Water Company
- Fertilizer Supplier
- Chemicals Supplier
- Veterinary services supplier
- Feed Supplier.

5. Catch and harvesting

In aquaculture operations, harvesting involves amassing the mature product once it has reached specified standards for sale.

For some products, individual identification is already enabled through tagging and readers. For other products, identification may be via cases, tubs, bins, cartons or trays which link grow sites, harvested product and these containers.

Wild catch fisheries

Catch quotas to sustain species fisheries are detailed by Commonwealth and state fisheries agencies. Key means to trace harvests include:

- Vessel tracking and monitoring
- Catch records
- Species and fishery identification by laboratory
- Tagging of catch.

Vessel tracking requirements

Vessel Monitoring System (VMS) are used to monitor the position, bearing and speed of commercial fishing vessels. It enables shorebased fisheries monitoring and protection of quota fisheries.

Northern Territory

NSW Fisheries Harvest Strategies (2021)

QLD Fisheries Act 1994, Fisheries (General) Regulation 2019 and Fisheries (Commercial Fisheries) Regulation 2019. Vessel tracking device is required on all vessels fishing in listed fisheries.

South Australia VMS is implemented in the:

- Miscellaneous fishery for licence holders fishing for giant crab
- Southern Zone Abalone fishery
- The VMS is implemented for boats over 7.5 metres in the:
- Northern Zone Rock Lobster fishery
- Sardine fishery.

Tasmania VMS is required for vessels that are:

 packaged with a fishing licence (giant crab) that has 15 or more giant crab quota units

- abalone mother boats
- undertaking abalone fishing trips as a mother boat and start a trip to take blacklip abalone outside the Bass Strait or northern area and conclude that trip outside the Bass Strait area or conclude a trip outside the northern area in which blacklip abalone was taken in the northern area
- participating in an open scallop season or are undertaking scallop surveys.

<u>Victoria</u>

Western Australia

Wild Catch reporting

Catch reporting in Commonwealth fisheries

The <u>Australian Fisheries Management Authority</u> (AFMA) is responsible for the management of Commonwealth fisheries, including catch quotas, catch reporting and monitoring of illegal, unreported and unregistered (IUU) fishing under international agreements.

Tracking fishing vessels is undertaken by satellite monitoring, with fishing boats required to have location transmission devices on at all times while at sea. Tracking the catch is undertaken through electronic logbooks, a Catch Documentation Scheme, electronic monitoring, observers, audits and inspections. On landing, the fishing permit holder, statutory fishing right holder, or a nominated authorised person is required to complete a catch disposal record form detailing the species caught and their accurate weight. Depending on the fishery, operators may also have to record the number of boxes of each fish consigned and usually the processing state (whole weight, headed, gilled/gutted etc) in which the fish were landed and the number of shark carcasses.

- The fishing operator keeps a copy of the completed and signed form, forwards the original to AFMA and sends the remaining two copies with the fish to the fish receiver.
- 2. On arrival at the first fish receiver, who must hold a fish receiver permit, the fish must be weighed and the fish receiver (who may be a processor, retailer or fish market) must record the species and weights (and shark carcass numbers) and sign the copy of the form consigned by the concession holder with the fish.
- **3.** The receiver forwards a copy of the form to AFMA and keeps the third copy on the premises, where it may be inspected if required.

Source: AFMA Catch Disposal records

Electronic monitoring (e-monitoring) is a system of video cameras and sensors capable of monitoring and recording fishing activities, which can be reviewed later to verify what fishers report in their fishing logbooks.

These systems are now compulsory for most commercial fishing boats in the Eastern Tuna and Billfish Fishery, the Western Tuna and Billfish Fishery, the Gillnet, Hook and Trap fishery and the Midwater Trawl Sector of the Small Pelagic Fishery.

Source AFMA Electronic monitoring

Catch reporting in State fisheries

Catch reporting is required in nominated fisheries in each state, often those with catch quotas. Reporting on catch for effort enables harvest strategies to be effective and for trends in catch to be recorded. In recent years electronic reporting in real/near time has been enabled by reporting applications that utilise mobile communications or voice recordings, transitioning from the manual logbook system data entry.

Northern Territory Commercial fishing logbooks | NT.GOV.AU

New South Wales Catch reporting Fish Online tool

Queensland

If you are a commercial fisher or harvester you must <u>contribute daily data</u> about your catch, including the location fished, your fishing method and the time spent fishing. You are legally obliged to record this information in a daily logbook or via the automated interactive voice response system.

The information from logbook/electronic/ voice recording returns is used for fisheries management and research purposes.

- retained catch
- discarded catch (in certain logbooks)
- time spent fishing
- location catch was taken
- fishing equipment used
- interactions with threatened, endangered and protected animals.

Quota fisheries

Landing location

codes or common name/GPS coordinates

Transport vessels used to transfer catch to shore – codes of registered vessels

Catch reporting

Tasmania commercial fishing; fishing licenses and catch reporting

Victoria PrimeSafe wildcatch ; fishery licenses

Western Australia Fish Eye catch reporting tool

Export catch certificates

For wild catch exports a Catch Certificate is required for import by many jurisdictions tackling illegal, unreported and unregistered fishing. See Manual of Importing Country Requirements (Micor) for information on Catch Certificate requirements.

Aquaculture harvest reporting

Each state issuing agency requires annual harvest reporting from aquaculture licensees. Common elements relate to stock management, translocation of animals, disease management, sales and production volumes.

Participants

- Authorised reporter to fisheries authority
 (Vessel master, farm manager)
- Production Manager
- Administrative Staff
- Operations Staff/crew.



6. Provenance Verification

Provenance of animals caught or grown in fisheries, pondages and leases is recorded to meet regulatory requirements. It is also a keystone of proof of sustainable production and responsible fisheries management in Australia, underlying the reputation of the seafood industry.

Linking proof of the *source* and *species* in a traceability system provides assurance to end consumers that the species and the origin is as claimed. The ability to achieve this for export product is a means to protect brands in international markets.

Verifying provenance (species and source) can be achieved through analysis of the chemical composition of a sample from the animal, consisting of trace elements, isotopes, chemicals, and molecules. Markers from the underlying soil, geology and water are quite specific to a location.

Sampling from the animal and location creates a unique "fingerprint", used for verification of origin of samples collected from the market. The following figures demonstrate the process of provenance verification.

Figure 1: Provenance Verification process



SAMPLES ORIGINATING FROM THE SAME SOURCE FORM A CLUSTER THAT COLLECTIVELY INDICATE A SINGLE SOURCE OF ORIGIN.



Source: Source Certain, 2022

Individual ponds and fisheries from which the animal was sourced can be confirmed against "in market" samples.

Attaching provenance verification results to supply chain traceability system

Provenance verification may be linked to the product along the supply chain via labelling on individual product tags e.g. lobster, tuna; or packed batches such as fish or prawns that are sent direct to market, in this case without further processing.

The label may be a QR code, 2D barcode or Digital Link code, which allows a customer or end consumer to scan the symbol/code and verify the provenance and origin certification for the product. Application Identifiers in GS1 Digital Link include:

- Expiry / Best before date
- Serial Number
- Production Date
- Package Date
- Catch Area
- Harvest Date
- Certification Reference.



7. Post-harvest handling

Post-harvest activities may include:

- Tagging of retained catch
- Separation of by-catch and non-target species
- Cleaning, gutting, scaling of fish
- Sorting for size
- Weighing of retained catch
- Rapid cooling or freezing
- Allocation to storage areas and
- Packing into cartons for sale or storage once landed
- Trans-shipment of the catch from fishing vessel to processing vessel or to land-based processing facilities may take place.

On-vessel processing

The first step in transformation of the animal, onvessel processing may be limited to protection of the integrity of the product for landing, transshipment, and further processing. The catch may be trans-shipped to a processing vessel at sea for direct shipment to an international landing port or packaged fully processed from the fishing vessel to a landing port.

Packaging

Packaging lots in use for whole animal or portion packing should be traceable. As they come in contact with the product, they may carry substances that pose a threat to the consumer. Recording of lot number, supplier and usage dates enables trace back.

Labelling

Labelling requirements are dependent on the level of processing and whether the product is at an initial processing or finished stage. The food label is required to contain a range of information. Highlighted items relate to traceability:

- Name of the product/species
- Unique identifier for the individual item, lot or batch processed
- Processed date and use by date
- Description of the ingredient or ingredient listing
- Description of allergens
- Instructions for storage and preparation e.g.
 temperature range
- Country of origin information
- Warning and advisory statements
- Relevant nutritional information
- Information about weights and measures (volume and quantity)
- Name and address of the processor.

For finished goods (consumer-ready), the allocation of a new unique identifier for the finished item or product unit is needed. This identifier, known as a <u>global traceable item</u> <u>number</u> (GTIN) is most readily applied in the labelling or tagging of the product.

Trans-shipment of wild catch

Records of registered trans-shipment vessels are required in Commonwealth fisheries and in each state. Registration depends on the size of the trans-shipment vessel or lighter.

For traceability, the date of trans-shipment, vessel identification and location record the activity.

Landing and unloading of wild catch

Identification of the port at which the product is landed, the vessel and the date of landing provide information on the catch being landed and changing custody. From the point of landing, traceability is focused on the information attached to the product and the labelling of the product unit, carton, pallet.

Initial processing of aquaculture for further processing

Where an aquaculture operation supplies animals that have been scaled, gutted, cleaned in the initial processing on-farm post-harvest, the farm forwards information regarding the harvested animals to further processors, should include information such as:

- Farm name
- Aquaculture licence number
- Farm certification/s
- Species (common and scientific name)
- Production method
- Production unit identification
- Source of brood stock, fingerlings, spat of the animals for processing
- Date of harvest from the production unit/s
- Average size and number of harvested animals, total net weight and unit of measurement (kg or tonne)
- Associated feed records
- Chemical treatment records
- Health Certificate for animal/lot of animals.

Participants

- Farm administrative staff
- Farm operations staff.

8. Sale and dispatch

Product dispatch is usually triggered by a sales contract or a transfer to a further processing plant. Information detailing the sale is detailed in a Purchase Order or a Transfer document.

Tasks related to traceability

- Receive Purchase Order from buyer
- Confirm product availability in inventory
- Validate Purchase Order
- Create Sales Order
- Create picking list
- Pick order
- Pack product
- Apply logistics label (carton, pallet)
- Complete outbound documentation e.g. product inspection and health declarations, Advance Shipping Notice to Customer, Processor Compliance Declaration and Transfer Declaration for export product under Authorised Arrangement
- Complete transport documentation e.g. Transport Instruction, Delivery Order
- Record outbound product in inventory balance
- Move product to load out area
- Load product
- If loading a shipping container or airfreight unit load device (ULD), affix seal and record seal number on Bill of Lading/Airway Bill.

Participants

- Consignor (producer shipping the product)
- Consignee buyer or 3rd party e.g. cold storage
- Administrative Staff
- Operations Staff
- Inspection and compliance staff
- Refrigerated Transport Operator
- Driver.

Critical Tracking Events and Key Data Elements

For each of the identified on-farm production activities, *critical tracking events* (CTEs) establish identity and enable traceability and compliance with traceability-related regulation.

CTEs are events that relate to the identity, movement and transformation of the food product.

Seafood Production – Wild Catch and Aquaculture				
Activity	CTE code	Critical Tracking Events (CTEs)		
Establishment	SP CTE1	Create Master Data		
	SP CTE2	Licencing, Authorisation		
	SP CTE3	Food Safety Accreditation		
Planning and Preparation	SCICTE4	Property Risk Assessment		
	SP CTE5	Biosecurity Management Plan		
	SP CTE6	Certification with industry standards and supplier requirements		
	SP CTE7	Conduct regular audit/inspection to update operating procedures		
Aquatic animal stocking and growth	SP CTE8	Animal identification		
	SP CTE9	Import and translocation of animals		
	SP CTE10	Inputs to animal growth		
Catch and harvesting	SP CTE11	Vessel tracking and monitoring		
	SP CTE12	Catch and aquaculture production reporting		
	SP CTE13	Provenance verification		
	SP CTE14	Individual catch tagging		
Post-harvest handling	SP CTE15	Scaling, gutting, cleaning, initial processing		
	SP CTE16	On-vessel/on-farm processing		
	SP CTE17	Packaging and Labelling		
Trans-shipment	SP CTE18	Trans-shipment tracking		
	SP CTE19	Landing		
Port landing	SP CTE20	Unloading of product		
Sale and dispatch	SP CTE21	Receive Sales/Purchase Order		
	SP CTE22	Issue Sales Receipt		
	SP CTE23	Small volume fresh seafood sales direct from the boat		

Key data elements

Key Data Elements (KDEs) ensure that captured and recorded data can be interpreted and used as relevant and required by all supply chain partners. Key Data Elements define Who, What, When, Where and Why for each Critical Tracking Event.

It is important to ensure consistent capture of information that forms the basis of enabling data sharing along the seafood supply chain.

A typical KDE is represented as follows:

CTE: Dispatch

Dispatch	
Who	Distributor/Wholesaler
What	Customer Purchase Order, Delivery Note, ASN number, Logistics/Pallet ID (SSCC) Product ID, Quantity, Batch, Date Information, Shipment number
When	Date/Time of Despatch
Where	Dispatch location
Why	Dispatch of product

Event code	СТЕ	Key data elements
SP CTE1	Create Master Data for producer, suppliers, customers, assets	 Australian Business Number Name and address – Human readable required for labelling on products/lots/batches. Vessel name and registration number Flag state of the vessel (if on national registry) trans-shipment Vessel Name trans-shipment Vessel Unique Vessel ID trans- shipment Vessel Registration trans- shipment Vessel Flag Global Location Number GPS coordinates/geotag Unique identifiers for production units, gear, logistics units e.g. pallets, tubs
		 Global Location Number (GLN) Unique ID for logistics units - serialised shipping container code (SSCC) Unique product identifiers (GTIN)
SP CTE2	Licensing, authorisation	 Export Establishment Licence number Aquaculture Licence number Commercial Fishing Licence number (Commonwealth or State)
		Information to be shared for supply chain traceability Export Establishment Licence number Aquaculture Licence number Commercial Fishing Licence number (Commonwealth or State)
SP CTE3	Food Safety Accreditation	 Food Safety Accreditation/Licence number Information to be shared for supply chain traceability
SP CTE4	Complete Property Risk Assessment	 Food Satety Accreditation/Licence number Risk Assessment (land, security, natural disaster, acce etc)
		Information to be shared for supply chain traceability Document code for Risk Assessment
SP CTE5	Prepare Aquaculture Biosecurity Management Plan	 Aquaculture Biosecurity Management Plan Standard Operating Procedures for the site Information to be shared for supply chain traceability Document code Biosecurity management Plan Document code/s for traceability SOPs

Event code	СТЕ	Key data elements	Event code	СТЕ	Key data elements
SP CTE6	Certification to industry standards and	- Certificate number	SP CTE10	Inputs to animal growth	Feed (Ranched/Aquaculture)
	supplier codes	- Certifying body			– Supplier name
		– Expiry date			- Supplier location
		Information to be shared for supply chain traceability			- Product name/ID code
		 Certifying body 			- Date of receipt
		– Expiry date			- Product expiry date
SP CTE7	Regulatory audit/Industry code/	- Date of last completed audit			– Batch/lot number
	supplier standard audit	- Standard/Code audited			– Usage record
		 3rd party auditor name and contact 			Bait (Wild Catch)
		– Result			- Supplier name
		- Corrective action schedule			- Supplier location
		 Current Standard Operating Procedures (SOPs) related to traceability 			- Date of receipt
		Information to be shared for supply chain traceability			- Product name/ID code
		 Document code for SOPs related to traceability 			- Product expiry date
SP CTE8	Animal identification	Lot/batch number - incoming from hatchery			– Batch code
		 Species (common and scientific name) Number of animals received 			Water chemical treatments
		 Pondage, grow out area, production unit allocation ID 			– Supplier name
		 Fishery code/symbol 			- Supplier location
		- Provenance verification certificate code			- Chemical name and composition
		Information to be shared for supply chain traceability			- Date of receipt
		 Species Lot/batch number of received stock 			 Expiry date of product
		 Date of receipt 			- Application rate
SP CTE9	Import and translocation of animals	- Import or translocation licence/approval number			- Period of application
		Information to be shared for supply chain traceability			- Application date
		- Import or translocation licence/approval number			Veterinary chemicals
					- Supplier name
					– Supplier location
					- Date of receipt
					- Product name and composition
					- Product expiry date

Event code	СТЕ	Key data elements	Event code	СТЕ	Key data elements
SP CTE10		- Application rate	SPCTE12		- Gear used
Continued		- Period of application	Continued		- Interactions with endangered species
		Water			- Fishing licence number
		- Supplier name			- Number of pots entitled
		- Supplier location			 Name of person reporting
		- Water source			– Master's full name
		- Date of receipt			Aquaculture production
		- Water usage record			- Annual Production Report availability
		Information to be shared for supply chain traceability			- Species
		- On request e.g. product recall/biosecurity incident			- Aquaculture Licence number
SP CTE11	Vessel tracking and monitoring	 Fishery Harvest Strategy document URL 			- Licence holder name
		- Availability of catch coordinates			- Reporting period
		- Vessel trip dates			 Movement of animals onto licensed area - source,
		- Catch date			species, average weight, number, total weight, mortality
		 Vessel monitoring and tracking authority e.g. AFMA; DAF Fisheries QLD 			 Movement of animals from licensed area - destination, species, total weight
		Information to be shared for supply chain traceability			- Feed input
		 Fishery Harvest Strategy document URL 			Information to be shared for supply chain traceguility
		 Availability of catch coordinates 			 Date of catch
		- Vessel trip dates			 Species of retained catch
		- Catch date			 Serialised ID of individual animals
		 Vessel monitoring and tracking authority 			 Weight or number of retained catch
SPCTE12	Catch and aquaculture production	Wild catch			 Fishery name, symbol, code
	reporting	 Production method (spectrum in wild catch) 			 Provenance verification certification code
		- Date of catch			Annual Aquaculture Production Report availability
		 Retained catch – species, number, weight 			
		- Discarded catch			Lot/ Batch code
		- Time spent fishing (number of fishing days)			
		- Fishery zone name/symbol/code			

Event code	СТЕ	Key data elements	Event code	СТЕ	Key data elements
SPCTE13	Provenance Verification	- Species	SPCTE15	Initial processing	- Date of initial processing
		- Production method			– Product form
		- Origin/harvest location			 Retained weight
		Information to be shared for supply chain traceability			- Species
		- Document code for analytical testing results			- Number of animals
		- Verifier credentials			 Production/fishing method
SPCTE14	Individual catch tagging (shellfish)	On tag			Information to be shared for supply chain traceability
		 date and time of harvest 			 Date of initial processing
		- name of harvest area from which shellfish were taken			 Product form
		– tag ID number			 Retained weight
		Catch Record			- Species
		 name and address of business under your licence 			- Number of animals
		- unique batch ID number (Product Record number)			 Production/fishing method
		- name of harvest area from which shellfish were taken	SPCTE16	On-vessel/on-farm processing	On-vessel
		- date of harvest			 Country of Origin
		 species and quantity of shellfish 			– Fishery location
		- a statement of the conditions under which shellfish			– Weight
		should be stored (e.g. 'keep refrigerated' for Pacific ovsters and mussels)			- Tub/carton ID
		 the country of origin (e.g. 'product of Australia'. This 			- Processing date
		is not required if the word 'Australia' is in the business			– Expiry date
		adaress).			- Certification/s
		Information to be shared for supply chain traceability			- Frozen/unfrozen product
		Catch Decard number			- Species
					– Quantity
		- Product Identifier			On-farm further processing
					- Country of Origin
					 Name and address of site
					- Quantity
					Weight and unit of measure
					- Processing date
					- Expiry date

SPCTE16 - Certification/s (BAP/ASC/FSSC 22000) SPCTE18 Trans-shipment tracking - trans-shipment location (at set - trans-shipment date - Product Form - Species - trans-shipment Vessel Name - trans-shipment Vessel Name - Animal ID/GTIN or batch/lot serial number - Animal ID/GTIN or batch/lot serial number - trans-shipment Vessel Name Information to be shared for supply chain traceability - All above - All above - trans-shipment Vessel Flag Packaging and labelling Packaging - Packaging supplier name - Packaging supplier name - trans-shipment vessel ID	ea or landed) Vessel ID trans- ply chain traceability 2a or landed)
Continued - Product Form - trans-shipment date - Species - Animal ID/GTIN or batch/lot serial number - trans-shipment Vessel Name - Animal ID/GTIN or batch/lot serial number - trans-shipment Vessel Name - trans-shipment Vessel Name - All above - All above - trans-shipment Vessel Flag - Packaging and labelling Packaging supplier name - trans-shipment location (at-set - Source/location of supplier - Source/location of supplier - trans-shipment vessel ID	Vessel ID trans- >ly chain traceability a or landed)
SPCTE17 Packaging and labelling - Species - Animal ID/GTIN or batch/lot serial number - Animal ID/GTIN or batch/lot serial num	Vessel ID trans- ply chain traceability a or landed)
SPCTE17 Packaging and labelling - Animal ID/GTIN or batch/lot serial number - trans-shipment Vessel Registration SPCTE17 Packaging and labelling Packaging - All above - trans-shipment Vessel Flag - All above SPCTE17 Packaging and labelling Packaging - Source/location of supplier name - Source/location of supplier - trans-shipment location (at-sel - trans-shipment vessel ID	Vessel ID trans- ply chain traceability 2a or landed)
SPCTE17 Information to be shared for supply chain traceability All above Packaging and labelling Packaging supplier name Packaging supplier name Source/location of supplier trans-shipment Vessel Flag trans-shipment location (at-se trans-shipment date trans-shipment vessel ID 	ply chain traceability ea or landed)
SPCTE17 Packaging and labelling Packaging - Packaging supplier name - Source/location of supplier Information to be shared for supplier - trans-shipment location (at-se - trans-shipment date - trans-shipment vessel ID	ply chain traceability ea or landed)
- Packaging supplier name - Source/location of supplier - Source/location of supplier - trans-shipment vessel ID	ea or landed)
 Source/location of supplier trans-shipment vessel ID 	
– trans-shipment vessel ID	
- receipt date	
- Lot/batch number of packaging	me at port of discharge
- Landing/port name	
 – Species/product name (Common & Scientific) 	
 Serialised identifier – lot, batch, item Information to be shared for support vessal arrival time 	ply chain traceability
 Name and address of supplier Landing/port name 	me at port of discharge
- Date of processing	
- Expiry/Use by/Best Before date	
- Country of Origin	J
- Weight/quantity	
For fully processed on-vessel product – List of any added ingredients – Catch Disposal Record number	۲
- Nutritional information	ply chain traceability
 Warning – allergens, intolerances 	
- Item ID/GTIN	r
 Date of landing 	
- Species/product name (Common & Scientific) SPCTE21 Receive Sales/Purchase order - Purchase Order number	
 Serialised identifier – lot, batch, item Packing list code 	
 Name and address of supplier Consignment/Delivery Order n 	lumber
- Date of processing	ply chain traceability
- Expiry/Use by/Best Before date	numbor
- Product form	univer
- Country of Origin	
- Weight/quantity	

Event code	СТЕ	Key data elements	Ap
SPCTE22	Issue Sales Receipt	 Wild catch Receiver/buyer name and address Receiver licence number Receiver Export Establishment number Date of sale Price per kilo/unit and total sale value Number of tubs/carton/pallets Species - name and net weight (whole or carcass) and total number of each species sold Description of the form of the fish sold and how they have been processed Sales Receipt number/unique sequential transaction number Fish Movement Record Full name and address of seller Fisher Licence Number/Permit Number 	Adop throu proc Trac Date Loco Lege
		 Aquaculture Receiver/buyer name and address Receiver licence number Receiver Export Establishment number Date of sale Number of tubs/cartons/pallets Species name and net weight (whole or carcass) and total number of each species sold Description of the form of the fish sold and how they have been processed Sales receipt number/unique sequential transaction number Name and address of seller Aquaculture Licence number Unique business identifier/GLN 	Prod Iden Trac Attri
SPCTE23	Small volume fresh seafood sales direct from the boat	Information to be shared for supply chain traceability Unique sales receipt number License number of seller (sales to public and to restaurants under 2 tonne per annum) Information to be shared for supply chain traceability Seller Licence Number Weight of seafood purchased Species Date of sale	Logi

Application of data standards

Adoption of *global data standards* in supply chains enables data sharing between businesses through using common formats. These formats allow a business to identify participants, locations, products, processes and events in the supply chain. **See Module titled Data Standards for Seafood Traceability for more information**.

Data standards that apply to key data elements and shared information are identified in this section.

Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Location/ Legal entity	Farm location Legal entity that owns mill, hatchery, farm, or processor	Global Location Number (PGLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here: www.gs1.org
Date/Time	Date of registration, Date of harvest Date of processing	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent approach. The globally adopted standard for date recording is YYMMDD
Product Identifiers	Input materials such as chemicals, spat, brood stock Outputs- Animals	Global Trace Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system. Information on how to allocate a GTIN Information on when to change a GTIN
Traceability Attributes	Batch, Serial Number, Production Date		AN20	Traceability Attributes, such as Batch or Lot Number, Serial Number, Production Date etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain. Also referred to as Application Identifiers, each
				has its own unique identifier and format. List of Application Identifiers:
Logistics units	Shipments	SSCC	N18	Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain.
				Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products



Adding attributes to identifiers such as QR codes/2D barcodes can be found in the GDST <u>Global</u> <u>Dialogue on Seafood Traceability Core Normative Standards V1.1 March 2022</u> and the correlating <u>GS1</u> <u>Foundation for Fish, Seafood and Aquaculture Traceability Guideline Release 1.3 2019</u>.

The following examples indicate various attributes that relate to seafood production that may be included in the identifier codes or labels:

Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Farming method	Extensive Semi-Intensive Intensive	code	Aquaculture method GS1 CVB attribute	Aquaculture methods and practices
Country of Origin	Batch/lot level		N3	See <u>GS1 Foundation for Fish, Seafood and</u> Aquaculture Traceability Guideline 5.9.2
Fish presentation				Commission Implementing Regulation (Eu) No 404/2011
Product form	Trade Item condition	code		<u>GS1 Global Data Dictionary</u>
Certification	Industry certification		CBVCN_18	A document confirming certain characteristics of an object (e.g. product), person, or
Provenance verification certificate	Product verification	cert		organisation, typically issued by a third party.
Species		code	Species for Fishery Statistics purposes Code	Scientific (Latin) name of the seafood.

Useful links

Fisheries Management and Regulation

<u>Australian Department of Agriculture, Fisheries</u> and Forestry

Australian Fisheries Management Authority (AFMA)

Australian Maritime Safety Authority (AMSA)

<u>Great Barrier Reef Marine Park Authority</u> (GBRMPA)

<u>New South Wales Department of Primary</u> Industries – Fishing

Northern Territory Department of Primary Industry and Resources – Fisheries

Queensland Department of Agriculture and Fisheries

South Australian Department of Primary Industries and Regions SA (PIRSA) – Fisheries and Aquaculture

Tasmanian Department of Primary Industries, Parks, Water and Environment – Sea Fishing and Aquaculture

Victorian Fisheries Authority (VFA)

Western Australia Department of Primary Industries and Regional Development – Fisheries

Vessel registration

Australian Maritime Safety Authority www.amsa.gov.au

Northern Territory – fishing vessel registration

New South Wales – In NSW, maximum fishing boat lengths have been extended and fisheries access has been limited by vessel size. Licensing of smaller vessels is no longer necessary.

Commercial fishing business efficiency program

Queensland – All boats used in connection with any commercial, government or research activity require <u>certification</u> under the Marine Safety (Domestic Commercial Vessel) National Law Act 2012 (the national law) to operate in Queensland.

South Australia – <u>licensing and registration forms</u>

Tasmania – <u>commercial fishing licences</u>

Victoria - License forms and permits

Western Australia – <u>License forms</u>

Operating Licences/fisheries access

<u>Australian Fisheries Management Authority</u> (for Commonwealth waters and large-scale operations) <u>AFMA forms</u>

- ACT commercial fishing license
- NT <u>commercial fisheries licenses</u> <u>Aboriginal Coastal Fishing Licence</u> <u>Commercial aquaculture license</u>
- NSW Licensing forms
- QLD https://www.business.qld.gov.au industries/farms-fishing-forestry/fisheries/ licences

https://www.business.qld.gov.au/ industries/farms-fishing-forestry/fisheries/ aquaculture/policies-licences-fees SA <u>https://www.pir.sa.gov.au/</u> primaryindustry/commercial_fishing

> https://www.pir.sa.gov.au/primary industry/aquaculture/leasing and_licensing

- TAS <u>www.service.tas.gov.au</u> www.nre.tas.gov.au
- VIC <u>Aquaculture licence</u> Commercial fishing licence
- WA Operators in commercial fisheries and aquaculture in Western Australia must be licensed by the Department of Primary Industries and Regional Development. (Licensing forms)

Food Safety

This global food safety standard is used by many multinational food companies and is benchmarked by the <u>Global Food Safety</u> <u>Initiative</u> (GFSI). <u>Global Standard Food Safety</u>, <u>BRCGS Issue 9 August 2022</u>

Food Safety Australia and New Zealand Food Standards for Primary Production and Processing. Chapters 3 and 4 of the Food Safety Standards.

SafeFish provides technical advice to support Australia's seafood trade and market access negotiations and helps to resolve barriers to trade. It does this by bringing together experts in food safety and hygiene to work with the industry and regulators to agree and prioritise technical issues impacting on free and fair market access for Australian seafood. SafeFish fact sheets

Australian Shellfish Quality Assurance Program

New South Wales

NSW Food Act 2003 is administered by the NSW Food Authority, with the object of ensuring food for sale is both safe and suitable for human consumption. A Food Authority Licence under the Food Regulation 2015 must be obtained for aquaculture stock destined for human consumption.

www.foodauthority.nsw.gov.au

Queensland

Accreditation is required by Safe Food Queensland and businesses are required to implement an agreement based on the Seafood Safety Scheme.

- <u>Aquaculture</u>
- <u>Wild catch harvest</u>
- <u>Commercial fishing boat producer</u>
- Seafood Processor
- Producer or processor bivalve molluscs
- Live holding seafood
- <u>Seafood Cold Storage</u>

South Australia - Biosecurity and food safety

Tasmania - <u>https://nre.tas.gov.au/biosecurity-</u> tasmania/product-integrity

Victoria

- Food Safety Standards
- <u>Wild Catch and Aquaculture Food Safety</u>
 <u>Program</u>
- Seafood Processor and Further Processor Licence
- <u>Water supply</u>

Western Australia – <u>Biotoxin monitoring and</u> <u>management</u>

Biosecurity

National Biosecurity Strategy

https://www.biosecurity.gov.au/about/ national-biosecurity-committee/nbs

https://www.biosecurity.gov.au/business/fishercommercial

https://www.biosecurity.gov.au/business/ aquaculturist

https://www.biosecurity.gov.au/business/ processor

Northern Territory

www.nt.gov.au

NSW www.dpi.nsw.gov.au

Queensland www.asia.com.au

South Australia https://pir.sa.gov.au/biosecurity/aquatics

Tasmania https://nre.tas.gov.au/biosecurity-tasmania/ aquatic-pests-and-diseases

Victoria www.vfa.vic.gov.au

Western Australia www.fish.wa.gov.au

Translocation of aquatic animals

Northern Territory https://nt.gov.au/_data/assets/word_ doc/0010/200206/application-for-themovement-of-fish-or-aquatic-life.docx

NSW www.dpi.nsw.gov.au

Queensland www.business.qld.gov.au www.publications.qld.gov.au

South Australia

Tasmania www.ifs.tas.gov.au

Victoria

www.vfa.vic.gov.au

Western Australia www.fish.wa.gov.au

Aquaculture harvest reporting/Annual Production Survey

New South Wales

Land-based aquaculture S7.13.3 An annual report may be required under your development consent, aquaculture permit, environmental protection licence and any other approval. The report may include matters relating to stock management including translocation issues, disease management, sales and production. www.dpi.nsw.gov.au

Queensland

www.publications.qld.gov.au

South Australia

EPA Environmental Monitoring Program (EMP) annual reporting. <u>www.pir.sa.gov.au</u>

Tasmania Home | Salmon Farming Data Portal

Victoria Aquaculture Production Returns (6 monthly)

Western Australia

Requirement to report under Regulation 64 of the Fish Resources Management Regulations 1995 to DPIRD Reporting Obligation – annual brood stock collection, mortality, environmental data, management and environmental monitoring (MEMP). Licence number, species, quantity and condition required. www.fish.wa.gov.au

Use of chemicals in aquaculture

National guidance and links to state requirements www.agriculture.gov.au

Provenance of seafood ANSTO www.ansto.gov.au



Glossary

Australian Fishing Zones

www.agriculture.gov.au

Figure 2: Australian Fishing Zones



Aquaculture

The cultivation of aquatic animals or marine vegetation for the purpose of harvesting the animals or marine vegetation, or their progeny for sale, or the keeping of animals or marine vegetation in a confined area for a commercial purpose.

Biosecurity Risk Management Plan

A document prepared to help you, your staff and visitors prepare for and understand how to reduce aquatic pest and disease risks to your aquaculture business, industry and the environment and to support a rapid response to any suspect pest or disease.

End-to-end traceability

Traceability is the ability to follow the movement of a product through stages of production, processing and distribution (ISO 2007).

Traceability is the systematic ability to trace the path of food ingredients and/or finished products throughout their entire lifecycle, using previously captured and stored records. These records catalogue key data elements (KDEs) at critical tracking events (CTEs).²

Food Safety Australia & New Zealand (FSANZ) defines traceability as "the ability to track any food through all stages of production, processing and distribution (including importation and at retail). Traceability should mean that movements can be traced one step backwards and one step forward at any point in the supply chain. For food processing businesses, traceability should extend to being able to identify the source of all food inputs such as raw materials, additives, other ingredients, and packaging."

At present, the key requirement is to be able to trace "one up and one down" in the chain of custody related to a food input or product.

Traceability may be achieved across a supply chain by combining the one-up/one down information from individual nodes or custodians, however it may not constitute a visibility capability of that particular supply chain. The data may be required to be held for regulatory purposes but not necessarily shared with other entities in the network to create visibility.

Global Dialogue on Seafood Traceability

www.traceability-dialogue.org

Growout

Stage and/or unit where the cultivation of aquatic animals is undertaken from initial seeding of young fry or juveniles up to harvesting of marketable sizes.

Illegal, unreported and unregulated (IUU) fishing

Illegal, unreported and unregulated (IUU) fishing is fishing which does not comply with national, regional or global fisheries conservation and management obligations. For more information see

www.agriculture.gov.au

Master Data

Master Data is the consistent and uniform set of identifiers and extended attributes that describes the core entities of the enterprise including customers, prospects, citizens, suppliers, sites, hierarchies, and chart of accounts (Gartner 2020).

Primary producer

A primary producer is an individual, partnership, trust or company operating a primary production business if they undertake plant or animal cultivation, fishing or pearling; and/or tree farming or felling.

Plant and animal cultivation includes:

- cultivating or propagating plants, fungi or their products or parts (including seeds, spores, bulbs and similar things) in any physical environment
- maintaining animals for the purpose of selling them or their bodily produce, including natural increase
- manufacturing dairy produce from raw material that you produced.

Fishing and pearling include conducting operations relating directly to:

- taking or catching fish, turtles, dugong, bêche-de-mer, crustaceans or aquatic molluscs
- taking or culturing pearls or pearl shell.³

¹ DAFF National Traceability
 ² Global Food Traceability
 ³ Australian Taxation Office





Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Freight Transport



Seafood Freight Transport

This module covers activities that generally take place in the transport segments of the food supply chain. In this module, the focus is on domestic/inland transport activities. Additional requirements are associated with freight transport for international shipments, related to documentation and port access. These are detailed in the Seafood Export and Import modules.

Transport may be owned by a food business (own transport), contracted via a transport company, or be supplied as part of an integrated offering by a supply chain/logistics service provider company.

Road transport accounts for the largest proportion of freight movement of food in Australia, however rail, air and coastal shipping are transport modes also deployed in food distribution. For most seafood products temperature control is critical, so refrigerated transport equipment is a requirement.

Transport is used on multiple occasions in food supply chains, given that seafood may be harvested in different locations from consumers. Wild catch is transported from the fishery via port of landing, or from freshwater harvest sites; aquaculture animals from production site to processing and/or manufacture off-site, then from the processing or manufacture site to storage facilities; and in distribution to retail/ food service. For many fresh food products, half of their post-harvest shelf life is spent in transit.¹ Multiple transits elevate the risk of product value being lost through shrinkage due to tampering, lost stock, temperature incursions and carton damage in transit, or through delays impacting best-before dates and shelf life.

In terms of freight transport associated with seafood, major flows of product consist of imported seafood, imported processed seafood and Australian harvested seafood distributed locally or exported. The reported average transport task associated with seafood is 1,800 kilometres, indicating the significance of the role of freight transport in Australia's seafood supply chains. The following excerpt from a Seafood Supply Chain Benchmarking Report prepared for the Commonwealth indicates the key seafood product flows in Australia.²



Figure 1: Typical seafood value chain (country agnostic) The seafood supply chain can be segmented into three key movements (referred to as 'flows' throughout this report)

- The first flow consists of imported chilled and frozen products (flow 1).
- The second flow consists of the movement of imported processed products (flow 2).
- The third flow consists of the movement of domestically caught or produced seafood to port for export or to domestic consumers (flow 3).

Australia's seafood supply chain transports c.340 kilotons (kt) of seafood annually (including salmon, barramundi, prawns and other fish) in a variety of forms including fresh/chilled, frozen and tinned. Australia's seafood is known internationally for its quality, as most high-value seafood is exported to international markets, with domestic consumption supplemented by imports. Seafood is moved large distances in Australia (c.1,800km on average), due to significant distances between key fishing areas and major urban centres, with road freight rates estimated to be AUD c.\$0.33 per tonne-km (tkm).

Source: Department of Infrastructure, Transport, Regional Development and Communications 2021

In this module, processes and activities are associated with seafood freight transport traceability. An additional element related to intermodal and multimodal freight transport indicates variations related to these operations.

For the purposes of this module, transfer vessels that bring wild catch harvests to land, or transfer animals to on-vessel processing facilities, are included in the Production Module.

- 1. Establishment
- 2. Transfers of seafood between export establishments under approved arrangements
- 3. Transport booking
- 4. Pick up
- 5. In transit tracking
- 6. Cross-docking
- 7. Delivery
- 8. Returns and salvage
- 9. Transport Asset /load unit traceability

10. Intermodal multimodal operations

¹ PMA-ANZ State of the Industry 2020

² LEK Consulting, 2021, Seafood Supply Chain Benchmarking Report, Department of Infrastructure, Transport, Regional Development and Communications

1. Establishment

Transport companies need to create unique identifiers to establish traceability of their business entity, location, transport assets and suppliers. These identifiers allow others in the product supply chain to connect transport activities and events accurately to create supply chain visibility.

These identifiers are incorporated into the Master Data a company uses on a regular basis in transacting with Consignors, Consignees and its own suppliers (fuel, vehicles, mechanics, etc).

Transport companies providing services to seafood will require licensing as a seafood transport with state safe food authorities. They define a seafood transport vehicle as:

Vehicles that distribute and/or transport seafood or seafood products, including:

- aquatic vertebrates (fish)
- aquatic invertebrates (crustaceans)
- Foods containing their products.

They do not include transport from retail premises to the consumer, or transport in a vehicle from which the seafood will be sold by retail.³

Tasks related to traceability

- Creation of unique identifiers for the business, location, transport assets and suppliers
- Creating unique and accurate Master data relating to regular Consignor identity and location and/or 3PL provider (warehousing)
- Providing unique entity identification and accurate Master data relating to regular

Consignee company (the business receiving the product)

- Apply for a seafood transport licence with state food authorities
- Meet food safety regulations set out by your safe food authority
- Prepare for regular food safety audits.

Participants

- Company Manager
- Unique identifier issuer e.g. GS1 Australia
- Suppliers
- Regular Consignors
- Regular Consignees
- State Food Authorities.

2. Transfers of seafood between export establishments under approved arrangements

A Transfer Declaration is used to consign seafood shipments for export between establishments under an approved agreement. This provides traceability for products entering countries requiring full traceability of imported products. This is not needed when the transfer is between facilities of the one entity, or for transfers direct to the air/sea terminal. It is required in the instance of 3rd party cold storage for export seafood prior to export shipment. See example opposite.

1
Company Name

Product

No XX Beach Rd Somewhere, Aust Ph: (0X) XXX XXXX Registered establishment no. 1234

Establishment of origin	Batch / Product code	Manufacture date	Number & kind of packages	Quantity	Net weight
		Specific import	ing country require	ments	

Transport company

Receiving establishment name	
Receiving establishment address	EU eligible (if applicable)
	Yes No
Receiving establishment registration number	

Temperature requirements of product while in transit:

□Must be kept frozen (keep at -18°C or less) □Must be kept chilled (keep at 5 °C or less) □Un-refrigerated

Date of departure	Estimated date of arrival

Declaration by despatching establishment

At the date that I, the undersigned make this declaration, the processed seafood product described above was manufactured in accordance with:

- 1. the prescribed export conditions, and any other export conditions that apply in relation to the seafood products under the Export Control Act 2020; and
- 2. importing country requirements relating to the seafood products have been met.

If no specific country has been nominated above, then the product identified in this declaration has been manufactured to the general export standard and not in accordance with any specific importing country requirement. Further information regarding importing country eligibility should be confirmed by contacting <name of company-*s.ie. your company*

I further declare the information contained in this declaration is true and complete Note: If you are EU listed as a seafood manufacturer then you must indicate if the product is EU eligible or not

Signed:	Printed Name:
Date:///	Position:
Note: The declaration can only be signed by a person listed in the company's approved arrangement as a person eligible to make such a declaration	

³NSW Food Authority Seafood Trasport Vehicles

3. Transport booking

Transport bookings are initiated by the grower/ fishing operator or wholesaler/processor, generally the supplier of the food product or a third party logistics provider (3PL) where the product is held in outsourced storage. In terms of freight transport, this business is named the Consignor of freight. Occasionally, a retailer may be both the consignor and consignee, organising or owning their own fleet to relocate product. A Consignee is the party receiving the product via freight transport.

Most transport companies have a website booking portal. If the transport booking is a regular occurrence, the Consignor business will create an account with one or more transport companies, depending on the nature of the transport task and the characteristics of the product. Transport companies may be specialised in a geography, the speed of delivery required, dimensions or weight of the freight, or the need to manage the cold chain of the product.

Tasks related to traceability

- Creating unique and accurate Master data relating to consignor identity and location e.g. 3PL logistics provider (warehousing)
- Providing unique and accurate Master data relating to consignee company (the business receiving the product)
- Providing correct information to the transport company on the consignment size, weight, quantity, content and specific requirements e.g. temperature, to ensure equipment is matched to the task
- Booking confirmation from the transport company, used as a tracking reference

- Creation of a Consignment Note containing detailed instructions and contract terms and conditions of transport
- Preparation of a Delivery Order for the Consignee which travels with the freight
- Affixing a Transport Label to the product carton/tub/pallet/container
- Notifying the Consignee of the pending shipment using an Advance Shipping Notice.

Participants

- The supplier of the food product or 3PL as Consignor of the freight
- The transport company/Logistics Service Provider (LSP) receiving and confirming the transport booking
- The customer as Consignee of the freight.

4. Pick Up

Based on a *transport booking confirmation* and *Delivery Order* being issued by the Consignor, the transport company will arrive to pick up the freight at the scheduled time. Some larger consignors have "gate in" records and may record the vehicle registration on arrival and departure. (See Figure 1 below).

Inspection of seafood transport vehicles

Records of inspection of vehicles pre-loading relate to the traceability of the source of contamination incidents and deterioration of products. Key to this inspection are temperature prior to loading and during transit, cleanliness and cleaning products used, and proof that the vehicle is maintained in good repair and fit for purpose.



Figure 1 Gate in Gate Out data


Transport labels

Transport services are complex and highly fragmented. The task of transporting seafood harvest products from port of landing or aquaculture farm to wholesaling sites, processing plant and manufacturer, to storage facilities, then on to retail, foodservice or an international forwarder and cargo terminal, mean that multiple equipment and contractors can be used in the journey to end consumers.

Transport labels become critical in this process, effectively being the "licence plate" for the shipment. Transport labels that provide encoded information to support the delivery are able to enhance efficiency and support the integrity of the product. 2D barcodes enable attributes such as detailed delivery instructions, routing, temperature requirements, to be available by scanning the QR code or digital link.

Figure 2: Transport labels

Service: STANDARD GINC: 931234518430	ACME Transport
Celeverte: GS1 Melbourne Office Attn: Michiel Ruighaver Nexus Business Park 8 Nexus Court Mulgrave VIC 3170 Australia PH: 1300 227 263	
Delivery Instructions: THIS IS A DEMO DELIVERY	A.T.L
G31 Sydney Office Aim Tony Repaci Lakes Business Park 2: 4 Lord Screet Boany NSW 2019 Australia O2 9065 2200	Tkg 0.03 m3
(00) 0 9312345	000000036

PALLETS



T = Transport L = Logistics

Source: GS1 Australia Scan 4 Transport Guide

Tasks related to traceability

- Vehicle arrives (Gate In)
- Signed *Consignment Note* provided to the driver
- Movement Record/Transfer Declaration as required (seafood not for commercial sale and export seafood)
- Weight Declaration checked to ensure mass limits are not exceeded e.g. COR Container Weight Declaration
- Scan product or load device transport label (items, cartons, crates, tubs, pallets etc) to verify loaded product, including date and time
- Transport leaves (Gate Out).

Participants

- Consignor
- Transport Company
- Logistics Service Provider
- Driver.

Air transport

The International Air Transport Association (IATA) Perishable Cargo Regulations provide guidance to air freight transporters in relation to seafood transport requirements. In Australia, seafood shippers and airlines have worked together to develop guidance around packaging of shipments to protect the aircraft from damage and maintain the integrity of the product.

Labelling on unit load device (air freight container) should include:

- Orientation labelling
- Perishables labels
- Dangerous goods labels if using dry ice as a coolant
- Airway Bill labels
 - Name and address of shipper/consignor
 - 24-hour contact number of consignor
 - Name of product
 - Live, fresh, or frozen
 - Weight must be < 60kg; single items over 20kg = "heavy item"
- Advice on handling hold in cooler/in case of delay
- Destination label
- "Live Fish" if applicable.4

Ocean freight and trans-shipment

International ocean freight of seafood is covered in the Export module of this Guide.

Coastal shipping requires some different procedures and documentation to surface transport. Coastal shipping consignments may also be delivered for international shipment as the product is transferred to/from port terminals.

Activities related to traceability

- Consignor prepares *Bill of Lading* required by shipping line
- Shipping line prepares manifest for loading
- Discharge of load unit from vessel to CTO
- Cargo Availability Notice sent by CTO to LSP, consignee
- Transport company books access to collect from CTO
- Transport company uses Delivery Order to verify access to cargo
- Transport company picks up load unit/ container and exits port gate
- Transport company delivers to consignee
- POD signed by consignee.

⁴ <u>Virgin Australia Cargo, Seafood and Perishable Cargo Transport</u> by Air Version 2 – March 2022 Seafood may be also transferred from a fishing vessel to a processing vessel which may land to catch at an international or domestic port. Trans-shipment typically is a part of harvest activities, using fishing operator-owned vessels to transfer catch from the harvest vessel to port, enabling the primary vessel to continue harvest while the fresh catch is transferred for sale and processing.

For some fisheries, catch is transferred at sea from harvest vessels to processing vessels. Global concerns regarding illegal, unreported and unregulated fishing (IUU)⁵ and vessel transhipment have seen an increased focus on monitoring and traceability in transhipment. Transhipping activities will be required to have Vessel Monitoring System (VMS) and where appropriate, Electronic Monitoring (EM) systems and/or observer on-board. If required, AFMA may introduce specific data collection and monitoring requirements for transhipping activities so that the data needs required for management are met.⁶ Catch Disposal Records record the seafood transfers from the supply vessel to the receiver processor vessel. See the production module for more information on transhipment activities.

5. In-transit tracking

The ability to track goods in transit is important to the consignor and consignee so both can track the transit time and efficiently plan for dispatch and inbound receival of the product.

Transport companies can track the vehicle in transit, providing location data on the shipment to the customer by associating the vehicle location with the transport booking number. An alternative means to transmit location and product monitoring data is via on-board devices placed with the shipment that can transmit data in transit. Telemetry, or remote sensing data, is transmitted via telecommunication networks and enables monitoring of on-board systems and locations.

These technologies enable tracking of the vehicle mass, distance and location and monitoring of the condition of the freight in terms of temperature, vibration, in real or near-time, depending on the quality of the telecommunications network.

Many smaller volume consignors/shippers use an *application programming interface* (API) supplied by their Logistics Service Provider or Freight Transport company, which enables data related to the shipment to automatically integrate with enterprise systems, providing in-transit visibility of the shipment for nominated supply chain parties.

Transport status messages relate to delays, disruptions, incidents and events taking place in the transit of the product, enabling the Consignor and Consignee to take responsive actions.

For some transport tasks, depot stopovers or staging of transport can mean a change of equipment, and transfer of load units e.g. pallets or cartons from one vehicle to another. Some transport depots offering "milk run" style pickups from small less-than-truckload (LTL) shippers such as small producers will provide short term storage prior to assembling a full truckload for a longer transit to market.



Tasks related to traceability

- Location of product in transit e.g. transport company customer portal or push message
- Notification of delays or disruptions or estimated time of arrival
- Short term storage at transport depot e.g. LTL shipments.

Participants

- Transport company
- Driver
- Consignor.

⁵FAO IUU definition

⁶https://www.afma.gov.au/reporting-and-accountability/ fisheries-management-policies/transhipping-policy-andguidelines

6. Cross-docking

Cross-docking involves the transfer of load units from one vehicle to another. This may be product from linehaul interstate transits that are transferred to smaller vehicles for metro or regional delivery. These load units carrying the product are otherwise undisturbed i.e. they remain intact. The Seafood Wholesale and Distribution Module covers cross-docking operations where products are combined or broken down for reconfiguration and further transport. The distinguishing factor is that the stock is not put away in storage. It is transferred from an inbound to an outbound dock, thus the term cross-docking. See Figure 3.

Activities related to traceability

- Scan of the off-loaded unit transport labels to transport company system and supplier enterprise system
- Scan of re-loaded transport labels
- Truck registration recorded with transport labels loaded on trailer
- Entry and exit time and date stamp recorded for inbound and outbound vehicles by truck registration number
- Driver ID recorded for inbound and outbound vehicles.

Participants

- Transport company
- Depot Manager
- Load Planner
- Driver.

Figure 3: Cross docking of freight



Source: Creative Safety Supply 2017

7. Delivery

The processes related to delivery of food products are initiated by the transport company booking an appointment to deliver the goods with the consignee. This is essential in the case of large retailer distribution centres where multiple suppliers are received, and large volumes of goods are despatched daily. Booking and adhering to delivery windows is a key process for transport companies. See Figure 4 below.



Gate arrival is a means to record a specific vehicle registration and the turnaround time for the vehicle on site. The vehicle will be directed to a dock or to a marshalling area to awaiting entry to a loading dock, where receival activities take place. At the receival dock, staff will scan the transport labels and reconcile the consignment against the Delivery Order and Advance Shipping Notice. Any damaged goods will be set aside, and any missing cartons or pallets will be recorded. Depending on the arrangement with the transport company, these goods may be returned to the supplier via the same truck.

In relation to food deliveries, specific recommendations from FSANZ relate to inspection of the packaging for leakage, damage or pest infestation, correct temperature at arrival and that the use-by date is not expired. Often receivers/consignees will reject the consignment if sufficient shelf life is unable to be achieved, resulting in lost value.

Once inspection is completed, a Proof of Delivery is signed by the receival staff and the vehicle exits the site, with Gate Out recorded by a gatehouse or security system. The transport company will then submit an invoice to the Consignor.

Activities related to traceability

- On arrival
 - Gate in date and time stamp
 - vehicle registration number
 - Driver ID and site induction status
- Inspection of delivered goods by inbound receival staff
- Goods scanned into Consignee system
- Proof of Delivery signed by Consignee representative
- Consignor notified of goods arrival and any missing or rejected stock
- Transport company exits delivery site.

Participants

- Transport company
- LSP
- Driver
- Consignor Consignee
 receivals staff.

8. Returns and salvage

Suppliers and their *3PL storage operator* may require the transport company to return freight/stock that has been rejected at the consignee receival. Rejection of part or all of a consignment at delivery can have a significant impact on transport scheduling. The transport company may also be tasked with collection of salvage stock, which may have been accepted at receival but is found unable to be sold or has been removed from the retailer shelves or production plant due to expiry or damage. Traceability of returns and salvage may be a requirement for a supplier to large manufacturers or retailers. Suppliers need to develop and adhere to procedures for recording damaged cartons/packs and product returns for disposal. Traceability audits will highlight the need for returns to be recorded.

Scenarios in relation to transport of the returns may be:

- The truckload is rejected prior to unloading. The driver must return the consignment to the consignor. The product is not scanned or unloaded.
- Part of the consignment is rejected at receival. The consignee will scan the cartons or pallets and notify the consignor. The transport company returns the rejected units on the same vehicle.
- The consignment is received, scanned and unloaded. Rejected units are notified to the consignor and return via a different vehicle.

Activities related to traceability

- The consignee (receiver) notifies the consignor (supplier) of missing and damaged stock units that have been rejected, or that the entire truckload has been rejected
- The consignor instructs the transport company to return or dispose of stock units
- The returned stock is scanned at unloading
- The disposition of returned stock is decided and recorded on the consignor system
- The transport company issues an invoice recording disposal or return of stock units.

Participants

- Transport company
- Logistics Service Provider e.g. cold storage operator
- Driver
- Consignor (supplier of product or their 3PL/LSP)
- Consignee receivals staff.

9. Transport asset/load unit traceability

Load units are transport assets or equipment used to contain or unitise freight. They increase the efficiency of logistics by enabling transport equipment such as forklifts to carry and stack multiple cartons or individual items for storage or distribution.

Common load units are pallets, bins, tubs, bags, shipping containers, crates. They do not include packaging.



Traceability of this equipment can improve utilisation and avert high costs associated with loss of equipment and detention charges.

It is likely that the rollout of 5G telecommunications networks will see a proliferation of sensor equipment integrated into load units to support traceability of product and associated transport equipment, helping to track and manage these assets.

Activities related to traceability

- Assign an identity to the transport asset
- For pooled assets such as pallets, ensure pallet transfer authority is signed at consignee receival
- Scan load unit barcodes/identifiers on inbound and outbound loading or apply IoT devices using active RFID or Bluetooth for pallet tracking (particularly useful in closed loop supply chains).

Participants

- Transport company
- Load unit leasing company
- Receival at consignee
- Consignor or 3PL supplier.



10. Intermodal and multimodal freight transport

Intermodal freight terminals are the points within the domestic supply chains where load units are transferred between different modes of transport: rail, road, sea and air. Intermodal terminals play a key role in permitting the most appropriate mode of transport to be used for different elements of the transport task, combining the flexibility of road operations with the linehaul efficiency of rail transport and the ability of sea transport to extend the transport chain beyond the geographical limits of the Australian continent. The participants in the intermodal supply chain include rail transport providers, road transport providers, terminal operators both import/export and domestic, freight forwarders and shipping/air lines.⁸

If a transport task is undertaken using multiple modes but without opening the container then it is called intermodal. The freight remains under the control of one LSP who arranges different modes under one main contract with the Consignor/supplier of product. If the container is opened and the goods transferred to another transport mode, it is termed multimodal freight. It may be arranged through coordination of multiple transport contracts by the Consignor. Australia uses different transport modes to move food products, including rail (rail shuttle, intercapital, port rail); coastal shipping; domestic and international airfreight (dedicated freight and passenger underbelly services). A combination of modes of transport is effective in managing long distance transits e.g. Perth-Sydney, or for freight accumulated in production zones and destined for export ports. Coastal shipping is effective for heavy or bulk food products that are less timesensitive or regularly replenish food manufacturing. Airfreight is an effective solution for high value, time-sensitive products e.g. chilled whole seafood.

Within an intermodal hub distribution centre, pallets may be unloaded, and goods reconfigured for a specific destination or to optimise space on specialised transport equipment.

Traceability of the product is usually based on the container or pallet identification; however use of multiple modes may require tracking at a load unit level if the product is reconfigured for different transport modes.

The four most critical data points for a tracking system to report are accurate, to-the-minute GPS-based location status, whether the container is loaded or empty, whether the door is open or closed, and for some products, the ability to send an alert if temperature and humidity fall outside of normal ranges.⁹

Activities related to traceability

- Location of the container or load unit in transit
- Arrival and departure of road freight vehicles at intermodal hubs
- Cross-docking between modes
- Load unit reconfiguration e.g. re-palletisation
 re-labelling pallets and load units.

Participants

- Transport company/companies (road, rail, ocean shipping, airline)
- Consignor
- LSP/3PL supplier
- Intermodal terminal operator (rail, air, sea)
- Port Manager
- Domestic freight forwarder.

⁸<u>QTLC</u> ⁹Transport Topics



Critical Tracking Events

For each of the identified freight transport activities, **critical tracking events** (CTEs) establish identity and enable traceability and compliance with traceability-related regulation are summarised as follows:

Critical Tracking Events (CTEs) are events that relate to the identity, movement and transformation of the food product.

CTE code	Freight transport activity	Critical Tracking Events (CTEs)	CTE code	Freight transport activity	Critical Tracking Events (CTEs)
	Establishment			Pick up shipment	
SFT CTE1	Establish identities and locations	Consignor and 3PL identity and location Consignee identity and location	SFTCTE5	 Vehicle arrives (Gate In timestamp recorded) 	– Gate arrival of transport – Vehicle registration recorded
SFT CTE2	Transport Company licences, permits and	Obtain Transport Company licences and registrations			- Driver ID and induction/security access code validated
	registrations	e.g. Food Transport Business Licence is required to carry seafood	SFTCTE6	 Signed Consignment Note provided to the driver 	Consignment Note signned (online or handed to driver)
		 Coastal Trading Licence for shipping 	SFTCTE7	- Catch Disposal Record and Transit	Transit declarations entered on the system or hard
		- Transport access permits, as required		forms signed and handed to the driver	copy signed by consighner must accompany each
		 Mass Management scheme registration 			consignment
		- Vehicle registrations (including trailer/wagon ID)	SFTCT8	 COR compliance check re load restraint mass management driver 	COR compliance checks completed and entered in consigner system
		 Driver Identification and evidence of site inductions/security card 		fatigue (Consignor risk)	
		- Safe Food Accreditation	SFTCTE9	 Scan and load product 	Scan load unit label (items,cartons,pallets etc) to
		 Transfer Declaration between Export Establishments 	SFTCTE10	- Transport departs	Scan load unit label (items, cartons, pallets etc) to verify loaded product, including date and time
SFT CTE3	Seafood Chain of Custody certification	 Certification under industry standards for chain of custody 			Transport leaves Consignor site and Gate Out data recorded
SFTCTE4	Booking and preparing for transport	Shipment tracking reference issued to Consignor		In-Transit	
		Consignment Note/Waybill/Manifest/Transfer Declaration prepared by Consignor	SFTCTE11	 Location of product in transit e.g. transport company customer portal or 	GPS tracking coordinates recorded
		Consignor prepares Delivery Order to travel with the		push message	
		freight	SFTCTE12	 Notification of delays or disruptions or 	Transport status message issued
		Product loaded on pallet/ULD and Transport Label		estimated time of arrival	
				Cross-docking	
		Consignor sends Advance Shipping Notice to the Consignee	SFTCTE13	FCL/FTL cross-docking	
				 Scan load unit into depot Transport Management System as received. A Dock allocation will be issued for container/load unit 	Scan the container/load unit number before unloading

CTE code	Freight transport activity	Critical Tracking Events (CTEs)	CTE code	Freight transport activity	Critical Tracking Events (CTEs)
SFTCTE13	- A Load Planner will allocate each load			Transport Asset/Load unit traceability	
Continued	- The load unit ID is re-scanned at		SFT CTE20	 Assign an identity to each transport asset 	Apply scannable unique ID
	 All load units are reconciled to vehicles prior to transit. 		SFT CTE21	 For pooled assets such as pallets, ensure pallet transfer authority is signed at consignee receival 	Pallet transfer authority signed by consignee or consignor
	LCL/LTL cross-docking		SFT CTE22	 Scan load unit barcodes on inbound 	Scan load units prior to unloading and when re-
	 Scan of the off-loaded load unit transport labels to transport company system 			and outbound loading or apply IoT devices using active RFID or Bluetooth for load unit tracking (particularly useful in closed loop supply chains)	loading on transport vehicles
	- Allocation of load units to Bays			Intermodal and multimodal operations	
	 Load units may be reconfigured with product from multiple inbound loads for one destination or to make up a full 	Load unit is scanned at re-loading and reconciled to vehicle/wagon/vessel	SFT CTE23	 Location of the container or load unit in transit 	GPS or IoT device tracking coordinates in real time
	container load		SFT CTE24	 Arrival and departure of road freight vehicles at intermodal hubs 	Gate In and Gate Out records
	transport labels	container/wagon ID and scanned at re-loading	SFT CTE25	 Recording load units allocated to each rail wagon/container on consist/vessel 	Transport company records loading bay allocation, transport vehicle, wagon allocation via new transport
	 Units are re-loaded and transport labels scanned with new container/ 			via new transport labels	labels
	skid/wagon number/truck registration assianment			Coastal shipping	
	- Gate In and Gate Out process recorded	Date and Time stamp records entry and exit of vehicles and drivers.	SFT CTE26	 Consignor prepares Bill of lading required by shipping line Shipping line prepares manifest for 	Bill of Lading received by Shipping Line
	Delivery			loading	
SFT CTE14	- Gate in process at Consignee premises	Gate in process completed e.g. site induction, security clearance	SFT CTE27	 Shipping line issues Ship arrival notice sent to LSP nominee 	Ship Arrival Notice
SFT CTE15	- Goods scanned into Consianee system	Load units received recorded in WMS/ERP system		 Discharge of load unit from vessel to CTO 	
SFT CTE16	 Proof of Delivery signed by Consignee 	Proof of Delivery signed by Consignee representative		 Cargo Availability Notice sent by CTO to LSP, Consignee 	
		Consignor notified of goods received and any missing or rejected stock	SFT CTE28	 Transport company books access to collect from CTO 	
SFT CTE17	- Transport company exits delivery site	Gate out time and date stamp		- Transport company uses Delivery Order	Cargo Availability NoticeLoaded truck/train exits
	Returns and salvage			 Transport company picks up load unit/ 	port – Cargo Terminal Operator records time and
SFT CTE18	 The Consignor instructs the transport company to return or dispose of stock units 	Consignor instructs transport company to return/ dispose of rejected stock	SFT CTE29	container and exits port gate Transport company delivers to Consignee 	date stamp
SFT CTE19	 The returned stock is scanned at unloading 	Returned load units scanned at unloading	SFT CTE30	 POD signed by Consignee 	Proof of Delivery POD signed by Consignee

Key data elements

Key Data Elements (KDE) ensure that captured and recorded data can be interpreted and used as relevant and required by all supply chain partners. Key Data Elements define Who, What, When, Where and Why for each Critical Tracking Event identified above.

Event code	Critical Tracking Event	Key data elements	Event code	Critical Tracking Event	Key data elements
SFTCTE1	Establish identities and locations for	- Global Location Number	Continued		Labels on load units –
	Consignor and Consignee	- Organisation	SFT CTE4		 Company name of consignor
		- Location name			- Address
		– Location ID			 Product description
		- Location address			- Count
		- Location country			- Content
SFTCTE2	Transport company licenses, permits and	- Food Transport Business Licence number			- Batch/Lot number
	registrations				- Use by date
SFTCTE3	Seafood Chain of Custody certification	 Certifying body 			 Net weight
		 Certification type (GDST code) 			 Serialised Shipping Container Code (SSCC)
		- Certificate ID			Advance Shipping Notice (ASN) contains data
		Information to be shared to a traceability platform			sourced from the Purchase Order and Packing List –
		– Global Location Number (GLN)			 Consignor/supplier identity description
		- Food Transport Business Licence number			 Contact person at supplier
		 Seafood Chain of Custody certification number 			 Shipment date and time
SET CTE/	Poolving and propaging for transport	(MSC/ASC, BAP)			 Transport company identification and booking reference number
SFI CIE4	booking and preparing for transport	consignor tracking of shipment)			 Special handling instructions
		Consignment Note/Seafood Transfer Certificate/ Waybill/Manifest			 Item level list including item description, quantity and purchase order number
		Delivery Order - on company letterhead			 Number and type of units e.g. cartons
		- "Ship to" identity and location			 Packing List Reference number
		 Mode of transport 			- "Ship to" Consignee identity and location
		 Special needs for the shipment e.a. temperature 			 Gross weight of shipment (including packaging)
		control			Information shared to a traceability platform
		- When to release the shipment			- Consignment Note Number
		- Shipment has been paid for			- Seafood Transfer Certificate number (as required)
					– Delivery Order number
					– ASN number

Event code	Critical Tracking Event	Key data elements	Event code	Critical Tracking Event	Key data elements
	Pick up shipment	 Vehicle registration number Driver identification 	SFTCTE12	Transport status message issued	 Vehicle and trailer/wagon/vessel type and capacity
SETCTER	Vahiala arrival	Driver site induction			- Transport asset ID e.g. pallet/container/skel
SFICIES	venicie arrival	- Driver site induction/ access card valid			– Reason for delay
					Information to be shared to a traceability platform
		 Driver site induction/access card valid 			- Actual departure and arrival time
SFTCTE6	Consignment Note signed and issued to driver	 Consignment Note serialised number 			 Reason for delay and actions that may impact traceability (consider decoupling equipment;
SFTCTE7	Transfer Declaration (export) or Seafood	 Transfer Declaration number 			transfer to another vehicle etc)
	issued by Consignor	 Catch Disposal Record number 			Information to be shared to a traceability platform
SFTCTE8	COR compliance checks completed and	Chain of Responsibility check			- GPS coordinates at regular timestamped intervals
	entered in Consignor system	- Mass			 Estimated departure/arrival time
				Cross-docking	
		- Load restraint		For FCL/FTL shipments	
SFTCTE9	Scan and load product	- Fatique management	SFTCTE13	Scan load unit/container before	- Company name of consignor
SETCTE10	Transport departs Consignor site	Information shared to a traceability platform		unloading	- Address
0.101210		 Date and time stamp of gate in and out 			- Product description
		 Pick up location (GLN) 			- Count
					- Content
		 Consignment Note number – Consignor signed 	SFTCTE14	Re-scan load unit/container at loading	- Batch/Lot number
		copy			- Use by date
		- Catch Disposal Record number (quota fisheries)			- Net weight
		 Seafood Transfer Declaration to accompany export freight 		For ICI /ITI chipmonte	- Serialised Shipping Container Code (SSCC)
		- Confirmation of COR compliance check completed	OFFOTF1F		
	In-transit		SFICIEIS	Load unit/container scanned prior to unloading	 Venicle registration associated with re-iodaed SSCC
SFTCTE11	Vehicle/container tracking coordinates	- Date and time			- Gate in and out date and time stamp
	recorded	- Location coordinates and Route ID	SFTCTE16	New transport label affixed, allocated to	Information to be shared to a traceability platform
		- Estimated and actual time of departure		wagon/vehicle/vessel and re-scanned	- SSCC unloaded
		- Estimated and actual time of arrival			- SSCC re-loaded
					 SSCC associated with new transport label for LCL/ LTC shipments

Event code	Critical Tracking Event	Key data elements	Event code	Critical Tracking Event	Key data elements
SFTCTE17	Vehicle arrival and departure	- Vehicle registration associated with re-loaded			Information to be shared to a traceability platform
		SSCC			– GPS tracking data
		- Location (GLN)			- Gate In and Gate Out time stamp
		- Date/Time stamp		Coastal shipping	
SFTCTE18	Returns and salvage The Consignor instructs transport	- Transport label SSCCs at loading	SFTCTE25	Bill of Lading signed by shipping line	 SSCC associated with new transport label and vehicle
	company to return/dispose of rejected stock	– Transport label SSCCs at un-loading			- cargo description
	Returned load units scanned at unloading	Information to be shared to a traceability platform			– Consignor ID
		 SSCC of returned or disposed goods 			 Vessel the cargo is being transported on
	Transport asset / load unit traceability				 Shipping line
CETCTE10					 Bill of Lading number
SFICIEIY	Apply scannable unique ID	- Unit load device SSCC			– Freight forwarder
SFTCTE20	Pallet transfer authority signed by Consignor/Consignee	 Signed Pallet transfer authority number 			- Consignee
SFTCTE21	Scan load unit prior to unloading and	Information to be shared to a traceability platform			- Notiry party (usually the freight forwarder or LSP
	when re-loading on to transport vehicles	- SSCC of load device	SFTCTE26	Ship Arrival Notice	Message to nominated parties of –
		- Associated location			 Shipment reference number
		- Pallet transfer authority number			- Container number
	Intermodal and multimodal transport				– Vessel name
SFTCTE22	GPS tracking	- GPS coordinates longitude and latitude			 Shipping line number
	5	- Time and time zone			 Estimated time of arrival
SFTCTE23	Gate In and Gate Out record	 Entry and exit gate arrival/departure date and time 	SFTCTE27	Cargo Availability Notice	Message to nominated parties (consignee, transport company, LSP)
		 Vehicle registration number 			 Advice on Bill of Lading/Notice that freight is paid and container is released ready for collection
		– Driver ID	SETCTE29	Logdod truck (train oxits port	
		- Driver site induction	SFICIE28	Lodded truck/ train exits port	
SFTCTE24	Transport company	 Security card number verification (ASIC/MSIC) 			- Vehicle registration
	Loading bay, transport vehicle, wagon allocation	 SSCC load units allocated to each rail wagon/ container on consist/vessel via new transport labels – new transport label scanned 			 Date and time Container number

Ev

SFTCTE29 POD signed by Consignee - Date delivered - Job number (transport company) - Invoice number (credit) - Freight paid by - Collected from location - Delivered to location - Number of load units or items - Contact name and number of Consignor - Terms & Conditions acceptance - Signature of Consignee Information to be shared to a traceability platform - BOL number - Port Gate In- Gate Out date and time - Signed POD number - Location (GLN)	Event code	Critical Tracking Event	Key data elements	Α
 Job number (transport company) Invoice number (credit) Freight paid by Collected from location Delivered to location Number of load units or items Contact name and number of Consignor Terms & Conditions acceptance Signature of Consignee Information to be shared to a traceability platform BOL number Port Gate In- Gate Out date and time Signed POD number Location (GLN) 	SFTCTE29	POD signed by Consignee	- Date delivered	Ac
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 Signature of Consignee Information to be shared to a traceability platform BOL number Port Gate In- Gate Out date and time Signed POD number Location (GLN) 			- Terms & Conditions acceptance	_
Information to be shared to a traceability platform - BOL number - Port Gate In- Gate Out date and time - Signed POD number - Location (GLN)			- Signature of Consignee	
 BOL number Port Gate In- Gate Out date and time Signed POD number Location (GLN) 			Information to be shared to a traceability platform	
 Port Gate In- Gate Out date and time Signed POD number Location (GLN) 			– BOL number	
 Signed POD number Location (GLN) 			- Port Gate In- Gate Out date and time	
- Location (GLN)			– Signed POD number	
Eboddion (den)			– Location (GLN)	

plication of global data standards

tion of global data standards enables data sharing between businesses through using common ats. These formats allow a business to identify participants, locations, products, processes and s in the supply chain.

ific seafood global traceability guidance has been prepared by the <u>Global Dialogue on Seafood</u> ability, that has identified critical tracking events, key data elements and formatting of data to with GS1 global supply chain data standards.

SI Core Business Vocabulary also supports formatting of key data for traceability.

insporting





Data standards that apply to key data elements and shared information are identified in this section.

Data Element	Examples	Valid Values	Data Type/ Format	Further Information	Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Location	Food Processor, Dispatch Dock, Transport Company, Logistics Services Provider, Drop point, Storage	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here: https://www.gs1.org/standards/ id-keys/gln	Traceability Attributes	Batch, Serial Number, Production Date		AN2O	Traceability Attributes, such as Batch or Lot Number, Serial Number, Production Date etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain.
Date/Time	Use-by Date, Date of transport booking, Date of pickup, Date of dispatch Date of goods delivery Date of goods	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and					Also referred to as Application Identifiers, each has its own unique identifier and format. List of Application Identifiers
	receipt			barcodes requires a consistent approach. The globally adopted standard for date recording is YYMMDD	Logistics Units	Crate or Box of finished Goods, Pallet of Finished Goods	Serial Shipping Container Code (SSCC)	N18	Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through
Product Identifiers	Outputs such as finished goods, packaged or processed goods	Global Trade Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system. Information on how to allocate a GTIN Information on when to change					the supply chain. Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets.
				<u>a GTIN</u>					GS1 Identification keys



Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Weights & Measures	Variable count of items. Count of items on a logistics unit.	Must be accompanied with a GTIN	Varying	Variable measure trade items use GS1 Application Identifier data fields that contains the quantity or
	Total weight of pallet in NET Kilos. Total Length of goods delivered in Metres.			dimension of a variable measure trade item. It also denotes the unit of measure. These element strings are used to complete the identification of a variable
	Total volume of goods delivered in Cubic Metres			measure trade item. They contain information such as the weight, size, volume, or dimension of a variable measure trade item.
Assets	Returnable assets like crate, pallet	Global Returnable Asset Identifier (GRAI)	N13	Can be identified as an asset type only or an optional serial number can be added to distinguish
	Individual assets like transport vehicle,	Global Individual		individual assets
	trailer, vessel, transport equipment etc	(GIAI)		https://www.gslau.org/download/ gslau-fact-sheet-identification- of-assets.pdf/file
Document Identifiers	Food transport Business licence, Vendor declarations, transport messages	Global Document Type Identifier (GDTI)		Can be encoded in a barcode or printed directly on the document. Companies can use the GDTI as a method of identification and registration of documents and related events.
				https://www.gs1.org/docs/idkeys/ GS1_GDTI_Executive_Summary.pdf
Service provider and recipient relationships	Driver ID, Consignee receivals staff	Global Service Relationship Number (GSRN)		Service providers and service clients can be individuals or businesses. The GSRN can identify either a recipient or a provider of the organisation's services, and often both roles need to be captured or recorded simultaneously.
				https://www.gs1.org/docs/idkeys/ GS1_GSRN_Executive_Summary.pdf

International freight transport

Containerised international shipping data standards

The Digital Container Shipping Association

(DCSA) is a not-for-profit organisation of nine major container shipping lines, dedicated to digitalisation of container shipping technology standards, based on United Nations Trade Data Models UN/CEFACT and ISO standards (e.g. ISO 9897 container park location). DCSA convenes the Future International Trade Alliance (FIT Alliance), constituted by DCSA, the Baltic and International Maritime Council (BIMCO), Fédération Internationale des Associations de Transitaires et Assimilés (FIATA), the International Chamber of Commerce (ICC) and Society of Worldwide Interbank Financial Telecommunication (SWIFT), each committing to standardise digitalisation of international trade, with an initial focus on adoption of electronic Bills of Lading.

<u>Track and Trace standards</u> developed by the FIT Alliance support pre-shipment, preocean, ocean, post-ocean and post-shipment transactions and operations.

Reference Data Models from UN/CEFACT

Reference data models for multimodal, buy-ship-pay, and supply chain have been developed by the <u>United Nations Centre for</u> <u>Trade Facilitation and Electronic Business</u> (UN/ CEFACT). Reference Data Models (RDMs) support international digital business and real time operations, helping to create interoperability in international trade transactions.

Useful links

Food Transport business establishment, licensing and registrations

- NSW <u>www.service.nsw.gov.au</u> www.foodauthority.nsw.gov.au
- NT <u>www.ablis.business.gov.au</u>
- QLD <u>www.safefood.qld.gov.au</u>
- SA www.pir.sa.gov.au
- VIC <u>www.ablis.business.gov.au</u> www.primesafe.vic.gov.au

Safe Seafood Australia, 2006, A guide to the Australian Primary Production and Processing Standard for Seafood www.foodstandards.gov.au See Section 7 Seafood Transportation

National Heavy Vehicle Regulator (NHVR) www.nhvr.gov.au/

Registered Industry Codes of Practice (NHVR) <u>www.nhvr.gov.au</u>

Vehicle and driver licensing <u>www.info.australia.gov.au</u>

Movement of aquatic animals

National Policy www.agriculture.gov.au

- NSW https://www.dpi.nsw.gov.au/fishing
- QLD www.business.qld.gov.au
- SA <u>www.pir.sa.gov.au</u>
- TAS www.ifs.tas.gov.au

- VIC <u>https://vfa.vic.gov.au/operational-policy/</u> moving-and-stocking-live-aquaticorganisms
- WA https://www.fish.wa.gov.au/ Sustainability-and-Environment/Pages/ default.aspx

Chain of Responsibility

https://www.nhvr.gov.au/safety-accreditationcompliance/chain-of-responsibility https://coradviser.com.au/article/loaders-anddrivers-cor-compliance-is-hinged-on-their-finalchecks/

Transport asset/load unit traceability

GS1 Scan4Transport https://www.gs1au.org/scan4transport/ https://austlogistics.com.au/media-centre/ alc-guideline-on-pooled-equipmentmanagement/

National Location Registry https://www.gs1au.org/nlr

Transfer document for export of seafood

https://www.agriculture.gov.au/biosecuritytrade/export/controlled-goods/dairy/ registered-establishment/transferring-goods



Glossary

Advance Shipping Notice

An advance ship notice or advance shipping notice (ASN) is a notification of pending deliveries, similar to a packing list. It is usually sent in an electronic format and is a common EDI document.

ASIC/MSIC

An Aviation Security Identification Card (ASIC) and Maritime Security Identification Card (MSIC) is required for drivers entering air and sea ports in Australia.¹⁰

Bill of Lading (BOL)

The Bill of Lading is used for international shipments and for coastal shipping processes. The BOL contains all the pertinent details required to ship the product and then invoice the transaction correctly once the transaction is completed.

The BOL acknowledges the receipt of cargo, provides evidence of contract of carriage and documents title of the goods.

Cargo Availability Notice

Once a Bill of Lading is marked as all freight paid and cleared with Customs, a notice may be sent to the consignee and their transport company that the cargo is now available for collection from the port of discharge.

Catch Disposal Record

Catch disposal records are used by fisheries managed under the quota system to gather and maintain data on the species caught.

On landing, the fishing permit holder, statutory fishing right holder, or a nominated authorised

person is required to complete a catch disposal record form detailing the species caught and their accurate weight.

Depending on the fishery, operators may also have to record the number of boxes of each fish consigned and usually the processing state (whole weight, headed, gilled/gutted etc) in which the fish were landed and the number of shark carcasses.

- The fishing operator keeps a copy of the completed and signed form, forwards the original to AFMA and sends the remaining two copies with the fish to the fish receiver.
- 2. On arrival at the first fish receiver, who must hold a fish receiver permit, the fish must be weighed and the fish receiver (who may be a processor, retailer or fish market) must record the species and weights (and shark carcass numbers) and sign the copy of the form consigned by the concession holder with the fish.
- The receiver forwards a copy of the form to AFMA/State Fisheries Management authority and keeps the third copy on the premises, where it may be inspected if required.

Chain of Responsibility (COR)

The aim of COR is to make sure everyone in the supply chain shares responsibility for ensuring breaches of the Heavy Vehicle National Law do not occur. Under COR laws if you are named as a party in the chain of responsibility and you exercise (or have the capability of exercising) control or influence over any transport task, you have a responsibility to ensure the Heavy Vehicle National Law is complied with. The law recognises that multiple parties may be responsible for offences committed by the drivers and operators of heavy vehicles. A person may be a party in the supply chain in more than one way. For example they may have duties as the employer, the operator and the consigner of goods.

Legal liability applies to all parties for their actions or inactions. The parties in the Chain of Responsibility for a heavy vehicle are:

- an employer of a driver
- a prime contractor for the driver if the vehicle's driver is self-employed
- an operator of the vehicle
- a scheduler for the vehicle
- a loading manager for any goods in the vehicle
- a loader and/or unloader of a vehicle
- a consignor of any goods for transport by the vehicle
- a consignee of any goods in the vehicle
- a loader and/or unloader of any goods in the vehicle. $\ensuremath{^{11}}$

Consignor

The owner of the goods being contracted to be shipped/transported. The agent for the consignor may be their 3PL operator but the party known as the consignor is the owner of the product. The consignor is responsible for the goods in transit until the nominated consignee signs for receipt of the goods.

Consignee

The consignee is the recipient of the goods being shipped. A consignee is a customer or client. Although products may be transported to a warehouse operated separately from the listed consignee, legally the responsible ultimate owner of the product is the consignee.

Consignment Note

The consignment note is a key document used in transporting freight within domestic supply and in the landside logistics of import and export.

The goods are deemed to be "on consignment" until they reach the consignee.

The document is prepared by the consignor and countersigned by the transport carrier as a proof of receipt of the consignment for delivery at the destination.

Container Weight Declaration (CWD)

A CWD is a written declaration of the weight of a container and its contents. It may be either in hard copy or electronic form, or a placard attached to the freight container. It may consist of one or more documents in different formats – for example, documents may be in the form of a sheet of paper, an email, on an electronic device, or in otherwise electronic form – but in any case, it must be able to be produced in its entirety, to an authorised officer, upon request.

Although there is no specific form for a CWD, it must include the following information:

- weight of the container including its contents
- container number and other details necessary to identify the container
- name and residential address or business name and address in Australia of the responsible entity for the freight container
- date of declaration.

¹⁰ <u>www.homeaffairs.gov.au</u> ¹¹ <u>www.nhvr.gov.au</u>

Delivery Order

A document from the Consignor of the freight which orders the release of the cargo to another party. This permits the delivery direct to a warehouse or depot, as organised with the Consignee. This enables the Consignor to order pick up of product from a 3PL warehouse in order to deliver to the party named in the Delivery Order.

FSANZ

Food Standards Australia New Zealand (FSANZ) is a statutory authority in the Australian Government Health portfolio. FSANZ develops food standards for Australia and New Zealand.

The Code is enforced by state and territory departments, agencies and local councils in Australia and the Australian Department of Agriculture and Water Resources for food imported into Australia.

Load Unit

The Principle of Unit Load states that, "it is quicker and economical to move a lot of items at a time rather to move each one of them individually". In other words this principle suggested that, the larger the load handled, the lower the cost per unit handled. Packages loaded on a pallet, in a crate or any other way that enables them to be handled at one time as a unit is described as a load unit.

Load units may be pallets, tubs, barrels, shipping or intermodal containers, tanks, cages or unit load devices (airfreight).

Logistics Service Provider (LSP)

Logistics refers to the overall process of managing how resources are acquired, stored, and transported to their final destination. There are three major activities in logistics – inbound, outbound and reverse logistics. A logistics service provider is responsible for outsourced logistics activities, generally contracted to a product supplier or retail customer. The LSP provides a broader range of services as compared with freight transport.

LTL/LCL shipment and FTL/FCL shipment

LTL stands for "less-than-a truckload"; LCL stands for "less than a container full" shipment, which can require load de/consolidation to achieve cost-effective freight transport.

FTL stands for "full truckload" and FCL for "full container load".

Order Confirmation

A legally binding commitment to deliver specified good on specified terms. This enables the buyer to plan for receipt of these goods and if unconfirmed, to look to alternative suppliers.

Proof of Delivery (POD)

A commercial document used by the Consignee or their Logistics Service Provider to notify the Consignor of the receipt and acceptance of a delivery. A signed POD enables the Transport Company to raise an invoice.

Purchase Order

A commercial document issued by a buyer to a supplier. This is a legally binding offer to buy product in return for payment. The terms and conditions for delivery and payment are detailed in this document, which also details the product quantity, price, terms and conditions, product quality specifications.

Seafood Transport Vehicle

Seafood transport vehicles are vehicles that distribute and/or transport seafood or seafood products including:

- aquatic vertebrates (fish)
- aquatic invertebrates (crustaceans)
- foods containing their products.

They do not include transport from retail premises to the consumer, or transport in a vehicle from which the seafood will be sold by retail.

To transport seafood, the vehicle must be licensed by the state food authority and always have the licence sticker on the vehicle.

Ship Arrival Notice

A notice is sent from a shipping line, freight forwarder to advise nominated parties e.g. consignee, Transport Company, of the arrival of the vessel and container at the discharge port. This enables the consignee and their transport company to make a vehicle booking to collect the cargo when it is cleared.

Third Party Logistics (3PL)

Outsourcing of distribution, warehousing, or fulfilment. In food logistics, a 3PL may operate storage for multiple food suppliers or retailers, often specialising in cold chain management, a specific product, or distribution at a national, metropolitan, or regional level. 3PL warehouses may assemble products for promotions, prepare in-store product displays. Through their warehouse management systems they monitor inventory and interact with customers to manage inventory, assembling orders and preparing for dispatch. A proportion of 3PL suppliers also offer distribution and delivery services.

Seafood Transit Form

The Transit Form applies to catch from quota fisheries. Each consignment of landed seafood requires a Catch Disposal Record and a Seafood Transit Form to accompany the consignment transported to a registered seafood receiver e.g. wholesaler or processor, retailer.

Completing transit forms - where more than one vehicle is used to carry a consignment of fish from a vessel to a receiver, the holder must complete a transit form as detailed in the fishing concession nominated to the boat. A transit form must be carried by each vehicle and the last vehicle shall carry the Catch Disposal Record, except where the fish are being carried to an 'exempt fish receiver'.¹²

Transfer Declaration for export product

A transfer declaration is a documented statement made by the dispatching establishment regarding the export eligibility of the goods being moved. The declaration on the transfer document must state that the specific product being transported has been stored in accordance with the relevant Export Control Rules and any specific importing country requirements identified in the approved arrangement.

A Transfer Declaration is not required if the shipment is going directly to the sea/airport, or if the shipment is between registered establishments owned by the one company.

¹² AFMA Catch Disposal Record





Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Processing and Manufacturing



Seafood Processing and Manufacturing

This module covers key activities that generally take place along the seafood supply chain post-harvest from wild fisheries or aquaculture facilities.

Initial processing, or pre/primary processing, includes the first actions taken to retain the integrity of the product once removed from the grow environment. This includes size and species sorting, gutting, removal of scales, fins, tails, washing of the animal and rapid chilling. This activity may take place on a vessel or initial processing plant on the aquaculture farm.

Further processing and packing may take place on the vessel or once landed. In the primary processed state, the animal may be packed into cartons, identified by an item/batch/lot/ carton number, and transferred to an off-site processing plant to be further processed e.g. filleted, portioned, for retail or food service. The animal may also be used as an ingredient in the manufacture of a new product, such as a fish/ crab cake, or the by-products removed from the animal further processed in the manufacture of products such as fish meal, fish oil or fertiliser.

Food processing involves the transformation of agricultural products into food. It may involve freezing or canning outputs directly from farm production or creating inputs to further manufacturing processes e.g. whole tuna to canned tuna to fish cakes/fish sauce.

Food processing helps to avoid wastage by preserving farm output and making it more edible.



In this module, seven major activities are associated with processing and manufacturing:

- 1. Establishment
- 2. Sourcing of inputs /ingredients
- 3. Goods receipt
- 4. Storage of inbound product (ingredient and raw materials storage)
- 5. Labelling and packaging
- 6. Industry certification and traceability
- 7. Retailer traceability standards.

1. Establishment

Creation of Master Data

During the establishment phase of a food processing business, creating a unique business entity and location identifier will support traceability along the supply chain. Increasingly, transactions and operational data are automated between supply chain partners, so the creation of Master Data identifying the processor, suppliers and customers enables this data to flow between entities. It also supports the operational efficiency of the business, by having consistent data regarding the location of the processing plant and the network of locations for product flow.

Registration and licensing

Food Safety registration

The relevant food safety standard and guideline for a seafood processor is the <u>Australia New</u> <u>Zealand Food Standards Code section 4.2.1.</u> A Guide to this standard is also available.¹

• Registration as an Export Establishment

Processors that are part of an export supply chain are required to be registered as an export establishment, under an Approved Arrangement. The registration number will form part of the business Master Data. • License to operate a Seafood Processing Business

A licence defines the need to obtain recognition / certification and registration to undertake a certain business activity. A fish processor can be defined as a person/business that processes, stores, transports or deals with fish or other aquatic resources for commercial purposes. Processing includes scaling, gilling, gutting, filleting, freezing, chilling, packing or any other activity involved in preparing fish for sale.

¹Safe Seafood Australia, 2006, A guide to the Australian Primary Production and Processing Standard for Seafood Fish processors may require distinct licences, depending on the extent of their activity. For example, a fishing or aquaculture operator might process fish in their own operation and sell direct to the public. Others may buy or sell from licensed fishing operators and aquaculture authority holders, a registered fish processor for further processing, or a fish wholesaler. These licenses are obtained from state agencies with the registration process differing state by state.

Typically, the applicant will need to prove they are a fit and proper person, and will need to nominate any vehicle, vessel or premises to be used as part of the processing business.

2. Sourcing of inputs/ ingredients

Identifying, contracting and managing suppliers is a major activity for food processing and manufacture.

In sourcing agricultural produce and other required inputs into food processing or manufacturing, identification and verification of supplier entities and the provenance of the inputs in terms of grow/harvest locations and integrity (i.e. the input is as described) is a precursor to traceability of those inputs. Exporting manufacturers may require full traceability from their suppliers due to the regulation of importers in overseas markets, for example, manufacturers supplying to the US market under the Foreign Supplier Verification Program.²

For food manufacturing/processing businesses, traceability should extend to being able to identify the source of all food-related batches/ lots of inputs such as raw materials, additives, other ingredients and packaging material. Manufacturers may experience substitution of product from alternative producers or locations. For example, the processor or manufacturer may select an intermediary such as a wholesaler to supply product from several aquaculture farms or wild catch fisheries of origin. Once the product undergoes processing, or is supplied for further manufacturing, verifying the origin of the product supplied becomes increasingly difficult. Without a traceability system in place from the original source of the product, claims related to provenance are difficult to substantiate.

Suppliers, who may be growers, wholesalers or processors, or importers of ingredients, should be able to provide verification of provenance of supplied raw materials, additives, other ingredients and packaging material. This may take place as part of the due diligence process in sourcing and procurement practices. Suppliers with traceability systems are able to provide data that can be automatically shared during this process. A processor or manufacturer may create a selection criterion related to the grower or producer being able to verify the product's origin.

Processing and manufacturing will transform the inputs. At this point, a new product is created that requires a new unique identifier for a blended or transformed product. This identity can be linked to the original ingredient identification e.g. fish species and origin in a fish sauce or fish cake.

Access to the unique identifiers for harvest location, ownership and the production business entity, are fundamental to traceability. These identifiers used frequently in supply chain activities and transactions, form what is termed 'Master Data'.

Key tasks related to traceability

- Create unique identifier for the business and location master data
- Create unique identifiers for each supplier's business entity and location
- Create unique identifiers for each product item, lot, batch, carton, tub
- Verify the input/ingredient origin and integrity.

Participants

- Fishing operator, aquaculture grower
- Suppliers (importer, wholesaler, packaging company)
- Food processor/manufacturer.

² <u>US Food Safety Modernisation Act Foreign Supplier</u> <u>Verification Program</u>



3. Goods receipt

Processors and manufacturers activate this process through placing an order with the fisher, grower, or wholesaler. A Purchase Order (including standard, blanket, call-off) will typically contain details of:

- Purchase Order Number
- Supplier ID
- Supplier Contact Details
- Supplier Location
- Buyer ID
- Buyer Contact Details
- Buyer Location
- Buyer delivery location
- Product Identifier
- Product Name/Description
- Quantity
- Unit Type
- Unit Price
- Total Cost
- Purchaser Order Placement Date
- Customer Order Delivery Date
- Shipping Terms and Conditions.

By using unique identifiers from the Purchase Order formation, the Processor or Manufacturer can create traceability for inputs and outputs that will remain intact for the duration of the product journey.

The Processor or Manufacturer will create a Customer Order once product, quantity, variety, delivery terms and price have been agreed. Often the Processor or Manufacturer will have a term contract in place to supply the customer, or the product has been grown or harvested to order. The chain of custody passes to the processor or manufacturer on receipt of the product.

Food Standards Australia and New Zealand (FSANZ) provides the following advice in relation to receival of food, which is regulated in each state or territory:

"If an enforcement officer asks you to do so, you must be able to provide the officer with information on the suppliers of any food on your premises and what that food is. You need this information in case food on your premises is found to be unsafe or contaminated in some way and has to be returned to the supplier or destroyed.

Although most, if not all, of the food you buy will be labelled with the name of the product and the name and address of the manufacturer, importer or packager of the food, you may also have unpackaged or unlabelled food on your premises and will need other ways of proving what this food is and where it came from. You might do so using your supplier invoices, or you might keep some other record of your suppliers and what you buy from them and the food you have on your premises.

You must not accept food unless you can identify it and trace it back to its supplier."³ For seafood, those receiving for processing must have the following documentation, to ensure the animals were caught, grown and harvested legally. Victorian seafood processors, for example, require the following:

Any person who carries on the business of selling, transporting, consigning, receiving or processing fish or fish products (including selling fish for consumption in a restaurant or cafe business) must ensure that any fish received by them, or in their possession, for any commercial purpose, are accompanied by one of the following in relation to those fish:

- 1. A Catch Disposal Record (CDR) issued by a commercial access licence holder at the point of landing - typically only used in quota-managed wild catch fisheries; or
- 2. A sales receipt a receipt or tax invoice created by the seller of the fish to the buyer of the fish; or
- 3. A fish movement record a document created to account for possession of fish when a sale has not occurred, and no CDR or sales receipt provided with the product (e.g. fish are being transported to a fish co-op and no CDR or sales receipt have been provided).⁴

Delivery Documentation

Delivery documentation that accompanies a supplier delivery is a requirement for most sites receiving a delivery. This delivery documentation should include relevant traceability information for the product(s) being delivered. Delivery documentation may also include returnable asset identification where it is critical to track such items e.g. cartons, pallets, tubs ID.

³FSANZ Chapter 3, Food Standards Code ⁴Victorian Fisheries Authority, Fisheries Regulations 2019, Seafood traceability requirements: Seafood transporters, processors and receivers, wholesalers, importers and exporters.



Key tasks related to traceability

- Catch Disposal record, Sales Receipt, or Fish Movement Record obtained from the fishing operator or aquaculture farm
- Delivery Notification (Delivery Note or Electronic Advance Shipping Notice received by processor/manufacturer)
- Product is delivered and unloaded from transport at nominated receipt location e.g. loading dock
- Product is inspected (contamination; identification; temperature) and accepted/ rejected/returned to suppliers with reason recorded (this may occur at put away)
- Inbound product is matched to purchase order and over/under/missing stock notified to supplier
- Proof of Delivery signed
- Delivery is receipted into inventory management system (spreadsheets, Warehouse Management System (WMS), Enterprise Resource Planning (ERP) or Production system).
- Critical Traceability information is recorded at this point (Supplier ID, Batch Number, Production Date, Expiry/Useby date).

Participants

- Fishing operator, aquaculture operator
- Processor/Manufacturer goods
 receival staff
- Processor/Manufacturer quality
 inspection staff
- Transport company and driver.

4. Storage of inbound product

Product may be transferred to the processor/ manufacturer's own pallets or bins for storage. Inbound products may arrive in returnable assets. These assets such as pallets and tubs are important to identify so their custody and return can be recorded.

The product is associated with a storage location in the inbound storage area. This may require a new identifier being introduced that associates the product received with the inventory location and potentially the storage pallet, tub or container.

Tasks related to traceability

- Product transferred to internal storage asset e.g. pallet, tub, crate, reefer container
- Product put away ready to be called forward to production floor
- Returnable asset identification.

Participants

- Processor/Manufacturer receivals staff
- Storage/warehouse staff.

5. Labelling and packaging

Labels

Food manufacturers use an array of ingredients used to preserve and transform the raw seafood inputs or ingredients.

The food label is required to contain a range of information. Highlighted items relate to traceability:

- Name of the food
- Unique identifier for food
- Manufactured date and use by date
- Lot identification
- Description of the ingredient or ingredient listing
- Description of allergens
- Instructions for storage and preparation
- Country of origin information
- Warning and advisory statements
- Relevant nutritional information
- Information about weights and measures (volume and quantity)
- Name and address of the processor or manufacturer.

For manufacturers creating finished goods (consumer-ready), the allocation of a new unique identifier for the finished item or product unit is required. This identifier, known as a Global Trade Item Number (GTIN) is most readily applied in the labelling of the product.

Packaging

All packaging that is in contact with any food must not contaminate the food it contains. Packaging components such as paper, adhesives, barrier film or print ink may come into direct contact with the foodstuff and potentially contaminate the product.

Traceability of packaging materials supply involves recording the serial numbers on each lot of packaging materials supplied to the Processor or Manufacturer and a record of their usage.

Packaging of cartons for unitising the product items e.g. a carton of fish portions, require identification so that the product can be protected in distribution. Carton labelling requirements are regulated by <u>Industry</u>, <u>Innovation and Science Australia</u>.

For traceability once the product is secured within a carton, the processor or manufacturer will allocate a serialised shipping identifier to the carton, as well the lot/batch number, date of production and the identity and location of the processing/manufacturing plant. The name of the food product and its use-by date enable storage systems to monitor inventory and food integrity.



Tasks related to traceability

- Record supplier, date, lot number identifiers on packaging of inbound product/ ingredients
- Affix compliant label to item and include product identifier code
- Pack into cartons with compliant labelling
- Affix serialised shipping code to identify individual cartons.

Participants

- Processor/manufacturer
- Packaging supplier.

Record keeping for traceability

The key requirement in traceability audit is for the processor/manufacturer to be able to demonstrate it can track product. In many audit standards, the manufacturer may be asked to perform a traceability exercise during the audit. This puts the responsibility for demonstrating an established traceability system on the manufacturer. The processor or manufacturer is required to demonstrate that it can account for the whereabouts of all of a particular product, ingredient or packaging material. In an onsite traceability exercise, the auditor will select a finished product, and the processor/ manufacturer will be required to produce records of the disposition of the product and the source of the ingredients and packaging used to produce it.

The records for a traceability test may include the following:

- Ingredients used, including quantities and unique identifier
- Packaging used, including quantities and unique identifier
- Identification and tracking of returnable
 assets
- Finished product lot identification and quantity produced
- Quantities of waste produced
- Location and quantities of product within the manufacturer's control and quantities shipped to individual recipients.

Tasks related to traceability

- Recording of all input materials into the processing or manufacturing process including batch related information
- Production floor pallet or tub ID
- Recording of production quantities (finished product weight and quantities), product, batch, production line
- Product Samples taken
- Recording of waste materials
- Return of un-used materials (if appropriate).

Participants

- Processor or manufacturer
- Supplier of returnable assets
- Auditor.

6. Industry certification and traceability

Global Sustainable Seafood Initiative (GSSI)

GSSI aims to "Ensure confidence in the supply and promotion of certified seafood as well as promote improvement efforts in seafood sustainability globally." GSSI is a pre-competitive⁵ body that works to align businesses, non-government organisations, governments and international organisations from the full seafood value chain to adopt sustainable development goals for seafood.

The GSSI⁶ recognises nine certifications, including the following commonly utilised in Australian seafood supply chains:

- <u>Marine Stewardship Council</u> (MSC)
- Best Aquaculture Practices (BAP)
- <u>Global G.A.P.</u> (a Trademark and Set of Standards for Good Agricultural Practices)
- <u>Aquaculture Stewardship Council Australia</u> (ASC)

⁵A pre- competitive body involves work conducted jointly by usually competing companies for the purpose of developing new commercially applicable technologies.

⁶Global Seafood Sustainability



MSC/ASC Chain of Custody standards

The Marine Stewardship Council (MSC) and the Aquaculture Stewardship Council (ASC) have partnered to share the <u>Chain of Custody</u>. <u>Standard</u>. This means you can have one certification audit that covers both MSC and ASC products.

The five principles that underlie the Marine Stewardship Council/Aquaculture Stewardship Council Chain of Custody (CoC) standards are:

- 1. Companies must purchase certified product from a certified supplier
- 2. Certified products are clearly identifiable
- 3. Certified products are separated from non-certified
- 4. Certified products are traceable, and volumes are recorded
- 5. Your management system addresses the requirements of the Chain of Custody Standard.⁷

For products to carry the blue MSC label (the blue tick), every company in the supply chain must have a valid Chain of Custody (CoC) certificate and to be certified, businesses are audited by independent certification bodies.

The use of the ASC logo can be applied only to products that are sold through a consecutive, certified chain of custody that ensures traceability of certified products from production to final point of sale. For the ASC, CoC is certified through application of the MSC chain of custody system. Only products that originate in ASCcertified operations and are sold through an MSC certified CoC, are eligible to carry the ASC logo.

Best Aquaculture Practices

The <u>Best Aquaculture Practices Standard</u> includes the following requirements that relate to traceability :

- The facility shall exercise proper control over any supplier or service that may have an impact on food safety, legality, quality, traceability and social responsibility.
- Traceability Management which covers product identity preservation, traceability systems, traceability elements (including wild caught raw material, farm-raised raw material, ingredients and packaging materials and finished product).
- Labelling controls (labelled with all information, including allergens required by local legislation and legislation of the country of destination as well as the necessary information to ensure safe handling, storage, display, preparation and use of the product along the supply chain or by the consumer).
- Product destinations (up to date lists of customer names and locations, documented records for all production lots, lot numbers, storage locations, shipping company method and date, receiving customer information and breakdown of all species, products, quantities, weight, sizes and lot numbers included in the shipment.
- Mass balance⁸ (demonstrating that the traceability system is effective with the quantities and mass balance results provided to the auditor for verification).

⁷Marine Stewardship Council, Chain of Custody

The ability to account for all quantities of raw materials, waste, work-in-progress and finished product. Correct calculations ensure that, in the event of a recall, it is possible to account for all potentially affected raw materials and finished product.

7. Retailer traceability standards

Retailers have supplier standards that relate to processing and manufacturing seafood products, and policies adopted by the retailers to meet sustainable and responsible sourcing of seafood.

Examples are as follows:

WOOLWORTHS

Retailer traceability standards for the Woolworths Group come from three sources, Processing and Manufacturing Standards Woolworths, Seafood Standards and the Woolworths Responsible Sourcing Policy.

- A procedure must be developed, documented and implemented to ensure that all material and inputs are traceable through all stages of the site's processes.
- Quality System records and all relevant production records in relation to the process must be identifiable to specific production.
- Finished product identification must be through product date marking and/or batch marking.
- Coding used must enable identification of the retail sale unit and the shipper/carton such that product may be identified and recovered at both consumer level and whilst in distribution.
- Best Before and Use By date coding must be in accordance with the regulatory requirements of the country of sale.

All raw material (including packaging) and Work In Progress must be forward and backward traceable through all stages of the process. Each individual raw material and its supplier must be identifiable.

All finished product (including packaging) must be backwards traceable through all stages of the process to all raw materials and inputs used.

- All finished product must be traceable through the product distribution chain until delivered to a Woolworths Ltd store or Distribution Centre.
- All product must be traceable through information on both the retail sale unit and the shipper packaging.
- The traceability system must be internally audited at a minimum frequency of 12 monthly across the groups of products produced or handled.
- The internal audit must test the system both forwards and backwards and incorporate a mass-balance check.
- The traceability exercise must be completed within 4 hours and records of the audit showing all steps maintained with corrective actions applied as required.
- Traceability records must be maintained throughout the storage and delivery process up to receipt at Woolworths.

In relation to seafood, Woolworths Group adopted a <u>Seafood Sourcing Policy</u> (2022) to transition to Marine Stewardship Council/ Aquaculture Stewardship Council certified seafood supply for own brand products by 2025. Woolworths Group will preferentially source Vendor Branded seafood that meets its Own Brand requirements or is third-party certified against Global Sustainable Seafood Initiative (GSSI) recognised standards.⁹

For farmed seafood, Woolworths will preferentially source from certified suppliers accredited by one of the following:

- Aquaculture Stewardship Council (ASC) certified – including MSC Chain of Custody certified
- <u>Best Aquaculture Practices (BAP)</u> Farm Standard certified
- GLOBALG.A.P. (GGN) certified.

For wild-caught seafood that is:

- <u>Marine Stewardship Council (MSC)</u> certified including MSC Chain of Custody certified
- ALDI.

The <u>Global Food Safety Initiative</u> (GFSI) commenced in 2000 and several of its standards have been recognised to harmonise food safety certifications. Certification according to a GFSI-recognized certification program can be achieved through a successful third party audit against any of the following certification programs, recognized by GFSI:

- BRC Global Standard for Food Safety issue 9
- BRC Global Standard for Packaging and Packaging Materials issue 6
- BRC Global Standard for Storage and Distribution issue 4
- FSSC 22000 v6.1 (based on the requirements defined in ISO 22000)
- Global Aquaculture Alliance Seafood –
 Seafood Processing Standard Version 5.1
- International Featured Standards IFS Food v7
- Japan Food Safety Management

Association JFS-C v 3.0

- Japan GAP Foundation ASIAGAP Version 2.3
- PrimusGFS Standard Version 3.2
- SQF Safe Quality Food Code Edition 9.

⁹Woolworths Group Seafood Sourcing Policy 2022

COLES

To meet Coles' Responsibly Sourced Seafood Requirements, Coles Own Brand farmed seafood products are required to be certified to one of the following independent third-party standards and certifications.

- <u>Aquaculture Stewardship Council (ASC)</u>
- Best Aquaculture Practices (BAP)
- GLOBAL G.A.P.

Farmed seafood products assessed against the ASC Chain of Custody (CoC) Standard carry the ASC logo. Farmed seafood products assessed against BAP or GLOBAL G.A.P carry the Coles' Responsibly Sourced Seafood (RSS) logo.

Cole's manufacturing supplier standards for traceability also apply. These include ensuring that systems of traceability, identification, and segregation of raw materials, rework, WIP, and finished products are in place to ensure that all claims relating to provenance or assured status can be substantiated. Products may include Organic, Non-GMO, Own Brand Egg Approved Production Methods, Sow Stall Free, Hormone (HGP) Free, Grass Fed, Responsibly Sourced, Product of Australia, etc.

The status of raw material, the status of the batch of raw material shall be verified where products claims are made on finished packaging that describe including:

- A specific provenance origin
- Breed / varietal claims
- Assured status (e.g. organic)
- Genetically modified organism (GMO) status
- Identity preserved
- Named specific trademarked ingredients.

The supplier shall maintain traceability records to substantiate claims including:

- purchasing records,
- traceability of raw material usage, and
- final packaging records.

Suppliers shall conduct a mass balance and traceability exercise to verify the chain of custody of the identity preserved claims. The exercise must be conducted at minimum annually for each scheme (unless the chain of custody scheme associated with the claim requires the exercise to be conducted more often).

COSTCO

In relation to traceability, Costco supplies require certification under the GSFI standard and will be audited twice yearly.

The requirements include:

"Facilities have a documented traceability exercise program and conduct at least 2 exercises per year for both finished goods and ingredients. The facility is able to account for 100% of product in a 2-hour timeframe during an auditor conducted traceability exercise. The program must include the distribution of specific product lots, raw ingredients and primary packaging. The exercise will be conducted on a Costco item chosen at the auditor's discretion."

Critical Tracking Events

For each of the identified processing and manufacturing activities, critical tracking events (CTEs) establish identity and enable traceability and compliance with traceability-related regulation are summarised as follows:

Critical Tracking Events (CTEs) are events that relate to the identity, movement and transformation of the food product.

The <u>Global Dialogue on Seafood Traceability</u> (GDST) was initiated by the <u>Institute of Food</u> <u>Technologists</u> and the World Wildlife Fund. The GDST has developed standards for event tracking and tracing along seafood supply chains.¹⁰

For seafood processing, critical tracking events, key data elements and associated data formats aligned with GS1 supply chain data standards are described in the <u>Core Normative Standards</u> <u>V1.1</u> released in March 2022.

The following Critical Tracking Events (CTEs) and Key Data Elements (KDEs) align with GDST standards and additionally incorporate traceability regulations applicable in Australia for seafood products.

¹⁰ GDST Standards and Materials



Processing/manufacturing activity	CTE code	Critical Tracking Events (CTEs)	Processing/manufacturing activity	CTE code	Critical Tracking Events (CTEs)
Establish master data identification of processor/manufacturer	SPM CTE1	Processing Vessel Identity Apply for Global Location Number	Prepare for outbound goods dispatch		
Certifications and licensing	SPM CTE2	Food processor/manufacturer licence issued	Pick and Packing	SPM CTE11	Outbound product picked and scanned for
		Export Establishment Number received			Product loaded to pallet or container for
		Industry Certifications			outbound distribution or off-site/3PL storage
Sourcing raw materials, ingredients, inputs	SPM CTE3	Identifying the input supplier and/or grower and location	Notify consignee/customer	SPM CTE12	Advance Shipping Notice sent to customer
	SPM CTE4	Verifying the origin and integrity of the input e.g. test results for residues			
Goods receival	SPM CTE5	Input product unloaded and product inspected. Product origin, batch/lot code, best-before/use- by dates recorded	Issue shipping instructions	SPM CTE13	Delivery Order signed
	SPM CTE6	Proof of Delivery signed	Departure of outbound product	SPM CTE14	Product Dispatched
		Goods receipt entered into inventory management system (spreadsheet, Warehouse Management System (WMS), Enterprise Resource Planning (ERP) or Production system etc).			
Input/ingredient storage	SPM CTE7	Input/ingredient transferred to internal storage asset e.g. pallet or bin			
		Input/ingredient put away ready to be called forward to production floor			
		Storage location identified			
Processing/Manufacturing					
Picking stock for production					
Product processing or manufacturing					
Record processing inputs	SPM CTE8	Record inputs of raw materials, ingredients, production inputs used			
Product inspection	SPM CTE9	Record discarded product			
Unique identification of newly formed product – labelling and packing	SPM CTE10	Apply unique identifier and compliant product, pack, carton labels			

Key data elements

Key Data Elements (KDE) ensure that captured and recorded data can be interpreted and used as relevant and required by all supply chain partners. Key Data Elements define Who, What, When, Where and Why for each Critical Tracking Event identified above.

Event code	СТЕ	Key data In	iputs and Outputs	Event code	СТЕ	Key data Ir	puts and Outputs
SPMCTE1	Establish master	Global Loc	ation Number			- the num	ber allocated to the export registered establishment
	data identification	The Global	Location Number (GLN) is used to identify locations and legal			– the limite	ed period for which the establishment is registered (if applicable)
	manufacturer	entities. Thi	s unique identifier is comprised of a GS1 Company Prefix, Location			- the expo	ort registered operations for the establishment
		Reference, and Check Digit.		– the eligik	ble country listing for the establishment which has been registered		
		GLNs are us within a co	sed to identify parties to business transactions; functional groups mpany: or real, physical "places" that miaht ship, receive, process, or			– persons	who manage and control the registered establishment
		hold the pro	oduct.			- conditio	ns of registration if any
		Request for	r GLN				
		Who	Processor			Request Fo	od Export Establishment Licence Number
			Issuing Agency			Who	Processor
		What	Issuing Agency				
		When	Date/Time of issuance of Global Location Number (GLN)			What	Processing Facility
		Where	Issuing Agency			When	Date/Time of request/issuance
		Why	Identification of Processing Facility			Where	Issuing Agency
CDMOTES	O sutificantian and	F	a Muudaan			Why	Food Export Establishment Licence request
SPMCTEZ	licensing	This licence	e number number is issued by local government			Certificatio	ns
		Request for	r Food Licence Number			- Harvest	certification (quota fishery, Catch disposal record, sales receipt) for
		Who	Processor			Chair of	
			Issuing Agency			- Chain of	Custody/BAP certification of processor
		What	Processing Facility			Information	n to be shared to a traceability platform
		When	Date/Time of request/issuance			– Global L	ocation Number (GLN)
		Where	Issuing Agency			– Export E	stablishment number
		Why	Food Licence request			– Food bu	siness registration number
		Food Expo	rt Establishment Licence Number			– Catch di	sposal record
		A copy of the establishme	he certificate of registration must be prominently displayed at the ent. The certificate must contain:			 Chain of of last are 	Custody/BAP Certification number, Certification body, date udit
		- the nam	e and address of the occupier				
		- the ACN	and ABN number of the occupier				
		– the alter	nate trading names (if applicable) of the occupier				

Event code	СТЕ	Key data Inputs and Outputs	Event code	СТЕ	Key data Inputs and Outputs
	Sourcing		SPMCTE4		- Feed use (type and lot numbers)
SPMCTE3		Wild-Caught Raw Material	Continued		- Reports of chemical treatments
	Identifying the	- Supplier name and address including country			 Testing data for the presence of microbes, antibiotics and product
	and/or grower	- Common or commercial name and species name			product
SPMCTE4		- Date of deliveries and lot numbers			Ingredients/Packaging Materials
	Recording the	- Input tonnage and total net weight produced for mass balance calculation			- Supplier name and dataress
	origin, species, integrity of the	- Quantity supplied by each supplier			- Facility invoice number and/or purchase order number
	input/ingredient	- Product form at the time of landing			- Receiving date, quantity and lot number
		- Date harvested (process date or date code)			Full description of the item
		- Date landed			- All label information including ingredients used and their
		- Fishery identification			 Lot number assigned by the facility when receiving in (if c receiving lot number)
		- Country of first landing			- Storage location
		– Country of origin			Information to share to a traceability platform –
		 Name of entity to which the fish was first landed or delivered including name, telephone, and email address of contact person 			 Master data identifiers of raw material and ingredient su location
		 Name of the flag of the harvesting vessel 			- Provenance verification for species, origin of input materi
		- Vessel(s) permit or license number			- Product identifiers and associated master data
		- Unique vessel identifier (such as vessel name or registration number)			- Certification number of supplier (e.g. BAP, MSC/ASC CoC
		- Specific type of fishing gear used for harvesting	SDMCTEE	Goods received	Percent of stack received
		Raw Material from aquaculture farm	SPMCTE5	Goods receival Input product	Record of stock received
		 Farm supplier name Farm cortification number and cortifuing body. 		unloaded, product	 Catch Disposal Record – auota fisheries (processor name)
		 Production method (nond cades, reservoir etc.) 		best-before/use-	Receiver Permit number, date received, number of fish/a
		 Identification of production unit 		by dates recorded	 Sales Receipt number
		 Sources of post larvae/stocking material 			Purchase order number
		 Date of deliveries and lot numbers (one pond/culture unit on a single day) 			 Delivery note number
		 Unit of measure and total net weight for mass balance 			– product ID
		- Movement document number (if relevant)			– batch, lot code
					- expiry/use-by date
					- quantity
					– weight
					 carton/pallet ID of product rejected/salvage/returns (m over ordered, damaged product)

Event code	СТЕ	Key data Inputs and Outputs	Event code	СТЕ	Key data Inputs and Outputs
SPMCTE6	Proof of Delivery	Proof of Delivery			Information to be shared to a traceability platform
	signed	- name of transport company			- Product ID
		- Vehicle and trailer registration number			– put away location
		- Time/Date of departure from port or farm			– Quantity
		- Consignor/seller name, address, contact			– Batch number
		 Purchase order number (item description, quantity ordered, quantity delivered, price) 			- Date of put away
		- Delivery Order/Packing List number	SPMCTE8	Processing Production records	Production refers to both processing of raw materials and manufacturing processes
		- Time and date delivered			- Production Order number / reference
		- Signature of receiver/consignee/processor			 Product ID of input materials
		Information to be shared to a traceability platform			 Input product quantity
		- Catch Receival Record (quota fisheries)			 Weight of products used
		– Purchase order number			- Input product batch number
		– Delivery order number			– Product ID of output material
		– Tax Invoice/Sales Receipt from supplier			- Quantity of product produced
		- Proof of Delivery number			– Batch number
		- Quantity (e.g. x pallets with unique IDs)			- Date of processing
		- Supplier of product			- Location of processing
		- Time and date of physical receipt			- Record of waste x input and processed product discarded at processing
SPMCTE7	Input/ingredient storage	Stock is moved from the receiving area to its designated storage location. Part of this process may involve transferring the product on to processor pallets or			Information to be shared to a traceability platform (as requested)
		internal assets prior to put away.			- Production Order Number
		- Product ID			 Input product(s), quantity, batch number
		– Quantity			 Output product, quantity, batch number
		– Batch number			- Processing/manufacture date
		- Use-by/expiry date			 Waste materials (product id, batch, quantity for both input and output products)
		- Pallet/tub/carton ID			
		- Storage location identifier e.g. chill/cold storage bay/rack position			

Event code	CTE	Key data Inputs and Outputs	Event code	CTE	Key data Inputs and Outputs
SPMCTE9	Product Inspection	Product inspection may occur during processing or post-processing.			Labelling of carton/unitised product packs
		Input information:			- Unique identifier linking the carton to items within
		– Production order number			– Batch number
		- Date of production			- Processor/manufacturer name and address in readable format
		- Date of inspection			- Use-by date
		- Product id	SPMCTE11	Processed/finished	Processed product is transferred from the processing area to a specified
		– Batch number		goods moved to	storage location.
		- Inspection record number		location	- Product ID
		- Type of inspection			- Quantity to transfer
		Information to be shared to a traceability platform			- Batch numbers
		– Production Order Number			- Date of transfer
		- Output product Quantity, Batch number	SPMCTE12	Dispatch	- Customer order number
		- date of production			- Picking slip number (or equivalent)
		- Quality status			– product ID
		- Inspection record			– Quantity
SPMCTE10	Labelling and	Product identifier - Affix a unique identifier (e.g. GTIN) to the newly created			– Batch number
	packaging	product			– Pick location
		On-label traceability			- Unit load device/pallet ID
		– Name of the food			Information to be shared to a traceability platform
		- Unique identifier for food			– Customer Order/Purchase Order number
		- Manufactured/processed date			– Product ID
		- Use-by /expiry date			– Actual Quantity picked (e.g. cartons)
		– Batch number			- Batch numbers
		- Country of origin			- Date of pick
		 Name and address of the processor or manufacturer 			- Location of pick
					– Delivery Order number
					– Advance Shipping Notice (ASN) number

Event code	СТЕ	Key data Inputs and Outputs	Applica
SPMCTE13	Departure of Outbound product	- Customer Order number	Adoption formats. T events in t
		– Delivery Order number	
		 Product ID, Batch #, quantity 	
		- Dispatch time and date	Data stan following t
		- Customer	
		- Deliver to location	
		- Dispatch location	Data Elem
		- Transport provider	
		- Vehicle registration number	Location
		Information to be shared to a traceability platform	
		- Customer Order Number	
		- Consignment note/Delivery Order number	Date/Time
		- Product ID	
		- Actual Quantity shipped x unit (e.g. 100 cartons per pallet)	
		- Time and Date of Dispatch	
		– Transport Company	Product Identifiers
		- Vehicle registration	
		(see Freight Transport Module for further detail on Dispatch processes)	
			Traceabilit Attributes

ation of GS1 global data standards

of global data standards enables data sharing between businesses through using common These formats allow a business to identify participants, locations, products, processes and the supply chain.

ndards that apply to key data elements and shared information are identified in the table.

Data Element	Examples	Valid Values	Data Type/ Format	Further information
Location	Manufacturing Plant, Finished Goods Location, Dispatch Dock	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here:
				https://www.gs1.org/standards/id-keys/gln
Date/Time	Production Date and/or time, Use By date, Best Before Date, Pack Date	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent approach. The globally adopted standard for date recording is YYMMDD
Product Identifiers	Input materials such as raw ingredients and	Global Trace Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system.
	packaging, Outputs such as finished goods, packaged or processed goods			Information on how to allocate a GTIN: https://www.gs1.org/1/gtinrules//en/
				Information on when to change a GTIN https://www.gs1.org/1/gtinrules/en/decision- support
Traceability Attributes	Batch/Lot code, Serial Number,		AN2O	Traceability Attributes, such as Batch or Lot Number or Serial Number etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain.
				Also referred to as Application Identifiers, each has its own unique identifier and format.
				List of Application Identifiers:
				https://www.gs1au.org/resources/standards- and-guidelines/identification-numbers/types-of- application-identifiers-(ais)

Data Element	Examples	Valid Values	Data Type/ Format	Further information
Logistics Units	Pallet of Finished Goods, Crate or Box of finished Goods	Serial Shipping Container Code (SSCC)	N18	Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain. Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets.
				https://www.gs1au.org/resources/standards- and-guidelines/identification-numbers/types- of-gs1-id-keys#LogisticsUnits
Weights & Measures	Variable count of items. Count of items on a logistics unit. Total weight of pallet in NET Kilos. Total Length of goods delivered in Metres. Total volume of goods delivered in Cubic Metres	Must be accompanied with a GTIN	Varying	Variable measure trade items use GS1 Application Identifier data fields that contains the quantity or dimension of a variable measure trade item. It also denotes the unit of measure. These element strings are used to complete the identification of a variable measure trade item. They contain information such as the weight, size, volume, or dimension of a variable measure trade item.



Useful links

Food Safety

FSANZ www.foodstandards.gov.au

Australian Institute of Food Safety www.foodsafety.com.au

Safe Food Australia www.foodstandards.gov.au

Seafood regulation www.legislation.gov.au

Food business regulation and licensing

- ACT <u>www.health.act.gov.au</u>
- NSW www.foodauthority.nsw.gov.au
- NT <u>www.health.nt.gov.au</u>
- QLD <u>www.health.qld.gov.au</u>
- SA <u>www.health.sa.gov.au</u>
- VIC <u>www.health.vic.gov.au</u>
- WA <u>ww2.health.wa.gov.au</u>
- TAS <u>www.dhhs.tas.gov.au</u>

Seafood processor licencing

- NSW www.foodauthority.nsw.gov.au
- NT <u>www.ablis.business.gov.au</u>
- QLD www.safefood.qld.gov.au
- VIC www.primesafe.vic.gov.au

- WA <u>www.ablis.business.gov.au</u>
- TAS <u>www.ablis.business.gov.au</u>
- SA <u>www.pir.sa.gov.au</u>
- **Product labelling**

NMI Weights and Measures www.business.gov.au

ACCC Country of Origin Food Labelling

Food Standards Code labelling www.foodstandards.gov.au

Carton labelling requirements are regulated by Industry, Innovation and Science Australia. www.industry.gov.au

Seafood Traceability – Processing standards, certifications

GDST www.traceability-dialogue.org

MSC/ASC Chain of Custody

Best Aquaculture Practices – Processing Standard 5.1 www.bapcertification.org

GS1 Seafood Traceability Guideline www.gs1.org



Glossary

Barcode

A barcode is a method of representing data in a visual, machine-readable form.

Chain of Custody (CoC)

CoC is a process that tracks the movement of evidence through its collection, safeguarding, and analysis lifecycle by documenting each person who handled the evidence, the date/ time it was collected or transferred, and the purpose for the transfer.

Critical Tracking Events

Critical tracking events are the events recorded throughout the supply chain that are essential for achieving food traceability and supply chain visibility. CTEs are dependent on industry standards specific to product categories, growing and processing procedures.

Electronic Product Code (EPC)

The EPC is syntax for unique identifiers assigned to physical objects, unit loads, locations, or other identifiable entity playing a role in business operations. EPCs have multiple representations, including binary forms suitable for use on Radio Frequency Identification (RFID) tags, and text forms suitable for data sharing among enterprise information systems.

Food processing

Food processing involves the transformation of agricultural products into food. It may involve freezing or canning outputs directly from farm production or creating inputs to further manufacturing processes e.g. whole tuna to canned tuna to fish cakes/fish sauce.

Global Individual Asset Identifier (GIAI)

GIAI is one of the two GS1 Keys for asset identification. Companies can apply a GIAI on any asset to uniquely identify and manage that asset. Examples include a computer, desk, vehicle, piece of transport equipment, or spare part.

Global Location Number

Global location number is the globally unique GS1 Identification Number for locations and supply chain partners. The GLN can be used to identify a functional entity (like accounts receivable or a bill back department), a physical entity (like a manufacturing plant, a distributor's loading dock, or a finished goods location), or a legal entity (like a parent corporation or subsidiary). The attributes defined for each GLN [e.g., name, address, location type (e.g., ship to, bill to, deliver to, etc.)] help users to assure that each GLN is specific to one unique location within the world.

Global Returnable Asset Identifier (GRAI)

A GRAI is a reusable package or transport equipment of a certain value, such as a beer keg, a gas cylinder, a plastic pallet, or a crate. The GS1 System identification of a returnable asset, the Global Returnable Asset Identifier (GRAI), enables tracking as well as recording of all relevant data.

Global Trade Item Number (GTIN)

GTIN is a number that can be used by a company to uniquely identify all its trade items. It is the number found in the barcode. GS1 defines trade items as products or services that are priced, ordered or invoiced at any point in the supply chain. The Global Trade Identification Number (GTIN) can be used to identify loose or pre-packed trade items, input materials, outputs, at any stage of the supply chain up to the end consumer.

Key Data Elements

Key data elements refer to the elements that have material impact on your organization's business operations, decisions, and other data demands such as regulatory, compliance or and market demands.

Mass balance

Mass balance is the ability to account for all quantities of raw materials, waste, workin-progress and finished product. Correct calculations ensure that, in the event of a recall, it is possible to account for all potentially affected raw materials and finished product.

Precompetitive

Pre- competitive body involves work conducted jointly by usually competing companies for the purpose of developing new commercially applicable technologies.

Radio Frequency identification (RFID)

RFID refers to a wireless system comprised of two components: tags and readers. The reader is a device that has one or more antennas that emit radio waves and receive signals back from the RFID tag. Tags, which use radio waves to communicate their identity and other information to nearby readers, can be passive or active.

Serial Shipping Container Code (SSCC)

SSCC is an 18-digit number used to identify logistics units. In order to automate the reading process, the SSCC is often encoded in a barcode, generally GS1-128, and can also be encoded in an RFID tag. It is used in electronic commerce transactions.





Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Wholesale and Distribution



Seafood Wholesale and Distribution

Seafood wholesalers and distributors provide producers and manufacturers a channel to market through receiving product from suppliers and distributing to retail or food service.

The transactions in wholesale are between businesses (B2B) and generally don't involve direct to consumer sales and often are in larger volume lots e.g. crates, polystyrene boxes, cartons of catering portions for restaurants, or for retail re-packaging.

Typically, the wholesaler may hold a range of products in volume, received from fishers, growers, processors and manufacturers, or may specialise in a particular product category e.g. abalone, lobsters, salmon, barramundi, prawns.

Using a wholesaler or food distributor saves retailers and foodservice operators the need to interface with multiple suppliers and in organising individual pick up and deliveries. The ability of the wholesale buyer to purchase in bulk can represent savings for small businesses such as restaurants and specialist retailers.

A food distributor may act as an agent for a seafood processor or manufacturer, selling the product to retailers or foodservice operators. Distributors may work directly between food manufacturers and retailers; with wholesalers supplying retail and food service; or directly servicing institutions such as hospitals or schools.

Distribution centres (DCs) may be operated by a retailer or wholesaler or supplied by an outsourced third-party logistics company (3PL). In seafood distribution facilities, handling multi-temperature products and cold chain management are critical factors. Products can come into warehousing for short or longerterm storage, or to be grouped according to destination. Distribution centres may break down pallets of the product to re-group them for a retail outlet or a specific delivery geography. They may cross-dock the freight for this purpose without breaking down the *load unit*, transferring a truckload of pallets to outbound vehicles for different destinations. Products from other sources can be also loaded on the same vehicle.

The workflow and tasks of a full-service distribution centre commence when goods are received from a source and end when goods are received by the customer business. Returned products may re-enter the wholesaler/ distribution centre or be directed to a specialised section/facility.

Wholesalers rely on effective warehouse management systems to keep control of inventory and distributors rely on both warehouse management and *transport* management systems to direct inbound and outbound products.

The traceability challenge is to maintain the identity and location of product as it is received, unpacked, stored, then picked and packed for outbound delivery. Co-mingling of product and shrinkage due to damage or error are a risk in wholesaling and distribution activities. Processes covered in this module include:

- 1. Establishing identities
- 2. Inbound product receival at wholesaler or distribution centre
- **3.** Storage of the product
- 4. Sale and dispatch of the product
- 5. Distribution to end consumer sales.

1. Establishing identities

Creation of unique identifiers for suppliers, the wholesaler and distribution centre, as well as customers will enable accurate information relating to the chain of custody of the product and enhance track and trace processes. Recording this data in the context of a sale and subsequent movement of the product can accelerate the speed of locating product and accounting for inventory in this segment of the supply chain.

Identifiers may be recorded as a fishing operator or aquaculture licence holder; a food business licence number; or a readable business name and address on the item or carton label. A Global Location Number (GLN) incorporates information on the business entity and location which can be used as a unique code to locate the business.

Identification of products at item level, batch or lot level, carton/crate level and subsequently at load unit level is critical to traceability in wholesale and distribution centre operations, as the product may be broken down or consolidated up to any of these levels during processes such as cross-docking, put away in storage, picking and packing and assembling customer orders for dispatch.

Attributes can be associated with the product using these identifiers, to support inventory management (e.g. best-before, expiry date, temperature) and in expediting delivery to customers (specific instructions, dock number, receival windows).

Tasks related to traceability

- Creation of unique identifiers for the business and supply chain partners e.g. suppliers and customers and their locations
- Creation of unique identifiers for the products traded or handled
- Creation of unique identifiers for the load units that contain the product
- Completion of food safety regulation and licensing.

Participants

- Wholesaler
- Suppliers (growers, processors, manufacturers)
- Property identification issuing organisation
- B2B Customers
- Food Authorities state and local government.
2. Inbound product receival at wholesaler or distribution centre

Most wholesalers and distribution centres receive product loaded on a load unit such as a pallet. Each load unit is affixed a logistics label that contains information relating to the load in both human readable form and barcoded. Each load unit is typically scanned by the Transport Company prior to unloading, capturing key traceability information (product, supplier, batch/lot number, best before date, quantity).

Warehouse/DC staff need to conduct an inspection which confirms the use-by or best before dates are consistent with shelf-life specifications; the product is undamaged in its packaging; spills or contamination by pests have not occurred; and the products are as listed in the *Delivery Order* or Advance Shipping Notice.

Once the inspection is complete, receival staff will unload the consignment and sign a *Proof of Delivery*, effectively proving the receipt of the goods.

Once unloaded, the inbound product is entered in the *Inventory Management System* as received product and is then moved to an allocated bay for re-loading for outward dispatch (cross-docking) or put away in an allocated slot in the warehouse/distribution centre, where the systems are updated. Some organisations may have implemented *Warehouse Management Systems* (WMS) to manage the storage and movement of stock. Seafood storage is generally divided into temperature levels – ambient, chilled and frozen. Most seafood is chilled or frozen, although canned products are kept at ambient temperatures. For storage and handling instructions see <u>Sydney Fish Markets Storage</u> and Handling Guide 2015, AFGC Cold Chain <u>Guidelines 2017</u>, or the AFCCC cold chain management codes and standards.

Tasks related to traceability

- Inspect inbound product reject of accept all or part of the Consignment
- Sign Proof of Delivery
- Notify supplier of Purchase Order reconciliation with Supplier Invoice
- Enter goods receipt into Inventory systems. Best practice is to scan product barcode/ identifier into warehouse management system
- Record use-by/product expiry date
- Allocate to identified storage slot, bay or floor grid area
- Customer re-packs rejected stock and relabels if new packaging is used
- Supplier organises returns of rejected stock.

Participants

- Receival staff
- Transport driver
- Warehouse operations staff
- Accounts staff.

3. Storage of the product

Food product *warehouse management systems* manage multiple needs, such as:

- Inventory management including First-In:First Out (FIFO) or First Expiry First out (FEFO), rotation of product
- Visibility of stock down to Bin location by batch number
- Stock counts
- Visibility of stock levels for customers and sales agents – often across several storage sites
- Order fulfilment
- Labelling of stock
- Shipment tracking of in-transit goods
- Returns monitoring
- Security and food safety
- Temperature, humidity requirements.

Wholesalers and Distribution Centres carry multiple stock keeping units (SKUs) and for those managing e-commerce operations, multiple item-level stock items. An increase in B2B/E2E distributors moving to B2C sales due to COVID 19 restrictions and geopolitical/trade issues can mean that wholesalers and distributors are handling multiple sales channels.

Different methods and technologies are used for tracking product in storage, including:

- Barcode scanning and scanning of associated storage location
- Voicepick systems to manage order fulfilment
- Active RFID tags to track product movement within the storage facility
- Spreadsheets.



Quality control and inspection of stock

The quality assurance (QA) department performs periodic checks of random samples of stock to ensure their condition meets a certain required standard. Products are checked throughout the warehouse racking, goods in and returned stock phases. The department may also do cycle counts to find missing stock. Quality control requirements are often associated with retailer standards or industry standards specific to the type of food being inspected.

Providing visibility for customers and sales agents

Availability of stock is made visible for customers' Order Management Systems through integration with the Wholesaler or Distribution Centre Warehouse Management System.

Tasks related to traceability

- Location of stock by item, batch, carton and pallet
- Count of stock keeping units (SKUs)
- Visibility of stock levels to customers and suppliers
- Quality Assurance inspection
- Recording of stock shrinkage in storage
- Returns monitoring
- Food safety compliance
- Monitoring of storage conditions e.g. temperature, humidity.

Participants

- Warehouse operational staff
- Suppliers
- Customers
- Quality Assurance inspectors and auditors
- Food safety auditors
- Customer auditors.

Continuous data logging from calibrated sensors is the preferred approach for cold storage. In less critical, short term or smaller business operations, monitoring must be sufficiently frequent to detect trends, and in particular malfunctions in temperature control. At a minimum, temperature readings must be at least twice daily.¹

4. Sale and dispatch of the product

Product sales for Wholesalers commence with a *Customer Purchase Order*, or Customer Account Orders for replenishment of stock levels at food operators. This activates the *Order Acknowledgement* and *Order Confirmation* detailing the specified goods to be delivered and terms of the sale. An Order Confirmation is dependent on the wholesaler ensuring the stock is available, highlighting the value of visibility of stock levels and locations.

The Customer Order is then initiated, and a *packing (or picking)* list is created to ensure the right products and quantities are picked and assembled for packing for outbound delivery. As products are picked, they are scanned according to the packing list. Some products are required to be packed into store-ready

displays or require additional labelling for sales promotion. This is completed and product is repackaged prior to palletising.

In the packing area the product is scanned as it is loaded to a transport asset load unit such as a pallet or tub. At this stage the product identification is now associated with this load unit. The pallet is shrink wrapped and a transport label affixed, which now associates each item or carton to the load unit and *transport management system* (vehicle registration, transport booking reference, delivery order and consignment note).

An Advance Shipping Notice is prepared for the customer and issued. This allows the customer to prepare for the inbound stock.

The product is now ready for delivery and a *Delivery Order* is prepared for the Transport Company, detailing the consignment instructions.

A *Consignment Note* is prepared to facilitate handover of the outbound shipment to the transport company.

An *Invoice* is then issued to the Customer requesting payment for the goods. Account credits are made for damaged, missing or returned stock. In some cases, the invoice is raised once the goods have been received by the customer and a delivery confirmation (Receipt Advice) is sent back.

Tasks related to traceability

- Receipt of Purchase Order from customer
- Picked and packed and linked to a logistics unit
- Advance Shipping Notice issued to customer
- Customer Invoice issued
- Transport Management System booking reference assigned.

Participants

- Sales representatives and agents
- Warehouse operational staff
- Wholesaler administrative staff
- Customers
- Transport suppliers.

1AFGC Australian Food Cold Chain Logistics Guidelines 2017 https://www.afgc.org.au/wp-content/uploads/2019/07/ Australian-Cold-Chain-Guidelines-2017.pdf



5. Distribution to end consumer sales (delivery to food operators)

For wholesalers and distribution centres, the *Proof of Delivery* message indicates the delivery has been received by the customer.

The customer will communicate any under or over delivered stock, damaged or missing stock against their Purchase Order and notify the wholesaler within a specified timeframe so the under/over stock can be included in the next order.

Arrangements for return of damaged or rejected stock are made as per sale terms and conditions. Returned stock will either be disposed of or re-enter the inventory of the wholesaler once its disposition is determined. Recording this stock and its re-entry or disposal will be required for traceability audit.

Tasks related to traceability

- Proof of Delivery received
- Reconciling Purchase Order with Invoice
- Stock returns management.

Participants

- Transport Company
- Customer
- Warehouse operations staff.

Critical Tracking Events

For each of the identified freight transport activities, **Critical Tracking Events (CTEs)** establish identity and enable traceability and compliance with traceability-related regulation are summarised as follows:

Critical Tracking Events (CTEs) are events that relate to the identity, movement and transformation of the food product.

Wholesale and distribution activity	CTE code	Critical Tracking Events (CTEs)
Establishment of unique identifiers	SWDCTE1A	Creation of unique identities for the business and supply chain partners; products traded or handled
Licensing and food safety program establishment	SWDCTE1B	Registration of food premises and food safety plan enacted
Industry certifications	SWDCTE1C	Certify against industry standards e.g. GDST, MSC/ ASC Chain of Custody, BAP
Receival from suppliers Inspection Inspection can occur at time of	SWDCTE2 SWDCTE3	 Receipt of Product completed and recorded in inventory systems Sign Proof of Delivery Notify supplier of Purchase Order reconciliation with Supplier Invoice Scan product barcode/identifier into warehouse management system Record use-by/product expiry date Allocate to identified storage slot, bay or floor grid area Inspect inbound product – reject or accept all or part of consignment
receipt, or once stock putaway has been completed		 Quality Assurance inspection And Food safety compliance
Storage	SWDCTE4	- Putaway stock in warehouse storage location
 Product moved from receiving area to warehouse location 		
Monitoring in storage	SWDCTE5	 Count of stock keeping units (SKUs) Visibility of stock levels to customers and suppliers Recording of stock shrinkage in storage Monitoring of storage conditions e.g. temperature, humidity. pest inspections and treatments

Wholesale and distribution activity	CTE code	Critical Tracking Events (CTEs)	Event code	СТЕ
Delivery preparation	SWDCTE6	 Customer Purchase Order or on-line order received 		Establishment
		 Order Acknowledgement sent to customer 	SWDCTE1A	Establish master
		 Stock availability checked and Order Confirmation sent to customer confirming terms of the sale 		business and assets
		- Customer Order created and packing list prepared		
		 Product picked from storage 	SWDCTE1B	Registration of
		 Product packed for outbound transport 		food safety plan
		 Transport booking made and Delivery Order and Consignment Note/Bill of Lading prepared 		enacted
Delivery to Customer	SWDCTE7	- ASN issued to Customer		
		- Invoice is sent to the Customer		
		- Proof of Delivery received from Transport Company		
		 Reconciling Purchase Order with Invoice and ASN to identify over/under/missing/reject stock 		
Returns Management	SWDCTE8	 Rejected stock re-packed and re-labelled with item or batch number recorded 		
		 Product scanned at return to wholesaler warehouse of DC 		
		 Scan returned product against Customer ASN/ Returns Notice/Returns Authorisation Notice 		
		- Re-enter stock in WMS inventory		
		 Record returns to supplier and scan prior to loading on transport 		
		 Enter stock ID prior to disposal 		
			SWDCTE1C	Industry certification

Key Data Elements

vent code	СТЕ	Key data Inpu	uts and Outputs				
	Establishment						
WDCTE1A	Establish master data for the	 Unique identifiers for entities and operational site/s location e.g. individual storage facilities, fishing cooperative cold storage, processing vessels 					
business and		- Allocation of unique identifiers for assets e.g. vehicles, containers					
assets	 Food Export Establishment number 						
		- Food Prem	ises Licence number				
WDCTE1B	Registration of	- Food Expor	rt Establishment number				
	food premises and food safety plan enacted	- Food premises Licence number					
		Request for G	SLN				
		Who	Distributor/Wholesaler				
			Issuing Agency				
		What	Site Locations				
		When	Date/Time of issuance of Global Location Number (GLN)				
		Where	Issuing Agency				
		Why	Physical Location set up and identification				
		Request for F	ood Licence Number				
		Who	Distributor/Wholesaler				
			Issuing Agency				
		What	Site Locations/organisation				
		When	Date/Time of issuance of License				
		Where	Issuing Agency				
		Why	Registration of business for Food export				
WDCTE1C	Industry	- Certificatio	on body				
	certification	- Certificatio	on code				
		– Last audit	date				
		Information to	o be shared to a traceability platform				
		– Global Loc	ation Number (GLN)				
		– Food Expo	rt Establishment number				
		- Food Prem	ises Licence number				
		– Industry Ce	ertification/s				

Event code	СТЕ	Key data Inputs and Outputs		Event code	СТЕ	Key data Inputs and Outputs		
SWDCTE2	Receipt of Product completed			SWDCTE3	Inspection	- Supplier	/Vendor ID	
	and recorded in inventory systems				At goods receipt and during	- Purchase Order Number		
	 Signed Proof of Delivery 	– POD seria	lised code number		inventory management	– Logistics/Pallet ID		
	- Notify supplier of Purchase	EDI messagii	ng between Supplier and Customer ERPs			– Product I	D	
	Order reconciliation with Supplier Invoice	- Supplier/V	/endor ID			– Quantity		
	- Scan product barcode/	– Supplier G	GLN			– Batch Nu	ımber	
	identifier into warehouse	– Purchase	- Purchase Order Number			- Code for	rejection – under/over; missing; damaged; QA fail	
	 Record use-by/product 	- Logistics/	Pallet ID			Goods Insp	ection	
	expiry date	- Product IE	D see Australian Fish Names			Who	Distributor/Wholesaler	
	- Allocate to identified storage	- Batch/Us	e-By or Best-Before date				Inspection	
	slot, bay or floor grid area in WMS	or grid area – Quantity				What	Purchase Order, Delivery Note, Logistics/Pallet	
		- Date due	for delivery and invoice payment				ID (SSCC) Product ID, Quantity, Batch, Date Information	
		- Invoice nu	Imber			When	Date/Time of Inspection	
		- Code for I	rejection – under/over; missing; damaged; QA fail			Where	Inspection location	
		Goods Rece	ipt			Why	Inspection	
		Who	Distributor/Wholesaler			Information to be shared to a traceability platform		
		Who						
		What	Purchase Order, Delivery Note, Logistics/Pallet ID,			- Product I	D	
			Product ID, Quantity, Batch, Date Information					
		When	Date/Time of Receipt			– Batch ID		
		Where	Receipt location			- Use-by/	expiry dates	
		vviiy	Receipt of product					
		Information	to be shared to a traceability platform					
		– Purchase	Order Number					
		- POD seria	l code number					
		- Product IE)					
		- Use-by/e	xpiry dates					
		- Goods rea	ceipt number					
		– Purchase	Order					
		– Quantity I	Received					
			eived					

Event code	СТЕ	Key data In	puts and Outputs	Event code	СТЕ	Key data I	nputs and Outputs		
	Storage	rage				Stock shrinkage			
SWDCTE4	Product putaway into storage	– Storage s	slot barcode identified on ERP/WMS system			Who	Distributor/Wholesaler		
	location	– Product k	oarcode scan/identifier recorded at putaway			What	Product ID, Quantity, Batch, Date Information, Logistics/Pallet ID		
		Put Away				When	Date/Time of Monitoring		
		Who	Distributor/Wholesaler			Where	Product location		
		What	Product ID, Quantity, Batch, Date Information, Logistics/Pallet ID			Why	Monitoring, stock shrinkage		
		When	Date/Time of Put away				Temperature control		
		Where	Receipt location				Temperature records twice daily -		
		Why	Stock Put away (movement)				 Date and time 		
		Information	to be chared to a traceability platform				 Recorded temperature degree Celsius 		
		mormation					- Corrective actions		
		- Product I	D				– Name		
		 Product of 	quantity/SKUs in storage inventory				 QA supervisor initials 		
		– Product u	use-by; expiry dates		Storage condition monitoring				
		- Date/Tim	ne stamp of putaway			Monitoring	g/Temperature		
SWDCTE5	Monitoring in storage	Inventory lev	vel reports by			Who	Distributor/Wholesaler		
	Inventory visibility for customer order management	- Batch/Sk	KU number			What	Product ID, Quantity, Batch, Date Information, Logistics/Pallet ID, Temperature reading		
	0	– use-by/e	expiry dates			When	Date/Time of Monitoring		
		Monitoring				Where	Product location		
		Who	Distributor/Wholesaler			Why	Monitoring, temperature		
		What	Product ID, Quantity, Batch, Date Information, Logistics/Pallet ID				Pest incursion and treatment –		
		When	Date/Time of Monitoring/Stock Check				 Date and time of inspection 		
		Where	Product location				 Date and time of treatment 		
		Why	Monitoring (Inventory levels)				- Supplier ID of chemical/product used		
	Stock shrinkage records	– Batch an	nd item level ID (GTIN, SSCC, Lot/batch number)				- Product name, batch number and expiry date		
		– Quantity					- Rate of application		
		– Supplier I	ID				– Pest Controller ID		
		- Date reco	orded						
		- Accounte	ed value						

Event code	СТЕ	Key data Ir	nputs and Outputs	Event code	СТЕ	Key data l	nputs and Outputs	
		Monitoring	/Pest Control		Delivery to Customer			
		Who	Distributor/Wholesaler	SWDCTE7	Transport Management System	– Booking	Reference/Tracking number	
			Pest Controller		booking	- POD/Re	eceiving Advice –	
		What	Service Type, Chemicals used, Pest control report		POD from Transport company	– Date ar	nd time delivered	
		When	Date/Time of Pest Control		ASN received by Customer	– Job nun	nber	
		Where	Warehouse location		Invoice issued to Customer		number	
		Why	Monitoring, Pest Control		Reconciliation of PO: Invoice:			
	Picking (order processing)				ASN and list variations in	– Freight j	paid by	
SWDCTE6	Receipt of Purchase Order from	Inbound Pu	urchase Order -		message to wholesaler/ DC	- Collecte	ed from location	
	Customer	• Custom	per name and location			- Delivere	ed to location	
		 Seller n 	ame and location			– Number	of load units/pallets/cartons	
		 Product 	t quantity			- Contact	t name	
		Product	t price			- Contact number		
		 Ierms c Product 	and conditions of sale			 Accontance of terms and conditions 		
		 Delivery 	y terms and conditions					
		 Paymer 	nt terms and conditions			- Signature		
		Picking				 ASN number Supplier invoice number 		
		Who	Distributor/Wholesaler					
		What	Customer Purchase Order Picking list number			- Item/lot/batch code		
			Product ID, Quantity, Batch, Date Information			 Quantity missing/under/oversupplied/rejected Manufacturer ID 		
		When	Date/Time of pick					
		Where	Pick location			– Date rea		
		Why	Picking stock			- Date received		
		Informatio	n to be shared to a traceability platform			Dispatch		
		– Purchase	e Order number			Who	Distributor/Wholesaler	
		- Product	ID			What	Customer Purchase Order, Delivery Note, ASN number, Logistics/Pallet ID (SSCC) Product ID, Quantity, Patch, Data Information, Shipmont	
		– Batch/U	Jse by/Best before dates				number	
		– Quantity	y picked			When	Date/Time of Despatch	
			age location			Where	Dispatch location	
			nick			Why	Dispatch of product	
		Date of	pox					

Event code	СТЕ	Key data Inputs and Outputs	Event code	СТЕ	Key data Inj	puts and Outputs
		Information to be shared to a traceability platform			Returns	
		- Customer Order Number			Who	Distributor/Wholesaler
		– Dispatch/ASN number				Transport provider
		– Shipment Identifier			What	Customer Purchase Order, Picking list number,
		- Product ID				Number, Logistics ID (SSCC)
		– Batch number			When	Date/Time of Return
		- Quantity picked			Where	Pick location
		– Dispatch location			Why	Stock Return
		– Dispatch date				
		– Receiving location			Information	to be shared on Traceability platform
		- Customer details			– Return Ide	entification
	Returns management	- Item/batch/lot code			– Product II	D, Batch and quantity returned
SWDCTE8	Rejected stock re-packed and	- Date returned			– Returned	Date
	re-labelled with item or batch	- Product ID/barcode			– Reason fo	pr return
	number recorded	– Quantity			- Logistics	unit identifier
	Scan returned product and	– Load unit SSCC				
	Invoice/ASN/Returns Notice	– Ship from				
		– Ship to				
	Re-enter usable stock in WMS inventory	 Return Merchandise Authorisation number affixed to item/ carton 				
	Record returns to supplier on	– RMA number				
	RMA – scan product ID and RMA number prior to loading on	- ASN/Delivery Order/RMA number				
	transport	- GTIN/SSCC numbers				
	Entersteck ID in Inventory	- New SSCC pallet/tub number				
	system/WMS prior to disposal	 New transport label printed and affixed 				
		– Purchase Order No				
	Product scanned at return to wholesaler warehouse of DC	– Shipment number				

Application of GS1 global data standards

Adoption of *global data standards* enables data sharing between businesses through using common formats. These formats allow a business to identify participants, locations, products, processes and events in the supply chain.

The following data standards have been defined and included to support the list of CTEs and KDEs listed in this module.

Data Element	Examples	Valid Values	Data Type/ Format	Further Information	Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Location	Distributor Receiving Dock	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here: https://www.gs1.org/standards/id- keys/gln	Traceability Attributes	Batch, Serial Number, Production Date	Al (10) = Batch	AN2O	Traceability Attributes, such as Batch or Lot Number, Serial Number, Production Date etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain.
Date/Time	Date of stock receipt, date of despatch	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent					Also referred to as Application Identifiers, each has its own unique identifier and format. List of Application Identifiers
Product Identifiers	Packaged Product	Global Trace Item Number (GTIN)	N14	approach. Unique product identification of all traceable objects is a foundational element of any traceability system	Logistics Units	Pallet of packaged product	SSCC	N18	Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain.
	Number (GTIN) traceable objects is a foundational element of any traceability system Information on how to allocate a GTIN: https://www.gsl.org/1/gtinrules//en/ Information on when to change a GTIN https://www.gsl.org/1/gtinrules/en/ decision-support		Information on how to allocate a GTIN: https://www.gs1.org/1/gtinrules//en/ Information on when to change a GTIN https://www.gs1.org/1/gtinrules/en/ decision-support					Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets.	
									GS1 Identification key

Data	Examples	Valid Values	Data Type/	Further Information	Useful links
Element	·		Format		Licensing of Seafood Wholesalers
Returnable Asset	Chep Pallet	AI (8003)	N29	The Returnable Asset Identifier is especially suitable for the management of reusable transport items, transport equipment, and tools. It can identify these returnable assets by type and if needed also individually for tracking and sorting purposes https://www.gs1.org/standards/id- keys/grai	And Distributors NSW https://www.service.nsw.gov.au/ transaction/apply-licence-process-pack-store-and-distribute-seafood NT https://ablis.business.gov. au/service/ag/fish-receiver-permit/187?bsld=1&locations=NT
Consignment	Grouping of logistics units assigned by the transport company	GINC	N30	The Global Identification Number for Consignment can be used by companies to identify a consignment comprised of one or more logistic units that are intended to be transported together. https://www.gsl.org/standards/id- keys/global-identification-number-	https://ablis.business.gov.au/ service/nt/fish-trader-processor- licence/3360?bsld=1 QLD https://www.safefood.qld.gov.au/food- business/want-sell-supply/
Shipment	Grouping of logistics units	GSIN	N17	Consignment-ginc The Global Shipment Identification Number (GSIN) is a number assigned by a seller and shipper of goods to identify a shipment comprised of one or more logistic units that are intended to be delivered together.	SA <u>https://www.sahealth.sa.gov.au/</u> wps/wcm/connect/public+content/ sa+health+internet/public+health/ food+safety+for+businesses/ starting+a+food+business
				https://www.gs1.org/standards/id- keys/global-shipment-identification- number-gsin	TAS <u>https://ablis.business.gov.au/service/tas/</u> fish-processing-licence/7400
					VIC <u>https://ablis.business.gov.au/service/vic/</u> seafood-retailer-or-wholesaler- licence/31158

Food Safety in wholesale and distribution operations

https://www.foodsafety.com.au/lawsrequirements/food-sectors/transportdistribution

https://www.foodstandards.gov.au/ publications/Documents/Safe%20Food%20 Australia/FSANZ%20Safe%20Food%20Australia_ WEB.pdf

https://www.afgc.org.au/wp-content/ uploads/2019/07/Australian-Cold-Chain-Guidelines-2017.pdf

https://afccc.org.au/current-standards.html

https://www.aepma.com.au/FileDownload/667/ CoP_Pest_Management_in_the_Food_Industry-1st_Edition_pdf

NSW Cold Store Food Safety Program 2019 https://www.foodauthority.nsw.gov.au/sites/ default/files/2023-03/cold_store_food_safety_ program_0.pdf

PrimeSafe Seafood Handling https://www.primesafe.vic.gov.au/licensing/ seafood/wholesaler/

Seafood Weights and Measures https://www.industry.gov.au/nationalmeasurement-institute/trade-measurement/ selling-seafood

Minimising shrinkage

WA https://ablis.business.gov.au/service/wa/

fish-processors-licence/17245

http://www.tradingpartnerforum.com.au/ publications/2016/4/18/loss-prevention.html

Glossary

Advance Shipping Notice (ASN)

An advance ship notice or advance shipping notice (ASN) is a notification of pending deliveries, similar to a packing list. It is usually sent in an electronic format and is a common EDI document.

B2B/E2E

Business-to-Business and Exchange-to-Exchange describes the IT system and business transactions between trading partners in a supply chain. In E2E transactions of data it is presumed these are automated processes.

Consignment Note

The consignment note is a key document used in transporting freight within domestic supply and in the landside logistics of import and export.

The goods are deemed to be "on consignment" until they reach the consignee.

The document is prepared by the consignor and countersigned by the transport carrier as a proof of receipt of the consignment for delivery at the destination.

Cross dock

An area within a warehouse or distribution centre where inbound goods are sorted and re-loaded on transport without storage. Bays in a crossdock are temporary holding locations for goods prior to re-loading.

Delivery Order (DO)

A document from the Consignor of the freight which orders the release of the cargo to another party. This permits the delivery direct to a warehouse or depot, as organised with the Consignee. This enables the Consignor to order pick up of product from a 3PL warehouse in order to deliver to the party named in the Delivery Order.

First in: First out (FI-FO)

FO-FO is a stock rotation mechanism based on recording the best-before/use-by/expiry date of food product received into a warehouse management system, to ensure food product is not overlooked and wasted due to expiry of these dates.

Inventory Management

Inventory is goods in raw form, bulk or packaged ready for sale. Management of inventory in the wholesale and distribution phase involves tracking and controlling this stock, generally in its finished product condition, ready for sale and delivery to food business operators.

Load Unit

The Principle of Unit Load states that, "it is quicker and more economical to move a lot of items at a time rather to move each one of them individually". In other words this principle suggested that, the larger the load handled, the lower the cost per unit handled. Packages loaded on a pallet, in a crate or any other way that enables them to be handled at one time as a unit is described as a load unit.

Load units may be pallets, tubs, barrels, shipping or intermodal containers, tanks, cages or unit load devices (airfreight).

Order Acknowledgment

An Order Acknowledgment is a commercial document/electronic message issued by the Wholesaler or Distribution Centre acknowledging receipt of the Purchase Order.

Order Confirmation

A legally binding commitment to deliver specified good on specified terms. This enables the buyer to plan for receipt of these goods and if unconfirmed, to look to alternative suppliers.

Order Management System

An order management system (OMS) is a tool that records all the sales and purchase order details of a business on a single platform.

Proof of Delivery (POD)

A commercial document used by the Consignee or their Logistics Service Provider to notify the Consignor of the receipt and acceptance of a delivery. A signed POD enables the Transport Company to raise an invoice.

Purchase Order (PO)

A commercial document issued by a buyer to a supplier. This is a legally binding offer to buy product in return for payment. The terms and conditions for delivery and payment are detailed in this document, which also details the product quantity, price, terms and conditions, product quality specifications.

Quality Assurance (QA)

In the context of food distribution and storage, QA involves compliance with regulatory requirements (based on Food Safety standards) and the specifications of industry and customer standards.

Return Merchandise Authorisation (RMA) or Returns Authorisation Notice (RAN).

A form used commonly in e-commerce to facilitate the return of product. The RMA details the reason for return of the product and enables execution of the agreed returns policy between the wholesaler and food business operator.

Shrinkage

Shrinkage of product in wholesale and distribution refers to the loss of stock and its value due to administrative errors, product deterioration and damage (e.g. packaging, contamination), theft or fraud.

Stock Keeping Unit (SKU)

Retailers use SKUs to identify products placed on sale to consumers. They are distinct to each retailer and designed for internal purposes. In connected Point of Sale and Inventory Management Systems, retailers may choose to track product based on their SKUs. Use of SKU number in traceability is limited at a supply chain level in comparison to a Universal Product Code (UPC) barcode symbol.

SKU	vs	UPC
ZG011AQA		0*123456*789012*
Unique for each retailer		Consistent across retailers
Alphanumeric		Numeric only
Varies in length		Always 12 digits

Transport Management System (TMS)

A TMS enables a wholesaler or distributor to coordinate movement of product from one location to another, including procurement of transport services, planning of inbound and outbound delivery route, transport mode and timelines, product tracking in transport processes and transport invoice control.

Warehouse Management System (WMS)

A warehouse management system is a software solution to manage and optimise inventory and supply chain operations in a distribution centre. Typical functions of a WMS include:

- Receiving products
- Tracking stock
- Efficient storage
- Picking and packing product for delivery
- Dispatch of goods
- Returns management
- Messaging between suppliers and customers.



Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Retail



Seafood Retail

This module covers key activities that generally take place along a retail business supply chain where food (fresh and/or processed) is sold to customers usually to be consumed elsewhere.

Retail businesses may include supermarkets, fishmongers, delicatessens, convenience stores, and fish markets. The seafood can be fresh or frozen, cooked, whole, fileted, or processed into a finished product (e.g. brined, canned, coated, or as an ingredient in fish cakes).

In this module, nine processes/activities are associated with retail businesses:

- 1. Establishing master data
- 2. Sourcing of product suppliers
- **3.** Auditing suppliers for traceability and food safety
- Inventory management in 3rd party logistics warehousing and retail distribution centres
- 5. Storage of inbound product
- 6. Ensuring food integrity, quality, and safety
- 7. Point of sale data capture
- 8. Product returns and store salvage.

1. Establishing master data

Regulatory agencies may mandate establishment activities for food retail businesses. This can be required for local, state or national government responsibilities, such as ensuring the entity can be located in the circumstance of a food safety or health riskrelated disease outbreak or food recall.

Councils classify every food premises within their municipal districts. Classification is determined by the food safety risk of the premises. The registering Council will determine the classification of the premises. All food retail businesses need to apply for a licence and registration with their local Council. This licence is annual.

In addition to having a food business licence number, creating a unique identification and location reference for the retail business will enable food logistics and traceability of inbound shipments to be undertaken efficiently. This is effective for food retailers with multiple outlets, enabling each to have a unique identifier for use in distribution.

Traceability can be created through establishing the identity of items supplied, suppliers and businesses handling inbound product. Assets used to store and to store/move product can also be identified and correlated with the product and locations.

Key tasks related to traceability

 Allocate a Global Location Number (GLN) (entity and location) to each retailer distribution centre, warehouse and retail outlet

- Ensure Logistics Service Providers such as 3PL (third party logistics) storage are identified e.g. cold storage off-site
- Request GLN of suppliers
- Create identification of own transport assets
 such as store-ready pallets, trays
- Ensure unique identification of each item sold.

Participants

- Retailer
- Logistics service provider/3PL
- Suppliers to retail
- Identity issuing agency.



2. Sourcing of product suppliers

Identifying, contracting and managing product suppliers is a major activity for food retail businesses. Sourcing involves:

- Establishing the requirements for products
- Defining the sourcing strategy to follow
- Sourcing potential suppliers from local and overseas markets
- Identifying desired suppliers based on requirements
- Evaluating possible suppliers
- Negotiating contract specifications
- Reviewing contracts to ensure compliance with standards and policies
- Signing the contract based on supplier/ vendor agreements
- Managing/auditing the supplier.

In sourcing seafood product into retail food businesses, identification and verification of supplier entities and the origin of the product (harvest locations) may be mandated by the retailer. It assists in telling the story of the product to consumers and supports product recall.

For food retail businesses, traceability should extend to being able to identify the source of all food products including fresh products, processed food products and other inputs such as packaging material.

Food retail businesses may experience sourcing of the same type of a product from many producers or locations. For example, a food retail business may select an intermediary such as a wholesaler to supply product from several fisheries or aquaculture farms of origin. Once the product is collected from different seafood suppliers, verifying the origin of the product supplied becomes increasingly challenging. Without a traceability system in place from the original source of the animal, claims related to provenance are difficult to authenticate and substantiate.

Product suppliers, who may be fishers, aquaculture farms, seafood wholesalers or food processors, should be able to provide verification of provenance of supplied raw produce and the components of the processed seafood product (including additives, other ingredients and packaging material). This may take place as part of the due diligence process in sourcing and procurement practices. Product suppliers with traceability systems will be able to provide data that can be automatically shared and can be established during this process.

3. Auditing suppliers for traceability and food safety

A traceability system should be audited at a minimum frequency of 12 monthly across the groups of products handled. Where multiple product groups exist, the traceability audit may cover one group annually on a rolling basis.

Once a traceability exercise is completed, records of the audit showing all steps should be maintained and corrective actions applied as required.

The key requirement in a traceability audit is for the food supplier and retailer to be able to track a product forward and trace the product backward (minimum one up, one down). In many audit standards, the supplier will perform a traceability exercise. This generally places the burden of demonstrating an established traceability system on the supplier. In an onsite traceability exercise, the auditor will select a finished product, and the retailer and suppliers will need to produce records of the disposition of the product and the source of the product and packaging used, and complete the exercise within a specified time.

Typically, two years minimum retention is required by auditors and for the purpose of being able to rely on a due diligence defence with food safety regulators domestically (and internationally in case of imports).

The documentation for a traceability test should include the following:

- Product lot identification including quantities
- Packaging used and unique identifier
- Quantities of waste products for disposal as waste
- Location and quantities of product within the food retailer's control and quantities sold/shipped to individual consumers including on-line consumers.

Tasks related to traceability

- Create establishment master data for the fresh food producer/supplier and processor/ manufacturer of food products
- Create unique identifiers for product suppliers
- Verify the product (and any relevant other input/ingredient) origin and integrity
- Conduct process mapping of the product flow from point of origin to consumer
- Undertake regular supplier audit.

Participants

- Fisher/aquaculture farm
- Supplier (processor, wholesaler, packaging company)
- Food processor/manufacturer
- Retailer
- 3PL Operator (if applicable)
- Distributor (if applicable).

Inventory management in 3PL warehousing and Retail Distribution Centres

Retailers are increasingly outsourcing the management of their inventory to integrated logistics suppliers offering *3rd Party Logistics* (3PL) warehouse and distribution solutions. In the case of seafood, this may be a cold storage warehouse.

3PL warehouses and Retailer distribution centres receive, store and distribute goods from suppliers. They de/consolidate loads of product into consignments for the retailer. Sometimes, storage is not involved at all, and goods are moved on immediately (*cross-docked*). At other times, the *3PL* operator may assemble retail displays or prepare sales campaign products.

Best practice inventory management enables total stock visibility and precise ordering. It reduces wastage, out-of-stock situations and delivers cost savings and improved food safety.

3PL and Retailer distribution centres rely on a suite of IT systems such as a Warehouse Management System, Inventory Management System, or Transport Management System, to trace products as they are received, stored, value-added and dispatched to retail businesses. Scanning the barcode as inventory is received, moved from the back room to the shelf. and eventually sold, enables key data to be captured electronically and exchanged without manual intervention into retail store administration and purchase order processing systems. In many instances this data is an input to CAO (Computer Assisted Orderina) systems in place at retailers, to automatically optimise inventory and automate replenishment processes. The key benefits include reduced inventory held; reduced out-of-stocks; less product waste due to obsolescence: better recall efficiency and effectiveness: improved demand forecasting; and less staff required for managing inventory.

All finished product available in the warehouse/ DC inventory is able to be made visible to the retailer ordering stock.

Tasks related to traceability

- Stock receival
- Inventory management
- Retailer Purchase Order processing
- Picking and packing of stock
- Notifying the Retailer of impending shipment
- Booking Transport
- Loading outbound stock.

Participants

- Supplier
- 3PL warehouse or distribution centre operator
- Transport company
- Retailer.

4. Inventory management in 3rd party logistics warehousing and retail distribution centres

Buying product for retail is initiated by the retailer submitting a Purchase Order. The Purchase Order becomes a fundamental traceability tool alonaside the Customer Invoice for retailers and their suppliers to reconcile what products were received. Order Acknowledgement and Order Confirmation by the supplier then allows the retailer to plan for receival of stock. An Advance Shipping Notice or Delivery Order or Transfer (if stock is from the retailers' own storage) provide the Retailer with details of the goods, delivery date and the number of load units being shipped. This enables loading dock/receival staff to prepare for the goods, storage space to be arranged and shelf space planning to be undertaken for the inbound product.

The suppliers of fresh and processed seafood products to major supermarkets will need to meet mandatory packaging and barcoding requirements defined in supplier guides. Failure to do so can cause major handling issues, processing and delivery delays and may result in orders being rejected. There can be significant variation in requirements from retailer to retailer. As an example, some retailers require a very high percentage of product received to be in Shelf Ready Packaging as it reduces store labour requirements as well as reducing corrugated cardboard. The fresh food supplier, food processor and manufacturer will create a *Customer Order* once product, quantity, variety, delivery terms and price have been agreed with the retail business. Often the supplier will have a term contract to supply, or the fresh product has been grown/ caught to order.

The *chain of custody* passes to the food retail business on receipt of the product or in the case of backhaul /customer pick up at the time the truck is finished loading at the supplier's distribution facility.

Store receipt can be line by line (carton by carton) or 'Receipt In Full'. Upon receipt, the store system receives against the purchase order (PO) or Transfer for the stock keeping units (SKUs) or product codes and quantities and this is then recorded in the Store inventory.

Food Standards Australia and New Zealand

(FSANZ) provides the following advice in relation to receival of food. See FSANZ Chapter 3, Food Standards Code. "If an enforcement officer asks you to do so, you must be able to provide the officer with information on the suppliers of any food on your premises and what that food is. You need this information in case food on your premises is found to be unsafe or contaminated in some way and has to be returned to the supplier or destroyed.

Although most, if not all of the food you buy will be labelled with the name of the product and the name and address of the manufacturer, importer or packager of the food, you may also have unpackaged or unlabelled food on your premises and will need other ways of proving what this food is and where it came from. You might do so using your supplier invoices, or you might keep some other record of your suppliers and what you buy from them and the food you have on your premises.

You must not accept food unless you can identify it and trace it back to its supplier."

This requires that the Supplier maintains a system of traceability with the ability to trace products whether they are fresh food products, finished or processed products, or packaging material.

Inventory records for vehicles that transport products enable those products to be tracked



from loading to delivery and include tracking the movement of trailers/vehicles. *A Returns Policy and Procedures* agreed between the Retailer, Supplier, 3PL, Distribution Centre and Transport Company will outline all procedures to ensure traceability of damaged packs and of any products returned to stock or for disposal.

Tasks related to traceability

- Advance Shipping Notice received by food retailer
- Product is delivered with Delivery Order correlated to the ASN (advanced shipping notice)
- Product is unloaded from transport at receival dock
- Product is inspected (contamination; identification; temperature) and accepted/ rejected/returned to suppliers with reason recorded
- Inbound product is matched to purchase order and over/under/missing stock notified to supplier
- Proof of Delivery signed
- Received product is scanned/entered into the retailer Enterprise Resource Planning (ERP) or inventory system
- Supplier Invoice is reconciled with Purchase Order/ASN/and transport documentation, such as Delivery Order and Proof of Delivery.

Participants

- Supplier of product
- Food retailer goods receival staff and accounts
- Transport company and driver
- Food safety inspector
- Retailer Quality Assurance inspector.

5. Storage of inbound product

Fresh food product and/or processed food products may be transferred to the food retailer's own pallets or bins for storage. The product, which may be in tubs or crates or enclosed in cartons is associated with a storage location in the inbound storage area.

Some retailers have their own stock identifiers such as *Stock Keeping Units* (SKUs) to identify product and associate it with their internal record keeping, order management system and stock location in store. They may use a SKU reference to order product from their regular suppliers. Use of a SKU as a single identifier is problematic in supply chain level traceability, as partners along the supply chain may not have access to internal product codes.

Retailers may also "portion pack" foods bought on a wholesale basis or in larger lots or in cases where the smaller stores require less than case quantities of generally slower moving inventory. For traceability, retailers rely on labelling each pack with information linking the sold product to supplied product information, including product identity, supplier identity, lot code, date received and consumer information such as use-by date, storage conditions, allergens etc.

Tasks related to traceability

- Position in storage identified and allocated
- Product transferred to internal storage asset e.g. pallet or bin
- Product put away ready to be called forward to retail sales floor
- Product best before, expiry dates recorded e.g. Julian date¹

Participants

- Supplier of product
- Food retailer goods receival staff and accounts
- Transport company and driver
- Food safety inspector
- Retailer Quality Assurance inspect.

¹A Julian Date is a traceability date that appears on a food product as a 4-digit code, in the absence of Best Before or Use By information. The first number indicates the year, and the remaining numbers indicate the day in the calendar, e.g. a Julian Date of 6273 assigns 6 for year 2016 and 273 for 30 September.

6. Ensuring food integrity, quality, and safety

Ensuring food safety is a key obligation of all food businesses including retailers. This ensures that the food is safe and suitable to consume. Food safety standards also contain health and hygiene obligations for food handlers, aimed at lowering the incidence of food-borne illness.

Traceability is a key means to manage the integrity of food product stored on-site and on floor display, by understanding the status of the product in the in-store inventory system, through the following actions:

- Recording inspections of storage conditions, particularly ambient temperature and light levels and effectiveness of refrigeration equipment
- Recording batch and lot number and expiry date at receival and adding this to the retail inventory management system for each SKU/GTIN/lot or batch
- Using colour markers on items to indicate expiry time/date of products at item or lot/ batch level
- Implementing a First-In First Out (FIFO) stock movement plan/system. This may be as basic as a whiteboard recording batches and their expiry dates
- Undertaking regular stock counts to identify older stock.

Retailers may use a range of display and service formats including temperature-controlled display cabinets, or shelves of finished goods at ambient temperature. A traceability challenge is counter sales of seafood. Australian retailers are required to identify the species of seafood – refer to the <u>Australian Seafood Names</u>

Standard maintained by the Fisheries Research & Development Corporation (FRDC). Additionally, retailers must disclose the County of Origin of seafood sold in unpackaged format at seafood counters. This assists the consumer to make a choice between Australian caught or grown product and imported product.

However, the most significant challenge in maintaining traceability in counter sales (not pre-packaged) is the potential co-mingling of product sourced from a variety of suppliers. This product may be supplied in uniquely identifiable lots or cartons in the retailer cold storage area but can be displayed as whole animals, or fillets, drawn from more than one carton/crate as the display is replenished during the day's sales.

Product may have an identifier affixed, such as a tag e.g. lobster, bag of oysters, a barcoded crate or carton label or sticker or it may have arrived in a format without item level identification. Ensuring all product has labelling, display and consumer-available information regarding usebefore and expiry dates for the item/lot can be critical to the speed and accuracy of product recall. This enables a lot, batch or expiry date to guide removal of product, rather than an entire display being removed. This information may be attached to the sale item once wrapped.

Tasks related to traceability

- Record Quality Assurance inspections of storage conditions and stock in inventory system
- Record species, supplier, country of origin, lot/batch code and expiry date at receival
- Implement a FI-FO stock movement system
- Undertake regular stock counts
- Record lot/item or batch codes of displayed product.

Participants

- Seafood retailer
- QA and food safety inspectors
- QA Auditors
- State level food retail regulators and health authorities.

7. Point of Sale data capture

Point of Sale (POS) is generally defined as a location where a product can be purchased by a consumer. This can be referred to as a retail checkout where barcode symbols are normally scanned via a POS scanning device.

A key ingredient for food traceability is relevant data associated with a physical product. That is one that is uniquely identified and can be linked to supporting business process. In this context the Global Trade Item Number (GTIN) is the most commonly implemented GS1 Standard. It is encoded in the universal product code (UPC) barcode for point-of-sale scanning and checkout systems. Point of sale is a dynamic environment in which a product may be withdrawn from the inventory system or reduced for sale. Active barcodes can adapt quickly to these variations to align with POS variations. In the case of most modern retailers, it is the aggregation of inventory that is sold at retail at all stores (through POS capture) that triggers automatic replenishment from a supplier to the retailer's warehouse. Recording GTINs at point of sale and linking the sale with the customer loyalty card enables tailored offers to be made, as well as providing evidence of the product in a food safety recall.

In the case of a biosecurity or health and safety breach detected at a retail business, records and other documentary evidence relied upon at the point of sale to establish a product's country of origin is key evidence for regulators and health authorities. This will help regulators and health authorities to rapidly and accurately trace a food product or ingredient through the supply chain to the originating source, as well as trace from the source forward.²

² GS1 (2013), Traceability FAQ for Retailers, July https://www.fmi.org/docs/default-source/ food-safety/traceability-backgrounder-forretailers-.pdf?sfvrsn=0 Clause 11 of Standard 3.2.2 – Food Safety Practices and General Requirements specifies:

A food business must ensure that food for disposal is held and kept separate until it is:

- a) destroyed or otherwise used or disposed of so that it cannot be used for human consumption;
- **b)** returned to its supplier;
- c) further processed in a way that ensures its safety and suitability; or
- d) ascertained to be safe and suitable.

A food business must clearly identify any food that is held and kept separate as returned food, recalled food, or food that is or may not be safe or suitable, as the case may be.

This means that recalled food must be held, separated and identified from other food until it is either destroyed, used for purposes other than human consumption (e.g. animal feed), returned to its supplier, or further processed or otherwise determined to be safe and suitable.³

Key tasks related to traceability

- Recording the product identity via the POS system capable of amending inventory levels automatically
- Notifying nominated supply chain partners of product sale status.

Participants

- Food retailing company store staff
- Food safety regulators
- End consumers.

8. Product returns and store salvage

Product returns result from overstock product supplied, damaged stock unloaded at the receival dock or stock that does not have the required shelf life prior to expiry as specified by the retailer (although in each case the approval for returns is predetermined through negotiated agreements between suppliers and retailer). Product returns are a subset of a broader discipline within supply chains entitled reverse logistics.

Traceability of this rejected stock can be achieved through a Returns Policy with suppliers and a Standard Operating Procedure (SOP) which staff can enact. Some retailers have Returns Centres or a 3PL dedicated to managing returns. On-line retailing can present a challenge as it entails high rates of returned items.

Store salvage is the merchandise that retailers are unable to sell in their own stores. For example, many food items from canned, are removed from shelves if they are approaching their expiration dates or because they are no longer at their peak quality, and hence stores consider them unfit for sale. To dispose of these items, retailers are likely to take several steps:

- sell a pallet or truckload for only a small portion of the actual cost. If something is salvage, it is sold "as-is"
- depending on the condition of the product, the retailer may return the product to the supplier or supplier DC
- retailers may participate in food donation programs, organic composting, and recycling initiatives, or
- simply dispose of the product through processes agreed to between the supplier and retailer in a manner that meets the guidelines of regulatory bodies.

Tasks related to traceability

- Identification of products returned to the retailer by consumers
- Identification of products returned by the retailer to supplier or DC/Returns Centre.

Participants

- Retailer
- Consumer
- Product supplier
- Distribution Centre (DC), Returns Centre, 3PL Returns warehouse.

³ https://www.foodstandards.gov. au/publications/Documents/ FSANZFoodRecallProtocol-2014.docx Critical <u>Tracking Events</u>



Critical Tracking Events

For each of the identified **seafood retail** (SR) activities, **critical tracking events** (C identity and enable traceability and compliance with traceability-related regulat in the following table. It should be noted that while regulators often identify stand cases, supply chain actors may choose to track additional events occurring within to create a more robust picture of their supply chain.

Critical Tracking Events (CTEs) are events that relate to the identity, movement ar the seafood product.

Soafood Potail activity	CTE codo	Critical Tracking Events (CTEs)			
		Childen Hacking Events (CTES)	- Position in storage identified and	SRCTE7	
Establish master data identification of food retailer	SRCTE1A Establishment of master data	Apply for Global Location Number Food retailer licence issued Establishment Registration for Food Retailer Number received	 allocated Product transferred to internal storage asset e.g. pallet or bin Product put away ready to be called 	Storage of inbound product	Location and storage asset ID for inbound
Establish master data for suppliers	SRCTE1B Supplier master data (sourcing product suppliers)	Creating establishment master data for the fresh food producer/supplier and processor/manufacturer of food products	forward to retail sales floor QA inspection	SRCTE8 Quality inspection	product recorded Record Quality Assurance inspections of storage conditions and stock in store inventory system
Auditing suppliers for traceability	SRCTE2 Supplier audit	Verifying the product (and any relevant other input/ingredient) origin and integrity and ability to track product	 Implement a FI-FO stock movement system Re-labelling for store display and SKU 	SRCTE9 Monitor stock in store	Record Lot/Batch and expiry date at receival
Stock receival	SRCTE3 Inventory management in 3PL warehousing and Retail Distribution Centres	Stock inspection – record rejected and accepted stock Sign Proof of Delivery Provide Inventory Reports to Retailer/ visibility of stock in storage	 - Undertake regular stock counts Point of sale (POS) data capture 	SRCTE10	Recording the product identity via the POS system capable of amending inventory levels automatically
Stock Putaway/Inventory Management	SRCTE4 Inventory management	Enter SSCC scan/record into inventory (WMS) Record use-by/expiry date for FI-FO management	Product returns and store salvage	SRCTE11	Notifying nominated supply chain partners of product sale status from POS device Identification of products returned to the retailer by consumer
Picking stock for dispatchDispatch product to Store	SRCTE5 Dispatch to store	Stock picked for dispatch to Store Product leaves processor storage/ Warehouse/DC and is dispatched to Store			Identification of products returned by the retailer to supplier or DC Record of product lots/items sent to waste

TEs) which establish tion are summarised lard CTEs, in many n their supply chain	 Receipt of food products at retail outlet Record/scan stock into receival area Record use-by/expiry date Reconcile against Purchase Order/ Delivery Order/Supplier Invoice 	SRCTE6 Stock delivered to Store	Proof of Delivery signed Record and notify variations to supplier
nd transformation of	 Enter received stock into store inventory system 		Received product is scanned/entered into the retailer <i>Enterprise Resource Planning</i> (ERP) or inventory system
its (CTEs) ition Number ssued ation for Food Retailer	 Position in storage identified and allocated Product transferred to internal storage asset e.g. pallet or bin Product put away ready to be called 	SRCTE7 Storage of inbound product	Location and storage asset ID for inbound
nt master data for er/supplier and ırer of food products	forward to retail sales floor QA inspection	SRCTE8 Quality inspection	Product recorded Record Quality Assurance inspections of storage conditions and stock in store inventory system
(and any relevant t) origin and integrity oduct cord rejected and	 Implement a FI-FO stock movement system Re-labelling for store display and SKU allocation Undertake regular stock counts 	SRCTE9 Monitor stock in store	Record Lot/Batch and expiry date at receival
orts to Retailer/ orage ord into inventory	Point of sale (POS) data capture	SRCTE10	Recording the product identity via the POS system capable of amending inventory levels automatically Notifying nominated supply chain partners
v date for FI-FO	Product returns and store salvage	SRCTE11	of product sale status from POS device Identification of products returned to the retailer by consumer
ssor storage/			Identification of products returned by the retailer to supplier or DC

Key data elements

Key Data Elements (KDE) ensure that captured and recorded data can be interpreted and used as relevant and required by all supply chain partners. Key Data Elements define Who, What, When, Where and Why for each Critical Tracking Event identified above.

Event code	СТЕ	Key data Inputs and Outputs	Event code	СТЕ	Key data Inputs and Outputs
SRCTE1A	Establish master data	Global Location Number	SRCTE2	Verifying the product (and any	Supplier Traceability Audit
	identification of food retailer	The Global Location Number (GLN) is used to identify locations		relevant other input/ingredient)	 Ingredient source record keeping
		ana legal entities. This unique identifier is comprised of a GST Company Prefix, Location Reference, and Check Digit.		to track product	- Trial traceability exercise result
		GLNs are used to identify parties to business transactions;			– Date of audit
		functional groups within a company; or real, physical "places" that might ship, receive, process, or hold the product.			– Auditor ID
SRCTE1B	Establish master data of	Request for GLN			Relevant processor/manufacturer declarations and test certificates
	Suppliers	Who Retailer			- Test certificate code
		Issuing Agency			- Date of testing
		What Retailer, location, business entity			Information to be shared to a traceability platform
		When Date/Time of Issuance			- Test Certificate/Manufacturer Declaration number and date
		Where Issuing Agency		Inventory management in	
		Why Requirement for Global location numbers, establishment		3PL warehousing and Retail Distribution Centres	
		Food Licence Number		Stock receival –	 Unique identifier on product and container scanned/ recorded into receival system
		This licence humber is issued by local government			- EDI message code for stock variation to PO
		Request for Food Licence Number	SRCTE3	Stock inspection, record	
		Who Retailer		Sign POD	- Proof of Delivery number
		Issuing Agency		Inventory management - enter/	- Pallet/bin/container SSCC
		What Retailer business entity		scan product into Inventory/	
		When Date/Time of Issuance		Warehouse Management	- Caton D in load unit unpacked
		Where Issuing Agency		oyacam	 Item level Lot or Batch number
		Why Food Licence			- GTIN
		Information to be shared to a traceability platform			– SKU number
		– Global Location Number (GLN)			- Date received
		 Food business registration number 			

Event code	СТЕ	Key data lı	nputs and Outputs	Event code	СТЕ	Key data l	nputs and Outputs
SRCTE3	Record use-by/expiry date for	Storage slo	ot location (if using a fixed location system)	SRCTE4	Stock Putaway	– Pallet/b	in/container SSCC
Continued	FI-FO management	- Product	ID			– Quantit	У
		- Product	supplier name			– Carton	ID if load unit unpacked
		– Lot/bat	ch number			– Item lev	el Lot or Batch number
		- Use by/	Expiry date			- GTIN	
	Provide inventory reports to	Inventory r	report			– SKU nun	nber
	Retailer/visibility of stock in storage	- Date of report				- Date and time of putaway	
		– Stock re	ference (SKU, GTIN, SSCC unopened carton)			- Storage	e slot location (if using a fixed location system)
		- Descript	tion			otorage	
		- Location	ı			Put Away	Potail Distribution
		– Quantity	у			What	Product ID Quantity Batch Date Information
		– -Reorde	er level				Logistics/Pallet ID, Location (Bin)
		– Value				When	Date/Time of Put away
		– Daily sto	ock in/stock out count			Where	Warehouse bin location
		Coode Dec				Why	Stock Put away (movement)
		Who	Distributor/Wholesaler			Informatio	n to be shared to a traceability platform
			Issuing Agency			- Logistic	s Pallet ID (SSCC)
		What	Purchase Order, Delivery Note, Logistics/Pallet ID, Product ID, Quantity, Batch, Date Information			- Wareho	use Bin Location
		When	Date/Time of Receipt			- Product	
		Where	Receipt location			- Batch	
		Why	Receipt of product			– Quantit	У
						- Date of	put away
		– Supplier	n to be shared to a traceability platform			– POD nu	mber
			mbor	SRCTE5	Picking stock for Store	- Store Or	rder Number
						– Product	ID
		- Lot/bat	ch number and expiry date			– Quantit	у
		- Returne	a stock reconciliation report message			– Store Lo	ocation
		– Inventor	y report (dated)				

Event code	СТЕ	Key data li	nputs and Outputs	Event code	СТЕ	Key data l	nputs and Outputs
		Picking				Informatio	on to be shared to a traceability platform
		Who	Retail Distribution			- Store ID	
		What	Store Order, Picking list number, Product ID,			– Store O	rder Number
			Quantity, Batch, Date Information, Logistics Unit number (SSCC)			– Logistic	s/Pallet ID
		When	Date/Time of pick			- Product	t ID
		Where	Pick location			– Batch	
		Why	Picking stock			– Quantit	-y
		Informatio	n to be shared to a traceability platform			- Date of	Dispatch
		- Logistic	s Pallet ID			– Shipme	nt Number
		– Wareho	use Bin Location	SDCTE7	Peceint of food products at	- Product	
		– Product	ID	SRCTE/	retail outlet	- Lot/bat	
		– Quantit	y Picked		Record/scan barcodes on stock		
		– Batch n	umber		batch use-by and expiry dates	- Use-by,	/ expiry date for each lot
		- Date of	Pick			- POD nu	mber for delivery
SRCTE6	Dispatch to Store	- Loaistic	s Pallet ID		Sign POD	Rejected/	missing stock identified and recorded
		– Wareho	use Bin Location			- Supplie	r ID
		- Product				- Lot/bat	tch numbers
		- Quantit	v Picked			– Reason	for rejection
		Batab N	lumbor			- Record	variations x SKU/GTIN, lot number and supplier ID
		- Batchin			Reconcile against Purchase	Receipt at	t Store
		- Store ID			Order/Delivery Order/Supplier	Who	Transport Provider
		– Iranspo	rt Provider				Store ID
		 Delivery 	o store		Order/Delivery Order/Supplier	What	Store Order, Delivery Note, ASN number, Logistics/Pallet ID (SSCC) Product ID, Quantity, Batch, Date Information, Shipment number
		Who	Retail Distribution		Received product entered into	When	Date/Time of Dispatch
		What	Store Order, Delivery Note, ASN number,		store inventory system	Where	Dispatch location
			Logistics/Pallet ID (SSCC) Product ID, Quantity, Batch, Date Information, Shipment number		Storage of inbound product	Why	Dispatch of product
		When	Date/Time of Despatch		storage area		
		Where	Dispatch location		FIFO stock control		
		Why	Dispatch of product				

Event code	СТЕ	Key data In	puts and Outputs	Event code	СТЕ	Key data In	puts and Outputs
SRCTE7 Continued		Information – Delivery I – Store Orc – Logistics,	to be shared to a traceability platform Note der /Pallet ID	SRCTE9	Point of sale (POS) data capture Record the product identity via the POS system Notify nominated supply chain	 Unique id compliar Name of Processir 	dentifier indicating batch and lot affixed with nt product information the fish/animal/seafood ng/manufacturing date and use-by date
		 Product I Batch Quantity Date of magical structure 	D eceipt		partners of product sale status	 Product Descripti Descripti Instruction 	lot identification ion of ingredients ion of allergens ons for storage and preparation
SRCTE8	GA Inspection Stock inspection, record rejected and accepted stock	 Product I number) Batch co Location Quantity Date of it 	D (GTIN of individual item or carton GTIN/SKU/Lot de			 Country Warning Relevant Informat quantity Name ar 	or origin information and advisory statements : nutritional information ion about weights and measures (volume and) nd address of the food processor or manufacturer.
	food safety inspection (FSI) inspection and audit	 Receival Supplier Use-by control 	date			Point of Sal Who What When	e Retail store Product ID, Date Information, Quantity Date/Time of Sale
		Who What When Where Why Information – Product I – Batch – Location – Quantity – Date of ir – Logistics – Store loce	Product Inspectors Product ID, Quantity, Batch, Date Information Date/Time of Despatch Store Location Inspection ot be shared to a traceability platform D nspection Pallet ID ation			Where Why Information - Product - Quantity - Batch (if - Use by/k - Store ID	Store Location Sales a to be shared to a traceability platform ID (Sold captured at POS) best before (if captured at POS)

Event code	CTE
	Product returns and store salvage
SRCTE10	Identification of products returned to the retailer by consumers

CTE

Identification of products returned by the retailer to supplier or DC

Key data Inputs and Outputs

- Product unique identifier (GTIN, SKU code, item or article number)
- Sales Receipt number
- Disposition return to supplier, destruction, salvage
- Tracking of returns (frozen/canned within use-by date)
- Record/scan of product prior to loading on pallet/tub for return to DC or direct to supplier
- Delivery Order number

Product Returns Who Retail store What Product ID, Batch, Date Information, Logistics unit/pallet ID, Quantity When Date/Time of Return Where Store Location Why Product return/reason for return

Information to be shared to a traceability platform

- Product ID
- Quantity Returned
- Batch
- Store ID
- Reason for return

Application of GS1 Data Standards

Adoption of global data standards enables data sharing between businesses through using common formats. These formats allow a business to identify participants, locations, products, processes, and events in the supply chain

Data standards that apply to key data elements and shared information are identified in this section.

Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Location	Manufacturing Plant, Finished Goods Location, Dispatch Dock	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here: https://www.gsl.org/standards/id-keys/ gln
Date/Time	Production Date and/or time, Use By date, Best Before Date, Pack Date	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent approach. The globally adopted standard for date recording is YYMMDD
Product Identifiers	Input materials such as raw ingredients and packaging, Outputs such as finished goods, packaged or processed goods	Global Trade Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system. Information on how to allocate a GTIN: https://www.gslorg/1/gtinrules//en/ Information on when to change a GTIN: https://www.gslorg/1/gtinrules/en/ decision-support Information on how to allocate a GTIN to a variable weight or variable measure trade item https://www.gsl.org/docs/barcodes/ GTIN-Allocation Rules Fresh Foods Unstream Standard pdf

Data Element	Examples	Valid Values	Data Type/ Format	Further Information	Useful links
Traceability Attributes	Batch/Lot code, Serial Number,		AN2O	Traceability Attributes, such as Batch or Lot Number or Serial Number etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain. Also referred to as Application Identifiers, each has its own unique identifier and format.	FSANZ www.foodstandards.gov.au Australian Institute of Food Safety www.foodsafety.com.au Safe Seafood Australia
Logistics Units	Pallet of Finished Goods, Crate or Box of finished Goods	Serial Shipping Container Code (SSCC)	N18	List of Application Identifiers Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain. Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets. https://www.gslau.org/resources/ standards-and-guidelines/ identification-numbers/types-of-gsl-id- keys#LogisticsUnits	www.foodstandards.gov.au Food business licensing and compliance www.foodstandards.gov.au ACT www.health.act.gov.au NSW www.blog.foodsafety.com.au www.foodauthority.nsw.gov.au WT www.ablis business.gov.au
Assets Shipment	Returnable assets e.g. pallet or individual assets e.g. crate Grouping of logistics units	GSIN	N13	Can be identified as an asset type only or an optional serial number can be added to distinguish individual assets https://www.gslau.org/download/gslau- fact-sheet-identification-of-assets.pdf/file The Global Shipment Identification Number (GSIN) is a number assigned by a seller and shipper of goods to identify a shipment comprised of one or more logistic units that are intended to be delivered together. https://www.gsl.org/standards/id-keys/ global-shipment-identification-number- gsin	NT www.dblis.business.gov.du QLD No accreditation with Safe Food QLD is required if engaging in the retail sale of seafood and not supplying or distributing seafood in any other way SA www.sahealth.sa.gov.au TAS www.business.tas.gov.au VIC www.health.vic.gov.au WA www.bealth.wa.gov.au

Food business classifications

DAFF www.agriculture.vic.gov.au

Each state and territory in Australia have different classifications for food businesses. The classification of a food business relates to the licenses required. To determine the classification of a food business, see the following links:

- ACT wwwhealth.act.gov.au
- NSW www.foodauthority.nsw.gov.au
- www.health.nt.gov.au NT
- QLD www.health.qld.gov.au
- SA www.health.sa.gov.au
- TAS www.dhhs.tas.gov.au
- VIC www.health.vic.gov.au
- WA www.public.health.wa.gov.au

Retailer Seafood Supplier Standards

Coles Responsibly Sourced Seafood www.colesgroup.com.au

Woolworths Seafood Sourcing Policy www.woolworthsgroup.com.au

ALDI Fish and Seafood Policy www.corporate.aldi.com.au

Metcash Supply Standards www.metconnect.metcash.com

Retail weights and measures www.industry.gov.au



Glossary

Chain of Custody

Chain of Custody is a process that tracks the movement of evidence through its collection, safeguarding, and analysis lifecycle by documenting each person who handled the evidence, the date/time it was collected or transferred, and the purpose for the transfer.

Computer Assisted Ordering

A Computer Assisted Ordering system uses point-of-sale data as its main driver for forecasting. It relies on complex algorithms to predict demand based on product movement history.

Cross docking

Cross-docking is a practice in logistics of unloading materials from a manufacturer or mode of transportation directly to the customer or another mode of transportation, with little or no storage in between. This may be done to change the type of conveyance, to sort material intended for different destinations, or to combine material from different origins into transport vehicles (or containers) with the same or similar destinations. Cross docking takes place in a distribution docking terminal; usually consisting of trucks and dock doors on two (inbound and outbound) sides with minimal storage space

Data Matrix

A Data Matrix is a two-dimensional code consisting of black and white "cells" or dots arranged in either a square or rectangular pattern, also known as a matrix. The information to be encoded can be text or numeric data. Usual data size is from a few bytes up to 1556 bytes.

FIFO

FIFO Stock movement system FIFO stands for First-In First-Out. It is a stock rotation system used for food storage. You put items with the soonest best before or use-by dates at the front and place items with the furthest dates at the back.

Julian date

A Julian Date is a traceability date that appears on a food product as a 4-digit code, in the absence of Best Before or Use By information. The first number indicates the year, and the remaining numbers indicate the day in the calendar, e.g. a Julian Date of 6273 assigns 6 for year 2016 and 273 for 30 September.

Lot

A lot is an amount of a food that the manufacturer or producer identifies as having been prepared, or from which foods have been packaged or otherwise separated for sale, under essentially the same conditions, for example:

- a) from a particular preparation or packing unit; and
- b) during a particular time ordinarily not exceeding 24 hours.

The lot identification (which could be a number or other information) is used to track a product in the event of a recall and needs to be able to identify where the food was packed or prepared.

Point of Sale (POS)

The point of sale (POS) or point of purchase (POP) is the time and place at which a retail transaction is completed. At the point of sale, the merchant calculates the amount owed by the customer, indicates that amount, may prepare an invoice for the customer (which may be a cash register printout), and indicates the options for the customer to make payment. It is also the point at which a customer makes a payment to the merchant in exchange for goods or after provision of a service.

Stock Keeping Units (SKU)

SKU stands for stock keeping unit and as the name suggests, it is a number (usually eight alphanumeric digits) that retailers assign to products to keep track of stock internally.

Third party Logistics (3PL)

A 3 PL third party Logistics service. is a partner or service that helps ecommerce merchants manage their supply chain. Common 3PL services include warehouse and inventory management, order fulfillment, shipping coordination, retail distribution, exchanges and return.



Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Foodservice



Seafood Foodservice

This module covers key activities that generally take place in foodservice supply chain settings where consumers are supplied with seafood. From a foodservice perspective, traceability means the ability of foodservice partners to quickly verify the history, location, and usage of the product, resulting from coordinated efforts of trading partners to collect and maintain product information that supports batch/ lot or serial number visibility of the product's movement through the distribution channel. The foodservice industry encompasses all of the activities, services, and business functions involved in preparing and serving food to people eating away from home. This includes all types of restaurants from fine dining to fast food. It also includes institutional food operations at locations such as schools, hospitals or industrial campuses, as well as other specialty vendors such as food truck operators and catering businesses.



Source: Food Map Australia 2012

In this module, processes/activities are associated with foodservice operations:

- 1. Establishment
- 2. Sourcing of seafood product suppliers
- **3.** Auditing suppliers for traceability and food safety
- Inventory management in foodservice 3PL warehouses and distribution centres
- 5. Receipt of seafood products from supplier/3PL warehouse
- 6. On-site storage of inbound product
- 7. Maintaining traceability once bulk packs are opened
- 8. Ensuring food integrity, quality and safety.

1. Establishment

Local councils and state authorities administering food safety regulations are involved in licensing food premises and allocating a current licence number to each foodservice business.

In addition to obtaining this registration and licence, creating a unique identification and location reference for the foodservice business will enable food logistics and traceability of inbound and outbound shipments to be undertaken efficiently. This is effective for foodservices with multiple outlets such as a restaurant chain, enabling each to have a unique identifier for use in distribution.

Traceability can be created through establishing the identity of seafood items supplied, as well as suppliers and businesses handling inbound product. Assets used to store and move product can also be identified and correlated with the product and locations.

Allocating unique identifiers to a business or supplier is important in digital transactions, where accurate information is vital in automated transactions and on-line ordering systems.

Key tasks related to traceability

- Allocate a Global Location Number (GLN) (entity and location) to each warehouse and foodservice outlet
- Ensure Logistics Service Providers such as 3PL (third party logistics) storage are identified
- Request GLN of suppliers
- Create identification of own transport assets such as pallets, trays, tubs
- Ensure unique identification of each item sold.

Participants

- Foodservice operator
- Logistics service provider/ 3PL
- Suppliers to foodservice.

2. Sourcing of seafood product suppliers

Identifying, contracting and managing product suppliers is a major activity for food retail businesses. Sourcing involves:

- Establishing the requirements for products
- Defining the sourcing strategy to follow
- Sourcing potential suppliers from local and overseas markets
- Identifying desired suppliers based on requirements
- Evaluating possible suppliers
- Negotiating contract specifications
- Reviewing contracts to ensure compliance with standards and policies
- Conducting appropriate <u>Know Your</u> <u>Customer (KYC) validations</u> and checks such as Politically <u>Exposed Persons</u> (PEP); Sanctions Screening; Tax ID; International Bank Account Number (IBAN) Verification
- Development and agreement on appropriate service agreements and performance metrics
- Signing the contract
- Managing the supplier.

In sourcing seafood into Foodservice businesses, identification and verification of supplier entities and the origin of the seafood may be mandated by the supplier contract. This also supports the Foodservice Operator to tell the story of the product to consumers and in product recall. For Foodservice Operators, traceability should extend to being able to identify the source of all food products including fresh, frozen, processed products, ingredients and other inputs such as packaging materials.

Foodservice businesses may source the same category of product from multiple producers or locations. For example, a Foodservice Operator may select an intermediary such as a wholesaler to supply product from several fisheries/farms of origin. Once the product is collected from different farms, verifying the origin of the product supplied becomes increasingly challenging. Without a traceability system in place from the original source of the seafood, claims related to provenance are difficult to authenticate and substantiate.

Product suppliers, who may be fishers, aquaculture farmers, or food processors, should be able to provide verification of provenance of supplied whole seafood, semi-finished product, and the components of processed products made from the seafood (including additives, other ingredients and packaging material). This may take place as part of the due diligence process in sourcing and procurement practices. Product suppliers with traceability systems will be able to provide data that can be automatically shared and can be established during this process.

3. Auditing suppliers for traceability and food safety

The key requirement in a traceability audit is for the Foodservice Operator to be able to link the unique identifiers of the food products to the origin / provenance of the product.

Relevant record keeping is an essential part of the mandatory food safety plan requirements for food businesses throughout Australia. Failure to keep proper records to demonstrate adherence to a food safety plan can be a criminal offence.

Typically, two years minimum retention of data is required by auditors and for the purpose of being able to rely on a due diligence defence with food safety regulators.

The documentation for a traceability test (and food safety) should include the following:

- Products lot identification including quantities
- Packaging used and unique identifier
- Quantities of product for disposal as waste
- Location and quantities of product within the Foodservice Operator's control and quantities sold/shipped to individual consumers including on-line consumers.
- Proper records and logs with the times and temperatures to which goods have been subjected in order to make appropriate decisions regarding food safety.

It is important to verify periodically that supplier bar codes contain correct and complete product information. For example, one operator regularly selects a sample of 20-30 products, asking distributor partners to send product dimensions, weights, and case pictures.

These data are compared against product records, assessing attributes such as:

- Does the GTIN match what is in the vendor contract?
- Do measurements (e.g., cube, weight) match what is in the contract?
- Does the GTIN have a batch lot, production date, or a use by or harvest date, (depending on product category)?
- Is the barcode image scannable?

The information gathered from these audits can be used to generate supplier scorecards and to facilitate traceability conversations between operators and suppliers.

Source: <u>Building Traceability in Foodservice</u> <u>Supply Chains</u>

Key tasks related to traceability

- Create master data for suppliers food, cleaning products, packaging
- Verify the product (and any relevant other input/ingredient) origin and integrity
- Complete supplier audit.

Participants

- Producer/fisher
- Supplier (processor, wholesaler, packaging company)
- Food processor/manufacturer
- Traceability Auditor
- Food safety authority
- Foodservice Operator.

4. Inventory management in foodservice 3PL warehouses and distribution centres

Caterers and restaurant chains may operate their own distribution operations. Increasingly, large-scale operators are outsourcing the management of their inventory to integrated logistics suppliers offering 3PL warehouse and distribution solutions.

3PL warehouses and distribution centres receive, store and distribute goods from suppliers. They de/consolidate loads of product into consignments for the foodservice operator, delivering in regular consignments as required.

A key aspect of these processes is **inventory management**. Best practice inventory management enables total stock visibility and precise ordering. It reduces wastage, out-ofstock situations and delivers cost savings and improved food safety.

3PL and Distribution Centres rely on a suite of IT systems such as Warehouse Management Systems, Inventory Management Systems, Transport Management Systems, to trace products as they are received, stored, valueadded and dispatched to foodservice businesses. All finished product lots, pallets, cartons and batches available in the warehouse/DC inventory are able to be made visible to the foodservice operator ordering stock.

Key tasks related to traceability

- Inventory management
- Purchase Oder processing
- Dispatch
- Delivery.

Participants

- Supplier
- 3PL warehouse of distribution centre operator
- Transport company
- Foodservice Operator.

5. Receipt of seafood products from supplier/3PL warehouse

Direct from the boat sales

Foodservice Operators may have a direct customer relationship with local fishers. For example, small scale sales to foodservice within a 30-kilometre catchment from the landing port, limited to 2 tonne of seafood and 500kg of any one species, is permitted in Victoria. A Wild Catch licence is needed, and the restaurant will need to retain the sales receipt for traceability. Any person who carries on the business of selling, transporting, consigning, receiving or processing fish or fish products (including selling fish for consumption in a restaurant or cafe business) must ensure that any fish received by them, or in their possession, for any commercial purpose, are accompanied by one of the following in relation to those fish:

- A Catch Disposal Record (issued by a commercial access licence holder at the point of landing - typically only used in quota-managed wild catch fisheries); or
- A sales receipt (a receipt or tax invoice created by the seller of the fish to the fish); or
- 3. A fish movement record (a document created to account for possession of fish when a sale has not occurred and no CDR or sales receipt provided with the product (e.g. fish are being transported to a fish co-op and no CDR or sales receipt have been provided).

Source: Victorian Fisheries Authority 2019

Buying product for foodservice is generally initiated by the Foodservice Operator submitting a *Purchase Order*, often from a wholesaler or distributor. The Purchase Order becomes a fundamental traceability tool alongside the *Customer Invoice* for Foodservice Operators and their suppliers to reconcile what products were received. Order *Acknowledgement* and *Order Confirmation* by the supplier then allows the Foodservice Operator to plan for receival of stock. An Advance Shipping Notice and Delivery Order provides the Foodservice Operator with details of the goods, delivery date and the number of load units being shipped. This enables loading dock/receival staff to prepare for the goods, storage space to be arranged, and freezer/cool room space planning for the inbound product.

The supplier will create a *Customer Order* once product, quantity, variety, delivery terms and price have been agreed with the Foodservice Operator.



FSANZ (see FSANZ Chapter 3, Food Standards Code) provides the following advice in relation to receival of food:

"If an enforcement officer asks you to do so, you must be able to provide the officer with information on the suppliers of any food on your premises and what that food is. You need this information in case food on your premises is found to be unsafe or contaminated in some way and has to be returned to the supplier or destroyed.

Although most, if not all of the food you buy will be labelled with the name of the product and the name and address of the manufacturer, importer or packager of the food, you may also have unpackaged or unlabelled food on your premises and will need other ways of proving what this food is and where it came from. You might do so using your supplier invoices, or you might keep some other record of your suppliers and what you buy from them and the food you have on your premises.

You must not accept food unless you can identify it and trace it back to its supplier."

Source: FSANZ Chapter 3, Food Standards Code

This requires that the Supplier maintains a system of traceability with the ability to trace products whether they are fresh food products, finished or processed products, or packaging material.

The Transport Company making food deliveries will record the transport booking reference and the Consignment Note related to the delivery and attach the Delivery Order for the Foodservice Operator receiving the goods.

A *Returns Policy and Procedures* agreed between the Foodservice Operator and Suppliers outlines all procedures for returned stock to enable traceability of damaged packs and of any products returned to stock or for disposal.

Key tasks related to traceability

- Advance Shipping Notice received by Foodservice Operator
- Product is delivered with Delivery Order correlated to the ASN (advance shipping notice).
- Product is unloaded from transport at receival dock
- Product is inspected (contamination; identification; temperature; use-by date) and accepted/rejected/returned to suppliers with reason recorded (as per returns policy and procedures)
- Inbound product is matched to purchase/ customer order and over/under/missing stock notified to supplier
- Proof of Delivery signed
- Received product is scanned/recorded in the Foodservice Operator Enterprise Resource Planning (ERP) or inventory system

• Supplier Invoice is reconciled with Purchase/ Customer Order/ASN/and transport documentation, such as Delivery Order and Proof of Delivery.

Key participants

- Supplier of product
- Foodservice Operator receival staff and Accounts
- Transport company and driver
- Food safety inspector.

6. On-site storage of inbound product

Fresh seafood, frozen and/or processed seafood products may be transferred to the Foodservice Operator's own storage pallets/tubs/containers. The product, which may be in mesh bags, loose in tubs or crates or enclosed in cartons is recorded with the business's storage location.

Key tasks related to traceability

- Position in storage identified and allocated
- Product transferred to internal storage asset e.g. pallet, bin, tub
- Product put away ready to be called forward to food preparation area
- Product identifiers, supplier and best before, expiry dates recorded.

Participants

- Foodservice Operator goods receival staff and accounts
- Transport company and driver
- Food safety/QA inspector.





7. Maintaining traceability once bulk packs are opened

Tracking by lot and batch numbers is the most effective means to undertake a recall in food preparation. This means being able to record the lot or batch number of a product supplied and in turn of meals prepared. Records of the supplier, the lot/batch number or individual tag code, and the use-by date related to the bulk/ caterer's pack, portions or individual animals used for food preparation, allows recall to be limited to that specific batch, lot, or animal prepared within a fixed timespan e.a. caterina event, service. An enterprise system enabled to scan this data allows association of the food served with the product supplied. Scanning/ recording the batch/lot number/animal tag and ID of supplier on portions before placing in cool rooms and refrigerators can link food served with the bulk/caterer packs as supplied.

As a recipe is being prepared, record the ingredient batch/lot number, the name of the ingredient, the brand name, the date received, and the quantity used in the recipe. Once the production of the recipe is completed, create and record your own batch codes for the end consumer reference. This batch code and a use-by date becomes a reference for consumers of catering at an event or restaurant diners. If more than one bulk pack is used in a foodservice production, both batch numbers need to be recorded and labelled on the serve.

Key tasks related to traceability

- Record lot/batch number and use-by date from supplier on portions before food preparation
- Record ingredient batch/lot number, the name of the ingredient, the brand name, the date received, and the quantity used in the recipe
- Place batch number and use-by date on each serve for end-consumer reference
- Record which location/event/outlet the batch is delivered to (own transport or see Freight Transport module).

Participants

• Foodservice Operator food preparation and production staff.

8. Ensuring food integrity, quality and safety

Ensuring food safety is a key obligation of all food businesses. This ensures that the food is safe and suitable to consume. Food safety standards also contain health and hygiene obligations for food handlers, aimed at lowering the incidence of food-borne illness.

Traceability is a key means to manage the integrity of food product stored on-site and on floor display, by understanding the status of the product, through:

 Recording inspections of storage conditions, particularly ambient temperature and light levels and effectiveness of refrigeration equipment

- Recording batch and lot number and expiry date at receival and adding this to the inventory management system for each SKU/GTIN/lot or batch
- Using colour markers on items to indicate expiry time/date of products at item/lot/ batch level
- Implementing a First-In-First Out (FIFO) stock movement plan/system. This may be as basic as a whiteboard recording batches and their use-by/expiry dates
- Undertaking regular stock counts to identify and use older stock.

Key tasks related to traceability

- Record inspections of storage conditions and stock in inventory system
- Record Supplier, Lot/Batch and use-by/ expiry date at receival
- Implement a FIFO stock movement system
- Undertake regular stock counts.

Participants

- Foodservice Operator
- Appointed food safety inspector
- State level regulators.

Critical Tracking Events

Critical tracking events (CTEs) are events that relate to the identity, movement and transformation of the seafood product. For each of the identified foodservice activities, CTEs establish identity and enable traceability and compliance with traceability-related regulation.

Seafood Foodservice (SFS) activity	CTE code	Critical Tracking Events (CTEs)	Seafood Foodservice (SFS) activity	CTE code	Critical Tracking Events (CTEs)
Establish master data for the foodservice business, including assets	SFSCTE1	Apply for Global Location Number Food operator licence issued	Receipt of seafood products at Foodservice Operator	SFSCTE6	Product Received and receipted into inventory management systems
and packed food portions		Unique ID for assets e.g. tubs, vehicles	Record/scan stock into receival area		 Proof of Delivery signed
		ID for outbound food portions	Record use-by/expiry date		
Establish master data for suppliers	SFSCTE2	Create master data for suppliers of food, cleaning products, packaging	Reconcile against Purchase Order/ Delivery Order/Supplier Invoice		 Record and notify variations to supplier
Auditing suppliers for traceability and provenance	SFSCTE3	Verify the product (and any relevant other input/ ingredient) origin, integrity and supplier's ability to	Enter received stock into inventory system recording supplier, lot number and use-by date		 Received product is scanned/entered into the Foodservice Enterprise Resource Planning (ERP) or inventory system
Verify the product (and any relevant other input/inaredient) origin and		track product non origin	For direct from boat seafood receivers	SESCTE7	Retain Catch Disposal Record or Sales Receipt
integrity			On-site storage of inhound product		
Complete supplier audit				0500750	
3PL Storage			Position in storage identified and allocated	SESCIE8	 Product internal storage unit ID and location recorded
Inventory management	SFSCTE4A	Provide Inventory Reports to Foodservice Operator for visibility of inventory in storage	Product transferred to internal storage asset e.g. pallet or bin		
Order Receipt and Picking Customer Order processing	SFSCTE4B	Foodservice Operator lodges order	Product put away ready to be called forward to kitchen		
Order receivedStock availability confirmed			Maintaining traceability once bulk packs are opened		
 Packing list prepared 			Record lot/batch number and use-by	FSSCTE9	Product Re-packing
 Order picked and packed 			date from supplier on portions before		 Record supplier, lot and use-by date on portions
- Advance Shipping Notice sent to	SFSCTE4C	Foodservice Operator receives ASN	lood preparation		from bulk packs
			Record ingredient batch/lot number,	SFSCTE10	Product Usage
 Delivery Order prepared 			name, the date received, and the		- Record lot details and quantities used in recipe
- Transport booked			quantity used in the recipe		
- Stock relocated to outbound area			Place batch number and use-by date	SFSCTE11	Identify packaged serves
ana loaded onto load unit			on each serve for end-consumer		- Place batch code and use-by for each packaged
 Product loaded 					serve
	SESCIES	Cate out time date vohicle registration	Record which location/event/outlet	SFSCTE12	Product Delivery
	3F3C1E3	Gate out time, date, venicle registration	the batch is delivered to		 Record delivery location for each batch number

Seafood Foodservice (SFS) activity	CTE code	Critical Tracking Events (CTEs)
Ensuring food integrity, quality and safety		
Record food safety/QA inspections of storage	SFSCTE13	Record inspections of storage conditions
Record each supplier Lot/Batch and expiry date at receival and enter into enterprise system	See SFSCTE6, SFSCTE7	Record each supplier Lot/Batch and expiry date at receival and enter into enterprise system
Implement a FIFO stock movement system		
Undertake regular stock counts		

Key data elements

Key Data Elements (KDE) ensure that captured and recorded data can be interpreted and used as relevant and required by all supply chain partners. Key Data Elements define Who, What, When, Where and Why for each Critical Tracking Event.

Event code	СТЕ	Key data e	lements
SFSCTE1	Create Master data for Foodservice outlets	– Global L	ocation Numbers
		Foodservic	e Master Data
		Who	Foodservice Operator
			Issuing Agency
		What	Foodservice organisation
		When	Date/Time of issuance
		Where	Issuing agency
		Why	Requirement for location identifier
		Food Licen	ice Number
		This licence	e number is issued by local government
		Food Licen	ice Number
		Who	Foodservice operator
		What	Foodservice organisation
		When	Date/Time of issuance
		Where	Issuing agency
		Why	Food business registration
		Informatio	n to be shared to a traceability platform
		– Global L	ocation Number (GLN)
		– Food bu	isiness registration number and currency
		- Certifico	ation
SFSCTE2	Establish master data of	– Supplier	GLN
	suppliers	– Supplier	Food Licence Number
		– Supplier GDST-c	certification e.g. MSC/ASC Chain of Custody, BAP, ompliant

Event code	СТЕ	Key data eler	nents	Event code	СТЕ	Key data ele	ements
		Supplier Mast	ter Data			Inventory Up	odate
		Who	Foodservice operator			Who	Foodservice Operator
			Food Supplier				Customer
		What	Supplier Products, Locations			What	Product ID, Inventory Levels, Quantity, Batch, Date Information
		Whore				When	Date/Time of pick
		Why	Magtar Data Sat-up			Where	Foodservice warehouse
		vviiy	Masiel Data Set-up			Why	Inventory update
		Inventory				Picking	
SFSCTE4A	Provide inventory reports to	- Current sto	ck on hand by item, carton/container			Who	Distributor/Wholesaler
	Foodservice Operator for visibility of inventory in storage	– Stock shrin	kage			What	Customer Purchase Order, Picking list number,
	Order Receipt and Picking	– Date					Product ID, Quantity, Batch, Date Information, Logistics unit number,
		- Description	1			When	Date/Time of pick
		– Location				Where	Pick location
		– Quantity				Why	Picking stock
		– Re-order le	evel			Information	to be shared to a traceability platform
		Customer Orc	ler			- Inventory	report (dated)
	Foodservice Operator lodges	- Date				- Customer	order number
	Customer Order	- Foodservic	e Operator ID and location			- Date of Pi	ick
		- Product ide	entifier			- Product p	icked
		– Quantity a	nd unit (carton, drum etc)			– Batch nur	nber
		– Delivery do	ite			– Use By/Be	est Before dates
		- Delivery ins	tructions e.g. opening hours, dock location)			- Logistics	unit number (SSCC)
SFSCTE4B	Foodservice Operator receives	Advance Ship	ping Notice				Der .
	ASN	- Item/Lot/c	ontainer identifier			AGINITIALITIE	
		- Value		SFSCTE5	Order Dispatch to Foodservice	– Customer	Order Number
		– Daily stock	in/stock out count			- Product	
						– Qty	
						– Batch	
						- Use By/Be	est Before dates
						- Date of d	espatch

SFSCTE5 Continued SFSCTE6	Receipt of food products at Foodservice Operator	Picking Who What When Where Why Information • Custome • ASN • Logistics	Distributor/Wholesaler Customer Purchase Order, Picking list number, Product ID, Quantity, Batch, Date Information Date/Time of pick Pick location Picking stock to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	 Information to be shared to a traceability platform POD number Receipt ID Product ID Actual quantity receipted Batch Use by/Best before date Date/Time of receipt 			
SFSCTE6 F	Receipt of food products at Foodservice Operator	Who What When Where Why Information • Custome • ASN • Logistics	Distributor/Wholesaler Customer Purchase Order, Picking list number, Product ID, Quantity, Batch, Date Information Date/Time of pick Pick location Picking stock to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	 POD number Receipt ID Product ID Actual quantity receipted Batch Use by/Best before date Date/Time of receipt 			
SFSCTE6 F S	Receipt of food products at Foodservice Operator	What When Where Why Information • Custome • ASN • Logistics	Customer Purchase Order, Picking list number, Product ID, Quantity, Batch, Date Information Date/Time of pick Pick location Picking stock to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	 Receipt ID Product ID Actual quantity receipted Batch Use by/Best before date Date/Time of receipt 			
SFSCTE6 F S	Receipt of food products at Foodservice Operator	When Where Why Information • Custome • ASN • Logistics	Product ID, Quantity, Batch, Date Information Date/Time of pick Pick location Picking stock to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	 Product ID Actual quantity receipted Batch Use by/Best before date Date/Time of receipt 			
SFSCTE6 F F	Receipt of food products at Foodservice Operator	When Where Why Information • Custome • ASN • Logistics	Date/Time of pick Pick location Picking stock to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	 Actual quantity receipted Batch Use by/Best before date Date/Time of receipt 			
SFSCTE6 F F	Receipt of food products at Foodservice Operator	Where Why Information • Custome • ASN • Logistics	Pick location Picking stock to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	BatchUse by/Best before dateDate/Time of receipt			
SFSCTE6 F F S	Receipt of food products at Foodservice Operator	Why Information • Custome • ASN • Logistics	Picking stock to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	Use by/Best before dateDate/Time of receipt			
SFSCTE6 F F	Receipt of food products at Foodservice Operator	Information Custome ASN Logistics	to be shared to a traceability platform er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers	- Date/Time of receipt			
SFSCTE6 F F S	Receipt of food products at Foodservice Operator	CustomeASNLogistics	er order number : Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers				
SFSCTE6 F F S	Receipt of food products at Foodservice Operator	ASNLogistics	Unit numbers (SSCC)	SFSCTE7	Off-the-boat receivers				
SFSCTE6 F F S	Receipt of food products at Foodservice Operator	 Logistics 	; Unit numbers (SSCC)						
SFSCTE6 F F S	Receipt of food products at Foodservice Operator				Retain Catch Disposal Record	Catch Disposal Record (seafood from quota fisheries)			
F	Foodservice Operator				or Sales Receipt	Long Form Receipt (all other catch)			
S						 name and net weight (in kilograms) of each species of fish s 			
	Sign Proof of Delivery	Proof of Deli	very			 whole or in carcass form 			
		 Delivery c 	date			- total number of each species sold			
		- Number o	of units – pallets, cartons, tubs			 a description of the form of the fish sold and, if processed, the way the fish have been processed 			
		Denveryn				- the date of the sale of the fish			
		- Name an	a signature of receiver			- the total sales value of each species of fish sold			
F	Record and notify variations to warehouse/DC or supplier	EDI message	e for rejected/missing stock						
		- Record vo	ariations x SKU/GTIN, lot number and supplier ID						
F	Received product entered into	– Product I	d (SKU + GTIN)			 full name and address of the purchaser of the fish 			
		– Lot/batc	h number			 a unique sequential identifying number allocated to the sale 			
		- Use-by/e	expiry date for each lot			 licence/permit number of the seller 			
		Receipt				Additional information for abalone			
		Who	Foodservice operator			 the date the abalone was packaged 			
		What	Order Number, ASN, Logistics unit ID, Product ID, Quantity, Batch, Use By/Best before Date Information			 the full name and address of the person who processed the abalone or the registered establishment number of the plac or premises where the abalone was processed 			
		When	Date/Time of Receipt						
		Where	Receipt location						
		Why	Receipting						
Event code	CTE	Key data el	ements	Event code	СТЕ	Key data elements			
------------	---	--	---	------------	---	--	--	--	--
SFSCTE8	Storage of inbound product	– Storage u	unit ID	SFSCTE10	Record lot details and quantity	– Product	- Product ID (brand and supplier)		
	Product internal storage unit ID	– Location	in storage		used in recipe/production	– Lot number			
	and located recorded					– Quantity	y used		
		Put Away				– Date			
		Who	Foodservice operator			Product Usage			
		What	Product ID, Quantity, Batch, Date Information, logistics unit id			Who	Foodservice operator		
		When	Date/Time of put away			What	Product ID, Quantity used, Batch, Date Information		
		Where	Put away location			When	Date/Time of usage		
		Why	Stock put away			Where	Usage location		
		0 1				Why	Usage		
	Opened bulk packs – Product Repack	- Supplier				Informatio	n to be shared to a traceability platform		
		Lot numberUse-by date				 Product ID 			
						- Lot numbers used in food preparation			
SFSCTE9						– Quantity			
	Record supplier, lot and use-by	Product Re-pack				- Date of usage			
	on portions of product from bulk packs	Who	Foodservice operator	SFSCTE11	New product creation Label serves of newly produced	- Batch code			
		What	Initial Product ID, Quantity, Batch, Date			- Use-by date			
			Information, re-packaged product ID, quantity, batch number		meal portions for end consumer	- Product ID			
		When	Date/Time of re-pack			Duraduat Crantian			
		Where	Repacking location			Product Cr	eation		
		Why	Re-pack			Who	Foodservice operator		
		Information	to be shared to a traceability platform			what	Information, Ingredients (product id's batch numbers, quantities)		
		– Lot numb	pers used in food preparation			When	Date/Time of creation		
		- Supplier	of each lot			Where	creation location		
		– Batch nu	imber of outbound meals			Why	Product Creation (transformation)		
		– Bulk Prod	duct ID			Informatio	n to be shared to a traceability platform		
		– Re-pack	aged product identifier			- New Pro	duct ID		
		- Quantity repacked				– Quantity	y produced (portions)		
		- Date of re	e-pack			– Batch number			
						– Best Bef	ore/Use by dates		
						- Date of	creation		

Event code	CTE	Key data e	lements	Applica	tion of GS	61 Da		
SFSCTE12	Record delivery location for each batch number	- Delivery - Batch n - Quantit - Delivery	location ID umber y delivered date	Adoption of <i>global data standards</i> en formats. These formats allow a busines events in the supply chain.				
		Product De	elivery	listed in this m	nodule.			
		Who	Foodservice operator					
		What	Product ID, Quantity, Batch, Date Information, Ingredients (product ia's batch numbers, quantities)	Data standards that apply to key data				
		When	Date/Time of delivery					
		Where	Delivery Location	Data Element	Examples	Valid Vo		
		Why Informatio – Product	Why Delivery Information to be shared to a traceability platform - Product Delivered		Distributor Receiving Dock	Global Locatio Number		
		 Delivery Quantit Batch c Date of 	location y delivered odes delivery	Date/Time	Date of stock receipt, date of despatch	Year -M Date		
	Food integrity, safety monitoring	– Inspecti – Inspecti	on date on record code	Product	Packaged	Global		
SFSCTE13	Record food safety/QA inspections	Food Safe	ty Inspection	Identifiers	Product	Item Nu (GTIN)		
		Who	Food Safety Auditor					
			Foodservice operator					
		What	Product ID, Quantity used, Batch, Date Information, Ingredients (product id's batch numbers, quantities)	Traceability	Batch, Serial	AI (10) =		
		When	Date/Time of inspection	Attributes	Production Date,			
		Where	inspection location		Best Before, Use by			
		Why	Product inspection					
		Informatio – Inspecti	n to be shared to a traceability platform on date					
		– Inspecti	on record code					
		- Inspecte	ed product ID, batch number					

ata Standards

nables data sharing between businesses through using common ss to identify participants, locations, products, processes and

een defined and included to support the list of CTEs and KDEs

a elements and shared information are identified in this section.

Data Element	Examples	Valid Values	Data Type/ Format	Further information
Location	Distributor Receiving Dock	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here:
				https://www.gs1.org/standards/id-keys/gln
Date/Time	Date of stock receipt, date of despatch	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent approach.
				The globally adopted standard for date recording is YYMMDD
Product Identifiers	Packaged Product	Global Trace Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system.
				Information on how to allocate a GTIN
				Information on when to change a GTIN https://www.gs1.org/1/gtinrules/en/decision- support
Traceability Attributes	Batch, Serial Number, Production Date, Best Before, Use by	AI (10) = Batch	AN20	Traceability Attributes, such as Batch or Lot Number, Serial Number, Production Date etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain.
				Also referred to as Application Identifiers, each has its own unique identifier and format.
				The call is a second



Data Element	Examples	Valid Values	Data Type/ Format	Further information
Logistics Units	Pallet of packaged product	SSCC	N18	Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain.
				Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets.
				<u>GSI Identification keys</u>
Returnable Asset	Chep Pallet	AI (8003)	N29	The <u>Returnable Asset Identifier</u> is especially suitable for the management of reusable transport items, transport equipment, and tools. It can identify these returnable assets by type and if needed also individually for tracking and sorting purposes <u>https://www.gsl.org/standards/id-keys/grai</u>

Useful links

Food Safety

ANZ Food Standards Code Standard 4.2.1 Primary Production and Processing Standard for Seafood

- ACT <u>https://health.act.gov.au/businesses/</u> <u>food-safety-regulation</u>
- NSW <u>https://www.foodauthority.nsw.gov.au/</u> _____retail/fss-food-safety-supervisors
- NT <u>http://www.health.nt.gov.au/</u> Environmental_Health/Food_Safety/ ______index.aspx
- QLD <u>http://www.health.qld.gov.au/foodsafety/</u>
- SA <u>http://www.health.sa.gov.au</u>
- TAS <u>https://www.dhhs.tas.gov.au/</u>

- VIC <u>https://www.health.vic.gov.au/food-</u> safety/food-businesses
- WA <u>https://www.health.wa.gov.au/Health-</u> <u>for/Licensing-and-industry/Food</u>

Food Safety Guide

Australian Institute for Food Safety fact sheets Seafood

Glossary

Advanced Shipping Notice (ASN)

An advanced shipping notice (or ASN) is an EDI document that's sent from the shipper (usually the merchant) to the recipient containing detailed information about an incoming shipment.

Batch coding

Also referred to as a lot number, lot code, or code number, a product batch code is a combination of numbers and/or letters that are used to identify a set of identical massproduced products. These shared characteristics may include Date/time of production Location of production (Plant Code, Line Number) Expiration date/Julian date.

Customer Invoice

A customer invoice is a document that a seller creates and sends to a buyer, either electronically or on paper. It lists the products or services, quantities, prices, discounts, taxes, and payment terms for a transaction that already took place or will take place. A customer invoice can be related to a sales order, which includes order lines and item numbers, and finishes the sales cycle. A customer invoice can also specify the terms and restrictions of use for a software product.

Customer Order

A customer order is a document that shows the customer's requirements or request for goods or services from a seller or provider. It may include information such as the quantity, price, payment, and delivery details of the order. It can be used for tracking the status of the order or the provisioning, adding, modifying, or terminating of services.

Deliver order (DO)

A delivery order is a document that can be issued by the owner of freight, consignee, shipper or a carrier to deliver the goods to another party. A delivery order should be differentiated from the bill of lading. The delivery order is not a negotiable document and it does not act as evidence or receipt of goods.

Enterprise Resource Planning (ERP)

Enterprise resource planning (ERP) refers to a type of software that organizations use to manage day-to-day business activities such as accounting, procurement, project management, risk management and compliance, and supply chain operations. A complete ERP suite also includes enterprise performance management, software that helps plan, budget, predict, and report on an organization's financial results. ERP systems tie together a multitude of business processes and enable the flow of data between them. By collecting an organization's shared transactional data from multiple sources, ERP systems eliminate data duplication and provide data integrity with a single source of truth.

First-In – First Out (FIFO) stock movement

First in, first out (FIFO) is an inventory method that assumes the first goods purchased are the first goods sold. This means that older inventory will get shipped out before newer inventory and the prices or values of each piece of inventory represents the most accurate estimation.

IBAN (International Bank Account Number) verification

IBAN checker is a software designed to validate an International Bank Account Number and identify the bank owning this account, BIC code and address. IBANs are not used in Australia. However, payers in certain countries may require you to provide one. In that case, your BSB and account number should be combined. Do not include any spaces or hyphens.

Know Your Customer (KYC) validation

As a reporting entity you must apply customer identification procedures to all your customers. Part B of your <u>AML/CTF program</u> is solely focused on these 'know your customer' (Austrac KYC) procedures.

You must document the customer identification procedures you use for different types of customers. The procedures you use must be based on the level of money laundering/ terrorism financing risk that different customers pose.

You must check a customer's identity by collecting and verifying information before providing any <u>designated services</u> to them. You must identify both individual customers (people) and non-individual customers (such as companies, associations or trusts).

Lot

A lot is an amount of a food that the manufacturer or producer identifies as having been prepared, or from which foods have been packaged or otherwise separated for sale, under essentially the same conditions, for example:

- a) from a particular preparation or packing unit; and
- b) during a particular time ordinarily not exceeding 24 hours.

The lot identification (which could be a number or other information) is used to track a product in the event of a recall and needs to be able to identify where the food was packed or prepared.

Politically Exposed Persons (PEP)

A PEP is an individual who holds a prominent public position or role in a government body or international organisation, either in Australia or overseas. Immediate family members and/ or close associates of these individuals are also considered PEPs.

PEPs often have power over government spending and budgets, procurement processes, development approvals and grants. Examples of PEPs include heads of state, government ministers or equivalent politicians, senior government executives, high-ranking judges, high-ranking military officers, central bank governors, or board members or executives of an international organisation (Austrac PEP).

Purchase Order (PO)

A purchase order (PO) is a legal document sent by a buyer to their supplier. It demonstrates their commitment to pay for specific products and/or services from a seller and establishes terms for payment.

Third party logistics

Third party logistics (abbreviated as 3PL, or TPL) in logistics and supply chain management is an organization's use of third-party businesses to outsource elements of its distribution, warehousing, and fulfillment services. Thirdparty logistics providers typically specialize in integrated operations of warehousing and transportation services.



Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Consumer Information



Seafood Consumer Information

This module contains the activities related to consumer information and the basis of consumer choice for seafood.

It covers the following areas:

- 1. The consumer experience
- 2. Supply chain information
- 3. Labeling of seafood
- 4. Identification of product at origin

Australian seafood consumption

Australians consume around 12 kilograms of seafood per person annually.¹

Figure 1: Seafood consumption per person



5. Verification of provenance

- 6. Smart labeling and product information
- 7. Feedback from consumers



Note: Apparent consuption is the sum of edible production and edible imports, less edible exports. Per person consumption is expressed on an edible weight basis, estimated using conversion rates for species-specific finfish (FRDC) and non-seafood categories (OECD).

Source: ABARES

Figure 2: Import share of seafood consumption



To understand the consumer experience and

1. The consumer experience

basis for choice of seafood for consumption, the Fisheries Research and Development Corporation (FRDC) undertook research on the consumer experience.² It found that Australians purchase seafood mainly from supermarkets (60%), seafood markets (15%) and fishmongers (8%). Findings from the survey responses of 1,902 respondents regarding significant factors influencing seafood selection include:

- Freshness
- Food safety
- Price
- Was the product frozen?
- Value for money as compared with other proteins
- Shelf life
- Australian origin
- Species
- Sustainably harvested
- Certified as sustainable
- Nutritional content
- Wild catch or farmed
- · Catch method.

¹ABARES ²FRDC Unpacking the consumer seafood experience





Figure 3: Factors considered when consumers purchase seafood. % rating 8-10 on importance of factors when considering buying seafood Base: all respondents who eat seafood, n = 1,902



Source: FRDC, 2019

2. Supply chain information

The Global Centre for Food Integrity defines transparency as "... the rational offering of honest information that has the emotional appeal of inviting confidence and authentic connection."³

Using this definition, transparency can be viewed as an individual company's choice, rather than a supply chain-wide decision to reveal information. Some components of traceability may be incorporated into a transparency commitment by a company, such as disclosing suppliers. Conversely, a product can be robustly and digitally traceable without the company providing that information to their customers.⁴

A by-product of implementing seafood traceability is the availability of information that can fulfil consumer information needs. However, this should be a shared, permissioned decision by supply chain partners, as an outcome of implementing a traceability data sharing framework, which includes clear content, data security and governance controls. Consumer information is part of the shared value created from traceability.

3. Labelling of seafood

Under Australian Consumer Law, consumers have guaranteed rights. Of relevance to purchasing seafood, are the rights to safe products and general consumer rights when buying goods. Consumer rights cover safety standards, recalls, bans, safety warning notices and mandatory reporting requirements.

Australia's Food Code covers standards the end consumer can expect when purchasing seafood, including:

- the microbiological safety of food;
- the composition of food, including contaminants, residues, additives or other substances; and,
- information about food, including labelling and advertising.

Under the Competition and Consumer Act 2010, Country of Origin Food Labelling Information Standard 2016, Country of Origin labelling is required for retail sale of seafood. In relation to labelling:

Figure 4: Data sharing



Country of origin claims must be true,

- accurate and based on reasonable grounds.
- For labels stating a product's country of origin, there are legal definitions of the terms 'grown in', 'product of' and 'made in'.
- Most food sold in Australia must be labelled with its country of origin, following rules set out in an information standard.

The Australian Government has recently considered the need for country-of-origin labelling for seafood sold through foodservice.⁵

³ Transparency Roadmap for Food Retailers ⁴ Traceability and Transparency ⁵ Consumer access to seafood origin information



4. Identification of the product at origin

Counterfeiting of seafood in Australia has been found to take place intentionally or inadvertently. A survey of barramundi and red emperor fish conducted in Australia and New Zealand found that species mislabelling occurred at harvest, in wholesale transactions, at retail and at foodservice.⁶

"The premium value of Australian seafood makes it a target for fraudulent activities in both export and domestic markets, with incorrect labelling of species and country of origin particular concerns; counterfeiting of overseasderived seafood product as Australianexported product was raised, as were the vulnerability of supply chains involving the import and subsequent re-export of product as Australian origin, and conversely the export and subsequent re-import of Australian product for processing and value adding." ⁷

Providing a unique identifier for the origin of the product, the fishery area or specific aquaculture site, such as a hatchery or pondage, can be achieved using a global location number or GLN. This can be encoded in the product label or individual animal tag. Similarly, processors and manufacturers can record this origin code from their supplier and link this with the inputs or ingredients for the finished product they create. For those receiving bulk product, use of a unique lot (wild catch) or batch (aquaculture) number can be used alongside the grower location code to identify the source of product prior to comingling at a processor or manufacturer.

These activities are a means to link provenance to the traceability data model described in the Implementing Food Traceability Guide.

There are multiple technologies available to capture data on the product origin and conditions of production, including data captured using Internet of Things (IoT) devices, Radio Frequency identification (RFID), Quick Response (QR) codes, 2D barcodes, and traditional barcodes. In addition, there are software-based technologies that can capture the varied digital signals created when a critical tracking event (CTE) occurs in a device-agnostic manner, and from this create a holistic picture of the journey of the product. In the case of serialisation, this can be done at a very granular (trade item) level.

Combining suitable technologies and symbologies with the critical tracking events and key data elements and using global data standards, the entire supply chain can be made transparent, expanding the potential for consumer information.

Key tasks related to traceability

- Use global location codes to identify the entity and location of origin of the product or ingredient
- To identify the source of bulk product, use lot level identification combined with grower/ fishery entity and location codes.

Key Participants

- Growers, fishers and first receivers
- Location code issuing organisation e.g. fisheries management agency, GS1 Australia
- Certifying bodies
- Seafood wholesalers
- Processors
- Manufacturers.

⁶Fish mislabelling_commonly asked questions ⁷Product Fraud: Impacts on agriculture, fisheries and forestryindustries

5. Verification of provenance

There are a range of technologies available to verify the provenance and integrity of a product. Food analysis laboratories conduct a range of tests. Some can link the product to the unique soil mineral or water "signature" of a region, or to test claims associated with organic production. DNA barcoding is a fast analytical tool to link the harvested seafood to a location and verify species.⁸

A certificate from an accredited laboratory can provide product claim and provenance verification. Creation of a unique identifier for these verification certificates, providing them to supply chain partners in a cyber-secure, encrypted and authenticated message, enables provenance verification to accompany the product. This information then becomes a product attribute that may be shared with end consumers.

Retailers often rely on vendor or supplier assurance programs to underpin product claims. However, these assurance symbols may be replicated on counterfeit product. To prevent this, a document code contained as a product attribute in a barcode or QR code can verify the accreditation/certification is true and current. By scanning this code,

Recording data from the critical tracking events (CTEs) in this Guide will enable detailed information to be accessed, from analytical verification of the species, specific harvesting sites and the source and integrity of inputs and ingredients in manufactured seafood products. This data is used for E2E (end to end) or B2B (business to business) transactions, to track the product's journey, to facilitate handovers of custody, to comply with regulatory regimes and buyer specifications. In recognition of the interest of fishers and growers in marketing the story of their product, AgriFutures has prepared a toolkit to assist primary producers in this task – *Provenance Storytelling for Success.*⁹

Key tasks related to traceability

• Embed test certificate codes related to provenance and integrity as an attribute of the product ID.

Participants

- Fishers/Growers
- Accredited analytics laboratory
- Seafood wholesalers
- Processors
- Manufacturers
- Retailers
- Foodservice.

6. Smart labelling and product information

Requirements for food labelling are described by FSANZ and cover a variety of foods and circumstances, such as product labelling for E2E sales versus B2C sales. The Australian Government also has requirements for country of origin labelling, weights and measures and Australian product content.¹⁰

Despite large amounts of information being encoded on product packaging and item labels, there are opportunities for brand owners to provide additional product information for consumers through use of smart labels. These labels use QR codes, sensors or microchips to enable information to be generated from the brand owner of the product to the consumer.

Smart labels have a dual purpose in providing consumer information and in traceability of the product. They can indicate deterioration of the product, as they change colour or blister, detecting oxygen and bacteria levels. This helps to notify consumers and avert food waste. For high value items such as liquor, smart labels containing an IoT sensor using Near Field Communication/5G can enable anti-tampering and tracking in transit. These embedded devices can detect changes in temperature and humidity via packaging and labels, while the product is in transit or storage. They will also indicate any tampering with the bottle.

Consumers can use a specific Application (App) or scan a QR code or digital barcode on the product to access product information held by the brand owner/manufacturer or producer. They can also search via the Web or conduct a product search on a registry of brands and products to gain additional information via smart phone, tablet or desktop.

Key tasks related to traceability

- Ensure compliant labelling on packaging and product item (FSANZ, ACCC product labelling)
- Determine the business case for smart label application to the product as a dual consumer information and traceability tool.

Key Participants

- Grower/Supplier
- Manufacturer
- Retailer
- Solution provider.

7. Feedback from consumers

Traceability is focused on monitoring the flow of the product to the consumer and the requirement to conduct product recall from the consumer back to the source of the threat in the circumstance of a food safety incident. Food safety must be the first priority, however, as consumers seek to engage with the upstream food supply chain beyond the food retailer or foodservice operator, the opportunity for feedback from consumers has expanded.

^e Antil S, Abraham JS, Sripoorna S, Maurya S, Dagar J, Makhija S, Bhagat P, Gupta R, Sood U, Lal R, Toteja R. DNA barcoding, an effective tool for species identification: a review. Mol Biol Rep. 2023 Jan;50(1):761–775.

https://www.agrifutures.com.au/rural-industries/provenanceand-story-telling/

¹⁰https://www.business.gov.au/products-and-services/productlabelling



Point of Sale (POS) devices can capture large volumes of consumer data regarding preferences, sales volumes, and consumer ratings of products. The use of QR codes also supports the opportunity for brand owners to gain valuable feedback. Customer loyalty schemes are also a tool to gather feedback on products. This capability is in addition to the use of social media as a feedback tool and can use the system interoperability created through use of product identification, business entity identification and the event history of the product created through the traceability data model, to transmit consumer feedback to upstream partners.

Many small and medium enterprises (SMEs) who are fishers, aquaculture farmers, and manufacturers, find consumer insights costprohibitive to purchase and they therefore miss out on valuable feedback. Use of the traceability data model enables them to receive consumer insights via system interoperability.

Key tasks related to traceability

 Determine with consumer-facing partners what consumer insights can be integrated in the traceability data model for the product.

Participants

- Food retailers
- Foodservice operators
- Fishers and aquaculture farmers
- Solution Providers
- Food manufacturers
- Wholesalers and distributors.

Critical Tracking Events (CTEs)

For each of the identified consumer information activities, **Critical Tracking Events (CTEs)** establish identity and enable traceability and compliance with traceability-related regulation. CTEs in this module relate to the transparency of the food product supply chain and supply of consumer information and consumer feedback.

CTE code	Consumer Information Activity	Critical Tracking Events (CTEs)
SCICTE1	Identification of the product	Use GLN, fishery identification to identify the entity and location of origin of the product or ingredient
SCICTE2		To identify the source of bulk product, use lot level identification combined with grower GLN/PIC
SCICTE3	Verification of provenance	Embed test certificate codes related to provenance and integrity as an attribute of the product ID
SCICTE4	Smart Labelling and product information	Ensure compliant labelling on packaging and product item Determine the business case for smart label application to the product as a dual consumer information and traceability tool
SCICTE5	Feedback from consumers	Determine with consumer-facing partners what consumer insights can be integrated in the traceability data model for the product

Key Data Elements (KDEs)

Key Data Elements (KDEs) ensure that captured and recorded data can be interpreted and used as relevant and required by all supply chain partners. KDEs define Who, What, When, Where and Why for each CTE identified above.

Event code	СТЕ	Key data elements		Event code	СТЕ	Key data elements
	Product Identification			SCICTE5	Consumer access to traceable	Potential data
SFSCTE1	Use location codes to identify	– Global Lo	ocation Number		information	- Link to supplier website to tell production story
	the entity and location of origin of the product or inaredient	– Fishery n	ame/code		Determine with consumer- facing partners what consumer	- Harvest date
	1 0	- Country	of Origin		insights can be integrated in	- Consumer rating of the product
		– Lot/bata	ch number		the product	- POS locations.
		– Best befo	pre / Use-by date.			
	Bulk product identification					
SFSCTE2	Use lot level identification	– Lot numb	ber			
	combined with grower GLN	- GLN				
		Test Certific	cate Links			
	Verification of Provenance	Who	Fisher, Grower, Processor, Retailer, Food Service operator			
SFSCTE3	Embed test certificate codes related to provenance and integrity as an attribute of the product ID	What	Product ID, Lot/Batch, Test Certificate number, Quantity			
		When	Date/Time of Testing			
		Where	Location of testing			
		Why	Linking Test Certificate to product lot or batch			
	Product labelling					
SCICTE4	Ensure compliant labelling on	– Food De	scription			
	packaging and product item	– Use by D	ate/ Best Before Date			
		– Lot/Bata	ch Identification			
		- Supplier	name, Certifying body and expiry			
		- Contact	Details of supplier			
		- Cooking	and storage instructions			
		- Country	of Origin			
		– List of Ing	gredients			
		– Percenta	ige of Ingredients			
		– List of All	ergens.			

Application of GS1 global data standards

Data standards that apply to key data elements and shared information are identified in this section.

Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Location	Manufacturing Plant, Finished Goods Location, Dispatch	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here:
	Dock			https://www.gs1.org/standards/id-keys/gln
Date/Time	Production Date and/ or time, Use By date, Best Before Date, Pack Date	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent approach. The globally adopted standard for date recording is YYMMDD
Product Identifiers	Input materials such as raw ingredients and packaging,	Global Trade Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system.
	Outputs such as finished goods,			Information on how to allocate a GTIN: https://www.gs1.org/1/gtinrules//en/
	processed goods			Information on when to change a GTIN https://www.gs1.org/1/gtinrules/en/ decision-support
				Information on how to allocate a GTIN to a variable weight or variable measure trade item
				https://www.gs1.org/docs/barcodes/G1IN- Allocation_Rules_Fresh_Foods_Upstream_ Standard.pdf
Traceability Attributes	Batch/Lot code, Serial Number,		AN20	Traceability Attributes, such as Batch or Lot Number or Serial Number etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain
				Also referred to as Application Identifiers, each has its own unique identifier and format
				List of Application Identifiers

Useful Links

Fish names standards

https://www.frdc.com.au/knowledge-hub/ standards/australian-fish-names-standard

Food testing laboratories

https://nata.com.au/accreditation/natasectors/

Provenance and story telling

AgriFutures toolkit https://agrifutures.com.au/

Food labelling

NMI Weights and Measures https://business.gov.au/legal/fair-trading/ australian-trade-measurement-laws

ACCC Country of Origin Food Labelling

https://www.accc.gov.au/system/files/ Country%20of%20Origin%20food%20%20 labelling%20Guide_March%202019.pdf

Labelling of unpackaged seafood

https://www.foodauthority.nsw.gov.au/sites/ default/files/_Documents/retailfactsheets/ labelling_requirements_for_unpackaged_ seafood.pdf

Food Standards Code labelling

https://www.foodstandards.gov.au/industry/ labelling/pages/default.aspx





Glossary

B2B

Business to Business transactions

B2C Business to Consumer transactions

loT

Internet of Things. A description for a range of devices that can connect with each other and the Internet without human intervention.

Point of Sale (POS)

POS devices are evolved from cash registers and cover a range of cloud-connected or stand-alone enterprise systems for recording sales, managing inventory and enhanced customer engagement e.g. loyalty programs/ customer preferences.

QR code

A Quick Response code is a machine-readable code consisting of an array of black and white squares, typically used for storing URLs or other information for reading by the camera on a smartphone. It can store 7,000 characters.

Small and medium enterprise (SME)

- The Australian Bureau of Statistics (ABS) uses the number of persons employed:
- a micro-business employs between 0-4 persons
- a small business, between 5-19 persons
- a medium business, between 20 and 199 persons; and
- a large business employing 200 or more persons.
- Various Commonwealth agencies define SMEs differently, however it is recognised that SMEs make up around 98 percent of Australian businesses.

Smart labels

Smart labels include QR codes, Electronic Article Surveillance (EAS) tags and specially configured RFID tags. Smart labels are created by combining three technologies: plain text, radio code and optical character recognition. Smart labels are divided into chip labels, printable labels and electronic labels.

Smart labels such as data-embedded barcodes (GS1-128), 2D/QR codes, RFID tags, enable a much larger amount of information to be provided to consumers. www.clearmark.uk

SmartLabel: Consumer Brands Association and Food & Consumer Products of Canada www.smartlabel.org



Australian Guide to Implementing Food Traceability: **Seafood**

Seafood Imports



Seafood Imports

Australia imports most of the seafood that Australians consume. Imported seafood accounts for over 60 percent of consumption

Food importation in Australia is dominated by small and medium-sized enterprises (SMEs), primarily food wholesalers (47%), food manufacturers (16%) and food retailers (14%).¹

Figure 1: Australian import markets.

	Major imp	ort markets		Key proc	duct group	s
		2019-20	2020-21			
Th	nailand	\$491m	\$392m			
c Vi	etnam	\$301m	\$363m			-
Cł	hina	\$309m	\$283m	Finfish	Prav	wns
N	ew Zealand	\$190m	\$215m		2019-20	20
- In	donesia	\$126m	\$132m	Finfish a	\$1,256m	\$
				Prawns	\$393m	\$
				Other product groups	\$547m	\$
				Total	\$2.20b	\$



Note: Graphs are presented in \$2020 dollars. All other values are presented in normal dollars. Totals may not add due to rounding. a FinFish includes sharks and rays. m million. b billion. Source: ABS

Source: ABARES, 2022

Processes covered in this module include:

- **1.** Establishment data for Australian food importer and overseas suppliers
- 2. Mandated food safety traceability requirements for Importers
- **3.** Tracing product origin and composition through offshore suppliers
- 4. Arrival and clearance at final discharge port
- 5. Re/Labelling of imported food products to meet Australian standards.

1. Establishment data for Australian food importer and overseas suppliers

It is important to note that once an imported food product has received border clearance, all domestic food regulations apply. If the imported food is for retail sale, the Importer is required to register as a food business.

Creation of master data for trading partners and locations

Sourcing of product for import usually requires the creation of master data for the fisher, grower, manufacturer and exporter in the country of origin of the product as well as for the Australian importer and key nodes in the supply chain such as cold storage. This will enable unique identification of the entities and locations engaged in the product's journey, including packing houses, distribution centres or warehouses the product moves through. For many jurisdictions, registration of the fisher, grower, manufacturer and exporter are required by responsible authorities.

Creation of master data for the Food Importer

Master data relates to unique identifiers for the business entity and business location. The creation of unique identifiers enables the business and trading partners to have consistency and interoperability between systems.

"Master data is the consistent and uniform set of identifiers and extended attributes that describes the core entities of the enterprise including customers, prospects, citizens, suppliers, sites, hierarchies and chart of accounts." ²

¹ Commonwealth of Australia, 2016, Imported Food Reforms Decision Regulation Impact Statement Department of Agriculture, Water & Environment.

²Gartner <u>https://www.gartner.com/en/information-technology/glossary/master-data-management-mdm</u>

Business licences and notifications

If a food Importer sells product for retail, the business must register with the local Council. If the Importer sells wholesale products, they must notify the state food authority. For some products, a licence will be required.

Tasks related to traceability

- Create master data for Importer and key supply chain partner entities and locations
- Registration/notification of Food Business.

Participants

- Producer/grower, wholesaler or manufacturer directly exporting
- Export company supplier (non-producer/ manufacturer)
- Importer
- State and local authorities managing food safety and business registrations
- Issuing body for Global Location Numbers.

2. Mandated Food Safety and Traceability requirements for importers

Is the seafood import classified as a risk?

The following seafoods are classified as a "risk" product under the <u>Imported Food</u> <u>Control Amendment (Risk Foods) Order 2020</u> administered by the Australian Department of Agriculture, Fisheries and Forestry (DAFF).

Table 1: Risk seafood imports

Crustaceans and crustacean products that are cooked and ready to eat, but are not:

(a) both retorted* and shelf stable* or

(b) dried

- Fish of the following kinds:
- (a) all fish in the family Carangidae
- (b) all fish in the family Clupeidae
- (c) all fish in the family Coryphaenidae
- (d) all fish in the family Engraulidae
- (e) all fish in the family Pomatomidae
- (f) all fish in the family Scomberesocidae
- (g) all fish in the family Scombridae.

Fish products that contain more than 300 grams per kilogram of all or any of the kinds of fish in the families mentioned above.

Finfish that is ready to eat.

Bivalve molluscs and bivalve mollusc products.

- Shelf stable refers to food that will last for an extended period of time, packaged or not, without any special storage conditions.
- * Retorting refers to the process of cooking canned food or food in a retort pouch after it has been sealed in the container.

The seafood products listed in Table 1 are referred to the <u>Imported Food Inspection</u> <u>Scheme</u>. It should be noted that if these products are imported from New Zealand, they aren't referred for inspection or testing. New Zealand and Australia have joint food standards allowing food to be imported between the countries without border inspection.

Importers that have a Food Safety Management System may enter a <u>Food Import Compliance</u> <u>Agreement</u> (FICA) to speed clearance of their imports.

Food receipt

In relation to food receipt, a food importer or wholesaler must be able to provide information about what food it has on the premises and where it came from.

A food business must provide, to the reasonable satisfaction of an authorised officer upon request, the following information relating to food on the food premises:

- 1. The name and business address in Australia of the vendor, manufacturer, or packer or, in the case of food imported into Australia, the name and business address in Australia of the importer
- 2. The prescribed name or, if there is no prescribed name, an appropriate designation of the food.

This means that a food business must not receive a food unless it is able to identify the name of the food and the name of the supplier.

Food recall

A food business engaged in the wholesale supply, manufacture or importation of food must have a system, set out in a written document, to ensure it can recall unsafe food. The system should include records covering:

- Production records
- What products are manufactured or supplied
- Volume or quantity of products manufactured or supplied
- Batch or lot identification (or other markings)
- Where products are distributed
- Any other relevant production records.

This information should be readily accessible in order to know what, how much, and from where product needs to be recalled.

Tasks related to traceability

- Record the identity of the food or ingredient and the identity of the supplier
- Document a Recall System for the business which compiles the identity and location of customers and the identity, date, volume, batch or lot of product sold.

Participants

- Importer
- Foreign supplier/exporter
- Distribution agent
- Customer (purchase orders and sales receipts)
- Food safety inspector
- Food safety auditor.

3. Tracing product origin and composition through offshore suppliers

Depending on the capacity of the grower of source ingredients, a minimum of lot number identification of the product from the farm can be traced.³ The lot number and Sales Receipt issued from the Processor or Wholesaler to the Grower can then be identified as the product becomes an input to processing or manufacturing.

Methods to establish and verify product origin and authenticity relate to analytical sampling, test certificates and auditing of the grower or supplier.

See On-Farm Production and Processing and Manufacturing Modules for Critical Tracking Events and Key Data Elements for growers, pack houses and processing/manufacturing traceability.

Tasks related to traceability

- Request proof of origin/provenance documentation from the supplier
- Undertake a traceability audit of suppliers to identify product origin and inputs to product manufacturing
- Document the Supplier policies and SOPs for traceability, recall and sourcing
- Record lot/batch numbers of incoming product.

Key Participants

- Grower
- Wholesaler/Agent
- Supplier
- Importer.

4. Arrival and clearance at final discharge port

A series of documents are required to enable the physical movement of the product from the vessel or aircraft on arrival in Australia.

Required documents include:

- Bill of Lading/Air Waybill
- Commercial invoice
- Packing list
- Packing Declaration (including packing materials)
- Certificate of Origin
- Fumigation Certificate
- Import Delivery Order.

These documents record dates, times and authorisation signatures associated with the event-based movement of the product and support traceability through the import process. The Air Waybill and Bills of Lading contain detailed descriptions of the product, including supplier lot and batch numbers on each carton.

The Air Waybill and Ocean Bill of Lading are critical documents that detail the shipment. Until the airline or shipping line authorises these documents to be handed over to the party nominated by the shipper (Exporter or their Freight Forwarder/Importer or their Freight Forwarder, Customs Broker) the cargo remains in the custody of the carrier. For ocean shipping, generally 24 hours' notice is required from the ship's Master that the vessel is arriving in port to prepare for biosecurity inspection. On arrival at the port of discharge/ destination, the nominated party on the Bill of Lading (Customs Broker, Importer) is notified of the discharge of the container and once clearance is completed, the availability of the container for collection. Visibility of the container and its movement from the time the vessel enters the port to leaving the terminal en route to the Importer can be achieved by using the <u>1-Stop</u> portal.

An Importer can gain access to:

- Event dates and time or procedures connected to the container
- The location of events
- The defined event
- The port of loading and destination
- The ISO code
- The commodity code
- Full or empty status of the container.

Biosecurity inspection may be required. This may be undertaken at the port of discharge (tailgate or full inspection), or once the container is transported to a facility that is licensed for inspection.

³ FAO Traceability Guide



The *Incoterms* of the transaction between Exporter and Importer determine the responsibility for port clearance and subsequent delivery to the Importer. Arrangements will be made via the Exporter (often via an International Freight Forwarder and their international partnering Customs Broker) to hire a Transport Company to collect the container from the terminal and deliver at the instruction of the Importer to a nominated warehouse/ DC. Shipping lines may arrange the transport delivery (carrier haulage) or the Exporter or Importer may take this responsibility (merchant haulage).

An electronic Import Delivery Order which the Airline/Shipping Line issues as per the Bill of Lading/Airway Bill enables the container to be loaded on the transport and leave the terminal. "Gate Out" date and time stamp at the port terminal are recorded.

On leaving the port, tracking of the transfer to the Importer premises or Distribution Centre is typically undertaken using a Transport Booking reference issued by the Transport Company, or via GPS tracking. In Australia, staging of containers is common, with the container being held at a transport depot overnight before being delivered to the Importer.

On arrival at the delivery destination, a *Proof of Delivery* by the Transport Company is signed by the Importer. The Importer will then check and remove the container seal (with IFIS inspector present as required), examine the goods as listed on the Bill of Lading/Airway Bill, packing list and commercial invoice and advise the Exporter of any variances.

Tasks related to traceability

- As per the Bill of Lading, the Shipping Line/ Exporter/Importer or Forwarder will book transport to collect the container from the port terminal
- An Import Delivery Order will enable the transport (road or rail) to clear the terminal
- The CTO records "gate out" details
- Proof of Delivery is signed by the Importer/DC
- Goods delivered are inspected and scanned/recorded in Importer goods receival system/Warehouse Management System.

Key Participants

- Airline/shipping line
- Transport Company
- International Freight Forwarder and Customs Broker
- Container Terminal Operator (CTO)
- Australian Border Force/Customs
- Department of Agriculture, Fisheries and Forestry (IFIS inspection staff).

Border Clearance regulation

Regulation at Australian borders relates to:

- Biosecurity control preventing the introduction and/or spread of harmful organisms to animals and plants to minimize the risk of transmission of infectious disease.
- Food Safety control and inspection to ensure imported food complies with Australian food safety standards.
- Food Import Declaration to ensure the goods are not prohibited for importation and the correct taxes and duties are paid.

Biosecurity and Food Safety

As with domestic food distribution, all importers are required to provide documents on request, demonstrating the traceability of imported food, one step forward and one step backward along the food supply chain.

The Australian Department of Agriculture, Fisheries and Forestry (DAFF) is responsible for biosecurity risk and food safety of imported foods. It will confirm whether the product to be imported is able to be brought into Australia and under what conditions. The <u>Biosecurity Import</u> <u>Conditions System</u> (BICON) on-line site identifies whether the product is permitted, is subject to conditions, requires supporting documents or needs an Import Permit. For example, imported prawns, live breeding fish stocks, raw seafood for pet food and stockfeed are considered a risk.

Food is classified by Food Safety Australia New Zealand (FSANZ) as being a *Risk Food* with a medium to high risk or microbial or chemical hazard; a *Surveillance Food* with a low risk; or a *Compliance Agreement Food* for regular importers who have qualified for this scheme.

Depending on the classification of the food to be imported, an Import Permit may be required. Addition documentation that may be required includes the following documents:

- Health Certificate
- Phytosanitary certificate
- Manufacturer Declarations
- Full Import Declaration
- Lot code listings with best-before dates.

E-certificates for imported products from

selected countries are able to be issued. These include phytosanitary certificates and sanitary certificates. Electronic certificates will increase the efficiency of import documentation. Inspections of food take place at the premises of the Importer or a warehouse area that has an arranged agreement with DAFF.⁴ Inspection bookings are made using the DAFF <u>Biosecurity Portal</u>.

Record keeping requirements for food Importers relating to traceability of imported foods are as outlined below.

- Food importers, or the owner of the food at the time of importation, must keep the following information in relation to the food being imported:
 - A name or description of the food sufficient to indicate its true nature
 - Batch or lot identification for the food
 - Name of the person, business name, street address and telephone number or email address of the producer of the food
 - Name of the person, business name, street address and telephone number or email address of customers that have received the food
 - The date the food was received and the date when it was dispatched to customers
 - The volume or quantity of the food involved in each transaction.
- Records may be kept in a manual or electronic system but must be kept for five years.⁵

⁴https://www.agriculture.gov.au/import/arrival/clearanceinspection ⁵DAFF Imported Food Notice INF18-19



Border clearance

All food importers are required to complete a <u>Full</u> <u>Import Declaration</u> (FID) on the Australian Border Force (Customs) *Integrated Cargo System* site. This declaration relates to the identification, food safety and value of the cargo, to ensure the Imported Food Inspection Scheme can determine inspection regime and all taxes and duties are paid.

Tasks related to traceability

• Maintain information to comply with the traceability requirements of state and Commonwealth legislation.

Key Participants

- Importer
- Distributor
- State food safety authorities
- DAFF Imported Food Inspection Scheme (IFIS) inspector.

5. Re/Labelling of imported food products to meet Australian standards

Importers should contact all suppliers, or put systems in place, to ensure that the labelling on their food products comply with the Code prior to importing food products or ensure that labelling is compliant prior to inspection. The <u>Imported Food Control Act 1992</u> provides for the labelling of food products to be amended after importation and before inspection by the department.⁶ If the imported product does not comply with Australian food labelling standards, the Importer may need to re-label the product. Key information required on the label relates to:

- Best-before/use-by dates the product may have an expiry or BBE date which is not compliant
- Country of Origin
- Nutritional information
- Ingredients.

The <u>Australian Food Standards Code</u> requires food to list ingredients, product specifications, have assurance from the suppliers in the country of origin that the food is safe for human consumption, the ingredients are permitted in Australia, meet compositional requirements and be correctly labelled. Australian Fish Names are particularly relevant for Australian consumers.

The Australian Competition and Consumer

<u>Commission</u> (ACCC) provides guidance for food labelling, including country of origin labelling. For product requiring re-labelling prior to IFIS inspection, there is an opportunity to also ensure the items are allocated a unique identifier on the label, to establish traceability in distribution within Australia.

The <u>Imported Food Inspection Scheme</u> (IFIS) officers will randomly undertake imported food inspections. As part of this inspection, they will check food labels to ensure they are compliant.

Tasks related to traceability

- Ensure compliant labelling
- Include unique identifier on re-labelled products prior to distribution.

Key Participants

- Importer
- Supplier
- Labelling supplier
- FSANZ
- State Food authorities
- Food label inspectors (IFIS).

https://www.agriculture.gov.au/biosecurity-trade/import/ goods/food/notices

Critical Tracking Events

For each of the identified Import activities, **critical tracking events** (CTEs) establish identity and enable traceability and compliance with traceability-related regulation are summarised as follows:

Critical Tracking Events (CTEs) relate to the identity, movement and transformation of the food product.

Import activity	CTE code	Critical Tracking Events (CTEs)	Import activity	CTE code	Critical Tracking Events (CTEs)
Establishment data Creation of Master data for Supplier and Wholesaler, Grower Creation of Importer master data Registration and Notification of Food Business	SIMCTE1A SIMCTE1B SIMCTE1C	Create master data for key supply chain partner identities and locations Create Master data for the Importer Food premises licence/notification	Clearance of container/ULD As per Bill of Lading, Air Waybill, Shipping Line/ Exporter/Importer or Forwarder will book transport to collect the container from the port terminal An Import Delivery Order will enable the transport (road or rail) to clear the terminal	SIMCTE8	Cargo clearance notice
and Premises Mandated Food Safety Traceability requirements for importers			Container departs terminal The CTO records "gate out" details	SIMCTE9	Gate Out message from terminal operator notified to Importer
Record the identity of the food or ingredient and the identity of the supplier Document a Recall System for the business	SIMCTE2	Create Traceability Record system for food imports Create a Product Recall system	Product arrives at Importer premises Proof of Delivery is signed by the Importer/DC Goods inspected (IFIS or Compliance	SIMCTE10 SIMCTE11	Proof of Delivery signed by Importer Food ID, labelling, packaging compliant and
which compiles the identity and location of customers and the identity, date, volume, batch or lot codes of product sold. Tracing product origin and composition			Agreement) Goods scanned/recorded in Importer goods receival system/Warehouse Management System (inclusion destroyed exported acade)		Importer receives eFIR,IFIA
through offshore suppliers Request proof of origin/provenance documentation from the supplier	SIMCTE4	Proof of Origin/provenance documentation of sourced product	Labelling of imported food products to meet Australian standards	SIMCTE12	Labellina/
identify product origin and inputs to product manufacturing Document Supplier policies and SOPs for traceability, recall and sourcing			prior to distribution	SIMCTE13	Re-labelling of Product to Australian labelling standards Apply unique identifier on re-labelled product prior
Obtain Import Permit for Risk-classified seafoods	SIMCTE5	Import Permit received	Border Clearance regulation		to domestic distribution
Lodge Full Import Declaration for the consignment as required by BICON	SIMCTE6	Lodge FID on Integrated Cargo System	Maintain information to comply with the traceability requirements of state and Commonwealth legislation	SIMCT14	Maintain records for mandated traceability
Vessel/Aircraft arrives at Sea/Airport and discharges container at terminal	SIMCTE7	Vessel/Aircraft arrives at Australian discharge port	Commonwealthegistation		

Key Data Elements

Event code	СТЕ	Key data ele	ements	Event code	СТЕ	Key data elements		
SIMCTE1A	Create master data for key	– Global Lo	cation Numbers of supplier/s			Traceability	System set-up	
	supply chain partner identities and locations					Who	Importer	
SIMCTE1B	Create Importer master data	– Global Lo	cation Number of Importer			What	Traceability system	
		Request for	GLN			When	Date/Time of creation	
		Who	Importer			Where	Importer	
			Issuing Agency			Why	Traceability system and compliance requirements	
		What	Importer, location, business entity					
		When	Date/Time of Issuance			- Traceabil	to be shared to a traceability platform	
		Where	Issuing Agency	SIMCTE3	Create a Product Recall system	Food Recall	Plan and procedures:	
		Why	Requirement for Global location numbers, establishment	SIMCTES		 internal procedures and staff responsibilities for conducting a recall 		
SIMCTE1C	Food Premises licence	Request for	Food Licence Number			 contact of home star 	letails and procedures for notification (e.g. FSANZ and te, distributors, wholesalers, retailers and consumers)	
		Who	State Authority			- distribution and other records that will help identify and retrieve		
		What	Food premises licence			the recalled food		
		When	Date/Time of Issuance			- procedure	es for food retrieval and assessing any returned	
		Where	Issuing Agency			product.		
		Why	Food Premises Licencing requirement			System set-	up	
		Information to be shared to a traceability platform – Global Location Number/s of suppliers				Who	Importer	
						What	Recall system and processes	
		- Global Lo	cation Number of Importer nises Licence/Natification certificate number			When	Date/Time of creation	
	Mandated Food Cafety	Trace alaility				M/h eve		
	Traceability Requirements for	 Approved 	System data helds Supplier List with current certification numbers and			wnere	Importer	
	Importers	currency f	or international suppliers			Why	recall and compliance requirements	
SIMCTE2	Create Food Safety Traceability	- a name o nature - s	r description of the food sufficient to indicate its true see Australian Fish Names			Information	to be shared to a traceability platform	
	Safety Management Plan and	- batch or l	ot identification for the food			- Product F	Recall procedures (SOPs) on request/document codes	
	System for food imports	 name of t telephone 	he person, business name, street address and e number or email address of the producer of the food	SIMCTE4	Tracing product origin recal	– GLN of Pr	oducer, Processor, and international Exporter	
		 name of t telephone 	he person, business name, street address and e number or email address of customers that have		composition through offshore suppliers	– Sales rece	eipt recording sale to Wholesaler by Producer	
		- the date	the food was received and the date when it was ad to customers			- Industry c	cer Analytical vehication Certificate code certification number of supplier e.g. GDST, MSC/ASC	
		- the volum	e or quantity of the food involved in each transaction.			COC, BAP	, GIUDUI GAF	

Event code	СТЕ	Key data elements		Event code	СТЕ	Key data elements			
SIMCTE4	Proof of Origin/provenance documentation of sourced	Proof of Orig	gin/Provenance		Vessel/Aircraft Arrival and discharge of container at	– Vessel II internat	D or Catch Disposal Record/Catch Certificate (for direct ional transits of seafood)		
	product	who	Importer Supplier		terminal	 Vessel/flight arrival notice (port manager/1-Stop aatewav) 			
		What	Product ID, Provenance, proof of origin, industry	SIMCTE7	Vessel/Aircraft arrives at Australian discharge port	– Bill of Lo	ading/Air Waybill code		
			certifications		Container/ULD discharged	– Port Loc	- Port Location ISO code		
		When	Date/Time of issuance		from vessel/aircraft	- Container/ULD Identifier e.a. SSCC number			
		Where	Importer			- Carao status messaae (ICS)			
		Why	Proof of Origin, Provenance, Certifications						
		Information	to be shared to a traceability platform			W/be			
		– Fisher, Pro	oducer GLN			WIIO			
		- Code of c	analytical product testing document/s			What	Vessel ID, Bill of Lading, Shipment ID		
		– Industry C	Certification and currency			When	Date/Time of arrival and discharge		
		- Fisher ves	sel ID/Producer sales receipt/Catch Disposal Record,			Where	Terminal location		
		Catch Ce	ertificate number supplied to international Receiver			Why	Container status tracking		
SIMCTE5	Import Permit received for	Information to be shared to a traceability platform				Information to be shared to a traceability platform			
	consignment	– Import Pe	ermit code			 Vessel ID (<u>IMO vessel identification</u>) 			
SIMCTE6	Lodge Full Import Declaration, Warehouse Declaration (under	 Name of producer of imported food (business that packs for bulk or retail e.g. seafood processor) 				– Flight number			
	bond movement) for each consignment on ABE Integrated	– Importer i	name			- Terminal location			
	Cargo System	- Importer	address			– Bill of Lading/Air Waybill			
		– Importer (contact details			- Container/ULD Identifier			
		– Importer email address	email address			- Vessel/flight arrival notice			
		– Location	where the goods will be inspected			- Cargo Status Advice message code			
		- Line identification for each product e.g. packing list, invoice		Collection of container from					
		- Lot codes	5		port terminal				
		– Nominatio	on of a testing laboratory	SIMCTE8	Cargo clearance notice	– Cargo (Clearance notice from ABF		
						– Contain	ner availability notice from terminal operator		
						- Electron	nic Import Delivery Order code		
					Transport company booking to collect container				
					Container loaded on transport				

Event code	СТЕ	Key data elements	Event code	СТЕ	Key data elements		
SIMCTE9	Container departs terminal	- Terminal Gate Out notice from seaport terminal			Receipt at Importer DC		
		Information to be shared to a traceability platform			Who	Transporter ID	
		 Gate Out time and date stamp data 				Importer ID	
		- Container/ULD unique identifier			What	Container ID, Bill of Lading, Shipment ID, Logistics units, Product ID, Quantity, Batch,	
		– Transport company name			When	Date/Time of Receipt	
		- Vehicle registration			Where	Receipt location	
		- Transport booking reference			Why	Receipt of product/container	
		- Delivery Order number			Information	to be shared to a traceability platform	
	Delivery to Importer or	- Date and time			 Proof of Delivery number 		
	nominee e.g. cold storage 3PL	– Job number			– Shipment ID		
	Product arrives at Importer	- Freight paid by			– Container ID		
		- Collected from			– Product ID		
SIMCTE10	Proof of Delivery signed by	- Delivered to			- Quantity received		
	Importer	- (or if de-consolidated) number of pallets or cartons			- Batch		
		- Contact			- Date of R	eceipt	
		- Phone			 Import Delivery Order/Air Waybill/BOL/Purchase Order reconciliation 		
		- Container Identifier - <u>BIC Code</u>			- Treatment record.		
		 Acceptance of terms and conditions 		Inconcetion of woods			
		- Signature					
		- Receival data and time		BOOK ON IFIS Inspection	- Importea		
		- Supplier ID and location			- imported	Food Inspection Advice (IFIA)	
		- Lot/Batch number and use-by date			– Discardeo quantity, l	d/destroyed/exported stock record – product, batch code, date, supplier.	
		- Item description	SIMCTE11	Food ID, labelling, packaging	Information	to be shared to a traceability platform	
		– Quantity		compliant and cleared -	– eFIR on re	equest	
		- Units		receive erik, iria			
		– Load unit SSCC e.g. pallet	SIMCTE12	Labelling/	- The name	e of the product	
		 Product requirements (temperature, humidity) 		Re-labelling of	- ingredient	ts list	
		- Proof of Delivery		Product to Australian labelling standards	 Name and operator of law. 	d address and/or registered mark of the certified or owner of the product and/or label as required by	

Event code	СТЕ	Key data el	ements	Application of GS1 global data standards							
SIMCTE13	Apply unique identifier on	- GTIN		Data standards that apply to key data elements and shared information are identified in this section.							
	re-labelled product prior to domestic distribution	– Batch									
		– Quantity	,								
		– Use By/Best Before date.		Data Element	Examples	Valid Values	Data Type/ Format	Further Information			
		Product re-	labelling for local market	Lesetter	Maria factoria a		NITZ	Further information on Olderal Location			
		Who	> Importer ID		Plant,	Global Location Number (GLN)	IN IS	Numbers (GLN), their structure, use, creation			
		What	Product ID original, Product ID new, Batch, Use By/ Best Before, Quantity		Finished Goods			can be found here: <u>https://www.gs1.org/standards/id-keys/gln</u>			
		When	Date/Time of re-labelling		Dispatch Dock						
		Where	Warehouse	Date/Time	Production Data	Year -Month- Date	YYMMDD	Whilst human readable date formats can			
		Why	Re-labelling	Date/ fille	and/or time, Use By date, Best Before Date, Pack Date			vary e.g. 21 December 2020, 21 December 2020, the structure of the date format to be			
		Information - New GTI	n to be shared to a traceability platform N of product					encoded into systems and barcodes requires a consistent approach. The globally adopted standard for date recording is YYMMDD.			
		– Batch		Dreduct	Input materials such as raw ingredients and packaging, Outputs such as finished goods, packaged or processed goods	Global Trade Item Number (GTIN)	N14	Unique product identification of all traceable			
		– Use by/E	Best Before date	Identifiers				objects is a foundational element of any traceability system.			
		– Quantity	,								
		- Importer	location					https://www.gs1.org/1/gtinrules//en/			
SIMCTE14	Maintain records for mandated traceability	Maintain re	cords for 5 years of					Information on when to change a GTIN:			
		- a name o nature	or description of the food sufficient to indicate its true					<u>nttps://www.gsi.org/l/gtinrules/en/decision-</u> support			
		- batch or	lot identification for the food					Information on how to allocate a GTIN to a variable weight or variable measure <u>Display</u>			
		 name of telephon 	the person, business name, street address and le number or email address of the producer of the food					<u>165 search results for 'variable weight item</u> <u>GTIN' (gs1au.org)</u>			
		 name of telephon received 	the person, business name, street address and e number or email address of customers that have the food		Batch/Lot code, Serial Number,		AN20	Traceability Attributes, such as Batch or Lot Number or Serial Number etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information			
		 the date dispatch 	the food was received and the date when it was ed to customers					along the supply chain.			
		– the volur	ne or quantity of the food involved in each transaction.					has its own unique identifier and format.			
		Information	n to be shared to a traceability platform					List of Application Identifiers			
		– As reque	sted.								

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Data Element	Examples	Valid Values	Data Type/ Format	Further Information	Useful links
Logistics Units	Pallet of Finished Goods, Crate or Box of finished Goods	Serial Shipping Container Code (SSCC)	N18	Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain. Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets. https://www.gs1au.org/resources/standards- and-guidelines/identification-numbers/ types-of-gs1-id-keys#LogisticsUnits	Prepare for export to Australia https://www.agriculture.gov.au/biosecurity- trade/import/before/prepare Documentation templates for container, packaging declarations https://www.agriculture.gov.au/biosecurity- trade/import/arrival/clearance-inspection/ documentary-requirements/templates
Assets	Returnable assets le: IBC or individual assets le: A crate		N13	Can be identified as an asset type only or an optional serial number can be added to distinguish individual assets https://www.gslau.org/download/gslau_ fact-sheet-identification-of-assets.pdf/file	Biosecurity Import Conditions System (BICON) https://www.agriculture.gov.au/biosecurity- trade/import/online-services/bicon
Consignment	Grouping of logistics units assigned by the transport company	GINC	N30	The Global Identification Number for Consignment can be used by companies to identify a consignment comprised of one or more logistic units that are intended to be transported together. <u>https://www.gsl.org/standards/id-keys/</u> global-identification-number-consignment- ginc	Labelling of imported food https://www.agriculture.gov.au/biosecurity- trade/import/goods/food/notices Food safety standards of imported foods https://www.foodstandards.gov.au/consumer/ importedfoods/Pages/default.aspx
Shipment	Grouping of logistics units	GSIN	N17	The Global Shipment Identification Number (GSIN) is a number assigned by a seller and shipper of goods to identify a shipment comprised of one or more logistic units that are intended to be delivered together. https://www.gsl.org/standards/id-keys/ global-shipment-identification-number-gsin	Imported Food Inspection (IFIS)https://www.agriculture.gov.au/biosecurity- trade/import/goods/food/inspection-testing/ifisFood import business licensing NSWhttps://www.foodauthority.nsw.gov.au/retail/ importersFood Recall Plan and procedures https://www.foodstandards.gov.au/industry/ foodrecalls/recalltemplates/pages/default.aspxCode of Conduct for Responsible Fisheries https://www.agriculture.gov.au/agriculture-land/ fisheries/legal-arrangements/code-conductFood and Beverage Importers Association https://www.fbia.org.au/

Glossary

Air Waybill and Ocean Bill of Lading

The Air Waybill (AWB) is a critical air cargo document that constitutes the contract of carriage between the "shipper" and the "carrier" (airline). The <u>Electronic Air Waybill Resolution 672</u> (MeA) removes the requirement for a paper AWB. There is therefore no longer a need to print, handle or archive the paper, largely simplifying the air cargo process. (IATA)

An ocean bill of lading (OBOL, BOL, BL) is a document required for the transportation of goods overseas across international waters. The contract is legal and outlines the type, quantity, and destination of goods being carried. The shipper and carrier sign the ocean bill of lading upon shipment, and the receiver signs the document upon receipt.

BIC

BIC codes are a superset of ANZSIC codes with improved supply chain categorisation that have been developed as a 5 digit extension by the Australian Taxation Office (ATO) and that are reported on relevant tax returns and schedules and used for statistical and audit purposes.

BICON

Australian Biosecurity Import Conditions (BICON) houses the Australian Government's Biosecurity import conditions database for more than 20,000 plants, animals, minerals and biological products.

Customs Broker

The Customs Act 1901 (Customs Act) provides that only the owner of goods or a customs broker licensed by the Comptroller-General of Customs for the Department of Home Affairs (the Department) can submit an import declaration to enter goods for home consumption in connection with the importation of those goods.

Customs Brokers also check all clearance documentation to ensure it's correct and can provide advice on the best way to obtain clearance of your goods into and out of Australia. A licensed Customs broker can lodge Customs entries in all states of Australia, and can clear cargo by air, sea, and post.

Cargo Terminal Operator (CTO)

Air CTOs undertake a wide range of activities. They may be an airline in their own right or act on behalf of other airlines. CTOs are responsible for the carriage or arranging the carriage of the cargo, the discharge of cargo from the aircraft, the release of the cargo and arranging to move it according to contractual obligations and operational requirements. (Australian Border Force - Customs)

Sea port CTOs manage terminal operations and load/unload vessels, oversee short term storage of cargoes, monitor security and transport access to the terminal.

Hermetically sealed

A package is hermetically sealed if it is 'airtight' e.g. Heat sealed plastic bag, sealed can or glass jar with screw cap. Hermetically sealed goods may also be heat treated but 'hermetically sealed' is not the same as 'canned' or 'retorted'.

International Freight Forwarder

The freight forwarder is a business specialising in international trade and transport. A Freight Forwarder manages shipping documents, freight rates, customs clearance, packing, insurance, road transport and delivery of cargo to its intended destination.

Full Import Declaration (FID)

Customs brokers and importers must complete FIDs for imported food. FIDs are lodged through the <u>Department of Home Affairs' Integrated</u> <u>Cargo System (ICS)</u>. For more information www.aariculture.gov.gu

Import Delivery Order/Electronic Import Delivery Order

An Import Delivery Order is provided by the Importer/Forwarder to the carrier (shipping line/airline) to release cargo to a third party (Transport Company) for delivery to the Importer. Until this is received, the cargo cannot be released to the transport to collect from the Cargo Terminal Operator. For this process to be automated for containerised cargo, see www.1-stop.biz

Incoterms

The Incoterms® rules are the world's essential terms of trade for the sale of goods. Whether you are filing a purchase order, packaging and labelling a shipment for freight transport, or preparing a certificate of origin at a port, the Incoterms® rules are there to guide you. The Incoterms® rules provide specific guidance to individuals participating in the import and export of global trade on a daily basis. https://iccwbo.org/

Proof of Delivery (POD)

A commercial document used by the Consignee or their Logistics Service Provider to notify the Consignor of the receipt and acceptance of a delivery. A signed POD enables the Transport Company to raise an invoice.

Retorting

Retorting refers to the process of cooking canned food or food in a retort pouch after it has been sealed in the container. The packages either go through a continuous retort (i.e. continually moving conveyor system) or may be cooked in a batch retort (i.e. big sealed pressure cooker). Many different types of food may be canned and retorted e.g. retort pouches of tuna, etc.

A retort pouch/package is a lightweight, flexible container or pouch in which foods are heated and sterilised.

Retort pouches generally have the following features:

- Manufactured from laminated polyester, nylon and/or aluminium.
- The polyester and nylon films usually have a layer of aluminium foil between them.
- Material used for manufacture of retort pouches may be thicker than the polyethylene used for vacuum pouches
- The material is soft and flexible to touch
- Do not require special storage conditions to maintain product quality e.g. refrigeration to maintain food quality prior to opening i.e. they are shelf stable.

Shelf stable

Shelf stable refers to food that will last for an extended period of time, packaged or not, without any special storage conditions. For example heat-treated canned/retorted food will last many years on the shelf.



Australian Guide to Implementing Food Traceability: **Seafood**

Export of Seafood



Export of Seafood

Australia has a target of \$100 billion p.a. value of food exports by 2030.¹ Currently, seafood exports make up less than 3 percent of Australian food exports with around 230,000 tonnes per annum (\$1.3 billion AUD) of high value seafood, traded to China, Japan, US, Vietnam, Taiwan as major markets. Product primarily consists of lobster, abalone, southern bluefin tuna, salmon, and prawns.²

Export seafood supply chain

High value seafood is often air freighted. The following graphics indicate the airfreight shipment process and the multiple entities engaged in the process.

Figure 1: Indicative airfreight export supply chain process



Figure 2: Participants in airfreight export supply chain

Supply Chain Participant/ Booking Initiator	Manufacture/Farm	Transport to Forwarder	Forwarder–Cross-dock	Transport to CTO-Process Documentation	CTO-Receive and Prepare Cargo Hold	Flight	Australian Border Force	Biosecurity	Shipping Equipment	Ramp-Transport from Plane Cargo Hold	CTO-Receive flight and dispatch	Transport to Cross-dock	Customs Broker Cross-dock	Transport to Importer	Importer	Overseas Customs	Overseas Quarantine
Manufacture/ Farm	•	•				•			•								
Exporter/Trader	•	•	•			•	•		٠								
Forwarder– Cross-dock		•		•		•	•	•	•								
СТО			•		•		•	•		•							
Airline				•			•			•	•						
Overseas CTO																•	٠
Customs Broker							٠					•		•	•	•	٠
Table							•						•	•		•	•

Source: Deakin University, Adaptation from VFLC Airfreight BAHS, 2023

Processes covered in this module:

- 1. Establishment data
- 2. Export sales contract and Incoterms
- **3.** Packing and labelling to export country requirements
- **4.** Preparing correct export documentation
- 5. Border clearance from Australia

- 6. Pickup and delivery to air/sea port
- 7. In-transit monitoring
- 8. Arrival and clearance at final destination port
- 9. Pickup from port terminal and delivery to importer.

¹https://nff.org.au/wp-content/uploads/2020/02/NFF_Roadmwap_2030_FINAL.pdf

²Seafood Industry Australia, *Export Market Strategic Plan, August 2022*. <u>http://seafoodindustryaustralia.com.au/our-priorities/market-access-and-trade/</u>

Export regulation

Department of Agriculture, Fisheries and Forestry (DAFF)

Prescribed or non-prescribed exports

In 2021, the Department of Agriculture, Fisheries and Forestry (DAFF) issued a <u>step by step</u> <u>guide to exporting seafood</u>. Key to addressing regulatory requirements is to determine whether the product is prescribed under the Export Control Rules (2021).

Seafood export products can be grouped into two regulatory classifications – *prescribed and non-prescribed*. A *prescribed product* is one listed in Australia's Export Control Act 2020 and Export Control (Fish and Fish Products) Rules, March 2021. These rules are controlled by DAFF.

DAFF rules around these regulations are contained in the following boxes. Nomenclature relates to their listing in the DAFF rules.

Non-prescribed goods are defined as:

- a) liquid fish and liquid fish products exported in a consignment of not more than 10 litres;
- b) dried fish and dried fish products (other than dried abalone) exported in a consignment of not more than 2 kilograms;
- c) fish products where fish or fish products are not the major component;
- d) fish or fish products that are animal food or pharmaceutical material;
- e) fish or fish products not covered by paragraphs (a) to (d) (other than dried abalone) exported in a consignment of not more than 10 kilograms;
- f) fish or fish products in the form of a tablet or capsule;
- **g)** fish or fish products for export to New Zealand.

For the purposes of subsection 28(4) of the Act, fish and fish products covered by subsection 21(1) of this instrument are taken not to be prescribed goods for the purposes of the Act if the fish or fish products. Requirements from these regulations are contained in the box below.

- a) are stores for the use of passengers and crew on an aircraft or a vessel on a flight or voyage from Australian territory; or
- b) are for the service of an aircraft or a vessel on a flight or voyage from Australian territory; or
- c) are imported into Australian territory and held in bond at all times before being exported; or
- d) are imported into Australian territory and then exported in the same covering in which, and with the same trade description with which, they were imported; or
- e) are consigned to an external Territory for consumption in that Territory; or
- f) are consigned to a resources industry structure that is installed in any of the following areas, for consumption on the structure:
- g) the Greater Sunrise special regime area within the meaning of the Seas and Submerged Lands Act 1973;

- the Greater Sunrise pipeline international offshore area within the meaning of the Offshore Petroleum and Greenhouse Gas Storage Act 2006;
- (II) the area in or above the Bayu Undan Gas Field within the meaning of the Timor Sea Maritime Boundaries Treaty;
- (III) the Bayu Undan pipeline international offshore area within the meaning of the Offshore Petroleum and Greenhouse Gas Storage Act 2006;
- (IV) (v) the area in or above the Kitan Oil Field within the meaning of the Timor Sea Maritime Boundaries Treaty.
- Note 1: Fish or fish products are in the same covering in which they were imported if they are in the same immediate container in which they were packed when imported (see the definition of **immediate container** in section 1-6).
- Note 2: A resources industry structure that is not installed is taken to be a vessel (see the Sea Installations

All other fish or fish products produced for human consumption and to be exported are deemed "prescribed seafood exports".

Prescribed seafood exports are required to meet the following four conditions:

1. Harvesting shellfish

Operations to harvest prescribed fish that are shellfish for export, or from which prescribed fish products for export are to be derived, must be carried out in an area specified in the Harvesting Areas (Shellfish for Export) List.

2. Registered establishment

Operations (other than operations to which subsection (2), (3) or (4) applies) to prepare the fish or fish products for export must be carried out at an establishment that is registered for those operations in relation to the fish or fish products. At the time the operations are carried out, the registration of the establishment must not be suspended in relation to those operations.

3. Approved arrangement

An approved arrangement covering operations (other than operations to which subsection (2), (3) or (4) applies) to prepare the fish or fish products for export at the registered establishment referred to in item 2 must be in force. At the time the operations are carried out, the approved arrangement must not be suspended in relation to those operations.

4. Export permit

The exporter of the fish or fish products must hold an export permit for the fish or fish products and the export permit must be in force and not suspended at the time the fish or fish products are exported.

Source: Australian Government Export Control (Fish and Fish Products) Rules, 2021

Traceability requirement

The 2021 DAFF Rules specify traceability requirements as follows:

- prescribed fish or fish products, or fish or fish products that are to be prepared for export as food, and their ingredients must be sourced only from a supplier with inventory and tracing systems to ensure that the fish or fish products and their ingredients are traceable and can be recalled if required.
- (8) The occupier of an establishment sourcing fish or fish products or their ingredients from an establishment referred to in subsection (4) or (6) must make records of each supplier of the fish or fish products and their ingredients.
- Note: The occupier of a registered establishment must retain each record made under this subsection for 3 years (see subsection 11 7(2)).

Segregation, identification and traceability for harvested fish

- fish and fish products meeting a particular description:
- must be identified and segregated during preparation and transport from other fish and fish products not meeting that description; and
 - must not be confused with other fish or fish products not meeting that description; and
 - (ii) must be prepared and transported under conditions of security; and
- inventory controls and tracing systems must be maintained.
- a record must be made of all information necessary to ensure the following in relation to prescribed fish or fish products prepared for export at the registered establishment:
- traceability to each lot of prescribed fish or fish products prepared for export at the registered establishment;
- traceability to the supplier of each ingredient used in each lot of prescribed fish or fish products (including date of supply).

- the record must include for each lot of prescribed fish or fish products prepared for export at the registered establishment:
- the identity of the lot; and
- the quantity of fish or fish products in the lot; and
- a description of the fish or fish products in the lot and their ingredients; and
- the date of preparation of the fish or fish products in the lot; and
- for fish harvested at the establishment, or fish products containing fish harvested at the establishment—the date and location of harvest.

Source: DAFF Guide 2021

Source: DAFF Guide 2021



Importing country requirements

Additionally, exporters are required to meet the regulatory requirements of the destination market. The <u>Manual of Importing Country</u> <u>Requirements (Micor) Fish</u> sets out the known importing country requirements, which differ from or are additional to Australian export conditions and which must be met in order to gain market access for fish and fish products to specific countries. Micor (Fish) also sets out importing country documentation and certification requirements.³

Australian Border Force requirements

Export Declarations for Customs

All goods being exported from Australia must be reported to the Australian Border Force (ABF) using either an Export Declaration or exemption code and are subject to customs control.

Goods intended to be exported from Australia must be declared on an Export Declaration if the goods:

- have a value of more than AUD2000
- need an export permit (regardless of their value)
- are goods where duty drawback is being claimed
- are dutiable or excisable goods where the duty or excise duty is unpaid.

Permission to move, alter or interfere with export goods

There may be circumstances where a change to an export consignment is made and goods need to be added or removed, or the goods need to be removed from export. Australian Border Force requires the exporter, or party with permission to deal with the shipment, to apply for permission to move, alter or interfere with declared exports that are under Customs control. This permission enables adjustment and accurate reporting of the consignment, which could be located at the Freight Forwarder premises or other Customs registered or bonded warehouse.

1. Establishment data (activities)

Create master data for trading partners and locations

Creation of master data for exporter, importer and key nodes in the supply chain will enable unique identification of the entities and locations engaged in the product's journey. This identification of parties and their locations is globally recognised and can be scaled from one business entity, include production and harvesting sites (fisheries and pondages), and locations off-site such as cold storage, processing and packing operations.

Master data includes frequently used information in trade transactions, such as identification of the product for export markets⁴ and export establishment/licence numbers.

Approved Arrangements

All export-registered establishments, including vessels involved in preparing, handling and storing prescribed fish and fish products destined for human consumption, must have an Approved Arrangement (AA). The AA must be in place before the premises can become an export-registered establishment e.g. processor. The Approved Arrangement covers food safety and traceability. Section 5.5 of the Export Control (Fish and Fish Products) Rules (2021) requires the establishment to have measures in place for the identification, traceability and integrity of the fish and fish products.

"The proposed arrangement must provide for measures for the identification, traceability and integrity of the fish and fish products that ensure that the fish or fish products can be identified, traced and, if necessary, recalled."

³ Micor https://micor.agriculture.gov.au/fish/Pages/default.aspx ⁴ https://www.agriculture.gov.au/biosecurity-trade/export/ controlled-goods/fish/industry-advice-notices/2022/2022-02

Export registered establishments

DAFF requires registration of Export premises for prescribed seafood exports:

"If you manufacture or store fish products for export, you must register your establishment.

This includes:

- processors/ manufacturers
- vessels where product is packed on board for export
- storage facilities
- freight forwarders/ facilities that store or load goods for export (excluding the wharf and airport terminal).

You are responsible for handling goods in line with export requirements. You may also generate export documents and certificates."

Read more about <u>responsibilities of export</u> registered establishments.⁵

Exporter EXDOC/EXDOC registration and Export Permit

"Exporters are legally responsible for complying with the export requirements of prescribed products. When requesting an export permit, exporters must declare the products are eligible for export and meet importing country requirements. You must be listed in the department's electronic export documentation system (EXDOC), and source the product from an export registered establishment in order to obtain export documentation." ⁶ The EXDOC platform is progressively upgrading by commodity to the EXDOC platform. It will automate more functions and integrate with other agencies to streamline access to export documentation.

Tasks related to traceability

- Create master data for key supply chain partner identities and locations
- Apply for an Approved Arrangement
- Register premises/establishment/s as export
 establishments
- Obtain a seafood export licence
- Apply for required certificates/e-certificates through EXDOC/EXDOC platform for each consignment.

Key Participants

- Producer or manufacturer directly exporting
- Export company (non-producer/ manufacturer)
- Department of Agriculture, Fisheries and Forestry (DAFF)
- Australian Border Force.

2. Export Sales Contract and Incoterms

Concluding an export sales contract is the activity that commences the process of exporting goods. The Terms of Trade (Incoterms) determine the point at which the responsibility for the product transfers between the Exporter and Importer. Incoterms is a key aspect of international trade.

The terms of trade between the seller and international buyer determine the chain of custody of the product and the extent to which the Australian exporter coordinates the processes and transactions related to the product movement.

- Importer or country distribution agent requests quote from supplier
- Supplier provides pro forma invoice(quote)
- Agreement on terms of trade and price
 prepared in sales contract
- Purchase Order received from the customer confirming quote/pro forma invoice
- Order Confirmation issued to Importer/buyer
- Customer Order created.

Tasks related to traceability

- Purchase Order received
- Customer Order created by Exporter/ Supplier.

Participants

- Exporter
- Exporter supplier
- Importer/Buyer.

3. Packing and labelling to export country requirements

Packing and labelling needs to be compliant with the country of destination requirements for seafood import. Every country has its own labelling requirements for food and beverage products. The label information must be true for the product and verifiable – with no unsubstantiated health claims. Translation must be supplied for the import market label.

The international Codex Alimentarius Food Standards is a collection of internationally adopted food standards which aim to protect consumers' health and ensure fair practices in the food trade. It sets out labelling requirements (see below).

8.3 Product labelling

Prepackaged goods should be labelled with clear instructions to enable the next person in the food chain to handle, display, store and use the product safely. This should also include information that identifies food allergens in the product as ingredients or where cross-contact cannot be excluded. The *General Standard for the Labelling of Prepackaged (CX 1-1985) Foods* applies.

Source: International Codex Alimentarious Food Standard

Australia also has labelling guidelines for exported products, especially around 'country of origin' and 'Australian made' claims. However, Australian labelling standards do not apply for "export-only" products.

^s <u>https://www.agriculture.gov.au/biosecurity-trade/export/</u> <u>controlled-goods/fish</u>

⁶ <u>https://www.agriculture.gov.au/sites/default/files/documents/</u> <u>fact-sheet-registered-exporter-obligations.pdf</u>

Tasks related to traceability

- Create picking/packing list
- Pick items for Customer Order
- Determine labelling and packaging requirements for destination country
- Determine cold chain management requirements
- Create labels for item, carton and pallet.

Participants

- Food product supplier
- Food export company.

4. Preparing correct export documentation

There are four important documents required prior to the goods commencing their journey. These are the *Commercial Invoice*, the Packing List, the Certificate of Origin and the *Bill of Lading*. For some food products, additional certificates and export licence requirements can form part of the export documentation e.g. phytosanitary certificate, manufacturer's declarations.

Documentation must include evidence of current export permits as required by the Commonwealth Export Control Act (2020), and export certificates as required by importing country authorities. For example, *Free Trade Agreements* (FTAs) with Thailand, South Korea, China and New Zealand require Country of Origin Certificates to be certified by the relevant Chamber of Commerce based in Australia, in order for importers to claim reduced tariffs and duties associated with the FTAs.⁷

End-to-end traceability requirements for foreign importers

For countries requiring traceability from source, Australian Exporters need to provide foreign importers with documentation of their policies and standard operating procedures (SOPs) for traceability, recall and sourcing. An example of requirements of importing countries is the US <u>Seafood Import Monitoring Program</u> administered by US Customs and National Oceanic and Atmospheric Administration (NOAA) under the US Department of Commerce. In addition to the SIMP regulations, importers need to comply with <u>Seafood Hazard Analysis Critical</u> <u>Control Point (HACCP)</u>, and the <u>National Shellfish</u> <u>Sanitation Program</u> (NSSP).

US Food and Drug Administration <u>Food Safety</u> <u>Modernisation Act Traceability Final Rule</u> issued the following in November 2022:

"...requires persons who manufacture, process, pack, or hold foods on the Food Traceability List (FTL) to maintain and provide to their supply chain partners with key data elements (KDEs) for certain critical tracking events (CTEs) in the food's supply chain."

A number of seafood products are now listed – finfish (fresh and frozen), crustaceans, molluscan shellfish and bivalves (fresh or frozen), and smoked finfish (refrigerated and frozen).

The following box provides a checklist of the new US FDA rules.

New US FDA Rules – Checklist

- Food Traceability List Companies that originate, transform or create food on the FTL must assign a new traceability lot code. All key data elements must be linked to the traceability lot code to ensure traceability within the firm and across the supply chain.
- Seafood Obtained from a Fishing
 Vessel First Receivers of seafood obtained from a fishing vessel must create/maintain a traceability lot code and have a mechanism for linking the code to the Harvest date range and locations (National Marine Fisheries Service Ocean Geographic Code or geographical coordinates) for the trip during which the seafood was caught.
- Key Data Elements The FDA's proposed system follows critical tracking events (CTEs) in the supply chain and stipulates capture of key data elements (KDEs) along the way.
- Data Flow Firms that ship foods on the FTL would be required to send product origin information, including the traceability lot code, to the receiving firm.
- Record Keeping Requirements Under the new mandatory record-keeping procedures, supply chain partners will have to maintain the data in their systems for two years and provide it to the FDA in a sortable, electronic spreadsheet within 24 hours in the event of an outbreak.

Source: Maritech <u>www.maritech.com</u>

Tasks related to traceability

- 1. Ensure completion of accurate documentation for shipment
- Commercial Invoice
- Packing List
- Bill of Lading
- Country of Origin Certificate as required
- Manufacturer Declarations, Catch Certificate as required by <u>Micor</u> e.g. lab reports, treatment records
- Transfer Certificate (if product is stored offsite/indirect transfer to port terminal).
- 2. Document the Supplier policies and standard operating procedures (SOPs) for traceability, recall and sourcing.

Participants

- Food Exporter
- Food Importer
- Food Supplier
- International Freight Forwarder
- Chambers of Commerce
- DAFF/ABF Single Export Window (certificates).

¹ <u>https://www.austrade.gov.au/contact/faqs/what-is-a-certificate-of-origin</u>

5. Border clearance from Australia

Unless specifically exempt, goods may not be loaded on a ship or aircraft for export unless they have been entered for export in the Customs and Border Protection Integrated Cargo System (ICS) and Customs has given approval to export. *Exporters will require an Export Declaration Number* from Australian Border Force (Customs).⁸

For Exporters of prescribed agricultural product such as seafood, Exporters use the EXDOC platform to generate the correct documentation. The DAFF Export Documentation System (*EXDOC*) is used to generate export documents. The EXDOC platform is linked to the Australian Customs *Single Electronic Window* (SEW), which generates border clearance approvals and electronic documents. Exporters registered with EXDOC can use this window to generate their Customs clearance documentation.

The Request for Permit (RFP) is lodged by the exporter in the EXDOC system. It describes product, when and where it was processed, its overseas destination, and other details such as Consignor, Consignee and transport company. RFPs contain equivalent information to that being provided to a department officer in a Notice of Intention to Export (EX28 or EX222). Once validated in the system, EXDOC will generate an Export Permit.

Tasks related to traceability

- Receive Export Declaration Number
- Receive Export Permit.

Participants

- Food exporter
- Food Supplier
- International Freight Forwarder
- Department of Agriculture, Fisheries and Forestry
- Australian Border Force Customs.

6. Pickup and delivery to air/sea port

In order to transfer the goods for shipment, the Exporter or their International Freight Forwarder will prepare bookings to manage the chain of custody of the shipment. An *Air Waybill* or *Bill of Lading* are key documents that facilitate the shipment.

In order to prove the goods have transited via export-listed establishments (a traceability requirement for some import countries) a *Transfer Certificate* is required.

Seafood is typically shipped in refrigerated load units. The product Supplier or Distribution Centre/3PL will be instructed by the Exporter to prepare for and complete the pickup and delivery of the product from their premises for transit to the air/sea port terminal in a *Consignment Note* issued to the Transport Company and the Bill of Lading/Airway Bill issued to the Exporter by the air/shipping line, termed the Carrier. For containerised product, goods specified in the packing list are picked and packed (often loaded onto a pallet) and a Transport Label affixed. The transport label contains details of the date of pickup required, the "ship from" and "ship to" details, equipment capacity required, transport company name and ID number, and a unique Serialised Shipping Container Code (SSCC) on the load unit.

Once loaded into a container, the goods are now identified by the *Export Container Number*, which is visible on the outside surface of the container. For Full Container Load (FCL) shipments, the container is sealed prior to leaving the Exporter/Supplier DC facility. A container seal number is issued by Australian Border Force (Customs).

For less-than-container-load (LCL) shipments, the container seal is placed on the container by the freight consolidator, who may be an international forwarding company or a wholesale exporter.

Australian sea port *cargo terminal operators* (CTOs) use a *pre-receival advice* (PRA) to notify of incoming containers. This PRA number enables the CTO to issue a Vehicle Booking Slot to the terminal to the Transport Company delivering the container. The 1-Stop system notifies the International Freight Forwarder/Exporter when the PRA is accepted, the date and time the container is "gated-in" and when the container is loaded on the vessel.⁹

 * www.abf.gov.au/importing-exporting-and-manufacturing/ exporting/how-to-export
 * 1-Stop Comtrac system https://www.1-stop.biz/tracking/comtrac/



Container seals

Tasks related to traceability

- Transfer Certificate completed for interim transits between export establishments
- Export Container Number for the shipment advised by the shipping line
- Container seal secured and recorded
- PRA accepted by CTO
- Port cargo terminal operator gate-in recorded.

Participants

- Shipping or airline
- International Freight Forwarder
- Exporter
- Supplier/packer
- Transport company
- Terminal operator/CTO.

7. In-transit monitoring

Location of a shipment is commonly supplied by the shipping line/airline in transit. This is particularly relevant where a transhipment is required. The international carrier is required to ensure goods are kept in a condition which is according to specifications whilst in transit, so for temperature or humidity-sensitive products, regular monitoring is vital to the shelf life of the product in the importing country.

Monitoring may rely on use of GPS trackers, *Radio Frequency Identification Data* (RFID) loggers/IoT sensor technologies, smart containers with their own sensors and communications devices, data aggregators of shipping movements, or the long established Partlow chart on reefer containers. Telecommunications infrastructure may impact the ability to transmit at sea and in flight in real time. Most airlines and shipping lines can advise location, which is generally accessible from the carrier's customer portal. International Freight Forwarders may also have tracking and condition reporting available to shippers.

Tasks related to traceability

- Location coordinates
- Condition of the goods real-near-time reporting.

Participants

- Airline or shipping line
- Data aggregators
- Technology suppliers
- International freight forwarder
- Exporter.

8. Arrival and clearance at final destination port

For ocean shipping, generally 24 hours' notice is required from the ship's Master or Agent that the vessel is arriving in port, to prepare for biosecurity inspection. On arrival at the port of discharge/final destination, the nominated party on the Bill of Lading (Customs Broker, Importer) is notified of the discharge of the container from the carrier, and once clearance is completed, the availability of the container for collection. Biosecurity inspection may be required. This may be undertaken at the port of discharge, or once the container is transported to a facility that is licensed for inspection. Documentation for import clearance includes:

- Commercial invoice
- Bill of Lading
- Packing list
- Certificate of Origin
- Certificates related to the product type
- Tax and duties paid.

9. Pickup from port terminal and delivery to importer

The Incoterms of the transaction between Exporter and Importer determine the responsibility for port clearance and subsequent delivery to the Importer. Arrangements will be made via the Exporter (often via an International Freight Forwarder and their international partnering Customs Broker) to hire a Transport Company to collect the container from the terminal and deliver at the instruction of the Importer to a nominated warehouse/ DC. Shipping lines may arrange the transport delivery (carrier haulage) or the Exporter or Importer may take this responsibility (merchant haulage).

An electronic *Import Delivery Order* which the Airline/Shipping Line issues as per the Bill of Lading/Air Waybill, enables the container/ unitised load device to be loaded on the transport and leave the terminal. "Gate Out" date and time stamp at the port terminal are recorded.

On leaving the port, tracking of the transfer to the Importer premises or Distribution Centre is typically undertaken using a Transport Booking reference issued by the Transport Company, or via GPS tracking. On arrival at the delivery destination, a Proof of Delivery by the Transport Company is signed by the Importer. The Importer will then check and remove the container seal at the instruction of a Biosecurity inspector, examine the goods as listed on the Bill of Lading/Airway Bill, packing list and commercial invoice and advise the Exporter of any variances.

Tasks related to traceability

- As per Bill of Lading, Shipping Line/Exporter/ Importer or Forwarder will book transport to collect the container from the port terminal
- An Import Delivery Order will enable the transport (road or rail) to clear the terminal
- The CTO records "gate out" details
- Proof of Delivery is signed by the Importer/DC
- Goods delivered are inspected and scanned/recorded in Importer goods receival system/Warehouse Management system.

Critical Tracking Events

For each of the identified export activities, **critical tracking events** (CTEs) establish identity and enable traceability and compliance with traceability-related regulation are summarised as follows:

Critical Tracking Events (CTEs) are events that relate to the identity, movement and transformation of the food product.

Export activity	CTE code	Critical Tracking Events (CTEs)	Export activity	CTE code	Critical Tracking Events (CTEs)
Establishment data			Pickup and delivery to port terminal		
	EXS CTE1A	 Create master data for key supply chain partner identities and locations 	PUD of empty container from container park nominated by shipping line for packing		
	EXS CTE1B	 Prepare and submit an Approved Arrangement for prescribed seafood export 	Packing of container by Exporter/supplier/ processor/DC		
	SIMCTE1C	 Register premises/establishment/s as seafood export establishments 	For LCL shipments, pickup and delivery to a consolidator for packing		
	EXS CTE1D	 Obtain export licence through EXDOC/EXDOC platform 	Transport to port booked – booking reference number issued for tracking		
Sales Contract and Purchase Order	EXS CTE2A	- Receipt of Importer Purchase Order	Record Export Container Number (ECN)		
	EXS CTE2B	- Create Packing List	Container seal placed and number recorded on		
Picking, labelling and packing to import country requirements	EXS CTE3A	 Affix unique identifiers and compliant labels for product lots 	Bill of Lading PRA acceptance message received by Exporter/Equivarder	EXS CTE6	Product departs warehouse location to port
	EXS CTE3B	- Affix unique identifiers to tubs, cartons, pallets	Receipt at port terminal	EXS CTE7	Terminal Gate-In details recorded
Export documentation	EXS CTE4A	Prepare shipping documents Commercial Invoice Packing List Bill of Lading/Airway Bill Country of Origin Certificate as required Manufacturer Declarations required by Micor 	Container loaded on vessel/aircraft Notice to Exporter/Forwarder that container is loaded Notice of departure from airline/shipping line	EXS CTE8A	Container/ULD loaded on vessel/aircraft Vessel/aircraft departs port terminal
	EXS CTE4B	e.g. lab reports, treatment records, catch certificate Document the Supplier policies and SOPs for traceobility recall and sourcing	In-transit monitoring	EXS CTE9	Monitoring of containers/product whilst in transit – In-transit location coordinates
Border clearance – Australia	EXS CTE5	Receive Export Declaration Number Receive Export Permit (EXDOC)			 Condition of the goods real-near-time reporting (as required)
Export activity	CTE code	Critical Tracking Events (CTEs)	Key Da	ta Elements	
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Arrival at final destination port and clearance procedures	EXS CTE10	Vessel/aircraft arrives at destination port	Event code	CTE	
Importer/Customs Broker submits all documents for port clearance				Establishment activities	
All taxes and duties paid			EXS CTE1A	Create master data for key supply chain partne	
Container Status Advice or Underbond Approval from Customs to CTO/Consignee/ Importer	EXS CTE11	Container cleared for pick up		identities and locations	
Pickup from port terminal and delivery to Importer	EXS CTE12	Container picked up from port by Importer			
As per Bill of Lading, Shipping Line/Exporter/ Importer or Forwarder will book transport to collect the container from the port terminal					
An Import Delivery Order will enable the transport (road or rail) to receive custody of the goods and clear the terminal			EXS CTE1B	Prepare and submit an	
Original Bill of Lading accompanies cargo to Importer				Approved Arrangement (Biosecurity) for prescrib	
The CTO records "gate out" details	EXS CTE13	Cargo leaves final destination port	EXS CTE1C	seafood export Register premises as exp	
Proof of Delivery is signed by the Importer/DC once goods unloaded and received	EXS CTE14	Cargo delivered to Importer		establishment (DAFF EXI	
Goods received, inspected and reconciled.					
			EXS CTEID	Obtain Export Licence	

ent code	СТЕ	Key data eler	nents
	Establishment activities		
(S CTE1A	Create master data for key supply chain partner identities and locations	- Global Location Number	
		Request for G	SLN
		Who	Importer
			Issuing Agency
		What	Exporter company, location, business entity
		When	Date/Time of Issuance
		Where	Issuing Agency
		Why	Requirement for Global location numbers
(S CTE1B	Prepare and submit an Approved Arrangement (Biosecurity) for prescribed seafood export	- Approved A	Arrangement
(S CTE1C	Register premises as export establishment (DAFF EXDOC)	– Export Establishment number	
		Export Establ	ishment licence
		Who	Exporter
			Issuing agency
		What	Exporter company, location, business entity
		When	Date/Time of Issuance
		Where	Issuing Agency
		Why	Export Establishment registration
(S CTE1D	Obtain Export Licence	– Export Lice	ence number (EXDOC)
		Information to - Global Loc	o be shared to a traceability platform ation Number
		– Plant Expo	rt Establishment number
		- Export Lice	ence number

Event code	СТЕ	Key data elements	Event code	СТЕ	Key data ele	ements
	Sales Contract and				Export Orde	r Preparation
	Purchase Order				Who	Exporter
EXS CTE2A	- Receipt of Importer	- Purchase Order number				Customer
	Purchase Order	(Supplier ID; Supplier Contact Details; Supplier Location; Buyer ID; Buyer Contact Details; Buyer Location; Product Name/Description; Quantity: Unit Type: Unit Price: Total Cost: PO placement date;			What	Product ID, Batch, Quantity Export Order number, Logistics Unit ID (SSCC), Container Number, Transfer Certificate, Bill of Lading
		Customer Order Delivery Date; Shipping Terms/Incoterms code)			When	Date/Time of load preparation
EXS CTE2B	- Customer Order and	- Customer Order number			Where	Warehouse
	Packing List created	(Date; Customer Name/ID; Product Code; Pack size; Description; Quantity: Units: Price)			Why	Export Order Preparation, stock picking
		additity, onits, rice,			Information t	o be shared to a traceability platform
	Picking, labelling, inspection and packing to import				- Inspection	record
	country requirements				– Transfer Ce	ertificate number
EXS CTE3A	Affix unique identifiers and	- Unique identifiers assigned and compliant labels attached			- Tray/Pallet	:/ULD, Container ID
	compliant labels to product items/lots			Export documentation	- Commercie	al Invoice number
EVC CTEZD	Affix and record unique	Logistics Assot ID			 Packing Lis 	st number
ENS CIESE	identifiers for logistics assets	- LOGISTICS ASSET ID			– Bill of Lading/Air Waybill number	
	e.g. tray, pallet		EXS CTE4A	Prepare shipping documents	- Country of	Origin certificate number
EXS CTE3C	Inspection by Authorised Officer	 Inspection Result record – product and container (EXDOC) random inspection 			- Product De	eclaration name and number/s as required
		Copy of the loading sheet (packing information from			– Purchase C	Drder number
		despatching/packing establishment)			- Customer (Order number
		 Copy of the container checklist which ensures the condition of the container is suitable for use 				
		 Photograph of the empty container 				
		 Photograph/s of the packed container (doors open) showing each product type and batch (where there is more than one) 				
		 Photograph of the closed container showing the container and seal number 				
EXS CTE3D	Transfer certificate for	- Transfer Certificate number				
	movement between Export Establishments	(Despatching establishment name and ID; Receiving establishment name and ID; Date of dispatch and arrival; Description of goods; Serial/batch numbers and processing dates; Type of package; Number of packages; Weight (L,kg,T); Transport Company; Driver's name; Temperature; Container seal number; Declaration signature and date (dispatcher); Attestation signature and date (receiver))				

Event code	СТЕ	Key data elements	Event code	СТЕ	Key data ele	ments
EXS CTE4B	Document the Supplier	- Traceability, recall and sourcing SOP and Policy document codes			Customs Clearance	
	policies and SOPs for traceability, recall and sourcing	The information related to traceability covered in a policy or SOP may vary according to each country requirement – check Micor			Who	Exporter Customs
		As an example, Australia requires – – a name or description of the food sufficient to indicate its true patient			What	Product ID, Batch, Quantity, Export Order number, Logistics Unit ID (SSCC), Container Number, Transfer Certificate, Bill of Lading, Shipment ID
		 batch or lot identification for the food 			When	Date/Time of customs/border release
		 name of the person, business name, street address and telephone number or email address of the producer of the food 			Where	Warehouse or Port
		 name of the person, business name, street address and telephone number or email address of customers that have received the food 	EXS CTE6A		Why	Border Clearance
		 the date the food was received and the date when it was dispatched to customers 			 Export Declaration Number Export Permit Number 	
		- the volume or quantity of the food involved in each transaction.			Bill of Lac	ding/Airway Bill (Product ID; Batch ID; Quantity;
		Information to be shared to a traceability platform - Commercial Invoice number			Export Container number/BIC Code of shipping container/ULD	
		– Packing List number		Pickup and delivery to port	livery to port	
		– Bill of Lading/Air Waybill number		Load and seal container	 SSCC of transport labels scanned at loading 	
		 Country of Origin certificate number 		 Record Export Container Number (ECN)/BIC code unique to this voyage 	 Time and date stamp of pickup from Exporter 	
		- Product Declaration name and number/s as required			– Export Co	ntainer Number (ECN)
		 Purchase Order number Customer Order number 			 BIC code check dig 	(owner prefix) + equipment identifier + serial number + git
		 Supplier policy/SOP document codes – traceability: recall: 		- Container seal placed and number recorded on	– Container	seal number – a unique ID
		sourcing			– Transport	company ID
	Border Clearance - Australia			Bill of Lading	– Vehicle reg	gistration number
EXS CTE5	Receive Export Declaration Number	 Export Declaration Number Export Permit Number 		Receival at Container Terminal		
	Receive Export Permit	Export Certificates from the EXDOC system that are issued on paper.		- Pre-Receival Advice	- PRA acce	ptance
		Users can scan the QR code to see an overview of the certificate. They can use it to confirm details such as:		acceptance message received from terminal	- Gate-In d	etails
		certificate number		Forwarder/Transport		
		product types current certificate state		Company		
		exporter	EXS CTE6C	Notice to Exporter/	– EDI messa	ige from CTO
		• Importer/consignee		Forwarder that container is		
		departure date				

Event code	CTE	Key data e	lements	Event code	CTE
		Delivery to	Port	EXS CTE7	Vesse
		Who	Exporter		
			Transport Company		
		What	Product ID, Batch, Quantity Export Order number, Logistics Unit ID (SSCC), Container Number, Transfer Certificate, Bill of Lading, Airway Bill, Shipment ID, Carrier ID		
		When	Date/Time of delivery		
		Where	Warehouse dispatch location		
		Why	Delivery to Port		
		Receipt at	Port		
		Who	Transport Company		
			Port/Terminal		
		What	Product ID, Batch, Quantity Export Order number, Logistics Unit ID (SSCC), Container Number, Transfer Certificate, Bill of Lading, Shipment ID, Carrier ID, BIC Code, Export Declaration Number		
		When	Date/Time of receipt	EVS CTER	In_tr
		Where	Port/Terminal Location	EX3 CIES	iii-u
		Why	Receipt at Port		
		Transfer to	Vessel/Aircraft		
		Who	Port/Terminal		
		What	BIC Number, Vessel ID, Bill of Lading, Airway Bill		
		When	Date/Time of transfer		
		Where	Port/Terminal Location		
		Why	Transfer to Vessel, Aircraft		
		Information - ECN/BIC	n shared to a traceability platform C Number		
		– Bill of La	ding/Airway Bill signed by Carrier		
		– Receipt	Date		
		– Shipmer	nt ID (carrier portal)		
		– Port ID			

– Vessel, Aircraft ID

nt code	СТЕ	Key data e	lements			
CTE7	Vessel, Aircraft Departs	– ECN/BIC number				
		– Bill of Lading				
		– Vessel, A	- vircraft ID			
		- Shipmor	t D (carrier portal)			
		- Shipmer				
		Vessel Dep	arts			
		Who	Port/Terminal			
			Vessel, Aircraft ID			
	What	BIC Number, Vessel, aircraft ID, Bill of Lading, Airway Bill, Destination				
		When	Date/Time of departure			
		Where	Port/Terminal Location			
		Why	Vessel, Aircraft departs port			
		Information shared to a traceability platform				
		 Vessel, . 	Aircraft ID			
		 Date of 	Departure			
CTE8	In-transit monitoring	- Contain	er/Carrier GPS coordinates in transit			
		- Tempero	ature (Degree Celsius in container or product)			
		- Humidity	/ (RH)			
		In Transit M	lonitoring			
		Who	Vessel, aircraft ID			
		What	Container/ULD ID, Vessel, Aircraft/flight ID			
		When	Date/Time of monitoring			
		Where	Vessel, Aircraft – GPS Co-ordinates			
		Why	Monitoring			
		Information	n to be shared to a traceability platform ordinates			
		– Date an	d time			

- Temperature 0 Celsius
- Humidity (RH)
- Vessel/Aircraft/Voyage ID
- ECN/BIC number of Container

Event code	СТЕ	Key data e	lements	Applic		
EXS CTE9	Arrival and clearance at discharge port			Adoption o		
	Container Status Advice/	– Vessel, A	Aircraft flight ID	formats. Ih		
Underbond Approval message		– Contain	- Container Status Advice/ Underbond Approval			
	C C	Information – Vessel, A	n to be shared to a traceability platform Aircraft, flight ID	Data stand		
		– Bill of La	iding, Airway Bill reference number	Data		
		- Custome	er, Importer ID	Element		
		– Date an	d time of arrival	Location		
		- Arrival Lo	ocation	Location		
EXS CTE10	Delivery to Importer					
	Import Delivery Order	 Electron Consign date; Bil type; Se Discharg issuing c Compar time of s 	ic Import Delivery Order (EIDO) number (Date and time; .ee; Discharge voyage and vessel numbers; Arrival I of Lading number; Container number (ECN); Container al number; Gross weight; Port of Load/Discharge/Final ge; Container location; Container Status; Signature of officer (shipping line); Date and time of signing; Transport ny; Driver signature; Container inspection report; Date and signing; EIDO pin number)	Date/Time		
	Cargo leaves discharge port	– Gate ou (Date ar	ıt nd time; Vehicle registration; ECN)	Developed		
	Cargo delivered to Importer	 Proof of time; Jo ECN (or Phone; A 	Delivery EDI 861/EDIFACT Receiving Advice (Date and b number; Freight paid by; Collected from; Delivered to; if de-consolidated) number of pallets or cartons; Contact; Acceptance of terms and conditions; Signature)	Identifiers		
		Final Delive	ery			
		Who	Transport Carrier, Import Receiver			
		What	Customer Order, Bill of Lading, Airway Bill, Logistics Units, Product ID, Batch			
		When	Date/Time of delivery			
		Where	Port/final destination	Traceability		
		Why	Final Delivery	Attributes		
		Information to be shared to a traceability platform				
		• EIDO nu				
		 Origina 	Il Customer Order number			
		Gate o				
		 Signed 	Proof of Delivery number			

Application of GS1 global data standards

Adoption of global data standards enables data sharing between businesses through using common formats. These formats allow a business to identify participants, locations, products, processes and events in the supply chain.

Data standards that apply to key data elements and shared information are identified in this section.

Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Location	Processing plant Finished Goods Location Dispatch Dock Fish Processing vessel	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here: www.gs1.org
Date/Time	Production Date/ time Use By date, Best Before Date, Pack Date	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent approach. The globally adopted standard for date recording is YYMMDD
Product Identifiers	Input materials such as raw ingredients and	Global Trade Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system.
	packaging, Outputs such as			Information on how to allocate a GTIN: <u>www.gs1.org</u>
	finished goods, packaged or			Information on when to change a GTIN www.gs1.org
	processed goods			Information on how to allocate a GTIN to a variable weight or variable measure trade iter https://www.gs1au.org/resources/frequently- asked-questions/national-product- catalogue-fags
Traceability Attributes	Batch/Lot code,		AN20	Traceability Attributes, such as Batch or Lot
	Serial Number,			into barcodes along with the Global Trade Item number enabling capture information along the supply chain.
				Also referred to as Application Identifiers, each has its own unique identifier and format.
				List of Application Identifiers

Data Element	Examples	Valid Values	Data Type/ Format	Further Information
Logistics Units	Pallet of Finished Goods, Crate or Box of finished Goods	Serial Shipping Container Code (SSCC)	N18	A logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain. Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets.
			https://www.gs1au.org/resources/standards- and-guidelines/identification-numbers/ types-of-application-identifiers-(ais)	
Assets	Returnable assets ie: IBC or individual assets		N13	Can be identified as an asset type only or an optional serial number can be added to distinguish individual assets.
	ie: crate			https://www.gs1au.org/resources/standards- and-guidelines/identification-numbers/ types-of-gs1-id-keys#LogisticsUnits
Consignment	Grouping of logistics units assigned by the transport company	GINC	N30	The Global Identification Number for Consignment can be used by companies to identify a consignment comprised of one or more logistic units that are intended to be transported together.
				https://www.gs1.org/standards/id-keys/ global-identification-number-consignment- ginc
Shipment	Grouping of logistics units	GSIN	N17	The Global Shipment Identification Number (GSIN) is a number assigned by a seller and shipper of goods to identify a shipment comprised of one or more logistic units that are intended to be delivered together.
				<u> https://www.gs1.org/standards/id-keys/gsin</u>

Containerised international shipping data standards

The Digital Container Shipping Association

(DCSA) is a not-for-profit organisation of nine major container shipping lines, dedicated to digitalisation of container shipping technology standards, based on United Nations Trade Data Models UN/CEFACT and ISO standards (e.g. ISO 9897 container park location). DCSA convenes the Future International Trade Alliance (FIT Alliance), constituted by DCSA, the Baltic and International Maritime Council (BIMCO), Fédération Internationale des Associations de Transitaires et Assimilés (FIATA), the International Chamber of Commerce (ICC) and Society of Worldwide Interbank Financial <u>Telecommunication</u> (SWIFT), each committing to standardise digitalisation of international trade, with an initial focus on adoption of electronic Bills of Lading.

Track and Trace standards developed by the FIT Alliance support pre-shipment, preocean, ocean, post-ocean and post-shipment transactions and operations. <u>www.dcsa.org</u>

Reference Data Models from UN/CEFACT

Reference data models for multimodal, buy-ship-pay, and supply chain have been developed by the <u>United Nations Centre for</u> <u>Trade Facilitation and Electronic Business</u> (UN/ CEFACT). Reference Data Models (RDMs) support international digital business and real time operations, helping to create interoperability in international trade transactions.

GS1 and FIT Alliance data standards reference the UN/CEFACT global trade data standards.



Useful links

Export Rules

https://www.agriculture.gov.au/biosecuritytrade/policy/legislation

https://www.agriculture.gov.au/sites/default/ files/documents/outline-export-control-fishrules-2021.pdf

https://www.agriculture.gov.au/biosecuritytrade/export/controlled-goods/fish

https://www.agriculture.gov.au/biosecuritytrade/export/controlled-goods/fish/exportfacilitator-service

Export premises

https://www.agriculture.gov.au/biosecuritytrade/export/controlled-goods/fish/registeredestablishment/approved-arrangements

https://www.agriculture.gov.au/biosecuritytrade/export/controlled-goods/fish/registeredestablishment/shellfish-qa

https://www.agriculture.gov.au/biosecuritytrade/export/controlled-goods/fish/registeredestablishment/abalone

https://www.agriculture.gov.au/biosecurity_ trade/export/controlled_goods/fish/registeredestablishment/declaration-compliance

https://www.agriculture.gov.au/sites/default/ files/sitecollectiondocuments/biosecurity/ export/dairy/product-standards-guidelinefish-exports.pdf

https://www.agriculture.gov.au/biosecuritytrade/export/controlled-goods/dairy/ registered-establishment/transferring-goods

Business licencing and permits

www.foodstandards.gov.au

Incoterms 2021

www.export.business.gov.au

Border regulation

www.abf.gov.au

Micor

www.micor.agriculture.gov.au

International Freight Forwarders

www.ifcbaa.com

Seafood Industry trade

Seafood Trade Advisory Group www.seafoodtradeadvisory.com

Seafood Export Strategy 2022 www.seafoodindustryaustralia.com.au

Austrade Go Global toolkit www.export.business.gov.au

Traceability standards

International Organization for Standardization's www.iso.org

Global Dialogue on Seafood Traceability Global Standards for Interoperable Seafood Traceability

www.traceability-dialogue.org

Industry certification and traceability

MSC/ASC Chain of Custody standard

Best Aquaculture Practices standard

<u>HACCP</u>

Glossary

Air waybill (AWB)

An AWB is a document that controls the routing of an exporter's cargo while it is in the hands of the air carrier or a consolidator. It is a contract for carriage; however, it cannot be negotiated.

Bill of Lading (BL/BOL)

A bill of lading is a document issued by a carrier to acknowledge receipt of cargo for shipment. Although the term historically related only to carriage by sea, a bill of lading may today be used for any type of carriage of goods.

The bill of lading is a legally binding document that provides the carrier and shipper with all of the necessary details to accurately process a shipment. It has three main functions. First, it is a document of title to the goods described in the bill of lading. Secondly, it is a receipt for the shipped products. Finally, the bill of lading represents the agreed terms and conditions for the transportation of the goods.

Certificate of Origin (CO)

The Certificate of Origin (CO) is a document to certify the place of growth, production or manufacture of goods. It is required when exporting to specific countries, when requested by the Consignee for Customs clearance, or when it's stipulated in a Letter of Credit.

The CO identifies goods and contains an express certification by a government authority, or other empowered body, that the goods in question originate in a specific country. Overseas importers may insist upon a CO when dealing with Australian exporters. Although obtaining a CO is straightforward, it's important that specific procedures are followed:

- You must include an Exporters Information Form Update. This form has to be completed and forwarded to the appropriate issuing body (see below for a list), together with a list of signatories authorised to sign the certificates on behalf of your company.
- Evidence of origin (ie. copies of the invoice, a bill of lading, a letter of credit, or a statutory declaration) must be supplied prior to stamping.
- Exporters must provide a copy of the documents being stamped for Chamber records.
- Before submission for authentication, the exporter must sign all export documents on the bottom left-hand side under the exporter's declaration.
- Importantly, Certificate of Australian Origin forms can't be used for any other origin, other than Australian.
- Certificates of Origin must always be typed.¹⁰

¹⁰ Austrade <u>www.austrade.gov.au</u>

A list of Certificate of Origin providers:

- <u>Ai Group issue certificates nationally</u>
- <u>VIC: Victorian Chamber of Commerce</u>
- <u>NSW: NSW Business Chamber</u>
- <u>SA: Business SA</u>
- QLD: Chamber of Commerce & Industry Queensland
- <u>ACT: ACT & Region Chamber of Commerce</u> <u>& Industry</u>
- <u>Canberra Business Chamber issues</u> Certificates of Origin
- WA: Chamber of Commerce & Industry
 Western Australia
- <u>NT: Chamber NT</u>
- TAS: Tasmanian Chamber of Commerce and Industry
- <u>AACCI Australia Arab Chamber of</u> <u>Commerce & Industry</u>

Depending on the importing country or size of fishing vessel for wild catch, these certificates may have a specific format e.g. ACCI JAEPA Certificate of Origin (Japan); Community Catch Certificate (EU).

Cargo Terminal Operator (CTO)

Air Cargo Terminal Operators and Sea Port Cargo Terminal Operators (stevedores) manage the interface between air and shipping lines, landside logistics and border agencies. They load and unload aircraft and vessels, load and unload rail, road and conveyor-delivered cargoes, provide security and a range of terminal services.

Export Declaration Number (EDN)

An Export Declaration Number is a nine-digit number issued through EXDOC or Customs SEW system, which is based on an exporter declaring details of goods to be shipped. It is used in the exporting and importing process for:

- Identification of individual export consignments included in one consolidated consignment
- Acknowledgement of an exported consignment in an outward manifest
- Notification of release or return of the goods from or to a warehouse
- Notification of release or removal of goods from a wharf or airport.

EXDOC

EXDOC is a software application developed by the Department of Agriculture, Water and the Environment for the purpose of managing export documentation for primary produce. EXDOC replaced manually generated permits and certificates.

NEXDOC

Next Export Documentation System (NEXDOC). DAFF is designing a modern and streamlined enhanced exports traceability system to support overseas market access for exports of agricultural product.

Health Certificate

Issued by DAFF through the EXDOC platform, a Health Certificate/Certificate as to Condition accompanies the product.

Incoterms

Incoterms are international rules for the interpretation of trade terms. Incoterms make international trade easier and help traders in different countries to understand one another. These standard trade definitions that are most commonly used in international contracts are protected by ICC copyright.

Labelling

Words, particulars, trademarks, brand names, names of certifying organisations, pictorial matter or symbols appearing on any packaging, document, notice, label, board or collar accompanying or referring to a product.

Micor - Manual of Importing Country Requirements

Micor provides accurate advice on the import requirements for individual countries and trading blocks and any specific commodity requirements by country.

Pre-Receival Advice (PRA)

A PRA is a two-way communication between exporters and cargo terminal operators in which the Exporter provides details about the cargoes/containers to be shipped and the CTO responds with cargo acceptance. Only then, the goods are dispatched to the terminal for loading into the aircraft/vessel.

Proof of Delivery (POD)

A commercial document used by the Consignee or their Logistics Service Provider to notify the Consignor of the receipt and acceptance of a delivery. A signed POD enables the Transport Company to raise an invoice.

Purchase Order (PO)

A commercial document issued by a buyer to a supplier. This is a legally binding offer to buy product in return for payment. The terms and conditions for delivery and payment are detailed in this document, which also details the product quantity, price, terms and conditions, product quality.

Radio Frequency Identification (RFID)

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects.

Transfer Certificate

A transfer certificate is a document which is completed by an establishment who is dispatching product to another establishment within Australia, possibly for further processing. A completed transfer certificate ensures that information about the product being transferred is maintained throughout the export chain, and provides evidence to the receiving establishment, and assurance to international trading partners, that importing country requirements have been met.



Australian Guide to Implementing Food Traceability: **Seafood**

Ethical Labour in Seafood Supply Chains



Ethical Labour in Seafood Supply Chains

Australian Government reports indicate an estimated 17,000 workers are employed in Australia's seafood industry, with 10,000 in fishing and 7,000 in aquaculture.² However, a much larger international workforce is engaged in supplying seafood consumed by Australians. Imported seafood caught, farmed and processed in other countries makes up over two thirds of the seafood consumed in this country.

While the focus of the AGIFT Seafood guide has been on the product journey, the traceability of "fishworkers" is becoming an important element of sustainable seafood supply chains and the commitment to address concerns regarding ethical labour engaged in the industry.

The International Labour Organisation (ILO) and global non-government organisations (NGOs) have identified workforce issues that underly the risk of unethical labour practices globally, including:

- A lack of visibility in isolated and remote fishing operations
- A high proportion of migrant, undocumented workers
- Lack of training, inadequate language skills, and lack of enforcement of safety and labour standards
- Poor health conditions on vessels for workers (food, water, medicines)
- Long working hours while at sea
- A link with trans-national organised crime
- Outsourcing labour hire to third party suppliers making tracing labour opaque
- Long supply chains involving multiple players, jurisdictions, and legal frameworks.

The Australian Government has made a commitment to tackle illegal, unreported and unregulated (IUU) fishing, signing the first legally binding alobal instrument aimed at combating IUU fishing. Australia signed the Agreement on 27 April 2010 and ratified it on 20 July 2015. The Agreement on Port State Measures (PSMA) entered into force on 5 June 2016. The PSMA's objective is to prevent, deter and eliminate IUU fishing by preventing vessels engaged in IUU fishing from using ports and landing their catches. In this way, the PSMA reduces the incentive of such vessels to continue to operate while it also blocks fishery products derived from IUU fishing from reaching national and international markets.

In 2018, the Australian Parliament passed the Modern Slavery Bill. In 2022, the first review of the Act was initiated. This Act requires companies to produce a Statement on their efforts to eliminate slavery in all its forms from their operations and supply chains. A <u>public registry of these</u> <u>statements</u> includes a number of seafood supply chain companies that have this requirement (turnover of \$100 million) and those that have voluntarily registered. It is notable that the Australian Seafood Importers Association has developed a <u>Modern Slavery Statement</u> and is supporting its members to address this issue.

SEDEX (Supplier Ethical Data Exchange), a not-for-profit organisation that audits and certifies sustainable supply chains, focusing on Labour Standards, Health & Safety, Environment and Business Ethics, recommends the following activities to support ethical labour in supply chains:

- Responsible sourcing due diligence
- Indicators of forced labour at audit
- Conduct risk assessment to understand the risks in your supply chain
- Work with suppliers
- Investigate work sites that exhibit multiple risk indicators
- Engage directly with workers
- Recognise that excessive overtime is a risky practice.²

The Global Dialogue on Seafood Traceability (GDST) <u>Traceability Standard V1.1</u> has incorporated a specific key data element

related to Human Welfare Policy Standards as follows

For aquaculture:

KDE No.	KDE Name	KDE Definition
A24	Human Welfare Policy Standards	Name of internationally recognized standards to which policy at a facility claims conformity

For wild caught:

KDE No.	KDE Name	KDE Definition
W35	Human Welfare Policy Standards	Name of internationally recognized standards to which policy on a vessel/ trip claims conformity

In 2022, the Marine Stewardship Council (MSC) reviewed its standards in relation to ethical labour. It released Labour Eligibility Requirements V.1 in October 2022. These standards came into force in May 2023. This standard will form part of the MSC/ASC Chain of Custody standard for both wild caught and aquaculture.

The Global Seafood Alliance Best Aquaculture Practices Farm Standard Issue Number: 3.1, effective February 2023, covers ethical labour requirements for BAP certification. The Worker Rights and Employee Relations standard covers:

- Wages and benefits
- Working hours
- Forced, bonded, indentured, trafficked and prison labour
- Child labour and young workers
- Hiring and terms of employment
- Discrimination, discipline, abuse and harassment
- Freedom of association and collective bargaining
- Worker health and safety.

Similarly, Section 5 of the <u>BAP Seafood</u> <u>Processing Standard</u> covers the above topics.

Policies, record keeping, certification and periodic audit form the basis of tracing ethical labour practices and proving the effectiveness of policies along seafood supply chains.

² SEDEX <u>www.sedex.com</u>

¹ ABARES <u>www.agriculture.gov.au</u>

CTE and KDE for Ethical Labour

CTE code	СТЕ	KDE
SELCTE1	Ethical Labour Policy	Modern Slavery Statement URLILO Work in Fishing Convention 2007 (188) conformity
SELCTE2	Industry certification that includes ethical labour audit	Certification bodyAudit date
SELCTE3	Responsible sourcing due diligence	 Responsible Sourcing Policy Responsible Sourcing Audit of supplier Date of audit

Useful Links

Modern Slavery Act reporting

Guide for businesses www.homeaffairs.gov.au

AMSA Modern Slavery Statement https www.amsa.gov.au

ILO International Labour Standards on Fishers www.ilo.org

Responsible sourcing of seafood

Tools for ethical seafood sourcing www.seafish.org

Supplier Questionnaire www.modernslaveryregister.gov.au

For multinational businesses

UN Guiding Principles on Business and Human Rights www.ohchr.org

Seafarer and Fisher Wellbeing AMSA www.amsa.gov.au

Stay Afloat Australia www.stayafloat.com.au

Glossary

Forced Labour

The International Labour Organisation (ILO) definition of forced labour comprises 2 key elements:

- Work or service is exacted under the menace. of a penalty, which can imply monetary sanctions, physical punishment, or the loss of rights and privileges or restriction of movement (e.g. refusing to allow free access to identity documents)
- Work is not voluntary. Other unethical practices considered by the ILO to fall under the category of forced labour include debt bondage, human trafficking, and other forms of modern slavery.

Child Labour

The ILO refers to child labour as work that is mentally, physically, socially or morally dangerous and harmful to children, or work that interferes with their schooling by depriving them of the opportunity to attend school, obliging them to leave school prematurely or requiring them to attempt to combine school attendance with excessively long and heavy work.

Modern slavery

The Act (Modern Slavery 2018) defines 'modern slavery' with reference to the Commonwealth Criminal Code and international law. It captures:

- conduct that would constitute slavery and slavery-like offences, whether or not the conduct took place in Australia
- human trafficking; and the worst forms of child labour. Slavery and slavery-like conduct would include forced labour, deceptive recruitment and debt bondage.

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fishing: illegal, unreported and unregulated fishing

SEDEX

Supplier Ethical Data Exchange.





Australian Guide to Implementing Food Traceability: **Seafood**

Data Standards



Application of data standards for seafood supply chains

The adoption of global data standards enables data sharing between businesses using a common language and formats. These formats allow a business to identify participants, locations, products, processes and events across the full end to end supply chain.

Growing levels of digitalisation and automation require standardisation of data formats and establishment of a common "language" so that information can flow in an uninterrupted stream along with the product. Standardisation facilitates system-to-system interoperability and lessens the cost and impact of manual system integrations, data translations and errors.

GS1 supply chain standards

In 2019, the <u>GS1 Foundation for Fish, Seafood and</u> <u>Aquaculture Traceability Guideline</u> was released. This guideline supports the identification, data capture and data sharing formats along seafood supply chains.

The fundamentals of GS1 data standards are as follows:

Location Identification



The unique identification of locations is a critical component of traceability systems and is used to identify where specific transactions and events have occurred.

The Global Location Number (GLN) is the globally unique GS1 Identification Number for locations and supply chain partners. The GLN can be linked to existing location identifiers that may already be in use to identify properties, farms, fields, etc.

The GLN can be used to identify a functional entity (e.g. accounts receivable or a bill back department), a physical entity (e.g. raw material receiving location, farm, paddock, row within a field), or a legal entity (e.g. a parent corporation or subsidiary). The attributes defined for each GLN [e.g., name, address, location type (e.g., ship to, bill to, deliver to, etc.)] help users to assure that each GLN is specific to one unique location across the world.

Product Identification



The Global Trade Identification Number (GTIN) can be used to identify trade items (loose or pre-packed), input materials, outputs, at any stage of the supply chain through to the end consumer.

Most trade items have a trading partner (processor) allocated Global Trade Item Number (GTIN). Where the trading partner has multiple processing facilities the same GTIN is often used for the same product, irrespective of the processing facility. To ensure traceability is maintained to the specific processing facilities the trading partner utilises Application Identifiers along with the GTIN to maintain traceability back to the respective processing facility e.g. GTIN plus site allocated Batch/Lot number.

Where product is being packed for a specific third party such as a product brand owner, the product brand owner allocates the GTIN to be used. This is likely to include the use of Application Identifiers with the GTIN to maintain traceability back to the respective processing facility used by the brand owner.

If a trading partner further processes and packages a product in the supply chain, such as the case with store-processed product, then that trading partner is responsible for assigning a GTIN or item reference and traceability attributes. This may be achieved by using a combination of human readable and scannable product information printed onto the product's packaging. This information should also be stored for future retrieval, if necessary.

It should be noted that governments and national trading partners may require additional business information to appear on the trade item labels and it is recommended that trading partners work closely with local regulatory authorities to ensure compliance.

A unique GTIN must be assigned to every different variation of a product. Size, style, grade, colour, quantity etc. as all are considered separate variations and thus require separate GTINs. Each level of packaging for a product (base unit, inners, outers) should be allocated a unique GTIN (and physically barcoded where applicable) separately to all other levels.

Variable Measure Trade Items Not Scanned in General Retail at Point-of-Sale (Carton/Case Labelling).

Trade items in the fresh produce industry may include variable measure because the production process results in a wide range of weights for the same product packed in crates or boxes. In these instances, a variable measure GTIN is to be assigned to the crate or box.

Variable Measure Trade Items Scanned in General Retail at POS

Variable measure trade items that are scanned at Point-of-sale have two main GS1 applications that are available. In some instances, due to trading partners (e.g. Retailer) requirements both options may be applied to the one variable measure fresh food trade item.

Before implementation of any GS1 applications for variable measure trade items that are scanned at Point-of-sale mutual agreement should be obtained between the trading partners. The two main GS1 applications for variable measure fresh food trade items are:

- Variable Measure Fresh Food Trade Items using a GTIN and additional attributes encoded with GS1-128 barcode or from 2027, the GS1 DataMatrix or QR symbology.
- Variable Measure Trade Items using a Restricted Circulation Number (RCN) encoded with the EAN/UPC symbology family or, from 2027 the GS1 DataMatrix or QR Code symbology.

Trading partners should ensure that retailer labelling requirements are known and understood when following this guideline. Where a retailer specified requirement contradicts this guideline the retailer requirement should be followed.

GS1 Digital Link

GS1 Digital Link is a standard which brings together the World Wide Web (WWW) and the GS1 system of identify, capture, and share. In simple terms, GS1 Digital link provides a standard way of expressing GS1 keys and attribute data in a format that can be used on the web. That means that GS1 identifiers, such as the GTIN, are now a gateway to consumer information that strengthens brand loyalty, improved supply chain traceability information, business partner APIs, patient safety information and more. GS1 Digital Link enables connections to all types of business-to-business and business to-consumer information.

Currently you only can use the GS1 Digital Link standard for Retail POS and consumer interaction. GS1 is working towards a future where it can be used in other environments and sectors.

Attributes of Trade Items

Attribute information of trade items is any data over and above the item identifier, i.e. the GTIN.

Examples of this type of information include batch/lot numbers, pack date, use by and best before dates and variable measure information such as, weight or count, etc.

Attribute information is represented by GS1 Application Identifiers (AIs) and these ensure that the attribute information can be interpreted unambiguously by trading partners throughout the entire supply chain.

In order to enable cost-effective adoption by food processes and manufacturers, we recommend the use of attribute data to provide traceability of product from the supplier into the packing house, providing visibility and faster and more efficient recalls and food safety.

Batch/lot and serial identification

The minimum requirements for traceability rely upon a combination of the GTIN and batch/lot number and/or serial number.

Note: If both the batch/lot number and serial number are present, as sometimes happens, the batch/lot number takes precedence in case of a recall.

For more information regarding the use of Als, please refer to the <u>GS1 General Specifications</u>:

Note: Regarding Trade Item Attribute information:

- Attribute information cannot stand-alone; it must always be accompanied by a GTIN
- Attribute information must be encoded in a GS1-128 barcode/ EPC enabled RFID tag / GS1 2Dimensional Symbol.
- If an Al appears on the same item more than once (e.g. if two labels are applied to the same item) the Al must be followed by the same information on each label.



GS1 Application Identifiers relating to seafood

(For a full list of GS1 Application Identifiers visit www.gs1.org)

All GS1 Application Identifiers indicated with (FNC1) are defined as of variable length and shall be delimited unless this Element String is the last one to be encoded in the symbol.

Note: GS1 Application Identifiers can be either fixed length and format or variable in length. For variable length Application Identifiers, a FNC1 must be placed at the end of the data string.

AI	Data Content	Format	FNC1 Required
00	SSCC (Serial Shipping Container Code	N2+N18	
01	GTIN (Global Trade Item Number)	N2+N14	
02	GTIN of the Contained Trade Items	N2+N14	
10	Batch or Lot Number	N2+X20	(FNC1)
11 (**)	Production Date (YYMMDD)	N2+N6	
13 (**)	Packaging Date (YYMMDD)	N2+26	
15 (**)	Best Before Date (YYMMDD)	N2+N6	
17 (**)	Expiration Date (YYMMDD)	N2+N6	
21	Serial Number	N2+X20	(FNC1)
251	Reference to Source Entity	N3+X30	(FNC1)
254	GLN extension component	N3+X20	(FNC1)
30	Count of items (variable measure trade items)	N2+N8	(FNC1)
310 (***)	Net weight, kilograms (variable measure trade items)	N4+N6	
320 (***)	Net weight, pounds (variable measure trade items)	N4+N6	
330 (***)	Logistic weight, kilograms	N4+N6	
37	Count of Trade Items	N2+N8	(FNC1)
410	Ship to – deliver to global location number	N3+N13	
411	Bill to - invoice to global location number	N3+N13	
412	Purchased from global location number	N3+N13	
413	Ship for – deliver for – forward to global location number	N3+N13	
414	Identification of a physical location – global location number	N3+N13	
415	Global location number of the invoicing party	N3+N13	
422	Country of origin of a trade item	N3+N3	(FNC1)
423	Country of initial processing	N3+N3+N12	(FNC1)
425	Country of processing	N3+N3	(FNC1)
426	Country of disassembly	N3+N3	(FNC1)
7002	UN/ECE Meat Carcases and Cuts Classification	N4+X30	(FNC1)
7007	Harvest Date	N4+N612	(FNC1)

(**): If only year and month are available, DD must be filled with two zeroes.

(***): The fourth digit of this GS1 Application Identifier indicates the implied decimal point position.

Example:

- 3100 Net weight in kg without a decimal point
- 3102 Net weight in kg with two decimal points

Logistics Units

The Serial Shipping Container Code (SSCC) can be used by companies to uniquely identify a logistic unit, which can be any combination of trade items packaged together for storage and/ or transport purposes; for example a case, pallet or parcel.

The SSCC is a crucial key for traceability as it uniquely identifies each distributed logistic unit and its content.

- The SSCC enables companies to track each logistic unit for efficient order and transport management
- The SSCC can be encoded in a barcode or EPC/RFID tag, ensuring the logistic unit can be accurately and easily identified as it travels between trading partners, anywhere in the world
- When SSCC data is shared electronically via EDI or EPCIS, this enables companies to share information about the status of logistic units in transit, and reliably link it to related transport information, such as shipment details

• The SSCC enables companies to link to additional information about the logistic unit. This information can be communicated via a Despatch Advice message (also referred to as Advanced Shipping Notice (ASN) prior to the logistic unit's arrival. Upon receipt the SSCC will be scanned, providing the required information to speed up the receipt of goods as well as the subsequent invoicing process.

Figure 1: Example of SSCC Application



Source: GS1 Australia

Consignments

The Global Identification Number for Consignment (GINC) can be used by companies to identify a consignment comprised of one or more logistic units that are intended to be transported together:

- Logistic units in a particular shipment may be associated with different GINCs during various transport stages; for example, when the shipment gets consolidated with other shipments during its journey and deconsolidated again before it reaches the consignee. The GINC allows freight forwarders and transport providers to keep track of the logistic units being transported together
- The GINC is typically used by freight forwarders to instruct transport providers; for example, on a Master Airway Bill (MAWB) or a Master Bill of Lading (MBL)
- The GINC can be encoded in a barcode or as text on a MAWB / MBL, or in addition to the Serial Shipping Container Code (SSCC), on a logistics label
- The GINC can be electronically used in transport instruction and transport status messages between freight forwarder and transport provider.

Shipments

The Global Shipment Identification Number (GSIN) is a number assigned by a seller and shipper of goods to identify a shipment comprised of one or more logistic units that are intended to be delivered together.

The logistic units keep the same GSIN during all transport stages, from origin to final destination. The GSIN identifies the logical grouping of one

or several logistic units, each identified with a separate Serial Shipping Container Code (SSCC).

- The GSIN can be encoded by the shipper in a barcode or as text on a House Waybill, or in addition to the SSCC, on a logistics label
- The GSIN can be electronically used by a company in transport instruction and transport status messages between freight forwarder and transport provider, and also as a reference in the Despatch Advice.

The GSIN Is fully compatible with ISO/IEC 15459 – PART 8: Grouping Of transport units. The GSIN also meets the requirements for unique consignment reference (UCR) according to the world customs organisation.

Figure 2: Example of GINC Application



Source: GS1 Australia

Assets

The GS1 System provides a method for the unique identification of assets. The objective of asset identification is to identify a physical entity as an inventory item.

Asset Identifiers may be used for simple applications, such as the location and use of a given fixed asset (e.g. a personal computer), or for complex applications such as recording the characteristics of a returnable asset (e.g. an Intermediate Bulk Container), its movements, its life-cycle history and any relevant data for accounting purposes.

GS1 System asset identifiers can be used to identify any fixed assets of a Company. It is left to the discretion of the issuer to determine whether the Global Returnable Asset Identifier (GRAI), AI (8003), or Global Individual Asset Identifier (GIAI), AI (8004), is more suitable for the application concerned. Asset identifiers must not be used for any other purpose and must remain unique for a period well beyond the lifetime of the relevant records.

Global Returnable Asset Identifier (GRAI) – AI (8003)

A Returnable asset is a reusable package or transport equipment of a certain value, such as a beer keg, a gas cylinder, a plastic pallet, or a crate. The GS1 System identification of a returnable asset, the Global Returnable Asset Identifier (GRAI), enables tracking as well as recording of all relevant data.

A typical application using a GRAI is the tracking of returnable crates. The owner of the crate applies a barcode carrying a GRAI to the keg using a permanent marking technique. This barcode is scanned whenever the crate is supplied full to a customer and scanned again when it is returned. This scanning operation allows the crate owner to automatically capture the life-cycle history of a given crate and to operate a deposit system, if desired.

Global Individual Asset Identifiers (GIAI) – AI (8004)

An individual asset is considered a physical entity made up of any characteristics. The Global Individual Asset Identifier (GIAI) identifies a physical entity as an asset. It must not be used for other purposes and must be unique for a period well beyond the lifetime of the relevant asset records. Whether the assigned GIAI may remain with the physical item when changing hands depends on the business application. If it remains with the physical item, then it must never be re-used. This element string might, for example, be used to record the life-cycle history of a wine vat or barrel. By symbol marking the GIAI, using AI (8004), on a given vat, or barrel, wine manufacturers are able to automatically update their inventory database and track assets from acquisition until retirement.



GS1 and the International Organization for Standardization (ISO)

GS1 has a long and active working relationship with ISO, an independent and non-government organisation with a membership of 163 national standards bodies. GS1 standards are now present in highly regulated sectors such as healthcare, fresh foods and foodservice. They are being used as the foundation for traceability or anticounterfeiting services and in this context collaborating with ISO is increasingly important. Governmental regulations and laws often refer only to ISO standards, so having normative references to GS1 in ISO standards is very useful.

GS1 standards recognised by ISO and other standard bodies

GS1 component	External standard
GTIN (Global Trade Item Number)	ISO/IEC 15459-6
SGTIN (Serialised Global Trade Item Number)	ISO/IEC 15459-4
GLN (Global Location Number)	ISO/IEC 6523
SSCC (Serial Shipping Container Code)	ISO/IEC 15459-1
GIAI (Global Individual Asset Identifier)	ISO/IEC 15459-4 & 5
GRAI (Global Returnable Asset Identifier)	ISO/IEC 15459-5
GSRN (Global Service Relationship Number)	ISO/IEC 15418
GDTI (Global Document Type Identifier)	ISO/IEC 15418
GINC (Global Identification Number for Consignments)	ISO/IEC 15418
GSIN (Global Shipment Identification Number)	ISO/IEC 15459-6
GCN (Global Coupon Number)	ISO/IEC 15418
CPID (Component / Part Identifier)	ISO/IEC 15418
Application Identifiers	ISO/IEC 15418
Global Product Classification (GPC)	ISO 22274
EPC URI Syntax	IETF RFC 3986
EANCOM syntax	ISO 9735
EANCOM content	UN/CEFACT UNSMs
GS1 XML syntax	W3C XML
GS1 XML content	W3C XML
Symbology identifiers	ISO/IEC 15424
EAN/UPC	ISO/IEC 15420
ITF-14	ISO/IEC 16390
GS1-128	ISO/IEC 15417
GS1 DataBar	ISO/IEC 24724
GS1 DataMatrix	ISO/IEC 16022
GS1 Composite	ISO/IEC 24723
GS1 QR Code	ISO/IEC 18004
UHF Class 1 Gen 2	ISO/IEC 18000-63
HF Class 1 Gen 2	ISO/IEC 18000-3
EPC Tag Data Standard	ISO/IEC 15962
Low-level Reader Protocol (LLRP)	ISO/ICE 24791-5
Application Level Events (ALE)	ISO/IEC 24791-2
Reader Management (RM)	ISO/IEC 24791-3
Discovery, Configuration, and Initialization (DCI)	ISO/IEC 24791-3
EPC Information Services (EPCIS)	ISO/IEC 19987
GS1 Core Business Vocabulary (CBV)	ISO/IEC 19988

ISO application standards which refer to GS1 standards

ISO 15394	Packaging Bar code and two-dimensional symbols for shipping, transport and receiving labels
ISO 22742	Packaging Linear bar code and two-dimensional symbols for product packaging
ISO 28219	Packaging Labelling and direct product marking with linear bar code and two-dimensional symbols
ISO 17363	Supply chain applications of RFID Freight containers
ISO 17364	Supply chain applications of RFID Returnable transport items (RTIs) and returnable packaging items (RPIs)
ISO 17365	Supply chain applications of RFID Transport units
ISO 17366	Supply chain applications of RFID Product packaging
ISO 17367	Supply chain applications of RFID Product tagging
ISO/TS 16791	Health informatics — Requirements for international machine-readable coding of medicinal product package identifiers
ISO 11615	Health informatics — Identification of Medicinal Products — Data elements and structures for the unique identification and exchange of regulated Medicinal Product information
ISO/TS 18530	Health Informatics — Automatic identification and data capture marking and labelling Subject of care and individual provider identification
ISO 10685-1	Ophthalmic optics — Spectacle frames and sunglasses electronic catalogue and identification — Part 1: Product identification and electronic catalogue product hierarchy
CEN/CLC/ TR 14060	Medical device traceability enabled by unique device identification (UDI)



Additional Standards supporting Seafood Traceability

Containerised international shipping data standards

The Digital Container Shipping Association (DCSA) is a not-for-profit organisation of nine major container shipping lines, dedicated to digitalisation of container shipping technology standards, based on United Nations Trade Data Models UN/CEFACT and ISO standards (e.g. ISO 9897 container park location). DCSA convenes the Future International Trade Alliance (FIT Alliance), constituted by DCSA, the Baltic and International Maritime Council (BIMCO), Fédération Internationale des Associations de Transitaires et Assimilés (FIATA), the International Chamber of Commerce (ICC) and Society of Worldwide Interbank Financial Telecommunication (SWIFT), each committing to standardise digitalisation of international trade, with an initial focus on adoption of electronic Bills of Lading.

<u>Track and Trace</u> standards developed by the FIT Alliance support pre-shipment, preocean, ocean, post-ocean and post-shipment transactions and operations.

Reference Data Models from UN/CEFACT

Reference data models for multimodal, buy-ship-pay, and supply chain have been developed by the <u>United Nations Centre for</u> <u>Trade Facilitation and Electronic Business</u> (UN/ CEFACT). Reference Data Models (RDMs) support international digital business and real time operations, helping to create interoperability in international trade transactions.

GS1 and FIT Alliance data standards reference the UN/CEFACT global trade data standards.

GS1 data standards that apply to key data elements and shared information in seafood traceability.

Data Element	Examples	Valid Values	Data Type/ Format	Further information
Location	Farm location, Fishery location	Global Location Number (GLN)	N13	Further information on Global Location Numbers (GLN), their structure, use, creation can be found here:
				https://www.gs1.org/standards/id-keys/gln
Date/Time	Date of registration, Date of planting, Date of harvest	Year -Month- Date	YYMMDD	Whilst human readable date formats can vary e.g. 21 December 2020, December 21 2020, the structure of the date format to be encoded into systems and barcodes requires a consistent approach.
	Date of processing			The globally adopted standard for date recording is YYMMDD
Product Identifiers	Packaged Product	Global Trace Item Number (GTIN)	N14	Unique product identification of all traceable objects is a foundational element of any traceability system.
				Information on how to allocate a GTIN: https://www.gs1.org/1/gtinrules/en/
				Information on when to change a GTIN: https://www.gs1.org/1/gtinrules/en/decision- support
Traceability Attributes	Batch, Serial Number, Production Date, Best Before, Use by		AN20	Traceability Attributes, such as Batch or Lot Number, Serial Number, Production Date etc. can be encoded into barcodes along with the Global Trade Item number enabling capture information along the supply chain.
				Also referred to as Application Identifiers, each has its own unique identifier and format.
				List of Application Identifiers
Logistics Units	Shipment of Grain, Pallet of fertiliser		N18	Logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain. Logistic units take many forms, a single box containing a limited number of products, a pallet of multiple products, or an intermodal container containing multiple pallets. https://www.gslau.org/standards/id-
				nttps://www.gs1au.org/standards/1a- keys#LogisticsUnits

Data Element	Examples	Valid Values	Data Type/ Format	Further information
Assets	Returnable assets like IBC, crate, pallet Individual assets like transport vehicle, trailer, vessel, transport equipment etc	Global Returnable Asset Identifier (GRAI) Global Individual Asset Identifier (GIAI)	N13	Can be identified as an asset type only or an optional serial number can be added to distinguish individual assets. https://www.gs1au.org/download/gs1au-fact- sheet-identification-of-assets.pdf/file
Document Identifiers	Food transport Business licence, Vendor declarations, transport messages	Global Document Type Identifier (GDTI)		Can be encoded in a barcode or printed directly on the document. Companies can use the GDTI as a method of identification and registration of documents and related events. https://www.gs1.org/docs/idkeys/GS1_GDTI_ Executive_Summary.pdf
Consignment	Grouping of logistics units assigned by the transport company	GINC	N30	The Global Identification Number for Consignment can be used by companies to identify a consignment comprised of one or more logistic units that are intended to be transported together. https://www.gs1.org/standards/id-keys/ginc
Shipment	Grouping of logistics units	GSIN	N17	The Global Shipment Identification Number (GSIN) is a number assigned by a seller and shipper of goods to identify a shipment comprised of one or more logistic units that are intended to be delivered together.

What Symbology (barcode) is to be used?

GS1 manages several types of barcodes. Each is designed for use in a different situation.

Figure 4: GS1 Data Carriers



Image: Strate of the strate of th	EAN/UPC Carries a Global Trade Item Number (GTIN)	GS1-128 Carries a GTIN with extended data such as Batch/Lot/Serial Number	G51-128 Carries a Logistics Label or GS1 SSCC
GS1 DataMatrix Carries a GTIN with extended data such as Batch/Lot/Serial Number GS1 EPC / RFID Carries a Serialised GIIN or an SSCC GS1 EPC / RFID Carries a Serialised GIIN or an SSCC Image: Comparison of the strength of the strengt of the strength of the strength of the strength of th	9 512245 67 9907 OR	0 1	Interference Marcan Marcan Marcan
C013 0041111987418 C013 00416111987418 C013 00416111987418 C013 0041611 C013 00	GS1 DataMatrix Carries a GTIN with extended data such as Batch/Lot/Serial Number	GS1 EPC / RFID Carries a Senalised GTIN or an SSCC	GS1 EPC / RFID Carries a Serialised GTIN or an SSCC
Barcodes EPC-Enabled RFID Tags EAN*/UPC 651 DataBar* 651 DataMatrix ITF-14 651-128 HF RFID UHF RFID	(01) 00414141987418 (17) 120831 (10) A182(39485 (21) 00098522		
EANY/UPC GS1 DataBar* GS1 DataMatrix ITF-14 GS1-128 HF RFID UHF RFID UHF RFID UHF RFID UHF RFID	Barcodes		EPC-Enabled RFID Tags
(013) C 64-14.1 SIZ7AS 3 (23)-6058522	EAN*/UPC GS1 DataBar* GS1 DataMat	rix ITF-14 GS1-128	

Besides the batch/lot ID and/or serial ID these may also include the pack date, best before date, weights, etc. The proper linkage of the barcode, the related data and the produced instances of the trade item, is a key aspect.

The symbology used to encode the GTIN and attribute data is dependent on a number of factors. The following table provides an overview and guidance on the which symbology to use for products moving through the supply chain through to point of sale.

Product Scenario	Usage	GS1 Number	Symbology
Harvested Seafood Traceability requirements • GTIN • Batch • Catch Date	Warehouse and Distribution	GTIN 8,12 13 or GTIN-14	GS1-128 (01)19501101530000(11)210515(10)ABC123
Processed Seafood Traceability requirements • GTIN • Batch • Production Date	Warehouse and Distribution	GTIN-13 or GTIN-14	GS1-128
Packaged seafood for Retail point of sale (no traceability information encoded into the barcode)	Retail point of Sale and Warehouse and Distribution	GTIN-8,12,13	P 312345 678907
Packaged seafood for Retail point of sale (with traceability information encoded into the barcode)	Retail point of Sale	GTIN-8, 12, 13	GS1 DataMatrix* * Note: GS1 DataMatrix only to be applied in agreement with Retail Trading partners.
Carton of packaged seafood destined for point of sale	Warehouse and Distribution	GTIN-13	GS1-128

Product Scenario	Usage	GS1 Number	Symbology
Returnable Asset	Returnable Crate, Bin	GIAI	(8003) 093123450012480001
Internal Asset	Vessel, Processing equipment	GIAI	GS1-128
Logistics Unit Refer to the label sample below for specific requirements regarding information and label layout recommended	Pallet of processed cartons	SSCC	SSCC number encoded in a GS1-128

For logistic units the barcodes have always been based on the SSCC, which is a serialised identifier. This means that logistics labels will be printed when the goods are packaged, and that the link between data and label will be secured that way.

Figure 5: GS1 Logistics Label for homogenous pallet



The barcode symbology used for variable measure trade items not scanned at Point-of-sale carton/ case labels is the GS1-128. The GS1-128 barcode allows secondary attribute information over and above primary global trade item identification to be represented in the barcode.

The barcode symbology can also represent attribute information such as batch or lot numbers, serial numbers, expiry dates and weight in a standard format. This ensures that the attribute information encoded by one trading partner can also be scanned and interpreted by any other trading partner in the supply chain.

Additional country, market or customer requirements may be applicable in certain circumstances. Contact the applicable representatives in those markets to determine the current requirements.

When using GS1-128 barcodes for fresh seafood items, it is recommended that the following information should be encoded in the barcode on every level of packaging:

- 1. Item Identifier [Global Trade Item Number (GTIN)]
- 2. Date (e.g. Pack date, harvest date)
- **3.** Production Information (Batch/Lot Number or Serial Number).

Capturing Traceability Information

The following section details how information is to be collected via the use of barcodes and/or other identification methods e.g. EPC/RFID as products move through the supply chain.

The use of barcodes and scanners to capture key data elements for each defined Critical Tracking Event greatly enhances data quality and speed of data capture.



Marking/barcoding traceable objects

Traceability systems can use GS1-approved barcode symbologies and EPC/RFID tags to encode GS1 identification keys that uniquely identify products, trade items, logistic units, locations, assets, and service relations worldwide. Additional information such as best-before-dates, serial numbers, and lot numbers may also be encoded into barcodes or EPC/RFID.

Other carrier-based technologies (such as digital watermarks) and carrier-less technologies (such as image recognition) may also play a role depending on the environment and nature of information that is required to be captured as part of a Critical Tracking Event.

Figure 6: Data Capture technologies used to capture the KDEs



Source: GS1 Australia

In addition to the data that is captured when scanning barcodes, data provided by the equipment used to scan or read the data –such as date & time, read-point and user (operator)– will be important in determining the **Who** completed the data capture, **Where** the data capture took place, **When** and **Why** e.g. receipting transaction.

Examples of CTEs and KDEs can be found here: <u>www.traceability-dialogue.org</u>

How to capture data/events

An important principle is the separation of data content from the way the data is exchanged (the communication method).

Best practice for maintaining traceability is to capture 'all agreed to traceable information' and store it within their systems by scanning the information directly from the trade item / case / input barcodes.

Scanning enables data to be captured, stored, and retrieved without the need to visually review the human readable information and manually key that information into systems. This typically involves the use of a scanning device, usually a barcode scanner.

Product can be scanned for Critical Tracking Events e.g. as it enters the processor vessel; as it is shipped out of the farm to processor, received at cold storage, or as it is received at a retailer.

More and more suppliers, processors, distributors and wholesalers are putting processes in place to collect and store at least the minimum product information required to support traceability.

When it comes to capturing the data, the main questions are:

- 1. Which process steps need to be captured?
- 2. What is the most cost-effective way to capture the data?

Usually the first step will be scanning of harvested animals or tubs/lots on landing. Where barcodes are present, this is usually done using handheld devices or fixed mount scanners. For EPC/RFID tags both handheld and fixed readers can be used.

Other process steps where data will be captured are harvesting, storing, picking, packing, shipping, transporting, selling. Often a combination of fixed mounted scanners or readers and handheld devices will be applied to capture the critical tracking events.

The emergence of mobile devices deserves a special mention here since it increases the availability of scanning capability (making scanning as pervasive as the barcode) and so may make it feasible to record additional events at limited additional cost.

Figure 7: Range of scanners that read liner, 2D and RFID tags





GS1 Digital Link – Key Components and URI Syntax

What is a Syntax?

Syntax is how things are arranged in a specific way to have meaning. GS1 currently has 4 different syntaxes which define how data is encoded into various data carriers.GS1 Digital Link URI syntax, the latest syntax, expresses data in a format that also can point to one or multiple resources on the internet.

Application Identifiers

Application Identifiers are prefixes used in barcodes to define the meaning and format of the data that is following it. For example: AI (01) denotes Global Trade Item Number (GTIN) and has a fixed length of 14 numbers (data format n14) There are over 300+ Application Identifiers and the full list can be viewed here. GS1 Digital Link URI syntax uses the application identifiers in a web friendly format.

GS1 Digital Link URI Syntax

Scheme

The scheme indicates the protocol and is always http:// or https:// (use of HTTPS is more secure and is therefore recommended as best practice).

Hostname

Is typically a registered Internet domain name or a subdomain of such a registered domain name (e.g., example.com/ or id.gs1.org/). Some recommendations when deciding on the domain name are as follows:

1) Use your brand's own internet domain

It is recommended that you build your GS1 Digital Link URLs using a domain name you own.

For example: https://www.yourbrand. com/01/09312345678907

The benefits of your own brand domain name include:

- Consumers will be confident that the URL their mobile phone displays is owned by your brand and more likely to trust the link.
- You will have direct access to, and ownership of any analytics captured by the website associated with your domain name, such as the frequency and locations at which the 2D barcode is being scanned.

Your domain name is a brand asset that can be transferred if your brand is sold or acquired. This means that 2D barcodes containing your GS1 Digital Link URL would not have to be reprinted.

There are solution providers that can take care of some of the more technical aspects of implementing GS1 Digital Link. Be aware of who is the owner of the data captured and who the owner is of the domain. When you want to switch to another solution provider's platform it is recommended to keep the same domain name if possible. This way the syntax, inside 2D barcodes, does not need to be updated.

2) Set up a subdomain

It is also recommended setting up a subdomain wherever possible.

A subdomain lets you separate portions of your site that warrant their own dedicated file structure, preventing you from having to set up a new site with a new domain that could result in confusion visitors. This would also reduce the risk of causing any disruption to your existing website. When creating a subdomain, it is recommended that you add an 'id' or similar prefix to your existing domain name to show this subdomain is about identification.

For example: www.<u>id.yourbrand.com</u>

3) Keep it short

The shorter the GS1 Digital Link URI, the smaller the 2D barcode can be.

For example:

https://id.yourbrand.com/gs1digitallink/ productname/01/0931234567890 is valid. This is because everything to the left of the actual GS1 identifiers is not part of the identification of the trade item, however, it will create a large 2D barcode.

It is recommended to add additional data such as expiry date, batch/lot code, etc. which can add value to your business case, instead of using a long domain name.

Path information

After the domain, the remainder of the web URI is case sensitive.

1) Primary Identification Key:

The next crucial element of your GS1 Digital Link URI is the GS1 Identification Key also called as the Primary identification key. Most products will already have GTINs allocated, a significant portion of which will be encoded in EAN/UPC barcodes that are printed on the product itself. This same GTIN needs to be encoded in the 2D barcode using GS1 Digital Link syntax. For example: When your product is identified with the GTIN 9312345678907 the GS1 Digital Link syntax will look like https:// id.yourbrand.com/01/09312345678907.

Note: A GTIN expressed in a GS1 Digital Link URI will always start with application identifier 01 following the GTIN expressed in a 14-digit format. A GTIN-8, GTIN-12 and GTIN-13 should have leading zeros.

You can have your GS1 Digital Link with just the GS1 Identification key only. When your business case requires additional information about the product to be encoded you can add them as described below.

2) Key qualifiers:

These refer to those attributes such as batch/lot, serial number, consumer product variant that are designated for use as part of a compound key. They follow a specific sequence such that the specificity increases from left to right.

Examples:

https://id.yourbrand. com/01/09312345678907/10/ABCD

https://id.yourbrand. com/01/09312345678907/10/ ABCD/21/12345678

The last examples show that first comes the identification key (GTIN), which is the class, followed by the batch/lot which is the sub-class and then the instance of the item which is the serial number.

3) Data Attributes: After the key qualifiers comes the data attributes such as expiry date, production date, count, price, net weight etc. These are added as query string in a URL. The order of the attributes does not matter.

For example:

https://id.yourbrand. com/01/09312345678907/10/ ABC123/21/456789A?3103=000 195&3922=0299&17=201225

Summary

To summarise the structure of the GS1 Digital Link URI syntax is as follows:

https://id.yourbrand.com/01/09312345678907/10/ABCDE?17=270905

Use re-direction

Another recommendation in terms of best practices is to use "redirection". If you as the brand owner already have a webpage created for a particular product, and when you are adding a 2D barcode with GS1 Digital link on the product. You don't need to create another webpage with the URL in the 2D barcode, you can simply redirect to the existing page. When the main website is changing you can easily change the redirection without changing the syntax in the barcode.

For example:

https://id.yourbrand.com/01/09312345678907 can be redirected to https://www.yourbrand.com/brand/productx/ productinfo.html

Note: The yourbrand.com domain name is used in the example as a place holder for any domain name.

Scan this QR Code



When you scan this QR Code it will take you to a fictitious product created by GS1.





Cyber Security, Data Sharing, Privacy

About this module

As global supply chains become more dependent on digital technologies, understanding, evaluating, and mitigating the cyber risks which impact supply chain critical business activities and trading data has become increasingly important.

This module outlines the security concerns. threats, and mitigation strategies for constituents of a supply chain such as trade companies and service providers to discuss and analyse when developing their overall security position. It uses a generic architecture of traceability divided into four main layers: data carrier, data capture, data sharina, and application layers. It describes the core elements of each layer and outlines threats and mitigation strategies based on Microsoft's STRIDE threat model. STRIDE is an acronym that stands for Spoofing, Tampering, Repudiation, Information Disclosure, Denial of Service, and Elevation of Privileae, and is widely used for analysina systems for different vulnerabilities and their potential countermeasures.

The module describes best practices for managing cyber-risks in supply chains and suggests strategies for ensuring the privacy of data shared amongst the trade partners. It aims to assist businesses to better understand cyber vulnerabilities and their potential threats to the traceability system. Disclaimer: This module is not a risk assessment report. The mitigation strategies and threats it describes are neither ranked nor sorted in terms of their impact, severity or risk to a given organisation. The module is intended to be used as a generic guide for business owners to determine the best security controls available to their organisations.

1. Digital technologies and modern supply chains

Digital technologies are increasingly adopted in modern supply chains, bringing many benefits including ease of data sharing amongst the trade partners, access of product related data whenever needed and end-to-end traceability of products. It is also useful for end-users to have product specific data because it enables them to make more informed decisions when purchasing a product.

The increased adoption of Information and Communication Technologies (ICT) in supply chains, however, has focused attention on cyber threats, and their potential to leak business data, disrupt business operations, and provoke financial, intellectual and reputation losses. Cyber threats occur most often because of the exploitation of vulnerabilities in these technologies or because of other weak links in business processes.

The STRIDE threat model

Using the traceability architecture of Microsoft's STRIDE threat model, this module provides businesses with potential mitigation strategies against common cyber threats to the seafood industry. Figure 1 shows STRIDE's four layered food traceability data flow architecture: the data carrier layer, data capture layer, data sharing and the application layer.

Figure 1: General traceability architecture



The *data carrier layer* is comprised of the means such as barcodes, RFID (Radio Frequency Identification) tags, IoT (Internet of Things) devices and Near Field Communication (NFC) tags) that are used to carry information related to products and other entities within the supply chain.

The *data capture layer* records the identification data from the various physical identification techniques attached to the products moving in the supply chain.

The *data sharing layer* contains a central repository of master data recorded for the

products as well as a distributed repository that can be accessed by various participants of the supply chain.

The application layer comprises software systems that access traceability data to provide services. This general food traceability architecture can be extended and applied to any specific food traceability process such as seafood traceability as shown in Figure 2. The STRIDE model analyses threats to supply chains by looking at common issues such as spoofing, tampering, repudiation, information disclosure, denial of service, and elevation of privileges.

Spoofing: these threats aim to subvert the authentication mechanism of the system by using fake or cloned credentials.

Tampering: these attacks target the various components of the system where the ICT components and data stored in them are tampered with to cause adverse impact to the system.

Repudiation: these attacks target the system's vulnerability in logging and tracing activities to prevent detection and identification of malicious activities.

Information Disclosure: these threats aim to access unauthorised information from the system and disclose to unauthorised end users.

Denial of Service: these attacks target the availability of the system in order to deny service to valid users.

Elevation of Privileges: this occurs when an unprivileged user or adversary gains unauthorised access to the system and performs actions higher than what they are authorised to perform leading to system compromise.

To identify the threats to the food traceability system, it is useful to understand the stages and all the assets through which the data flows from source to destination.

The STRIDE threat model can be applied to the traceability data flow architecture layers to highlight the various layer specific threats see Figure 2 opposite. Figure 2: Seafood traceability



2. Threats and vulnerabilities associated with the Data Carrier Layer

The data carrier layer focuses on the identification and description of the various assets that carry the product data and are physically attached to the assets to track and monitor the product locations and conditions. Table 1 shows the three main assets in the data capture layer that contain product information and/or monitor products in the food supply chain. An explanation of all terms and acronyms is provided in the glossary at the end of this module. Table 1: Data Carrier Layer - Assets

Asset Description

Barcode	Barcodes capture various product-related information such GLN, GTIN, SSCC
RFID tags	Hardware RFID tags used to store the EPC
loT devices	Hardware sensor devices used to monitor and track the products and packages such as sensors and loggers that monitor for environmental conditions of temperature and shock/vibration and shipment tampering.

Barcodes

Cyber attackers can exploit barcodes to launch several types of attacks. For example, a motivated adversary can launch attacks using methods such as Advanced Data Formatting, ASCII¹ control characters, or encode malicious data into different barcodes to facilitate the attacks that can exploit the subsequent layers (e.g., data capturing and data sharing).

Figure 3 (next page), shows a common RFIDbased supply chain system and the various assets through which the product data moves.

The data is first added to the data carriers such as barcodes, Radio Frequency Identification (RFID) tags, NFC (Near Field Communication) tags or IoT devices. The reader devices are then used to capture the information from these data carriers and pass it to the middleware applications which provides various interfaces to the supply chain applications.

An EPCIS (Electronic Product Code Information Services) event is a structure that represents real-world events shareable among trading partners. These communicate the What (the object involved), Where (the location), When (the date and time) and Why (the business step) of an event.

¹ ASCII is American Standard Code for Information Interchange. It's a 7-bit character code where every single bit represents a unique character. Figure 3: Data flow diagram of a RFID based supply chain application



Examples of maliciously encoded data may include the following.

- A motivated adversary can encode a malicious URL in QR codes to launch popular Phishing attacks, that redirects the scanner to an illicit web address to capture sensitive data (e.g., credential of user/scanner)²³⁴. These malicious sites can in turn inconspicuously install malware on the system by leveraging exploit kits that fingerprint the device and selects the appropriate exploit and malware⁵.
- Similarly, it is also possible to integrate one barcode into another (e.g., QR in QR or Data Matrix in QR), and since the readers generally conforms to multiple standards, the embedded barcode may be read by the reader which can potentially carry the harmful commands or may direct to malicious sites⁶.

Other threats pertaining to barcodes at this layer include:

- Barcodes can be cloned and attached to fake products.
- Adversaries can physically tamper with the barcodes, leading to denial-of-service by rendering the barcodes unreadable.
- Information encoded in a barcode may be readable by any scanner if there is no mechanism in place that ensures scanning by only an authorised scanner (i.e., information disclosure).

²Krombholz, et al (2014). QR Code Security: A Survey of Attacks and Challenges for Usable Security. In Human aspects of information security, privacy, and trust (pp. 79–90). Cham: Springer International Publishing.

 ³ Kieseberg et al., (2012). Malicious pixels using qr codes as attack vector. In Trustworthy ubiquitous computing (pp. 21–38). Springer.
 ⁴ Vidas et al., (2013) Qrishing: The susceptibility of smartphone users to qr code phishing attacks.

^sKharraz, Kirda, Robertson, Balzarotti,& Francillon, (2014) Optical delusions: A study of malicious QR codes in the wild

^eDabrowski et al. (2014), <u>Qr inception: Barcode-in-barcode</u> <u>attacks</u>



Radio Frequency Identification (RFID) Tags

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify, and track tags attached to objects. The advantages of RFID tags over barcodes include faster and more accurate scanning of products and larger storage for product information. It has resulted in a wider adoption of RFID in supply chain applications, however, the use of RFID tags instead of barcodes introduces several cyber security vulnerabilities to the supply chain system.

RFID tags have the following vulnerabilities that adversaries can exploit to launch cyber-attacks on supply chain system.

- RFID tags can be detached from a genuine product and attached to fake products -i.e., tag snatching. This can be used to insert fake products to the supply chain by using the identity of a genuine product.
- Physical access to RFID tag may enable an adversary to create a replica of a tag by performing the reverse engineering that may reveal the confidential information stored on the tag.
- RFID tags may be forged and used to masquerade as a valid tag (i.e., spoofing attacks). A typical example could be to read a tag's data from a cheap item (e.g., in a retail store) and then upload that data to another tag attached to some other more expensive item.
- RFID tags can be used as a medium to propagate viruses.
- The tag data may be corrupted or manipulated by an adversary by using a malicious tag writer.
- The memory limitations on RFID tags may make it vulnerable to kill comman DoS attacks.

Internet of Things (IoT) Devices

IoT devices are hardware devices such as sensors, gadgets, appliances and other machines that collect and exchange data over the Internet. The increasing adoption of IoT for food traceability can open attack vectors as various device level IoT vulnerabilities' have been identified primarily targeting the device, communication protocols, and the applications used in IoT environments.

Potential vulnerabilities of IoT devices include the following:

- IoT devices are prone to hardware level attacks such as device tampering, cloning, device capture attacks. In food supply chain such attacks can have adverse impact on food traceability and food quality.
- Attacks such as reverse engineering attacks and IoT malware attacks target the IoT software. Credentials obtained by brute force attacks or extracted from firmware can be used to perform lateral attacks that target other parts of the traceability system.
- Poor IoT security measures built into IoT firmware as well as faster time to ship devices results in vulnerable IoT devices prone to cyber-attacks. Software backdoors installed by malicious manufacturer or software developer can be used to remotely access IoT devices and data stored in them.
- Lack of IoT firmware support can result in unpatched devices connected to the supply chain network leaving the supply chain system vulnerable to cyber-attacks.
- Insecure user practices such as using weak passwords and use of default passwords for Internet exposed IoT devices have resulted in many recent malwares targeting the consumer IoT devices.

 Use of heterogenous IoT devices and their evolving IoT technologies can introduce challenges in managing such diverse range of devices and lead to vulnerabilities in supply chain which can be leveraged by adversary to target the supply chain system.

3. Threats & vulnerabilities associated with the Data Capture Layer

The Data capture layer focuses on assets and interfaces that facilitates the capturing of product data encoded in carriers attached to the product, and its subsequent conversion to a format that is suitable for different applications and storage in repositories. The assets related to data capture layer are:

- Barcode printers and scanners
- Barcode readers
- Tag writers and readers
- RFID Air Interfaces (The air interfaces provide a common Radio Frequency operating range and a standard communication protocol to facilitate the tag and reader to communicate)
- RFID Software Interfaces (the middleware between the RFID tags and the applications that access RFID data and help in transforming the RFID stored data into format required by the upper layer applications. These interfaces, the following examples.

⁷ Neshenko et al (2019). Demystifying IOT security: An exhaustive survey on IOT vulnerabilities and a first empirical look on internet-Scale IO exploitations





Barcode Scanner/Printers/Host Applications

Barcode scanners that are directly connected to the host system pose a cybersecurity threat to the host system and other layers of the supply chain system.

Table 2: Threats and potential mitigation strategies in the use of Barcodes

Threats		Potential Mitigations
S poofing	Cloning or reprinting bar- codes	Use the potential anti-copying and anti-cloning methods for example, the use of special printing material, physical unclonable functions (PUF), digital water marking and high-density black and white blocks for preventing illegal copying of barcodes. These mitigations may increase the cost.
T ampering	Physical tampering, embedding malicious data or attaching unauthorised barcodes.	Use the tamper-resistant and durable materials for making barcode labels with additional security of voiding tampered labels Similarly, implement the tamper detection for QR codes. For example, integrate the digital signature of a barcode content in the error correcting area by using stenographic techniques. These countermeasures can be complemented with market vigilance on the part of the brand owner and trading partners.
Repudiation	Denying malicious actions due to lack of logging capability	Repudiation attacks are difficult to defend as barcodes are non- electronic and any logging of actions is not possible.
Information disclosure	Leaking sensitive information due to the lack of or weak encryption mechanisms.	Use security enhanced barcodes such as Secret-function- equipped QR codes (SQRC) that carry an additional private information that may be accessible through a purpose-built scanner with the correct cryptographic key.
D enial of	Carrying out buffer over- flow attacks by embedding malicious codes.	Use limits on the data that is being read to block any potential buffer-overflow attack.
Elevation of orivileges	Carrying out SQL injection attacks and QR Code Phishing attacks. SQL injection (SQLi) is a web security vulnerability that allows an attacker to interfere with the queries that an application makes to its database. It generally allows an attacker to view data that they are not normally able wto retrieve.	Incorporate security features in scanners or host device to block the execution of malicious commands or loading of malicious URL for example incorporate threat signature library.

Vulnerabilities that affect the barcode scanners include the following:

- Unauthorised scanners can be interfaced with the host system to send malicious commands to the system
- Malicious scanner manufacturers can load malware/spyware to the firmware or Operating System to monitor the scanning events and data scanned by the scanners. As these handheld scanners are connected to the organisations Wi-Fi systems these devices can pose security threat to the organisation.
- Lack of security updates and patches to vulnerable scanner OS/Firmware can be exploited by adversaries to compromise the device
- Insecure barcode software applications installed on the host system can be used to compromise the host system and other network computers
- Vulnerabilities on the reader applications can be exploited using crafted barcodes to compromise the system as scanners can be used to insert keystrokes in the host computer.
- Networked barcode printers can be compromised and caused to print invalid barcodes or be disabled causing outages.
- Scanners can be compromised using malicious barcodes which can be used to further get access to the supply chain network.

Table 3: Threats and potential mitigation strategies in the use RFID tags

Threats		Potential Mitigations
S poofing	Attaching cloned, forged counterfeited tags	Use tamper evident RFID tags that alerts if tags are detached from an item and render them unusable. Use anti-counterfeiting techniques, such as PUFs, chipless RFID tags), and distance bounding protocols that utilize broadcast and collisions to find cloned tags).
Tampering	Physical tampering, modifying tag memory or unauthorized tag killing.	Use RFID authentication protocol and write protect memory banks to prevent data manipulation. Use malicious tag data detection techniques in the RFID middleware.
R epudiation	Denying malicious actions due to limited memory on tags to store logs.	Allocate sufficient memory to log tag manipulations.
Information disclosure	Reverse engineering stolen or discarded tags to access data due to weak encryption and weak authentication	Use mutual Reader/Tag authentication and encryption to prevent unauthorised access. Use shielded enclosures to protect against any unauthorized access to tag data outside the legitimate access area.
D enial of service	Causing buffer overflow by inserting malicious tag data.	Perform exception handling at the reader applications. Increase the data buffer size.
Elevation of privileges	Accessing tags and installing malware on RFID tags.	Incorporate security features in reader/middleware to detect the presence of malicious viruses and malware in the tag's memory.

Vulnerabilities that affect the RFID Reader/ Writer include the following

- An adversary can also compromise the legitimate RFID reader and use it to access data read from a tag.
- An attacker can place malicious readers in the vicinity of products to have an unauthorised access to the stored data
- An adversary can use malicious readers to read data from a real tag and write it to fake tags to conduct the relay attacks.
- An attacker may use a malicious writer to manipulate the tag data or kill the tag leading to a DoS (Denial of Service) attack.
- An adversary may insert hardware trojans in readers/writers in the fabrication process of Identification Codes (ICs) used in these devices to have an unauthorised access to the data.

RFID Air Interface

The majority of the threats to RFID systems emerge from the air interfaces between the tag and reader RFID aids machines or computers to identify objects, record metadata or control individual target through radio waves. Connecting an RFID reader to the terminal or Internet, the readers can identify, track and monitor the objects attached with tags globally, automatically, and in real time, if needed.

This is the Internet of Things (IoT) and the RFID is often seen as a prerequisite for the IoT. A representative set of threats that may emerge from the vulnerabilities of air interface is listed below. Table 4: Threats and potential mitigation strategies in the use IoT devices

Threats		Potential Mitigations	
S poofing	Impersonating device credentials. Cloning IoT devices to bypass authentication.	Use strong authentication mechanism e.g., device- characteristics-based mutual authentication. Use multi-factor authentication.	
Tampering	Tampering firmware to access sensitive information. Physically damaging and disabling the IoT device.	Encrypt and digitally sign the firmware binaries to preserve their confidentiality and integrity. Enforce a secure boot process to prevent modification of a back- doored firmware. Authenticate and encrypt device update process. Physically secure the IoT devices from being tampered.	
R epudiation	Denying malicious actions by erasing the IoT device logs or due limited memory for logs.	Use cloud locations to store critical event logs.	
Information disclosure	Reverse engineering stolen or discarded tags to access data due to weak encryption and weak authentication	Encrypt data. Use cryptographic operations resistant to side- channel analysis. Avoid hard coding encryption key in firmware.	
Denial of service	Sending unnecessary communication requests to drain a device's batteries	Use middleware platform that can detect attacks DoS attacks.	
Elevation of privileges	Installing malware or adding IoT devices to Botnets.	Protect against unauthorised access to firmware by encrypting the binaries (Infosys, 2020). Detect and disable malicious or compromised IoT devices. Enable strong access control. Disable unnecessary services running on IoT devices.	

RFID Software Interface (Middleware)

RFID Middleware is a radio-frequency identification (RFID) software that sits between the readers and the enterprise/business applications. The middleware has several functions and plays a major role in RFID system operation and management. The middleware not only manages RFID readers and printers and communicates between these devices and your business applications but also manages, filters, aggregates, and makes sense of the data coming from the RFID tags.

4. Threats & vulnerabilities associated with the Data Sharing Layer

In order to support the traceability of products, GS1 provides global traceability standards which support the identification, capturing and sharing of traceability data such as the master data and transactional data and the event data related to the products.

Table 5: Barcode Scanner / Writer/ Reader Applications threats and mitigation strategies

Threats		Potential Mitigations
S poofing	Using unauthorised scanners.	Mutual authentication between barcode scanners and the host computer system to prevent unauthorised connections.
Tampering	Tampering software/firmware and installing backdoor on scanners.	Implement access control polices. Digitally sign and encrypt firmware updates. Physically secure Wi-Fi connected handheld barcode scanners from unauthorised usage.
R epudiation	Denying malicious actions by clearing logs or scanner events on reader software application.	Logging needs to be enabled and secured on all the scanner devices and reader applications.
Information disclosure	Using compromised scanner and host applications. Eavesdropping attack on Wi-Fi connected handheld scanners.	Encrypt the communication between scanners and host applications. Patch the scanner firmware and reader applications regularly.
D enial of service	Jamming attacks or sending unnecessary Bluetooth messages to wireless scanners.	Implement anti-jamming techniques and use secure Bluetooth communication using fingerprinting techniques. Secure and patch the communication mechanisms used by wireless bar- code scanners to prevent DoS attacks.
Elevation of privileges	Deploying malware to scanners/readers.	Incorporate the access control levels on the host systems to prevent reader applications from having privileged access.

GS1 defines three different standards for data exchange between trading partners within the supply chain. These include Global Data Synchronization Network (GDSN) used for sharing Master Data), Electronic Product Code Information Services (EPCIS) used for sharing Visible-Event Data, and Electronic Data Interchange (EDI) used for sharing Transactional Data as highlighted inFigure 4 (below).

Figure 4: GS1 Traceability data standards



- Master Data refers to data that shared by one trading partner with many others and contains the description of attributes of real-world entities identified by GS1 ID keys. Examples include trade items and physical locations etc.
- Transactional Data refers to execution of a business process function such as supply contract, custom processing, order placement, and final settlement using the GS1 identification keys.

Table 6: Data Sharing Layer - Assets

 Visibility-Event Data - refers to details of physical activity of products (or other assets) identified by keys within the supply chain, detailing where and why products are at a time within and across the organisations.

Assets relevant to the data sharing layer are in Table 6 below.

I. Asset	Description
GDSN Data Pools	The data pools contain the product information (product catalog and product prices) which is shared among the trading partners. The data pools can be either maintained by a third-party or can be deployed internally by the trading partner.
GDSN Registry	The GS1 global registry is a directory of registered parties and products which also federates between data pools. It also serves as the pointer for data pools with respect to the master data of products and parties.
EPCIS Capture Interface	With this interface, visibility event data in accordance with EPCIS data model is delivered from capturing applications to a receiver (e.g., persistent repository of EPCIS data).
EPCIS Repository	A persistent store of visibility event data, comprising all EPCIS events generated internally within the organisation and received from other trading partners and makes them available to be used by the EPCIS Accessing Application.
EPCIS Query Interface	With this interface, EPCIS event data may be requested by and delivered to a business application or a trading partner.
AS2 (Applicability Statement 2)	Communication protocol used for GDSN synchronization and sharing EPCIS event data with trade partners. Applicability Statement 2 (AS2) is a specification on how to transport structured business-to-business data securely and reliably over the Internet.
Global registries	'Thin' registries, that is, registries of basic brand-authorized facts about items that are identified using GS1 keys. These provide an important reference against which more detailed data can be checked.
Resolver services	Based on the GS1 Digital Link standard, resolvers provide a means to connect identified items to EPCIS repositories and other traceability information, master data, promotional data, usage information and instruction manuals, information for patients and clinicians, and more.

Vulnerabilities of Data Sharing Layer Assets and potential mitigations

The Global Data Synchronisation network (GDSN) uses XML message format to exchange and update product information, which means the data pools can be vulnerable to various XML based attacks that target vulnerabilities in XML message formats. The Extensible Markup Language (XML) is a simple text-based format for representing structured information including documents, data, configuration, books, transactions, and invoices.

Table 7: RFID Reader/Writer/Air Interface threats and mitigation strategies

Threats		Potential Mitigations
S poofing	Using malicious readers and writers. Replay attacks.	Use strong authentication between readers, writers and tags. Use timestamps, counters, and challenge response protocols to protect against replay attacks.
Tampering	Tampering or reverse engineer the reader/writers firmware.	Enable authentication and access control to prevent tampering. Encrypt and digitally sign the firmware updates.
R epudiation	Denying malicious actions due to limited logging capability.	Enable logging on all readers/writers.
Information disclosure	Eavesdropping unencrypted communication. Extract authentication keys by analysing power fluctuations. Divert communications to malicious devices by impersonation attacks.	Encrypt communication between tag and reader. Filter the power signal or delay the computation randomly to make power analysis difficult.
Denial of service	Carrying out RF jamming attacks on communication or desynchronization attacks between endpoints. Unauthorised killing of tags using malicious writers.	Use mutual authentication to prevent desychronisation (attacks and launching kill command attacks. Use external noise/radio shielded enclosure to protect against the RF jamming attack.
Elevation of privileges	Compromising readers/writers using malicious data.	Built in security features in reader to detect malicious data from tags.

EPCIS Capture Interface / Query Interface

The communication channels between the middleware, EPCIS repository, and query interface must be secured, as this could be targeted by an adversary to access sensitive data. The RFID software interface is comprised of Low Level Reader Protocol (LLRP) and Application Link Enabling (ALE) middleware. In accordance with the GS1 Electronic Product Code network architecture defined by EPC global, LLRP resides between the Filtering and Collection role and the reader.

Table 8: RFID Middleware threats and mitigation strategies

	Threats		Potential Mitigations
	S poofing	Connecting to RFID middleware using malicious readers or scanners. Potential replay attacks.	Mutual authentication between readers and ALE middleware. Use sequence numbers and timestamps to protect against the replay attacks.
	T ampering	Tampering LLRP communication or middleware applications by deploying back- doors and unauthorised code.	Build security feature in middleware that can check for insertion of any malicious data. Enable authentication and access control between reader and ALE.
2	R epudiation	Improper logging configuration or deleted logs.	Enable activity logs that track modifications and communication in middleware.
	Information disclosure	Eavesdropping unencrypted Eavesdropping unencrypted LLRP communications. Man-in-the- middle (MiTM) attack is a type of cyber-attack in which the attacker secretly intercepts and relays messages between two parties who believe they are communicating directly with each other.	Use of encryption in LLRP communication as well as the middleware to protect against the eavesdropping between a reader and ALE.
z	Denial of service	Using malicious values in the reader protocols to cause buffer overflow attacks. Corrupting the ALE interface with malicious reader values.	Use programming languages that offer bound checking to protect against buffer overflow.
	Elevation of privileges	Compromising ALE interface to gain unauthorised access. Launching cross-site scripting or SQL injection attacks.	Build a security feature in readers and middleware that accepts data only in predefined format to protect against code injection.

EPCIS data

GS1 Electronic Product Code Information Services (EPCIS) is an open standard which allows businesses to capture and share supply chain information about the movement and status of goods, both within their enterprise and with their business partners. The EPCIS Standard enables disparate applications to create and share visibility event data, both within and across enterprises. It helps provide the "what, when, where why and how" of products and other assets, enabling the capture and sharing of interoperable information about status, location, movement, and chain of custody.

The potential attacks that may be mounted here include the following:

- Eavesdropping If the data sent from middleware to backend EPCIS repository, or other trading partners is not encrypted, this can result in MiTM attacks
- Replay attacks An attacker may record the communication between middleware, repository, and other trading partners, and use it later to perform some malicious activity such as send malicious data to repository or to some other applications.
- **Spoofing** Without the appropriate mutual authentication malicious readers may succeed in sending data to repositories or unauthorised application or trade partner can request data from a reader or repositories.
- With limited authorisation mechanisms specified in the GS1 ECPIS standards (GS1, 2014), adversaries can perform unauthorised actions by elevating their privileges.

• XML injection attacks through the SOAP webservice interface or use search-based techniques to find malicious combinations of input data to compromise (GS1, 2014) the EPCIS webservice can be launched. SOAP is a messaging protocol for exchanging information between two computers based on XML over the internet. SOAP messages are purely written in XML which is why they are platform and language independent.

5. Threats & vulnerabilities associated with the Application Sharing Layer

The application layer is the uppermost layer in the data flow architecture where end-user applications access the traceability data to perform various tasks. The traceability data is accessed by various end-user applications such as Enterprise Resource Planning (ERP) tools, Supply Chain Management (SCM), audit applications, consumer applications, monitoring and analytic tools.

These applications that access the traceability data can be broadly categorised into business to business (B2B), business to government (B2G) and business to customer (B2C). Due to complex interrelationship between the food producers, supply chains, consumers, financial institutions and government organisations, weakness or vulnerabilities in any one domain can lead to cyber security risks to the entire food traceability system.

Business to Business (B2B) application vulnerabilities

Enterprise resource planning (ERP) and Supply Chain Management (SCM) software

Enterprise resource planning (ERP) refers to a type of software that organisations use to manage day-to-day business activities such as manufacturing, sales, and finance. Security vulnerabilities can therefore significantly impact the success and survival of the business. Supply Chain Management (SCM) software manages activities such as procurement, supply chain planning (e.g., inventory planning, and product lines maintenance), and logistics. Because SCM systems need to interact with multiple other partners and businesses, it can lead to the unintentional revealing of important information and other cyber-attacks.

Table 9: Threats to Data Repositories and potential mitigations

Threats		Potential Mitigations
S poofing	Using stolen/ spoofed credentials. Using stolen authorisation token to access event data repositories.	Enable strong authentication (e.g., multifactor authentication) prior to giving access to critical data stored in data pools.
T ampering	Tampering the master data. Compromising a single weak trading partner.	Allow only authorised individuals to make any changes to product related information after verifying their identity.
R epudiation	Denying malicious activity due to improper logging or log configuration errors.	Enable logging on repositories.
Information disclosure	Carrying out data breaches at the global registry servers. Malware infected repositories may lead to data leakages.	Ensure that correct data is being shared only with authorised partners. Enable protection against virus and malware. Accept data only in pre-defined format to protect against any malicious data fed to event data repositories.
D enial of service	Flooding Master/event data queries. Malicious payload in XML files, or oversized XML documents.	Protect against different types of XML attacks.
E levation of privileges	Compromising master and event data repositories. SQL injection attacks on repositories. Malicious payload of AS2 or from RFID tags.	Ensure that access tokens for event data is shared with correct partners. Allow data pool access only to authorised partners. Protect against malicious XML payloads that may lead to unauthorised data retrieval.

Enterprise resource planning (ERP) and supply chain management (SCM) vulnerabilities

- Ransomware can impact ERP/SCM systems leading to the disruption of critical business activities and often causing significant financial losses to the business.
- ERP/SCM systems protected with weak authentication such as simple passwords can be precarious since passwords are easy to hack.
- Allowing full data access and edit privileges to everyone in ERP system can lead to unauthorised information disclosure.
- Failing to keep up with the software updates to alleviate the impact of known security issues can also impact ERP system.
- ERP systems may also be impacted by application vulnerabilities such as XSS and SQL injection attacks.
- ERP/SCM software may be impacted by Malwares.
- An attacker may exploit the vulnerabilities in ERP/SCM software applications to conduct different types of attacks.
- Insecure communication between ERP/SCM applications and backend servers can lead to eavesdropping/MiTM attacks.

Cyber vulnerabilities arising from the use of data analytics

The use of various applications in the food traceability system will result in a significant amount of data being generated from various sources which relate to consumers, traceability of products, various events on supply chain, manufacturing processes and various physical devices involved in product movement from source to destination. The sensitive nature of data in this domain can lead to several vulnerabilities.

- Unauthorised access to data by various parties involved in data analysis and possible data leak due to weak security practices.
- Third-party client applications collecting user's data without their consent
- Vulnerabilities to privacy of consumer information due to lack of privacy measures when analysing sensitive data which may contain personal identifiable
- Vulnerabilities to privacy of manufacturer and supply chain trader's information which can include trade secrets and financial information
- Adversarial attacks to data analysis tools or data tampering attacks.

Table 10 shows the Threats to Data Sharing Interfaces and potential mitigations.

Table 10: Threats to Data Sharing Interfaces and potential mitigations

Threats		Potential Mitigations	
S poofing	Carrying out impersonation attacks or replay attacks due to lack of mutual authentication between a middleware and repository.	Enable mutual authentication between capture application, accessing application, repositories, and repository and trade partners.	
Tampering	Tampering data in transit, sending tampered content.	Accept data only from authenticated readers /trade partner in proper format to prevent data corruption. Allow only authorised individuals to makes changes to master and event data.	
R epudiation	Denying malicious actions due to improper logging or log configuration errors.	Enable activity logging.	
Information disclosure	Conducting information theft due to lack of encryption and mutual authentication between capture application, repositories, and trade partners.	Encrypt the communication between middleware, accessing application, repositories, and repository and trade partners.	
Denial of service	Sending malicious data and corrupting capture and query interface. Sending unnecessary queries to exhaust resources.	Accept data only in pre-defined form from data carriers and enable anomaly detection to detect and prevent malicious data and anomalous requests.	
E levation of privileges	Exploiting weak authorisation mechanism.	Mutually authenticate capture application and repositories. Accept data only in predefined from data carriers and trade partners. Incorporate proper redaction to alleviate the unauthorised access to data (redaction refers to denying a data request or restricting the amount of data requested by a trade partner (GS1, 2017).	

Business to Customer (B2C) application vulnerabilities

The B2C applications allow customers to access the traceability data related to the products they purchase. Organisations provide applications often in the form of mobile applications that allow customers to access traceability related information.

These consumer facing applications can be vulnerable to various vulnerabilities such as the following:

- Consumer errors can occur which can could lead to accidental deletion of data, accidentally revealing access credentials or fall victim to social engineering attacks which harvest sensitive information leaving the consumer facing software applications vulnerable to cyber-attacks such as compromise, elevation of privileges or information disclosure.
- Consumer related data stored in backend servers without adequate privacy measures can reveal sensitive user information.

- The consumer facing client mobile applications, or the backend servers can be vulnerable to malware attacks which could result in infected mobile applications or infected backend server applications.
- The Internet facing traceability application servers can be targeted with DoS attacks to result in availability issues.
- Insecure communications between client application and backend servers can result in eavesdropping.

Table 11: Threats and mitigation strategies for data sharing protocols

Threats		Potential Mitigations
S poofing	Using stolen digital certificates for bypassing authentication.	Keep digital certificates in secure locations such as on an encrypted device and hardware security module. Keep the OS and antivirus up to date and avoid running any suspicious program.
Tampering	Tampering HTTP/S based communications or tampering the payload. Tampered XML schema, malicious characters in XML documents.	Use strong hash algorithms so that collision attacks are not possible and any attempt to tamper the sent data will be detected. Use strong XML payload encryption and validation of XML documents.
R epudiation	Performing malicious actions on communication servers and removing traces of adversarial actions.	EEnable logging of all operations.
Information disclosure	Poisoning DNS cache leading to MiTM attacks or using stolen digital certificates to get access to the EDI data. Accidentally or with malicious intentions revealing private keys or credentials.	Ensure that digital certificates are kept in secure locations. Use strong public-private keys for asymmetric encryption.
D enial of service	Flooding based application layer attacks against server Large size XML documents and exploiting XML parser.	Prevent HTTP/S or application message flooding attacks by incorporating techniques such as traffic profiling, computational challenges, firewall, and constant monitoring of threats
Elevation of privileges	Compromising weak supply chain trading partner's EDI servers to gain privileged access. Sending malicious communication pay- load such as malware infected Excel files, or XML based attacks	Check for malicious payloads such as XML injects attacks

Table 12: Assets in Application layer

Туре	Asset	Description
3*B2B	ERP, SCM	Various ERP systems of manufactures to supply chain traders access the traceability data for inventory management, order management, shipping, transportation, and financial transactions related to food products (GS1, 2012). SCM systems are used to manage the flow of products from source to destination
	Traceability/Supply chain Analytic	Such applications are used in the supply chain industry to use traceability data for conducting exploratory analysis
	Audit Applications	These applications are primarily used for ascertaining the compliance of traceability standards and regulations
B2C	Consumer Application	These applications enable consumers to access the information related to the products they purchase in terms of the origins for food products

6. The potential Impact of cyber threats on Traceability Systems

This module has described the vulnerability of traceability systems across the length of the supply chain. The diversity of the system landscape and the large number of stakeholders increases the potential impact.

This section describes some of the potential impacts of cybersecurity threats to the traceability system. The data carrier layer is prone to more physical tampering attacks compared to other layers. The data carriers such as barcodes and RFID tags carry primary identifiers and are physically attached to the products, so are susceptible to tampering attacks that aim to introduce counterfeit goods or divert goods to unauthorised third parties.

The upper layers are more prone to communication channel-based attacks that aim to either gain unauthorised access to the traceability system or cause disruptions and delays in supply chains.

Best Practices for Managing Cyber Risks in Supply Chains

Research conducted by the <u>Global Supply Chain</u> <u>Institute</u> in 2020 outlined several best practices for managing cyber risks in supply chains. They interviewed 30 senior executives who manage the complex global supply chain and several solution providers in supply chain. Their suggested best practices are outlined below.

Cataloging and mapping the processes

Cataloging the cyber inventory may be considered as a first step towards understanding the cyber risks. Mapping of supply chain (i.e., cataloging hardware and software) nodes gives visibility into the people and processes that leverage IT systems and current defence mechanisms such as the firewall. This knowledge can help in devising effective risk protection mechanisms.


Ensuring you have a clear cyber strategy in place

An effective and clear cyber risk management strategy should be in place to counter any threats. For example, one of the possible approaches that may serve as a basis for developing comprehensive cyber strategy is the NIST Framework shown in Figure 5. The NIST Cybersecurity Framework is a set of guidelines for mitigating organisational cybersecurity risks, published by the US National Institute of Standards and Technology and is based on existing standards, guidelines, and practices.

Figure 5: NIST Risk Management Strategy

Detect: an organisation's ability to identify the

occurrence of any cyber incident.



Table 13: Threats and potential mitigation strategies B2B Application layer

Threats		Potential Mitigations
S poofing	Using compromised credentials to access to access the ERP/SCM and Cloud computing systems.	Protect ERM/SCM systems with strong authentication mechanisms.
Tampering	Exploiting weak access control measures or causing shared memory attacks on cloud nodes to tampering data.	Allow only authorized individuals to modify the traceability data using access control measures.
R epudiation	Denying malicious actions by deleting logs and associated traces to cause non-repudiation attack.	Enable logging of all operations.
Information disclosure	Exploiting weak authentication, weak access control or insecure communication between B2B applications. Causing XSS or SQL injection attacks. Causing data breaches in cloud computing infrastructure.	Protect all communication with encryption to alleviate chances of any unauthorized access to data. Enable strict query checking to prevent SQL injection attacks. Enable robust authentication and using it enable fine-grained access control. Use of privacy preserving techniques such as differential privacy
Denial of service	Launching ransomware attacks or exploiting the vulnerabilities in the ERP/SCM software	Train staff on ransomware and how they impact system Scan systems regularly with good anti-virus.
E levation of privileges	Circumventing weak application authorisation controls. Infecting ERP/ SCM server with virus or malware. An adversary exploiting known software vulnerabilities.	Incorporate fine grained access control. Protect against virus/malware. Update software as soon as they are made available to patch any known security vulnerabilities.

Table 14: Threats and potential mitigation strategies Application Layer (B2C)

Threats		Potential Mitigations
S poofing	Using stolen client credentials or forged client identities	Enable multi-factor authentication to protect against any potential subversion of first factor of authentication.
T ampering	ETampering client and backend consumer facing applications (e.g., Leaving a backdoor or inserting a malware) or tampering traceability data	Allow only authorized individuals to modify the traceability data. Protect against the insertion of malware.
R epudiation	Denying malicious actions due to insufficient logging capabilities or by deleting logs on client applications and the backend servers	Enable logging of all operations.
Information disclosure	Exploiting insecure communication between client applications and the backend servers	Encrypt communication with back-end server.
D enial of service	Adversaries launching spamming or DoS attacks by sending unnecessary requests (i.e. sending large number of digital link queries to resolver service) to the backend servers to exhaust resources	Incorporate a reliable DoS detection and mitigation solution.
E levation of privileges	Using compromised client applications or backend servers to launch attacks	Update client application and server software regularly to fix any know security vulnerabilities. Regularly scan system for malware/ ransomwares.

Some best practice suggestions for managing cyber risk in your company

As a part of cyber risk management, organisations can identify the critical systems that hold the important business data and place a robust mechanism to protect such systems. An aggressive cyber risk management strategy for such systems might include the following strategies:

- unplugging such systems from the internet
- having qualified personnel to manage those systems
- incorporating multi-factor authentication for such systems
- mandating software updates immediately when they are available.

Instead of treating cyber strategy as an isolated operation within the four walls of an organisation, it should be extended to all components of the supply chain end-to-end by collaborating with trade partners thorough strategic principles such as collaboration, integration, and synchronization.

Organisations should adopt the latest defence mechanisms such as firewalls, endpoint security, an Intrusion Detection Systems (IDS). An Intrusion Detection System (IDS) is a monitoring system that detects suspicious activities and generates alerts when they are detected

Many businesses today are heavily reliant upon Artificial Intelligence (AI) and machine learning for analyzing the enormous amount of data to provide insights to the business leaders. These technologies are often used within the cyber strategy – e.g., in intrusion detection systems, however, they open a whole new vector of cyber threats, that must be considered and mitigated.

A common misconception in many organisations is that the cyber incidents are the responsibilities of its IT staff, but an effective strategy needs awareness amongst the entire workforce. Ongoing training on a regular basis must be conducted to effectively prepare against potential cyber-attacks. Training and awareness can also prove to be pivotal against insider misuses.

Not all cyber risks come from cyber attackers, they may often be associated with personnel within the company's supply chain, with no adversarial motives. For example, an accidental sharing of sensitive business information with someone can lead to devastating consequences. Appropriate training and awareness of company staff in partner businesses can help mitigate such insider misuses.

A supply chain is only as secure as its weakest link and many supply chains partners are SMEs that may be targeted due to their weaker cyber security settings. One way to mitigate cyber security risks in diverse and complex supply chain IT systems is by sharing the information and intelligence related to cybersecurity threats the organisations face. This information sharing can be done directly between trading partners or through a trusted third-party.

As automated supply chains rely heavily on IoT devices and cyber physical systems (CPS) it is essential that organisations have effective strategies in place to manage and establish the security policies necessary to safeguard devices and the data stored in them. As traditional security tools cannot be implemented on constrained devices, it is essential to use IoT specific measures that can play a critical role in securing the access and communication to these devices, such as lightweight authentication protocols and encryption schemes suited to IoT devices. Physical security of all the devices used within the supply chains is also important.

Within a supply chain, trading partners should ensure that they and their peers are security compliant to established standards such as <u>NIST, ISO27001</u> or <u>PCI</u>. This can be leveraged by organisations to create a strong security position and increases trust among the trading partners.

Supply chain organisations should develop an *incident response plan* to create an action plan in the event of cyber security breach. This allows supply chain trading partners to quickly resolve cyber security issues and quickly restore normalcy in the supply chains.

To protect against insider threats it is important to immediately terminate system access to any employee leaving the organization, whatever the circumstances. A disgruntled employee with access to company resources can pose serious threats to the business.

Data backup is fundamental to cyber security. It's important to back up your data regularly in case a cyber-incident erases all the data from the systems.

Table 14 outlines potential threats and mitigation strategies in the application layer (B2B).

Best Practices for Ensuring Privacy of Shared Data

When analyzing the data sharing layer in the section above we highlighted a number of threats and mitigation strategies. In multi-party supply chains, data is shared with many trading partners, raising data confidentiality and privacy concerns with implications for the business confidentiality agreement. Companies must not only emphasise *what* information can be shared and *with whom* it can be shared, but they also need to ensure that their own confidential data and the data shared by other trade partners remains secure.

Data Protection

Always encrypt data whether in rest or in transit. The use of Secure Multi-Party Computation (MPC) is recommended for securing data between several trading partners. This necessitates that all the trading partners update their security mechanisms and adopt the same security standards as their counterparts.

Anonymization

It is important to incorporate privacy-preserving publication techniques, such as k-anonymity and differential privacy, when making personal information available to stakeholders or to the public. K-anonymity is a property of a dataset that indicates the re-identifiability of its records. A dataset is k-anonymous if quasi-identifiers for each person in the dataset are identical to at least k – 1 other people also in the dataset. It is essential to test and evaluate the inherent utility vs privacy trade-off resulting from the application of these techniques.

Multi-party secure computation

Companies should consider using multi-party secure computation protocols tailored to supply chain data-sharing needs, combining inputs by different entities in a privacy-preserving manner.

Identity Establishment Prior to Data Access

Companies should consider enabling multifactor authentication on systems that hold important data. They should also consider using continuous authentication for enabling the periodic identity establishment beyond the entry-points.

Data Release

It is important to ensure fine-grained rolebased and time-bound access control so that unauthorised individuals cannot access important confidential data.

Principle of least privilege

By enforcing the principle of 'least privilege' on traceability system models, companies can ensure that traceability and provenance data are accessible to authorised parties only.

Decentralisation

De-centralised data sharing techniques such as blockchains provide a secure network to share data with added security of immutability, resilience to cryptographic attacks and updated only with peer consensus. The use of such technologies can allow supply chain partners to share data related to traceability in a transparent way.

Data Cleanrooms

Sharing sensitive product information among peers for demonstrating the competitive advantage over others is a challenging task. Solutions such as data cleanrooms and digital marketplaces have been suggested as means to securely share such sensitive information. A data clean room is a piece of software that allows brands and advertisers to run targeted advertising campaigns, apply frequency capping, measure and report on the performance of campaigns, and run attribution – all in a privacy-friendly way.

These methods can enhance the quality of the shared data and introduce transparency among the supply chain peers which are essential for competitive intelligence. An example of digital cleanroom was setup by A.T. Kearney for a fastfood chain where the sensitive information was shared among the trading partners, allowing them to optimise their supply chains.

Audit

Always log the requests made to access critical data and conduct regular audits on those logs.

Secure Data Storage

Store critical data on secure locations with proper protections (i.e., authentication and access control). Destroy any data that is not used anymore and maintain its record.

Avoid Credentials Sharing

Ensure that employees are not sharing login credentials for accessing important resources.

System Security Settings

Allow only authorised individuals to change approved security settings on critical systems (Department of Prime Minister and Cabinet, 2020).

Unauthorised Data Sharing

Ensure that data is not being shared with unauthorised persons.



Protection of Work Areas

Ensure that a work area is only accessible to authorised individuals.

Data ownership

Data ownership deals with the control and possession of data and the rights around its access, generation, modification, conducting analysis and its retention. It also entails the right to grant permissions to others.

Challenges arise when data is shared among various stakeholders to derive benefits to data owners as well as to others. In supply chains, data sharing is critical to establish traceability and hence the data ownership rights, and responsibilities of other stakeholders needs to be identified to preserve the privacy and security of data.

The use of modern technologies such as cloud computing, IoT and other emerging technologies can make the data ownership concept challenging. In supply chains where numerous trading partners work together and share product data, it can cause conflict in data ownership, because multiple stakeholders can claim ownership to data. For example, there could be conflict in ownership of the data generated by primary produces such as fishermen and seafood processing organisations.

New regulations can be introduced to deal with the data ownership issues to protect it from being misused, but this can also limit the data sharing and open access to information. International Data Spaces (IDS) argues that data sovereignty is the key in a business ecosystem where numerous organizations need to share data at the same time need to protect their data. According to IDS, there needs to be a balance between efforts to protect data and at the same time share data with others for successful business operations. IDS proposes three key perspectives in a data sharing architecture: Security, Certification, and Governance.

The security perspective aims to keep the identification of stakeholders, data exchange and data usage secure, and enable trust among the participants. The *Certification* perspective ensures only certified participants are allowed to participate in the data exchange ecosystem. The *Governance* perspective focuses on providing a trusted data exchange environment from establishing the requirements, to identifying roles, functions with the IDS. The governance also takes care of data ownership principles.

In a supply chain traceability system, the data ownership includes guidelines that oversee access rights, usage and control policies and data storage.

The following principles might apply around data ownership:

- Responsibilities for maintaining data accuracy and integrity
- Right to share or sell data to others
- Maintain and protect sensitive data
- Choose between a centralised (data owner is the parent organization) versus a decentralised (data owners are individual stakeholders) system
- Protect privacy of all stakeholders.

To maintain the correct data ownership and integrity of collected data it is important to have clear policies and procedures for various data-driven operations in supply chains. There should be agreements between stakeholders that governs data generation, collection, usage, sharing and storage.

Some key elements of such data sharing agreements should cover:

- Definition and the type of data that is going to be collected and shared
- Roles, rights, and responsibilities of all stakeholders who will deal with the data
- Security and confidentiality measures that need to be adhered by all stakeholders
- Protocols for collection, sharing and storing of data
- Data retention requirements
- What happens in the event of a data breach and responsibilities of stakeholders in such situations
- How will disputes be solved.

Supply chains organisations can adopt the <u>Five Safes Framework</u> that has been designed to enable data owners and data users to make decisions regarding the effective use of confidential and sensitive data. The Five Safes Framework breaks down decisions surrounding data access and use into five related but separate dimensions:

- Safe projects Is this use of the data appropriate, lawful, ethical, and sensible?
- **Safe people** Can the users be trusted to use it in an appropriate manner?
- Safe data Does the data itself contain sufficient information to allow confidentiality to be breached?
- **Safe settings** Does the access facility limit unauthorised use or mistakes?

Safe outputs Is the confidentiality maintained for the outputs of the management regime?

The NSW Government has developed a useful data sharing checklist for data owners which consists of criteria for data ownership and governance, data quality and metadata, data use requirements, intellectual property and disputes and liabilities.

In 2022 a Farm Data Code was developed and adopted by the National Farmers Federation in consultation with industry. The Code focused on ensuring that farmers know and control how data relating to their farms is collected used and shared. It operates as a framework through which farmers can evaluate data management and policies of their providers.

Benefits to farmers include:

- increased awareness and understanding of the ways in which providers are collecting, using and sharing their farm data
- a framework to compare providers and inform negotiations about data policies
- improvements to industry-wide data practices over time.

Benefits for service providers include:

- clear and agreed guidance on data policies
- a helpful framework to inform discussions with farmers about data.



Useful links

Farm Data Code

Five Safes Framework

<u>GS1 Australia</u>

International Data Spaces

ISO27001international standard

Microsoft STRIDE Threat modelling tool

National Institute of Standards and Technology

NSW Government data sharing checklist

PCI Security Standards Council

Glossary

- ALE Application Link Enabling
- AS2 Applicability Statement 2 is a specification on how to transport structured business-to-business data securely and reliably over the Internet.
- ASCII American Standard Code for Information Interchange. It's a 7-bit character code where every single bit represents a unique character.
- B2B Business to Business
- B2C Business to customer

- Botnets A botnet is a group of Internetconnected devices, each of which runs one or more bots. Botnets can be used to perform Distributed Denialof-Service attacks, steal data, send spam and allow the attacker to access the device and its connection.
- **DoS** Denial of Service
- EDI Electronic Data Interchange
- EPCIS Electronic Product Code Information Services
- **ERP** Enterprise Resource Planning
- **GDSN** Global Data Synchronisation Network
- ICT Information and Communication Technologies
- loT Internet of Things
- LLRP Low Level Reader Protocol
- MiTM Man-in-the-middle (MiTM) attack is a type of cyber-attack in which the attacker secretly intercepts and relays messages between two parties who believe they are communicating directly with each other.
- NFC Near Field Communication
- NIST National Institute of Standards and Technology
- PUFs Physically unclonable functions are a technique in hardware security that exploits inherent device variations to produce an unclonable, unique device response to a given input.

- **RFID** Radio Frequency Identification
- SCM Supply Chain Management
- SOAP SOAP (Simple Object Access Protocol) is a messaging protocol for exchanging information between two computers based on XML over the internet.
- SQLi SQL injection is a web security vulnerability that allows an attacker to interfere with the queries that an application makes to its database.
- XML Extensible Markup Language

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