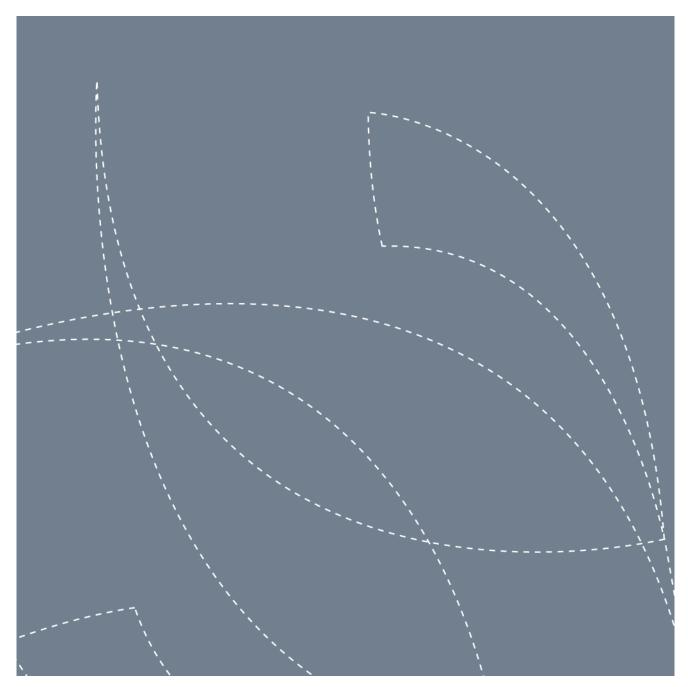


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Traceability requirements for foreign producers wishing to use the 'Norway' logo

Kathryn A-M Donnelly





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<i>Three keywords:</i> Traceability, Norway Logo, Salte	ed fish				
Traceability, Norway Logo, Salted fish Summary: In many foreign markets Norway is the preferred land of origin for seafood products. Documentation of the Norwegian origin of seafood products is therefore important for producers and exporters of seafood. Some of the fish which is exported from Norway is further processed abroad and the documentation of Norwegian origin is lost. The Norwegian Seafood Export Council (NSEC) wishes to analyse the requirements which must be met by foreign producers in order to be allowed to use the 'Norway' logo. The NSEC requires a solution which secures traceability back to Norwegian caught fish for products using the 'Norway' logo. In addition it would be desirable that the scheme is practical and can be subject to controls. Four theoretical models, designed to fulfil these needs are described in this report. This report also describes how implementation testing may be carried out.					
-	er er Norge et foretrukket oppha på produkter er derfor til større forde				
,	Eksportutvalg for fisk (EFF) ønsker en løsning for å dokumentere fiskens opphav i Norge, når norsk fisk er produsert og merket med 'Norge logoen' utenfor Norge.				

Denne rapporten skisserer fire modeller for dette og beskriver hvordan utprøving av modellene kan gjøres.

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1 Introduction

In many foreign markets Norway is the preferred land of origin for seafood products. Documentation of the Norwegian origin of seafood products is therefore important for producers and exporters of seafood. Currently permission is not given for foreign producers to use the 'Norway' logo without there being appropriate controls in place. Norwegian producers have permission to use the logo when exporting fish/seafood products. However some of the fish which is exported from Norway is further processed abroad and the documentation of Norwegian origin is lost.

Nofima Market has been contacted by the Norwegian Seafood Export Council (NSEC) in order to analyse the requirements which must be met by foreign producers in order to be allowed to use the 'Norway' logo. Meeting these requirements would allow these producers to realise the expected additional value associated with the country of origin label. It is thought that the increased motivation associated with this would increase the possibility of successfully implementing the licensing agreement.

The Norwegian Seafood Export Council (NSEC) requires a solution which secures traceability back to Norwegian caught fish for products using the 'Norway' logo In addition the scheme needs to be practical and be able to be subject to controls.

It is important that the scheme is credible because the 'Norway' logo is used to represent the Norwegian fisheries as a whole. In a future scenario the 'Norway' logo may be used to represent the concept of a national fisheries certification scheme, for example 'Norwegian code of conduct for responsible fisheries' as suggested by Kristiansen [1]. In this case the maintenance of current credibility is important. It is also important because in such a scenario the idea of national responsibility for maintaining responsible fisheries within a country (as is the case in Canada and under consideration in Iceland) could come to have much greater significance than Marine Stewardshop Council (MSC) which merely certifies fisheries that meet their requirements but does not take any direct action to stop other fisheries within the same country which do not meet their requirements and may not be fishing in a desirable fashion [1]. In such a scenario the label could become a very valuable and important asset to the Norwegian fishing industry and care should be taken in these early stages to maintain this potential.

A long term goal for the Norwegian Seafood Export Council will be to develop the standard so that it can also be used on the Norwegian quality labels such as SKREI, Norwegian fresh cod etc.

This report will;

- Investigate the existing environmental labels and analyse the demands for documentation of origin and traceability.
- Outline a selection of possible traceability models which could be used in conjunction with the licensing agreement.
- Outline the possible advantages and disadvantages for each of the models.
- Identify the way forward by:
 - Clarifying models for practical implementation guidelines for companies outside of Norway wishing to use the 'Norway' logo on their products.
 - Quantifying costs and benefits for the company in order to give better feedback with relation to implementation costs including consumer studies related to the 'Norway' logo in the specific environment – how much does the company have to earn? (in cooperation with existing research and development activities).

2 Overview of existing 'environmental labels'

The aim of this section is to analyse the requirements to document origin and traceability related to the use of other origin and environmental labels, such as those from Marine Stewardship Council (MSC), Friends of the Sea (FOS), KRAV, Naturland, Soil Association, Responsible Fisheries Iceland and Carrefours "Peche responsible". These may provide an alternative to a 'new system' or provide pointers as to how a new system may be implemented.

The different labels can be categorized. For example there are those which are concerned with organic food (KRAV, Naturland, Soil Association and so on) these labels have similar demands and have a degree of interoperability [2]. MSC and FOS are labels mainly concerned with stock sustainability and are not connected to a specific country and are not interoperable. Responsible Fisheries Iceland and other labels such as the Marine Eco-label Japan are environmental labels associated with specific countries.

Table 1A short summary of some of the well known 'environmental or sustainabilitylabels' with a focuson documentation of traceability and origin.

Marine Stewardship Council (MSC),
-Independent, global, not for profit organisation established in 1997 with the aim to combat over fishing.
-The standards used by MSC were established in 1999
-The criteria demand that the products that carry the MSC label are sourced from a sustainable population and that they can be traced back through the supply chain.
Friend of the Sea (FOS),
-Independent, global, not for profit organization established in 2006 with the aim of protecting marine environments by using market forces.
-The standards were established in 2006
-The criteria demand that products marked with FOS labels are from sustainable populations and can be traced back through the supply chain.
KRAV
-A non governmental organization in Sweden, established in 1985, which is aimed at sustainable fisheries in Scandinavia. There is a plan to extend this in 2010. -The standards were established in 2001
Naturland "WILDFISH"
-Naturland established standards for assessment of 'Sustainable Capture Fishery' in 2007 and focuses on whole ecosystems and not just the single population under consideration.
-Naturland focuses on small artisanal fisheries
Responsible Fisheries Iceland
These standards are under development but will focus on national products and sustainable fisheries.
Correfoure "Doobo reconcercible"

Carrefours "Peche responsible"

-Is no longer in use and Carrefour have not responded to my requests for further information.

The assessments presented in tab.2 have been funded by the World Wildlife Fund which together with Unilever were instrumental in founding the MSC organization. If the reader requires further details these two reports are openly available online and give comprehensive descriptions of the assessments and standards.

Table 2Results of studies which have comprehensively evaluated both the
environmental or sustainability labels above and others. The studies considered
many factors but here the results with regards to the traceability and the
standards used are summarized.

	Traceability related to the	Standard system score from WWF bench marking [4]		
Environmental logo	label scheme [3](pg112)	Standard system	Subject of standard and chain of custody	
Marine Stewardship Council (MSC)	2	-	-	
Friend of the Sea (FOS),	1.83	65 %	67 %	
KRAV	1.83	81 %	100 %	
Naturland (with regards to fisheries aqua. and wild)	1.83	87 %	100 %	
Responsible Fisheries Iceland	No data currently available			
Carrefours "Peche responsible"				

*note to tab. 2 column headed 'Traceability...' relates to the label scheme, the criteria for these scores are 0=Not enough information to determine the presence or absence of criterion-subject with standard scheme, 1=Partially meets criterion, 2=Fully meets criterion and 3=Exceeds criterion.

From tab. 2 it can be seen that MSC, KRAV and Naturland score highest of the chosen environmental labels. This is with regards to the degree of compliance in the traceability scheme and the standard system. Many of these standards are based on or refer to the Food and Agriculture Organization (FAO) Code of conduct for responsible fisheries [5] and the FAO Guidelines for the eco-labelling of fish and fishery products from marine capture fisheries [6]. The environmental labels also often refer to the International Organisation for Standardisation (ISO) standards ISO 9000:2000 Quality Management Systems - Fundamental, Vocabulary and ISO 9001:2000 Quality Management Systems - Requirements. Both these documents should be considered when establishing the licensing standards.

A notable point is that the labels focusing on 'organic' products and production methods are interoperable even though there are slight differences from country to country. This level of flexibility would seem to enable the labelling to work in different settings without losing any integrity.

Each of these schemes is designed for their specific purpose; therefore none are ideally suited for use in conjunction with the licensing of the 'Norway' logo. For example the MSC market is concerned mainly with certifying fisheries and fishing vessels. It is not solely concerned with the origin of the fish. Other schemes such as those administered by Naturland and KRAV have a focus upon, amongst other points, the principles of organic agriculture not origin.

Using the strengths from these schemes together with the latest research into the area, four models for traceability have been developed and an assessment of each one made.

3 Theoretical models for information exchange

This section outlines generic models for implementing internal traceability which can be controlled by external auditors. These will aid the understanding of the models described in the next section. The following points should be considered when reading this section.

- 1. These are models and are not intended to be implemented without appropriate adaptations and clarifications.
- 2. The models are created on the basis that they will in the first instance be used in the dried salted fish industry and the system is not intended to be extended to the supply chain beyond the processor.
- 3. As is clarified in the final section of this document practical implementation studies must be carried out in cooperation with NSEC, auditors, appropriate researchers and the industry before these can be implemented into the licensing documents.

3.1 Basic principles

Some basic principles will be common throughout the models. It is therefore relevant to explain these in detail first so that they can be referred to without further explanation.

3.1.1 What is traceability?

The International Organisation for Standardisation (ISO) defines traceability as follows:

'Ability to trace the history, application or location of an entity by means of recorded identifications' [7]. Applied to a product it may relate to the origin of materials and parts, the product processing history and the distribution and location of the product after delivery.' Product information consists of all that is known about the product such as origin, date of picking/slaughter/catch and anything else that has happened during the production process which has been recorded. Process information tells us about what has happened to the product during processing up to the time it reaches the consumer, for example product storage temperatures

Product and process information can include any of the following: information about ingredients, information about the suppliers of the ingredients, the location of any part of the food at any point during production, which store at the factory the goods were kept in, the status of the ingredients, e.g. organic or the fishing area within which the fish were caught, or the plants which the honey bees have been visiting.

3.1.2 Models for information exchange

Internal traceability is the ability to track and trace all products internally within a company. Chain traceability is defined as the ability to trace the product and process information through all of the links in a supply chain. There are several models for chain traceability and these are presented in fig.1. Each of these models has advantages and disadvantages and can often be combined within any one supply chain.

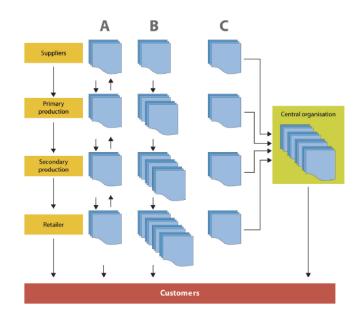


Figure 1 modified from Meuwissen et al [8].

3.1.3 Critical Traceability Points

Critical Traceability Points (CTP's) are points at which traceability needs to be maintained by recording appropriate identifiers (ID's) this is illustrated in fig.2. This not only gives access to traceability but also associated product and process information that may be of use to the producers.

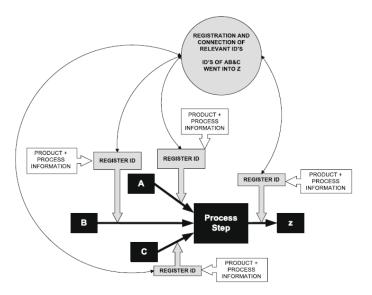


Figure 2 An illustration of a Critical Traceability Point [9].

In order to maintain traceability it is necessary use universally unique identification on outgoing products (and incoming if they do not already possess such an ID). Internally products should be identified in a manner which is at least unique within the company.

3.1.4 Transformations

Transformations are what happens when products are mixed or processed during production, they are always associated with Critical Traceability Points.

3.2 Four models for consideration by NSEC with regards to licensing of the 'Norway' logo

For each model the assumption is made that each delivery is associated with a catch certificate number which is received by the company and that the study will in the first instance be directed towards consumer packaged products. This is illustrated in fig 3.

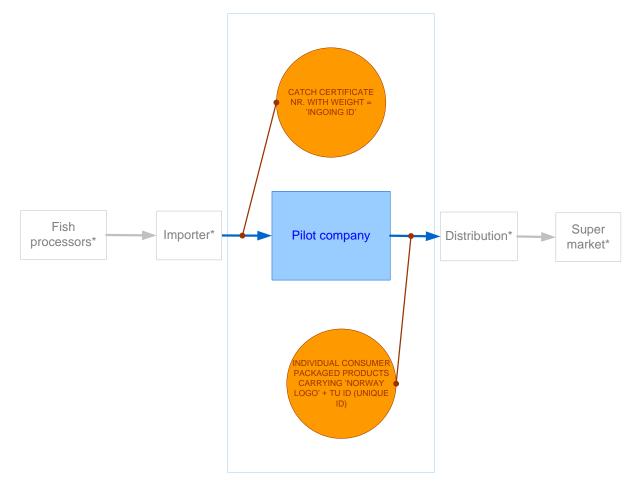


Figure 3 Illustration of the criteria with regards to the ID's used in the following four models. TU ID is a Trade Unit Identification.

Model 1. Weight in Weight out

In this model the company involved is expected to report the weight they receive of Norwegian fish (identified by a catch certificate number) and report the amount produced within a certain time period. The producers would be expected to fill out report forms (see below) and return these to the auditors at appropriate time intervals and these can be then controlled using a yield factor and cross checking data against that on the catch certificate database (origin, species and weight sent to the first importer in the EU). In addition auditing visits to the place of processing are expected to be part of the control mechanisms.

Form 1 To be filled out by the producer on receipt of products.

DATE SPECIES INCOMING ID CATCH C		INCOMING ID CATCH CERTIFICATE	QUANTITY (IN)

Form 2 To be filled out by the producer when dispatching products.

DAT	ГЕ	SPECIES	PRODUCT TYPE	 OUTGOING ID/BATCH ID/PRODUSENT ID ON THE PRODUCT	QUANTITY (OUT)

Form 3 To be used by the control authority.

Species Product type		Min yield Max yield	

Model 2. Full Internal and Chain Traceability

In order to achieve full internal traceability and chain traceability a number of actions must be carried out and documented electronically.

Internally

- 1. All inputs must be recorded with an appropriate ID for example a catch certificate number with sufficient detail to trace them back to their supplier.
- 2. Separate production of Norwegian and non Norwegian product either in space or time in is required.
- 3. Identification (unique where appropriate) of the transformations of products through all internal processes.
- 4. Document electronically all transformations throughout production.
- 5. Produce and record all of these in an electronic data base which referentially can both 'push' and 'pull' data messages in an XML format (such as TraceCore which is a standardised way of communicating the relevant data in a computer readable fashion) to an auditing authority. Completion of forms such as the examples in model 1 would be part of the control mechanisms for this model. It should be said that the information on the forms should already be included in the electronic messages sent back to the regulatory body.
- 6. Product checks to be carried out at time intervals set by the regulating authority.
- 7. Compliance with the ISO 12875 and 12877 (Previsouly TraceFish standards) [10]. These standards specify which data elements need to be recorded with regards to incoming and outgoing products in order to maintain traceability.

- 8. Subcontractors must also fulfil all principles required by chosen system.
- 9. Any product sold and marked with the 'Norway' logo must be marked such that it can be traced back through production to the Norwegian inputs.
- 10. The records should allow calculation of yields from inputs in order to verify the system.

Externally

- 11. The previous links in the supply chain must also fulfil the 'shall' and 'should' criteria which form the TraceFish standards.
- 12. Exchange of information relating to the products in question should be facilitated.

For this system the extent of chain (or external) traceability must be established.

Model 3. Part time Production

Companies wishing to use the 'Norway' logo are only allowed to do this in specific periods when then can separate production and fulfil the criteria outlined in model 2 during this separate production. It is expected that at other times the companies may run production as they see fit but these products will not be permitted to be marked with the 'Norway' logo even if they are of Norwegian origin.

Model 4. Known percentage 'other'

Model 4 is a variation of model 2. The requirements for registration would be the same as in model 2, however there is no demand to separate production of other nation's fish from that of Norwegian origin. As stated in model 2 there is a requirement to record all transformations and maintain traceability throughout production. The main difference in this model is that the company will be given a tolerance of a combination of fish of other origin mixed (due to access to raw material or buyer demands for size etc) with Norwegian origin product up to an agreed percentage for example 90%. This would be documented through the traceability system and can be validated as in model 2.

Assessment of each model

Each of the above models have positive and negative points. These are summarised in the table below.

Table 3Assessment of the individual models described above. The colours are intended
to assist the readability of the table with green being positive and red the most
negative with yellow a neutral.

Area of assessment	Model 1:	Model 2:	Model 3.	Model 4.
Expected ease of implementation for company	Easy	Difficult	Medium	Medium
Possibility to label non Norwegian fish with the "Norway' logo'	High	Low	Medium	Low
Ease of control for Norwegian regulatory authorities	Medium	High	Medium	Medium
Adaptability	High	High	High	High
Credibility	Low	High	Medium	Medium to High
Degree of effort in assessment and in implementation	Medium	High	Medium to High	Medium to High

The table is meant as a guide rather than an ultimate assessment. A further assessment would have to take place in the context of a practical implementation situation.

4 Discussion

Marking dried salted fish (klippfisk) with the country of origin (Norway) is an advantage because Portuguese consumers have been shown to prefer dried salted fish with Norwegian origin [11]. Therefore the possibility of documenting the origin as Norwegian and applying this to consumer packaging will give the processor an advantage. It is important in this context that the logo maintains its integrity.

The challenges likely to be encountered have previously been studied in relation to production within Norway. The article ' Lessons from Two Case Studies of Implementing Traceability in the Dried Salted Fish industry' [12] examines these challenges.

From previous experience in implementation of traceability, including those specifically within the dried salted fish sector, four models have been suggested which could in different ways enable Traceability. An assessment of these models is presented in tab.3. This is intended to assist NSEC in making descisions about which model is preferred.

4.1 Future prospects

Following on from this report a number of steps should be taken in order to implement and formulate appropriate guidelines for licensing the 'Norway' logo' that can be used in a wide variety of setting and in a credible fashion.

These steps include:

- 1. Assessing which of the models is an appropriate starting point for NSEC.
- 2. Carry out an implementation study with an appropriate processor in Portugal (or other appropriate land) in cooperation with NSEC, auditing body and researchers.
- Carry out a cost benefit analysis for implementation of traceability for the processor in question. This could be achieved by using the method developed by Mai et al [13]. This will give the company an idea of the benefits of implementing a possibly costly system.
- 4. Explore consumer attitude to dried salted fish of Norwegian origin in Portugal. This could further the indication shown in 2007 and could be of interest to parties outside the scope of this project and a common research project maybe appropriate.
- 5. Formulate new text for licensing agreement specifically for salted fish producers in the EU/Portugal.

5 Implementation study

5.1 Background

In order to fulfil the step outlined in point 2 above an implementation study should be carried out to test and refine the chosen model. The implementation study will help clarify the guidelines which should be used in the licensing agreement. Companies who wish to use the 'Norway' logo' must demonstrate traceability of these products. This case study will test the requirement to document this traceability. This is an important part of the licensing agreement. This case study will enable NSEC to clarify the requirements for the licensing agreement.

5.2 Aim

Test traceability demands for use by foreign companies processing fish of Norwegian origin.

5.3 Activities

The suggested activities to achieve this aim have been broken down into two sub sections these are outlined below. The first section is investigative leading to information that can be considered by the pilot company, NSEC, auditors and other experts. The second part concerns implementation of auditing guidelines, testing the traceability and adapting the traceability guidelines for the NSEC licensing agreement.

Part I.

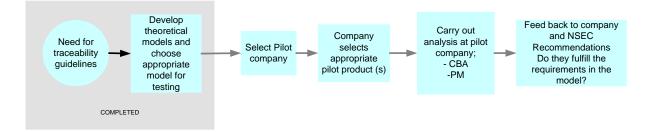


Figure 4 Part 1 of the implementation study.

This section expands the work flow shown in figure 4.

- 1. Choose model.
- 2. Involve company ensure that they are aware of what this participation would require (see section: guidelines for pilot company).
 - a. Define type of product (s) to be involved in the pilot those that will be marked with the 'Norway' logo?
 - b. Define suppliers and customers and check that appropriate incoming and outgoing ID's are available and suitable.
 - c. Define yield factor if this is to be used.

- 3. Carry out a process mapping.
 - a. Identify relevant ID's (internal and external).
 - b. Identify relevant control documents.
- 4. Cost Benefit analysis specifically related to the use of the 'Norway' logo.

Part II.

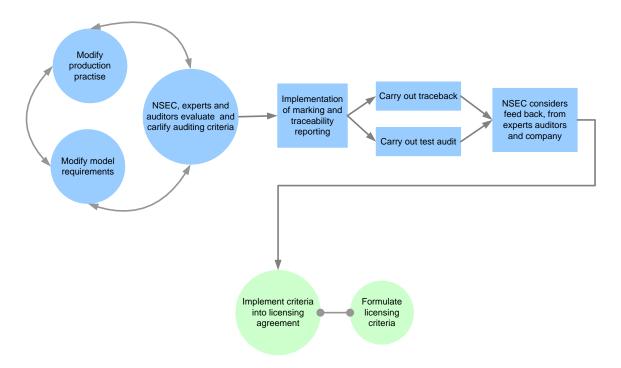


Figure 5 Part 2 of the implementation study and expected outcomes.

This section expands the workflow shown in fig.5.

- 1. Develop guidelines for reporting and auditing.
- 2. Following the process mapping carry out a recall and traceback from retailer through producer with the aim of identifying one or more catch certificate numbers (using a consumer packed product).
- 3. Identify the appropriate number of audit points both in time and space.
- 4. Investigate how this may be implemented in other sectors/countries/other variable.
- 5. Formulate guidelines in licensing document.

5.4 Guidelines for pilot company

Input to the NSEC licensing agreement regarding traceability demands.

Being a pilot company for testing the traceability of use of the 'Norway' logo on your products

The process mapping results in a detailed report describing the state of the art with respect to material flow, information flow and information loss in the pilot company and chain. The pilot company can choose to be anonymous when the report is published and/or to keep parts of the report confidential. The process mapping takes 1-2 days at the company site, and the pilot company is responsible for making available personnel that can answer the questions.

The cost/benefit analysis results in a report comparing the costs and benefits of the old system with the new system. The pilot company can choose to be anonymous when the report is published and/or to keep parts of the report confidential.

The main benefit for the pilot company involved is the specifically tailored free assistance and advice from internationally prominent researchers and consultants in the field of food traceability, If there are any questions, please do not hesitate to contact us. In particular we can provide a lot more detail about the methods used for process mapping and cost/benefit analysis if anyone should be interested.

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