

# The Food Value chain of Oat in Belgium

## CROPDIVA – 5.1

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# 1. THE VALUE CHAIN OF OAT IN BELGIUM

## 1.1 Oat in Belgium

Oat (*Avena sativa*) is a species of cereal grain grown for its seed. While it is often produced for feed, it also has quite some potential for human consumption with for instance a growing market of oat drinks as a plant-based alternative for milk (Morahan, 2022). Despite this potential, oats are only marginally produced in Belgium, with a total cultivated area of 3,860 ha in 2019 which corresponds to about of 0.5% of the total arable land in the country (FAOSTAT, 2019). Considering a production of 20,170 MT in 2019, the country's succeeding yield of oats was 52,254 hg/ha. In the same year, a large amount of oats was imported in Belgium, approximately 150,273 MT. However, looking over the last 15 years of oat production in Belgium, it is clear that production trends are declining steadily. For example, it is evident from Figure 1 that only about 20,000 MT of oats were produced from 2016-2020 on average, a stark difference from the previous decade.

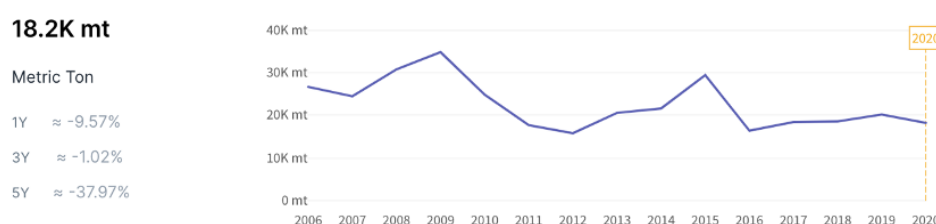


Figure 1: Production trends of oats in Belgium, 2016-2020 (Tridge.com, based on FAO data, n.d.)

While the production trends of oats in Belgium are generally declining, a more niche area of organic oat production seems to be thriving. In Belgian farmlands, a doubling of total production value and acreage was observed for organic oats from 2012-2016, amounting to around 1,000 ha of land and 2,620 MT of the product (Statista, 2020). Through the years, these values have steadily increased, and in 2020, organic oat acreage in Belgium amounted to 1,500 ha (Timmermans & Van Belleghem, 2021). However, it should be mentioned that this niche production is mainly located in the Wallonia region of the country, with an acreage share of around 1,405 ha compared to only 45 ha of organic oats in Flanders for 2020 (Beaudelot et al., 2022).

Oats are rarely used for food consumption in Belgium as FAOSTAT (2019) estimates that only 0.2 kg of oats per capita were consumed in 2018. Oats are mainly used for the production of bakery products in Belgium, such as cookies and granola bars, as well as in plant-based dairy alternatives, as discussed above (Whitehead, 2022). For instance, Alpro, a brand subsidiary of Danone, is a European market leader in these plant-based alternatives, and they originated from Belgium, with active production facilities within the country. Furthermore, there is also a growing interest among Belgian consumers in other oat-based beverages, even if historical production of these alternatives concentrated only on soy-based products and their derivatives (Biojournaal, 2020). Therefore, this rising market potential warrants a more in-depth mapping of the Belgian oat value chain. In line with the goals of CROPDIVA, oats can indeed give rise to food innovations, leading to more sustainable food production.

## 1.2 Results

### 1.2.1 Description of the oats value chain

The Belgian oats value chain is multi-layered, because of the different applications of oats after processing. The most traditional way of processing is dehushing and steaming oat groats after which these are rolled into flat flakes under heavy rollers followed by stabilization by being lightly toasted. This will lead to rolled oats, which are sometimes consumed by itself as breakfast or accompanied with for instance yogurt. These rolled oats can also be used in bakery products such as bread (and bread rolls) but also breakfast cereals (for instance granola) and cookies. Another way of processing oats is hydrolysis. Hydrolysed oats can be used for making a plant-based alternative to milk. The value chain of oats is listed in Figure 2.

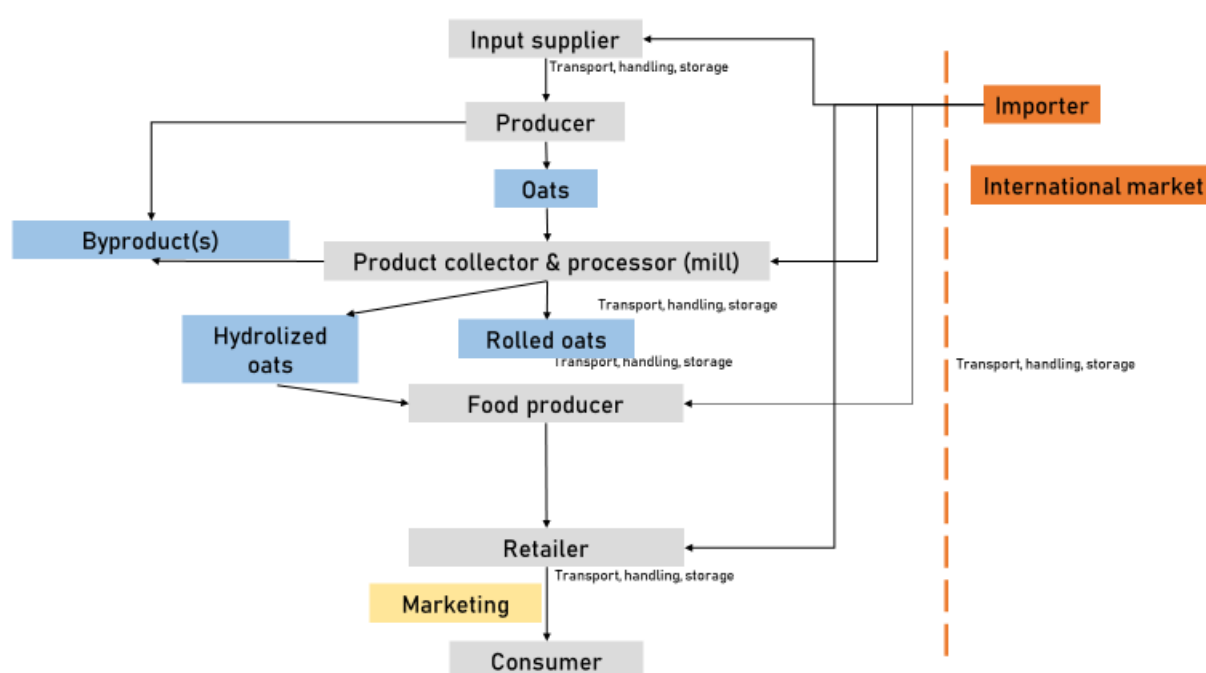


Figure 2: Oats value chain in Belgium

### 1.2.2 Overview of the interviews completed

In total, 10 interviews were performed to map the oats value chain in Belgium of which most of them were by phone while some took place by means of videoconferencing software (Zoom or MS Teams) depending on the preference of the interviewee. Most interviews were performed with persons involved in either collecting and/or processing of oats. These actions are often combined, which is why they were combined. Input suppliers for seeds, producers and especially food suppliers were more difficult to find and participate in this study. No information of retailers was obtained, especially as most products containing oats that are sold in Belgium are from the international market. One expert of the farmers' union was across the chain so this input has been integrated in several parts below.

Table 1 Overview of the number of interviews performed for each VC actor.

VC actor	Seed supplier	Farmers	Farmers association	Collector & processing	Food producer
Number of interviews	2	1	1	5	1

### 1.2.3 Seed suppliers

Given that the oats supply chain is rather marginal in Belgium, no relevant growers are present in Belgium. Few farmers sow oats in Belgium, therefore sales of oats from input supply is minimal. Oat is a cheap crop to grow with a low need for nitrogen input. It used to be grown on poor soils, but modern techniques make it possible to grow crops with higher yields as well on these soils. Oat is a vulnerable crop as the grains are not hulled and therefore not protected from weather dependent threats. If oats are sown in Flanders it is summer oat, only when other crops cannot be sown due to external factors. Winter oats are not sown in Belgium due to the low yields. Oat is a more popular crop in regions such as the UK and Finland, as horses who are the main target animal for oat based feed are more popular in these countries. When oats are sown, it is to use as feed for the farmer's own animals.

Oats offered by the input suppliers are mainly imported from the UK and Finland as the amount of oats that is grown in Belgium is not enough to produce feed. The lack of innovation in the oat crops result in low implementation possibilities. Usage of oats would be higher if yield would be higher and the crop would be economically feasible to produce in Belgium as it is a rather popular crop for human consumption.

### 1.2.4 Farmer

As mentioned in before, the production of oats by farmers in Belgium is rather a marginal phenom. The main reason is that the production of oats is less profitable than the production of other grains (such as wheat) for a large part of the country. The lower yields per hectare in combined with rather low market prices are unfavourable for farmers. The main production of oats is in the Condroz region of Belgium. Some farmers have a smaller production of oats, specifically to be used as feed for their own animals. Furthermore, as oats need to be treated (hydrothermal) during processing for food applications, it is a less convenient crop for short supply food chains as that requires investment in infrastructure for larger quantities.

Seeds are typically bought by seed suppliers and it is normally not difficult to get into the market. The production of oats is not seen as hard (it is considered as an undemanding crop in production). Harvested oats are typically bought by collection centres and mills. For the marketing conditions, the health benefits of the crop (high nutritional value) is mentioned and the fact that it can provide an additional flavour (although some consumers might need to get acquainted with that flavour first). The highest grown potential is seen in using oats for oats drink, as the higher price of these products might warrant also a higher price for produced oats. Also the potential of organic oats should be considered and the fact that oats has big potential for gluten-free diets.

### 1.2.5 Product collector & processor

Larger product collectors and processors mainly buy the oats (and its components like oat flawks) from international market (up to 90%, mainly neighbour countries Germany and France ) due to low local production. After processing, larger processors provide typically the oats products in a region of about 300 km so range from North of France, part of Germany, Luxemburg, Netherlands besides Belgium. The processing firms uses oat bran, oat flocks and milled oats. Oats are used as an addition to multiple grain mixes to achieve certain claims on their products. Bran and flocks are used as decoration in bread products. Milled oats are bought from a German supplier, as milling oats themselves is not economically efficient.

The suppliers of buckwheat to the processing firms are usually large companies in the market. Supply by small suppliers is avoided as they regularly don't comply with the quality standers larger milling and processing companies require, such as the presence of metal detection in triage, strict standards towards cross-contamination when working with allergens, BRC certification,... Having a constant quality of supplied products is described as something that might be a challenge sometimes, often the products (also when locally produced) don't meet the standards for the food industry which is why they could only be used as feed.

The processing firm supplies mainly to Belgian bakeries, either artisanal or industrial, or specialized biscuit processing firms who focus on integrating multiple grains into one product. In general in these types of products, oat flocks are present in a low amount. When oat is present in a higher concentration in a product, it is usually in the form of oat bran with (15-20% of the total product) to achieve certain claims towards the consumer. As such, oats are often used as partial replacement of wheat in for instance bread or cookies. The use of oat floaks is also something what consumers appreciate to see in some food products, it sees more natural and healthy according to some interviewed people. Also from a technological point of view, oats are interesting during baking products.

Another processing firms (but more on a small scale) buys their oats from a Belgian supplier, specialized in grain supply for human consumption. The flour mixes produced by the processing firm which contain oat distinct themselves by containing multiple grains, which is branded to the consumer as the healthier and more artisanal option. The processing firm uses oat in their complete form (flocks). Oats are familiar with consumers, such as in muesli and breakfast cereal and therefore are also easily accepted in bakery products. The processing firm supplies mainly to Belgian bakeries, either artisanal or industrial, or specialized biscuit processing firms.

For feed, oat is used in feed for cattle and horses. It contains high energy content and is used during reproduction periods as it should stimulate the fertility of the animals. As oat supplies such high energy content when implemented in feed, it is only used in limited periods in the year and therefore there is only a limited demand for the customers of the supplier.

### 1.2.6 Food producer

A food producer of breakfast cereals indicated that there is more and more interest of having baked oats in mixes of breakfast cereals. While oatmeal porridge is seen as more a traditional breakfast (even more old-fashioned by younger people), oats can be part of upcoming breakfast solutions for younger people as granola which is why they see a growing market for oats in the future. Besides that oats are interesting considering its nutritional composition, it has the advantage that it is gluten free. The oats

used by the food producer were processed locally and obtained from mills, but its origin was from abroad (German). They mention that supply is not a problem, but that quality checks are important based upon their experience. As the oats can easily be processed by the food producer with common knowledge, also machine manufacturers were mentioned as source of knowledge transfer. No entry barriers were mentioned to get into the market of oat foods, but they report that there is quite some pricing power from supermarkets when they want to get the products in their shelves.

## 1.3 Discussion

Based upon the interviews, it is clear that oats themselves are not a niche product but oats production in Belgium is. Oats are mainly used in bakery applications (incl. breakfast) but also as a plant-based alternative for milk. Oats are seen as an interesting and promising product, also for innovations in the bakery industry due to its nutritional composition and technological properties.

Oat production in Belgium is limited, especially in the Flanders. Main reason is that the cost-benefits is lower compared to the traditional production of wheat. The current shortages due the war in Ukraine even makes it even more interesting to produce wheat. When oat is produced in Belgium, this is mainly on soils which are more poor for example in the Condroz region where the production of wheat is less interesting.

From a consumer point of view, oats can be find in the shelves although mostly as part of bakery products (which makes them less visible) or as oat drinks as a plant-based alternative for milk. Better communication about the potential and benefits of oats to consumers (but also to food producers) might help to improve their uptake and increase demand.

### 1.3.1 Challenges and chances of the value chain

The interviewees were also asked to provide the most important challenges, strategies to undertake these challenges and potential & benefits for the actors in the oat VC chain. The outcome of their opinions is listed in Table 2 for each stage of the VC. The pricing, the yields of the oats varieties and potential applications and innovations are the most important issues within the Belgian oats VC.

*Table 2: Main challenges of the Belgian triticale value chain*

VC actor	3-5 main challenges (order: most important first)	Strategies undertaken/to undertake	Potential & benefits for the actor in the VC chain
<b>Seed supplier</b>	<ol style="list-style-type: none"> <li>1. Increase yields of varieties of oat</li> <li>2. Low use of oats in Belgium</li> <li>3. Seed quality</li> </ol>	<ol style="list-style-type: none"> <li>1. Investing in R&amp;D for local, high yield varieties</li> <li>2. Better promotion/communication with potential buyers</li> </ol>	<ol style="list-style-type: none"> <li>1. Oat production becomes more competitive in comparison to wheat production</li> </ol>
<b>Farmers</b>	<ol style="list-style-type: none"> <li>1. Price</li> <li>2. Higher quality oats, leading to</li> </ol>	<ol style="list-style-type: none"> <li>1. Providing more information to farmers</li> </ol>	<ol style="list-style-type: none"> <li>1. Potential higher production of oats in Belgium</li> </ol>

	better yield to the local conditions	2. More R&D into higher yield varieties	
<b>Food collection and processors</b>	1. Price 2. Quality of the raw materials 3. Standardisation of the raw materials	1. Research to provide more stable quality	1. More stable market
<b>Food producers</b>	1. New applications and innovation 2. Marketing of oat-based products	1. R&D for new applications and potential collaborations 2. Investment of marketing	1. Increased consumption of oat-based food products

### 1.3.2 Limitations

Several limitations should be mentioned. First, the VCA is qualitative from nature, so one should be cautious by generalizing the findings. Second, some VC actors were not willing to participate in the VCA which might impact the results. Third, novel developments might not be captured by this type of VCA. Participants for the VCA were recruited by on one hand desk research but on the other hand also snowballing. Nevertheless, we believe that the study delivers a valuable insight in the oat value chain in Belgium and it is known that few actors might be sufficient to deliver a realistic picture of a value chain.

## 1.4 Synthesis

Oat is not a new food product on the Belgian market, but raw oats are often associated with an old-fashioned breakfast meal. New products, e.g. oat-based drinks are gaining popularity mainly under younger vegans as an alternative for milk but these are often more costly. In general, oats are seen as healthy food products (e.g. due to its nutritional composition) but the oat production in Belgium is rather limited and mainly for feed purposes. The main challenge regarding oat lies its yield and the price farmers receive, which makes that it's often not competitive compared to the production of other crops such as wheat. The further development of the market should therefore focus in high yield varieties but also research to obtain more stable quality might be interesting. Further, some participants highlighted that also the marketing could be improved by promoting, more local oat, as a healthy food product for young and old persons.



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