Fiskeriforskning

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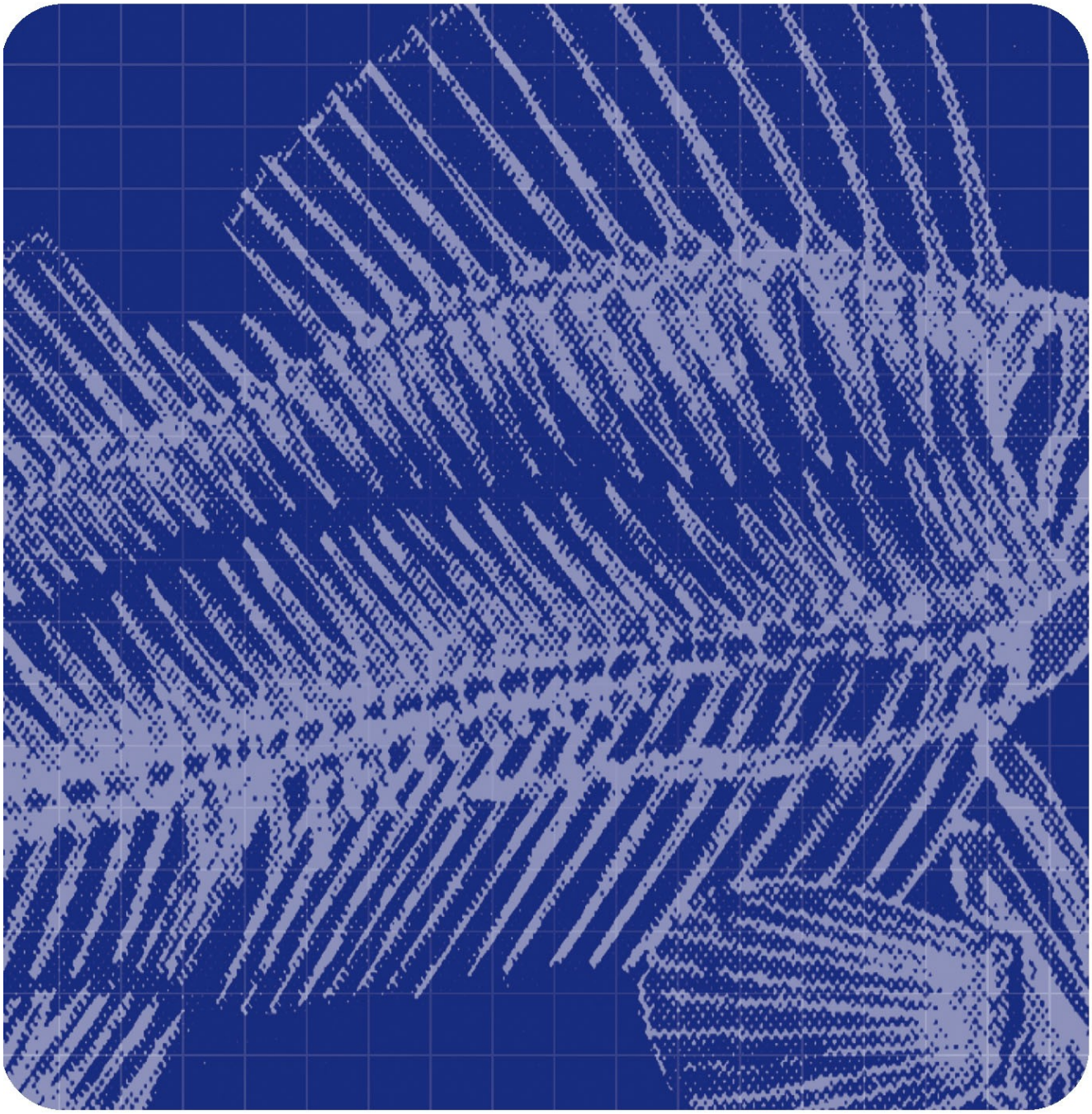
Material flow and information flow at Kritsen Landivisiau salmon smokehouse

Petter Olsen



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Summary:

The overall objective of the KILREIS project is to ensure that the information loss in the pilot chain from salmon farming, through processing to export and consumption, is minimal, and that the fish/product can be traced both forwards and backwards.

Salmon farmed and slaughtered by Aalesundfish, and smoked at Kritsen Landivisiau was chosen as the case study. This report describes in detail the materal flow and information flow through Kritsen Landivisiau, a smoke house in Bretagne, France. The report also points out where information is lost in the current system, and recommends changes to existing routines and practices.

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1 BACKGROUND

Traceability will be an immensely important subject for the food and fish industry these upcoming years. From August 12th 2004, registration and prior notice sent in electronic form with a wealth of traceability information is required for all food shipments to the US (Bioterrorism Act PL107-188). The EU Common Food Law (178/2002) came into effect on January 1st 2005 and requires one-up, one-down traceability, and the Japanese Directorate for Fisheries have established a 'Traceability Group' to harmonize the minimum required documentation for all seafood imported to Japan.

The KILREIS R&D project is a joint effort between fish industry and solution providers, assisted by research institutes and financed partly by national funding, to ensure that the salmon industry, and in particular the part of the salmon industry that originates in Norway, is ready to meet these challenges. The KILREIS first year pilot study has been funded by Innovation Norway (SND) and the Norwegian Fisheries and Aquaculture Fund (FHF).

2 OBJECTIVE

The overall KILREIS objective is to ensure that the information loss in the chains from farms, through processing to export and consumption, is minimal, and that the fish/product can be traced both forwards and backwards through all links. Tracing back from consumption / processing to farming / origin may be useful if undesirable product properties originating from previous links are discovered. On the positive side, trace back may also be used to access particularly desirable qualities of the fish (the feed received, the ingredients in the feed, density in cage, medication use, other ethical or ecological properties) and then to disseminate these to the discerning consumer. Tracking forward from farm / origin to processing / product to find where the fish went is used in connection with recalls (both to effectuate, to reduce the scope of, and to avoid), but also to study the applications further down the chain, and in particular to get feedback with respect to how the quality in the earlier links in the chain influence the quality of the product as it reaches the consumer (color, fat content, treatment, processing, etc.)

The outcome of this project should be improved access to timely, relevant and accurate data about the fish or product, from any point in the chain to any point in the chain. In addition, a significant tangible benefit for the users in the fish sector will be reduced transaction costs and less re-punching of data, where as a significant benefit for the solution providers will be interoperability, platform independence, and increased value of the services and products they already offer.

3 THIS REPORT

When performing a process study of this type, the chronologically last link in the chain ('the link where fish and information from the respective systems is received') is visited first. The method we use systematically moves against the material flow, as previous experience has shown that it is far simpler to ask the right questions when the situation in the next link in the chain is known already. Also, by moving against the material flow, the study can focus on one, and only one starting point (the product, or product family), and decisions with respect to which raw materials or ingredients to include in the study can be taken in the link where the branch in the material flow is encountered.

The chain originating (or rather, passing through) Aalesundfish was chosen to be the pilot chain in the KILREIS project. At the project kick-off meeting in Trondheim on May 27th 2004, smoked salmon was chosen as the product to be studied, and the smoking process was identified as the most downstream link to be investigated, at least for now.

As mentioned above, the chronologically last link in the chain is investigated first, and this report details the material and information flow at the Kritsen Landivsiau smokehouse, the first link to be investigated in the KILREIS project.

4 OVERALL MATERIAL FLOW AND INFORMATION FLOW

The Kritsen processing / smoking company is owned by Aalesundfish. It has 3 locations in Bretagne, France; it employs close to 400 people, and has a turnover of over 50M€. The Kritsen Landivsiau plant is situated not far from Brest, and it receives 7.500 tons salmon per year and 500 tons of other fish. This report focuses on salmon coming from Aalesundfish and then being smoked at Kritsen Landivsiau.

Based on Kritsen's orders and contracts for smoked salmon, a need for salmon of a specified quality and size is identified, and an order is placed with a supplier. A list of OK (green), problematic (amber) and unacceptable (red) European slaughterhouses is kept, and Kritsen will require to know the identity of the proposed slaughterhouse and check it against that list before committing to a purchase.

The identifier during order, reception and production is the Kritsen Lot Number (KLN). This is an internal, 5-digit, unique sequential number, and it may refer to anything from a pallet to a truckload of salmon (500kg to 18.000kg), delivered by one supplier in one truck on one day. The salmon might come from different slaughter houses and have different production dates. The KLN is specified on the order that Kritsen places with Aalesundfish, and it is also printed on the pallets and boxes that Aalesundfish delivers.

Gutted, whole and chilled salmon is received in 21.5 kg boxes, in general from Norway, Scotland and Ireland. The boxes are transported on pallets in trucks, and deliveries of salmon are made at Kritsen several times per day. The sizes of the pallets vary depending on the country of origin as follows:

- Pallets originating in Norway – 27 boxes per pallet
- Pallets originating in Scotland – 21 boxes per pallet
- Pallets originating in Ireland – 24 boxes per pallet

For each delivery received, 2 or 3 boxes are opened and sensory spot checks are made, recording:

- Fish temperature on arrival
- Sensory analysis of eyes of fish (letter and number grade)
- Sensory analysis of gills of fish (letter and number grade)
- Sensory analysis of flesh of fish (letter and number grade)
- Sensory analysis of peritoneum of fish (letter and number grade)
- Sensory analysis of smell of fish (letter and number grade)
- Sensory analysis of gutting of fish (letter and number grade)
- Sensory analysis of glazing of fish (letter and number grade)
- Sensory analysis of colour of fish (letter and number grade)

When a spot check is made, the data above is linked to the delivery by recording, for the delivery being sampled:

-
- Delivery date
- Kritsen Lot Number (KLN)
- Date of slaughter
- ID of slaughterhouse (variable number alphanumeric characters)
- Country of origin

Based on the result of the quality control, a large brightly coloured handwritten label is affixed to each pallet. The following information can be recorded on this label:

- Kritsen Lot Number (KLN)
- ID of slaughterhouse (variable number alphanumeric characters)
- Date of slaughter
- Date received at Kritsen
- Size grade (2/3, 3/4, 4/5, 5/6, 6/7 kg)
- Pallet number (not recorded on sample label)
- Choice of product / production method
- Country of origin (different country, different coloured labels)

The rest of the information on the pallet and on the individual boxes is ignored. The handwritten label serves as the data repository during production, and the information that is re-punched on the label is the information Kritsen keeps and forwards, as relates to the raw material.

No special software is used to record data. For data stored electronically, Excel files developed in-hose are employed. The Excel files are developed and maintained by ‘everybody’, there is no single person responsible for structure, harmonisation or consistency.

An invoice is sent from Aalesundfish detailing the number of boxes of each size grade delivered. A detailed packing list is attached to the invoice, specifying pallet numbers and individual box sizes within each pallet (but not box IDs). A full pallet (from Norway) contains 27 boxes of 21.5 kg each, all containing the same quality and size grade. Boxes with different quality or size grade may not be packed on the same pallet, but pallets containing fewer than 27 boxes may be delivered.

The salmon is produced within 7 days of shipping; transport time plus pre-production storage of max 3-4 days. Filleting typically takes 1 day, and smoking takes 1 day.

The smoked salmon is sold in many different sizes, either as whole fillet or ready sliced, and there are 3 main product types:

- The smoked salmon is shipped chilled (0º-4º) 1-2 days after production
- The smoked salmon is stored at (-3º-0º) for about 2 weeks and then shipped
- The smoked salmon is frozen and then shipped later

The smoked salmon is sold to hypermarkets and retailers. Identification of shipped product is by product type and production date, with KLN explicitly recorded on the shipped goods.

The Kritsen plant is ISO 9001 certified and “Label Rouge” certified.

Kritsen is a member of GS1 (formerly EAN), but the same EAN code (3013214300108) is used by all locations, and GLNs are not employed.

5 CONCLUSIONS AND RECOMMENDATIONS

With respect to traceability, the production at Kritsen is fairly simple with separate and clearly identified batches from reception, through processing, to shipping. In general, traceability is good, the information loss is acceptable, and traceability knowledge and consciousness among Kritsen employees seems sufficient.

Kritsen meets with 178/2002 Common Food Law requirements for traceability, and also to some degree fulfil the additional recommendations made in the accompanying guidance document.

Kritsen does not meet with TraceFish requirements, mainly because globally unique identifiers are not systematically used to document the relationship between received goods and shipped goods. TraceFish requires each shipped trade unit to have a globally unique identifier (identified by GTIN+); trade units shipped from Kritsen may be identically marked if they stem from the same production batch. TraceFish requires production parameters and raw materials used to be keyed to globally unique trade units; at Kritsen these data are keyed to the locally unique KLN. As production in traceability terms is fairly simple, this is not a big problem in itself. It does, however limit Kritsen's ability to send information in structured or standardised manner. Subsequent queries or requests for more information would always have to specify the KLN, as all information is keyed to this.

To identify the weaknesses in Kritsen's current system, let's look at two simple scenarios, tracing back through Kritsen and tracking forward through Kritsen:

Tracing back through Kritsen:
Let's assume that the fish was contaminated in some invisible way, and that this was not discovered during the smoking process. A real life example similar to this was the dioxin scandal in Belgium in 1999, when chicken feed accidently became contaminated. To trace salmon from consumer / supermarked, back through Kritsen and identify supplier and fish farm is only possible if the KLN is supplied. If only product type and production date is known, it will in general be impossible to uniquely identify a single KLN. Unfortunately, this case is quite likely. The KLN is a local code only meaningful within Kritsen, and the next link in the chain is unlikely to record it or store it. Product code (GTIN) and production date are standard terms, and much more meaningful outside of the local context. Also, even if the KLN is identified, one KLN might refer to a whole truckload of fish, originating from several different suppliers, which makes tracing back difficult. It is possible to trace back fish through Kritsen with the existing system, but it is very time-consuming. Thus Kritsen is not well prepared for a crisis that might require trace back through the production.

Tracking forward through Kritsen:
Let's assume that one of Kritsen's suppliers issues a recall on fish that already has been processed and sold. With the current system Kritsen will be able to unambiguously identify the KLN, and from that the product shipping and the destination. The traceability is good enough, as Kritsen benefits from the fact that a (although only local) identifier is assigned to the raw material, and kept without mixing or splitting throughout the production process.

A rough plan to improve the traceability at Kritsen, especially relating to trace backs, could look as follows:

1. Extend the use of GS1 codes so that each product type gets a unique GTIN, add a serial number (or a guaranteed unique date/time stamp) to the GTIN to get unique identification of each trade unit (TU) shipped. Assign a unique GLN to each Kritsen location. For explanation of these codes and terms, and instructions about how to get them and use them, contact GS1 or read the ECR Blue Book "ECR – Using Traceability in the Supply Chain to meet Consumer Safety Expectations", available at www.ecrnet.org.

2. Record the relationship between the uniquely identified TUs and the KLN; each TU should link to only one KLN, but one KLN may have many TUs.

3. Provide information to customers and consumers keyed to the unique number on the TU. Information can be supplied on request, it can be transmitted on paper or electronically along with the product, it can be put on a web site, etc.

Tracing back through Kritsen will then be based on the globally unique number on each TU. Kritsen customers will have a unique number in standard form to relate to, and this number will be the key for Kritsen internally to find the KLN, and then identify all the recordings keyed to the KLN and the raw materials that constituted the KLN.

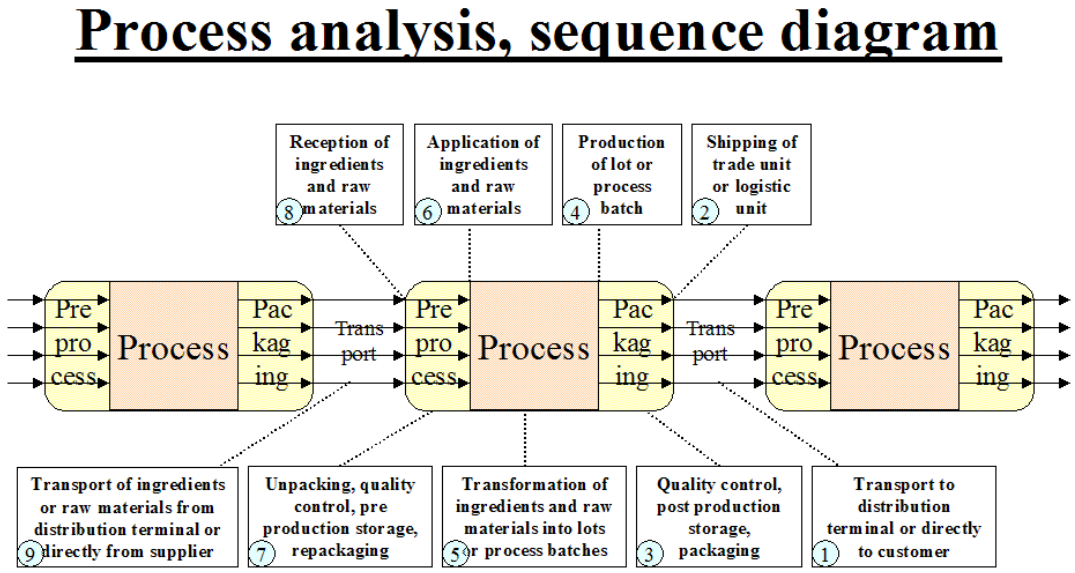
Tracking forward through Kritsen will be based on the identification of deliveries by given transporters on given days. In Kritsen's current system this relates directly and uniquely to a KLN, which in turn will yield a list of globally uniquely identified TUs. Although some information is lost when salmon is received in the current system, the existing solution seems adequate enough to enable both tracing of contamination and tracking forward to facilitate withdrawal or recall.

6 APPENDIX: THE METHOD AND THE DATA GATHERED

The information is based on a survey and interview with Nicholas Guern and Marie-Christine Philippe at the Kritsen plant in Landivisiau in July 2004.

The "Olsen P." method "Analysis of traceability in food supply chains - Standard method" was used. This method was developed for exactly this type of analysis, and this chain is one of the reference chains for the method.

The principle and sequence of events can be illustrated as follows:



When performing process studies to document material and information flow of the food, each of the 9 steps above can be converted to a form to be used in the mapping or interview. The lists with questions below are quite extensive, and not all questions will apply to all links. In addition, some products or links may have special attributes that it is relevant to record in addition. These may easily be appended to the respective forms.

Note that step 2, 4, 6 and 8 deals with the transformation information; the documentation of what happens exactly at the point and time when the product moves from one context to the next. Steps 1, 3, 5, 7, and 9 deals with durations; what happens or what is the state during transportation, pre-processing, production and packaging of the product.

The diagram above and the lists with questions below show how to map one product, starting with a form or table where the information about the transportation of it to the next link is recorded. As the process mapping moves against the material flow, it is likely that multiple tables or forms will be needed. In particular this is true when moving from mapping the process parameters (step 5) to the application of raw materials and ingredients (step 6). If only one product, process and transportation route is documented, there will be only one set of questions to ask (one form or table) in steps 1, 2, 3, 4, and 5. If multiple raw materials or

ingredients are used then each of these will be documented on a separate form 6, and each of these form 6's will then have to be traced through steps 7, 8 and 9.

This method has been applied when studying material flow and information flow at the Kritsen Landivisiau facility, see below.

6.1 Transport of finished goods

Question to transporter of finished goods	***Answer, fill in***	**Description or example**
What type of transport is used?	*Truck*	Truck / vessel/ air plane / post / courier / etc.
What type of delivery is it?	*Directly to customer*	Distribution terminal or directly to customer, either
How is the vehicle identified?	*Not investigated*	Registration number of vehicle or name and address (or GLN)
How is the trip identified?	*Not investigated*	SSCC, transporter code, delivery code, freight code, etc.
Is there a link from vehicle / trip to delivery?	*Not investigated*	No / Yes, indirectly / Yes, directly
What parameters are linked to this transport? How are they recorded; on Label, Paper, Fax, Electronically, Other? Are they kept for own use only, given to the buyer or given back to the supplier?	*Not investigated*	List of parameters. For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Own”, “Buyer” or “Suppl”.
Which temperature control method was used?	*Not investigated*	None / iced / iced and refrigerated / refrigerated / etc.
Is temperature logged during transportation?	*Not investigated*	No / Yes manually / Yes electronically

6.2 Collection of finished product

Transformation questions, shipping	***Answer, fill in***	**Description or example**
To whom are shipments of this type delivered?	*French hypermarkets and retailers*	Name and address / GLN
From where are shipments of this type shipped?	*Kritsen Landivisiau*	Name and address / GLN
Description of the total amount collected?	*Not investigated*	Full/part containers, full/part trucks, full/part holds / etc
Range of total amount collected every time?	*Not investigated*	From-to in kg / ton / other number relating to TU/LU
How often does collection take place?	*Several times per day*	Daily / weekly / etc
How is the total collected amount identified? What type of code and media?	*Not investigated*	Trip number / SSCC[1] / etc Unique / Non-unique. Sequential / Structured Bar-code / RF-ID / Direct reference (label) / Indirect reference, etc.
What parameters are linked to the whole shipment? How are they transmitted; on Label, Paper, Fax, Electronically, Other? Are they kept for own use only, given to the transporter, sent directly to the buyer, or sent to the buyer via the transporter?	*Not investigated*	List of parameters. For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Own”, “Tran”, “Sent” or “Via”.
If collected amount is divided into LUs; how is each LU identified? What type of code and media?	*SSCC*	Trip number / SSCC / none / etc. Unique / Non-unique. Sequential / Structured Bar-code / RF-ID / Direct reference (label) / Indirect reference, etc.

[1] Each logistic unit is often marked with a ***Serial Shipping Container Code*** **(SSCC)** which uniquely identifies the company and the particular logistic unit.

Can the producer link from the identification of the total amount to each LU?	*Not investigated*			No / Yes indirectly / Yes directly (LU-ID recorded upon collection)
If the answer is yes, how is it linked?				Electronic / manual
What parameters are linked to each LU? How are they transmitted; on Label, Paper, Fax, Electronically, Other? Are they kept for own use only, given to the transporter, sent directly to the buyer, or sent to the buyer via the transporter?	*Not investigated*			List of parameters. For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Own”, “Tran”, “Sent” or “Via”.
If LU is divided into TUs; how is each TU identified? What type of code and media?	*GTIN* *KLN (sequential code)*			GTIN+ / other Unique / Non-unique. Sequential / Structured Bar-code / RF-ID / Direct reference (label) / Indirect reference, etc.
Can the producer link from TU-ID to LU-ID?	*Not investigated*			No / Yes indirectly / Yes directly (TU-ID recorded upon LU-ID)
If the answer is yes, how is it linked?				Electronic / manual
What parameters are linked to each TU? How are they transmitted; on Label, Paper, Fax, Electronically, Other? Are they kept for own use only, given to the transporter, sent directly to the buyer, or sent to the buyer via the transporter?	*Species* *Product type* *Production date* *Expiration date*	*L* *L* *L* *L*	*Via* *Via* *Via* *Via*	List of parameters. For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Own”, “Tran”, “Sent” or “Via”.
Does a temperature log accompany the shipment?	*Not investigated*			No / Yes
Is the temperature of the shipment measured on collection?	*Not investigated*			No / Yes

6.3 Post production storage, quality control, packaging, labelling

Questions post-production	***Answer, fill in***	**Description or example**
What is the name/type of the product?	*Smoked salmon, sliced or fillets*	Identifying description or name of the product
What is the product condition?	*Chilled or frozen*	Ambient / chilled / frozen / etc
Which storage method is used post-production?	*Cold storage or freezer*	Boxed / bulked / seawater tanks / brine tanks / cold storage / etc.
What type of transport from process to packaging is used?	*Not investigated*	Not needed / Flow line / Fork-lift / By hand / etc.
Is a label used, if so, what type?	*Not investigated*	Clear text, barcode / Radio Frequency Identification-number (RFID) / none / etc.
If a label is used, what information is on it?	*Not investigated*	Name of the company / date and time of production / date of durability etc
What quality control checks are linked to the finished product? How are they recorded; on paper, punched into computer system, automated data gathering?	*Not investigated*	List of parameters. For each parameter, indicate “Paper”, “ComPunch” or “ComAuto”.
Which temperature control method was used?	*Not investigated*	None / iced / iced and refrigerated / refrigerated / etc.
Is the storage / display temperature shown or recorded?	*Not investigated*	No / Shown only / Recorded manually / Recorded electronically

6.4 End of production

Transformation questions, from production	***Answer, fill in***	**Description or example**
What type of lot / batch is used for finished product?	*Daily*	Daily / weekly / etc
What is the lot / batch amount?	*Not investigated*	From-to in kg / ton / etc
How is the lot / batch identified?	*KLN (locally unique, sequential)*	Unique / Non-unique. Code structure. Internal / Visible number
Can the producer link from identification of lot / batch to shipment of finished product?	*Yes, via KLN*	No / Yes indirectly / Yes directly (Lot / batch-ID recorded after production and linked to TU-ID)
If the answer is yes, how is it linked?	*Manual*	Electronic / manual
What parameters are linked to the finished production batch? How are they recorded; on paper, punched into computer system, automated data gathering?	*Not investigated*	List of parameters. For each parameter, indicate “Paper”, “ComPunch” or “ComAuto”.
Is the finished lot / batch split up, joined together or kept as one?	*Not investigated*	Split up / joined together / kept as one

6.5 During production

Questions production	***Answer, fill in***	**Description or example**
How are the batches separated during production?	*Physically*	Physically, staged mixing, continuous mixing, etc
1 batch only or many in parallel?	*Many*	One / Many
If many, are they ever mixed?	*No*	No / Yes
How are batches identified during production?	*KLN*	Unique / Non-unique. Code structure. Internal / Visible number
Is this identifier retained or referred to after production?	*Yes*	No / Yes

6.6 Application of ingredients and raw materials

Transformation questions, into production	***Answer, fill in***		**Description or example**
Can the producer link from identification of ingredients and raw materials to identification of lot / batch?	*Yes, salmon received already has KLN*		No / Yes indirectly / Yes directly (ingredients and raw materials ID recorded under production)
If the answer is yes, how is it linked?	*Manual*		Electronic / manual
Is the ingredient / raw material split up, joined together or kept as one?	*KLN (which may be a whole truckload) kept together*		Split up / joined together / kept as one
What parameters are recorded to document the application of this ingredient / raw material? How are they recorded; on paper, punched into computer system, automated data gathering?	*Not investigated*		List of parameters. For each parameter, indicate “Paper”, “ComPunch” or “ComAuto”.

6.7 Raw material reception, pre production storage, mixing

Questions pre-production	*Answer, fill in*		Description or example
Storage type for this raw material / ingredient as it enters production?	*Each LU as received, pallet by pallet placed on tray*		Whole shipment as received / each LU as received / each TU as received, in local tank, etc.
Relationship from the above to received shipments?	*1:1 with LU*		1:1 with shipment / LU / TU, split, joined, mixed, added in queue, etc.
Identification of this raw material / ingredient as it enters production?	*KLN, as before*		As before, by date/time, by tank number, by other reference
What quality control checks are linked to the raw materials / ingredients pre-production? How are they recorded; on paper, punched into computer system, automated data gathering?	*Not investigated*		List of parameters. For each parameter, indicate “Paper”, “ComPunch” or “ComAuto”.
Which temperature control method was used?	*Not investigated*		None / iced / iced and refrigerated / refrigerated / etc.
Is the storage / display temperature shown or recorded?	*Not investigated*		No / Shown only / Recorded manually / Recorded electronically

6.8 Reception of ingredients and raw materials

Transformation questions, reception	***Answer, fill in***			**Description or example**
From whom are shipments of this type received?	*In our case, Aalesundfish* *In general, salmon exporters in Norway, Scotland or Ireland*			Name and address / GLN
Where are shipments of this type received?	*Kritsen, Landivsiau, Brest*			Name and address / GLN
Description of total amount received?	*A number of whole pallets, from one to a whole truckload*			Full/part containers, full/part trucks, full/part holds, etc
Range of total amount received every time?	*500kg-18.000kg*			From-to in kg, ton / etc
How often does reception take place?	*Several times per day*			Daily, weekly, etc
How is the total received amount identified? What type of code and media? Is this identifier discarded or recorded and kept?	*The total received amount is one delivery of fish, constituting of a number of pallets, each containing fish of a given quality and size grade.* *Trip ID not investigated*			Trip number / SSCC / etc Unique / Non-unique. Sequential / Structured Bar-code / RF-ID / Direct reference (label) / Indirect reference, etc.
What parameters are linked to the whole shipment? How are they transmitted; on Label, Paper, Fax, Electronically, Other? Are they recorded on reception?	*Not investigated*			List of parameters. For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Discarded”, “Kept” or “Repunched”.
If received amount is divided into LUs; how is each LU identified? What type of code and media? Is this identifier discarded or recorded and kept?	*The LU is one pallet containing 27 boxes of fish, each with the same quality and size grade.*			Trip number / SSCC / none / etc Unique / Non-unique. Sequential / Structured Bar-code / RF-ID / Direct reference (label) / Indirect reference, etc.
Can the producer link from the identification of the total amount to LU?	*Yes, KLN identifies the total delivery and KLN on each LU and TU label*			No / Yes indirectly / Yes directly (LU-ID recorded upon collection)
If the answer is yes, how is it linked?	*Manual*			Electronic / manual
What parameters are	*SSCC*	*L*	*D*	List of parameters.

linked to the each LU? How are they transmitted; on Label, Paper, Fax, Electronically, Other? Are they recorded on reception?	*Species* *Treatment* *Quality* *Size* *Net weight* *Harvest date* *Order number* *Pallet number* *Slaughterhouse ID* *Country of origin* *Fish farm name* *EAN number* *Exporter company name*	*L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *I*	*K* *D* *D* *R* *D* *R* *R* *D* *R* *R* *D* *D* *R*	For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Discarded”, “Kept” or “Repunched”.
If LU is divided into TUs; how is each TU identified? What type of code and media? Is this identifier discarded or recorded and kept?	*The TU is one 21.5kg box og salmon of a certain quality and size grade.*			GTIN+ / other Unique / Non-unique. Sequential / Structured Bar-code / RF-ID / Direct reference (label) / Indirect reference, etc.
Can the producer link from TU-ID to LU-ID?	*Yes, LU-ID on each TU label*			No / Yes indirectly / Yes directly (TU-ID recorded upon LU-ID)
If the answer is yes, how is it linked?	*Manual*			Electronic / manual
What parameters are linked to the each TU? How are they transmitted; on Label, Paper, Fax, Electronically, Other? Are they recorded on reception?	*Species* *Treatment* *Quality* *Size* *Pieces* *Net weight* *Harvest date* *Order number* *Box number* *Pallet number* *Slaughterhouse ID* *Country of origin* *Fish farm name* *EAN number* *Exporter company name*	*L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *L* *I*	*K* *D* *D* *R* *D* *D* *R* *R* *D* *D* *R* *R* *D* *D* *R*	List of parameters. For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Discarded”, “Kept” or “Repunched”.
Does a temperature log accompany the shipment?	*Not investigated*			No / Yes
Is the temperature of the shipment measured on reception?	*For 2-3 boxes per shipment*			No / Yes

6.9 Transport of ingredients and raw materials

Question to transporter of ingredients and raw materials	***Answer, fill in***	**Description or example**
What type of transport is used?	*Truck*	Truck / vessel / air plane / post / courier / etc.
What type of delivery is it?	*Directly from supplier*	Distribution terminal or directly from supplier, either
How is the vehicle identified?	*Not investigated*	Registration number of vehicle or name and address (or GLN)
How is the trip identified?	*SSCC*	SSCC, transporter code, delivery code, freight code, etc.
Is there a link from vehicle / trip to delivery?	*Not investigated*	No / Yes, indirectly / Yes, directly
What parameters are linked to this transport? How are they recorded; on Label, Paper, Fax, Electronically, Other? Are they received but ignored, re-recorded for own use only, given to the buyer or given back to the supplier?	*Not investigated*	List of parameters. For each parameter, indicate L/P/F/E/O for type of transmission. For each parameter, indicate “Ignore”, “Own”, “Buyer” or “Suppl”.
Which temperature control method was used?	*Iced and refrigerated*	None / iced / iced and refrigerated / refrigerated / etc.
Is temperature logged during transportation?	*Not investigated*	No / Yes manually / Yes electronically

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