

# The Food Value Chain of Oat in Czechia

## CROPDIVA – 5.1

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# 1. THE VALUE CHAIN OF OAT IN THE CZECH REPUBLIC

## 1.1 Oat in the Czech Republic

Oat represents in the context of Czech agriculture a minor crop. Oat in general takes up around 40-50 thousands of hectares of arable land (i.e. 3,5% of land dedicated to production of cereals in the Czech Republic). Oat production is fairly stable. Official statistics do not recognize specific varieties and thus figures include information on different forms of hull- as well hull-less varieties.

Spring varieties of oat are more suitable in the Czech Republic due to climate conditions (Moudrý 1993)

*Figure 1 Key statistics on oat production in the Czech Republic (MZe 2022)*

Year	2021/22
Land (thousands ha)	57,7
Yield (t/ha)	3,37
Production (thousands t)	194,7
Import (thousands t)	3,0
Domestic consumption (thousands t)	121,0
Food	30,0
Seeds	13,0
Feeds	75,0
Technical usage	3,0
Export (thousands t)	48,0

Oat used to be very important agricultural crop before the WWII. In those times, oat production took up 800 thousand hectares in the former Czechoslovakia.

If we take a look at the relative representation of cereals in Czech agriculture, we can see that wheat and barley take up around 85 % of arable land dedicated to cereals and represent mainstream cereal crops. However, oat (4%) is less common than corn (7%), but more popular than triticale (3%) or rye (2%) (MZe 2022).

In food processing sector, oat products represents create a niche market. Food products based on oat are important in the area of healthy diets and specific lifestyles. Oat products are becoming popular among consumers focused on gluten-free products and specific functional foods (offering positive impacts on human health).

## 1.2 Overview of the interviews completed

Primary data for the case study was collected through semi-standardized interviews with selected actors on each level of the value chain. Actors were sampled purposefully in order to collect the most relevant information on their experience and practices.

Interviews were conducted face to face or over telephone. This specifically included: 1 researcher, 1 breeder, 1 seed trader, 3 farmers, 4 processors and 5 retailers. Some actors were engaged in more than one process of the value chain. Overall there were interviewed 15 actors in 10 organization. With

respect to the extent of the study, the sample provided a baseline for generating saturated explanation of the case.

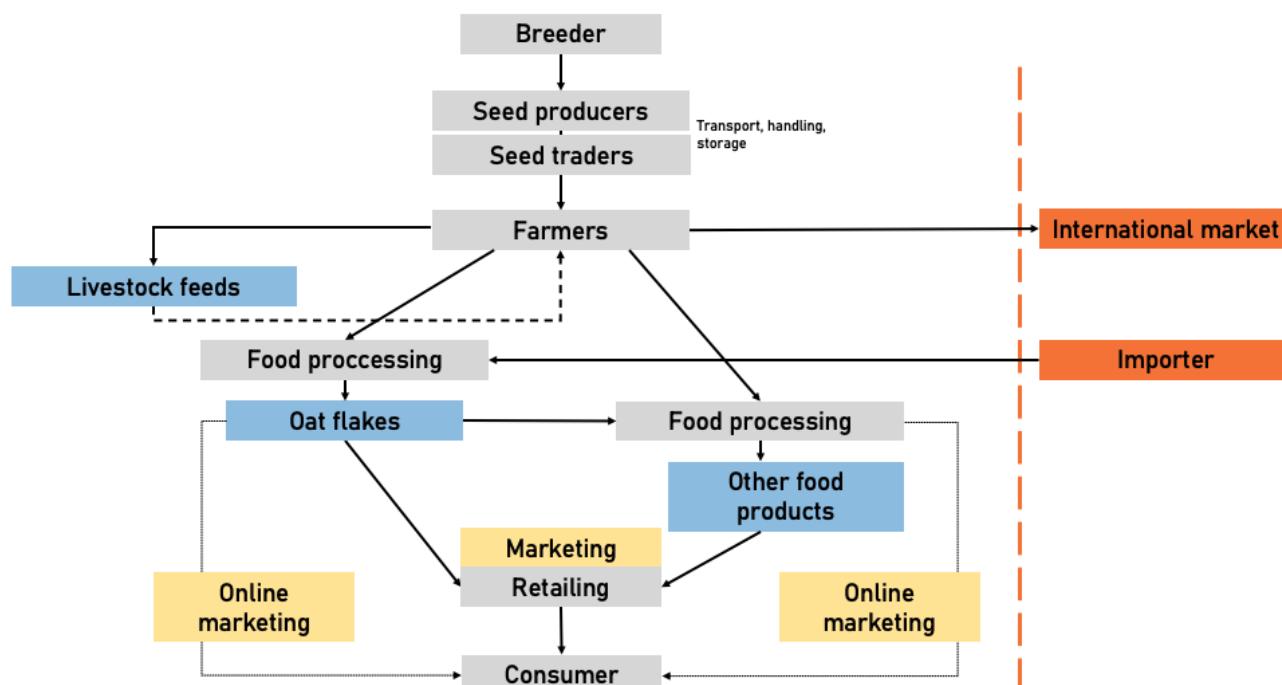
Figure 2 Number of interviews

VC actor	Input supplier	Producer	Collector	Processor	Retailer
Number of interviews	3	3	0	4	5

## 1.3 Results

### 1.3.1 Description of the oat value chain

The value chain for oat is fairly close to value chains existing in mainstream agricultural primary production and food sector. Seed producers operate closely with seed traders that create offers to farmers (primary production). Oat is used for different purposes. Majority of oat production (depending on specific varieties) is used for livestock feeding. One third of the production is processed for food. Core food product from oat are oat flakes. Oat flakes are sold as a final product – either by retailers or directly to consumers via e-commerce. Oat flakers are often sold for further processing. In this way they become a basis for other oat-based food products, such as muesli or granola. This part of the value chain includes a fairly large potential for development of new food products with unique qualities. Some of them are introduced in the study.



### 1.3.2 Researcher, breeders, seed producers

Breeding of oat in the Czech Republic was started in 1910s, in the times before the WWII there was available 36 varieties of oat, whereas in the year 1947 there were only 3 varieties (Čurn 1998). In 1960s there was registered a first variety of a Czech hull-less oat.

Most research projects in the Czech (dealing with oat as an agricultural crop) are dated in the past. Breeding experiments focus on improved breeds of oat that would have higher yields, be more resistant to pathogens and obtain improved qualities for food production.

Specific attention has been dedicated to varieties of hull-less oat, particularly by the breeding institute Selgen that has been engaged in a long-term breeding programme of hull-less oat varieties in the Czech Republic (Selgen 2022).

#### **VC capacities and organization**

The initial levels of the VC are organized in a standard way. Officially registered varieties of oat are offered by seed traders that produce seeds on their own or contract production of seeds on farms.

Central Institute for Supervising and Testing in Agriculture currently registers 20 varieties of *Avena sativa* L. and 10 varieties of *Avena Nuda* L. All varieties have been registered between the years 1998-2020 (ÚKZUZ 2021). Based on ongoing experiments and testing, the Ministry of Agriculture has short-listed 8 varieties of oat that are officially recommended to farmers, processors and seed growers with respect to yields, health conditions and technological qualities (ÚKZUZ 2022).

#### **Market conditions**

Seed traders offer oat in a standard way. The range of varieties is fairly broad and overall reflect an importance of this crop in Czech agriculture.

### 1.3.3 Producers

Oat is mainly produced in regions that have enough winter falls, lower temperatures in Summer and lower rainfalls in August. Such regions can be found in areas with higher elevation.

Arable land that is used for oat production in the Czech Republic has been growing (Figure 3). There is no official statistics that would show production volume for specific types of oat. However, a qualified estimates says that about 90% of the production are oat varieties with hulls and 10% production are varieties of naked oat (Zagata & Hrabák 2016).

*Figure 3 Number of hectares with oat in the Czech Republic (2016-2021)*

Year	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Land (thousand s ha)	37,6	44,1	42,8	42,5	46,7	57,7

Main advantage of oat is that it can be used for multiple purposes – fodder, hay (as a single crop in combination with others), or grains that can be used in animal or human diets. Currently it is mainly used for feeding livestock in Czech agriculture and therefore it does not continue in the VC into processing stage.

It has been mentioned by the interviewed farmers that oat has got important potential for crop rotation (since it can be positioned between two cereals). Production costs are generally more favourable in comparison to wheat, which requires intensive treatments during cultivation. The yields are lower than the yields of the mainstream cereals, however, profitability of the crop is adequate.

Most oat production in the Czech Republic (two thirds of the overall production) is used for livestock. In general, oat as a feed competes with wheat, whereas surplus of low quality wheat (suitable for feeding) decrease consumption of oat in livestock production. Market price of oat for feeding was in the year 2021 around 4.000 CZK/t (163 EUR/t).

### 1.3.4 Food processors and food producers

Food production utilizing oat does not have a long tradition in the Czech Republic and therefore consumers' demand for such products is relatively smaller than in other countries. International statistics show that oat consumption in Central-European countries (including Czechia) is around 0,4-0,8 kg per capita, while for example in Finland it is 20 kg per capita.

The most typical food products made of oat are (1) oat flakes, (2) flour and (3) whole grains.

Oat flakes is the major food product made of oat in the Czech Republic. Oat flakes belong among traditional food products in the Czech Republic. However, consumption of the oat flakes was fairly low before the year 1989. It is possible to notice a growing interest in this food product since that. The new demand is supported by consumers orientation towards healthy life-styles and overall 'turn to quality' in food sector. Oat flakes are important element in healthy breakfasts (raw flakes, granola and muesli). Major uptrend in this area has started in 1990s.

Currently there are three major producers of oat flakes in the Czech Republic. Major part of the oat flakes production is sold for direct consumption and the rest is sold for further procession (such as muesli, protein bars etc.). Market segment is developing quite slowly, however, there has emerged a few innovations that stand out as successful examples and interesting cases of successful marketing.

- Mixit – founded as a 'business project' by two university students in 2009 (Mixit 2022). Business model of this company is based on internet sale. Their strategy emphasizes distinct food quality, individuality of consumers and aesthetical aspects of food. Core idea is that customers can select and mix their own muesli from ingredients that are offered within online shop. The company did not want to provide too many details about their business model, however, the range of products is growing in time, as well as number of customers. What a more, their business model proved to be resilient enough during the pandemic of COVID-19.
- Semix – large food processing company founded in 1995, with about 230 employees, exporting to 35 countries all over the world (Semix 2022a). The company originally started business with producing bakery mixes and later on enlarged its food products. One of the latest innovations include a new food product called 'Ovsánek' (which can be translated to English as 'Oatie'). The product is based on fermented oat flakes made of germinated grains (. Such processing gives unique qualities to the product including lactose-free, gluten-free and suitable-for-vegans. The product is not available in organic quality. It was pointed out during the interviews that Czech consumers do not trust organic label enough to market the product in this way. Ovsánek is available only in the Czech Republic due to issue with logistics (it needs to be stored in cool and expiration time is quite limited). However, the company succeeded with enlisting the product in one of the major food retail chain stores in the Czech Republic (Lidl). In this way they managed to offer this product to mainstream Czech consumers.

Oat flour and oat whole grains (mentioned above) are made of hull-less varieties of oat. We did not pay specific attention to this segment in our case study. However, food products made of hull-less oat have a large potential for gluten-free diets. Particularly, oat flakes made of hull-less oat would be suitable for celiacs. According to the interviews, such innovation is condition by further technological development on the side of processors as well as increased consumers' demand.

### **1.3.5 Food sellers**

Food sellers are using 2-3 basic marketing channels. Oat flakes, that represent a fairly homogenous food product, are available in conventional retail chain stores. They are sold under different brands in various price ranges.

Oat flakes of higher quality (such as in organic quality or products of premium brands that are distinguished by consumers oriented on healthy lifestyle) are typically available in smaller food shops that are located on large cities all over the Czech Republic. Those shops often offer a wide range of products in organic quality. There is a fairly strong tradition of such shops particularly from the past time, when organic food products represented a small niche market and their availability in conventional super and hypermarkets was quite limited.

Thirdly, producers of oat products are often using direct sales particularly with the use of e-commerce. This trend is typical of highly innovative food products (such as Mixit) that fully utilizes potential of online sales and its popularity among young consumers. Online shops are also operated by large food processors that offer innovative food products in the premium segment of organic food products. The above mentioned example of Ovsánek (Oatie) does not match this context. The main reason is that the company is more oriented towards businesses (rather than consumers) and does not operate online shop.

## **1.4 Discussion**

Oat represents a minor crop within the Czech agriculture. However, it is the most mainstreamed crop from the set of underutilized crops that are objects of this research project.

Cultivation of oat has got a long tradition, although production of oat severely declined during the 20<sup>th</sup> century. Main reason is that oat was used as feed for livestock (and particularly horses that used to be more important in agriculture and transport before the WWII).

Two thirds of the oat production in the Czech Republic is used for feeding animals. Only one third is used in human diets. Key food products made of oat are oat flakes. Oat flakes are used for direct consumption as well as further processing and production of additional food products (such as protein bars or muesli).

Despite the fact that consumption of oat products in the Czech Republic is lower than in other Western-European countries, oat products are very well recognized by consumers. They keep a stable position among food products that are demanded by conscientious consumers oriented towards healthy lifestyles. Due to this position, oat products have a great potential for developing innovative food products based on oat. One example is Ovsánek (fermented oat flakes made of germinated oat).

### **1.4.1 Past challenges & successes of the value chain**

#### ***Breeding***

The range of oat varieties has significantly increased since 1990s. New interest in cultivation of oat has been supported by growing interest in functional food, organic farming and higher differentiation of oat varieties to fulfil specific production purposes. Main goals in breeding are currently oriented towards improving key qualities of the crop, such as yields and resistance towards pathogens. Czech Republic has got a long and successful breeding programme focused on hull-less oat.

#### ***Production***

There has been established a stable market for oat based on existing demand and exporting opportunities.

#### ***Processing***

Major processors of oat often integrate production in their business. Therefore they produce oat (on their farms) and process it (in mills and flake-production factories). Major processors of oat often cooperate with a fairly small number of suppliers. Such market governance resembles a oligopsony, however the reason for such formation is a preference for a long-term cooperation that would ensure stable and quality supply of the goods.

#### ***Food production***

Major food product made of oat (oat flakes) is widely available to consumers under many different brands. From one point of view the product is homogenous, on the other hand it offers many possibilities for market differentiation and development of new food products.

### **1.4.2 Current and foreseen challenges and chances of the value chain**

#### ***Enhancing process-based and product-based qualities***

Oat food products are appraised by consumers for their positive impacts on health. One of the ongoing challenges is to breed such varieties of oat that would bring higher yields and make oat cultivation more attractive for producers. Another challenge is to improve qualities and availability of hull-less varieties of oat that have got big potential for gluten-free diets. Preferences for healthy food products should be coupled with supply of crops in organic quality. Production of oat in organic quality and particularly facilities for processing oat in organic quality are at this moment very limited.

#### ***Increasing consumers' demand***

Looking at the international statistics on consumption, it is clear that consumption in the Czech Republic is not fully utilized. Main challenge is promotion and marketing of these products to make sure that consumers are capable of recognizing specific qualities of oat products and positive impacts on human health.

#### ***Valorisation of food products through innovation***

Examples mentioned in the study suggest that it is possible to increase consumers demand for oat-based food products through innovations. There were successfully launched new food products that are perfectly addressing consumers' needs for quality food products. The examples also show that in



certain contexts it is possible to successfully market an innovative product through mainstream retail chain stores.

VC actor	3-5 main challenges (order: most important first)	Strategies undertaken/to undertake	Potential & benefits for the actor in the VC chain	Remarks & implications
<b>Breeders</b>	<ol style="list-style-type: none"> <li>1. Increase yields of varieties of oat</li> <li>2. Increase resistance to pathogens</li> <li>3. Promote specific qualities of selected varieties of oat (namely hull-less oat)</li> </ol>	<ol style="list-style-type: none"> <li>1. Breeding goals are included in ongoing breeding programmes</li> <li>2. Ditto</li> <li>3. No specific strategy for supporting oat</li> </ol>	<ol style="list-style-type: none"> <li>1. Oat becomes more competitive in comparison to other cereals</li> <li>2. Higher potential for acknowledging specific qualities of oat varieties</li> <li>3. Increased demand on producers' side</li> </ol>	
<b>Farmers</b>	<ol style="list-style-type: none"> <li>1. Increase production of oat for human diets</li> <li>2. Increase production of oat in organic quality</li> </ol>	<ol style="list-style-type: none"> <li>1. Support information for farmers</li> </ol>	<ol style="list-style-type: none"> <li>1. Increased supply of oat for processors</li> <li>2. Opportunity for enlarging processing capacities (particularly in organic quality)</li> </ol>	
<b>Food producers</b>	<ol style="list-style-type: none"> <li>1. Innovative food products</li> <li>2. Marketing of the new food products</li> </ol>	<ol style="list-style-type: none"> <li>1. New demonstration and collaboration projects</li> <li>2. Innovative strategies in marketing</li> </ol>	<ol style="list-style-type: none"> <li>1. Increased demand for production of oat in agriculture</li> <li>2. Valorisation of food production through innovations</li> </ol>	
<b>Food Sellers</b>	<ol style="list-style-type: none"> <li>1. Provide more information to consumers (education)</li> <li>2. Marketing of the new food products</li> </ol>	<ol style="list-style-type: none"> <li>1. Investment in marketing</li> </ol>	<ol style="list-style-type: none"> <li>1. Increased consumers' demand for oat-based products</li> </ol>	

### 1.4.3 Limitations

The empirical study has followed a general guidelines prepared for the CROPDIVA project, Task 5.1. The case study research (Yin 2009) applied in this specific task is based on qualitative approach in social sciences. Main goal of the study is to provide a specific insights into relations, actors and their practices within the selected value chain. Main limitations are derived from the basic features of this type of research. Findings from the study can be generalized for understanding other cases that function in the same or similar context.

## 1.5 Synthesis

The value chain for oat is an example that is very close to mainstream cereal production and processing in agriculture and food processing sector. Oat has been traditionally produces and consumed in the Czech Republic, although the current level of production is only a fraction of the past figures. Two thirds of the oat production in the Czech Republic is used for livestock feeds, only one third is used for human diets. Consumption of oat-based food products is relatively small in comparison to Western-European countries. Due to high recognition of oat (as a crop that impact positively on human health) there is a huge potential of using oat in innovative food products. There are several examples that show such oat products can grow out of a niche and appeal to mainstream consumers.

## ANNEX

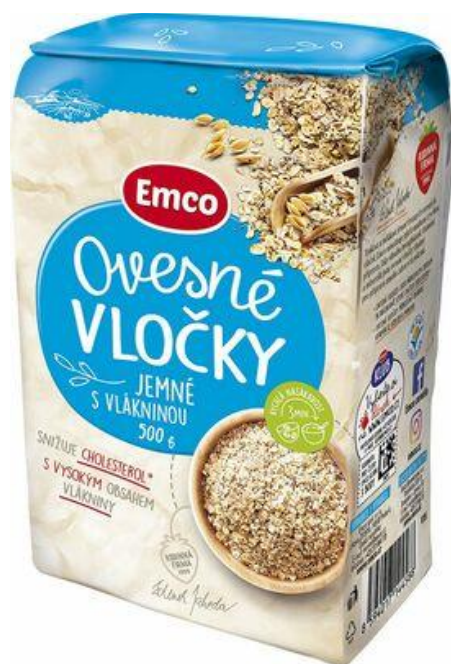
Figure 4 Presentation of the Mixit products (Source: Mixit 2022)



Figure 5 Presentation of 'Ovsánek' (Source: Semix 2022a)



Figure 6 Presentation of the oat flakes made by major Czech producer (Source: Emco 2022)



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