

TRACEABILITY SYSTEM OF FISH PRODUCTS - LEGISLATION TO IMPLEMENTATION IN SELECTED COUNTRIES

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ABSTRACT

In January 2002, Regulation (EC) 178/2002 was adopted as the General Food Law of the European Union (EU). In this Regulation, a new requirement on Traceability of food and feed, food and feed-producing animals, and substances intended to be incorporated into food and feed was introduced for the first time for universal application through out the Union. *The Regulation also requires the countries exporting the above products to be able to ensure the conditions, which are at least equivalent to those set by the Union in terms of food safety and traceability.* In the same year, the US Parliament passed the Bioterrorism Preparedness Act, with a section requiring the maintenance of records for foods. This Act gave the US Food and Drug Administration the right to regulate detailed requirements to the records system. Both of the above systems caused concern in the food industries, especially those dependent on food export. Many of them were not ready for such a system. The enforcement date of traceability requirements of these two markets are from 2005. As a food product category, fish and fishery products are also covered by the above regulations. Therefore, this paper is an intensive study on current requirements of food/fish product traceability in the EU and its member states, and the U.S. legislations, before looking at the availability of fish products traceability in both legal and practical terms in Iceland and Vietnam. In comparison with the Icelandic fisheries industry, the situation of fish production in Vietnam makes implementation of traceability more difficult.

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1 INTRODUCTION

Today, food traceability is highlighted on the agendas of all food-concerned agencies and companies. Despite the long existence of a similar system, the word ‘traceability’ is a new term mostly emerging since the breakout of the Bovine Spongiform Encephalopathy (BSE) and dioxin crises in Europe in the last decade.

1.1 Definition of traceability

Etymologically, the word ‘traceability’ is formed from the verb ‘trace’, which is derived from the vulgar Latin *tractiare* (to drag), from Latin *tractus*, past participle of *trahere* (to pull) and refers to the action to follow the footprints, track, or trail of; to follow or study in detail or step by step; to discover by going backwards over the evidence step by step; to discover signs, evidence, or remains of something (Merriam Webster Dictionary 2003).

However, the word ‘traceability’ is employed in a broader sense. Traceability implies a system to document the history of a product along the entire production chain from primary raw materials to the final consumable product (MacDaniel and Sheridan 2001). In this sense, traceability is needed for all products, which are tradable.

In the fields of animal health and food safety, there are several legal definitions and different terms for traceability, such as:

- *the ability to trace the history, application or location of an entity by means of recorded identification*
(ISO standard 9000:2000)
- *the ability to follow the movement of a food through specified stage(s) of production, processing and distribution*
(CAC 27th Session Report 2004)
- *the ability to trace and follow a food, feed, food-producing animal or substance intended to be or expected to be incorporated into a food or feed through all stages of production, processing or distribution*
(EU Law. Regulation No 2002/178 - Article 3. 15)
- *the creation and maintenance of records needed to determine the immediate previous sources and the immediate subsequent recipients of food, (i.e., one up, one down)*
(USA Law. Bioterrorism Act 2002 - Section 306)
- ...

Through the above definitions, it is noted that the term “ability to trace” is used in ISO standard, “ability to follow” is in Codex standard, “ability to trace and follow” is used by the EU, while in the United States this is simply called “the creation and maintenance of records”. Many others speak of tracking and tracing, but these documents are all about the same system having a common core, whose principles are summarised in the following sections (EAN.UCC 2004).

1.2 Descriptions of a food traceability system

1.2.1 Main principles and components

- *Unique identification:* Any traced or tracked unit must be uniquely identified. The unique identifier is the key factor accessible to all available data about its history, application or location. Most products are being tracked and traced by their production batch, and by their transport/storage/distribution.
- *Data capture and recording:* Data has to be captured and recorded between steps throughout the supply chain, or in between each step in better case. The accuracy and speed of data capture, recording and accessibility are the main performance indicators of any traceability system.
- *Links management:* Successive links between what is received, produced, packed, stored and shipped across the entire supply chain. If one of the partners in the supply chain fails in managing these links, this will result in the rupture of the information chain and in the subsequent loss of traceability.
- *Data communication:* The data captured is transferred between steps in the production chain accompanying the physical flow of products. To ensure the continuity of the information flow, each supply chain actor must communicate captured traceability data to the next one, enabling the latter to apply traceability principles.

Based on the above practices, two categories of traceability are identified:

- The external traceability: the system that ensures the links management and the data communication between the steps of the production chain. This is the minimum traceability the industry must maintain.
- The internal traceability: the system that ensures the links management and data communication of every unit of raw materials and ingredients during the processing at each step, until the final products.

The external traceability is mandatory according to the current legislation, while the internal traceability is the factor assuring the accuracy of the external traceability.

1.2.2 The importance of food traceability

The reasons why a traceability system is vital to the food industry, as noted by Dillon and Derrick (2004), are:

- In case of food safety incidents, a traceability system enables quick identification and recall of hazardous materials. In this way, traceability can prevent, or at least reduce, the likelihood of re-occurrence. It also reduces losses, which result from recalling more products than those involved.
- Product traceability facilitates the identification of key points within the supply chain at which the surveillance of residue in products is necessary.

- By linking information on the entire history of a product throughout the production chain, the origins of products or ingredients that may have food safety implications can be identified, which allows assessing risks from food exposure.
- The traceability system can help in protecting the products from fraud, and proving the labelling claim.

1.2.3 Pre-requisite conditions of food traceability

To implement a system of traceability in the food business, no matter whether the system is paper-based or computerised; the traceability shall be constructed on prerequisite conditions, which include:

- Regulated responsibilities for traceability of all concerned entities in the food production chain;
- Standardised identifiers (ID) for every input and output ingredients/packaging/ food that are readable between steps in the production chain;
- Descriptive traceback and tracking (recalling) procedures. However, it is noted that the efficient breadth, depth, and precision of these procedures are still debated.

Based on these pre-requisite conditions, the efficiency of each legislation system on traceability will be discussed in next chapter.

From the practical point of view, an effective traceability system can be based on various technologies even for the same products. In the fish industry, it needs to be emphasized that the effective traceability systems should be different between captured fish and farmed fish. The rationale for this recommendation will be discussed in the practical study later on.

1.3 Scope and rationale of the project

Although traceability has twice been subjected to study under the framework of the United Nation University - Fisheries Training Program so far (Maria Rita 2001, and Liu 2002), the following new results are expected from this project:

- A broad summary of traceability-related legal requirements in the largest fish markets, in Iceland as well as Vietnam;
- An observation on traceability systems through the whole production chain from catching/farming to transportation in Iceland's fish industry;
- A recommended solution to the implementation of traceability for an artisanal fishing industry like Vietnam in the next years.

In order to achieve the above goals, the project will be carried out under the following sections:

- *Legal Study:*

An analysis of the current requirements on food traceability of international organizations and of the main seafood markets will be explained in the second chapter. The legislation of the European Community, and the most out-standing systems of the member states will be examined, followed by the U.S. requirements on traceability, giving the background on which the analysis on the effectiveness of the existing Icelandic and Vietnamese legislations will base as long as they keep exporting to the EU and the U.S.

This study aims to find out the basic mandatory requirement on seafood traceability at the current time, and also the specific requirements the industry has to fulfil when exporting seafood to different markets. On the other hand, it focuses on explaining the effects of each system on the world market and the interdependences between systems as parts of the whole.

- *Observations and investigations:*

The knowledge brought from the legislation study part will serve as the frame/navigator for the observations on the practices of traceability in the fishery industry in Iceland, and for the investigations on the existing situation in Vietnam.

While the observations on the traceability practices in Icelandic companies is aimed at getting experience regarding things that should be taken into consideration when building up a traceback system toward the full assurance of safety and quality in the fish industry, the investigations on conditions of the Vietnam fishery industry is to understand the availability for applying the basic traceability system.

- *Conclusion:*

The ambition of this part is twofold:

- To suggest a solution for the Vietnamese seafood industry to apply an efficient traceability system in 2005, more prone to the legislative solution as a result of intensive legal study on traceability.
- To look ahead and forecast the future trend of basic requirements on traceability and suggest actions that the industry should take today for the sustainable development in the seafood market.

2 LEGAL REQUIREMENTS ON TRACEABILITY

Before analysing the current legal requirements concerning traceability for fish product, it is needed to summarise shortly the basic principle on which all legal systems are based, regardless of nationality and complexity.

2.1 Hierarchy of norms in international law

The basic principle on which every legal system is based is the Principle of Hierarchy of Norms in International Law (Marshall 1807, Salcedo 1997 and Abdelkhaleq 2002). Generally speaking, in a democratic country the legislation system is commonly built in light of the Constitution (which is the highest effective legal document in the system). Laws and sub-laws brought into force must be constitutional, or conform to the Constitution. Depending on the classification of the document leads to the so-called 'Pyramid of Effect' of legal documents, where the most important document sits at the head of the pyramid and from which all others are derived from..

In terms of legislation on traceability for food, the same principle must be applied.

- Within the legislation system of a nation, the principles for food traceability should be stated in a single legal text, which serves as the top of the pyramid. From this statement of principles other legal requirements are derived in detail forming the detailed rules and regulations. The documents containing the detailed requirements must be under the effect of the top document.
- Turning to the pyramid effect amongst legislations between a block/union (such as the EU), any legal document on traceability adopted by the union will often serve as the top effect document in its member countries, above any national document. However, in the event that the traceability requirements of a member's legislation does not contrast with, but are more stringent than the requirements laid down by the union, the national legislation now takes effect, with a sense of being higher than the effect of the related union document.
- Looking into the relationship between national and international law on traceability, it is confirmed that, despite of the wide scope of application, international law on traceability can only serve as the reference for national law. The reason is that there is no international agreement in terms of food safety/traceability as yet, and that the national requirements are still posing the highest effect in a direct and straight manner in the food trade. But, it is theoretically probable to expect sometime in the future a universal international convention on food safety and traceability (in the same sense as the UN Convention on the Law of the Sea 1982 in the field of exploitation and conservation...). If this document was to be produced it would become the top effect document in this field and all nations would have to respect its provisions.
- Looking into a specific case in the international market, the applicable law would be the one chosen by both (or all) parties to the contract.. This applicable law could be either one based on international standards, or the national law of a party or even third party.

2.2 Requirements on food traceability in international standards

In this section, the standards set by the ISO, Codex and OIE will be discussed.

2.2.1 Introduction of the standards

ISO, CODEX and OIE are the acronyms of three food-concerned international organizations (International Standard Organisation, Codex Alimentarius and Office International des Epizooties respectively).

However, their concerns about food are at different levels, driven by their functions and objectives:

- ISO is for standardisation of products quality in general, including standards for food quality;
- OIE is for animal health, focusing on the health of living aquatic animals; and
- CODEX is for food safety in general, including safety of food from fish.

2.2.2 Descriptions of the standards on food traceability

2.2.2.1 International Standard Organization (ISO)

ISO standards on traceability fall under the Series of Quality Management, which at first defined traceability as the:

ability to trace the history, application or location of an entity by means of recorded identifications
(ISO 8402:1994 - Definition 3.16)

This definition later changed to the:

ability to trace the history, application or location of that which is under consideration
(ISO 9000:2000 - Part 3.4.2)

The new definition goes further than the previous one by noting that when considering a product, traceability can relate not only to the origin of materials/parts and processing history, but also to the distribution and location of the product after delivery. This definition implies the responsibility of every entity in the production chain for ensuring traceability.

At present, ISO standard 22518 - *Traceability Systems in the agricultural food chain – General principles for design and development* is being developed jointly between Codex and ISO. It is expected that this new ISO standard will give a workable description on traceability to the agricultural food industry, including the fish industry.

2.2.2.2 Office International des Epizooties (OIE)

OIE considers that effective traceability is urgently needed for different types of aquaculture operations and for trading of agriproducts.

This reasoning of the OIE is easily explained by the fear of disease out-breaks which have occurred in the food industry recently like BSE, dioxin and bird-flu.

In contrast to the ISO, the OIE International Animal Health Code – 2004 emphasises that traceability should be a demonstration for Government Veterinary Services' capacity to exercise control over all animal health matters, and not a description about the responsibility of private stakeholders in the chain. It implies the responsibility to stipulate the traceability system of the Government.

1. Animal health and veterinary public health

The Veterinary Services should be able to demonstrate that they have the capacity, supported by appropriate legislation, to exercise control over all animal health matters. These controls should include, where appropriate, compulsory notification of prescribed animal diseases, inspection, movement controls through systems which provide adequate traceability, registration of facilities, quarantine of infected premises/areas, testing, treatment, destruction of infected animals or contaminated materials, controls over the use of veterinary medicines, etc.

(Part 1, Section 1.3, Chapter 1.3.4, Article 1.3.4.7.)

Due to the fact that seafood is much safer than food originated from other animals, the OIE does not make much effort drawing up traceability standards for this animal.

2.2.2.3 Codex Alimentarius (CODEX)

Traceability requirements by CODEX date back to 1985 and can be found in sections 4.5.1 & 4.5.2 of Codex Stan 1 – 1985 under the heading “the country of origin of food” (ACFS 2003).

But CODEX did not define traceability until its 27th session in July 2004, where traceability was adopted and added into one of the Procedural Manuals as:

the ability to follow the movement of a food through specified stage(s) of production, processing and distribution

(Report of CAC 27th Session).

Despite its late definition, Codex Standards encompass key elements of traceability and these are adopted by most national Governments in their own legislation. The most mentioned standards are:

- Recall procedure in CAC/RCP 1-1969, Rev. 4-2003 (Section V.5.8)
- Labelling requirements of pre-packaged foods in CAC/Stan 1 –1985

4.5.1 The country of origin of the food shall be declared if its omission would mislead or deceive the consumer.

4.5.2 When a food undergoes processing in a second country, which changes its nature, the country in which the processing is performed shall be considered to be the country of origin for the purposes of labelling.

- Requirements of certificates in CAC/GL 38 - 2001

16. The details of the product being certified should be clearly documented on the certificate, which should at least contain the following information:

- nature of the food;*
- name of product;*
- quantity, in the appropriate units;*
- lot identifier or date coding;*
- identity and, as appropriate, the location of the production establishment;*
- name and contact details of the importer or consignee;*
- name and contact details of the exporter or consignor;*
- country of dispatch; and*
- country of destination.*

- With regard to foods derived from modern biotechnology (e.g. GMOs), Codex does not require traceability, even in CAC/GL 44-2003 - the latest guideline for risk analysis of this food category.

At present, there is an ongoing debate within Codex as to the extent to which the mandatory traceability for GMOs should be and Codex continues taking traceability for food in general, GMO-food in particular into consideration as a matter of priority. Three committees involved in this are CCFICS, CCGP and CCFL.

2.2.3 Comments

In brief, measures to trace animals and animal products through a production system are accepted in international trade by the WTO SPS Agreement as an SPS measure to provide assurance of food safety. However, WTO encourages importing countries to make use of available international standards, guidelines and recommendations in the development of traceability measures, and WTO also places an emphasis on using international standards as reference standards in disputes.

Three international standards are recognised as the reference standards in the WTO: OIE, Codex and International Plant Protection Convention (animal health, food safety and plant health respectively). This mechanism puts international standards in the right place, especially the Codex standards for the food industry, which are optional but very important as a reference for dispute resolution between nations.

2.3 Legislation of the EU

2.3.1 Review of the legislation system of the EU

EU legislation is numerous in terms of quantity of documents. It is formed by two simultaneous systems: Community law and national law.

Community law is an independent legal system, which takes higher effect than national legislation, even though the voluntary national legislations can set up more stringent requirements for the products that are marketed in their territory.

In general, Community law is composed of three different but interdependent types of legislation: Primary, Secondary and Case law.

Primary legislation is adopted by the members' legislature (Parliament) in the form of Treaties/Agreements after direct negotiations between members' Governments. These documents mostly define the institutional set-up of the union, but not in narrow issues like food safety.

Secondary legislation is elaborated by the European Commission in the form of Regulations, Directives, Decisions, Recommendations or Opinions. This legislation is based on primary legislation

Regulations, Directives and Decisions are binding on all EU member states, while Recommendations and Opinions are not.

- Regulations are directly and universally applicable to all EU member states without any national implementing legislation. The European Parliament, the Council and the Commission can issue Regulations.
- Directives are binding on member states, but in indirect method. They are required to be transformed into national laws within a certain time limit. Only the Council can issue Directives.
- Decisions are directly binding for those to whom they are addressed, which can be any member states, a third country, enterprises or individuals. Both the Council and Commission can adopt Decisions.
- Guidance or Recommendations are facultative, and are often used when the matters have not been fully regulated by the binding law. (EC Treaty, Article 249 and Euratom Treaty, Article 161) .
Case law is in the form of standard judgments from the European Courts of Justice and is applicable in individual cases.

2.3.2 *Traceability in the Community Laws*

Most of the EU legal requirements relevant to traceability are made in secondary legislation, some are in the form of guidance.

The main requirement on traceability applied to all food and feed is defined in Regulation 178/2002/EC, especially articles 18, 19, 20. There are also a number of requirements related to the practices of traceability, which have to be analysed.

2.3.2.1 Products and operators covered by food traceability requirement

Covered products

The products subjected to the requirement of food traceability are defined by Regulation 178/2002/EC as:

1...food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed ...
(Regulation 178/2002/EC – Article 18(1)).

This means that not only the food and feed itself are subject to traceability but also the food-producing animals or substances intended to be, or expected to be incorporated into them..

However, it excludes all ingredients that produce the ingredients for food and feed, for example, the grain used as seed for cultivation and materials for making packaging (SCFCAH's Guidance on General Food Law).

The article also excludes veterinary medicine products and plant protection products directly used for animals, as they are covered by other specific regulations. For aquaculture animals, the control and traceability of veterinary medicines and chemical substances used must follow the EU Law 1996, Directive 96/23/EC of 29 April 1996.

Covered operators

In the words of EU Law 2002. European Parliament and Council. Regulation 178/2002/EC, the persons who are responsible for ensuring food and feed traceability are ““food business operators” and “feed business operators”. In particular and in accordance with the Regulation these persons are:

- the persons who imported, produced, processed, manufactured or distributed food or feed;
- the persons who undertake retail or distribution activities which do not affect the packaging, labelling, safety or integrity of the food or feed; retail here means:

.the handling and/or processing of food and its storage at the point of sale or delivery to the final consumer, and includes distribution terminals, catering operations, factory canteens, institutional catering, restaurants and other similar food service operations, shops, supermarket distribution centres and wholesale outlets.

(EU Law 2002. European Parliament and Council. Regulation No 178/2002 - Article 3.7, Article 19, Article 20).

2.3.2.2 Responsibilities of operators

- Each food/feed business operator shall:
 - o Be able to identify their suppliers and customers (*one up, one down*) and convey this information to the Competent Authority on demand;
 - o Have a system to withdraw/recall unsafe products;
 - o Provide customers with necessary information to access the risk; and
 - o Inform the competent authorities of unsafe food.
(Regulation No 178/2002 - Article 18, 19, 20; Directive 2001/95/EC - Article 5).

The points to note here are, that the Regulation:

- Does not regulate the methods to ensure the ability to identify suppliers and customers of the food operators;
- Does not obligate internal traceability (systems ensuring the links between management and data communication within each operation of the supply chain);
- Does not fix the time limit in which the operators have to store traceability information for conveying to the competent authority in case of need.
- In order to fulfil the above responsibilities, food/feed business operators have 2 derivative responsibilities:
 - o To put in place a system and procedures, which ensure their responsibility on demand by the competent authority.
 - o To facilitate traceability, by adequately labelling or identifying their products in accordance with the provisions on labelling:

3. Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied...

4. Food or feed which is placed on the market or is likely to be placed on the market in the Community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions.(Regulation No 178/2002 - Article 18(3) & 18(4)).

Thus, labelling and identification of products are needed for the implementation of traceability.

2.3.2.3 Requirements on the identification and labelling of fish products

- All food products, including fishery products, have to be identified by lot, which is defined as:

a batch of sales units of a foodstuff produced, manufactured or packaged under practically the same conditions.

(Directive 89/396/EEC – Article 1(2)).

The Directive leaves the lot size to producers to decide according to the practical situation in their business.

The information needed for the purpose of identification or labelling of a lot is not fixed in this Directive, but a date of minimum durability can be judged as satisfactory to the labelling requirement:

When the date of minimum durability or 'use by' date appears on the label, the indication referred to in Article 1 (1) need not appear on the foodstuff, provided that the date consists at least of the uncoded indication of the day and the month in that order.

(Directive 89/396/EEC – Article 5).

The lot identification must be shown on the label in the case of pre-packaged food; or on the packaging, on the container, or the accompanying documents in other cases (Directive 89/396/EEC – Article 4).

- To all chilled, frozen, smoked fish/fillets and shellfish offered for retail sale to the final consumer, the following information must be shown:
 - o Species (common and Latin name),
 - o Method of production (whether caught at sea/inland water), or
 - o Farming area of capture (FAO defined marine/inland fishery areas), or the country in which fish are farmed.
 (Regulation No 104/2000/EC and No 2065/2001/EC).

The above information can be given by labelling, or being placed on packaging, or by means of commercial documents accompanying the product (Regulation No 2065/2001/EC, Article 8).

2.3.2.4 Withdrawal and recall requirement for goods in general

Applied to every product served for human consumption, the withdrawal system is set by the Directive 2001/95/EC of 03 December 2001.

1. ...

Within the limits of their respective activities, producers shall adopt measures commensurate with the characteristics of the products which they supply, enabling them to:

(a) ...

(b) choose to take appropriate action including, if necessary to avoid these risks, withdrawal from the market, adequately and effectively warning consumers or recall from consumers.

(Directive 2001/95/EC – Article 5(1));

2.3.2.5 Traceability of genetically modified organisms (GMO) and food and feed produced from GMO

All foods (or food ingredient) containing > 0.9% GM material; or containing > 0.5% of not approved adventitious material will be subject to specific requirements on traceability of food consisting of or containing GMOs:

3. For products intended for direct processing, paragraph 1 shall not apply to traces of authorised GMOs in a proportion no higher than 0,9 % or lower thresholds established under the provisions of Article 30(2), provided that these traces are adventitious or technically unavoidable.

(Regulation 2003/1830/EC – Article 7(2)).

As a temporary measure, food or feed that contains < 5% of not-approved adventitious ingredient will not go through the authorisation procedures set by Article 4(2) and 16(2) of the Regulation 2003/1829/EC:

1.The presence in food or feed of material which contains, consists of or is produced from GMOs in a proportion no higher than 0.5 % shall not be considered to be in breach of Article 4(2) or Article 16(2), provided that...

(Regulation 2003/1829/EC – Article 47(1)).

The EU member states have an obligation to ensure the traceability of GMO contained products (Directive 2001/18/EC - Article 4(6)).

However, this Directive requires labelling of GMOs, which are addressed to the notifier, but this does not extend to operators who subsequently place the GMO on the market.

EC Regulations 1829/2003 and 1830/2003, which come into effect on 18 April., 2004 require detailed descriptions on traceability of GMO-contained food. In particular, Regulation 1830/2003 (articles 4(1), (2), (4) and(6)) provides that:

- Operators shall transmit in writing to the operator receiving the product specified information concerning the identity of a product in terms of the individual GMOs it contains or whether it is produced from GMOs (Article 4(1)).
- At all stages of the placing on the market of products, operators shall ensure that the specified information received from the suppliers is indicated in writing to the next operators who receive the products (Article4 (2)).
- Operators shall retain specified information for a period of five years and make it available to competent authorities on demand (Article4 (6)).
- In labelling products, operators shall ensure the words “This product contains genetically modified organisms” or “This product contains genetically modified [name of organism(s)]” appear in the product label for pre-packaged products, or in connection with the display of the non-pre-packaged products (Regulation (EC) No 1830/2003 – Article 4(6)).

2.3.2.6 Applicability to imported food and feed

Concerning food and feed imported into the EU, Regulation 178/2002/EC renews the principle of equivalence to the EU relevant requirements where they exist. This means that the third country exporting food and feed to the EU must ensure traceability is equivalent to the level set by EU requirements.

Food and feed imported into the Community for placing on the market within the Community shall comply with the relevant requirements of food law or conditions recognised by the Community to be at least equivalent thereto or, where a specific agreement exists between the Community and the exporting country, with requirements contained therein. (Regulation No 178/2002 - Article 11).

Thus, all the traceability requirements in this Regulation as specified above need to be fulfilled when food and feed are exported to the European Union.

There are also many other legal requirements that regulate various components for traceability, although they are not specific to traceability:

- Directive 91/493/EEC specifies the health conditions for the production and placing on the market of fishery products.
- Directive 91/492/EEC specifies the health conditions for the production and the placing on the market of live bivalve molluscs.

- Directive 96/23/EC provides measures to monitor certain substances and residues thereof in live animals and animal products.
- Directive 93/43/EEC requires the food businesses and food handlers to exercise due diligence with respect to food hygiene.
- Directive 92/48 provides the hygiene rules applied to fish caught on certain vessels in accordance with Directive 91/493/EC.
- Decision 94/356/EC concerns the own-check system (HACCP).

2.3.3 Conclusion

In brief, Regulation 178/2002/EC requires each food/feed operator to:

- Be able to know from whom food ingredients are supplied and to whom food will be sent;
- Be able to identify and label food by lots, and inform customers of necessary information to evaluate the risk;
- Be able to recall unsafe products from the market;
- Clearly label GMO products to notify consumers about its status. Each GM-containing product must bear a unique ID issued by the competent authority in the label, and their records must be kept for five years.

Despite its complex provisions, Regulation 178/2002/EC could be evaluated as a vague law for the following reasons:

- Firstly, it does not provide any description as to how precise traceability should be and there is no requirement for how long to record keep for with the only principle being the “one up, one down” principle;
- Secondly, it does not require an internal traceability system. The identification of how batches are split and combined to create particular products within each step of food or feed production chain which is needed for effective traceability, is only optional but this information is essential for identifying the products to recall;
- Thirdly, an audit for the effectiveness of such a system has not been required. Combined with the absence of an obligatory internal system, the Regulation implies the acceptance of the wider information when tracing up each stage in the production chain.

These are the reasons why the EC Standing Committee on Food Chain and Animal Health (SCFCAH) issued a Guidance on Implementation of its several articles, including traceability, before the enforcing date of the Regulation.

It should be emphasised that Regulation 178/2002/EC, as a general food law laying down principles of equivalence in terms of ensuring food safety, will also affect third countries that export food and feed to this market.

Next to the requirement “one up, one down”, GMO-containing food is also required to be labelled with clear details about its status. Clearer responsibilities to the business operators of GMO-containing food are also applied (the obligatory transmission of written documents stating the GMO-containing status of the products between businesses in the production chain; the obligatory keeping of records for 5 years, the unique identifier approved by authorities on each GMO product).

2.3.4 Legal provisions of some EU Member States

2.3.4.1 Regulation in the UK

In the field of food safety within the UK, the Food Safety Act 1990 is the highest effect document. To bring into force the Act of Parliament, Ministers make orders, rules or regulations by means of Statutory Instruments (SI) providing the necessary details that are considered too complex to include in the body of the Act, or to amend or modify the Act without passing a new Act by the Parliament (UK Law. Factsheet L7 - 2003). Therefore, it is observed that sometimes the SIs contain the provisions amending the Act they support.

The above system is applied universally in the UK. However, SIs can apply either to the whole UK, or to each individual country of the UK (UK Law. Factsheet L7 - 2003).

The common situation is that the same SI(s) normally apply to England, Wales and Scotland, but not to Northern Ireland. For this reason, the regulation of Northern Ireland on traceability will be further examined at the end of this part.

There is not a general legal requirement for the traceability in the food chain within the UK. However, many components of traceability are required under a number of separate measures:

- The Materials and Articles in Contact with Food Regulations 1987 provide a basic form of traceability for finished items intended to come into contact with food when sold at retail that: *the items shall be shown with either the name or trade name and address or registered office or the registered trademark of the manufacturer or processor of the item, or of a seller of the item established in the European Community (Regulation 7, 8)*. These Regulations shall not extend to Northern Ireland.
- Earlier than the recall requirement of the EU legislation, the General Product Safety Regulations (1994) of the UK imposed requirements concerning the safety of products (including food and drink) intended for, or likely to be used by, consumers, *including a requirement for systems to be in place that enable the product to be withdrawn from sale*, where a problem that might affect consumer safety is reported. The Regulations apply to the whole UK.
- The Food Lot Marking Regulations (1996) implementing EC Directive 89/396/EEC apply to the sale of all foodstuffs for human consumption require the *lot marking indication in such a way as to be easily visible, clearly legible and indelible. The producer, manufacturer, packer or first seller within the EC*

determines the size of any lot. A “sell by” or “use by” date on the labelling of the product may be used as a lot mark (Regulation 3). These Regulations extend to England, Wales and Scotland.

Note: these Regulations of the UK only transposed the EU Directive, but do not fix more specified requirements for marking of food lots.

- The Feeding Stuffs Regulations 2000, which implement various EC Directives, place controls on the marketing of feed materials (including ingredients for feed). These require that *a label must be attached to, or travel with, the batch of feed material, containing the name and address of the person responsible for the information and other statutory information relating to composition (Regulation 5, 6).* In addition, *where a batch of feed material is divided, the second labels must refer to the original batch. For sales of feed materials from farms, the batch is considered to enter the feed chain only at the premises of the crusher, central store or feed compounder.* Therefore no label or batch reference required is to be generated on-farm. Several regulations extend to all countries of the UK, but the ones related to traceability only apply to England (*Regulations 11, 12 and 24*).

There are also labelling requirements for compound feeding stuffs, feed additives and premixtures (mixtures of additives with a carrier). These require *the details of the person responsible for the labelling information, the establishments and intermediaries manufacturing or using certain feed additives (e.g. vitamins and trace elements) to be approved or registered.* This includes manufacturers of compound feeds and farmers who buy compound feeds with additives. The Regulations specify *minimum conditions that must be fulfilled including records of suppliers and customers.* There are similar requirements concerning premises producing feeding stuffs containing zoo technical additives (e.g. antibiotics or growth promoters) (*Regulation 10*).

- The Food Irradiation Provisions (England) Regulations 2000 require that *irradiation plants keep records for each batch of food irradiated. Irradiated food has to be labelled and accompanied by documentation and/or identification that identifies the facility where it was irradiated (Regulation 6A).* These Regulations extend to England only.
- Implementing EC Commission Regulation 2065/2001, which came into force in the UK on 7 May 2002 *requiring fish and fishery products, when offered for retail sale to the final consumer, to be labelled with 3 groups of information, given by labelling or on packaging, or by means of commercial documents accompanying the product (mentioned in the part 2.1.1 above); the UK generally understood that commercial documentation (e.g. sales note, invoice) is the usual means of providing this information through the chain.*
- Regulation 2003 No 461 – that fish labelling also specifies a list of the commercial designations for common species of fish and allow omission under certain circumstances of references to the production method. Their regulations extend only to England.

- Referring to traceability and labelling of GMO products, the following new regulations are also applied:
 - o The Genetically Modified Organisms (Traceability and Labelling) England Regulations 2004, extend to England and Wales, but is binding in England only.
 - o The Genetically Modified Organisms (Traceability and Labelling) Scotland Regulations 2004. These Regulations extend to Scotland only.

Both of them are for the purpose of the execution and enforcement of Regulation (EC) No 1831/2003, and give no more detailed requirements than the EU regulation. The main principle applied to food sold to the final consumer or mass caterer, which contains GM material (i.e. protein or DNA from a genetically modified organism) is required to carry a label, to indicate this.

The Northern Ireland Regulations on Traceability

The General Food Regulations (Northern Ireland) 2004 provide for the enforcement of certain provisions of Regulation (EC) No. 178/2002, including articles 18 and 19 on traceability. It designates district councils and the Food Standards Agency as the competent authorities for the purposes of those Articles of the EC Regulation (*Regulation 3*) and also makes provision for offences (*Regulation 4*) and penalties (*Regulation 5*).

The requirements on traceability of this country do not exceed those set by the community laws.

The first comment about the U.K. legislation system is that traceability was started earlier than in the EU system, especially in the practices of cattle production. There are the stipulations on declaring clearly the person responsible for food/feed information, even for food/feed producing ingredients in the UK. The food/feed businesses in the UK also have to be monitored strictly by a regulating authority.

For fish and fishery products, there are a lot of miscellaneous requirements on traceability scattered in different documents (e.g. requirement to register premises processing fishery products, requirement to label materials intended to come into contact with food etc.), but this does not result in a very stringent system. Evidently, the traceability of bovine products is still the greatest concern of the U.K. food industry.

2.3.4.2 Regulation in Ireland

Similar to the countries of the UK., Ireland uses Statutory Instruments (SI) for transposing the European Community Law into the national system. The SIs on food safety are mainly issued by the enforcement authority in food safety - Food Safety Authority of Ireland (FSAI). The most important SIs to quality and safety of fish and fishery product are:

- SI No. 170 of 1996, which gives effect to Council Directives 91/493/EEC and 92/48/EEC. Fishery products must not be placed on the market except in compliance with these Regulations. These Regulations also define the basic conditions required for the premises, establishments, factory vessel, laboratories, or auction/wholesaler markets in which the fish are handled or processed.
- S.I. No. 253 of 1996 and S.I. No. 377 of 2000 regulate the conditions for placing on the market and control of certain diseases of aquaculture animals and fish and gives full effect to several corresponding EC Directives.
- SI No. 147 of 1996 (amended by S.I. No. 390 of 2000) regulates the conditions for production and placing on the market of live bivalve molluscs. The regulation also applies to echinoderms, tunicates and marine gastropods.
- S.I. 320 of 2003 gives effect to Article 4 of Council Regulation (EC) no 104/2000 and to Commission Regulation (EC) 2065/2001(EC) which lay down the labelling requirements and conditions for informing consumers about fishery and aquaculture products.

Beside the requirements of the EC Regulations, the Irish SI 320 requires fish to be labelled with commercial designations in both English and Irish, and provides an option for including the scientific name of the species. A list of the commercial names of fish and fishery products in Ireland is included in a Schedule to S.I. 320 of 2003 (Regulation 7).

The Regulations apply to live, fresh, chilled or frozen fish, fillets of fish, smoked, salted and dried products, raw or cooked whole prawns and shrimps, and live or raw shellfish; but excludes processed products such as breaded fillets, crab sticks or ready-to-eat dishes. Fish purchased directly from a fisherman or fish farmer up to a value of €20 are not subject to the Regulations (Regulation 4).

The above SIs are the basic requirements linked to the application of traceability for fishery products. Despite the inexistence of a national statutory instrument regulating traceability, the FSAI released a Guidance Note on Product Recall and Traceability (Guidance note No 10).

- Guidance Note No 10 gives suggestions to the stakeholders involved in the food production chain on defining the scope of their traceability systems, the model on detail information needed to be documented, for the key element of product batch. Going further than the European legislation, the Guidance Note suggests that each traceability system to be revised at least yearly by a multi-disciplinary team and to carry a horizontal as well as vertical assessment of the system. The horizontal check should consist of an audit of several batches at the same step of process to ensure all the identification marks and documentation are correct. The vertical check should follow several batches from the receiving down to suppliers, through in-house processing, to the customers. Non-conformities found should be addressed after the audit. Each audit should be documented, whether non-conformities were detected or not.

Although developed by the competent authority, this Guidance Note is not a regulation. It does not expose an obligatory effect, but could be an essential reference for the food industry.

- Concerning the traceability for products consisting of or containing GMOs, the FSAI applies directly the relevant EC directives without further interpretations.

The Irish Authority does not regulate a complex regulatory system for food traceability, but it does provide an effective solution for applying it through a practical guideline that has been shortly presented above.

2.3.4.3 Regulation in Belgium

To the bovine farms supplying materials for food production in Belgium, a premise ID system for animal traceability called SANITEL has been mandatory since 2001.

Additionally, an inventory of livestock and its density by species are maintained for each farm, in both the central database as well as in on-farm records. However, for fish and fish products, the Sanitel system is not mandatory.

Concerning the traceability of food products, most Belgian requirements are more detailed and stringent than many member states' legislation:

- Belgium has indicated exactly what records are needed to be kept for 5 years (EAN Ireland 2004). This is considered as one step ahead for Belgium in comparison with European law, since the Community has not gone into such detail.
- Royal Decree AR/KB November 14, 2003 (which came into force on the 1st of January 2005) relates to self-control, mandatory notification and traceability and sets down the means to put EC Regulation 178/2002 in place. This Decree requires:
 - All food business operators to establish an internal system within businesses for ensuring the ability to register the characteristics of incoming ingredients for their products:

Unofficial translation:

All operators have at their disposal systems or procedures to register the characteristics of incoming products: the nature, the identification, the quantity, the date of receipt, the identification of each supplier who supplies those incoming products ...

(Article 6, § 1).

The same ability to register the same characteristics (including the customer) of outgoing products must be ensured (Article 6, § 2).

- All food business operators to follow/trace the incoming ingredients through out the production:

Unofficial translation:

All operators have at their disposal systems or procedures to establish the relationships between incoming and outgoing products allowing traceability in every stages of the production, processing and distribution process.
(Article 6, § 3).

Depending on the sector concerned, the Minister of the Ministry of Agriculture will determine the detailed level where that relationship shall be established.

The above requirements can be considered as more stringent than other traceability regulations at the present time, as the operator not only has to be able to trace back the material supplier (one-up), and forward to the customers (one-down), but also has to ensure the link between the materials to the final products.

This means that companies need to have in place an internal system that enables them to quickly and comprehensively trace products throughout the processing chain.

Furthermore, they have to maintain a high amount of detailed information on materials and products, while the European system only requires information “to be made available to the competent authority on demand” (Article 18 (2), Regulation 178/2002/EC).

2.3.4.4 Regulation of the Netherlands

One difference from the community requirement on traceability is the period of five years document keeping for the purpose of product traceability is required in the Netherlands (EAN Ireland 2004).

2.3.4.5 Regulation in Italy

Concerning the traceability of food, the Italian authorities have enacted two specific standards on traceability, which are useful references for food operators:

- UNI 10939: 2001 “Traceability system in agricultural food chain – General principles for design and development” of April 2001; and
- UNI 11020: 2003 “Traceability system in agri-food industries – Principles and requirements for development” of December 2002. This standard is “the second EEC regulation 178/2002”, since it conforms identically to the document so called ‘Food Law.’

Both standards are issued by the Italian Standards Institute (UNI) and are voluntary in application.

Beside, Decree Law N.157 of 24 June 2004 urgent disposition for agricultural and food products labelling, is the document laying down obligatory basic requirements for traceability.

2.3.4.6 Regulation in France

In France, to enforce the European Regulations No 1829/2003 and 1830/2003 of April 18, 2004 on traceability and labelling of GMOs and the traceability of food and feed products produced from GMO, la Direction Générale de la Concurrence, de la Consommation et de le Répression des Fraudes (DGCCRF), playing the role of the authority, has published several official legal texts/guidance setting down labelling requirements which differ from those set by the mentioned EC regulations.

Non-biotech labelling

Four information fact sheets to help industry adapt to the above two new regulations were published by the DGCCRF. Most of the said fact sheets clarify EC Regulations. However, Fact Sheet No 2004-113, dated August 16, 2004: non-biotech labelling, specifies the labelling requirements for products in France to be labelled as “nonbiotech,” “biotech-free,” or “PCR negative,” as EC Regulations do not cover this type of label. The sheet provides that:

- The product cannot contain any biotechnology products above the detection threshold of 0.1%, not the 0.9% threshold set in the EC Regulations for such labelling.
- No genetically modified organism, or product derived from GMO, or obtained with the help of a genetically modified organism (such as amino acids, vitamins or enzymes) have been used at any processing step of the product.
- When negative labelling is on one ingredient of a final product, it must not mislead to the understanding that the final product is biotech-free as a whole.
- Negative labelling cannot be used if a product can potentially contain biotech material.
- Negative labelling indicating “derived from non-biotech seeds” is considered to be misleading if the final product could contain adventitious biotech material.
- Organic products cannot be labelled as biotech-free because they are organic, except in the case that the biotech content used for product is lower than the threshold of 0.1%, as is the case for non-organic products.

Traceability for food in hotels, restaurants and institutions (HRI)

According to the EC Regulation 1829/2003, the non-packaged (bulk) food products sold in hotels, restaurants and institutions (HRI) are subject to the biotech labelling regulations only if these products are not transformed or processed (warmed, cut, prepared, etc.) on the site of the hotel, restaurant or institution. It means that food products transformed on the site of the HRI are not covered by biotech labelling regulations.

2.3.5 *Comments*

2.3.5.1 Comparativeness to pre-requisite conditions in the EC legislation

In contrast to the pre-requisite conditions summarised in section 1.2.3 of this study, the EU legislation on traceability provides all the conditions needed for an effective traceability system, namely:

- a clear definition on traceability responsibility for every operator in the food production chain;
- a clear requirement on controlling production by lots and ID numbers; and
- a mandatory recall procedure.

2.3.5.2 Relationship between EU and member state legislation

With the parallel existence of EU and member states' own legislation on food traceability, it must be asked whether manufacturers can ignore Community laws, and follow the legal provisions of the country where they export their products to?

In my opinion, they cannot because:

- Community law and national law are intertwined , where Community law serves as the basis for national laws, which in turn develop this further. Fulfilling the requirements of Community law is just the first step for fulfilling further requirements set by the member states.
- In cases where Community law is not directly applicable (i.e. Directives), and they are mis-transposed into national law, either intentionally or accidentally; then the national law will be annulled.
- Finally, one of the aims of the EU is to unify, or at least, to harmonise the different legislation systems. The idea is to remove contradictions and conflicts between national laws and regulations. To ensure this as far as possible, Community law should be read with together with the specific national laws of member states.

2.4 Legislation in the U.S.

Within the US legislation system, the Public Health Security and Bioterrorism-Preparedness Act of 2002 passed by the Congress in June, 2002 set the fundamental rules about food traceability. The Act gives as the first priority the reinforcement of security in the United States (as a response to the events of September 11, 2001), and this motivates the scope of food traceability required by this Act.

Under the Act, the Food and Drug Administration (U.S.FDA) imposes more detailed requirements on this matter and will effect businesses differently depending on their sizes.

Next to the Bioterrorism Act of 2002, the Farm Security and Rural Investment Act of 2002 sets a requirement of Country of Origin Labelling (COOL) on food product, is also one part of traceability.

To implement the COOL requirement of the above Act, the U.S. Department of Agriculture on October 30, 2003 published proposed rules on mandatory country-of-origin Labelling.

In contrast to EU legislation, the US does not require the exporting countries to have in place an equivalent system in terms of food traceability. However, US legislation affects foreign operators, who are exporting products to the US, by setting down many single requirements applied to imported products. This is clearly observed as proved in the below analysis of the COOL requirement.

2.4.1 *The Public Health Security and Bioterrorism-Preparedness Act of 2002*

Sections 306 and 307 of the Act put in place the principles for the implementation of food traceability in the U.S.:

Section 306. Maintenance and Inspection of Records for Foods

- *Amends Chapter IV to authorize the Secretary of the Department of Health and Human Services to have access to certain records when there is a reasonable belief that an article of food is adulterated and presents a threat of serious adverse health consequences or death to humans or animals. It applies to all records relating to the manufacture, processing, packing, distribution, receipt, holding, or importation of the food. It excludes farms and restaurants. It also excludes information such as recipes, financial data, personnel data, research data, and sales data (other than shipment data regarding sales).*

...

Section 307. Prior Notice of Imported Food Shipments

- *Amends Section 801 to require prior notice of imported food shipments. The notice is required to provide the article, the manufacturer and shipper, the grower (if known within the specified time in which notice is required), the country of origin, the country from which the article is shipped, and the anticipated port of entry. States that, if notice is not provided, the article shall be refused admission...*

From the above section, the following stipulations should be highlighted:

- The Act authorises the Secretary of the Department of Health and Human Services to have access to the records about the history of an article of food when there is a

reasonable threat of serious adverse health consequences or death to humans or animals;

- Such records have to allow for the identification of the immediate previous sources and immediate subsequent recipients of a food article in question;
- This section does not apply to farms and restaurants, but is limited to the records relating to the manufacture, processing, packing, distribution, receipt, holding, or importation of the food;
- The time for maintenance of records will be decided by the Secretary of Agriculture, but the record-keeping requirement must be limited to two years.

The following difference between the requirement of the US and the EU concerning food traceability should be noted: the USA does not require farms and restaurants to apply such a system, while the EU requires all the farms, and some restaurants to establish a system that allows for product traceability.

2.4.2 *The record-keeping regulation 2004*

As a new subpart to Part 1 of the Bioterrorism Act of 2002, the final version of the record-keeping regulation issued by the Department of Health and Human Services on December 6, 2004 placed detailed requirements concerning traceability on food and feed manufacturers in the US, as well as foreign food and feed transporters who transport them into the US.

The objective of the record-keeping rule is to help the FDA track foods implicated in future emergencies, such as terrorism-related contamination.

In brief, this rule requires that:

- Each operator (excluding farms and restaurants) of food keeps records identifying the immediate source as well as the immediate recipient (the one-up, one-down rule). Section 1.337(a) requires operators to:

... establish and maintain the following records for all food you receive:

- (1) The name of the firm, address, telephone number ... whether domestic or foreign;*
- (2) An adequate description of the type of food received, to include brand name and specific variety ...;*
- (3) The date you received the food;*
- (4) For persons who manufacture, process, or pack food, the lot or code number or other identifier of the food (to the extent this information exists);*
- (5) The quantity and how the food is packaged ...; and*
- (6) The name of the firm, address, telephone number, and, if available, the fax number and e-mail address of the transporter's immediate previous source ...*

(Subpart J to the Act - Section 1.337(a)).

- Food must be understood as included, but not limited to fish, fishery products, raw commodities for use as food or as components of food; animal feed, including pet food; food and feed ingredients and additives (Section 1.328(2));

- Any records and other information about a questioned article of food must be made readily available for inspection and photocopying or other means of reproduction, not to exceed 24 hours from the time of receipt of the official request from the FDA (Subpart J to the Act - Section 1.361).
- Some persons or facilities are excluded from all the requirements of this regulation (Section 1.327):

For the U.S. food business operators: all farms and restaurants and some food operators are excluded.

For foreigners: all foreigners who manufacture, process, pack, transport, and distribute food are excluded from this Regulation, except the transporters subjected to Section 1.352 mentioned below:

The foreign companies transporting food in the U.S. are required to abide by this regulation. However, the transporter will have several options to choose from in order to fulfil the requirements of the Regulation (Section 1.352, a, b, c, d, e). Amongst these solutions, the transporters can:

- Establish and maintain records by themselves. The record must include (Section 1.352(a)):
 - (1) Names of the transporter's immediate previous source and transporter's immediate subsequent recipient;
 - (2) Origin and destination points;
 - (3) Date shipment received and date released;
 - (4) Number of packages;
 - (5) Description of freight;
 - (6) Route of movement during the time you transported the food; and
 - (7) Transfer point(s) through which shipment moved;

Or

- Establish and maintain records by themselves, according to the current requirement by the Department of Transportation's Surface Transportation Board of rail and water interstate transporters (Section 1.352(c)), or by the Warsaw Convention of international air transporters on air waybills (Section 1.352(d)).

Or

- Enter into an agreement with the non-transporter's immediate previous source located in the United States and/or the non-transporter's immediate subsequent recipient located in the United States to establish, maintain, or establish and maintain, the information in Section 1.352(a), (b), (c), or (d) (Section 1.352(e)).

For non-transporters in the U.S., records have to be established at the time the activity occurs, and have to include information about the immediate previous source (Section 1.337), and the immediate subsequent source (Section 1.345).

- Records can be kept in any form (paper or electronic). Electronic records are considered to be onsite if they are accessible from an onsite location (Section 1.360(h)).
- Record-retention time (Section 1.360) is separated into 3 sorts according to the shelf-life of products: two years after the date where food is received or released for food with a greater than 6 month shelf-life; one year for food for human consumption with a shelf-life between two to six months; and six months for food that spoils within 60 days of manufacture.
- Compliance deadline (Section 1.368) is December 9, 2005. However, depending on the size of the business, this date may vary:
 - June 9, 2006 for small businesses with fewer than 500 people but more than 10 full-time equivalents;
 - December 11, 2006: very small businesses (10 or fewer full-time equivalent employees);
 - The size of the business is determined by counting the total number of full-time employees in the entire business (not each individual location or establishment). Two part-time employees, each working half time, count as one full-time equivalent employee.

This does not apply to the transporter of food into the U.S.

Thus, the requirements of this new Regulation:

- Will not apply to all persons having food businesses outside of the U.S., except persons who transport food in the country,
- However, foreign manufacturers, processors, packers, or exporters supplying food for transport to the U.S. will be certainly requested by the transporter for the information relevant to the food they supplied (section 1.352). Therefore external traceability is needed.

2.4.3 The Farm Security and Rural Investment Act (FSRIA) of 2002

The Farm Security and Rural Investment Act (FSRIA) of 2002 (commonly referred to as the 2002 Farm Bill), title X amended the Agricultural Marketing Act of 1946 to require that certain "covered commodities" be labelled with the country of origin at the retail outlet.

The COOL provision of the FSRIA 2002 sets the principles applied to covered commodities as:

- All retailers of fish and fishery products must inform the customers about the country of origin of the fish used for the food they sell, and inform them whether the fish are wild or farm-raised:

Section 282. Notice of Country of Origin.

(a) In General -

(1) REQUIREMENT- Except as provided in subsection (b), a retailer of a covered commodity shall inform consumers, at the final point of sale of the covered commodity to consumers, of the country of origin of the covered commodity.

(2) UNITED STATES COUNTRY OF ORIGIN ...

(3) WILD FISH AND FARM-RAISED FISH- The notice of country of origin for wild fish and farm-raised fish shall distinguish between wild fish and farm-raised fish.

(The 2002 Farm Bill – Section 282(a)).

- The retailers can use any visible sign (label, stamp, mark...) on fish or fishery products for the purpose of informing the country of origin. The sign on individually labelled regarding country of origin is accepted:

Section 282. Notice of Country of Origin.

(c) METHOD OF NOTIFICATION-

(1) IN GENERAL- The information required by subsection (a) may be provided to consumers by means of a label, stamp, mark, placard, or other clear and visible sign on the covered commodity or on the package, display, holding unit, or bin containing the commodity at the final point of sale to consumers.

(2) LABELED COMMODITIES- If the covered commodity is already individually labelled for retail sale regarding country of origin, the retailer shall not be required to provide any additional information to comply with this section.

(The 2002 Farm Bill – Section 282(c)).

- The fish subjected to the COOL requirements are farm-raised and wild fish, farm-raised shellfish; and fillets, steaks, nuggets, and any other flesh from a farm-raised fish or shellfish:

(3) FARM-RAISED FISH- The term 'farm-raised fish' includes--

(A) farm-raised shellfish; and

(B) fillets, steaks, nuggets, and any other flesh from a farm-raised fish or shellfish.

...

(9) WILD FISH-

(A) IN GENERAL- The term 'wild fish' means naturally-born or hatchery-raised fish and shellfish harvested in the wild.

(B) INCLUSIONS- The term 'wild fish' includes a fillet, steak, nugget, and any other flesh from wild fish or shellfish.

(C) EXCLUSIONS- The term 'wild fish' excludes net-pen aquacultural or other farm-raised fish.

(The 2002 Farm Bill – Section 281(3)&(9)).

2.4.4 Interim Rule on Mandatory Country of Origin Labelling of Fish and Shellfish

On October 5, 2004, the Department of Agriculture issued Interim Rule on Mandatory Country of Origin Labelling of Fish and Shellfish to make details on COOL requirements set by the Farm Bill 2002.

2.4.4.1 Covered products

- According to the Interim Rule, the Country of Origin labelling will not apply to fish and shellfish when they are ingredients in a processed food product:

§ 60.105 Covered commodity.

(a) Covered commodity means: ...

(b) Covered commodities are excluded from this part if the commodity is an ingredient in a processed food item as defined in § 60.119.

(The Interim Rule - Section 60.105).

- If a fish or fishery product subjected to this Regulation is imported for retail in the U.S. without further substantial transformation, they must be sold in the status as declared to U.S. Customs and Border Protection.

However, the Regulation does not provide a definition of the substantial transformation. The US Customs and Border Protection is conferred the responsibility to identify this:

“(f) Labelling Imported Products That Have Not Undergone Substantial Transformation in the United States. An imported covered commodity shall retain its origin as declared to U.S. Customs and Border Protection at the time the product entered the United States, through retail sale, provided that it has not undergone a substantial transformation (as established by U.S. Customs and Border Protection) in the United States.”

(The Interim Rule - Section 60.200(f)).

- If a fish and fishery products subjected to this Regulation is imported for further substantial transformation in the U.S. before being disposed at retail, they must be labelled as ‘‘From [country of origin], processed in the United States.’’

(2) Wild and Farm-Raised Fish and Shellfish: If a covered commodity was imported from country X and subsequently substantially transformed (as established by U.S. Customs and Border Protection) in the United States or aboard a U.S. flagged vessel, such product shall be labelled at retail as “From [country X], processed in the United States.”

(The Interim Rule - Section 60.200(g)(2)).

- For blended products imported for further substantial mixing up in the United States (to mix with other covered commodities also transformed substantially in the US or originated in US); the label must indicate the countries of origin for covered commodities contained therein or can be contained therein:

(2) For imported covered commodities that have subsequently undergone substantial transformation in the United States that are commingled with other imported covered commodities that have subsequently undergone substantial transformation in the United States (either prior to or following substantial transformation in the United States) and/or U.S. origin covered commodities, the declaration shall indicate the countries of origin contained therein or that may be contained therein.

(The Interim Rule - Section 60.200(h)(2)).

2.4.4.2 Covered operators

- Any retailer of covered products in the U.S. (The Interim Rule - Section 60.400(a)).
- Any supplier of covered products intended for retail in the U.S. (The Interim Rule - Section 60.400(b)(2)).
- Any other operator engaged in the production chain of covered products (The Interim Rule - Section 60.400(b)(3)).

2.4.4.3 Responsibilities

- Retailers of covered food must indicate the country of origin, and the production method of food retailed by means of label or sign attached to food, or documentary evidence upon at the point of sale (The Interim Rule - Section 60.400(c)(1)(2)).
- Suppliers of a covered commodity to a retailer in the US must supply the retailer with the information on country of origin and method of production (wild or farm-raised) of the commodity (The Interim Rule - Section 60.400(b)(1)).

The above information can be provided either on the product itself, on the master shipping containers, or in accompanying documents. The information shall identify the product unique to that transaction by means of a lot number or other unique identifier (The Interim Rule - Section 60.400(b)(1)).

- Business operators, including foreign operators, who supply covered commodity to a retailer in the US, are required to maintain records to identify the immediate suppliers and immediate recipient of the said commodity for a period of 1 year (The Interim Rule - Section 60.400(b)(4)).

2.4.4.4 Enforcement provision

- The effective date of Country of Origin Labelling of Fish and Shellfish is April 4, 2005, and will not apply to the retail of frozen fish or shellfish caught or harvested before December 6, 2004 till October 6, 2005 (The Interim Rule - Section 60.400(c)(2)).

Though all the above requirements solely extend directly to food operators under the jurisdiction of the U.S, excluding the foreign operator; it is needed to reconfirm that, in reality, by setting requirements to imported commodities, the foreign operators who are exporting products to this market will have to comply with the above requirements. Moreover, this is an interim rule, and their provisions may have been changed in the final rule.

In addition, US legislation also requires:

- a voluntary product recall strategy (Subpart C of Part 7 of FDA regulations 21 CFR 7.40-59),
- that incoming materials correspond to the orders sent to specific suppliers,

- that suppliers of all materials (packaging, ingredients, labels...) have to be known, preferably by means of an independent audit,
- that the coding and packaging of incoming products should be known in advance and authenticated upon receipt,
- that the location, storage and use of all materials should be tracked throughout the operation between the steps.

In conclusion, the US requirements on traceability are clear in each individual document. However, there are some overlaps amongst them, which could result in different practices for exporters:

- Traceability regulation under the Bioterrorism Act 2002 will come into force in 2006 (either June or December).

It requires foreign food transporters to report about the immediate previous suppliers of food, and to keep records for up to 2 years.

- However, the COOL regulation under the Farm Bill 2002 is going to take effect on 4th April 2005 and will require imported fish, shellfish and their flesh in every form to be labelled with country of origin and method of production.

The record must be kept up to 1 year for identifying the immediate previous source, where it is applicable, and the immediate subsequent recipient of covered commodities.

For fish and shellfish-production operators, the best solution should be to have a record-keeping system fulfilling both regulations. Also it will be important to have the ability to know the immediate supplier and immediate recipient, and to label the country of origin and the production method. More practical information can be obtained when the USDA issue the final guidance for this Regulation.

2.5 Comparisons between EU and the U.S. legislations on food traceability

2.5.1 Similarities

- Both systems are based on “one up one down approach”, requiring each operator to know the step before him in the food chain and the step after.
- Both systems do not define how wide the traceability shall be. The only reason is that the wider traceability is, the bigger economic losses from which the producers suffer in case of recalling, therefore the producers are spontaneously taking care of the matter.
- Both systems require food operators to document information on their suppliers and customers, and to make them available to the authority on demand.
- Both systems place requirements on foreign food operators who wish to export products to their markets.

2.5.2 Differences

- The different political reasons for food traceability:
 - In the EU, food traceability is the measure in reply to a clear need to gain back the trust of their customers after the severe food crisis (BSE, dioxin ...) which has emerged in Europe from the mid-1990s.
 - In the case of the U.S., food traceability is aimed at protecting the public from the threat of bioterrorism.
- Those different starting points lead to many divergent requirements on food traceability between the two systems:

- From the point that any unsafe food should be quickly identified and withdrawn from the market, mandatory recall and traceability were introduced for the first time across the EU.

Meanwhile, in the US, regulations have the tendency to stick to voluntary recall and trace-back approaches.

- With the aim of preventing bioterrorism, U.S. laws and regulations put great focus on regulating the declaration of the place where the imported food comes from. The other steps in the food chain are not as important as this point. Some food operators inside the U.S. (like restaurants, farms) are even exempted from traceability regulations.

In contrast, the EU has focused on the ability to trace food through the whole chain, starting at the farms as well as in food catering services, to food produced inside the EU as well as to imported food.

- Moreover, the responsibility of foreign transporters can be switched over to their immediate previous suppliers or the immediate subsequent recipient located in the U.S, with whom they had made an agreement on this transfer.

In contrast, the EU regulation, focuses on hygiene and safety, and stipulates the responsibilities to each operator in the food/feed production chain, as they are the only persons in the chain that can assure food safety under their activities.

- From the point of view of food safety, weaknesses of the U.S. system in traceability can be seen:
 - Comparing the pre-requisites conditions (Chapter I), U.S. legislation could be argued to be weak because of lack of:
 - a mandatory recall procedure; and
 - a clear responsibility for every operator in the chain, except the step before sending food into the U.S. (declaration of country of origin).

- If a food crisis occurs, traceability with non-mandatory recall provisions could easily result in recalling huge amounts of stocks for destruction. The collapse of the bovine industry after the BSE crisis when adequate traceability provisions were not in place could be taken as an example.
- A different attitude to GMO products
 - The EU introduced a prerequisite requirement for the clear labelling and traceability of GM products. They considered it essential to enable European consumers to exercise real choice over whether or not they choose to buy GM products.
 - The U.S. did protest officially to this requirement. Their argument was that there is no science-based evidence on the harmful effect of GMO on the human health and environment, which could be the only reason to make the EU's strict requirement compliant to the WTO's SPS Agreement (U.S. Case 2003).
 - The E.U. argument on the matter is the precautionary principle. Following this principle, a public authority cannot take a purely hypothetical approach to risk and may not simply base decisions on "zero risk", and this principle is also allowed by the WTO's SPS Agreement as stated by Byrne 2004:

It provides that precautionary measures "shall be proportionate and no more restrictive of trade than is required to achieve the high level of health protection chosen in the Community, regard being had to technical and economic feasibility and other factors regarded as legitimate in the matter under consideration.

The comment that could be made here is that the present international legislation tool does not seem to provide enough support to justify the appropriate scope and limitations for the use of the precautionary principle:

.... when establishing or maintaining sanitary or phytosanitary measures to achieve the appropriate level of sanitary or phytosanitary protection, Members shall ensure that such measures are not more trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection, taking into account technical and economic feasibility. (WTO's SPS Agreement - Article 5.6).

In conclusion:

- a transparent and consistent approach to risk communication is vital in gaining and maintaining public confidence and trust; and
- the way that individuals, groups and societies react when faced with risk situations can often be difficult to predict – and indeed may appear irrational.

2.6 Icelandic legislation on food traceability

2.6.1 Background on Iceland institutions and Icelandic legislation system

According to the Constitution of 17 June 1944, amended 30 May 1984 and 31 May 1991, Iceland is a Republic where the parliamentary government (Althingi) and the President of Iceland exercise jointly legislative power, the President and other governmental authorities exercise executive power, and Judges exercise judicial power. For the purpose of this paper, only the executive activities will be studied, with the aim at providing the background on competencies in terms of fishery quality and safety management (Article 1 and 2).

The Icelandic hierarchy of norms can be simplified by the model below:

- Highest document in the system is the Constitution of 17 June 1944.
- Under the Constitution, there are bills which can only come into force as laws after being passed through 3 readings in the Althingi, then signed by the President for confirmation before coming into force (Article 26 and 44 – Constitution of 17 June 1944 as amended).
- Ministers can sign government measures for carrying out executive acts, and must be responsible for these acts (Article 14 - Constitution of 17 June 1944 as amended). The government measures signed by Ministers can be in the form of Regulations.

At present, there are 11 ministries in Iceland. Amongst them, the following ministries are involved in fishery management:

- Ministry of Fisheries is responsible for management of the Icelandic fisheries: maintaining a sustainable fishing industry, marine environmental policy, ships and gear management, stocks, cooperation, processing and markets and seafood safety;
- Ministry of Agriculture is in charge of monitoring fish aquaculture activities at farms (exclude slaughtering);
- Ministry for the Environment is in charge of food and environment, including materials and packaging for seafood;
- Ministry of Justice and Ecclesiastical Affairs is in charge of coast guarding.

Icelandic legislation concerning food traceability is made up of laws adopted by the Althingi and executive regulations issued at ministerial level.

2.6.2 Icelandic legislations on fishery traceability

2.6.2.1 Icelandic Law. Act No 93/1995 on Foodstuffs

As the document exerting the highest effect in terms of food safety, the Foodstuffs Act No. 93 was passed by the Icelandic Althingi for enforcement on 28th June 1995, as amended, requires food products to be safe and wholesome, and to be labelled properly with all necessary information concerning their quality, safety and wholesomeness:

The purpose of this Act is to ensure as far as possible the quality, safety and wholesomeness of foodstuffs and that their labelling and other information concerning them are correct and satisfactory. This is to be achieved by providing instruction, dissemination of information, research and supervision

(Icelandic Law. Act No 93/1995 on Foodstuffs - Article 1).

This article is mentioned, because labelling properly to ensure the correct information concerning food is available is also a means of tracing them.

The Act also requires pre-packaged food to be labelled with specific names and addresses of producers or distributors.

Packaging for foodstuffs shall be labelled with the name and address of the foodstuffs producer or distributor. The name of the product shall be indicated, together with information on the contents, storage conditions, shelf life and net weight or liquid measure

(Icelandic Law. Act No 93/1995 on Foodstuffs - Article 15).

The requirement on continuous traceability through-out the food production chain is not stated in the Act. This was a common situation found in most countries' food legislations at the time of issuance.

However, there is an item allowing more detailed requirements on labelling with respect to specific categories of food, where it is justified as necessary:

The Minister may in a Regulation lay down detailed provisions on labelling laying down, for instance, requirements that packages have information on the concentration of individual substances, nutritional values, condition of the products and the treatment to which they have been subjected in production. Furthermore, the Minister may exempt certain types of products or product classes from specific provisions on labelling

(Icelandic Law. Act No 93/1995 on Foodstuffs - Article 15).

So far, several regulations have been promulgated to implement this article of the Act, including Regulations 142/1995, 726/1997, 54/2000, 439/2000 and 863/2000.

2.6.2.2 Icelandic Law No 55/1998

Specific to fishery products is the Icelandic Law No 55/1998 on the handling, processing and distribution of marine products, which entered into force on 10 May 1998. This provides that:

Unofficial translation:

Fishery products shall be correctly and clearly marked so that the information displayed is not misleading. The packaging shall bear the name Iceland, written in full or abbreviated as IS and the approval number of the establishment so that the product can be traced back to the producer. If the product is shipped unpacked (in bulk) the same information shall be available in the accompanying documents. Labelling shall in other aspects be in compliance with requirements in the receiving country.

(Icelandic Law No 55/1998 - Article 11).

In contrast with the Icelandic Law. Foodstuffs Act No. 93, this Law goes further on the labelling of fishery products in the following areas:

- Besides having to be labelled with the name and address of processors or distributors in accordance with the Icelandic Law. Foodstuffs Act No 93, the labelling of pre-packaged fishery products must clearly state the country of origin as “Iceland” or abbreviated to “IS”, and the approval number of the processing establishment must be displayed.
- Fishery products sold in bulk also need to come with the same information shown in the accompanying documents.

This requirement can be considered as equivalent to one part of the COOL requirement of the US legislation, but it is only applied to processors who produce either pre-packaged or non-packaged seafood while the COOL requirement applies also to retailers for the purpose of informing final consumers about the origin of food.

2.6.2.3 Supporting regulation

The requirements on traceability for fishery products can also be found in many regulations in Iceland. The most important regulations are:

- Icelandic Law. Regulation 233/1999 on the handling, processing and distribution of fishery products, which entered into force 30 March 1999.
- Icelandic Law. Regulation 588/1993 on the labelling, advertising and introduction of foodstuffs.

Unofficial translation of Article 1 – Icelandic Law. Regulation 588/1993

This regulation is applicable for labelling of foodstuffs distributed to consumers and items concerned with the advertisement and introduction of those. This regulation also applies to foodstuffs distributed to catering services. It does not apply to foodstuffs intended for export to countries outside the EEA.

(Icelandic Law. Regulation 588/1993 - Article 1).

The Regulation also stipulates that group of foodstuffs to which these specific labelling requirements extend must also fulfil the requirements laid by other relevant documents.

Unofficial translation of Article 2

When there are requirements in specialised regulations for certain foodstuffs or groups of foodstuffs these shall be labelled according to this regulation and the requirements laid down in the specialised regulation.

(Icelandic Law. Regulation 588/1993 - Article 2

- In the Icelandic Law, Regulation number 233/1999 on the handling, processing and distribution of seafood was issued by the Ministry of Fisheries under Law No 55/1998, and requires:

Unofficial translation of the Icelandic Law, Regulation No 233/1999, addendum 7,

All the letters and figures must be fully legible and grouped together on the packaging in a place where they are visible from the outside without any need to open the said packaging.

(Icelandic Law, Regulation No 233/1999 - addendum 7).

Therefore, this requirement extends to pre-packaged products, and ensures the accessibility to all labelling information required by law.

In conclusion, the existing legislation system of Iceland in terms of food traceability:

- provides provisions on labelling of food, which fully ensures the traceability of fishery products back to their producers;
- requires food processors to bear full responsibility in marking food for the purpose of traceability;
- provides the obligatory HACCP as a basic condition for a traceability system;
- however, there is no responsibility on the other stakeholders to keep records on traceability in the fishery production chain. The link between the identifying information of the products between the stages in the production chain (one up – one down) is not obligatory.

2.6.3 *European Economic Area (EEA) Agreement and the homogeneity within the EEA in terms of food safety*

The European Economic Area Agreement (EEA Agreement), signed on the 2nd of May 1992, as amended on the 13th of December 1993 entered into force on the 1st of January 1994, and is a so called mixed international agreement, between Iceland, Norway and the European Economic Community, the EU Member States, the European Coal and Steel Community (ECSC) and the Member States of the European Free Trade Association (EFTA).

The EEA Agreement aims to establish a homogenous European Economic Area based on common rules and equal conditions of competition creating 4 freedoms: free movement of goods, persons, service and capital:

The aim of this Agreement of association is to promote a continuous and balanced strengthening of trade and economic relations between the Contracting Parties with equal conditions of competition, and the respect of the same rules, with a view to creating a homogenous European Economic Area....

(EEA Agreement - Article 1).

To achieve this goal, the Agreement focuses on the following (Stefánsson 2003.):

- the rules applicable in this area must be uniform or similar, so that everyone can acquire the same rights and are equally obligated to the same conditions;
- the rules must also be interpreted and applied in the same way in order to ensure that the same rights and conditions apply to all parties within the EEA.

This is one reason for justifying the transposition of many directives and regulations of the EC in the field of fishery quality and hygiene control into Icelandic legislation. There are some examples of Icelandic documents transposing EU stipulations, summarized by Zoëga (2004), as:

- Law No 55/1998 on the handling, processing and distribution of marine products and Regulation 233/1999 on the safe handling, processing and distribution of seafood, which transpose the requirements of the following EC legislation:

- Directive 91/493 (Fishery products)
- Directive 92/48 (Fishing vessels - Freezer vessels)
- Decision 93/25 (Heat treatment - bivalve molluscs)
- Decision 93/51 (Microbiological criteria)
- Decision 93/140 (Parasites)
- Decision 65/149 (TVBN)
- Decision 93/51 (Microbiological criteria – crust)
- Decision 94/356 (HACCP)
- Regulation 2406/96 (Organoleptic criteria)
- Regulation 466/2001 (Contaminants)

- Regulation 558/1997 on check systems in fish production (HACCP) transposes the following EC legislation:

- Decision 94/356 (HACCP)
- Directive 91/493 (article 6) Fishery products

- Regulation 260/1999 on the catching, handling, processing and distribution of live bivalve molluscan shellfish transposes the requirements of the following EC legislation:

- Directive 91/492 (Live bivalve molluscs)
- Directive 91/493 (Fishery products)
- Decision 93/51 (Microbiological criteria)

- Decision 93/383 (Biotoxins – Laboratory)
- Decision 94/356 (HACCP)
- Regulation 466/2001 (Contaminants)

2.7 Vietnamese Legislation on food traceability

2.7.1 Background on Vietnam Institutions and Vietnamese legislation system

Similar to the organisation of the Icelandic executive power, there is a Government, which plays a role of executive organ. But the difference between the two states is that in Iceland there is a separation of powers, while the power of the State of Vietnam is not separated but belongs to the people as a whole.

The Ministry of Fisheries is responsible for aquatic resources and its utilisation and management including: fishery farming, exploitation, processing, protection and development of fishery resources inland and offshore throughout the country. Concerning the transportation and distribution of fishery products, the Ministry of Fisheries is responsible for those for export.

In addition, the following ministries are also involved:

- the Ministry of Health is responsible for monitoring hygiene and safety of food for domestic consumption, including seafood;
- the Ministry of Agriculture is responsible for controlling cultivation and breeding, and business and logistics for cultivation and breeding, except in those areas, which fall inside the ambit of the Ministry of Fisheries. In fact, the practices of the agriculture and the fishery activities are linked in many ways, and the two ministries usually coordinate their management activities (monitoring the use of veterinary drugs, chemicals, developing animal and plant races used for breeding...).
- the Ministry of Science and Technology is responsible for instructing and establishing universal policies on quality, including fishery products;
- the Ministry of Trade is responsible for the universal state management of importing and exporting commodities and the circulation of commodities for domestic consumption and commercial services, including fishery commodities;
- the Ministry for the Environment is in charge of food and environment monitoring;

The legal document system of Vietnam and the Vietnamese hierarchy of norms is summarised by the model below:

- Highest effect document is the Constitution of 1992.
The Laws under the Constitution set the rights and obligations for natural and legal persons in different fields.

The National Assembly is the only organ, which can modify the Constitution and make laws.

- In contrast to the Icelandic system, there are decree-laws, which are also binding through-out the country as laws in the Vietnamese system.
- The Government and its members can issue regulatory documents to implement the Laws and Decree-laws in the field under their authority.

- Decrees, decisions and directives issued by the Prime Minister are binding throughout the whole nation, regulating often issues which have not been covered by Laws and Decree-laws.
- Ministerial documents including decisions, directives and circulars issued by Ministers and other Government agencies are binding in the field under the management of the Ministry. Regulations or standards are used to stipulate requirements applying to specific areas, or contain technical issues, and these are always inspired by the Prime Minister or a member of Government through a decision. These documents must not be contrary to Laws and Decree-laws.

- In the field of fishery, the Vietnam Fisheries Law is the highest effect document, adopted in November 2003 and coming into force on 1 July 2004.

Under the Fisheries Law of 2004, the Government is preparing 7 Decrees to provide detail guidance for implementation. The Ministry of Fisheries will soon thereafter issue supporting documents for implementing the higher effect law and regulatory documentation.

2.7.2 Vietnamese legislation on fishery traceability

The regulatory documents concerning food traceability are rare.

2.7.2.1 Decision No 178/1999/QĐ-TTg, as amended by Decision No 95/2000/QĐ-TTg.

Decision No 178/1999/QĐ-TTg dated 30/8/1999 promulgates the Regulation on the labelling of goods to be circulated in the country and export as well as imported goods. This Regulation sets up the basic requirements to label goods in general, including food commodities.

According to the Regulation, merchandise must be at least be labelled with information containing the name and address of the business operator who produces the whole merchandise, or who assembles parts of the good (in the case of assembled goods), or who imports or is a sales agent for a foreign business operator.

1. In cases where a goods item is completely produced at a production establishment, the name of the merchant responsible for such goods shall be the name of such production establishment, with the following inscription on the goods label:

Manufactured at or produce of

(Decision No 178/1999/QĐ-TTg dated 30/8/1999 - Art 7).

Merchandise for import and export must be labelled additionally with the country of origin. Food commodities must also be labelled with the expiry date:

2. Depending on the characteristics and requirements of the instructions on the use and management of each specific group and category of goods, one of the following dates must be inscribed on the good labels:

a) For goods groups and categories being food, cosmetics and pharmaceuticals, the expiry date must be inscribed. The expiry date is the number indicating the day, month and year, beyond which the goods must not be circulated and used.

(Decision No 178/1999/QĐ-TTg dated 30/8/1999 - Art 11).

“For export goods and import goods, the names of the countries of origin must be inscribed on the goods labels.”

(Decision No 178/1999/QĐ-TTg dated 30/8/1999 - Art 13).

The information on the label of the merchandise must be clear and true. It must not be vague or misleading or cause confusion with other goods:

All letters, numerals, drawings images signs and/or marks put on goods labels must be clear and true to the real properties of goods. They must not be ambiguously inscribed, thus causing mistakes for other goods labels.

(Decision No 178/1999/QĐ-TTg dated 30/8/1999 - Art 4).

Article 1 of the Regulation provides that it is applicable to all types of merchandise, except unpacked raw or processed food sold directly to customers, or pre-packed food and drinks having a shelf life less than 24 hours:

2. Goods being processed foodstuffs, raw and fresh foodstuffs, essential commodities and necessities which are not ready-packed and sold directly to consumers; foods and drinks which are ready-packed and have a consumption value within 24 hours, shall not be governed by this Regulation.

(Decision No 178/1999/QĐ-TTg dated 30/8/1999 - Art 1).

Thus, food sold in mass (unpacked) must also comply with this requirement.

Therefore through the business operator responsible for the food and in conjunction with the expiry date on label, the tracing one step back of the food placed on the market can be assured.

However, similar to the requirements of the Food Law of Iceland, the links between steps in the production chain for the purpose of traceability is not obligatory under the above Regulation.

2.7.2.2 Supporting regulations:

Ministry of Trade Circular No. 34/1999/TT-BTM

This Circular of the Ministry of Trade No. 34/1999/TT-BTM dated 15/12/1999 guides the implementation of Decision of the Prime Minister No 178/1999 /QĐ-TTg dated 30/8/1999.

It provides guidance on the format of the label and the types of good subjected to labelling.

The Circular provides that those involved in the assembling of the good includes those who repack the good before selling.

Unofficial translation

According to the item 2, article 7 of the Regulation, the labelling the name and address of the merchant responsible for the good assembled by his establishment shall be understood as applied also to the repacking of good for sold. The name and address of such establishment shall be written as: Packing establishment ... or Packed at ...

(Circular No. 34/1999/TT-BTM dated 15/12/1999 – Item II.A.2).

Concerning the labelling of ingredients, Item II.A.4 specifies that for food, labelling of all ingredients is obligatory:

Unofficial translation

The group of goods requiring the high safety for use as food, drink, cosmetic and drug, according to the stipulations of item 1, article 9 of the Regulation, shall be labelled with all ingredients in its label.

(Circular No. 34/1999/TT-BTM dated 15/12/1999 – Item II.A.4).

The Circular also suggests additional information to be included in label to enable the identification of products, such as the barcode issued by the nation; the trademark recognized as controlled industrial possession etc. This information could be very helpful for linking the products to the records about processing kept by the producers. Through those documents, the tracing back of the suppliers of the products' ingredients is highly certain. However, this is non-compulsory labelling.

Unofficial translation

The merchant can print in the label the information (if needed) as: the numeric code and the barcode issued by the nation; the registered and controlled trademark...

(Circular No. 34/1999/TT-BTM dated 15/12/1999 – Item II.B.2).

Ministry of Fisheries Circular No 03/2000/TT-BTS dated 22/9/2000

This Circular guides the implementation of the Prime Minister's Decision No 178/1999 /QĐ-TTg dated 30/8/1999.

It covers detailed labelling requirements applied to various fishery commodities, which includes:

Unofficial translation

a) aquatic animal and plant-origin processed food, or those compose of aquatic animal and plant as a characteristic ingredient (hereafter referred to as fishery food)

b) fishery animal and plant breed (including parent animal and plant)

c) fishery raw material for production of feed and commercial feed used in aquaculture (herein after referred to as raw materials and feed)

d) drug, chemical substances and bioproducts used for aquatic animals and plants (herein after referred to as drug, chemical and bioproducts)

(Circular No. 03/2000/TT-BTS dated 22/9/2000 – Item I.2).

All the above commodities must at least be labelled with the following information:

Unofficial translation

a) Ingredients

b) Storage life and the shelf life

c) Storage and usage guidance

(Circular No. 03/2000/TT-BTS dated 22/9/2000 – Item I.3).

For each group of fishery commodity, the information detailed below is required (*Item II.A.1, 2, 3, 4*):

- name of fishery commodities
- name and address of merchant who is responsible for the product: every operator involved in the production chain has to take this responsibility
- date of production, storage life and shelf life of fishery commodities
- the country of origin of fishery commodities

The labelling of GMO-containing, or irradiated fishery food is also required:

Unofficial translation

d) Fishery food using Genetically modified organisms (GMO) or one GMO-ingredient must be labelled with the Vietnamese sentence “Using genetically modified technology”

e) Fishery food having irradiated or containing one ingredient having irradiated in the manufacture, production, preservation must be labelled with the Vietnamese sentence “Irradiated food” or the signal of irradiated food in accordance with international regulation that Vietnam has published for application.

Thus, under this Circular, the information on the supplier of fishery food, fish fry, drug, chemicals and bioproducts used for aquaculture are ensured (but lacking of requirements to drug, chemicals used in other production steps e.g. processing, storage...)

The Circular does not fix the method to provide the above information, but in line with the Decision of the Prime Minister, it must be understood that the information is to be supplied by means of a label. Using this interpretation, fishery food in bulk is not regulated.

The Circular does not fix the threshold for GMO fishery food either. Therefore it must be understood that fishery food containing any level of GMO must follow this requirement.

Administrative document:

Official letter No 3997/TS-KHCN dated 31/12/2001 concerns the information attached to fishery products exported to the EU.

For fishery products for export to the EU the letter requires that:

- the commercial name (English name) and the scientific name (Latin name), the method of production, and the catching area of the fish species to be accompanied with the final products,
- the above information is to be written in the label or packaging of the products, or in their commercial documents. For products for retail in the EU market, the letter requires such information to be printed in the label or packaging of products.

This letter was for the purpose of meeting the requirements laid by the Regulations No 104/2000/EC and No 2065/2001/EC. The significance here is for exporters to be able to provide the information on the catching area of the fish species, which must be transferred along with the fish throughout the production chain. This is the utmost element for the traceability. Nevertheless, the transmission of information only with respect to the catching area is not satisfactory for the purpose of traceability. It lacks the requirement to identify the previous source and subsequent recipient of each business operator.

The Ministerial Standards

- 28 TCN 130 – 1998: Fish processing establishments - General conditions for food safety (established on the basis of Directive 91/493/EC).

Item 6 of the standard requires establishments to apply the following conditions to each lot of fishery products:

- Establishments have to build up a coding system identifying each lot of products,
- Each lot of raw materials received must be issued with an identification number linked with the following information:
 - Supplier of raw material
 - Date and time of receipt
 - Fish species
 - Volume
 - Quality and hygiene evaluation...
- 28 TCN 129 – 1998: Fish Processing Establishments - HACCP Based Program for Quality and Safety Assurance (established on the basis of Directive 91/493/EC).

Item 5.9 requires establishments to apply a system allowing the tracking of origin of products for the purpose of recall in case a quality failure is found. The record keeping period is required for up to 2 years.

Relevant stipulations

There are also some relevant documents providing conditions for the application of traceability:

- Regulation on monitoring residues of certain harmful substances in aquaculture animals and products thereof (No 15/2002/QD-BTS dated 15/5/2002);
- Regulation on the methods of inspecting hygienic conditions of fishery processing factories (No 649/2000/QD-BTS); and
- Document on the methods of inspecting hygienic conditions of fishery collection establishments (Decision No 09/2002/QD-BTS dated 15/3/2002).

In conclusion, Vietnamese regulations only have the basic features for the traceability of fishery products: product labelling, lot coding, recording the origin of materials and tracing back of products. However, this is not satisfactory to ensure the ability to

follow the movement of food throughout the chain, as defined by the Codex Alimentarius CAC 27th Session.

2.8 Comparison of Icelandic and Vietnamese legislation on fish traceability

2.8.1 Comparisons of the pre-requisite conditions for traceability

In comparison to the summary of pre-requisite conditions for traceability (see chapter 1.2.3), the Icelandic and Vietnamese legislations on fish traceability are still missing the necessary conditions for building up an efficient system, as:

- There are no traceability obligations at every step in the food production chain;
- The requirements concerning product identification and control by lot and ID numbers is not been properly regulated;
- There is no obligatory recall procedure.

2.8.2 Similarities and differences

Despite the absence of a direct statement about fish traceability, both systems provide certain measures to guarantee it. These measures are scattered in different texts:

- the labelling of products is required before placing of products into the market, as the last step in the whole production chain. But, the Icelandic regulation also subjects fish in bulk (unpacked) to this requirement of labelling, while in Vietnam there is no such provision, mostly explained by the uncommon practices in the fish production for export.
- there is a provision in Vietnam requiring the coding and tracing of lot of products at processing, however the information required stops at the suppliers of raw materials. This has not been seen in the Icelandic system.
- both systems provide more guarantees for food traceability through a number of scattered provisions: the mandatory labelling of name and address of producer/or person who is responsible for the food, the labelling of the country of origin. However, the Icelandic legislation goes into stronger detail by setting up the requirement of labelling the approval number (ID number) obligated to every processor, while it is facultative in the Vietnamese legislation.

In both systems, there is an effect at a high level of the EU policy of food hygiene and standards. The most important requirements of EU food standards are the background on which both food traceability systems of Iceland and Vietnam are based. Some reasons for this phenomenon have been mentioned in the previous parts of this paper.

Because the truly fair comparison requires more time and study, please bear in mind that this paper only provides initial comments on the matter. With both Icelandic and Vietnamese legislative systems providing the same guarantee for food and fishery product traceability the question has to be asked whether the possibility to trace fishery products in both countries is identical? The next chapter will go through the observations on traceability implementation in the fishery industry of Iceland, before

looking into the factual situation of the Vietnamese fishery industry in order to figure out the answer for the above question.

3 APPLICATION OF TRACEABILITY

3.1 Traceability implementation in the Icelandic fishery industry

3.1.1 Overview of fishery production in Iceland

The Icelandic Fish Industry is export-oriented, supplying 2% of the global fish consumption, and was ranked 13th in the world fishing league by the FAO in 1999 (Hameri and Pálsson 2003). Natural catch plays an important role, while farmed fish is a secondary source of production.

From a population of about 300,000 inhabitants, 8.7% of Iceland’s total labour force is directly related to the fish industry (around 24,000 people), supplying around 1.7 million tons of fish annually.

Considering the practice that fish are handled through many different operations, which can distort the information on where fish comes from or goes to, fish traceability is well applied in Iceland.

Thus, it is necessary to address the main operations of the fishery activities and their main traits, before following them to observe the traceability implementations.

Figure 1 describes a simplified flow of fishery production for fish destined for export.

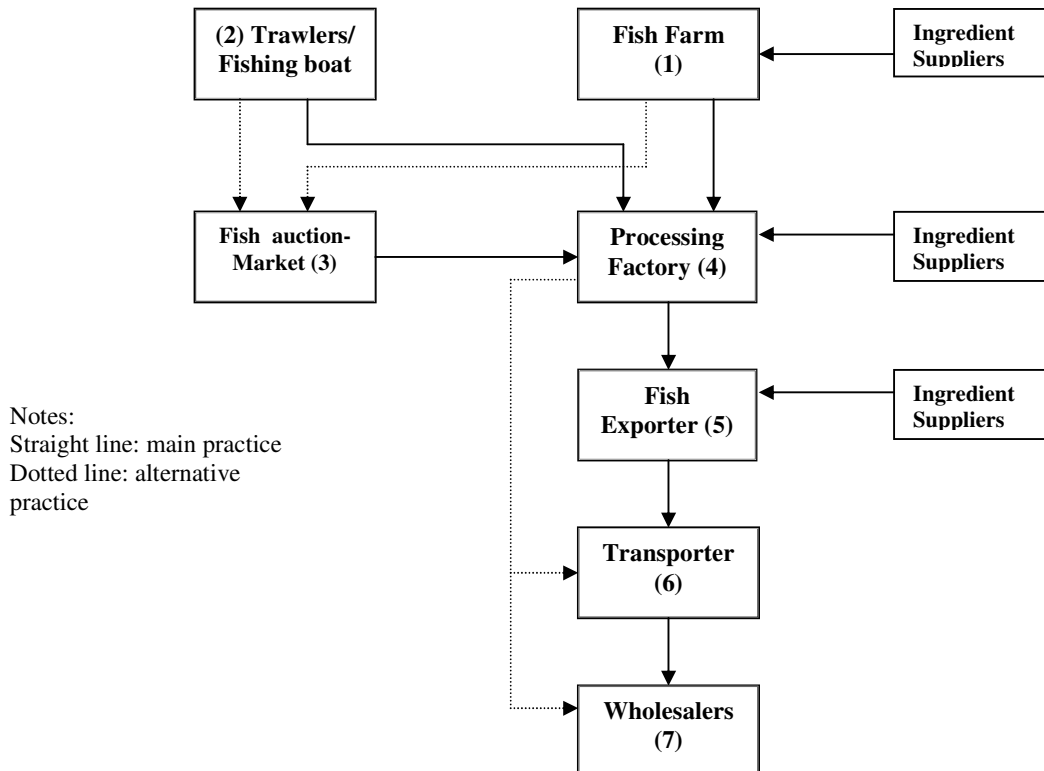


Figure 1: Simplified flow chart of production chain of fishery products for export in Iceland.

The trend in the Icelandic Fishery Industry is toward the larger companies. At most stages in the production chain, the merging of small businesses into one big company is observed, resulting in bigger production units.

All stages in the production chain apply IT to some extent for recording and keeping the production information. Trawlers have equipment to record catching information. The activities of fish auction-markets have been computerised. Fish processing factories, exporters and transporters also rely on computer-based management.

Batches are identified by barcodes linked with the production database. At all processing factories, the codes issued by European Article Numbering Uniform Code Council (EAN.UCC) are used. Based on the analysis above, the observations of traceability at fishing trawlers, fish farm, fish processing, fish exporter and transporters in Iceland were carried out.

3.1.2 Observations of traceability linkages between fish operations

3.1.2.1 Tracing of fish from the sea - description of procedure

Observations

Trawlers and boats normally stay at sea from 1 to 7 days.

During this time, fish is usually identified by fishing day. They can also be identified by haul number.

After being pre-processed (grading, beheading, bleeding, gutting, etc.), fish are put into tubs, each identified by both a visual tub number and a label indicating the fishing day. Some trawlers have begun using barcodes or Radio Frequency Identification (RFID) -tags (see Figure 2 and Figure 3). In some cases, the tub numbers, either the one printed on the tubs, the paper label, or the RFID, are used to connect the content of the tubs to more information like haul number, catch size, etc. The ID number of each individual tub is also linked with the haul number and thereby to the haul information (fishing ground, sea temperature, haul start and duration etc.).



Figure 2: Enlarged picture of fixed RFID (Margeirsson *et al.* 2003).



Figure 3: Tub of fish attached with fixed RFID (Margeirsson *et al.* 2003).

If tracing back to the ship becomes necessary, the ID number of the tub has this link. Then, through the ID number of the tub, the boat takes responsibility to trace back the haul and the information of the catch.

There are different levels of traceability, depending on the practical process on board:

- If fish of one haul is put into one or a number of tubs: full and precise traceability information can be assured for fish if its tub number is pointed out.
- If fish of several hauls has been mixed (for grading, pre-processing), then filled into tubs, the ability of trace back to the information of fish at catch is wider than the first case: we know that the fish come from any of a number of hauls when its tub number is pointed out.
- ID number of haul is the key element for traceability of the boat, because it allows access to all information on the catching conditions of the haul, including:
 - The date of catch
 - The location and the time length (minutes) of catch:

+ The location of the catch can be identified through the satellite-based navigation GPS (Global Positioning System) which normally allows the calculation of a 2D position (latitude and longitude) of the catch. Within the sea area around Iceland, the location of catch is also identified as the specific square where the trawl had been dropped, corresponding to the zoning map shown in Figure4.



Figure4: Map of fishery catching zones (Margeirsson *et al.* 2003).

+ The time length of the catch started at the time when trawl was dropped and ended when it as towed in.

- The depth of the trawl, the water temperature during catching time: This information was measured through a special device attached to the trawl, which reported the required parameters to the system on board.

- The size of catch was measured in the number of tubs filled. From the number of tubs the weight (kg) was estimated. After the catch had been unloaded, weight (kg) in tubs, was measured and registered.

Summary

- The system of tracing fish from trawlers and boats is in accordance with “the one up, one-down” requirement of the traceability regulations.
- In some places, access to traceability is available through the Internet, which is more than what the law requires.

3.1.2.2 Fish Traceability at a fish farm - visit to SILUNGUR ehf. – 09/12/2004

Operations at the farm

The farm produces Arctic Char with an average production capacity of 1500 tons per year.

To operate the business, the farm is approved with three approval numbers, respectively for fish farming, assuring the control over harmful effects to the environment, and slaughtering and processing of fish.

However, the ID number for fish slaughtering and processing issued by the Directorate of Fisheries is used for labelling as a factor of traceability of products.

The farm owns a hatchery facility, which supplies the farm with smolts every three months. Fish are raised in tanks for around 6-8 months. There are 28 farming tanks, and each has been given an ordinal number.

Fish is fed and vaccinated during the farming time. No other medicine is used.

Feed is supplied by FODURBLANDAN in Reykjavik, transported to the farm in units of 1000 kg, each labelled with a unique batch number.

Vaccines used for fish are ordered from one Norwegian importer. Each dispatch is given a unique batch number.

Because smolts grow at different rates, the slaughter and filleting of fish reaching commercial-size is carried out in-house by machine almost every day. Fish after slaughtering and sometimes also filleting are packed in boxes, ready for transport.

The traceability requirements followed here are:

- suppliers: information of each batch of smolts, each box of feed, each batch of vaccine;
- customers: buyers of fish after slaughtering.

Traceability practices

ID numbers of feed and vaccines boxes are read at receiving. These numbers are linked with information of factors monitored during farming time: the quality of water used, quality of smolts, quality of feed, quality of vaccine.

The farm has to check the quality of feed before using it to feed fish. If the feed is disqualified, the farm can contact the producer using the batch number on the label of the feed box. Then, at the feed factory, the supporting system will tell how the feed was produced, and the cause for disqualification can be addressed.

For tracing the vaccine used, the unique batch number is also used to contact the suppliers.

Fish fry are hatched by the same company, and the information on fry quality can always be traced back though record keeping at the hatchery. The key linkage here is the tank ID number where the fish fry had been nursed, the date when they had been moved to the farm, and the tank ID number at farm.

When fish reach commercial size, they will be slaughtered. ID numbers of the tanks where the fish were taken out, and processing/slaughtering conditions are recorded. Fish leave the farm in lots. The lots are labelled with ID numbers of the farm, lot number and processing date. In some cases (e.g. for fresh fish exported to the US), no farm ID number is put in the box, but the documents accompanying the fish (invoice) shall contain the relevant information (even processing date and ID number of the farm).

Through the processing date, the farm can trace back the processing/slaughtering conditions of the lots, then the number of tank and the conditions under which the fish were raised, by reading them together with the internal traceability documents at farm.

- Internal traceability:

Table 1 shows the information recorded as the system allows internal traceability at the farm. This information is kept for five years.

Table 1: Example of Internal traceability record.

M3	Charröx	1004	2	
(number of tank)	(species – öx: fry from Öxnalækur)	Month & year of processing	Number of lot	Processing Date

Through this table, it can be identified that the farm sold 2 lots of Char in October 2004 from tank No 3.

The number of the processing date and the number "1004" was put on the fish boxes from both batches. In case of finding reason to conclude that the fish from this tank are not up to standard, the farm can use the date of production to trace the ID number of the lots from Tank No. 3, and recall the products, which are exactly involved.

Summary

- The traceability one step back, one step forward is assured by the system
- The internal traceability is an application further than required by the law and can link products with information about fish during the rearing-up period.

3.1.2.3 Fish auction markets

Observations

Fish from catch which do not go directly to processing, are transported to the auction market in tubs/boxes (see Figure).

The identification of each tub (by RFID, printed paper label etc...) has to be read before entering the market, kept with the information about suppliers, information of quality, quantity etc. This is the key element to trace fish back to the information at catching or aquaculture step.

At the market, fish from different tubs of different suppliers can be mixed up for sorting, grading. After this, each grade goes into separate tubs, with a new ID. Then, the auction can start. Each tub sold must be recorded with the information of the buyers.

In reality, all the activities of the auction market are recorded on computers. The information about the fish from entering the market, through to grading and auctioning at the market, up until they are sold can be traced. The frequent practices at fish auction markets have been investigated by UNU/FTP (Latiff 2002).

Summary:

- The IT system used for auction markets offers the full ability to trace fish back to suppliers as well as to buyers

3.1.2.4 Fish during processing: Visit to HB GRANDI hf. – 20/12/2004

Information at the factory

HB Grandi has two factories processing fishery products, located in Akranes and Reykjavík. For the purpose of this paper, the tracing upstream follows the processing line of frozen and fresh fish in the factory in Reykjavík.

The frozen and fresh fish lines use around 400 tons of raw materials per week and out of this produce 200 tons of products.

Raw materials come from the trawlers of the factories, or fish market, or other processing companies. Fish are received in tubs/boxes, with unique identifiers (see Figure). The company also uses salt bought from Saltkaup in Reykjavík.

Fish from the company is sold both to other processing companies for further processing, and to wholesalers (to retailers or restaurants). Transport is by ship if

products are frozen, and by air if products are fresh. In both cases, products are transported in containers, marked with a barcode.

Given that there is a demand to trace back to the origin of a product, which has been placed in the market, the tracing one step back here will be the ability to link the supplier of the fish with that who produced the product.

Traceability practices

The key factors to trace one step back can be seen in Figure 2 and Figure 3. These are:

- The factory code **IS-01116**
 - IS:** Iceland
 - 01116:** Approval number of the processing establishment at Reykjavík
- The lot number: **4 316 007**
 - 4:** the production year 2004.
 - 316:** the production date (the ordinal number of day).
 - 007:** the code of products (for Rotbarsch Filets set by the factory).

The animations of lot number and factory code are shown in Figure 2 and Figure 3

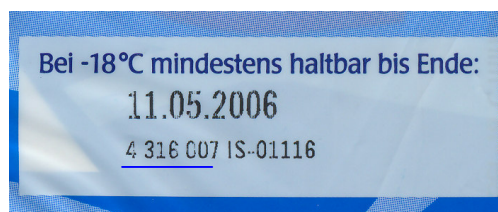


Figure 2: Enlarged piece of information for traceability



Figure 3: The 1000 g package of seabaste marinus produced by HBGrandi

Since the legislation only requires the factories to control products by lots, and leaves the size of lots to them to decide, then depending on the factory, the lot can be either very big, like all products produced in the whole week, or very small like products produced in only 1 hour.

Hence, the lot number provides a differing degree of accuracy regarding the lot size depending on each factory system and also depending on the diversity of the raw material. There is no doubt that this is still legal according to the “one-up, one-down” requirement of the current legislation systems, but in the event of a food crises, it is not adequate for locating the source of danger exactly.

- Pallet number:

A pallet is a wooden or plastic platform used to stack material for easier movement from one area to another. Today, it is a vital traceability unit during storage and transportation of food in Iceland.

There are two standardised sizes for pallet - Europallets and ISO pallets, but the more commonly used in Europe is Europallets 48" x 40" x 5" (see Figure 4 below).

Advantages of pallets:

- Through the use of forklift trucks, using pallets facilitates the handle of food in bulk during storage and transportation;
- Pallets help to harmonize the size of food holding unit. They facilitate the loading food in freezing containers, as well as the arrangement in warehouses;
- Pallets help to trace products as well as protect them. Each pallet is given an ID number as a traceable unit through storage to transportation and distribution. Products are not sent out of the factory without being stacked in a pallet and wrapped (See Figure 5).



Figure 4: Example of Plastic EuroPallet for General-Purposes
Palcon LLC Company.

Figure 5: Pallets of cod fillet wraps in the Icelandic Group's plant
Taken by *Liu – UNU/FTP 2002.*

A given amount of products of the same type (example: 007) that are produced during a certain timeframe, are stacked on a pallet after processing. Here, the ID number of pallets is issued, and linked with all information regarding the products.

Comparison of information in processing accessible through pallet number and lot number:

- The lot number is used for products made during the whole day. For example: in the records of the factory, lot number 2316 – 007 means all Rotbarsch Fillets produced on the 10th, November 2004 (see Figure 6). This way, the internal record system can tell how many tubs of materials and ingredients have been used in that production day. From the ID of materials and ingredients, the person who has supplied them can be traced. The record keeping period of internal record is

decided by agreement between the processors and buyers. The information during processing of fish can be also traced (see Table 2).

- Pallet numbers are issued after the completion of a given amount of products during the production day; therefore it allows access to accurate processing information during this specific period of time. Following the same principle as described in the previous paragraph, the ID number of materials and ingredients and the suppliers can be traced.
- However, both allow tracing back through the processing up to the suppliers of the materials and ingredients of products. The difference is only about the processing information, and this is not obligatory according to the current traceability legislation.



Figure 6: Example of information accessible through lot number.

Table 2: Explanation of Recorded Information for lot number at factory during processing.

Type of information recorded		Recorded signs	
Commercial Name of Product		ROTBARSCH FILETS TIEFGEFROREN	
Latin name	FAO catching area	Sebastes marinus	FAO 27
Lot number	Fishing ground	4316 – 007	Golden Bay
Best Before date		11 05 2006	
Inter controlling number by factory	Code by customer	062007	520129
Storage temp.		- 18oC	
Carton box	Buyer	Factory code	8 x 1kg
			CLAMA
			IS-01116

The traceability of fish during processing was investigated by Liu (2002) through a project under the UNU-FTP. Therefore, it is not necessary to repeat it again in this study.

- The EAN.UCC code

The application of the EAN.UCC system is not mandatory but practised at almost all fish processors in Iceland, due to the fact that it enables the product to be identified worldwide.

Factories that have applied for EAN.UCC application will be assigned with a unique barcode and a 6 digit-number: 3-digit prefix for country code (exp. 569 for Iceland), 3 others for the logistic unit, good and services. The EAN.UCC barcode and number provide not only the unique identification for products of each processor but also the detail information about products such as best before dates, batch numbers etc.

(EAN.UCC 2002). At HB Grandi, the barcode used is printed in each single package (see Figure 7 and Figure 8).

Food operators often do not use EAN.UCC for tracking and tracing of products within their own activity. But labelling the product units traded locally or abroad with an EAN barcode and number is well practised in Iceland, facilitating the traceability between links in the fish production line as well as in the world market.



Figure 7: Enlarged barcode used for seabaste marinus from HB Grandi



Figure 8: The package using barcode for traceability of seabaste marinus produced by HB Grandi

Summary

- The tracing of fish one step back, one step forward is obtained by identifying well the transferred units between steps (e.g. tubs of raw materials, pallets and EAN.UCC code of final products).
- The practice at the factory allows access to more information than stipulated by law, by using internal traceability to trace the precise processing data of the products.

3.1.2.5 Fish at secondary processing (visit to the salted fish line at SÍF HF.)

Information at the company

Primarily salted cod is bought from small processors for re-salting at SÍF before being shipped to sell in Europe.

Materials are transported to the factory in big cases. Each case is given an ID number, linked with information of suppliers.

After being re-salted, fish will be packed in new packages marked with SÍF marks and leave the company in a new unit – a pallet. Through the pallet number, the precise information about fish during processing can be traced back (see Annex 2).

Traceability practices

- Key factors that are recorded

For each case of materials, the date of receipt, the date of processing, the pallet number after processing and their ID numbers are recorded.

The pallet is the containing unit of products leaving the factory. Through the pallet number, the date of processing and the date of receipt can be traced back.

Then, through the date of receipt, the supplier and information of materials at the receiving end can be traced back.

- Through the date of processing, and the record of HACCP documents, the processing information can also be traced (see Annex 1 and Annex 2).

Summary

- The same level of fulfilment to traceability requirement as previous steps is assured.
- The factory has also set up internal traceability system to enable the tracing back the processing condition.

3.1.2.6 Traceability at fish exporters and transporters

Observations

Products are pre-packed before entering the exporters' or transporters' warehouses. No matter how they are packed (in big cases for further processing, or in final packages), the fundamental factor here is that they will remain in their original packages through the process.

Traceability here can be simplified as:

- Records of the date when the products come in, and the ID information of the products;
- Linking the products with storage information under their control
- Linking the products with information of their final destinations or buyers.

TALLY SHEET

Loader: _____ Shipper: FH

Receiver: SIF HOLTABAKKA Box Weight: 19800 kg

Container: SANUS00971-Y Pallet Weight: 400 kg

Vessel: SENT Container Weight: 41695 kg

Seal No: 51816 Total Weight: 24895 kg

Port of Destination: REYKJAVIK No.: 27599

Plant No.	CODES	CASES						TOTAL	Total Pallets	Country of Origin Production Year
		PALLET NO.								
35	P80S	29	29	29	29	29	29	468	6	ISC 07
		20818	20915	20955	20908	20819	20820			
35	P80S	29	29	29	29	29	29	468	6	-H
		20802	19843	20252	20797	20851	20763			
35	P65S	29	29	29	29	29	29	468	6	-H
		20799	20811	20668	20251	20686	20675			
35	P65S	29						29	1	-H
		20721								
35	P35S	29						29	1	-H
		20526								

Example of traceability information recorded at SIF is shown in Figure 9 below

Figure 9: Receiving Sheet of products at SIF (Blomsterberg 2004.)

The sheet above shows that the company is recording their customers (by numbers), the number of food pallets received, and the total of pallets. This sheet will be continued with table recording the temperature and time of products entered on board, and these two factors during transportation, and at the delivery.

Summary

The ability to trace the suppliers and the customers at this step is obviously easy to ensure.

3.1.3 Conclusion

3.1.3.1 With regards to the fulfilment of basic traceability requirement

Full ability to fulfil the basic traceability requirement to fish is ensured.

Fish traceability is facilitated by the fact that most operators of fishery products in Iceland are practising the business on a large scale. The industry is using barcodes and computerised systems for production management, and this is ideal for traceability implementation, because barcodes are easy to read whenever batches are transferred inside or outside of the step, and they also enable quick access to the stored information during the production.

The application of the EAN.UCC code in most factories in Iceland is one advanced technology in comparison with the current general situation in the world, ensuring the ability to trace seafood back to producers regardless where they are sold.

Food traceability in Iceland is not only able to trace “one-up, one-down”, but also offers the ability to trace the information in between steps through internal systems. Recently, a project realised by Björnsson 2005 –(an IFL analyst) hypothesised that the traceability should extend to record the fluctuation of temperature during the storage and transportation time. The advanced idea here is by tracing back the fluctuation of temperature - the most important factor for quality and safety of seafood, the quality and commercial index (hardness of texture, rimes inside the packages) can be looked over and controlled, helping producers in optimising production.

3.1.3.2 With regards to the legislation aspect

As discussed in Chapter II, the legislation of traceability for fish/food products does not provide a full legal framework for traceability.

But, the industry is still offering an effective assurance of traceability. The question here is will Iceland really need the legislation on traceability, or is the industry strong enough to ensure it without any legal control?

The following section tries to provide the answer for this, by using the theory on the functions of laws:

- Starting with a solitary individual - a hermit living in a completely isolated environment from human society – he will require nothing more than habits. When he gets socialisation where individuals having different habits, some of these habits begin to crystallise into customs and then into social rules (Farrar and Dugdale 1990). The social rules are not enforceable.

As long as the social rules are voluntarily obeyed by individuals in the society, the society order is still maintained.

If social rules are broken, the society needs a stronger tool to maintain its order. It must be entrusted with the powerful to sanction the violation, enforced by the highest power in the society – the State. Law was created for this purpose. (Farrar and Dugdale 1990).

- It is understood that the fish industry of the world is operating under a set of rules, which can be approximately considered as the society rules for fish trading community. In this community, the buyers/traders are exercising their rights to require the sellers to have several levels of traceability. The exporters of fish in Iceland are practising good traceability mostly because of the governing of the rules in this society.

As far as the rules are still practised successfully, the law will not be convened. But the legislation of traceability is certainly needed, to create the minimum standards with regards to food safety so that traders must be able to be judged and sanctioned for violations when they occur.

3.2 The fishery industry in Vietnam and the ability to adapt to the new requirement on seafood traceability in the world market

3.2.1 Overview on the practices of the Vietnam fishery industry

The number of people working in the fishery sector is around 3.4 million (year 2000), producing 1.3 million tons of catch and 723,000 tons of farmed fish. In the year 2003, the total catch increased to 1.5 million tons while farm production reached 1.15 million tons. Fish farming plays an increasingly important role in the sector (Vietnam Ministry of Fisheries 2000).

Different from the situation in Iceland, steps 1, 2, 3 (see Figure 10) in the fishery production chain in Vietnam are operating in a small scale business (in terms of productivity and capital), and they are numerous and scattered. According to the statistic of the Vietnam Ministry of Fisheries 2000, 99.5% of the total catch is supplied by small fishing. The number of motor-driven fishing boats was 44,347 in 1991, equivalent to 59.6% of the total fishing boats. The number has reached 71,767 boats, equivalent to 82.4% of total fishing boats in 1998. Statistics on the capacity of motor-driven fishing boats are shown in Table 3.

Table 3: Capacity of motor-driven fishing boats

Year	Engine Capacity (horse power)	Percentage in total motor-driven boats
1992	< 20 hp	58.0 %
	20 – 45 hp	32.0 %
	46 – 75 hp	9.0 %

	> 76 hp	0.7 %
1998	< 20 hp	53.0 %
	20 – 45 hp	30.0 %
	46 – 75 hp	10.0 %
	> 76 hp	7.0 %

In Vietnam, instead of a fish auction-market, there is a so-called “middle-men” system. They collect fish from fishermen, and supply to factories. There can be several levels of middlemen, this means there are also some “middle-man” of other “middle-man”.

The production management at all steps before processing do not applied any sort of information technology. Farmers, fishermen and middlemen involved are usually poorly educated and therefore documenting is difficult for them to do.

The simplified flow chart of the fishery production in Vietnam is shown in Figure 10 in order to facilitate the traceability study.

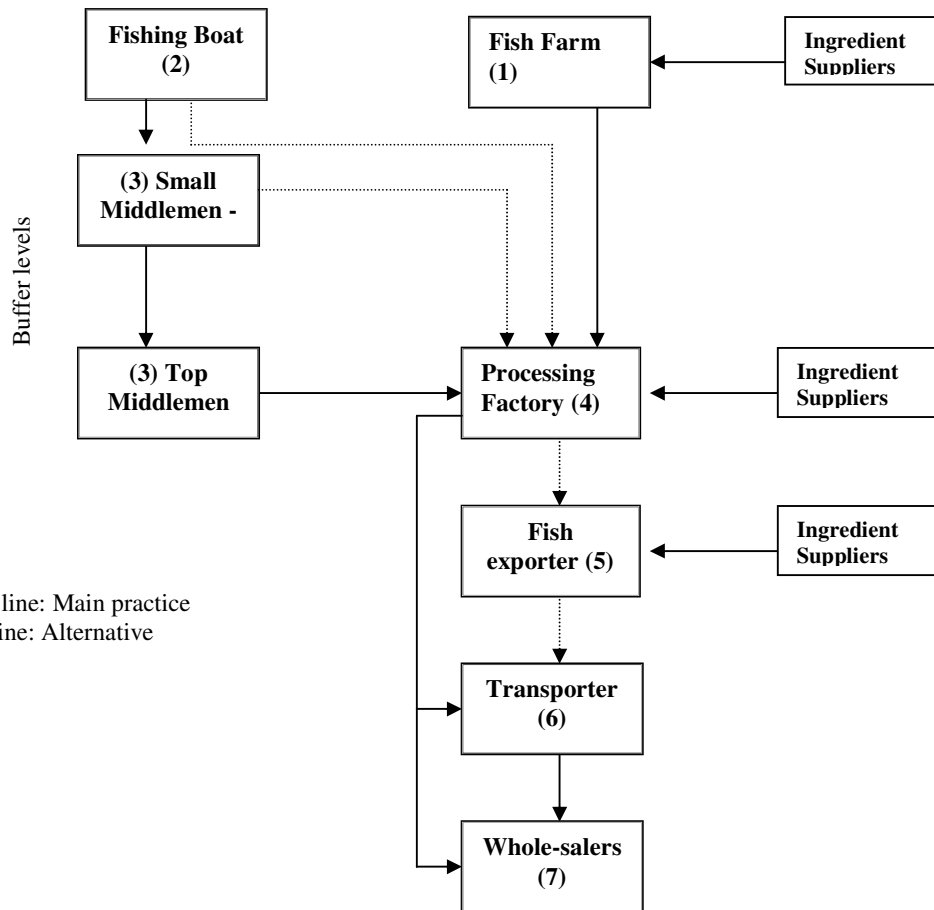


Figure 10: Simplified flow chart of the production chain of fishery products in Vietnam

3.2.2 Current practices of the Vietnam fishery production activities

The current practices of the Vietnam fishery production activities provide the following advantages and disadvantages for application of traceability.

3.2.2.1 Certification of production method of fish (Regulation No 104/2000/EC and No. 2065/2001/EC)

- Tracing of fish from the sea

Advantage: the catch of Vietnam comes from the South China Sea and Gulf of Thailand, which the FAO has coded into 4 catching areas. The identification and certification of catching areas, in accordance with Regulation 104/2002/EC, has been well practised by fishery exporters and producers of Vietnam.

Disadvantages:

- Lack of information and research on common name and Latin name of fish species.
- The fishing fleet is at a low capacity, and raw material is coming from numerous sources in different conditions.

- Recording of the conditions of catch and its preservation on board is poor. Therefore, it is impossible to identify the catch by lot.

- Fish traceability at farms (also: Art 18 – Regulation 178/2002/EC; US COOL Bill – see Chapter II)

Advantage: The National Program of Vietnam on monitoring harmful residues of aquaculture animals and products thereof has been monitoring 137 fishery aquaculture areas working at an industrial scale. Each area has been given a unique code by the authority. This facilitates the identification of aquaculture farmed and the tracing of fish back to the farms of production.

Disadvantages:

- Number of farms has increased, but are spread on a small scale.
- The farmers are mostly unaware of traceability responsibility.
- Records, either on one step forward (i.e. whom they sell fish to) or one step backward (whom they bought the fish fry, fish feed from etc.) are often not kept or are wrongly recorded and kept. However, at least there are financial records containing this information.
- Farming methods and species are very diversified. Recording of farming conditions has not been properly and adequately practised, therefore internal traceability is not completely accessible.

3.2.2.2 Fish material supplying system (Art 18 – Regulation 178/2002/EC; US COOL Bill. Chapter II)

- Fishery processing factories rarely catch/farm fish themselves. They are being supplied with raw materials through a middleman system.

In this system, some simple records have been maintained, more for accounting purposes than to keep track of fish. Fish with fishermen are always mixed up, then divided into species and graded according to the order of the factories. Very poor record keeping is practised by the middlemen.

- There is no traceability and no awareness of lot division.

3.2.2.3 Processing step (Art 18 – Regulation 178/2002/EC; US COOL Bill. Chapter II)

- The HACCP system is mandatory in processing factories. Recording of the supplier of fish, the receiving time and the volume of fish received is mandatory.

Fish is then taken to be preserved, sometimes for a month (when raw materials are at a low price). No separation of fish received from different suppliers during storage. Lot IDs of material are not always transferred during processing.

- Lots are normally products of one shift. Each shift has its own record of production, material taken in and products out. But the information that is recorded is about productivity (quantity of material and ingredients but not their ID numbers, numbers of final product units).

- Products for export:

Seafood for export is often pre-packed with the expiry date on box. Fishery products exported to the EU have to be accompanied with a unique approval code both on the labels and in commercial documents. This is a method to trace back the processing date, and the materials and ingredients used for processing.

- No clear consciousness of traceability responsibility.

- However, by training the management staff, traceability could be assured at this step.

3.2.2.4 Distribution step (products for export) (Art 18 – Regulation 178/2002/EC; US COOL Bill. Chapter II)

- Final products as well as semi-products can also be traded before export.

Due to the fast development of fishery processing activities recently, many exporters are collecting products from small businesses, then shipping them for exporting to a third party. At these operators, fish products often get mixed up. Traceability information is easily lost here.

- No clear consciousness of traceability responsibility.

- For transporters of food into the U.S, the food traceability has not been well prepared.

- The affairs are often documented, mostly for commercial purpose, but can assure trace one step back and also one step down.

3.2.2.5 Labelling of products (of products for export) (EU Directive – Chapter II.3.2.4.)

- Some markets require stringent labelling (EU, US, Japan, Canada etc.)

- In some markets the food labelling is applied according to the customer's order. For this reason, many products are not labelled with adequate information for traceability. However, the commercial documents can assure the information about the customers.

3.2.3 *Conclusion:*

In contrast to the levels of traceability assurance in most steps in the Icelandic fishery industry, fish traceability in Vietnam can be divided into 2 types:

- Most processors, exporters and transporters practice methods to ensure traceability of their goods. At these stages, basic paper-based record systems have been established and are well applied.

For the purpose of traceability, some further training and adjustments of documentation procedures should be given to help the operators in understanding the requirements provided by laws.

The basic requirement “one-up, one-down” can be assured. Internal traceability will also be possible in most factories producing products for export.

- Poor traceability practices are apparent in the steps before processing. At most fishing boats and middlemen, the documents recording the fish bought and fish sold is not properly practised. Most operators lack basic knowledge and awareness about traceability. The basic one-up, one-down requirement is not met.

In summary, traceability is poor in the stages before processing.

4 DISCUSSION AND CONCLUSION

This Chapter will focus on the method the Vietnamese fisheries sector should follow to implement successfully traceability requirements of importing markets when they come into effect.

Therefore, the key requirements of traceability should be clearly repeated, before using them for orienting the proposals, which are necessary for effective implementation in Vietnam, and some predictions for the future of traceability legislation in the world.

4.1 Key requirements of current traceability legislation

At present traceability legislation:

- aims at tracing products throughout the production line: each operator has responsibility for one up, one down;
- requires the ability to recall products in case of food safety problems;
- requires the ability to make the information available to the competent authority.

However, it does not:

- require the ability to ensure safety or quality of products;
- require internal traceability;
- ask for the whole documentation system for their own purpose.

4.2 Proposals for fish traceability implementation in Vietnam

4.2.1 Key navigators

Considering the low level of management of the fishery industry of Vietnam, especially at the steps before processing, in my opinion, the following key elements should be kept in mind when building up a fish traceability system for Vietnam:

- Stick to the legal requirements: one step forward, one step backward;
- Use the available conditions, do not build up a complicated system so that it does not work in the poor condition of the fishery of Vietnam

- Consider the ability to apply internal traceability in the processing stage, and at farms where basic documentation is available and external traceability in fishing, farming and raw material collecting (middle-men) where traceability will be implemented for the first time.

4.2.2 *Suggested solutions*

4.2.2.1 Regulatory solutions

- It is recommended that the Ministry of Fisheries amends the relevant regulatory documents to regulate the traceability implementation.

The documents should define the basic principles of traceability, as:

- “one step up, one step down” requirement;
- the responsibilities of each fish operator in the production chain (having in place a system for traceability, and making it available to the authority on demand); and
- the record keeping time for each step.

They should also assign the competent authorities to monitor and guide traceability practices for operators. Due to the reason that fish stakeholders are numerous and divided into groups (fishermen, farmers, middle-men, processors etc.), the authorities in charge of monitoring and guiding traceability should be the level closest to the group.

The documents covering this purpose should be:

- The Governmental Ordinances on the Guidance for the implementation of certain articles of the Fisheries Law: for regulating the principal traceability requirement in the fishery production chain, and the responsibility of each operator in the production chain to have in place a record system that allows the access to one-up, one-down traceability.
- Circular No 03/2002/TT-BTS: for regulating the responsibility of labelling or transferring the traceability information between operators.

Other relevant documents for regulating the detail responsibility of each group in the supply chain:

- Regulation on monitoring residues of certain harmful substances in aquaculture animals and products thereof (No 15/2002/QD-BTS dated 15/5/2002);
- Regulation on the methods of inspecting hygienic conditions of fishery processing factories;
- Document on the methods of inspecting hygienic conditions of fishery collection establishments (Decision No 09/2002/QD-BTS dated 15/3/2002)

For the responsibility on traceability of exporters and transporters where their business are not under the authority of the Ministry of Fisheries, it is recommended the co-ordination of concerned authorities by amending regulatory documents and identifying the recording and archiving procedures for this purpose.

It is recommended that the Ministry of Fisheries issue a Ministerial guideline for traceability implementation.

The guideline should give detailed description on the methods to document the traceability information at each step of fish production. The following is suggested:

Suggested ID information for every stage: using date and volume of production for raw material in the chain. At farms and processing factories, the identifiers should be in detail to identify the lots of each recipe.

Suggested method: improving the available documentation, attached them to the traceability purpose. This can help in building up capacity to fulfil the basic requirement of “one-up, one-down”, especially at the first steps in the production chain.

Fishermen: record catches in a logbook, and
For each catch: record the date and volume of catch for each fish specie next to the date and volume of selling information

Farmers:

systemise the available records to create the proper documents for source of fry, feed, and chemicals until the selling information. (i.e. date and volume)

Identifying information of each unit of input and output factors must be established.

Farms should be able to assure internal traceability, for the purpose of controlling the quality and efficiency of production.

Middlemen:

record date and volume of each fish specie bought until they are sold.

Processor:

should establish internal traceability, possible mixed with HACCP documents, in order to at least be able to follow the products inside the factories.

The management of raw materials used must be ensured, at least by lot production.

The traceability should focus on safety and quality of products: the processing conditions, the temperature fluctuation during storage and processing.

Exporter and transporter:

ability to make available the information on fish suppliers and recipients by request of the authority must be assured.

It is recommended that further investigations be conducted on several processing factories and fish farms of different production size, in order to establish the model guide of traceability documentation and practice based on the Guide to traceability of Eurofish and Sippo 2004.

4.2.2.2 Training

Training on traceability should be conducted separately for different groups of operators, fitting to their practical goals in traceability application. There should be at least 4 different groups: fishermen and middlemen, farmers, processors, and exporters and transporters.

The trainings and meetings should:

disseminate requirements of foreign markets, the requirements of the Ministry of Fisheries to operators in fishery production. The transporters of fishery products into the U.S. have to be informed about the food traceability requirement of this market.;

- help concerned stakeholders understand what has to be done;
- provide guidance in how to record traceability information for each group, and define their responsibility in the implementation;
- simplify the documentation works for groups of fishermen and middlemen and small farmers is the way to make traceability feasible;
- for group of processors and farmers: training on traceability should be given to at least the quality managers and staff. Here, the guidelines should be specified for each group, with detailed model of internal traceability.

4.2.2.3 Research

- At present, a project for building up the list of common and scientific names for fishery species has been started. This project will be carried out by NAFIQAVED (National Fisheries Quality Assurance and Veterinary Directorate) – Ministry of Fisheries for a period of 12 months, with the cooperation of other fishery research institutions of the Ministry.

This should be continued and updated by then, for the purpose of labelling of fish and certification of scientific name of fish.

4.2.2.4 Long-term objectives

- *Traceability for fishery products, not only fish for export*

For ensuring the safety of products, the ability to recall is needed. But the recall system must be based on mandatory traceability.

For the time being, fish traceability is not been extended to the domestic market, since the fish for in-country customers is still produced by small fisheries, sometimes households, where traceability is difficult to be in forced.

Traceability for seafood in general will be a challenge for the authorities in Vietnam, and this should be a long-term objective of the industry.

- Improving the raw-materials supply system

The suppliers system at present badly affects the effectiveness of the production, both for the quality of raw materials and the traceability of products.

It is recommended that the Ministry of Fisheries build up a system of whole-sale markets or auction-markets near to the fishing grounds so that the entered catch can be recorded with the origin, the quality status and other information for traceability. By registering catch/fish sold, and by providing the place where factories and fishermen can get direct contact, fish traceability will certainly be ensured.

- Traceability should focus on food safety assurance.

The experience of the Icelandic fishery industry is that the better traceability is, the better quality the fish will be.

From the point of view of food safety assurance, the Government will not go further than the ability to trace fish “one step back, one step forward”, as the information necessary for recall and withdrawal procedures.

But by the side of the producers, traceability should be a tool for controlling and maximizing the quality of fish, from the early stages until transportation and distribution.

- Technology application

At the stages where fish production is at large, it is suggested to consider the application of information technology (IT) for monitoring the production.

IT systems reduce the manpower required for recording and archives, as well as enabling quick access to the information when needed. An IT system also facilitates the tracking of units of products, ensuring the ability for internal traceability.

4.3 Food Traceability in the World context

At the time of writing, the EU and the U.S. - two of the current three biggest importing markets - maintain traceability requirements of fish products. These two markets however do not require the same level of food traceability. Japan is currently preparing a new Food Law, providing requirements of food traceability, mostly

relating to proper labelling of food for the purpose of safety assurance (USDA Foreign Agricultural Service 2003).

The question is which traceability requirements among the above systems the food/fish producers should follow, and what they should prepare for the coming time?

First of all, considering traceability as a tool to ensure food quality and safety, it has to be confirmed that the requirement of traceability of the European Commission have been followed.

- Secondly, ensuring traceability of the highest degree will provide the possibility to access to every importing market, thus the traceability requirements of the EU market should be followed.

- Thirdly, the U.S. does not yet require a strict traceability regime for the purpose of food safety. But through the experiences of food crises in the context of the common market, where its adverse affect on human health can be out of control, no one knows for sure that the U.S. Government will maintain this position for long, and the industry should be well prepared for change.

- Lastly, with respect to competitiveness, the better the ability to trace, the higher the chance to sell the products.

In the context of the common market of food/fishery products, the Industry should take into account the traceability as a common matter to cope with

With respect to legislation, traceability should be addressed by an international convention for the common purpose of food safety assurance.

Through a common convention, the basic principles of traceability can be agreed. This document should be the background on which national legislations are based, to ensure the rational level of consumer protection as well as to avoid the irrational abuse of traceability as a barrier to trade. For this purpose, this common traceability document should be adopted as the reference standard in dispute settlements between nations in world trade.

To meet the criteria above, the common convention on food traceability seems to be a Codex standard.

From the angle of application, it is ideal if the world can go into a common language on traceability. The idea that the fish from any country can be traced back from anywhere in the world, based on a common identifier is the best, or the target the world food industry should aim for.

This is not impossible, and could be achieved with the use of a worldwide barcode, for example. Some companies have put forward the idea of using DNA as an unique identifier for traceability. Even though, the idea is quite difficult to reach at present, we can obviously expect that it will be achievable as technology improves.

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LIST OF REFERENCES

Books and Articles

- Abdelkhaleq B. 2002. *La hiérarchie des droits : droits internes et droits européen et international*. Paris: L'harmattan (Logiques juridiques), 2002, 272 p. [12/01/2005]
<<http://www.educnet.education.fr /dossier/bibliodroit/international.htm>>
- ACFS 2003. (Thai National Bureau of Agricultural Commodity and Food Standards). Traceability for Food Safety for Food Safety Purpose as Discussed in Various Codex Committee [01/12/2004] <http://fostat.biotech.or.th/doc_upload/rad1BB6E.pdf>
- Blomsterberg F. 2004. *Quality Assurance Systems – SÍF producers – C/P prawns*. Lecture to UNU-FTP 2004.
- Björnsson H.T. 2005. *Storage and transportation logistics for single frozen seafood*. M.Sc. Thesis. University of Iceland.
- Byrne D. 2004. *The Regulation of Food Safety and the Use of Traceability /Tracing in the EU and USA: Convergence or Divergence?* European Commission for Health and Consumer Protection [30/01/2005]
<http://europa.eu.int/comm/dgs/health_consumer/library/speeches/speech168_en.pdf>
- CIES- The Food Business Forum 2004. *Implementing Traceability in the Food Supply Chain* [08/11/2004] <<http://www.ciesnet.com/pdf/globalfood/impl-traceab-doc.pdf>>
- Dillon M. and Derrick S. 2004. *A Guide to Traceability within the Fish Industry*. SIPPO/EUROFISH 2004.
- EAN Ireland 2004. *FAQ on the Food Law* [12/01/2005]
<<http://www.ean.ie/trackandtrace.shtml?sid=13&ssid=97>>
- EAN.UCC 2002. *Traceability of Fish Guidelines*
- EC Treaty. *The Treaty Establishing the European Community* , Article 249:
http://europa.eu.int/eur-lex/en/treaties/dat/C_2002325EN.003301.html
- EUROTOM Treaty. *Treaty establishing the European Atomic Energy Community* ,Article 161.
<http://eur-lex.europa.eu/en/treaties/dat/12006A/12006A.htm>
- Farrar and Dugdale 1990. *Introduction to legal method*. Chapter 1 - 3rd ed. London:
- Sweet and Maxwell 1990. [14/11/2004] <<http://law.hku.hk/lawgovtsociety/farrar.pdf>>
FCN Publishing/CRC Press <<http://www.foodtraceabilityreport.com/ejournals>>
- Hameri A. and Pálsson J. 2003. Supply Chain Management in the Fishing Industry: the Case of Iceland. *International Journal of Logistics: Research and Applications* Vol. 6, No.3, 2003

- Kirk J.L. 2004. *The Power of Code: Traceability Compliance* [06/11/2004]
<http://www.appliedcreativetech.com/white_papers/confirmation.html>
- Latiff Z. 2002. *Auction market for Fisheries in Iceland – Increasing catch value and enforcement in fisheries*. UNU-FTP.
<<http://www.unuftp.is/proj02/ZarinaProjectPRFa.pdf>>
- Lees M. 2003. *Food Authenticity and Traceability*. 1st ed. Cambridge England: Woodhead Publishing Ltd.
- Liu J. 2002. *Investigation on Traceability of Fish Products in Iceland - A Traceability Study for Fish Processing Industry in China*. UNU-FTP.
<<http://www.unuftp.is/proj02/Liu1PRF.pdf>>
- MacDaniel H.A. and Sheridan M.K. 2001. *Traceability of animals and animal products*. Chapter 2 & 3, Office International des Epizooties – OIE [August 2001] [06/11/2004] <http://www.oie.int/eng/publicat/rt/A_RT20_2.htm>
- Margeirsson S. *et al* 2003. *Processing Forecast of Cod*. M.Sc. Thesis. University of Iceland.
- Maria Rita Hernández Palacios 2001. *Study of the Quality Management System and Product Traceability in a Fish Processing*. UNU-FTP
<http://www.unuftp.is/proj01/MariaRitaPRF.pdf>
- Marshall 1807. *La hiérarchie des norms*. Cour suprême des États-Unis dans Marbury c. Madison 5 U.S. (S. Ct.) 137 (1807) (Theory of Laws) [12/01/2005]
<<http://www.er.uqam.ca/nobel/r31400/jur2515/ch4testc.htm>>
- Merriam Webster (2003). – Merriam-Webster’s collegiate dictionary, 10th Ed. Merriam-Webster, Springfield, Massachusetts, 1,600 pp.
- Palcon LLC Company – Profiles [28/01/2005]
<<http://www.careypallet.com/plastic.htm>>
- Russell I. 2003. *FoodTracE - State of the Art Reviews* [06/11/2004]
<<http://www.eufoodtrace.org/files/statereview.pdf>>
- Salcedol J.A.C. 1997. Reflections on the Existence of a Hierarchy of Norms in International Law. *European Journal of International Law* Vol. 8 (1997) No. 4 (Theory of Laws) [12/01/2005] <<http://www.ejil.org/journal/Vol8/No4/art3.pdf>>
- S. CLAPP, CRC Press/FCN Publishing 2002. *A brief history of traceability*
<<http://ift.confex.com/ift/responses/2002/16.doc>>
- SIF 2004. *SIF Group Introduction 2004 – Presentation to QMFHP* . SÍF Company.
- Stefánsson S.M. 2003. *The EEA Agreement and its Adoption into Icelandic Law*. IUSEF No. 25. Scandinavian University Press.

TraceFish 2002a. *Traceability of fishery products-Specification of the information to be recorded in captured fish distribution chains*. CWA (CEN Workshop Agreement), [07/11/2004] <<http://www.cenorm.be>>

TraceFish 2002b. *Traceability of fishery products-Specification on the information to be recorded in farmed fish distribution chains*. CWA (CEN Workshop Agreement) , [07/11/2004] <<http://www.cenorm.be>>

TraceFish 2002c. *Traceability of fish products- Specification of information encoding*. [10/11/2004] <<http://www.tracefish.org>> ‘Tracefish’ project <www.tracefish.org>

U.S. Case 2003. WTO File on US and Cooperating Countries Case against EU Moratorium on Biotech Foods and Crops. [30/01/2005]
http://www.zs-l.de/gmo/downloads/us_wto_13_05_03.pdf

US Embassy in France 2004. *France Biotechnology Implementation Regulations* [31/12/2004] <<http://www.fas.usda.gov/gainfiles/200411/146118022.pdf>>

USDA 2003. *Japan’s New Food Safety Basic Law*. [05/01/2005]
<<http://www.fas.usda.gov/gainfiles/200305/145885543.pdf>>

Van den Belt H. 2003. *Biotechnology, the US-EU dispute and the Precautionary Principle*. Wageningen University and Research Centre. [30/01/2005]
http://library.wur.nl/frontis/transgenic_crops/12a_van_den_belt.pdf

Vietnam Ministry of Fisheries 2000. – *Master Plan for social and economical development in the fishery sector in the period of 2000 – 2010* [14/01/2005]
<<http://www.mofi.gov.vn/ifep/index.asp?progid=3§ion=50013&oid=41>>

Zoëga H.Ó. 2004. *Law and regulation - Seafood Safety*. Seafood Safety Department – Icelandic Directorate of Fisheries. Lecture to UNU/FTP 2004.

Legislation documents:

International Standards:

CAC 1985. General Standard for the Labelling of Prepackaged Foods CODEX STAN 1 – 1985, Rev.1-1991 (20/11/2004) Guide

<http://www.codexalimentarius.net/download/standards/32/CXS_001e.pdf>

CAC 2001. ALINORM 01/41 - Report of CAC twenty-fourth Session, Geneva, 2-7 July 2001 (15/11/2004)

<<http://www.codexalimentarius.net/web/archives.jsp?year=01>>

CAC 2001. Guidelines for Generic Official Certificate Formats and the Production and Issuance of Certificates. CAC/GL 38-2001 (20/11/2004) Guide

ftp://ftp.fao.org/codex/standard/en/CXG_038e.pdf

CAC 2003. Agenda item 3 for the Joint FAO/WHO Food Standards Programme – Codex Adhoc InterGovernmental Task Force on Food Derived from biotechnology – Fourth Session at Yokohama, Japan, 11-14 March 2003. (14/11/2004)

<<http://www.codexalimentarius.net/web/archives.jsp?year=03>>

CAC 2003. Guidelines for Food Import Control Systems. CAC/GL 47-2003

<http://www.codexalimentarius.net/download/standards/404/CXG_047e.pdf>

CAC 2003. Agenda Item 6, Programme of 18th Session of Codex Committee on General Principles – Consideration of Traceability/Product Tracing., Paris, 7-11 April 2003 (27/11/2004) <ftp://ftp.fao.org/codex/ccgp18/gp03_07e.pdf>

CAC 2003. Principles for the Risk analysis of Foods derived from modern biotechnology. CAC/GL 44-2003 (27/11/2004)

<http://www.codexalimentarius.net/download/standards/10007/CXG_044e.pdf>

CAC 2004. 27th Session Report, ALINORM 04/27/41, Appendix II, Geneva, Switzerland, 28 June – 3 July 2004. (15/11/2004)

<ftp://ftp.fao.org/codex/reports/al04_41e.pdf>

ISO 1995. ISO 8402:1994 Quality management and quality assurance- vocabulary.

ISO 2000. ISO 9000:2000 Quality management system- fundamentals and vocabulary.

ISO 2000. ISO/AWI 22519

Office International des Epizooties (OIE) International Animal Health Code – 2004 (27/11/2004) http://www.oie.int/eng/normes/mcode/en_chapitre_1.3.4.htm

Reglugerð nr. 233/1999 um hollustuhætti við meðferð, vinnslu og dreifingu sjávaraflla og fiskafurða (Regulation No 233/1999 of 9 April 1999 on health conditions for the handling, processing and distribution of fishery products.)

Vietnam Ministry of Fisheries 2002. Master Plan for Economic and Social Development of the Fishery Sector in the period 2000 – 2010.

<http://www.mofi.gov.vn/ifep/en/index.asp?progid=2§ion=50017>

National and Community legislation:

Belgian Law. Federal Agency of the Safety of Food Chain. Decree AR/KB November 14, 2003 related to self-control, mandatory notification and traceability (15/01/05)

<http://www.favv-afsc.fgov.be/images/cereus/us/pdf/structure/2003-11-14_AR_autocontrole.pdf>

EU Law - Definitions <http://europa.eu.int/eur-lex/en/about/pap/process_and_players2.html>

EU Law 1989. European Council. Directive 89/396/EEC of 14 June 1989 on indications or marks identifying the lot to which a foodstuff belongs (Official Journal L 186 , 30/06/1989.)

EU Law 1996. European Council. Directive 96/23/EC of 29 April 1996 on measures to monitor certain substances and residues thereof in live animals and animal products (Official Journal L 125, 23/05/1996).

EU Law 2000. European Commission. White Paper on food safety. <http://europa.eu.int/comm/dgs/health_consumer/library/pub/pub06_en.pdf>

EU Law 2001. European Parliament and Council. Directive 2001/95/EC of 03 December 2001 on general product safety (Official Journal L 11/4, 15 Jan 2002.)

EU Law 2002. European Parliament and Council. Regulation (EC) No 2002/178 laying down the general principles and requirements of food law, establishing the European Food Safety Authority (EFSA) and laying down procedures in matters of food safety. (OJ L 31, 01 Feb 2004.)

EU Law 2002. European Parliament and Council. Regulation (EC) No 2002/178. Article 3.7, Article 19, Article 20. bls. 14 79

EU Law 2003. European Parliament and Council. Regulation (EC) No 1829/2003 of 22 September 2003 on genetically modified food and feed. (OJ L 268 , 18/10/2003)

EU Law 2003. European Parliament and Council. Regulation (EC) No 1830/2003 of the European Parliament and of the Council of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC (OJ L 268, 18/10/2003)

EU Law 2004. European Commission. Regulation (EC) No 65/2004 of 14 January 2004 establishing a system for the development and assignment of unique identifiers for genetically modified organisms (OJ L 010, 16/01/2004).

EU Law 2004. European Parliament and Council. Regulation (EC) No 853/2004 of 29 April 2004 laying down specific hygiene rules for food of animal origin (OJ L 139, 30.4.2004)

EU Law 2004. European Parliament and Council. Regulation (EC) No 854/2004 of 29 April 2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption (OJ L 139, 30.4.2004)

EU Law 2004. European Parliament and Council. Regulation (EC) No 882/2004 of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules (OJ L 191, 30.4.2004)

EU Law 2004. European Parliament and Council. Regulation (EC) No 852/2004 of 29 April 2004 on the hygiene of foodstuffs (OJ L 139, 30.4.2004)

EU Law 2004. Standing Committee on the Food Chain and Animal Health (SCFCAH). Guidance on the Implementation of Articles 11, 12, 16, 17, 18, 19 and 20 of Regulation No 2002/178 on General Food Law.

French Law. DGCCRF 2004. Fact Sheet No 2004-113, dated August 16, 2004 non-biotech labeling <<http://www.finances.gouv.fr/dgccrf>>

Icelandic Law. Act No. 93/ 1995 on Foodstuffs.. *Lög nr 93/1995: Lög matvæli 1995, nr. 93, 28 júní.* Act No 93/1995 of 28 June 1995 on Foodstuffs.
<<http://brunnur.stjr.is/interpro/umh/umh-english.nsf/pages/foodstuffsact>

Icelandic Law. Act number 55/1998.. *Lög nr. 55/1998 um meðferð, vinnslu og dreifingu sjávarafurða* (Act No 55/1998 of 10 June 1998 on handling, processing and distribution of fishery products).

Icelandic Law. Regulation number 233/1999, addendum 7. *Reglugerð nr. 233/1999 um hollustuhætti við meðferð, vinnslu og dreifingu sjávarafla og fiskafurða* (Regulation No 233/1999 of 9 April 1999 on health conditions for the handling, processing and distribution of fishery products.)

Icelandic Law. Regulation number 588/1993. *Reglugerð nr. 588/1993 um merkingu, auglýsingu og kynningu matvæla.* (Regulation No 588/1993 on the labelling, advertising and introduction of foodstuffs.
<<http://www.reglugerd.is/interpro/dkm/WebGuard.nsf/lookByNumer/5881993?OpenDocument>>

Irish Law. FSAI 2002. Guidance Note - Product Recall and Traceability (Guidance Note No 10) (Retrieved 13/11/2004)
<http://www.fsai.ie/publications/guidance_notes/gn10.pdf >

Irish Law. Minister for the Marine and Natural Resources 2000. S.I. No. 390 of 2000. European Communities (Live bivalve molluscs) (Health Conditions for production and placing on the market) Regulations.
<<http://www.irishstatutebook.ie/ZZSI390Y2000.html>>

Irish Law. Minister for Communications, Marine and Natural Resources 2003. S.I. No. 320 of 2003 European Communities (Labelling of Fishery and Aquaculture Products) Regulations
<http://www.fsai.ie/legislation/food/eu_docs/aquaculture_animals_products/labelling_fish/SI320_2003.pdf>

Italian Standards. UNI 2001. UNI 10939 “Traceability system in agricultural food chain – General principles for design and development” of April 2001.

Italian Standards. UNI 2002. UNI 11020 “Traceability system in agri-food industries – Principles and requirements for development” of December 2002.
<<http://webstore.uni.com/unistore/public/searchproducts>>

Northern Ireland Laws. Department of Health, Social Services and Public Safety 2004. The General Food Regulations (Northern Ireland) (15/01/05)
<http://www.food.gov.uk/multimedia/pdfs/genfoodregsni2004.pdf>

UK laws. Parliament 1990. Food Safety Act 1990 (15/01/05)
<http://www.hmso.gov.uk/acts/acts1990/Ukpga_19900016_en_1.htm >

UK laws. Parliament 2003. Factsheet L7 Legislative Series Revised July (15/01/05)
<<http://www.parliament.uk/documents/upload/L07.pdf>>

UK laws. The Minister of Agriculture, Fisheries and Food 1991. The Food Premises (Registration) Regulations (15/01/05)
<http://www.hmso.gov.uk/si/si1991/Uksi_19912825_en_1.htm>

UK laws. The Minister of Agriculture, Fisheries and Food 1996. The Food (Lot Marking) Regulations 1996 (15/01/05)
<http://www.legislation.hmso.gov.uk/si/si1996/Uksi_19961502_en_1.htm>

UK laws. The Secretary of State for Health 2000. The Feeding Stuffs Regulations (15/01/05) <<http://www.legislation.hmso.gov.uk/si/si2000/20002481.htm#3>>

UK laws. Secretary of State of England 2003. The Fish Labelling (England) Regulations (15/01/05)
<<http://www.legislation.hmso.gov.uk/si/si2003/20030461.htm>>

UK laws. Secretary of State for Environment, Food and Rural Affairs 2004. The Genetically Modified Organisms (Traceability and Labelling) (England) Regulations (15/01/05)

UK laws. Scottish Ministers 2004. The Genetically Modified Organisms (Traceability and Labelling) (Scotland) Regulations (15/01/05)
<<http://www.scotlandlegislation.hmso.gov.uk/legislation/scotland/ssi2004/20040438.htm>>

UK laws. Secretary of State for Environment, Food and Rural Affairs 2004. The Genetically Modified Organisms (Traceability and Labelling) (England) Regulations (15/01/05) <<http://www.legislation.hmso.gov.uk/si/si2004/20042412.htm>>

USA Laws. Public Health Security and Bioterrorism Preparedness and Response Act of 2002. (07/11/2004) <<http://www.fda.gov/oc/bioterrorism/bioact.html>>

USA Laws. The 2002 Farm Bill. (07/11/2004) <<http://www.usda.gov/farmbill>>

USA Laws. USFDA Final Regulation on Establishment and Maintenance of Records 2002. (07/11/2004) <<http://www.fda.gov/OHRMS/DOCKETS/98fr/03-11460.html>>

USA Laws. USDA 2004. Mandatory Country of Origin Labeling of Fish and Shellfish - Interim Rule and Summary (20/01/05)
<<http://www.ams.usda.gov/cool/COOLfr.pdf>>

USA Laws. USFDA. Code of Federal Regulation (year). Good Manufacturing Practices, Title 21 Part 225 (10/11/2004)
<<http://www.oznet.ksu.edu/grsiext/White%20Paper%20CVM.PDF>>

USA Laws. USDA 2003. Guidance for Industry Product Recalls, Including Removals and Corrections <http://www.fda.gov/ora/compliance_ref/recalls/ggp_recall.htm>

Vietnam law. Prime Minister 1999. Decision No 178/1999/QĐ-TTg dated 30/8/1999 promulgating the Regulation on labelling of goods traded for domestic circulation, and goods for import, export
<<http://www.luatvietnam.com.vn/noidung2k.asp?id=10011>>

Vietnam law. Prime Minister 2000. Decision No 95/2000/QĐ-TTg dated 15/8/2000 revising and amending some articles of the Regulation on labelling of goods traded in domestic market and for import, export
<<http://www.luatvietnam.com.vn/noidung2k.asp?id=11192>>

Vietnam law. Minister of Fisheries. Decision No 15/2002/QĐ-BTS dated 15/5/2002 promulgating the Regulation on monitoring residues of certain harmful substances in aquaculture animals and products thereof
<http://www.mofi.gov.vn/ADC/Vietnam/Vvanban/Vvanbanbo/vVanBanBo.htm>

Vietnam law. Minister of Fisheries. Decision No 09/2002/QĐ-BTS dated 15/3/2002 promulgating the document on the methods of inspecting hygien conditions of fishery collection establishments
<http://www.mofi.gov.vn/ADC/Vietnam/Vvanban/Vvanbanbo/vVanBanBo.htm>

Vietnam law. Minister of Fisheries 2000. Circular No 03/2000/TT-BTS dated 22/9/2000 guiding the implementation of Decision No 178/1999/QĐ-TTg dated 30/8/1999 of the Prime Minister promulgating the Regulation on labelling of fishery commodities traded in domestic market and for import, export
<<http://www.luatvietnam.com.vn/noidung2k.asp?id=11363>>

Vietnam law. Ministry of Commerce 1999. Circular No 34/1999/TT-BTM guiding the implementation of Decision of the Prime Minister No 178/1999/QĐ-TTg dated 30/8/1999 promulgating the Regulation on labelling of goods traded in domestic market and for import, export
<<http://www.luatvietnam.com.vn/noidung2k.asp?id=10424>>


ANNEX

Annex 1: The recording information of salted fish accessible through production date SÍF company

Micro and salt results

PRODUCER:

Production date	PCA + 0.5% NaCl 30°C	Coliforms MPN/g		Staph. aureus/g	Listeria/25g pos/neg	Salmonella/25g pos/neg	Salt %
		Total	Feecal				
0-349 14.12.2000	140	0,7	<0,3	<10	neg	neg	1,70
0-350 15.12.2000	180	0,4	<0,3	<10	neg	neg	1,70
0-353 18.12.2000	190	0,4	<0,3	<10	neg	neg	1,60
0-354 19.12.2000	340	2,1	<0,3	<10	neg	neg	1,60
0-355 20.12.2000	510	<0,3	<0,3	<10	neg	neg	1,90
0-356 21.12.2000	240	<0,3	<0,3	<10	neg	neg	1,60
0-357 22.12.2000	40	<0,3	<0,3	<10	neg	neg	1,60
1-003 3.1.2001	160	<0,3	<0,3	<10	neg	neg	1,80
1-004 4.1.2001	80	<0,3	<0,3	<10	neg	neg	1,60
1-005 5.1.2001	90	<0,3	<0,3	<10	neg	neg	1,60
1-010 10.1.2001	50	<0,3	<0,3	<10	neg	neg	2,00
1-011 11.1.2001	60	<0,3	<0,3	<10	neg	neg	1,80
1-012 12.1.2001	30	<0,3	<0,3	<10	neg	neg	1,70
1-015 15.1.2001	700	<0,3	<0,3	<10	neg	neg	1,80
1-016 16.1.2001	110	<0,3	<0,3	<10	neg	neg	1,80
1-017 17.1.2001	60	<0,3	<0,3	<10	neg	neg	1,80
1-018 18.1.2001	20	<0,3	<0,3	<10	neg	neg	1,80
1-022 22.1.2001	250	<0,3	<0,3	<10	neg	neg	1,40
1-023 23.1.2001	150	<0,3	<0,3	<10	neg	neg	1,40
1-024 24.1.2001	50	<0,3	<0,3	<10	neg	neg	2,20
1-025 25.1.2001	200	<0,3	<0,3	<10	neg	neg	1,40
1-026 26.1.2001	80	<0,3	<0,3	<10	neg	neg	1,40



Annex 2: The recording information during processing accessible through production date and pallet number– SÍF company

Product inspection sheet *Traceability*

SÍF HF. Pallet sample

Producer: *Grader* Production days: **04.01.01 to 05.01.01**

Product number: **P655** *until roll up* Number of cases per pallet: **78**

Pallet number: **20721** *tell this product was produced within this time scale*

Date	Time	Silo	Wgt bag	Clumping 2	Wgt de-gl. >=3	Glaze %	Whole number	Bits #	Count tot.	Bits g	Bits %	Shell #	Flavour	Colour	Smell	Brine Conc.	Product Temp.	Sign.	Comment
4.1.2001	13:31	4																	
4.1.2001	14:43	4																	
4.1.2001	15:53	4																	
4.1.2001	17:04	4																	
4.1.2001	17:59	4																	
5.1.2001	06:48	4																	
5.1.2001	13:40	4																	
5.1.2001	15:19	4																	

Wgt. de-gl. Glaze % Whole # Bits # Count g Bits % Shell #

Average

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