TRACEABILITY OF FISH GUIDELINES

Application of EAN•UCC Standards in implementing EU legislation and business requirements regarding consumer information and traceability

7th November 2002

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1. Executive Summary

The Traceability of Fish Guidelines were developed together with EAN Member Organisations, the TraceFish project[1] and the national working groups. The Traceability of Fish Guidelines should be read in conjunction with the "General EAN.UCC Specifications". The adoption of the Traceability of Fish Guidelines is voluntary. They define the minimum requirements for traceability of fish. These guidelines only apply to fish that have been farmed, caught from the wild and to products processed from such fish. However, they do not apply either to shellfish or to fish used as a raw material in the production of fish meal.

The aim of the guidelines is to provide a common approach to traceability of fish by means of an internationally accepted identification system – the EAN.UCC System. The degree to which companies will implement this guideline may vary because of differences in commercial operations. However, the use of common identification and communication standards will significantly improve the accuracy and speed of access to information about traceability, as well as the logistic processes involved in the fish supply chain.

2. Limitation of the Guidelines

The Traceability of Fish Guidelines specifically address EAN.UCC numbering and bar coding for the purpose of traceability. They provide recommendations and guidance needed to understand and implement the EAN.UCC System for the numbering and bar coding of trade units (e.g. cases, boxes or bins) and logistics units (e.g. pallets). They do not address the use of EDI messages or XML schemas, which will be covered in a separate document.

These guidelines will be amended whenever deemed necessary by EAN.UCC; subsequent to which an updated edition will be published. The Traceability of Fish Guidelines are fully consistent with commercial and inter-governmental arrangements for the identification of fish where the EAN.UCC System is also being adopted. The use of EAN.UCC standards is subject to the "General EAN/UCC Specifications".

3. Disclaimer

EAN International (EAN) provides these application guidelines as a service to interested parties. These guidelines were developed through a consensus process using information obtained from within the sector, a review of applicable legislation and the application of the EAN.UCC System.

Although every effort has been made to ensure that the application guideline is correct, reliable and technically accurate, EAN International makes no warranty, express or implied, that these application guidelines are correct, will not require modification as experience and technological advances dictate, or will be suitable for any purpose or workable in any application, or otherwise.

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[1] TraceFish was a two-year project funded by the European Commission. It was aimed at bringing together companies and research institutes to establish a common position on which traceability information was to be recorded in the farmed and captured fish supply chains. The TraceFish Project conclusions recommended the use of the EAN.UCC System for the identification, bar coding, traceability, and e-communications regarding fish and fish products.

4. Acknowledgements

We would like to acknowledge the invaluable assistance given to EAN International in making the Traceability of Fish Project a success. Thanks to:

AECOC (EAN Spain)
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e.centre (EAN UK)
GENCOD (EAN France)
Indicod (EAN Italy)
Uniform Code Council (UCC)

5. Introduction

Food safety has become a critical priority for the fish supply chain. However, rather than just identifying a more generalised commodity group, an effective and cost-efficient traceability system should accurately identify any problem in food safety related to a specific geographical origin, slaughtering or processing facility, down to a vessel or to a batch of fish.

The European Commission has recognised a need to improve consumer information related to fish. Recognising this, the European Commission, the European Parliament and Council have adapted a regulation on compulsory labelling of fish (EC) 2065/2001 (here called the Fish Labelling Regulation) [2] and the legislation for food safety and traceability (Product Safety Law and General Food Law) to cover this requirement. In addition, there may also exist or be in preparation national legislation in EU member states that has to be taken into account.

The Fish Labelling Regulation aims to ensure that consumers receive information about the specie, production method and catch area. The General Food Law requires companies to have access on demand to upstream and downstream trading partners and to have traceability available at all stages in the supply chain. This also includes the preparation of feed used in the farmed fish sector.

Adopting the EAN.UCC System, a unique identification numbering system together with the use of UCC/EAN-128 Bar Codes can help users to comply with the Fish Labelling Regulation and General Food Law. These Guidelines show how to implement this legislation in an efficient manner using the EAN.UCC System. However, in this edition, the Guidelines do not contain Electronic Data Interchange (EDI)[3] solutions for Tracking and Tracing.

5.1 Global Supply Chain Standards

The reason for using internationally accepted business standards is to overcome the barriers to commerce that national, industry and company specific solutions create when they are used in place of international multi-industry standards. Trading, identification at each point of the supply chain, tracking and tracing of goods all become more expensive because of the need to fulfil different identification and communication requirements of each importing country or company. The key to designing cost-effective and efficient identification and traceability

[2] A copy of Regulation (EC) 2065/2001 can be found by visiting the European Union's official web site at http://www.europe.eu.int
[3] EANCOM® is the EAN.UCC standard for EDI messages

systems is to satisfy different customer and legal requirements by applying one global standard.

The EAN.UCC system enables efficient supply chain management and international trade by providing standard tools that allow all the fish supply chain participants to communicate in one common global language of business. The key concepts driving EAN.UCC system applications can be summed-up in three areas:

- Automation of business processes by means of automated data capture and electronic data processing. It significantly increases productivity and reduces the amount of paper-based administration and associated costs. Automation also eliminates the inevitable errors resulting from manual data entry and processing.

- Communication of information in the fastest and most accurate manner by means of standard electronic messages that automatically update computer applications with data from trading partners. Electronic communication enables companies to better manage and control their business cycle and results in improved logistics management.

- The time needed to meet identification, legal and commercial requirements, which offers strategic opportunities to improve customer satisfaction, not just by efficient product traceability, but also by re-engineering business processes across the supply chain. Time reduction increases customer service responsiveness and helps to restore consumer confidence in the event of a product recall.

5.2 The EAN Fish Traceability Project – EAN FISH

In March 2001, EAN International, together with West European EAN Member Organisations, decided to actively support the TraceFish Project. It is a project funded by the European Commission with the aim of bringing together companies and research institutes to establish a common position on which traceability information must be recorded in the farmed and captured fish supply chains. In August 2001, EAN International formally established the EAN Fish Traceability project with core membership from 10 EAN Member Organisations.

The EAN Fish Traceability Project co-operated with the TraceFish Project regarding input from users and with EAN Member Organisations from around the world that are active in the fish sector. The project team has met regularly to formulate the 'Traceability of Fish Guidelines', which are primarily intended for:

- All EU Member States (see Figure 1);

- Non-EU countries exporting to EU Member States;

- Countries that are non-EU Member States but which have decided to adopt the EU Regulation as the primary means for Tracking and Tracing in the fish supply chain.

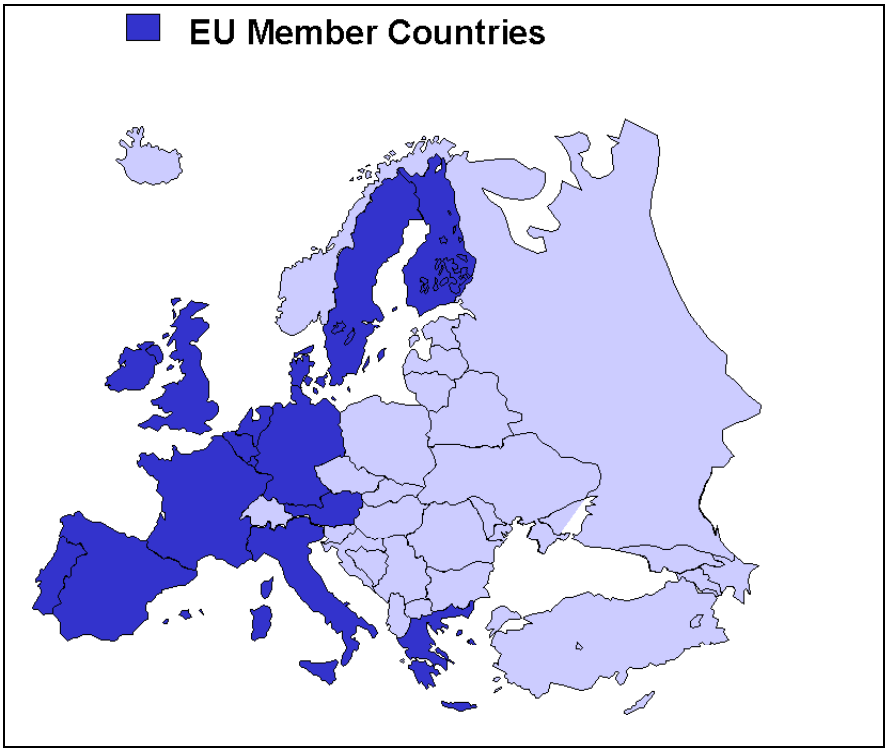


Figure 1: European Union (EU) Member States January 2002

6. Impact of legislation

6.1 Introduction

A review of the farmed, wild caught and shellfish industry shows that regulation, best practice and codes of practice associated with the sector proliferate. This 'regulation' falls into three main areas. Firstly, the conservation of wild stocks to ensure the ongoing availability of the resource for future generations. Secondly, to ensure that product supplied to consumers is free from any risk to their health and finally, is produced with due consideration to the welfare of the live fish.

It is to the second area that the work of TraceFish is primarily directed. Current regulation seeks to ensure that at each stage of fish production, processing and movement through the supply chain steps are taken to maintain product intended for human consumption, at its highest quality. However, currently the ability to trace consignments of fish through the supply chain, in a consistent manner, does not exist. Local arrangements have been implemented in some elements of the sector that aim to achieve limited traceability, but this is fragmented, uncoordinated and inconsistent in approach. The Tracefish project is intended to provide a uniformity of approach for all human consumption fish products within the EU.

6.2 An overview of the application of EU regulation to traceability of fish

The quality of food available to EU citizens continues to be of key concern to the EU authorities. General and sectoral laws, regulation and directives control many aspects of food production with these being frequently reinforced by national governments with local regulations. It is within this context that the TraceFish project was established. It is necessary to determine which specific detail of the many regulations needs to be enabled within the track and trace proposals for fish. There will of course be many areas that will not need to be included, but the ability to deliver, at each point in the supply chain, the information required by statute must be available.

There are many regulations that impinge on the sector, however, the lead document is Council Directive 92/59/EEC which covers General Product Safety. A later Directive COM(2000) 139 revised the earlier document and added many new areas of interest. Full supply chain traceability is one of the significant new requirements.

EC 178/2002 concerning General Food Law requires each stage in the supply chain to have access on demand to its upstream and downstream trading partners. In addition it specifically includes the production of animal feed stuff where the animals to which it is to be fed are intended for food production. There is also a specific requirement to ensure that animals that will be used in the production of feed on fish farms is covered.

On 01.01.02 the Commission Regulation 2065/2001 concerning information available to consumers about fishery and aquaculture products became effective.

E*C 2065/2001 requires the following information to be available to the consumer*

Available information	**EAN.UCC solution**
Commercial name and scientific name	Related to GTIN + human readable text
Production method	Related to GTIN + human readable text
Catch area	Related to GTIN + human readable text

For wild caught fish, a reference to the sea area in which it was caught shall be provided and for fish caught in fresh water the country in which it was caught requires notification. Farmed fish require the notification of the origin of its final development to be specified. Where farmed fish have been reared in different countries, the EU Member State may authorise the various countries in which it has been farmed to be indicated. When offering product to the final consumer, the scientific name is voluntary.

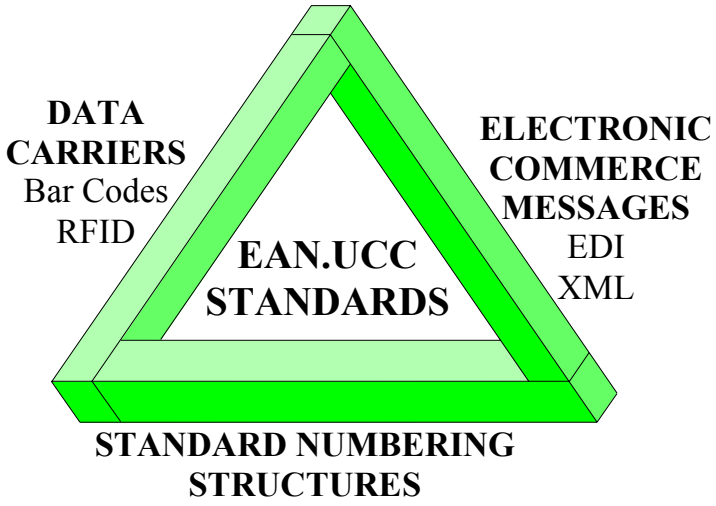
The US Mission to the EU produced a document called "How to Export Seafood to the European Union". It has analysed in great detail the requirements from all the directives etc that apply to the fish sector. It would seem reasonable that production in EU Member States would need to follow very similar if not identical requirements. Due to its date of publication the document does not include reference to 2065/2001. It is available at www.nmfs.noaa.gov/trade/EUCONTENTS.htm and is worth viewing, if only for reference, as an indication of 'control' that EU regulation applies to the fish sector. The ability to track and trace product in the supply chain will add to this 'control'. However, much of the information required will be available as it is recorded as a requirement for compliance to other national or EU regulatory requirements.

7. EAN.UCC System Overview

The EAN.UCC System is a set of tools, which facilitate business transactions and electronic commerce. It provides a standard way to identify, track and trace products, services, and locations. The aim is to improve supply chain management and other business transactions that reduce costs or add value for both goods and services. Established in 1977, EAN International and its global partner organisation for the USA and Canada, the Uniform Code Council (UCC), today have more than 900,000 member companies in over 120 countries.

The EAN.UCC Standards
The EAN.UCC System provides for the use of unambiguous numbers to identify goods, services, assets, and locations world-wide. These numbers can be represented in bar code symbols to enable their electronic reading wherever required in business processes. The system is designed to overcome the limitations of using company, organisation or sector specific coding systems, and to make trading much more efficient and more responsive to customers.

As well as providing unique identification numbers, the system also provides for additional information such as best before dates, serial numbers, location numbers and batch numbers to be shown in a bar coded form. These identifying numbers are also used in electronic commerce. At the moment bar code symbols are used as data carriers but other technologies, such as radio frequency identification tags will be added in the future.



The basic elements of the EAN.UCC System

Following the principles and design of the EAN.UCC System means that users can design applications to process EAN.UCC data automatically. The system logic guarantees that data captured from bar codes produces unambiguous electronic messages and their processing can be fully pre-programmed. The system is designed to be usable in any industry, any trade sector in any place of the world.

8. Definition and requirements

The International Standardisation Organisation (ISO) defines traceability in the following ways:

ISO 8402:
"Traceability is the ability for the retrieval of the history and use or location of an article or an activity through a registered identification."

ISO 9000:
"The organisation should take steps to identify the status of the product/service insofar as it concerns the required measurement and verification activities and should, where necessary, identify the product and/or service using the appropriate means throughout the process. This should apply to all parties involved in the product and/or service where their interaction has a bearing on the conformity to requirements. When traceability is a requirement, the organisation should control and record the unique identity of the product and/or service.

In discussing traceability, it is important that the distinction between the terms tracking and tracing is understood:

- Tracing is the retrieval of information to reconstruct the history of a shipment, package, etc. From the users' perspective, tracing may be defined as the following-up of trade items in both a qualitative and quantitative manner within space and time. A flow of information has to be systematically associated with the physical flow of goods with the objective of being able to obtain pre-defined information concerning units using one or more key identifiers.

- Tracking is the retrieval of the actual status of a shipment, a package, etc. It is the capability to follow the path of a specified unit and/or batch of a trade item downstream through the supply chain as it moves between trading partners. Trade items are tracked routinely for availability, inventory management and logistical purposes. In the context of these guidelines, the focus is on tracking items from the point of origin to the retail point of sale.

8.1 Identification and links between successive trade unit and logistic unit configurations

Identification numbers must be accurately applied and recorded guaranteeing a link between successive packaging and transport/storage configurations. It is the responsibility of each company to manage the links between what they are delivered by their suppliers, the manufacturing processes, and what they are shipping to their customers.

8.2 Accurate and timely record keeping

Certain data must be systematically transmitted between partners in the supply chain, while other data must only be recorded. It is up to the trading partners to decide which data to systematically transmit. In addition data required by legislation must be taken into account.

To ensure the traceability of fish, accurate and timely records must be maintain at each point within the supply chain. The data recorded may be required by legislation or by the need to provide full chain traceability. Trading partners should agree which elements of data will be systematically transmitted between them. This data will include both information required to meet legal requirements and that necessary to ensure product traceability.

8.3 Recording of Batch composition

Many fish products move through the supply chain in batches. At times, existing batches may be combined or split to form new batches. It is critical to the process of traceability that an accurate record is maintained of the composition of a batch when it is created and when there is a change to the constitution of an existing batch.

8.4 Electronic communication of traceability data

Traceability data may be transmitted by electronic means, such as EDI or XML messages, and related to the given units' identification number –GLN, GTIN, batch numbers and SSCC-numbers.

9. EAN.UCC Tools

The introduction of EAN.UCC standards can improve the efficiency of recording and exchanging information between supply chain participants. When used in conjunction with databases containing accurate and timely records, EAN.UCC standards provide all supply chain participants with the technical capability to know the origin of a product, both in their own locations and across the entire supply chain.

EAN.UCC standards carry data, which allow supply chain participants to identify, track and trace products. Application of those standards requires manufacturers, packers, importers/exporters, carriers, distributors and retailers to keep records of serial numbers of logistics and trade units, identification numbers and attribute information of traded units, as well as location numbers of their origin. Record keeping enables the manufacturers and packers to provide the traceability data needed by importers/exporters and distributors, as well as their customers. The ability to convert this capability to practical benefits requires bilateral agreements to share corresponding inventory information.

9.1 EAN.UCC Tools for Trade and Logistics Items Identification

In the EAN.UCC System, the trade items are identified by the Global Trade Item Numbers and logistics items by Serial Shipping Container Codes. At the simplest level, item numbering is what the name suggests – a system for identifying items by giving each one a unique number. Numbering can be applied at every stage of production and distribution. It is used to identify products and services. While the most visible aspect of item numbering is the bar code, it is only a machine-readable representation of a number. It is the number itself, which is the most important element in the EAN.UCC System, because the number identifies the item to which it is assigned.

The EAN.UCC numbering system provides for global uniqueness and overcomes problems in confusion, duplications and misinterpretation, because all users of the EAN.UCC System follow the same coding rules. An EAN.UCC number can be recognised not only by local trading partner companies, but by companies operating overseas as well. Each EAN.UCC number is unique world-wide, so there is no possibility of confusion. The EAN.UCC numbering system also provides the ability for items to carry, within the numbering convention, extra or attribute information concerning that item.

9.2 EAN.UCC Tools for Identification of Locations

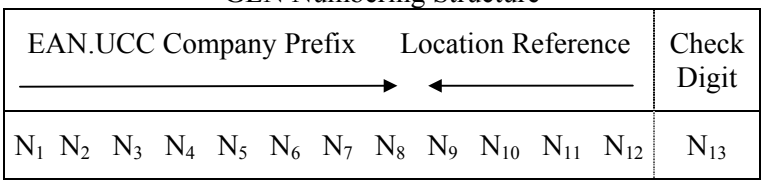
Locations are identified by a Global Location Number (GLN). It is a numeric code that identifies any legal, functional or physical entity within a business or organisation. Each location is allocated a unique number. The EAN/UCC-13 numbering structure is used for the identification of locations.

Traceability requires the identification of all physical entities (locations) where products originate from and where they are packed and stored. These include, but are not limited to, manufacturing plants, packing sites, carriers, wholesalers and retailers.

The identification of locations is also required to enable an efficient flow of goods and information between partners through electronic messages to identify the parties involved in a transaction (e.g. buyer, supplier, place of delivery, place of departure).

EAN.UCC Global Location Numbers (GLN) are the key concept in supply chain management. The EAN/UCC-13 numbering structure is used for the identification of locations. Global location numbers are equally represented in bar code format and used for information on logistic units and to enable the bar coding of actual locations (goods inward, warehouse shelving, etc.).

GLN Numbering Structure



Traded and logistics units should carry the GLN of the packing site they were packed in. A GLN should be assigned to each physical location of a packing site. Alternatively, the physical location of a packing site can be determined by a combination of a Global Trade Item Number (GTIN) and associated batch number on a traded unit or the Serial Shipping Container Code (SSCC) on a logistic unit.[4]

9.3 EAN.UCC bar codes

Bar codes are carriers of data. Barcode symbols are used in the EAN.UCC System to represent EAN.UCC numbers. In simple terms, a bar code consists of a series of parallel, adjacent bars and spaces. Predetermined width patterns are used to represent actual data in the bar code. This data can be the item number or attribute information related to the item. A bar code reader (scanner) is moved across the barcode and during that time, the width pattern of the bars and spaces is analysed by the reading equipment and the original data is recovered. It allows real-time data to be collected accurately and rapidly.

EAN.UCC bar codes allow automatic data capture, which is a key business solution in an efficient supply chain. The EAN.UCC numbering and bar coding system allows fast, accurate and timely data input into computer systems, automating the flow of information into business processes. It also enables improved data capture and transfer of information, while reducing costs.

9.4 Definitions of retail and non-retail trade items and logistics units

For the convenience of the reader, definitions of retail, trade and logistics units are listed below. They enable common understanding of terms used in the following sections of this guidelines.

9.4.1. Definition of a trade item

A trade item is any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain. This definition covers services and products, from raw materials through to end user products, all of which may have pre-defined characteristics.

[4] The EAN.UCC company prefix is a part of the GTIN, GLN and SSCC data structures. To be able to distinguish between different packing stations belonging to the same company, the batch number should contain an identifier, which enables identification of the packing station location in which the batch was made.

9.4.1.1 Definition of a retail trade item (trade item crossing the point-of-sale)

A retail item, is a trade item intended for sale to the final consumer through a retail point of sale. An item that can be considered as both a retail and a non-retail trade item is numbered and bar coded according to the rules applicable to retail items.

9.4.1.2 Definition of a non-retail trade item (trade item not crossing the point-of-sale)

A non-retail item is any trade item or standard grouping of trade items intended for sale through any distribution channel, other then a retail point of sale.

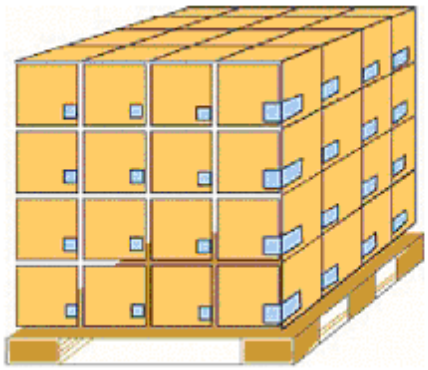
9.4.2 Definition of a logistics unit

A logistics unit is an item of any composition established for transport and/or storage that needs to be managed through the supply chain.

Trade and logistic units, which need to be tracked and traced individually across any supply chain, require a unique identification number.

Retail trade unit (trade item crossing the point-of-sale)

Non-retail trade unit (trade item not crossing the point-of-sale)



Logistics unit

9.4.3 Definition of attribute information

Attribute information is any variable information required over and above the trade unit or logistics unit identification, such as batch number, serial number or best before date. In the EAN.UCC System, this information is expressed by means of EAN.UCC Application Identifiers (AI). Attribute information is bar coded in the UCC/EAN-128 bar code symbology.

9.5 Identification of Trade and Logistic Units

Traceability requires the identification of products in all their packaging and transport/storage configurations at all stages of the supply chain. Identification numbers must be applied to all trade and logistics units in both human readable and bar coded format. The lead in period for the introduction of bar codes on traded units is subject to agreement between trading partners.

9.5.1 Identification of Trade Units

A trade unit is any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in the supply chain. This includes individual items as well as all their different configurations.

The normal rule for EAN.UCC numbering is that the supplier of the product assigns the Global Trade Item Number (GTIN). However, when a product is packed specifically for a customer and orderable only by this customer, it is then permissible for a GTIN to be assigned by the customer.

EAN.UCC numbers are unique, non-significant, multi-industry, international and secure. GTIN has been developed to uniquely identify trade items world-wide. It contains up to 14 digits expressed in four different variations: EAN.UCC-14, EAN.UCC-13, UCC-12, EAN/UCC-8.

Global Trade Item numbering structure

Data Structures	**GTIN Format***													
	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}	T_{13}	T_{14}
EAN/UCC-14	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}
EAN/UCC-13	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}
UCC-12	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}
EAN/UCC-8	0	0	0	0	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8

*T represents the position of each individual digit in a computer file format, N represents the position of each individual digit in a given data structure, and 0 represents a filler digit.

9.5.2. Identification of Logistics Unit

The Serial Shipping Container Code (SSCC) provides an unambiguous identification for logistic units. All parties in the packaging supply chain can use it as a reference number to the relevant information held in computer files. The SSCC is a non-significant, fixed-length, 18-digit number, which contains no classifying elements.

SSCC numbering structure

Extension Digit	EAN.UCC Company Prefix → ← Serial Reference	Check Digit
N_1	N_2 N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12} N_{13} N_{14} N_{15} N_{16} N_{17}	N_{18}

The extension digit is assigned by the user according to internal needs. The company prefix is allocated by an EAN International Member Organisation or by UCC to an organisation that wishes to uniquely identify items, locations, assets and service relationships. The logistic units reference number is assigned by the user and is structured according to internal needs. The check digit is calculated according to the EAN.UCC algorithm.

The UCC/EAN-128 symbology and the associated EAN.UCC Application Identifiers (see Section 9.8) are used to represent the SSCC and any additional data required, in machine-readable form. The Application Identifier 00 precedes the SSCC.

9.6. The EAN.UCC Logistics Label

The EAN.UCC Logistics Label is used to identify pallets or other logistics units carrying trade items. It uniquely identifies the logistics unit for administration and logistics purposes and provides article identification for the unit, or its contents, together with additional manufacturer and customer information in machine-readable form.

The non-significance of the SSCC allows any logistics unit to be identified by any supply chain participant, regardless of the business sector or geographical location. The EAN.UCC Logistics Label is fully compatible with ISO 15394 and EN 1573 standards.

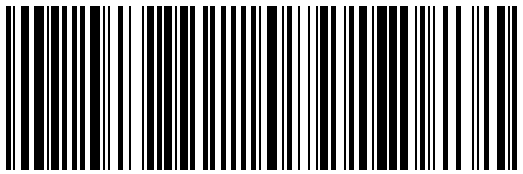
The EAN.UCC Logistics Label provides a link between the physical flow of goods (using EAN.UCC numbers and bar codes) and electronic information flow (using EANCOM®, X12 or XML messages).

Example of an EAN.UCC Logistic label

9.7. Bar Coding of Trade and Logistic Units

EAN.UCC numbers identifying trade and logistics units are represented by UCC/EAN-128 bar codes. These allow for the identification numbers and attribute data to be machine-read for automated data capture and data processing. The use of UCC/EAN-128 symbology is not intended for data scanned at a retail point of sale.

The UCC/EAN-128 symbology, a sub-set of Code 128, is one of the most complete, compact and reliable alphanumeric linear symbologies available today. UCC/EAN-128 uses a special non-data character known as function 1 (FNC 1) following the start character in the bar-code. According to International Standard ISO/IEC 15417, the use of FNC 1 immediately following the start character in Code 128 is exclusively reserved for EAN.UCC.



Example of an UCC/EAN-128 barcode encoding AI 01 (GTIN) and AI 10 (Batch/lot number) (see Appendix)

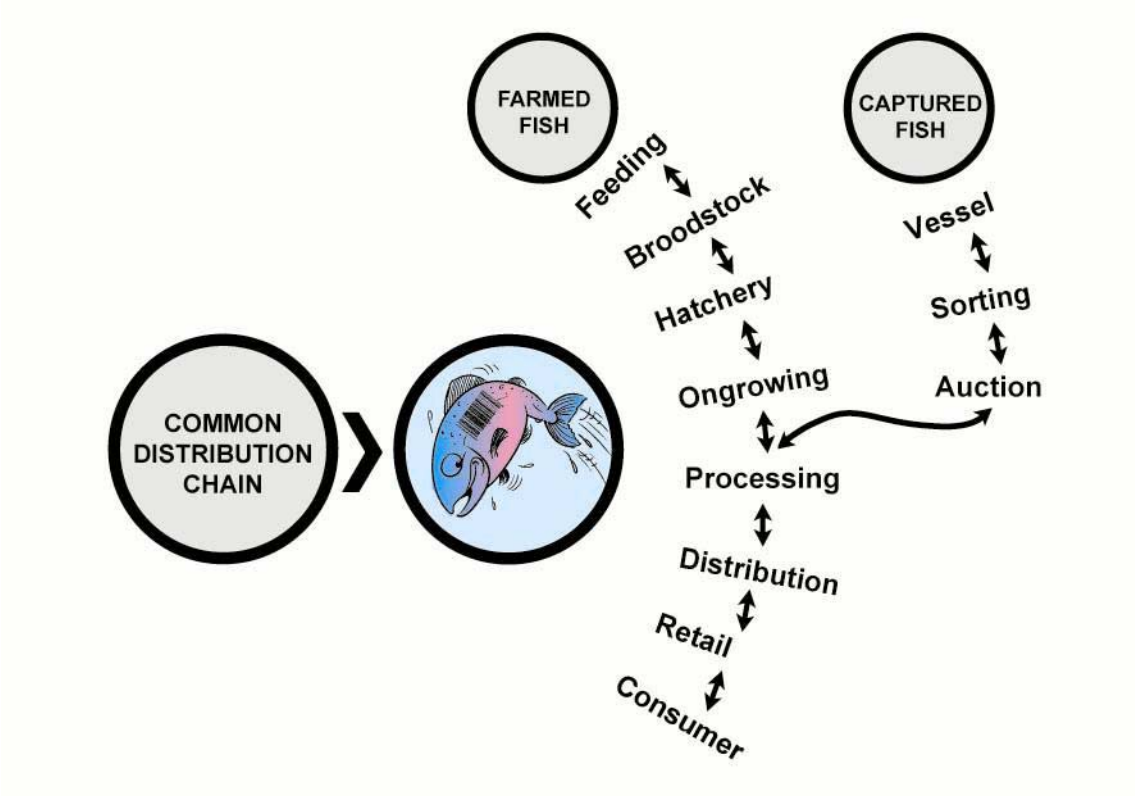
9.8. Trade and Logistics Unit Attribute Data

An EAN.UCC Global Trade Item Number (GTIN) may be used alone on a trade unit. Where additional information is required to be bar coded using the UCC/EAN-128 symbology, the appropriate EAN.UCC Application Identifier (AI) must accompany the GTIN.

An Application Identifier is a prefix used to define the meaning and format of the information following in a data field. Application Identifiers have been defined for product and logistics unit identification, traceability data, dates, quantity, measurements, locations, and many other types of information. The use of EAN.UCC AIs is subject to rules established by EAN.UCC. EAN International has been designated the organisation responsible for the maintenance of these AIs.

The Fish Traceability Project defined the requirements for attribute information to be bar coded on trade and logistics units. Other human readable information may be printed on the trade and logistic unit labels, which may not be bar coded. Some of these requirements, especially the legal requirements, have been included in this document but most of it are left to the discretion of trading partners. The attribute information to be bar coded and corresponding AI's are described in next Chapter. For a list of AI’s, see Annex.

10. Fish Supply Chain Models



The figure above shows the Supply Chains Models for Captured and Farmed Fish. Note that the last links of these Supply Chains Models i.e. from Processing to Consumer are common.

In the supply chain for captured fish it is necessary to trace fish or products made from them all the way through the supply chain from the vessel that landed the fish to the point of sale to the consumer.

The farmed fish requirement is also for traceability backwards in the supply chain to the fish farm, the eggs and parents of the fish. The EAN/UCC system offers a global traceability solution using unique numbering with related bar codes that allow for scanning/identification at every step of the chain.

The EAN.UCC bar codes are familiar to most people from their experience with point of sale scanning at the supermarket. However, these bar codes represent only the GTIN (Global Trade Item Number) and a link is required to a database in which the item attributes are held. The UCC/EAN-128 symbology can encode additional information such as batch number or best before date. The SSCC provides the unique identifier for the individual logistic units.

In order to comply with Regulation (EC) 2065/2001, it is a requirement that information about the commercial and scientific names (species), catch area and method of production – whether it is a farmed or a captured fish, is to be available throughout the supply chain. This can be achieved by means of the labelling or packaging of the product, or by means of a commercial document accompanying the goods.

In the following sections each step in the Captured and Farmed Fish supply chains will be described. These models were developed in the EAN-workgroups covering Captured and

Farmed fish and were based on the business requirements determined by these sectors during the work of the TraceFish project.

In the models we have distinguished between what, from a traceability point of view is considered mandatory and that which is optional. We have specified information in both human readable text and barcoded format, for example UCC/EAN-128.

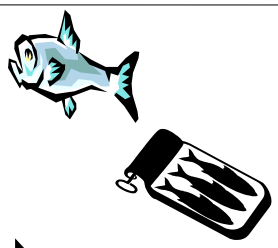
The Human Readable Text is often agreed bilaterally between the parties, or is specified in the applicable legislation. The data that has its base in the legislation does not physically appear in the barcodes, but forms part of the data underlying the GTIN for the product.

Each party in the supply chain must take individual responsibility for providing the correct information and must ensure that it is formatted into the correct bar code, while also ensuring that secure, accurate recording systems for the information are maintained.

In general the data noted in the individual sections of the models is valid for Trade Units, whereas the data on the transport label is valid for all logistic units, regardless of which step in the supply chain is emphasised.

10.1 Captured Fish

Information exchange in Fish Labelling for captured fish

Vessel	Auction/-collector	Processing/-wholesale	Retail
			
Fishbox	**Fishbox**	**Fishbox**	**Consumer label**
EAN•UCC SYMBOL: UCC/EAN 128	**EAN•UCC SYMBOL: UCC/EAN 128**	**EAN•UCC SYMBOL: UCC/EAN 128**	**EAN•UCC SYMBOL: EAN/UCC-13**
UCC/EAN-128: AI 01 GTIN. AI 10 Batch no AI 310X Net wght*** Optional AI 11 Catch date AI 414 Vessel id. * **Human read.** Scientific name Commercial name Catch area Production method Preservation Size of fish - etc.	**UCC/ EAN-128:** AI 01 GTIN. AI 10 Batch no AI 310X Net wght*** Optional AI 11 Catch date AI 414 Vessel id. * AI 412 GLN ** **Human read.** Scientific name Commercial name Catch area Production method Preservation Size of fish - etc.	**UCC/EAN-128:** AI 01 GTIN. AI 10 Batch no AI 310X Net weight*** Optional AI 412 GLN ** AI 11 Catch date AI 13 Package date AI 15 Best before date **Human read.** Scientific name Commercial name Catch area Production method Preservation Size of fish - etc.	GTIN = Key to the article database during scanning at the point of sale 8 712345 678906 **Human read.** Commercial name Production method Catch area Batch number Best before date Net weight Preservation etc.

Required traceability information

Transport labelling (for logistic units). See 10.3 Transport
SSCC (AI 00) GLN (AI 412) GLN (AI 410) GTIN (AI 01) and (AI 02 + AI 37)

** The AI 414 is the EAN.UCC tool for the exact unique identification of a physical location. The vessel is considered as a storage location and should be able to provide all the information related to the captured fish. If the users prefer to maintain their registration number as ID, this can be accomplished by means of AI 7030 followed by the three digit ISO country code and the registration number.*

*** As an alternative to the use of AI 412, the physical location of, e.g. a collector or a processor can be determined by a combination of a Global Trade Item Number (GTIN) and an associated batch number on a traded unit within the Serial Shipping Container Code (SSCC) on a logistic unit.*

**** According to General EAN/UCC Specification for Trade units with variable measure the variable weight must be present at the same time*

The EAN Fish Traceability Model for captured fish will now be explained in more detail

It should be stressed that the examples given in this model are based upon a scenario, in which the fish will be landed in boxes. Other solutions exist, for instance in industrial fishing, but even here the ID of the vessel, the GTIN, and the batch number are essential pieces of information, when traceability is required.

What will be required in Human Readable Text is, as mentioned earlier, agreed bilaterally between the parties, or decided by legislation, but the data which appears in barcoded form must also be recorded in human readable text.

Depending on which step in the chain we consider, information such as, fishing gear, condition, or ice/unit may be relevant.

Sorting/separating

The vessel is given an unique GLN-identification by use of the Application Identifier AI 414, and a thirteen digit data string allocated by a local EAN.UCC Member Organisation.

AI 01 (GTIN = Global Trade Item Number) should be added to the label at this stage, and this will be the agreed identification for the unit, sorted or assorted between the parties – for instance by ordering/invoicing. (In some countries, fish must be species-sorted prior to landing).

These details together with the AI 10 (batch number) ensure that a link from the first step of the supply chain is available to the succeeding parties.

In case where more than one catch is kept on the vessel without sorting/separating, the date of the first catch must be recorded as catch date (AI 11), if this info is not part of the batch number.

Furthermore, the net weight of the box must be added to the label in case of variable measure trade item by use of AI 310X – the (X) indicates the implied decimal point position. An example:

GTIN with variable weight	*the actual weight*
(01) 95712345111119	*(3102) 002875 = 28,75 kg.*

The first figure "9" of the GTIN indicates that it is an item of variable weight

In order to comply with Regulation (EC) No. 2065/2001, it is necessary for information about the commercial name (species), catch area, and production method to be provided throughout the supply chain. This can be provided by means of the labelling or packaging of the product, or by the use of a commercial document accompanying the goods, including the invoice (see also chapter 6).

The catch area will be part of the product description which the GTIN is linked to as is the case with production method and commercial and scientific names

Mandatory

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Specie (commercial and scientific names)		HR
- Production method		HR
- Production area		HR
- Batch or lot number	AI 10	HR
- Net weight*	AI 310X	HR

Optional

Data	**UCC/ EAN-128**	**Comments**
- Identification of the vessel	AI 414	HR
- Catch Date	AI 11	HR
- Size of the fish		HR
- Preservation **		HR

HR=Human Readable

** According to General EAN/UCC Specification for Trade units with variable measure, the variable weight must be present at the same time*

*** Preservation indicates whether the fish for instance have been frozen- this information is mandatory in some countries.*

Example of label in the sorting-step containing two UCC/EAN-128 symbols with the following information: AI 01 (GTIN), AI 414 (GLN), AI 10 (Batch/lot number), AI 11 (Catch date) and AI 3102 (Net weight)

The requirement noted applies regardless of the next step in the supply chain which could be to a collector/auction or direct to a wholesaler or for processing.

The collector and the auction are often co-extensive, and unless future legislation dictates differently, the identification of the vessel (AI 414) will be maintained on the boxes in this step. If, howeve,r new registration is required, the (AI 412) will be succeeded by the 13 digit unique numeric reference (the GLN) for the collector/the auction hall (the second step in the supply chain).

An alternative AI 01 can replace the existing, if any sorting or other change of contents takes place.

AI 10 (batch) is retained unless e.g. a wholesaler is creating a new pallet with different species/qualities. In this case a link must be maintained to support traceability, in a database, between the old and new batch numbers.

The wholesaler will typically repack different species/sizes of fish (different AI 01's) and new logistic units are created = new SSCC's (see Transport).

New AI 10 (batches) will be created, and data in databases must link back to previous batches.

To secure traceability, the wholesaler will add his AI 412 (with the 13-digit unique GLN number) onto the label of the boxes, or, perhaps the wholesaler is co-extensive with the processing.

If this is not the case, the processing will add their unique AI 412 with their GLN.

Processing:

This section describes the label which for instance would be used between primary and secondary processing.

In this step the AI 01 (GTIN) will be changed as a new product is created. In addition a batch number AI 10 will be created and a link to batch numbers in earlier steps must be established and recorded in a database. This batch number typically changes each day or for each hour of production.

The GLN of the processor will be added to the label. Catch area, species, preservation, best before and net weight will also appear. Catch date and Box no. would probably be optional information in this step.

Mandatory

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Specie (commercial and scientific names)		HR
- Production method		HR
- Production area		HR
- Batch or lot number	AI 10	HR
- Net weight*	AI 310X	HR

Optional

Data	**UCC/ EAN-128**	**Comments**
- Company id = GLN	AI 412	HR
- Best-before-date	AI 15	HR
- Treatment		HR
- Preservation		HR
- Storage temperature		HR
- Catch date of the fish	AI 11	HR
- Package date	AI 13	HR

HR=Human Readable

** According to General EAN/UCC Specification for Trade units with variable measure, the variable weight must be present at the same time*

For the two last steps – wholesaler/processing and transport– frequently the SSCC is the only piece of information which physically appears on the label, the additional details will then be exchanged by means of EDI (Electronic Data Interchange). However, the mandatory information (species/catch area and production method) has also to be provided in human readable text on the label.

Retail

The information in this step is the EAN-13 barcode on the actual consumer-unit and the batch number in human readable text which the retailer has linked in his system to information from earlier steps in the supply chain (plus the information required by legislation).

MANDATORY

Data	EAN/UPC	Comments
- GTIN (EAN/UCC-13)	BARCODE	HR
- Batch number		HR
- Species (commercial name)		HR
- Catch area		HR
- Production method		HR
- Best-before-date		HR
- Net weight		HR
- Preservation		HR

HR=Human Readable

Example of label on consumer unit containing an EAN/UPC symbol with an EAN/UCC-13 (GTIN) number for a fixed weight product

Please note:

In the future, if similar legislation to that introduced for beef, is required for fish, then instead of using GLNs to identify parties in the supply chain a solution combining AI 7031 to 7039 with an authorisation number and the ISO country code would provide the required functionality.

***Transport**:*

Farmed and captured fish both follow identical processes in their respective supply chains, the details for which are provided in Section 10.3

10.2 Farmed fish

It should be noted that fish farming is in general very similar to industrial production. It is thus possible to control and document each step of the process. This makes traceability possible from the consumers all the way back to the parents of the fish and to the eggs they produced. In addition data on the food used and any medication applied during the growing process is available. This is different to captured fish where it is not possible to determine any history prior to the point of capture of the fish.

The Farmed Fish supply chain model can be divided into both an upstream and an downstream section.

Upstream market: Feeding, Broodstock, Hatchery, Ongrowing,
Downstream market: Slaughtering, Processing & wholesale and Retail

In addition there is a transport requirement between all the steps in the model.

The following table will demonstrate each step in the Farmed Fish supply chain.

10.2.1 Upstream market

Information exchange in Fish Labelling for upstream market for farmed fish

Feeding	Broodstock	Hatchery	Ongrowing
Bags & pallets	**Box**	**Well boats & tanks**	**Well boats & tanks**
EAN•UCC SYMBOL: UCC/EAN 128	**EAN•UCC SYMBOL: UCC/EAN 128**	**EAN•UCC SYMBOL: UCC/EAN 128**	**EAN•UCC SYMBOL: UCC/EAN 128**

Required traceability information

UCC/EAN-128:	**UCC/EAN-128:**	**UCC/EAN-128:**	**UCC/EAN-128:**
AI 01 GTIN. AI 10 Batch no AI 3100 Net wght*	AI 01 GTIN. AI 10 Batch no AI 30 Number* AI 3150 Litres*	AI 01 GTIN. AI 10 Batch no AI 30 Number*	AI 01 GTIN. AI 10 Batch no AI 3100 Net weight*
Optional AI 11 Prod. date AI 412 Supplier id. AI 414 Plant id.	Optional AI 412 Supplier id. AI 414 Farm id.	Optional AI 412 Supplier id. AI 414 Hatchery id.	Otional AI 412 Supplier id. AI 414 Farm id.
Human read.	**Human read.**	**Human read.**	**Human read.**
Feeding type Batch number Feed ingredients GMO etc.	Scientific name Commercial name Production method Production area etc..	Scientific name Commercial name Production method Production area etc.	Scientific name Commercial name Production method Production area etc.

Transport labeling (for logistic units). See 10.3 Transport
SSCC (AI 00) GLN (AI 412) GLN (AI 410) GTIN (AI 01) and (AI 02 + AI 37)

* According to General EAN/UCC Specification for Trade units with variable measure, the variable measure (weight, litres or count) must be present at the same time.

Feeding manufacturer

The fish food manufacturer delivers food to broodstock, hatchery and ongrowing fish farms. The food is packed in bags on pallets, big bags or is delivered in bulk. Labels using UCC/EAN-128 on bags, big bags and pallets are already implemented by some food manufacturers. The following *mandatory* and *optional* information is exchanged between food manufacturers and the customers they supply.

The data shown in the table below can be encoded in the UCC/EAN-128 bar code:

MANDATORY

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Fish feed type		HR
- Batch number, internal allocated by the company	AI 10	HR
- Net weight*	AI 3100	HR

OPTIONAL

Data	**UCC/ EAN-128**	**Comments**
- Production date	AI 11	HR
- GLN of Supplier	AI 412	HR
- GLN of Plant	AI 414	HR
- Feed ingredients		HR
- GMO (yes / no)		HR

HR = Human readable

** According to General EAN/UCC Specification for Trade units with variable measure the variable weight must be present at the same time*

Note:

- The fish food type is a part of the product description that is specified by the supplier. The supplier allocates a GTIN for each product.
- The batch number is designed and allocated by the supplier. A link to previous batches for instance fish raw material should be kept in the database to support traceability.
- The combination of GTIN and batch-number secure a world-wide unique reference key to a specific batch. If this uniqueness not may be derived from the GTIN + batch number or from the SSCC-number, the GLN of the supplier and the production plant should be barcoded
- The quantity is specified in kilos and should only be barcoded for variable weight goods
- The production date may be replace by the best-before-date (AI 15).

Example of a label for big bags of fish feeding containing two UCC/EAN-128 symbols with the following information: AI 01(GTIN), AI 15 (Best before date), AI 10 (Batch/lot number), AI 00 (SSCC) and AI 92 (Internal use) (see Appendix).

Broodstock

Eggs are sold by the broodstock farms to the hatchery farms. The eggs are packed in boxes and transported by air, road etc. Labelling of the boxes will be possible. The following *mandatory* and *optional* information is exchanged between broodstock supplier and the hatchery.

The data shown in the table below can be encoded in the UCC/EAN-128 bar code:

MANDATORY

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Batch number, internal allocated by the company	AI 10	HR
- Specie (commercial and scientific names)		HR
- Production method		HR
- Production area		HR
- Quantity of number of eggs*	AI 30	HR
Or	or	
- Quantity in litres*	AI 3150	HR

OPTIONAL

Data	**UCC/ EAN-128**	**Comments**
- GLN of Breeding supplier company	AI 412	HR
- GLN of Breeding station	AI 414	HR

HR = Human readable

** According to General EAN/UCC Specification for Trade units with variable measure, the variable measure (litres or count) must be present at the same time*

Note:

- The specie (commercial and scientific names), production method and production area (ref EC 2065/2001) is a part of the product description that is specified by the supplier. The supplier allocates a GTIN for each product.
- The batch number is designed and allocated by the supplier. A link to previous batches for instance the identification of parents, batches of feed used and medication must be kept in the database to support traceability.
- The combination of GTIN and batch-number secure a world-wide unique reference key to a specific batch. If this uniqueness cannot be derived from the GTIN + batch number or from the SSCC-number, then the GLN of the breeding supplier and breeding station should be bar coded.
- The quantity is specified as the number of eggs or litres supplied.

Hatchery

Young fish from the hatchery to the ongrowing farm fish are carried in tanks or by well boats. Labelling may be possible on tanks, but not for well boats. An alternative is to issue a document on which barcodes can be printed. The following *mandatory* and *optional* information is exchanged between hatchery and ongrowing farm.

The data shown in the table below can be encoded in the UCC/EAN-128 bar code:

MANDATORY

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Batch number, internal allocated by the company	AI 10	HR
- Specie (commercial and scientific names)		HR
- Production method		HR
- Production area		HR
- Quantity in number fishes*	AI 30	HR

OPTIONAL

Data	**UCC/ EAN-128**	**Comments**
- GLN of Hatchery supplier company	AI 412	HR
- GLN of Hatchery station	AI 414	HR

HR = Human readable

* *According to General EAN/UCC Specification for Trade units with variable measure, the variable measure (count) must be present at the same time*

Note:

- The specie (commercial and scientific names), production method and production area (ref EC 2065/2001) is a part of the product description that is specified by the supplier. The supplier allocates a GTIN for each product.
- The batch number is designed and allocated by the hatchery. A link to previous batches e.g. eggs, feed and medication must be kept in the database to support traceability.
- The combination of GTIN and batch-number secure a world-wide unique reference key to a specific batch. If this uniqueness cannot be derived from the GTIN + batch number or from the SSCC-number, then the GLN of the hatchery supplier and hatchery station should be bar coded.

Ongrowing farm (fish farm)

Fish are transferred from the ongrowing farm to the slaughterhouse by well boats in off shore situations and by tank or box in smaller scale operations. Labelling of the fish is not practical when well boats are used. An alternative is to issue a document onto which barcodes are printed. The following *mandatory* and *optional* information is exchanged between ongrowing farm and slaughter house.

The data shown in the table below can be encoded in the UCC/EAN-128 bar code:

MANDATORY

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Batch number, internal allocated by the company	AI 10	HR
- Specie (commercial and scientific names)		HR
- Production method		HR
- Production area		HR
- Quantity (Net weight) in kilos*	AI 3100	HR

OPTIONAL

Data	**UCC/ EAN-128**	**Comments**
- GLN of the Supplier	AI 412	HR
- GLN of the Fish farm	AI 414	HR

HR = Human readable

** According to General EAN/UCC Specification for Trade units with variable measure, the variable weight must be present at the same time*

Note:

- The specie (commercial and scientific names), production method and production area (ref EC 2065/2001) is a part of the product description that is specified by the supplier. The supplier allocates a GTIN for each product.
- The batch number is designed and allocated by the fish farm. It is recommended that the identity of the cage, where the fish has been grown, is a part of the batch number. A link to previous batches e.g. hatchery, feed and medication must be kept in the database to support traceability.
- The combination of GTIN and batch-number secure a world-wide unique reference key to a specific batch. If this uniqueness cannot be derived from the GTIN + batch number or from the SSCC-number, then the GLN of the fish farming supplier and fish farm should be bar coded.

10.2.2 Downstream market

Information exchange in Fish Labelling for downstream market for farmed fish

Slaughtering	Processing/ wholesale	Retail
Fishbox	**Fishbox**	**Consumer label**
EAN•UCC SYMBOL: UCC/EAN 128	**EAN•UCC SYMBOL: UCC/EAN 128**	**EAN•UCC SYMBOL: EAN-13**

Required traceability information

UCC/EAN-128:

AI 01 GTIN.
AI 10 Batch no
AI 3100 Net weight*

Optional
AI 11 Slaught. date
AI 412 Supplier id.
AI 414 Slaught id.

Human read.
Scientific name
Commercial name
Production method
Production area
Preservation
etc.

UCC/EAN-128:

AI 01 GTIN.
AI 10 Batch no
AI 3100 Net weight

Optional
AI 11 Slaught. date
AI 13 Packaging date
AI 15 Best before date
AI 412 Supplier id.

Human read.
Scientific name
Commercial name
Production method
Production area
Preservation
etc.

GTIN = Key to the article database during scanning at the point of sale

8 712345 678906

Human read.
Commercial name
Production method
Production area
Batch number
Best before date
Net weight
Preservation
etc.

Transport labeling (for logistic units). See 10.3 Transport
SSCC (AI 00) GLN (AI 412) GLN (AI 410) GTIN (AI 01) and (AI 02 + AI 37)

** According to the General EAN/UCC Specification for Trade units with variable measure, the variable weight must be present at the same time*

Slaughterhouse

After slaughtering, fish are moved to the processing packed in boxes and carried by road, air, sea etc. Alternatively product may be packaged ready for retail sale. Solutions for labelling fish boxes, pallets and retail packages are defined in the EAN.UCC standards and have been implemented by farmed fish suppliers. Note that the processors are an optional party in the supply chain. The following *mandatory* and *optional* information is exchanged between slaughterhouse and processing.

The data shown in the table below can be encoded in the UCC/EAN-128 bar code:

MANDATORY

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Batch number, internal allocated by the company	AI 10	HR
- Specie (commercial and scientific names)		HR
- Production method		HR
- Production area		HR
- Quantity (net weight) in kilos*	AI 310X	HR

OPTIONAL

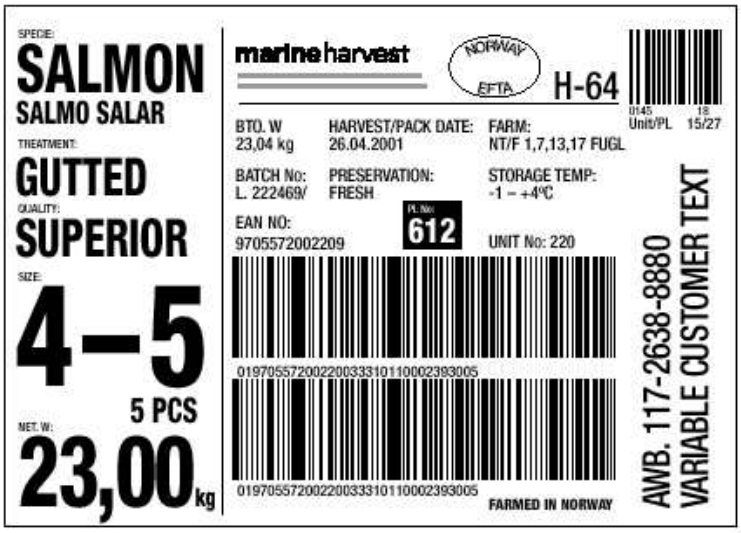
Data	**UCC/ EAN-128**	**Comments**
- Slaughter date	AI 11	HR
- GLN of Supplier	AI 412	HR
- GLN of Slaughterhouse	AI 414	HR
- Preservation		HR
- Treatment		HR
- Quality grade		HR
- Size of fish		HR

HR = Human readable

** According to General EAN/UCC Specification for Trade units with variable measure, the variable weight must be present at the same time*

Note:

- The specie (commercial and scientific names), production method and production area (ref EC 2065/2001) is a part of the product description that is specified by the supplier. The supplier allocates a GTIN for each product. Additional product information related to the GTIN may be preservation, treatment, quality grade and size of fish.
- The batch number is designed and allocated by the slaughterhouse. A link to previous batches, for instance fish cages and transport, must be kept in the database to support traceability.
- The combination of GTIN and batch-number secure a world-wide unique reference key to a specific batch. If this uniqueness cannot be derived from the GTIN + batch number or from the SSCC-number, then the GLN of the supplier and slaughterhouse should be bar coded.



- *Example of label containing UCC/EAN-128 symbol barcoded by the slaughter house*

Processing

At the processor fish are packed in consumers and despatch units and carried by road, air, sea etc. Solutions for labelling consumer units, trading units and pallets are specified in the EAN.UCC standards and for retail packs largely implemented. Please note that the processor is an optional part of the supply chain. Fish may be shipped directly from slaughter and packaging location , sometimes via distributors, to retailers. The following mandatory and optional information is exchanged between processing and retailers.

The data shown in the table below can be encoded in the UCC/EAN-128 bar code:

MANDATORY

Data	**UCC/ EAN-128**	**Comments**
- GTIN	AI 01	HR
- Batch number, internal allocated by the company	AI 10	HR
- Specie (commercial and scientific names)		HR
- Production method		HR
- Production area		HR
- Quantity (net weight)*	AI 310X	HR

OPTIONAL

Data	**UCC/ EAN-128**	**Comments**
- Slaughter date	AI 11	HR
- Packaging date	AI 13	HR
- Best-before-date	AI 15	HR
- GLN of supplier	AI 412	HR
- Preservation		HR
- Treatment		HR
- Quality grade		HR
- Size of fish		HR

HR = Human readable

** According to General EAN/UCC Specification for Trade units with variable measure, the variable weight must be present at the same time*

Note:

- The specie (commercial and scientific names), production method and production area (ref EC 2065/2001) is a part of the product description that is specified by the supplier. The supplier allocates a GTIN for each product. Additional product information related to the GTIN may be preservation, treatment, quality grade and size of fish.
- The batch number is designed and allocated by the processor. A link to previous batches for instance fish boxes and transport must be kept in the database to support traceability
- The combination of GTIN and batch-number secure a world-wide unique reference key to a specific batch. If this uniqueness cannot be derived from the GTIN + batch number or from the SSCC-number, then the GLN of the processor should be bar coded.
- Depending on the value added by the processor, the following dates may be appropriate: Slaughter date, packaging date or best-before-date. It is recommended to only have one of this dates printed and barcoded on the label
- The quantity should only be barcoded for variable weight goods.

-

Example of pallet label for a fish processor containing two UCC/EAN-128 symbols with the following information: AI 02 (GTIN of trade items contained), AI 20 (For internal use), AI 15 (Best before date), AI 37 (Count of trade items), AI 00 (SSCC) and AI 10 (Batch/lot number) (see Appendix)

Retail

The retailers supply product to the consumers either packed by the retailers, from loose products or sold in pre-packed consumer units. Solutions for labelling the consumer units have been implemented by the retailers for a long time. The following *mandatory* information is exchanged between retailers and consumers.

In the table below only the GTIN i.e. EAN/UCC 13 will be barcoded.

MANDATORY

Data	**EAN/UPC**	**Comments**
- GTIN (EAN/UCC 13)	Barcode	HR
- Batch number		HR
- Specie (commercial name)		HR
- Production method		HR
- Production area		HR
- Best-before-date		HR
- Net Weight		HR
- Preservation		HR

HR = Human readable

Note:

- The specie (commercial name), production method and production area (ref EC 2065/2001) is a part of the product description that is specified by the supplier. For each product a GTIN is allocated.
- Regarding the specie, only the commercial name and not the scientific name needs to be printed.
- Farmed fish origin is to be specified by the country. The consumer only has to be provided with the country of origin in human readable text.
- Production method means the word “farmed” in the local language.
- The consumer units are either fixed or variable weight goods.
- The batch number shall be specified.

10.3 Transport

Every time fish are packed into a logistic units, an AI 00 = SSCC (Serial Shipping Container Code) is added to the label. The SSCC will from then on be the identification of that specific pallet, and no other logistic unit in the whole world will share this ID (even a single fish box is to be labelled with SSCC, if the box is sent on its own, as one logistic unit).

Mandatory

Data	**UCC/ EAN-128**	**Comments**
SSCC	AI 00	HR
- GTIN of the contained trade item	AI 02	HR
Count of trade item	AI 37	HR

Optional

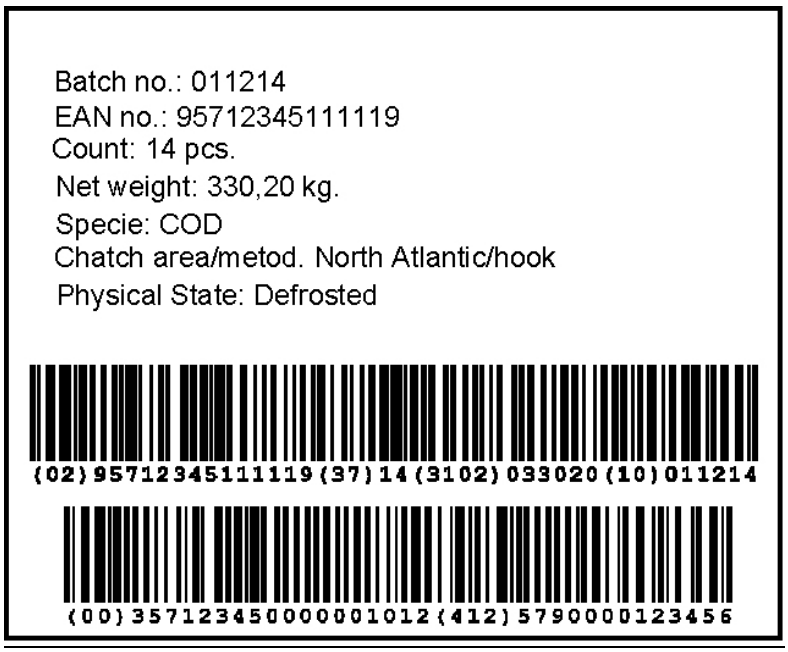
Data	**UCC/ EAN-128**	**Comments**
GLN of the supplier	AI 412	HR
- GLN of the vessel or physical location	AI 414	HR
- GLN of the receiver	AI 410	HR
- Gross weight	AI 330X	HR

HR=Human Readable

If the pallet is a traded item, a specific GTIN (AI 01) should be allocated for the pallet.
If the pallet is not traded as one item but it contains the same product(same GTIN), the content of the pallet will be given by an A1 02 succeeded by AI 37.

If the pallet is not traded as one item and if it does not contain the same product, then there is only one mandatory data, the SSCC (AI 00). Information related to the product such as the GTIN (AI 01 and 02), best-before-date etc. is NOT to be bar coded.

GLNs should be used for identifying the vessel, the supplier and the receiver. It is also possible to add appropriate optional information related to the various steps in the Captured Fish and Farmed Fish Models in bar coded format.



Example of a pallet label for a supplier containing 2 UCC/EAN-128 symbols with the following information: AI 02 (GTIN of trade items
- *contained), AI37 (Count of trade items), AI 3102 (Net weight), AI 10 (Batch/lot number),*

	PL.No.	***147***		
	Order	***19876***		
	Prod.:	***OH-45***		
Name	***Box***	***Pcs.***	*Size*	*NW-Kg.*
Eds-hg	*123*	*8*	*3-4*	*25,2*
Eds-hg	*122*	*8*	*3-4*	*23,2*
Eds-hg	*120*	*8*	*3-4*	*22,5*
Eds-hg	*125*	*8*	*3-4*	*24,0*
Eds-hg	*133*	*8*	*3-4*	*22,3*
Eds-hg	*130*	*8*	*3-4*	*22,0*
Eds-hg	*121*	*8*	*3-4*	*25,3*
Eds-hg	*124*	*8*	*3-4*	*24,8*
Eds-hg	*126*	*8*	*3-4*	*24,2*
Eds-hg	*128*	*8*	*3-4*	*23,1*
Eds-hg	*132*	*8*	*3-4*	*21,9*
Eds-hg	*127*	*8*	*3-4*	*24,1*
Eds-hg	*131*	*8*	*3-4*	*24,7*
Eds-hg	*129*	*8*	*3-4*	*22,9*
				330,20

Additional pallet label containing information of the individual boxes on the pallet

11. Getting started

How can I comply with article 18 of the EU Regulation 178/2002?
Article 18 of the EU Regulation 178/2002 requires the traceability of items to be established at all stages of production, processing and distribution. This can be done by using the UCC/EAN-128 for the unique identification of raw material, trade items and logistic units and batch/series as well as its linkage, recording and communication.

For full chain traceability, what data should be recorded, how and where?
Data which is relevant to one or all supply chain partners and/or subject to any legislation or sector specific regulation. This can be most effectively achieved by using an open system that is applied throughout the value chain. Recorded data can be stored and archived either at each of the supply chain partners' in-house databases or in a central database. The duration of the archiving period depends on the particular trade or logistic unit. The EAN.UCC system offers a key numbering scheme that facilitates the recording and archiving. More detailed information can be found in chapters 7 - 10 of these guidelines.

What advantages are offered to users of 'open' numbering, such as that available from the EAN.UCC system, over those available from a closed system?
An open numbering system permits all parties in all business sectors to use a common standard and thus increase the efficiency of transactions within the supply chains of which they are part. The global EAN.UCC system provides this functionality. In contrast to this, restricted, bilateral or sector specific systems restrict the ability of businesses to obtain the benefits available from the use of global standards. The global spread, over the last 25 years of the EAN.UCC system, has additionally resulted in the development of hardware and software for the cost effective application of the bar codes. The cross-functionality of the EAN.UCC system has been recognised by the providers of enterprise resource systems and is now incorporated in the standard software available to the multi-sectorial uses of these products.

Where do I start?
Contact your local EAN International Member Organisation and register as a member. Construct Global Trade Item Numbers and/or Global Location Numbers and/or Serial Shipping Container Codes using your national EAN.UCC Company prefix in combination with the EAN member organisation number allocated to you. Communicate your intentions to all trading partners that will read EAN.UCC bar codes representing the above numbers and/or EANCOM® EDI messages.

What does it cost to become an EAN member?
Membership costs vary from one country to another and in general depend on the numbering capacity and the services required. However, EAN membership fees are low. They usually consist of an annual fee and a one-time joining fee.

What do I get in return?
A member company receives an EAN member organisation ID number, a capacity to number its products and basic support in implementing the EAN.UCC System. The numbering capacity given to member companies depends on their requirements and can be in the range between 1,000 and 100,000. Should a company wish to use EDI via EANCOM® messages, it can request the necessary information and manuals from its national EAN organisation.

How do I administer the number bank allocated to me by an EAN International Member Organisation?
When you join an EAN International Member Organisation, it will provide you with the necessary documentation to administer the numbering system. It is advisable that all companies centrally allocate product numbers.

How do I print EAN.UCC bar codes on labels?
Label composition software should permit you to use desktop laser or ink jet printers, or you can use specially designed high performance thermal direct or thermal transfer printers. These may be self- contained units able to print pre-programmed label formats, or may require to be driven by a PC. Alternatively, labels can be printed off-site by a supplier that specialises in this type of printing.

Do I have to become a member of an EAN International Member Organisation in every country I operate in?
No. One national EAN organisation membership should meet all the identification and communication needs of a company. However, if there is a need for continuous national EAN organisations support in other countries (i.e., in the local language) it is then advisable to seek membership in those countries too.

Do I need to become a member of an EAN International Member Organisation to use UCC/EAN-128?
Membership in an EAN International Member Organisation or UCC is required to generate EAN.UCC data structures. These data structures are represented in EAN.UCC data carriers (bar codes), which are in the public domain. If you are not already a member of an EAN Member Organisation, you will have to do so if you wish to use the UCC/EAN-128.

If you are already a member of an EAN Member Organisation, your annual membership fee includes support concerning all EAN standards, including UCC/EAN-128. Logistics providers can use SSCC's applied by EAN members to their packages and derive benefit from the functionality available

Is UCC/EAN-128 used only to identify pallets?
No, it is being used for the identification of trade units, identification and tracking and tracing of logistics units (mainly pallets) and assets, as well as encoding of additional information, such as batch numbers, production or best before dates, etc. Many other applications also utilise the UCC/EAN-128 specification.

Can communication be done via WebEDI?
Yes.
WebEDI provides companies with the ability to exchange low volumes of data electronically t via the Internet. The information is made available in standardised electronic style sheets. Using this process and modern browser technology electronic messages, e.g. ORDERS can be received or DESADV* created. The acceptance and the rationalisation of such solutions requires global standardisation, which is currently being developed by EAN.UCC based on EANCOM® standard data profiles. For further information, please contact your local Member Organization.

Can communication be done via XML?
Yes.
EAN International and the UCC offer a suite of global B2B standards, which are based on a core set of schemas. These are shared across all industries and can be extended to meet the needs of a specific sector. These XML schemas are based on business requirements, which are documented as UML (Unified Modelling Language) business process models. For further information, please contact your local Member Organisation.

Can RFID be used for traceability purposes?
Yes.
RFID is an essential data carrier that complements the existing EAN*UCC standard tool set in significant application areas, this includes the tracking and tracing of trade items, assets etc. As the various components of RFID applications become standardised, the number of potential users, industrial processes and businesses increases. The first RFID standard developed by EAN.UCC is the GTAG Technical Specification, which is designed to operate within a range of frequencies in the UHF band. EAN.UCC considers RFID to be a complementary technology to the current EAN.UCC standards, as stated in the EAN.UCC General Specifications, and they will co-exist for a considerable period of time. For further information, please contact your local Member Organisation.

Can Reduced Space Symbology® be used for traceability purposes?
Yes.
The Reduced Space Symbology® (RSS) is compatible with the existing EAN.UCC Enabling Technologies. It is designed to bring the benefits of identification to space-constrained situations, where bar codes produced from existing linear symbologies could not normally be used. For further information, please contact your local Member Organisation.

12. Directory of EAN International Member Organisations and UCC

Please see www.ean-int.org for the latest update of the EAN International Member Organisations directory.

13. Glossary of terms used in these guidelines

GLOSSARY OF TERMS USED IN THE GENERAL EAN/UCC SPECIFICATIONS

AI	Abbreviation for Application Identifier
AIDC	Automatic Identification and Data Capture
Alphanumeric (An)	Describes a character set that contains alphabetic characters (letters), numeric digits (numbers), and other characters, such as punctuation marks. Normally used to indicate the permissible characters in a UCC/EAN-128 Bar Code Symbol.
Application Identifier	The field of two or more characters at the beginning of an Element String encoded in an UCC/EAN-128 Symbol, which defines uniquely its format and meaning.
Attribute	A piece of information reflecting a characteristic related to an identification number (e.g., GTIN and GRAI).
Carrier	The party that provides freight transportation services.
Check Digit	A digit calculated from the other digits of an Element String, used to check that the data has been correctly composed. (See EAN.UCC Check Digit Calculation.)
Customer	The party that receives, buys, or consumes an item or service.
Data Carrier	A means to represent data in a machine readable form, used to enable automatic reading of the Element Strings.
Data Field	The smallest part of the data part of an Element String which needs to be distinguished.
Data Structure	The UCC and EAN numbering structures defined in the various lengths required for the different identification purposes which all share a hierarchical composition. Their composition blends the needs of international control with the needs of the users.

EANCOM®	The international EDI standard provided by EAN International, conforming to the UN/EDIFACT standard.
EAN International	EAN International, based in Brussels, Belgium, is an organisation of EAN Member Organisations that jointly manages the EAN.UCC System with the UCC.
EAN Member Organisation	A member of EAN International that is responsible for administering the EAN.UCC System in its country (or assigned area) and for managing the correct use of the EAN.UCC System by its member companies.
EAN-8 Bar Code Symbol	A bar code symbol of the EAN/UPC Symbology that encodes EAN/UCC-8 Identification Numbers.
EAN-13 Bar Code Symbol	A bar code symbol of the EAN/UPC Symbology that encodes EAN/UCC-13 Identification Numbers.
EAN.UCC Company Prefix	Part of the international EAN.UCC Data Structures consisting of an EAN.UCC Prefix and a Company Number, both of which are allocated by either the UCC or an EAN International Numbering Organisation.
EAN.UCC System	The specifications, standards, and guidelines co-administered by EAN International and the UCC.
EAN.UCC –8 Identification Number	The EAN.UCC Identification Number comprising eight digits used to identify trade items and special applications.
EAN.UCC -13 Identification Number	The EAN.UCC Identification Number comprising 13 digits used to identify trade items, locations, and special applications (e.g., coupons).
EAN.UCC -14 Identification Number	The EAN.UCC Identification Number comprising 14 digits; used to identify trade items.
EAN/UPC Symbology	A family of bar code symbols including EAN-8, EAN-13, UPC-A and UPC-E versions. Although UPC-E Symbols do not have a separate Symbology Identifier, they act like a separate symbology through the scanning application software. See also EAN-8 Bar Code Symbol, EAN-13 Bar Code Symbol, UPC-A Bar Code Symbol, and UPC-E Bar Code Symbol.
EDI	Electronic Data Interchange.
Electronic Commerce	The conduct of business communications and management through electronic methods, such as electronic data interchange and automated data collection systems.
Electronic Message	A composition of Element Strings from scanned data and transaction information assembled for data validation and unambiguous processing in a user application.
Element String	A piece of data defined in structure and meaning, comprising an identification part (prefix or Application Identifier) and a data part, represented in an EAN.UCC System endorsed data carrier.
Extension Digit	A digit, allocated by the user, used to increase the capacity of the Serial Reference within the SSCC.
Fixed Length	Term used to describe a data field in an Element String with an established number of characters.
Fixed Measure Trade Item	An item always produced in the same pre-defined version (type, size, weight, contents, design, etc.) that may be sold at any point in the supply chain.
Fnc1	Abbreviation for Function 1 Character.
Full String	The data transmitted by the bar code reader from reading a data carrier, including Symbology Identifier and Element String(s).
Function 1 Character (Fnc1)	A Symbol Control Character used to form the double start pattern of a UCC/EAN-128 Bar Code Symbol. It is also used to separate certain concatenated Element Strings, dependent on their positioning in the bar code symbol.
GLN	Shorthand term for the EAN.UCC Global Location Number using the EAN/UCC-13 Data Structure to identify physical, functional, or legal entities.
GMO	Genetically Modified Organisms
GTIN	Shorthand term for the EAN.UCC Global Trade Item Number. A GTIN may use the EAN/UCC-8, UCC-12, EAN/UCC-13 or EAN/UCC-14 Data Structure.
GTIN Format	The format in which GTINs must be represented in a 14-digit reference field (key) in computer files to ensure uniqueness of the identification numbers.
ISO	International Standards Organisation
Location Number	See GLN.

Logistic Unit	An item of any composition established for transport and/or storage that needs to be managed through the supply chain.
Scanner	An electronic device to read bar code symbols and convert them into electrical signals understandable by a computer device.
Serial Reference	The part of the data structure allocated by the user in conjunction with the Extension digit that establishes a unique SSCC for a given EAN.UCC Company Prefix.
Serial Shipping Container Code	See SSCC.
SSCC	The unique identification of a logistic unit using an 18-digit data structure.
Supplier	The party that produces, provides, or furnishes an item or service.
Symbol	The combination of symbol characters and features required by a particular symbology, including Quiet Zone, Start and Stop Characters, data characters, and other auxiliary patterns, which together form a complete scannable entity; an instance of a symbology and a data structure.
Symbology	A defined method of representing numeric or alphabetic characters in a bar code. (A type of bar code.)
Trade Item	Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in any supply chain.
UCC	See Uniform Code Council.
UCC Company Prefix	Part of the UCC-12 Data Structure consisting of a UCC Prefix and a Company Number allocated by the UCC.
UCC/EAN-128 Bar Code Symbol	A subset of the Code 128 Bar Code Symbol that is utilised exclusively for UCC.EAN defined data structures.
Uniform Code Council	The Uniform Code Council (UCC), based in the United States, is a membership organisation that jointly manages the EAN.UCC System with EAN International. The UCC also administers the EAN.UCC System in the United States and Canada.
UPC-A Bar Code Symbol	A bar code symbol of the EAN/UPC Symbology that encodes UCC-12 Identification Numbers.
UPC-E Bar Code Symbol	A bar code symbol of the EAN/UPC Symbology representing a UCC-12 Identification Number in six explicitly encoded digits using zero suppression techniques.
Variable Measure Trade Item	An item always produced in the same pre-defined version (type, design, packaging, etc.) that may be sold at any point in the supply chain, which either may vary in weight/size by its nature or which may be traded without a pre-defined weight/size/length.

Appendix
AI'S IN THE FISH SUPPLY CHAIN

In this appendix you will find the AI's described in this Guideline

AI	Full Title	Data Title	Format AI	Format data field
00	Identification number of a logistic unit	SSCC	n2	n18
01	Global Trade Item Number	GTIN	n2	n14
02	Global Trade Item Number	GTIN	n2	n14
10	Batch/Lot number	BATCH/LOT	n2	an..20
11	Production date of a trade item (Catch date)	PROD DATE	n2	n6
13	Packaging date of a trade item	PACK DATE	n2	n6
15	Best before/minimum durability date of a trade item	BEST BEFORE or SELL By	n2	n6
30	Count of items contained in a variable measure trade item	VAR. COUNT	n2	n..8
310(n)	Net weight	NET WEIGHT (kg)	n4	n6
330(n)	Gross weight	GROSS WEIGHT (kg)	n4	n6
37	Count of trade items contained in a logistic unit	COUNT	n2	n..8
410	Delivery to Global Location Number	GLN	N3	N13
412	Global Location Number of supplier	GLN	n3	n13
414	Global Location Number physical location	GLN	n3	N13
7030 up to 7039	Approval no. of processor with ISO-code	PROCESSOR # s	n4	n3 + an..27