

Tracing fish: a question of definition

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work-in-progress

ABSTRACT

In 2005, Norway had a trade leakage of €60,000,000 on bacalhau, only in Portugal. The aim of this article is to illuminate how this can happen. Four case studies of the Norwegian-Portuguese bacalhau network are presented. Qualitative interviews were performed with 45 business actors. These data were collected as a part of Haugnes' (2010) dissertation. The empirical cases traces 'Bacalhau da Noruega' (i.e. salted and dried codfish from Norway) from the Portuguese supermarkets and the consumers towards the Norwegian Sea, looking at the business actors' activities. The study will identify variations in the traceability, and the actors' definitions and use of the term 'Bacalhau da Noruega'. The article will conclude by suggesting a means to decrease the trade leakage.

Keywords: traceability, bacalhau, network, activity links.

INTRODUCTION

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The aim of this study is to illuminate how it is possible for an annual trade leakage of € 60,000,000 to take place. The simple answer is that there is sold more bacalhau (i.e. salted dried codfish) as Norwegian in Portugal, than the volumes actually exported from Norway. The complex answer we get from looking into the activities of all the business actors involved.

To accomplish the purpose of this article, it starts out with a presentation of the literature, before the methodology of this article is introduced. Next, a brief description is given of the Norwegian-Portuguese bacalhau network, in which the numbers behind the highlighted trade leakage is looked into. Then, four sub-structures are presented where the companies have developed different definitions of 'Bacalhau da Noruega', focusing on the bacalhau's traceability. This development is discussed in relation to the literature, before conclusions are made.

LITERATURE

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METHODOLOGY

The empirical base for the findings discussed in this chapter is derived from a study of the Norwegian-Portuguese bacalhau network (Haugnes, 2010).

The data collection included primary data in the form of interviews and observation. This was supplemented with secondary data such as information on the companies, organisations working close to them, internet, laws and legislations, and other public sources. The interviews were semi-structured and followed an interview guide focusing on relationships and interaction.

Interviews with 45 business actors in Portugal and Norway were conducted between October 2005 and March 2006, and lasted, on average, two hours and twenty minutes. As the Norwegian-Portuguese bacalhau network is a rather closed community to outsiders, identifying the actors and arranging the interviews were, accordingly, problematic. These problems were solved by using gate-keepers (e.g., Miles and Huberman, 1984) and a snowball technique (e.g., Gobo, 2004) to access the sample. A major proportion of the limited number of business actors the Norwegian-Portuguese bacalhau network consists of was interviewed. Only 0.1 per cent of the Norwegian fishing vessels were included in the sample. Not all of the approximately 7,000 (www.ssb.no, 2011a) primary producers supply Portugal, however, and in any case their activities are standardized to a great extent with little deviation. The Norwegian secondary producers who were interviewed are responsible for more than 90 per cent of the bacalhau exported to Portugal, and together with the interviewed Portuguese secondary producers account for approximately 80 per cent of the total market share. Finally, Portuguese retailers covering at least 60-70 per cent of the bacalhau market share were interviewed.

Both large and small business actors were included in the sample. Table 1 lists those interviewed. The interviewees were managers and business owners. The idea was that these people would be able to give a better overview than their employees. During the interviews, which most of the time took place at the interviewees' businesses, the interviewer(s) was

often invited for a guided tour. Seeing how the instruments and the processing equipment were used, together with the supplementary information given on these guided tours, represent firsthand information (e.g., Silverman, 2006).

Table 1: Overview of interviews.

Actor	Country	Number of Interviewees
Primary Processors	Norway	Seven
Secondary Processors	Norway	Nine
Secondary Processors	Portugal	Eight
Retailers	Portugal	Six
Broker	Norway	One
Agents	Portugal	Two
Exporter	Norway	One
Importers and Wholesalers	Portugal	Six
Organizations	Norway	Five

Table 1 does not include the cod stock manager or the consumers. As a result of the cod stock manager's wide ranging and dispersed nature it was considered more efficient to research it indirectly, through those activities which are visible to the producers. The internet, together with the documents given by the interviewees, represents the sources used with regard to the cod stock manager. Concerning the consumers, generic consumers' activities classifications in the existing literature were used (e.g., Ekström, 2004; Wilk, 2004; Arnould et al., 2004). When questioning the business actors about their activities, their answers revealed a great deal about the way in which they experienced the consumers and the consumers' activities. The business actors' talk about how they acted upon this was used in the description of the consumers and the consumers' activities.

Some of the Portuguese business actors had little or no knowledge of the English language, as Portuguese is their working language even when doing business with Norwegians. Three students at the University of Porto acted as interpreters. They were asked to interpret back and forth between the interviewer and the interviewee, and to correct potential misunderstandings caused by the language barrier.

The interviews were not tape-recorded, as that can prevent the interviewees from relaxing and speaking as freely as they otherwise would. Instead notes were made, which were typed up immediately afterwards. Unclear elements were discussed between the interviewers, or with the interpreter. The interviewees were contacted again in the case of any ambiguities. Finally, reports were made. The analyzing had already started with the writing of reports immediately after each interview, which gave the advantage of opportunities to follow up on insights before the data collection was completed, in addition to drawing insights from the entire body of data (e.g., Easton, 2010; Mick and Fournier, 1998).

After the data collection, several months were spent writing up a summary of the raw data. It described the activity network from the cod stock manager to the retailers, based on the interview reports, the observations and the collected documents. This descriptive text became the starting point of a somewhat chaotic and unstructured analysis. It was chaotic and unstructured insofar as a solution like a computer program could not be used, as that would require a 'truth table'. Such a table would list "the various combinations of independent variable that appear in a data set along with their corresponding values on the dependent

variable. Configurations appear only once in a truth table, regardless of their frequency of occurrence in the data” (Drass, 1992). Linked activities, however, are by nature impossible to structure and simplify into a ‘truth table’ before analyzing.

A DESCRIPTION OF THE NETWORK AND ITS HISTORY

In view of the above presentation of the methodology, this section provides a short introduction to the Norwegian-Portuguese bacalhau network. I will illuminate the network’s history, before the fish tracing of the network and the term ‘Bacalhau da Noruega’. ‘Bacalhau da Noruega’ is Portuguese and means literary “salted dried codfish from Norway”.

Historical background

Bacalhau¹ was probably invented by the Basques², around the Bay of Biscay north of Portugal, in the Middle Ages (Kurlansky, 1999; Johansen et al., 2003). In the beginning, salted and dried cod provided the Basque fishermen with a preserved and nutritious food supply, when they travelled to unknown distant waters to hunt whales off the coast of Newfoundland, and later to fish for cod (Kurlansky, 1999). “By the year 1000, the Basques had greatly expanded the cod market to a truly international trade” (Kurlansky, 1999:22). The medieval Roman Catholic Church participated by imposing fast days on which the eating of meat was forbidden, while eating ‘cold’ foods was permitted. “In total, meat was forbidden for almost half the days of the year, and those lean days eventually became salt cod days” (Kurlansky, 1999:24). In this way the bacalhau culture established firm roots in catholic Portugal, and approximately 182 other countries worldwide.

As for Norway, for centuries a lack of salt forced the Norwegian producers to preserve fish by drying only, a product known as ‘stockfish’. Around 1300-1400 Norway began to trade salt with Italy and Spain, although this trade did not really expand until the first half of the 1600s (Vollan, 1956:59). Even then, Norway’s first large-scale transformation of bacalhau was not established until the middle of the 1700s (Vollan, 1956:58; confer with Svendsen, 2003:9). From then on Norway soon became, and remains, the world’s largest producer and exporter of bacalhau. Today, Norway’s four main export markets are, respectively, Brazil, Portugal, the Dominican Republic and Jamaica (www.ssb.no, 2011c). In 2007, Norway exported seafood worth 2.2 billion NOK (approximately 230 million EUR) to Portugal (www.seafood.no; www.noruega.org.pt). This makes Portugal Norway’s sixth largest export market for seafood in general, and the second largest for bacalhau (www.noruega.org.pt).

The bacalhau culture in Portugal has roots that stretch back a thousand years. The bacalhau culture in Norway and the trade between the two countries goes back three hundred years, but something has happened during the last decade or two. The Portuguese consumers’ demand for bacalhau is declining. While bacalhau had, for example, 93 per cent of the consumer market in 2001, it had only 75 per cent in 2006 (Jensen, 2008:6). Furthermore, while 47 per cent of consumers indicated that bacalhau was their favorite fish meal in 2001, the figure fell to 22 per cent in 2006 (Jensen, 2008:5).

The development into three product categories does also represent a break in the history. Today, bacalhau in Portugal can be divided into dry bacalhau, desalted frozen bacalhau and frozen ready-meals of bacalhau. In 2004 dry bacalhau had 90.6 per cent of the market share, while frozen ready-meals had 6.2 per cent and desalted frozen bacalhau the

¹ Originally in Portuguese bacalhau mean ‘cod’ (<http://no.wikipedia.org/wiki/Bacalhau>). Today, bacalhau is a reference to wet-salted dried cod.

² The Basques’ land includes provinces of both modern-day Spain and France, north and south of the Pyrenees (Wikström, 2001).

remaining 3.2 per cent (TNS, 2005b). The industrial networks of the three product categories are different. Dry bacalhau is the oldest and the traditional bacalhau product category, and is the only one of the three that is transformed by secondary processors in both Portugal and Norway. Within the dry bacalhau product category, the activities of the transformation will necessarily have developed variations, which of course at first sight are less visible than the variations that have developed into the additional two product categories. This presentation will be limited to the dry bacalhau, henceforth referred to simply as ‘bacalhau’.

Despite the downturn of the industry, bacalhau is very important to both Norway and Portugal. Still, on average, each Portuguese eats approximately 13 kilogram of bacalhau annually; calculated from 70,000 tonnes of bacalhau (Mikkelsen jr., 2006:32; Figure 3) divided by a population of 10.7 million (CIA, 2009), bearing in mind that the bacalhau’s weight is about doubled during desalting. This is the equivalent of each Portuguese eating bacalhau for dinner for a whole month!

Defining ‘Bacalhau da Noruega’

The bacalhau has been transformed through a number of activities on its way from the sea to the consumers’ plates. The main types of actors of this transformation are here considered to be Portuguese consumers, Portuguese retailers, Portuguese and Norwegian secondary processors (i.e., land based processing plants), Norwegian primary processors (i.e., fishermen), and the cod stock manager represented by the sea territories’ governmental authorities. In addition, to the main actors, the network involves a varying number of intermediaries, like wholesalers, traders, agents and organisations. The network consists of many activity sub-sections. A simplification of the Norwegian-Portuguese bacalhau network is illustrated by Figure 1. The arrows point in the direction of the product’s transformation, illustrating the bacalhau’s ways through various sub-sections of the network.

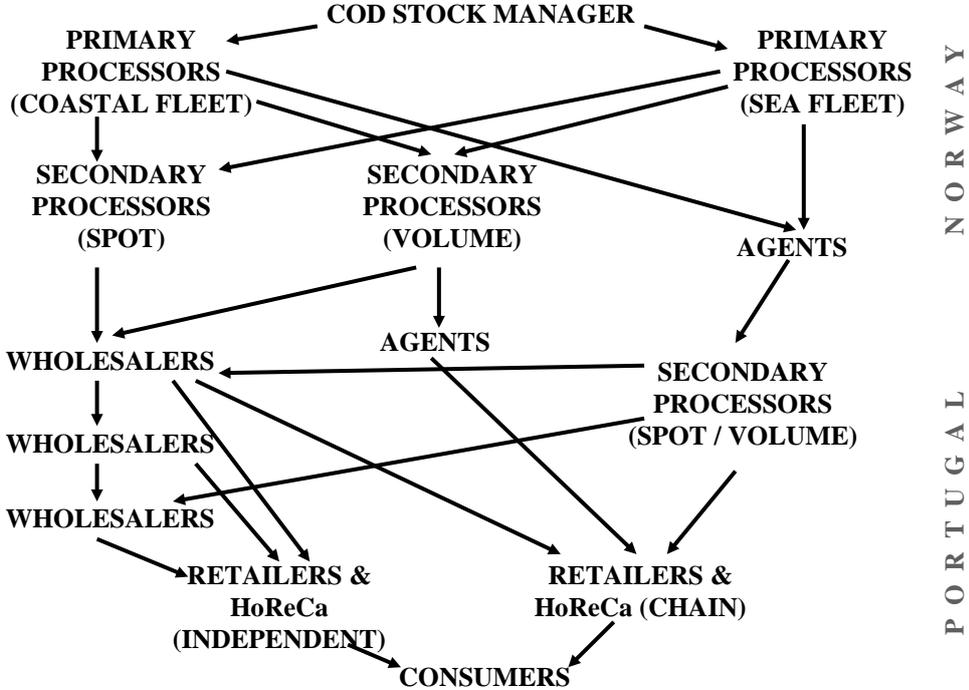


Figure 1: Norwegian-Portuguese bacalhau network.

The North-Atlantic cod specie *Gadus Morhua* is the dominating bacalhau base consumed in Portugal, henceforth referred to as ‘cod’. Concerning the primary processors, it can be predicted how many tonnes of cod a vessel will catch. A sea territory’s Ministry of Fisheries regulates and controls quotas. In 2008, for instance, the Norwegian coastal fleet was allotted a quota of 21,000 tonnes of cod and the sea fleet a quota of 170,650 tonnes of cod (Protocol, 2007). The Directorate of Fisheries and the coastguard enforce the regulations by performing controls at sea. Furthermore, all first-hand trade of fish in Norway is arranged by one of the fishermen’s registered sale organizations (Law of raw fish trading, 1951:§2 part 1), whom control the vessels’ catch upon landing.

When writing year 2005, however, approximately 20 per cent of the final catch (Ot.prp. nr.98 (2005-2006):no. 2.1) in the Norwegian sea territories was illegal, unreported or unregulated (IUU) (www.fisheries.no, 2006b). As a consequence, in February 2006, Portuguese and Norwegian ministers signed a protocol to create a higher level of transparency (Protocol, 2006) with regard to the bacalhau’s country of origin. The protocol states that “The Parties recognize the need for information on the total amount of fish landed in order to make more precise calculations of the total catch and thereby determine the level of possible IUU fishing activities” (Protocol, 2006). The parties agreed that Portugal would forward landing information on a vessel-by-vessel basis to the flag State and to Norway, and also let Norway initiate relevant control activities and be present to observe the performance of the control. Through these demands for transparency, it should become more difficult to distribute untraceable bacalhau.

By regulating and controlling both at sea and during landing, the Norwegian government counter possible IUU fishing. Their activities make it easier for primary processors, secondary processors and retailers to provide information about, and compete by emphasizing, the bacalhau’s country of origin. Thereby, it should also make it easier for consumers to purchase based on the bacalhau’s country origin. In 2004, 74 per cent of the Portuguese consumers answered that they normally purchase ‘Bacalhau da Noruega’ (Mikkelsen jr., 2006). The latter study is illustrated by Figure 2.

The answers of Figure 2 could of course be a result of consumers’ guessing of the moment or attempts to give a certain impression, and so on, without the consumers knowing or caring the slightest for the bacalhau’s country of origin. However, the “typical product information of bacalhau [posted at retailers seem to be focused on] its country of origin, size and price” (Østli and Heide, 2004:26, my translation). These information posters support the correctness of consumers believing to know their bacalhau’s country of origin. Retailers do also experience that consumers traditionally prefer ‘Bacalhau da Noruega’. What ever caused their answers, Figure 3 illustrates that less than 50 per cent – highlighted by the black line – , and not 74 per cent, of the 73-74,000 tonnes of bacalhau imported to Portugal in 2004, came from Norway. Accounting for roughly 42,000 tonnes (60 per cent (an approximate average of 2004 and 2006 in Figure 2) of 70,000 tonnes (in Figure 3)) minus approximately 32,000 tonnes (in Figure 3), Figures 2 and 3 indicate a mismatch, in 2005, of at least 10,000 tonnes.

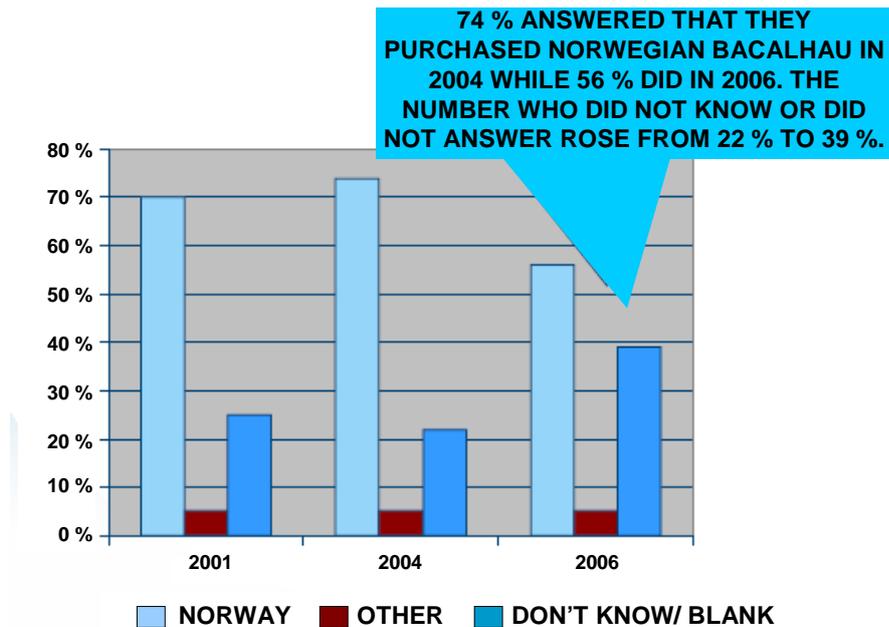


Figure 2: “From what country of origin do you normally purchase bacalhau?” (source: Mikkelsen jr., 2006, my translation)

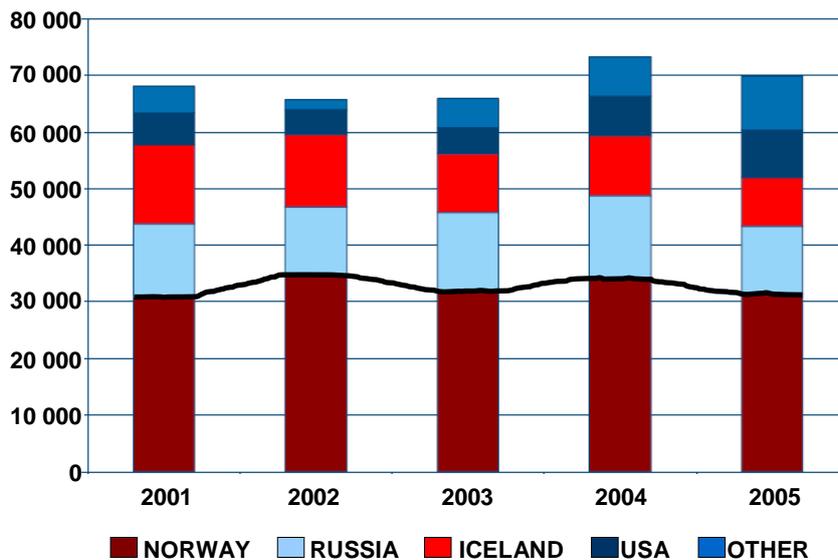


Figure 3: Import of bacalhau to Portugal 2001-05, here converted into bacalhau weight. Tonnes (source: Mikkelsen jr., 2006, my translation).

Considering the numbers of Figures 2 and 3, a conversion into price per kilogram strengthens the impression of a considerable leakage. Table 2 gives examples of two selected secondary processors’ prices per kilogram divided by the bacalhau’s standard weight classification. Considering the weight classification Crescido, and bacalhau based on a frozen raw material to be most common, the potential trade leakage constituted at least € 60,000,000 (€ 6.00 * 10,000,000 kilograms) in 2005.

Table 2: Examples of secondary processors' bacalhau prices in 2005 (source: anonymous interviewees)

Weight	Miúdo	Corrente	Crescido	Graúdo	Especial	Jumbo	
Quality							
Based on fresh raw material	€5.00	€5.75	€6.80	-	€8.50	€9.50	€10.60
Based on frozen raw material	-	€5.24	€5.86	€6.07	€6.99	€8.49	-

FOUR EMPIRICAL CASE STUDIES OF TRACEABILITY

In the previous, I have given a short introduction to the Norwegian-Portuguese bacalhau network, and the probable trade leakage. Considering the network's great importance to both Norway and Portugal: How can a €60,000,000 trade leakage of 'Bacalhau da Noruega' take place? Even when ministers of Norway and Portugal have set their minds on creating a high level of transparency? In this section, four case studies of sub-structures are presented, based on the level of integration between the involved actors' activities. This is here represented by their varying control with the origin, of what they purchase (input) and what they supply (output). The first example describes a fully controlled and transparent sub-structure. The second illustrates actors with limited traceable input and output. In the third sub-structure the actors control the origin of what they purchase, but have limited control with their output. Opposite, the fourth and last example describes a sub-structure controlling the origin of what they supply, but not that of their purchase. The purpose of the examples is to illustrate the bacalhau's traceability through the actors' contained control, and the variation in their definition of 'Bacalhau da Noruega'.

Case 1: traceable input and output

The first activity sub-structure to exemplify consists of a Portuguese retail chain, a Norwegian secondary volume processor and their Portuguese agent, a numerous vessels of the Norwegian coastal fleet, and the Norwegian cod stock manager. This example is marked by its transparency, tight control and high integration with both input and output. The activities are directly linked to each other in terms of volume, quality and origin.

Retail-One is the largest retailer on bacalhau in Portugal, selling about 15,000 tonnes annually. Since year 2000, Retail-One has been running a campaign focusing on a fictive spokesperson. He is a bacalhau consumer who knows everything there is to know about the product and therefore is able to communicate this to other consumers. The aim with this expert consumer has been to educate the average consumer on the quality differences between various types of bacalhau and on the origin of the cod. In 2003, they started an additional campaign with the same purpose.

Retail-One sources approximately 47 per cent of all its bacalhau from SecPro-One. SecPro-One supplies Retail-One with 70 per cent of its total production, approximately 7,000 tonnes annually. SecPro-One is Norway's second largest secondary processor (Tande jr., 2005:54). Retail-One is SecPro-One's only customer in Portugal. Every year, they enter into an agreement of, among other things, a set price and volume. The interdependency and predictability of this relationship has made SecPro-One able to build a complex structure, resting on this one main customer.

Together, SecPro-One and Retail-One promote “the real Bacalhau da Noruega” towards consumers. The bacalhau is available all year round, based on a traditional recipe, being ten per cent drier, individually tagged³, using a fresh raw material, not containing phosphate, and it is produced in Norway by SecPro-One and Norwegian primary processors in Norwegian sea territories. The whole idea behind the tagging is for consumers to be able to differentiate the bacalhau from other bacalhau when presented to the retailers’ displays. Not all secondary processors individually tag their bacalhau. All do, however, glue information stickers on the bacalhau’s transportation cartons. These contain the bacalhau’s water content (e.g., Cura 7/8), year of catch, weight in kilograms, required temperature, cod specie (e.g., *Gadus Morhua*), name of exporter, name of secondary processor, code of the production plant, name of the receiver, production date, and expiring date. These transportation cartons are not as a rule used at retailers’ display, and then the origin information is lost.

In May 2003, SecPro-One started tagging their bacalhau with Retail-One’s private brand. Since then, sales have increased by ten to 15 per cent annually. The tagging represented a strategy for further differentiation in the consumer market, which until then had been limited to the generic ‘Bacalhau da Noruega’. The generic branding did, for example, not allow for differentiating between bacalhau based on a fresh raw material and that based on a frozen raw material. Bacalhau based on a fresh raw material is considered to be of a better quality, which is reflected in the price difference of Table 2. Because of a limited fishing season, however, using a fresh raw material does make SecPro-One dependent on an enormous amount of salt fish in storage in order to secure a stable supply. Their stores empty in the months leading up to Christmas, which is the consumers’ peak devouring season. After the winter’s fishing season, it has again as much as 5,000 tonnes of salt fish in store, which SecPro-One estimates corresponds to an investment of 150 to 200 million NOK (20 to 27 million EUR). The storage functions as an insurance against rough weather and the cod’s travelling.

SecPro-One buys both freshly caught fish and salted fish for producing bacalhau. It has nine production plants spread along the coast line. The freshly caught fish bought on auction is sent to the production units in Northern Norway, where the salting process is conducted. The salt fish is sent south to production units in Mid-Norway, where it is dried. The former units are treated as regular suppliers to the latter, even SecPro-One owns both the units producing salt fish and those drying the salt fish into bacalhau. The price of the salt fish is based on standard agreements, but some negotiations are left to the incoming control of the fish at the production units in the south. The negotiations, – based on the salt fish’s amounts of water and salt, size and volume – with representatives from the supplying facilities, takes place immediately as they come with the fish.

To secure a highest possible quality, one of SecPro-One’s criteria is that the cod should be dead for less than 24 hours by the time it is wet-salted. Quality control checks on freshness are made at the point of landing at the plants. Only the coastal fleet fishing on a day to day basis are able to keep the time restriction. The coastal fleet consists of fishing vessels sized 21 meters or less. The time restriction and the size of the vessels of the coastal fleet provide an assurance of the cod’s country of origin. The origin-details are given orally upon landing. SecPro-One has a close and daily contact with their primary processors, and makes sure to give the best pay. About 15 vessels supply each of their plants with fresh cod, in the fishing season, from January to March, of which some come as far south as from the Sogn- and Fjordane county.

One of SecPro-One’s owners spends about 130 days annually travelling between their production plants in the North of Norway, focused on the fishing season. He controls the

³ “The tag is attached directly to the bacalhau by a plastic fastener, [and] is a tool to communicate quality” (Aarseth, undated, my translation).

quality on the cod they purchase in that part of the country and speaks with the fishermen. The primary processors are mostly smaller boats operated by four to five fishermen. There is a great competition over the cod. SecPro-One has a large number of loyal vessels supplying them. Some of these suppliers have been involved with SecPro-One since the middle of the 1980s. They are situated in North of Norway, in the Lofoten region, the Vesterålen region, and the Troms county. SecPro-One has trained their suppliers to offer good quality. If the quality requirements are not met, SecPro-One will not hesitate in leaving them. Usually this does not happen twice.

There is some cod along the coast all year, but the fishing season lasts from January till March. Then the cod migrates to the coast to spawn, which makes the catching very seasonal dependent. The coastal fleet's fishing of cod follows the regulation for winter fishing in the Lofoten region. The Norwegian Minister of Fisheries has taken this into consideration when setting the quota of the coastal fleet.

In this sub-structure, the actors have a direct and transparent interaction. The example is a good illustration of the actors' easiness of keeping different origins separated and unfeasibility in mixing them. The activity sub-structure is well integrated with both the input and the output, and the actors define the bacalhau's origin based on it.

Case 2: difficult to trace

The second activity sub-structure consists of a Portuguese retail chain, a Portuguese wholesaler, a Norwegian secondary volume processor, Norwegian and Russian primary processors and cod stock managers. This second example is marked by the involved business actors' weak control with the origin of both their input and output. The activities are directly linked to each other both in terms of volumes and quality, but not when it comes to origin.

Delivery 'guarantees' are of major importance to the retail chains. They want concrete and detailed contracts. The retail chain Retail-Two wants, for example, one Norwegian supplier. A high level of integration, combined with a low number of involved business actors, represent predictability to the involved business actors. This make the retail chains more and more take over the wholesaler function.

Wholesale-Two is a wholesaler of all kinds of food products, with an annual turnover of approximately €100.000.000. Thirty per cent of its production line is bacalhau, which constitutes about 14,000 tonnes annually. Its line in bacalhau is, however, increasing with ten to 15 per cent every year. Wholesale-Two has more than 7,000 customers, and sells 50 per cent of their total through 250 cash and carry shops all over Portugal. Cash and carry shops are giant supermarkets selling large packages to business customers. Restaurants, independent supermarkets, caterers, hotels and any other businesses go and purchase there. Wholesale-Two has its own distribution network of 30 trucks to distribute to these cash and carry shops, and to supply larger customers.

Wholesale-Two purchases bacalhau from the Norwegian secondary processor SecPro-Two and Icelandic SecPro-TwoB. Wholesale-Two has worked with SecPro-Two for 15-20 years, and functions as its agent in Portugal. In this position, Wholesale-Two considers the direct import and the direct distribution its strengths. It distributes approximately 90 per cent of SecPro-Two's bacalhau in Portugal. Their relationship is old; they know each other well and trust each other. The General Manager of Wholesale-Two states that "We have a good knowledge about them – it is a long marriage!"

SecPro-Two produces approximately 12,000 tonnes of bacalhau annually of different fish species. This makes Wholesale-Two Portugal's largest importer of bacalhau. Through Wholesale-Two, SecPro-Two has four to five large customers. These visit SecPro-Two in Norway two to three times annually, while SecPro-Two seldom goes to Portugal. SecPro-

Two bases its sale on tight relationships to few but large customers and suppliers. SecPro-Two's bacalhau is sold in transportation cartons with its own brand. When reaching consumers at retailers, as for example Retail-Two, however, the transportation cartons are removed and the bacalhau branded as 'Bacalhau Noruega'.

SecPro-Two bases its bacalhau production mainly on frozen raw material. With a freezer capacity amounting for about 22,500 tonnes, it purchases a large share during the fishing season from January till March. Being Norway's largest secondary bacalhau processor, with a processing plant of 20,000 square meters (Tande jr.,2005:57), basing its processing on mainly frozen raw material, however, allow for a high degree of efficiency. SecPro-Two focuses on volume and has an industrial perspective on the production. It wants as much fish as possible to pass through the facilities, which means they can keep production costs down, offer lower prices and large volumes.

It has a continuous storage of frozen cod, at least large enough to cover demands for the coming two to three months of bacalhau production, which correspond to a continuous lock up of approximately 40 million NOK (5.3 million EUR). SecPro-Two does this in order to supply continuously, independent of changes in the raw material access and customer requests. The frozen storage is supplemented by buying throughout the years.

SecPro-Two produces the same quantity day in and day out 240 days a year. It takes minimum four weeks to produce bacalhau. It is probably the most advanced and efficient secondary processor of fish products in Norway. The finished bacalhau is stored up to three to four months before being sold. SecPro-Two only sells bacalhau it has salted and dried. It has full control on all levels from the cod's arrival until the bacalhau being sold.

Raw material to SecPro-Two's bacalhau production is supplied from mainly two sources. Firstly, the small vessels of the Norwegian coastal fleet provide net and line caught cod. (The previous example discussed how the size of the vessels of the coastal fleet provides an assurance of the cod's country of origin.)

Secondly, SecPro-Two is supplied by the large trawlers of the sea fleet catching cod by trawl. SecPro-Two is a major buyer, buying 15 per cent of the total Norwegian and Russian cod and saithe quotas, constituting approximately 40,000 tonnes annually. Fish landed in Norway, whether regulated by Norwegian or Russian quotas, is thoroughly controlled. The control is performed by, among others, the authorised freezing facilities positioned at fishing harbours along the coast, the Directorate of Fisheries, the fishermen's sales organisations, customs duty and the coast guard. This control of landing of fish in Norway makes it close to impossible to land IUU fish.

The Russian authorities do, on the other hand, not perform the same thorough control as the Norwegian authorities. This fact makes it more difficult for the purchaser to control whether the fish is quota regulated or IUU. Furthermore, Russian supplies are often handled via agents outside Russia. These agents, brokers or traders, can be Norwegian business actors, handling fish of different national origins, both concerning its quota regulator and landing harbour. Moreover, business actors do not always attach their brand to the products, as some trade without being in physical contact with the products. In addition, cod becoming bacalhau does not have to be packed (Legislation, §8-7 no.2:2001), as salt kills all bacteria (e.g. Lynum, 2003:212). Cod that is not physically packed inevitably does not have information written on its carton either.

In this sub-structure, the main actors have a direct interaction. The example represents a situation by its actors' relatively weak control with their input's and output's origin. The easiness of mixing different origins and complications with keeping them separate could, however, possibly been prevented through the main actors' few and tight relationships.

Case 3: traceable input

The third case study contains a sub-structure with a Portuguese retail chain, a Portuguese secondary volume processor, an intermediary, various primary processors, and Norwegian, Russian and Icelandic cod stock managers. This third example is marked by its various definitions of ‘Bacalhau da Noruega’ in the output, but where the actors control the origin of what they purchase.

The retailer Retail-Three purchases and sells 9-10,000 tonnes of bacalhau annually. All of it goes through the retail chain’s distribution centre. There, the quality control is made, which makes a consistent quality at its more than 450 stores all over Portugal. At its supermarkets, consumers can identify Icelandic and Norwegian sourced bacalhau, based on the cod specie *Gadus Morhua*, in addition to Alaskan sourced bacalhau that is based on the cod specie *Gadus Macrocephalus*. Upon arrival the bacalhau is in boxes marked with the scientific generic name (e.g., *Gadus Morhua*) and the zone where it is caught, for example North East Atlantic Sea, and so on.

The retail chain believes that educating consumers is important, although they find it very difficult. Their Bacalhau Purchasing Manager has noticed “the real Bacalhau da Noruega” campaign of their competitor Retail-One, but considers it “too technical” to inform consumers in that way. Origin in terms of nationality of the raw material is, however, not what Retail-Three considers to be important. What is important is to get the bacalhau sold and keep the consumers satisfied. They experience the consumers to seem to think Norwegian bacalhau is the best quality. Consequently, the retail chain has started to treat ‘Bacalhau da Noruega’ as a reference to high quality bacalhau from the North Atlantic Sea, rather than a reference to the country of origin. This is, among other reasons, due to Norwegians also supplying bacalhau which is not of the best quality.

SecPro-Three is one of Retail-Three’s suppliers. The Portuguese secondary processor is aware of how Retail-Three uses the term ‘Bacalhau da Noruega’, but does not find it to be its business to intervene. SecPro-Three is the largest of the Portuguese secondary processors with an annual transformation capacity of 18,000 tonnes (Costa, undated). Half of this is sold to retail chains and independent supermarkets. SecPro-Three, itself, claims to sell everything based on *Gadus Morhua* as ‘Bacalhau da Noruega’, even though it purchases only approximately 30 per cent of the raw material from Norwegians. The argument is that it can not know for sure where it’s Icelandic, Norwegian or Russian suppliers have purchased the cod. In addition, it experiences most secondary processors to mix bacalhau of different national origins in the same way. It believes ‘Bacalhau da Noruega’ has become a generic term for all bacalhau based on *Gadus Morhua*.

SecPro-Three has been in business for decades and has built strong relationships with its suppliers, among others in Norway. It has invested money in its main suppliers’ plant(s) in (Alaska and) Russia, in addition to its own plant in Portugal. From whom of its suppliers it purchases, however, varies with the price. Opposed to most competitors, to make sure it is supplied the absolute best cod, it pays its suppliers in advance. In addition, its quality control is very strict. SecPro-Three makes its orders by phone, but does always have a representative to control the fish at the point of purchase. From the contract is written to the fish is onboard the transporting truck or vessel, this representative does not sleep but guard the fish until it is loaded. When onboard, the cod is re-checked to be 100 per cent sure it is the same fish. These activities are partly a result of bad experiences with the various tricks of the business.

The business actors who supply SecPro-Three, with frozen cod or salt fish, purchase cod from primary processors. When not supplying SecPro-Three, these producers supply Norwegian customers, among others, whom export it further as ‘Bacalhau da Noruega’ (included in the numbers of Figure 3). Other times, as SecPro-Three bases its bacalhau on a

frozen raw material, it buys from the sea fleet in Norway or Russia. The sea fleet can spend up to eight weeks at sea before landing. Their hunting and catching are regulated and controlled by cod stock managers through various activities. One of the cod stock managers' activities is to make annual agreements of quotas in each other's territories (www.fisheries.no, 2006a). For instance, the Norwegian government controls and regulates "one of the few remaining cod stocks in a reasonably good condition" (www.fisheries.no, 2007a). Ninety per cent of this cod stock, however, travels between Norwegian, foreign and international sea territories (Ot.prp. nr.98 (2005-2006): no. 2.1). Consequently, one particular cod could be caught by a Russian primary processor or a Norwegian primary processor in their respective nation's sea territory, dependent of that cod's travelling. Furthermore, as the governments exchange quotas in each other's sea territories, one particular cod can also be caught by a Russian primary processor in Norwegian territory, just as well as by a Norwegian primary processor in Russian territory. An Icelandic primary processor could catch the same cod in either Icelandic or Norwegian sea territories, due to the cod's travelling and the vessel's quotas.

Cod stock managers regulate fishing through quotas, controls and by making annual agreements of quotas in each other's territories (www.fisheries.no, 2006a). The sea fleet receives geographically dependent quotas. In addition, they store origin-details on their computers. They use WinCatch (www.wincatch.com), GPS and similar systems to store information about the date, length of catching time, location etc. Each catch is given a number. The numbers are, however, only used when the trawler receives complaints from their customers, or similar. The primary processors' activities represent a guarantee of traceable origin, but a problem occurs if the cod is traded later on, and its origin information is lost. The frozen cod is not packed and thereby has no origin information attached to it (e.g., Lynum, 2003:212; confer with Legislation, 2001:§8-7 no.2).

In this sub-structure, the main actors have a direct interaction and full control with their purchases' origin. The example illustrates business actors supplying all bacalhau based on *Gadus Morhua* as 'Bacalhau da Noruega', as a reference to high quality bacalhau, also when knowing the bacalhau does not origin from Norway.

Case 4: traceable output

The fourth and final activity sub-structure consists of a Portuguese independent supermarket, a Portuguese secondary wholesaler, a Portuguese primary wholesaler, a Norwegian secondary spot processor renting production capacity at other Norwegian secondary processors, various Norwegian intermediaries, various primary processors, and potentially various cod stock managers. This fourth example is marked by its main activities' partly independence. The involved actors control the origin and object of their supply, but not that of their purchase.

The retail chains have approximately 80 per cent market share for bacalhau (TNS, 2005a). Retail-Four in Porto is one of the few remaining independent supermarkets, which now are most commonly found in villages and smaller towns. According to the owner, consumers know that bacalhau from Norway represents good quality, so the shop sell bacalhau from Iceland as 'Bacalhau da Noruega'. If they had not done this, it would not have been able to sell Icelandic bacalhau.

The owner of Retail-Four estimates that 90 per cent of his bacalhau customers do not know how to choose between bacalhau qualities. This is supported by a blind-test study, concluding there is little connection between consumers' meal experiences and the way that they consider the bacalhau at the point of purchase (Østli and Heide, 2004:59). They can first tell the quality after cooking, so to secure a good quality they shop at the independent supermarket and not at any of the retail chains. They trust that Retail-Four provides them

with good quality. Consequently, the retailer sells Icelandic bacalhau as 'Bacalhau da Noruega'. This is also supported by the agent of SecPro-One, saying that the Icelandic bacalhau both got a better reputation (among business actors) and keeps a higher standard than the Norwegian.

Retail-Four has three Portuguese wholesalers supplying it with bacalhau. One of these is Wholesale-FourA. Opposed to the other two, whose bacalhau is dried in Portugal, the retailer experiences all Wholesale-FourA's bacalhau to be dried in Norway. Furthermore, Retail-Four experiences Wholesale-FourA's bacalhau to have a much better quality, and most of the time also to have a much better price. The independent supermarket only returns bacalhau, due to unsatisfying quality, two to three times annually. Retail-Four does not know who Wholesale-FourA's suppliers are.

Wholesale-FourA has approximately 400 customers, of which 20 per cent represent a large share of its sales. The owner has seen that some of his customers sell Icelandic bacalhau as 'Bacalhau da Noruega', but he considers it to be none of his business. His customers ask specifically for Icelandic origin bacalhau, even it is more expensive, as they think it looks better than the Norwegian. Wholesale-FourA experiences, for example, the Norwegian bacalhau not to be washed when it arrives. Consequently, it purchases 70 to 80 per cent from a producer who process and transform bacalhau bought from Iceland, mind it does not know who that supplier's suppliers are.

Wholesale-FourB is Wholesale-FourA's only supplier of Norwegian bacalhau. Wholesale-FourB is an importing wholesaler, with its own distribution via car and three trucks, in the north of Portugal. It has 112 customers in total, of which 50 per cent stable and returning on a regular basis, while 50 per cent varying. Five to six of the clients account for about 40 per cent of the volume, of which Wholesale-FourA is one.

Wholesale-FourB purchase 70 per cent from Norway and 30 per cent from Iceland. The Norwegian secondary processor SecPro-FourA is a central supplier. The owner of Wholesale-FourB and the owner of SecPro-FourA have a close personal, as well as a close business, relationship. Bacalhau in Wholesale-FourB's own packaging are only from Iceland. The Norwegian bacalhau is in SecPro-FourA's – or the other suppliers' – own labeled packaging. The bacalhau is always landed at Wholesale-FourB for inspection and quality control before continuing to the customers.

SecPro-FourA exports 20 to 25 per cent of its total to Portugal, which constitute 500 to 600 tonnes annually. Wholesale-FourB is its only bacalhau customer in Portugal. SecPro-FourA knows where all its 'output' ends up, for example that all the Norwegian bacalhau at Retail-Four is supplied by it via Wholesale-FourB and Wholesale-FourA. It is in regular touch with Wholesale-FourB's main customer, Wholesale-FourA, on a personal / social level. The owner of SecPro-FourA is the only among his suppliers' suppliers the owner of Wholesale-FourA has met.

SecPro-FourA is a secondary spot processor. Compared to volume processors, spot processors are unable to make long-term purchase and supply plans. Their limited economy, processing facilities and access to raw material makes them unable to supply a steady volume at a set price. As a spot processor, SecPro-FourA does not own a production plant, but rents production capacity at three other secondary processors. It has several year long and tight relationships with all of them. One fourth of its bacalhau going to Portugal is, for example, produced at SecPro-FourB.

Ten larger and smaller Norwegian business actors supply SecPro-FourA on a regular basis, in addition to sporadic offers of interest. Because of the relationships' character, it does not always inspect the cod itself upon arrival. When it purchases, it is supplied directly to one of its three cooperating production plants, and they control the cod on SecPro-FourA's behalves. If they find faults with it, it trusts them to always let it know. It purchases 60 to 70

per cent as fresh or frozen cod, which it arranges the processing of. The remaining, it purchases as ready produced bacalhau to complete orders from its customers.

SecPro-FourA's bacalhau origin from various sources, but is all based on *Gadus Morhua*. In the season it is supplied by the Norwegian coastal fleet. Else it is supplied by the Norwegian sea fleet, together with other countries' sea fleets, regulated by both the Norwegian or other countries' governments.

This sub-structure represents a traditional structure consisting of many smaller actors. The involved actors' activities are well integrated concerning their output, but do not necessarily know where it comes from. The example illustrates business actors supplying all bacalhau based on *Gadus Morhua* as 'Bacalhau da Noruega', as a reference to high quality bacalhau, when they do not know where it origin from or positively knows it is not from Norway. The easiness of mixing different origins could, however, possibly been prevented or limited through the social bonds on which the interaction between the main actors are funded.

DISCUSSION

I have described the traceability in the activity structure for bacalhau in Portugal, and identified a mismatch between the volumes of bacalhau exported from Norway versus the volumes sold as 'Bacalhau da Noruega' in Portugal. In this section, I will discuss the important features in this traceability in relation to the literature, highlighting the effects on the actors embedded in the network.

The literature...

The four empirical case studies revealed the complexity of the Norwegian-Portuguese bacalhau network, and its various definitions of 'Bacalhau da Noruega'. Differences representing four extreme points in the involved business actors' control with their output and input were uncovered.

There seems to have become a worked in view among many business actors to define 'Bacalhau da Noruega' as a certain quality of *Gadus Morhua*, at least towards consumers. This indicates a challenge in altering this present use of the term 'Bacalhau da Noruega'. A solution could be to establish a clear 'pure' alternative. The increased annual sales of Retail-One's and SecPro-One's promotion of "the real Bacalhau da Noruega" indicate that consumers want a 'pure' and traceable 'Bacalhau da Noruega' alternative. An not company specific 'pure' alternative, could be performed by individual tagging, as tags can not be separated from the bacalhau in the same way as, for example, information stickers on the transportation cartons can. A tag makes mixing origins very difficult, as it, for example, hinders retailers to deliberately sell Icelandic bacalhau as Norwegian.

The fishermen's sales organizations that control all landed cod entering the bacalhau industry could certify it with a tag stating "Caught by Norwegians in Norwegian waters". Likewise, the Norwegian cod stock manager could certify the cod with a tag that includes, for example, the national coat of arms, the identification number of the quota and a text about how the cod is caught in a way that is naturally sustainable. The latter could also help to counter IUU-fishing. Tagging the cod in this way could then be linked to the secondary processors' activities, if necessary, to ensure that the tags survive the salting and drying procedures. Concerning the secondary processors' salting and drying, there should at least also be a tag stating what Norwegian secondary processor, and at what production plant, the drying of the cod was performed. This could, for example, be controlled through their report of export, which the export tax is based on.

To simplify the communication to consumers, these three tags could, for example, all be bright red and contain the numbers one, two or three. Red tag with a large “1”, in addition to the explaining text, represents the Norwegian cod stock manager’s guarantee of its origin. Red tag with a large “2”, in addition to the explaining text, represents the Norwegian primary processors’ and the fishermen’s sales organisations’ guarantee of its origin. Finally, red tag with a large “3”, in addition to the explaining text, represents the Norwegian secondary processors guarantee of it being salted and dried in Norway.

CONCLUSION

This article, gives strong empirical evidence...

There is a significant gap between what is exported from Norway, and what is actually sold as Norwegian(, and what is actually produced in Norway). At the present situation, however, the dominating share of both Norwegian and Portuguese business actors treats ‘Bacalhau da Noruega’ as a reference to a certain quality of *Gadus Morhua*. Alternatively, they consider it a reference to their own definition of how much of the production activities that must take place in Norway for the bacalhau to have a Norwegian origin. In the Norwegian-Portuguese bacalhau network, at the present, ‘Bacalhau da Noruega’ is not a question of country of origin, but a question of definition.

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