



NOVELBALTIC

Market driven authentic non-timber forest products from the Baltic Sea region

Market driven authentic Non-Timber Forest Products
from the Baltic Region – focus on wild and semi-
cultivated species with business potential

Project acronym: NovelBaltic

Traceability report



1. Introduction

One way to build consumers trust on the food market, and the manufacturers of the food, is to make sure that the chain of production all the way from the collection of raw materials till the end products is both transparent and systematic. An important part of the transparency is the ability to trace the used raw materials back to their origins through the chain of processing. Product traceability is a fundamental factor in the food sector as it makes consumers feel safer by providing information on where food comes from. After numerous food scandals, especially the horse meat scandal in 2013, consumers have expressed concerns about food origin and the authenticity of ingredients. Food fraud is a common issue, and according to Bitzios et al. (2017), customers are concerned about food safety, quality, and adulteration. These concerns largely fall under the traceability of food products and can be seen as drivers for it - the key driver for traceability being food safety. Moreover, extrinsic cues that provide information on food origin can be seen as an indicator for product quality by consumers, knowledge on food origin may produce a positive perception towards foodstuffs and increase consumers' willingness to pay (Grunert 2005, Stefani et al. 2006). Thus, besides safety issues related to foodstuffs, the use of indications on geographical origin and product traceability may tell of product quality and could allow producers to sell their products at a premium price.

The false use of geographical cues can be detrimental to both consumers and producers. Within the European Union, the EU General Food Law 2002 Article 18 (EU 2002) sets requirements for food traceability. For example, recital 28 of the aforementioned article states that "Experience has shown that the functioning of the internal market in food or feed can be jeopardized where it is impossible to trace food and feed. It is therefore necessary to establish a comprehensive system of traceability within food and feed businesses". However, even though the EU legislation is quite definitive, its requirements have been criticized for being inadequate support robust traceability. For example, within Article 18, traceability is defined as "the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution". However, as pointed out by Badia-Melis et al. (2015), Olsen & Borit (2013), and Ragattieri et al. (2007), while this definition is quite detailed, it doesn't include information on what exactly is traced and how traceability is implemented in practice. For this reason, some companies have devised their own systems for traceability.

Additional cues, such as the "Hyvää Suomesta" ("good from Finland") label (Figure 1), have been devised in order to inform consumers that raw materials are of certain origin. The "Hyvää Suomesta" label is used to indicate that the raw materials within a product come from Finland. The label is managed by Ruokatieto Yhdistys ry and its purpose is to give customers a trustworthy indication on the fact that raw materials are of Finnish origin. The label is voluntary, but to be worthy of it, certain criteria have to be fulfilled: products have to be manufactured and packed in Finland, and the ingredients must be at least 75% of Finnish origin (Ruokatieto Yhdistys ry 2019). Companies using the "Hyvää Suomesta" label on their products are subject to product auditing every three years. Another example of a label proving the origin of products is the "Nyt Norge" ("enjoy Norway") label (Figure 1) used in Norway (Nyt Norge 2019). To be qualified to use this label, raw materials used in products have to be of Norwegian origin and products derived from these raw materials manufactured in Norway. These labels, and the related auditing, enforce producers to provide more detailed information on the origin of their raw materials.



Figure 1. The “Hyvää Suomesta” and “Nyt Norge” labels

Organic food production, as a certified production method, aims at more sustainable and environmentally safe natural resource management as well as providing healthier food to consumers. In the European Union, the Council Regulation (EC) No 834/2007 (EU 2007) and Commission Regulation (EC) No 889/2008 (EU 2008) lay down the minimum requirements for organic production. Products fulfilling the requirements for organic production and processing are eligible to use a label (Figure 2) on the products to indicate that the raw materials are of organic origin. Areas from which organic raw materials are harvested have to be certified, and according to the EU legislation (EU 2008), organic producers are subject to auditing once every year. Because of this, producers of organic products are required to provide detailed information on the origin of their raw materials.



Figure 2. The European Union organic logo

The purpose of this study was to find out how traceability systems work in practice. We were most interested in what happens in the early stages, during the collection of material, how the material is marked, and whether the information on exact origin is retained all the way till the end products. This is important since the development of sophisticated authenticity methodology is impossible without this knowledge.

2. Implementation

Information on the traceability systems for raw materials used by NTFP companies in the Baltic states, Finland, and Norway was collected by direct contacts either via phone or e-mail, and by using a short questionnaire specifically prepared for this purpose. The English form of the questionnaire is presented in appendix I. Ultimately, information was gathered from a total of 19 companies. Of these, 9 were from Finland, 5 from Latvia, 2 from Lithuania, and 3 from Norway. Most of the companies fall

under the size of microenterprises and small enterprises (1 to 49 employees) but included are a few medium-sized enterprises (50 to 249 employees) as well. Majority of the inquired companies deal with wild berries, such as bilberry (*Vaccinium myrtillus* L.), lingonberry (*Vaccinium vitis-idaea*), sea buckthorn (*Hippophaë rhamnoides*), cranberry (*Vaccinium oxycoccos*), cloudberry (*Rubus chamaemorus*), and crowberry (*Empetrum nigrum*). However, besides wild berries, some companies focus on herbaceous species such as yarrow (*Achillea millefolium*) and nettle (*Urtica dioica*), and material harvested from trees, including pine bark extracts (*Pinus sylvestris*), birch (*Betula*) sap, and Norway spruce (*Picea abies* [L.] H. Karst.) spring growth, as well as mushrooms. By default, the information collected was defined confidential, and thus, no names of the companies will be published within this report.

3. Results

Information on raw material origin

The companies' knowledge on raw material origin and its traceability at the very early stages of production depends on whether they collect raw materials by themselves or whether the raw materials used in their products are provided by suppliers. In the former case, it is generally known where the raw materials are collected, especially if the material is collected from areas certified as organic. In Finland, for example, the certified areas are monitored and checked at least once a year to see if they fulfill the criteria of being organic. Collection areas besides organic are generally known and selected beforehand, and in most cases, collectors are given maps to guide them to these areas. A common practice is to give the collections a running batch number which can then be followed through the chain of later processing and can be connected to the collector or location. In the case of raw materials received from suppliers, origin traceability is left in the hands of the supplier. Consignment notes for raw material deliveries and batch numbers for different collections, if available, are provided, but the traceability information contained within them depends on the supplier and do not necessarily have information on the exact origin of the raw material(s). In some cases, the information on origin traceability is limited to the name of the collector. Furthermore, in some cases, especially when raw materials are transported in bigger quantities, multiple collections are mixed, and the information on exact origin may be lost. The information may be, however, retained at the level of region because the supplier can tell, based on collection dates, where the raw materials were collected at a specific time period. Most of the companies inquired get their raw materials through suppliers (Table 1).

More reason for keeping detailed information on the origin of collected raw materials comes from the fact that companies in northern Finland can apply for storage support money from the Centre for Economic Development, Transport and the Environment in case they acquire and can provide exact information on origin. Moreover, if the final product is given the "Hyvää Suomesta" label, the producer has to be able to prove that the raw materials are collected from Finland. Also, some companies need to ensure the high quality of their products, and thus need to be able to track materials to their exact origins in the case of quality deflections. In general, the bigger the company, more is put into the origin traceability of used raw materials both for consumer trust, marketing, and food safety. For one small enterprise case, the only information the producer has on raw material origin, is the name of the supplier. In another case, a sophisticated system for origin traceability is under development. This system would include the exact coordinates for every collection site and the information on raw material origin could be accessed by the customer based on an identifier in the

product packaging. In some cases, no information on exact origin is maintained because the collection of raw materials is limited to a small area within a single municipality and there is no need for extensive systems. Also, in some cases, the information on exact origin could be retained, but would be too laborious, and moreover, is not seen as very fundamental. When it comes to information on exact origin, some companies are satisfied if they can tell that their raw materials come from, for example, Lapland, and can be marketed as such.

Raw material traceability

In almost all cases, the raw materials can be traced back to their origins at the municipality level, or at least indicate a region (such as province) from which the material has been collected (Table 1). However, in many cases, especially when materials are collected by the companies themselves, it is possible to trace raw materials back to their exact collection sites (including coordinates). In some cases when companies have to rely on information provided by their suppliers, knowledge given on the origin is only approximate or not known except from which country materials come from. Further processing of the raw material, even those done by subcontractors, all the way till the end product, can be traced through batch numbers in a “one step forward and one step backward” fashion according to the EU legislation. It is at these later stages, however, when information on the exact origin may be lost due to the combining of different collections.

In a very few cases, information on raw material origin is not mentioned in product packaging at all (Table 1). This is, for example, because companies are doing only business-to-business and origin information is not relevant, or because raw material origin is not seen valuable for marketing. However, in almost all cases, the information on raw material origin provided on the product packaging, is on country level, and in cases where material origin is not specified, at least a batch number is presented. The batch number included in the final products is either a specific batch number is given to each batch or, as it is in most cases, the best before date which serves as a traceable batch number. It can be set, for example, to a date one year after production, and therefore contains information on batches produced on that specific date. However, not in all cases does this batch number allow to trace the raw materials used back to their origin. In addition to information on origin, products may contain, for example, the “Hyvää Suomesta” label, or a label indicating that the raw materials used are organic. Additional information provided in product packaging may include a mention that the product is local. However, based on this study, the information provided is the country of origin, or not stated. In some cases, information on the region of origin is included in the company and/or product name (e.g. Lapland, or arctic).

While batch numbers on product labels may allow to trace the used raw materials back to their origins, this information may be lost if different batches of raw materials are mixed at some point during production. According to the survey, some companies keep different collections separate through the whole chain of production and produce only one batch from a single batch of raw materials (Table 1). In the case of multiple collections used and mixed at some point, the traceability of every individual collection depends on the company. Out of the 19 companies included in the survey, four do not mix their batches at all, 11 provide traceability information even for mixed batches, and only four companies do not provide traceability for mixed batches. However, in some cases, materials are collected from such a small area that they are practically traceable. Based on the survey, if information is not retained until the end product, it is not seen as important. One of the Finnish companies stated that the country of origin is mentioned only if it is Finland. In a few cases, the only information on origin provided for customers in product packaging is a batch number which can be used to access further information if needed.

Availability of recorded traceability information

The information on raw material origin and its traceability is by default, in every case, only accessible by people working in the companies, and in some cases, subcontractors (such as suppliers). However, this information is available to officials, such as inspection bodies, upon auditions, and even customers on request. Customers might, for example, complain about bad quality, or want to know the origin of the raw materials in the products. The archiving time for information on raw material origin and its way through the stages of production within the companies inquired ranges from one year to indefinite. Nine out of 19 companies keep the information for five years or more, whereas only four companies store the information for less than two years (Table 1).

Table 1. Summary of traceability information

Raw material acquisition:	Own collection	32 %
	Supplied	68 %
Batch no. for raw material origin:	Yes	74 %
	No	26 %
Traceability level:	Exact location	42 %
	Municipality	42 %
	Country	16 %
Origin information on packaging	Country	58 %
	Local	5 %
	None	37 %
Raw material batches mixed:	Yes	79 %
	No	21 %
Mixed batches traceable separately:	Yes	73 %
	No	27 %
Time of traceability data storage:	Less than two years	21 %
	Two to four years	32 %
	Five years or more	47 %

4. Conclusions

Based on this study, the traceability of raw materials through the chain of production in NTFP companies, in all countries, is according to the EU legislation, and follows the ‘one step forward – one step back principle’ by using batch numbers which are traceable at least till the supplier of raw materials. However, traceability information on the exact origin of raw materials ranged, depending on the company and the way of raw material acquisition, from very thorough information on exact location, to seriously limited. In the best case, raw materials are collected, a batch number is given to every single collection, these numbers can be followed all the way through the chain of processing, and ultimately, the end product is given a final batch number which includes traceability information on all the collections put into that final batch. Even if the collections get mixed along the chain of production and go through subcontractors, information regarding their origin is retained. In the worst case, companies do not know where their raw materials come from exactly, but even in cases with the least knowledge, raw material origin is known on at least country level, and more information may be available from the supplier(s).

A curious observation is that while the information on exact origin would be available, it is not marked on product packaging, and therefore, for example, the locality of the products is not necessarily advertised. The reasons behind this are that it is not seen as important and not required by legislation. Moreover, country of origin can be a vague expression as it may indicate the country in

which the last major stage of processing has occurred. Nevertheless, for the consumer, this small piece of extra information could be meaningful, especially if the real origin of raw materials can be proven. However, according to Olsen & Borit (2013, 2018), more elaborate traceability systems would be needed in order to have “true” traceability for raw materials.

In general, there is very little information on how the EU legislation on traceability is implemented in practice, especially related to plant-based products. Thus, this report provides insight to this scarcely studied matter. Furthermore, based on the collected information, it is possible to acquire products with exact origin traceability to be used in the development of authenticity analyses.

5. References

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Questionnaire on traceability (origin)

For trade organizations / companies acting in non-timber forest product (NTFP) sector (with wild or semi-cultivated berries, plants, mushrooms etc.)

- Name of company/trade organization
- Contact person
- Contact details

How traceability is defined?

The EU General Food Law (EU, 2002) defines traceability as “The ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution”.

According to Olsen and Borit (2013), traceability should be defined as “The ability to access any or all information relating to that which is under consideration, throughout its entire life cycle, by means of recorded identifications”. They also state that “It is the recording of information, and the giving access to the recorded information that constitutes traceability”.

In the NovelBaltic project, we are most interested in the origin of plant materials used, and the possibility to trace this material back to its origin. Our focus is in developing methodology for the determination of both NTFP authenticity and quality.

Questions regarding the traceability (origin) of materials:

1. How thorough information you have on the origin of raw materials used in your products:
 - a. Do you (or your supplier) keep track of the exact collection sites/areas?
 - b. Do you (or your supplier) have, for example, a unit identification system or numbering scheme for sample origin identification (which can be followed till the final product and back)?
2. How can the origin of the products be tracked:
 - a. If exact location is not known, to what level is it possible to trace back the material? Is it possible to track the materials at country/municipality level or do you have more detailed information (e.g. coordinates for collection sites)?
 - b. What kind of follow-up systems do you have for tracking the origin (and subsequent stages) of the product, e.g. sophisticated computerized systems / forms / identifiers?
 - c. In product packaging, do you provide information to the customer related to the origin of materials used, and if, how detailed?

d. If collections from different sites are mixed in the end product, is it possible to track these collections individually back to their origin?

3. Availability of recorded information:

- a. Is the information on the origin and traceability available, and who can access it?
- b. For how long do you keep the information?

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The information collected through this questionnaire will be used in a review of traceability within the EU project NovelBaltic. The names of companies / organizations are confidential and will not be published in the review unless given permission.

