

# The Food Value Chain of Oat in Switzerland

## CROPDIVA – 5.1

### Deliverable Information

Title	<b>The Food Value Chain of Oat in Switzerland</b>
Deliverable number	<b>5.1</b>
WP number	<b>5</b>
Author(s)	<b>Solène Clémence, Alexander Zorn</b>
Lead beneficiary	<b>WBF (Agroscope)</b>
Type	R: Document, report
Dissemination Level	PU: Public
Due date	<b>June 2022</b>

### History of Changes

Version 1.0	Final version (29.06.2022)
-------------	----------------------------



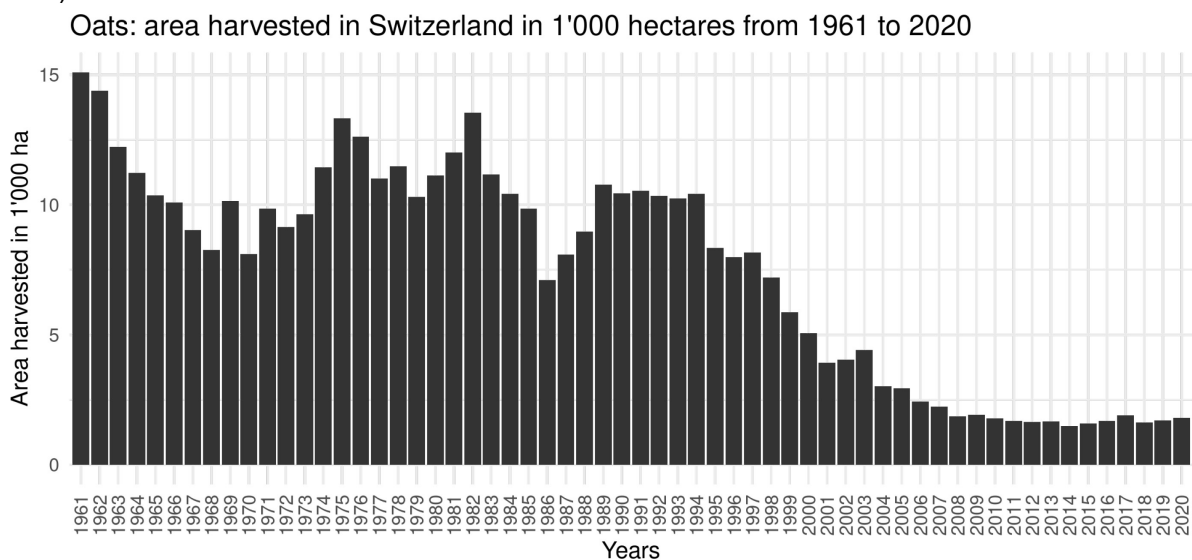
# CONTENTS

<b>1.</b>	<b>The FOOD value chain of oat in Switzerland</b>	<b>3</b>
1.1	Oat in Switzerland	3
1.2	Overview of the interviews completed	5
1.3	Results	5
1.3.1	Description of the oat food value chain	5
1.3.2	Input suppliers (Researchers, seed producers, seed traders)	6
1.3.3	Producers	8
1.3.4	Collection centres	9
1.3.5	Mill	9
1.3.6	Food processor	10
1.3.7	Retailers	12
1.4	Discussion	13
1.4.1	Past challenges & successes of the value chains	13
1.4.2	Current and foreseen challenges and chances of the value chains	14
1.4.3	Limitations	16
1.5	Synthesis	17
	References	17
	Annexe	19

# 1. THE FOOD VALUE CHAIN OF OAT IN SWITZERLAND

## 1.1 Oat in Switzerland

In Switzerland, as in Europe, the first proven traces of cultivated oats date back to the Iron Age (Jacomet, 2007). In the Roman Age, as well as in the Middle Ages, the cultivation of oats is also attested. Oats were a spring cereal in the rotation of the “three-field system”<sup>1</sup> (Jacomet, 2007). Descriptions of oats were made in the 16th century by Leonhart Fuchs, a physician and botanist, and by Jacob Theodor Tabernaemontanus, a physician, botanist and pharmacist (Schilperoord, 2016). Albrecht von Haller, a known 18th century researcher, was the first to describe different varieties of cereals (and oats) and the use and cultivation of oats in their<sup>2</sup> time (Haller, 1775, 1776, 1782). Used as horse feedstuff, oats were also eaten by humans in the form of porridge. Following Albrecht von Haller, Nicolas Charles Seringe, a French botanist who worked in Switzerland for several decades, also listed several varieties of oats, as well as their diseases such as oats smut and (probably crown) rust (Seringe, 1818).



Source: FAOStat (2022)

Figure 1. Area harvested for oats in Switzerland from 1961 to 2020. In 1'000 hectares.

Albert Volkart, a Swiss agronomist, described in 1912 the reasons for the decrease in the importance of cereal cultivation (and oat as well). One of the reasons was the increase in trade and the government principles that items necessary for everyday life (such as food) should be subject to the lowest possible tariff protection. Cheap imports made the sale of agricultural products unprofitable, decreasing cereals' cultivation in Switzerland (Schilperoord, 2016; Volkart, 1912). Rudolf Koblet, a Swiss crop scientist, explained in 1965 that the introduction of potatoes and the increase in animal food production decreased oats' importance in people's diet. Statistical evolution of oats cultivated area from 1961 to 2020 can be seen in figure 1. According to Koblet (1965), oats would remain as a feedstuff for animals. Afterwards, the importance of oats as feedstuffs decreased as well, due to the replacement of labour horses by machines. Table 1 shows the rather stable evolution of the area and yields for oats in Switzerland in recent years.

<sup>1</sup> The three-field system is a type of crop rotation where the land is divided into three plots. Two plots were planted with crops, the last one was left fallow. The fallow and crops were rotating between the plots.

<sup>2</sup> In this text, "their" is used as a singular gender-neutral third-person pronoun.

*Table 1. Area cultivated and yield of oat in Switzerland in recent years*

Year	2015	2016	2017	2018	2019	2020	2021
Cultivated area (ha)	1'556	1'684	1'899	1'628	1'713	1'793	1'905 <sup>a</sup>
Average yields (usable production divided by cultivated area) (kg/a)	49.0	42.2	53.8	50.7	56.3	49.7	- <sup>b</sup>

According to SBV (2017, 2020). <sup>a</sup> number for 2021 is an estimation (Agristat, 2021). <sup>b</sup> not available at the time of writing the report.

The history of oat varieties and breeding in Switzerland is complex and divided into several stages, summarised by Schilperoord (2016). At the beginning of the 20th century, selection was carried out in several places. Local varieties from Switzerland and cultivated varieties from abroad constituted the breeding materials. The foreign varieties were often heterogeneous, which made it possible to select individual plants and check whether they were suitable for cultivation in Switzerland. The varieties resulting from selection of local and foreign varieties in Switzerland were lost due to a progressive abandon of oat selection from 1930 until about World War II. The reason for abandoning oat selection is the decrease in oat cultivation and the import of foreign spring varieties, which were well adapted and provided good yields. However, some varieties had been sent abroad, many of them to the Vavilov Institute in St. Petersburg. Oats varieties were kept there and later, after the creation of the national Gene bank, were returned to Switzerland from 1998 to 2014. However, the origin of the returned varieties is not precisely known. We recommend reading Schilperoord (2016) to learn more about the history of oats in Switzerland.

At present, all varieties grown in Switzerland are of foreign origin, because there is no breeding done on oats in Switzerland. Oat seeds are produced by Swiss seed producers with the imported varieties. In Switzerland, oats have so far been grown mainly as feed grain. Within Swiss feed grain production, oats play a minor role compared to barley, triticale and wheat (Ramseyer et al., 2021). Swiss oat market is dominated by imports. On the oats feed market, imports represent around 80 % whereas on the oats food market, the share of imported oats is around 90 %. The most important exporting countries to Switzerland for oats are Finland and Germany, followed by France and Czech Republic (BAZG, 2022a). Table 2 summarises the importance of oats' importations in Switzerland, for both the feed and food sector.

*Table 2. Swiss importations and inland production of oats.*

Year	2015	2016	2017	2018	2019	2020	2021
Importations - feed (t)	19'511	25'807	23'179	27'088	31'698	25'363 <sup>a</sup>	- <sup>b</sup>
Importations - food (t)	28'996	24'204	25'563	25'807	23'364	22'890 <sup>a</sup>	- <sup>b</sup>
Inland production – feed (t)	7'001	5'734	8'377	6'237	5'933	5'700	4'564 <sup>a</sup>
Inland production – food (t) - of which is organic production	- <sup>c</sup>	561 - <sup>c</sup>	1'080 - <sup>c</sup>	1'135 - <sup>c</sup>	2'962 - <sup>c</sup>	2'400 423	2'060 <sup>a</sup> 1'664 <sup>a</sup>

According to Swissgranum (2021a, 2021b). <sup>a</sup> provisory. <sup>b</sup> not available at the time of writing the report. <sup>c</sup> apparently not recorded.

For the CROPDIVA project we have chosen to explore a food value chain, namely of a Swiss oat drink. Important players in the Swiss food industry recently established this value chain. This value chain is interesting because of its media coverage and the increasing popularity of plant based alternatives to

cow milk, such as the oat drink. In the following, we present the interviews conducted and the results obtained. Then we discuss the results and limitations, before concluding with a synthesis.

## 1.2 Overview of the interviews completed

Table 3 summarises the interviews conducted per value chain actor. An agricultural cooperative is acting as a value chain coordinator. We found a responsible of the strategic business unit from this agriculture cooperative through an online article about Swiss oat production. The interview partners were identified through magazine articles and contacts (references to suppliers and buyers) within the existing value chain.

*Table 3. Overview of the number of interviews performed for each VC actor<sup>3</sup>.*

VC actor	Numbers of interview
Organisation (extension, research, etc.)	2
Seed company	1
Organisation linking breeding and seed production	1
Seed trader	2
Producer	2
Collection centre	1
Mill	1
Food processor	1
Food company	0
Retailer	1

Through internet researches, we found in parallel a responsible of an organisation linking international breeding and inland seed production, as well as a category manager for dairy products and eggs (and dairy alternatives) for one of Switzerland's largest retail and wholesale companies. One extension organisation, one producer and one seed trader were cross-interviewed. The marketing department of the food company, whose oat drink production branch we interviewed (food processor), did not respond to our interview requests.

## 1.3 Results

### 1.3.1 Description of the oat food value chain

The value chain we investigated concerns the conventional sector and relies on Swiss oats for producing a 100% Swiss oat drink. Oat varieties are imported from abroad and seed production takes place in Switzerland, as can be seen in Figure 1. Seed traders are selling the seeds to producers, which are cultivating oats in a conventional way. Harvested oats are delivered to collection centres. After cultivation, the oats are milled into oat flour by one mill. The oat flour is then processed into an oat drink by a dairy company. This dairy company is specialized in niche and alternative products and is the daughter company of a larger food company. . The “larger” food company is responsible for

<sup>3</sup> Please note that we counted the number of interviews for each role taken by one interviewee. For example, if one producer was processing and selling oats directly to consumers, one interview with this producer would count as three interviews: one producer interview, one processor interview and one seller interview.

advertisement and general oat drink marketing. Oat drinks are then distributed to different retailers in Switzerland (supermarkets, bakeries, smaller shops, etc.).

It is important to notice that there is one important agricultural cooperative coordinating the value chain. One seed trader and one collection centre interviewed are business branches of this agricultural cooperative. This agricultural cooperative initiated the cooperation with the mill and the food processor in the value chain.

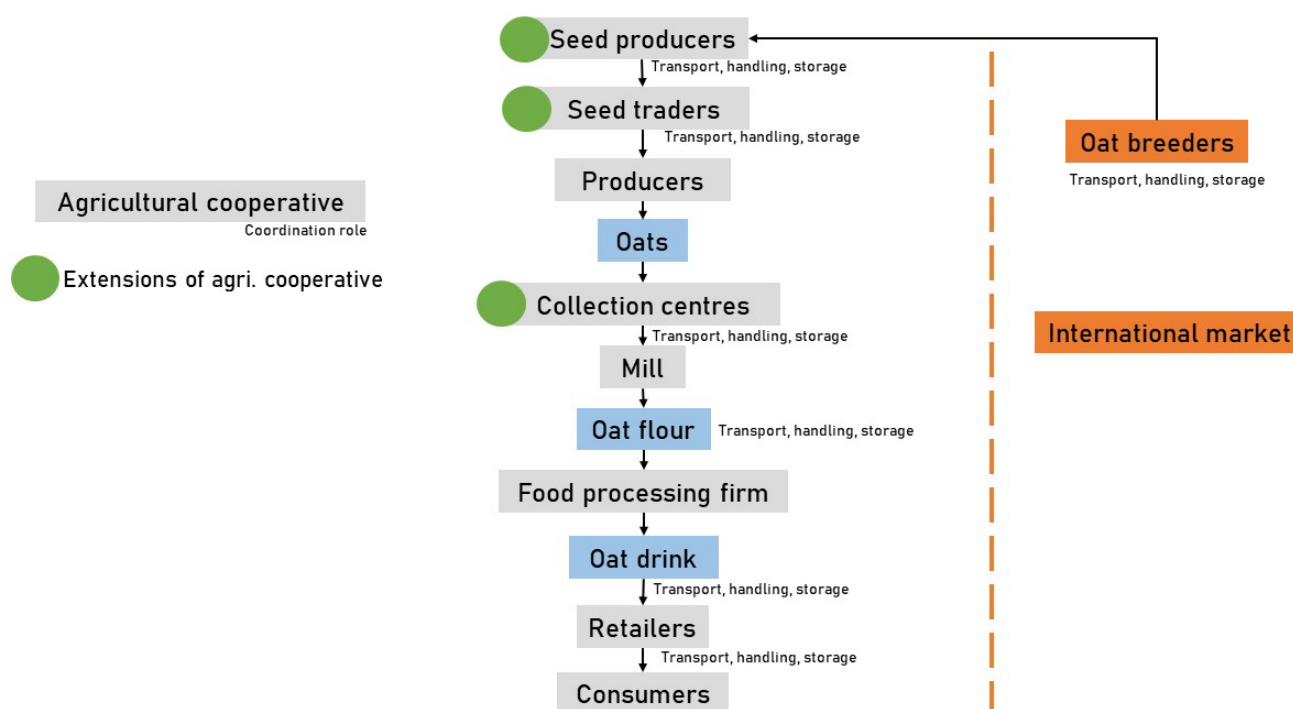


Figure 2. Oat food value chain mapping.

In Switzerland, a large number of agricultural products including oats are subject to customs duties when imported at the border. This allows domestic producers to sell their products more expensively than in a market regime without tariffs. This agricultural protection benefits not only producers, but also those upstream and downstream of farmers (Christoffel & Leuenberger, 2016). For oats, tariff protection is relevant for seed imports, food and feed imports. Oats seeds are more tariff protected than food and feed oats, hence oats seed production is profitable for Swiss seed producers. Compared to other grains, tariff protection of oats (food/feed) is relatively low (Ramseyer et al., 2021). Please consult Annex A and BAZG (2022b) for more information about tariff protection on oats.

### 1.3.2 Input suppliers (Researchers, seed producers, seed traders)

No oats breeding is conducted in Switzerland. However, foreign varieties are tested and evaluated – if they are accepted by the cereal branch organisation Swissgrandum, they appear on the Swiss oat varieties list. Last trials were done 2019 and 2020 with varieties from Sweden, Germany and France. Six varieties are on the list for the harvest year 2022. “Black” oat varieties<sup>4</sup> are not accepted in general for food production.

<sup>4</sup> “Black oats varieties” have black husks. Oats grains are dehulled before processing, however, husk fractions remain in the final product. If these husk fractions were black, black dots would appear in the oat drink, which is not wanted. Hence, only varieties with yellow or white husks are accepted for oat drink production, but also in other food usages.

Regarding seed production, seed traders order the amount of seed they need and seed producers try to plan accordingly.

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

#### Horizontal linkage

There is a reported good understanding regarding oat varieties' evaluation and acceptance for the Swiss varieties list between members of the cereal branch organisation. There is no friction regarding feed versus food usage, and no-trade-offs as well between food industry and production.<sup>5</sup> Important quality criteria for seed traders are mainly hectolitre weight and use of green cuttings (for feed).

#### Vertical linkage

As mentioned under part 1.3.1, Description of the oat food value chain, the seed trading company and the collection centres are branches of the agricultural cooperative, which coordinates different levels of the oat VC. Therefore, the collection centres and the seed trader are vertically integrated. The seed traders sell their seeds through those collection centres.

#### Knowledge and technology of actors

There is no breeding of oats in Switzerland, however, varieties description are conducted in the Agroscope and the organisation linking breeding and seed production trial network (Last time: 2019-2020). This is done in order to distinguish varieties based on parameters on the variety list provided for farmers.

#### Entry/exit barriers

The market size for oat is reported very low. Consequently, breeding is not profitable. Seed production is reported as very competitive with seed imports, because of lower transport costs and tariff protection on seeds (see below; regulatory and institutional environment). However, seed production for oat is more costly per unit than e.g. wheat seed production (see under Existing and required infrastructure).

### ***Resource and infrastructure***

#### Inputs availability

There was 2021 a shortage in oat seeds, because of hails and bad weather, in addition, demand was higher because of a reported "oat hype". Hence, there was the need to import seeds. However, one seed company responsible reported the motivation to produce seeds inland and not import them, since oats is currently "trendy" so much demanded.

#### Existing and required infrastructure

In general, variety trials of cereal seeds are conducted in different places. However, for oat, it is not possible to test one variety in different places, because the quantity of seeds produced per location is too low, and hence small batches are a challenge to handle for seed production and are linked with higher transaction costs. Each variety is grown in only one location, which results in scale advantages but more risk in terms of local adaptation of the variety.

### ***Framework conditions***

#### Regulatory & institutional environment

As mentioned above, tariff protection for oats seeds is important for domestic seed production. This protection fosters profitability of seed production.

---

<sup>5</sup> This is not always the case for crops. For example, the food industry wants wheat varieties with high gluten content; however, this requires a lot of fertilizer for producers. Producers would like to have resistant varieties, which might not be the best ones regarding yields and quality parameters.

### 1.3.3 Producers

The agricultural cooperative coordinating the Swiss oat drink value chain indicated that the planned production volumes are around 2,000 tonnes. This corresponds to a total area of 400-440 ha cultivated by 200 producers. Many producers are situated in the Swiss Prealps<sup>6</sup>, where the climate in summer is cooler than in the plain and well suited for oat cultivation. Different interviewees mentioned that oats fit well in a crop rotation and are recommended as an extensive crop. Oats, often grown as a spring crop, would loosen up the crop rotation in winter cereal-heavy rotations, so that the resistance of weeds can be counteracted. Oats can be grown extensively, and require not much fertilization and plant protection. In addition, oats have very good competitive power against weeds, which means that once the crop is established, weed pressure is low. Soil requirements are low as well.

The interviewed farmer involved in this value chain (not cross-interview) mentioned that they came across oats when looking for a crop that would fit into their crop rotation and could be grown extensively.

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

##### Knowledge and technology of actors

Oat cultivation (or production) does not usually pose any major challenges for farmers. On the one hand, this is explained by the great similarity to the cultivation of other cereals. On the other hand, farmers have experience in growing oats as horse feed. The producer interviewed reported having no difficulty to reach the quality threshold of 50 kg hectolitre weight<sup>7</sup>, which is required, unless the oats are declassified as feed. However, some interviewees reported a certain difficulty to reach the 50 kg hectolitre weight, because of the less suitable climatic conditions of Switzerland (when compared with Northern countries).

#### ***Market conditions***

##### Distribution channels

Oat prices for feed production are reported as not attractive. This is due to the fact that oats are usually grown as feed grain and the prices for feed grain are lower than those for bread grain. Hence, for the food price, the farmers receive a price premium of about 25% in addition to oat feed price, in order to make domestic production more attractive given the possibility of relatively cheap imports. However, interviewees reported that this price should be higher for long-term interest and profitability of Swiss producers. Producers deliver their oats to a collection centre. About 20 collection centres are involved in this value chain. This number of collection centres implies that some producers have high transport distance to their collection centre.

The interviewed producer is interested to sell their own oat flakes for their on-farm shop. However, they could not find a conventional mill interested for such small batches at an acceptable distance. The producer reported the disadvantage of producing not organically; they mention that organic production would be more opened and adapted to take small batches.

#### ***Framework conditions***

##### Regulatory & institutional environment

The tariff protection for oat seeds guarantees seed supply reliability and lower prices for producers when buying their seeds, as reported by one seed trader. This is because tariff protection allows for the

---

<sup>6</sup> The Swiss Pre-Alps form a vast ensemble of medium-altitude mountain ranges on the northern edge of the Alps.

<sup>7</sup> The hectolitre weight is a measure of the specific weight or of the density, and is used as indicator of grain quality (Burke et al. 2001). In this value chain, producers are expected to have at least 50 kg of hectolitre weight (measured at the "exit" of the collection centre). However, collection centre can increase post-harvest this number by cleaning the oats repeatedly, for example passing them multiple times in a de-awner machine (to a certain extent).



inland production of seed and there is no need to rely on imports. In addition, transport costs are lower. However, interviewees mentioned that imported oats (not the seeds) were cheaper than Swiss ones. For more information, please refer to part 1.3.1, Description of the oat food value chain, and to annex A.

### 1.3.4 Collection centres

About 20 collection centres are involved in this value chain and collect oats for the Swiss oat drink production. With a total of about 210 collection centres in Switzerland, about every tenth collection centre accepts oats for beverage production. After receiving the oats, collection centres clean and eventually dry the oats. They have the possibility to increase the hectolitre weight in the cleaning process.

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

##### Horizontal linkage

The collection centre interviewee reported that they have a good collaboration with other collection centres. They were recommended for collecting oats by one collection centre that did not collect oat. Moreover, they recommend other collection centres for the crops they do not collect.

##### Vertical linkage

As mentioned under part 1.3.1, Description of the oat food value chain, the collection centres are branches of the agricultural cooperative managing the value chain (and one seed trader as well). Therefore, collection centres and the seed trader are vertically integrated.

##### Entry barriers

The entry barriers for collection centres are the additional handling costs a new crop represents. There is the need to separate food and feed oats, but also organic and conventional. Small batches are also challenging, as reported in the following paragraph.

#### ***Resource and infrastructure***

##### Volume & capacity of facilities

The low production volume of oats in Switzerland is accompanied by challenges for the collection centres: minimum quantities of 3-8 t are required to fill drying machines (in general, for bigger collection centres). With small batches, there is also the risk of mixing with other products during collection, storage and processing. This is not dramatic when working with large quantities, but when a small batch of oats is mixed with larger batches of other crops, the oats might be too “diluted” with other crops.

### 1.3.5 Mill

Cleaned and dried oats are sold to the agricultural cooperative and they remain in the silos of the collection centres. During the year, one mill is responsible for milling the oats to oat flour. This mill deals with imported oats and Swiss oats, in both organic and conventional quality. They have different clients from the food and non-food sector, among them the food processor producing the Swiss oat drink.

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

##### Knowledge and technology of actors

The mill is advanced with both knowledge and technology and is working with oats for about 6-7 years. The miller interviewed reported learning about oats in the mill where they did their apprenticeship, and at school oat processing was part of the curriculum.

They reported that the quality of Swiss oats is lower than the one of Northern countries, mostly regarding hectolitre weight and kernel content. This would be due to the less favourable climate for oats in Switzerland compared to Northern countries. However, the oat quality is less important for oat drink than for flakes, it is indirectly important for the final extracted output<sup>8</sup>. As for now, they did not test specific oat varieties and they were not involved in the varieties' evaluation of the cereal branch organisation.

#### Vertical linkage

The mill and the food processor were solicited by the agricultural cooperative. The work between them is hence important, and there is some level of vertical coordination and exchange between the actors.

### **Resources and infrastructure**

#### Volume and capacity of facilities

Processing oats does not require specific investments, since it can be milled with standard equipment. However, if the demand for oat drink continues to increase, they reported the eventual need to invest in machines, in order to be able to handle bigger batches. Separating Swiss from imported oats was not challenging or costly for them, because they already do the separation. The claim of domestic origin (Swissness) is very common in the Swiss food market (Feige et al., 2020).

### **Market conditions**

#### Products

Important quality parameters are, in no particular order, hectolitre weight, kernel content and hullability<sup>9</sup>. In addition, resulting colour of the milled flour is important, and hence no black oats should be processed.

#### Concurrence

The miller mentioned in general a very high concurrence between mills. However, he was not sure if this concurrence is relevant for the oat flour market since currently, they are the only mill in this value chain.

## **1.3.6 Food processor**

The oat flour is sold to a sister company of a larger food company specialised in dairy products. This sister company was bought by the larger food company and it is specialised in niche and organic products, such as dairy alternatives. They produce the oat drink by mixing water, enzymes and oat flour. The enzymes are responsible for “digesting” the complex carbohydrates to sweeten the drink naturally. To stop the enzymatic processing, the oat drink is heated up and the enzymes deactivated. The drink is afterwards filtered from solid particles, then ultra-high temperature processed (UHT) and put in liquid packaging board. The food company is responsible for the marketing logistics and the advertising of the oat drink. In addition to a pure oat drink, they produce a Barista oat drink, a mix oat and almond drink, a mix oat and hazelnut drink, and a vanilla oat drink. We will focus on the pure oat drink in general, as it contains only Swiss oats and water.

<sup>8</sup> Kernel content in particular would be an important parameter that influences indirectly the output. The bigger the content, the higher the extraction rate. Low kernel content results in lower extracted output, so that more oats are needed for a similar output. According to Burke et al. (2001), kernel content is “the characteristic most closely related to the millers’ extract yield of product.”

<sup>9</sup> Hullability describes the ease to remove the husk and is measured as the percentage of grain unhulled after milling. Low hullability results in greater kernel breakages, reducing extract yield (Burke et al. 2001). For hectolitre weight and kernel content, please consult respectively footnote number seven and nine.

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

### Knowledge and technology

Processing oat into oat drink is not very challenging. However, they do not possess the “right” technology but work “unconventionally” with machines that are not specially conceived for oat drink processing. For the processor, the most important quality parameter is the size of the oat flour particles. The size of oat flour particles depends mostly on the quality of the milling, so only indirectly on the oats quality.

The interviewee reported being surprised that dairy companies and not breweries produce the milk alternatives. In fact, for them, the oat drink production, dealing with enzymes, would be much more similar to brewing than to dairy production. The food processor employees were mostly coming from the dairy technology sector. According to the interviewee, they have some experience with plant products like chocolate, coffee, etc. and thus, oats and other alternative (almond, coconut, etc.) were not a challenge for them.

## ***Market conditions***

### Distribution channels

The food company sells their oat drink to different retailers, from big supermarkets to smaller shops.

### Products

The packaging of the product has a very different design than other oat drinks' packages encountered in Swiss supermarkets. Its main colour is green, contrasting with general white or brown packages. The product has the Swiss cross on the product (Swissness label) and it is written that the oats are of Swiss origin.

### Marketing communication

The food company's promotional campaign was very extensive during the market launch of the oat drink. To increase awareness of the product, free product samples of the oat drink were distributed on a large scale in supermarkets and at railway stations. In addition, a well-known Swiss singer was recruited to promote the oat drink. Advertising was also done on billboards and on the internet. The distribution of product samples in the canteen of a university was aimed at the target group of young consumers who are open to alternative diets: for a while, every vegan meal was accompanied by a free oat drink. One interviewee justified this remarkable marketing campaign with the fact that the Swiss oat drink came late to the market. Two important marketing arguments reportedly used are that the oat drink is vegan and of Swiss origin. The product packaging reflects those two arguments by its colour (green) and the labels: Swiss cross and vegan label. However, one interviewee reported that the nutritive aspects of the oat drink are much lower than regular milk. For them, oat drink is more a “soft drink alternative” than a milk alternative. The oat drink however addresses the trend of vegetarian and vegan food.

## ***Framework conditions***

### Certification

Important certifications are the vegan label and the Swiss origin (Swissness label). The product can indeed claim the Swissness label, thus allowing the use of the Swiss flag on the product.<sup>10</sup> This visual sign is important for marketing. Two interviewees mentioned the intentions to have a gluten-free<sup>11</sup>

---

<sup>10</sup> According to the Swissness regulation, at least 80% of the weight of the raw materials used must come from Switzerland (if they can be grown in Switzerland). In addition, the processing that gives the product its characteristics must take place in Switzerland (IPI, 2017).

<sup>11</sup> Oats contain a form of gluten-molecules, called “avenins”. However, these proteins are different than the ones contained in wheat, barley and rye and their ingestion should not lead to the development of the coeliac disease (Londono et al., 2013).

product; however, in Switzerland this would be difficult because there is very often gluten contamination at one level of the value chain.

### 1.3.7 Retailers

There are many different retailers of the Swiss oat drink (bakeries, shops, supermarkets). However, there are only a few supermarket chains in Switzerland, the market could be considered as an oligopoly. We interviewed one category manager for dairy products and eggs (and dairy alternatives) for one of Switzerland's largest retail and wholesale companies. This company currently sells about 20 different oat drinks including a retailer own brand produced within the group itself, but based on European oats.

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

##### Vertical linkage

Historically, the retail and wholesale company has a good partnership with the food processing company.

##### Knowledge and technology

Oat drinks in general are considered as the leading “milk alternative” in both market quantities sold and market growth. The demand for oat drinks is much higher in the cities than in the countryside. They observe that organic oat drink is currently preferred over Swiss oat drink. In addition, the French-speaking part of Switzerland is less interested in oat drink brands (like the Swiss oat drink) and rather buys the retailer's own brand drinks. Swiss German consumers are more willing to pay and buy oat drink brands like the Swiss one.

#### ***Market conditions***

##### Prices

In the media, there are many articles about the high prices of oat drinks. In addition, different actors of this value chain were complaining about the high selling prices. Some interviewees hypothesized that either the food processor or the retailers are making high margins on the oat drinks.

The category manager of the retailer mentioned that the selling prices of the oat drinks brands are set based on the buying prices (like for the Swiss oat drink). Regarding their own brand, they set the price based on their costs. Handling small batches, as well as guarantying organic and gluten-free production (with European oats) would be very costly for them. Probably high marketing costs (due to market launching costs) could be another reason for the hypothesized high margins.

##### Demand

Oat drink (general category) is the first demanded milk alternative and experiences the most growth. In parallel, the milk market currently loses 1-2% percent of sales per year. The steady decrease in milk demand was reported as a future challenge for the Swiss agrifood system to account for. Milk alternatives sales are fluctuating as well, but are mostly decreasing, but not for oats.

#### ***Framework conditions***

##### Certification

Currently, sales statistics of this retailer show that organic oat drink is more demanded than the Swiss oat drink. Consequently, the retailer company plans to produce a Swiss and organic oat drink alternative. However, there are not enough producers for now.

---

Article 41.2 of the Swiss Ordinance on Food Information mentions that oats foodstuff can be designated as 'gluten-free' or 'very low gluten' if they can be produced, prepared or processed in such a way that exclude contamination by wheat, rye, barley or crosses of these cereals. The gluten content of these oats should not exceed 20 mg/kg. (EDI, 2017).

## 1.4 Discussion

Oats have a great tradition in Switzerland and Europe. They were traditionally grown for feeding horses before. Now, because of their health benefits and sustainable halo, they seem to be increasingly demanded by consumers. This trend is also reflected in increasing oat drinks sales. In Switzerland, the downstream sector is hence very well developed. However, 90% of the oats used by the food industry are imported. Main reasons for this are the cheap imports of oats and the higher quality of oats from Northern countries due to a more favourable climate.

The underdeveloped upstream part of the value chain (underdeveloped in comparison with the downstream part) might be surprising, because of the horse feeding tradition and the benefits of oats in crop rotation. However, profitability for producers is very low, which is the reason why for now only about 10% of consumed oats are of Swiss origin. Because of the increasing demand for oat drink (and sustainability), some important agrifood actors decided to produce a Swiss oat drink, in order to provide a domestic alternative, since Swiss origin in food marketing since Swiss origin can often skim off a higher willingness to pay in the food market.

### 1.4.1 Past challenges & successes of the value chains

#### *Downstream sector*

It was a great opportunity for the Swiss oat drink value chain creation that the downstream sector was already well developed. In fact, with the exception maybe of some collection centres, all downstream actors were handling oats already. The mill involved, for example, started about 6-7 years earlier and has good experience in oat milling. The mill has already experience with imported oats; however, Swiss oats were reported of lower quality (lower hectolitre weight due to less favourable climate). Having some level of experience is probably very important for the providing high-quality oat flour to the food processors. The food processor as well, needed to know about the enzyme process, which was reported as not challenging. Their experience with plant products and some knowledge of machines were very probably also important for smoothly starting producing a milk alternative.

In addition, the food company and the retailers were already aware about the trend regarding plant based milk alternatives. The powerful marketing strategy of the food company was very important for launching the value chain and the associated products. The retailers were already very much involved in selling milk alternatives and wanted to expand their product range. As mentioned above, only the collection centres from the downstream part were not involved before the value chain creation. The reasons for that is the high reliance on cheap imported oats (90%), of higher quality, which is delivered to mills and food processors directly. Thus, imported oats bypassed the upstream part of the food value chain. Strong and important Swiss agrifood system actors addressed this bypass situation, as we discuss in the next paragraph.

#### *Organisational capacities of the chain*

The prominence of certain players (agricultural cooperative and its branches, mill, food processing company) in the Swiss agrifood landscape has probably been a huge opportunity for the creation of this value chain. The coordinator of the value chain was able to use their network to enable value chain creation on a larger scale. The agricultural cooperative and vertically integrated companies (collection centres, the seed trading company) and its connection with the mill and the food processor were key for linking the upstream and downstream parts of the value chain. The 20 recruited collection centres

started to find interested producers, which should be about 200. The players' importance in Switzerland provides credibility to the oat drink, which in turn becomes interesting to different retailers in Switzerland.

Not only the prominence of the players and the strong network of the value chain coordinator was important, but probably the reported good cooperation between the actors. The actors knew each other and seem to work together towards a common goal. Hence, those three factors were probably very important for the creation of this value chain at a large scale, and could play a role in its resilience.

*Table 1. Summary of the challenges, strategies and potential benefits for each value chain actor.*

VC actor	Main challenges/opportunities (order: most important first)	Strategies undertaken/to undertake	Potential & benefits for the actor in the VC chain
Input suppliers (extension, seed producers, seed traders)	<ul style="list-style-type: none"> <li>• Tariff protection on seeds</li> <li>• No breeding in CH, not locally adapted breeds</li> <li>• Need to import if low inland production (CH as small market for foreign seed suppliers)</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure relationships with foreign seed suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Reliable supply</li> </ul>
Producers	<ul style="list-style-type: none"> <li>• Cheap imports</li> <li>• Low competitiveness compared e.g. to bread wheat</li> <li>• Quality parameter: reaching hectolitre weight</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiate prices/tariff protection</li> <li>• Differentiation (Swiss, organic, health, etc.)</li> <li>• Knowledge about obtaining sufficient hectolitre weight</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for diversification</li> <li>• Potential benefits for crop rotation</li> </ul>
Collection centres	<ul style="list-style-type: none"> <li>• Low tonnages</li> <li>• Horizontal cooperation</li> <li>• Distance to producers</li> </ul>	<ul style="list-style-type: none"> <li>• Work horizontally or vertically to obtain higher tonnages</li> <li>• Or invest in small batches machines and infrastructures (tonnages might increase, so it might not be a problem in the future)</li> </ul>	<ul style="list-style-type: none"> <li>• Possibility of finding new clients, new oat uses</li> <li>• Niche crops attractive for new clients</li> </ul>
Mill	<ul style="list-style-type: none"> <li>• Lower quality of CH oats</li> <li>• Managing quantity and quality</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure reserves to accommodate quantity and quality</li> </ul>	<ul style="list-style-type: none"> <li>• Reliable oat flour supply to food processor</li> <li>• Expand Swiss oat market</li> </ul>
Food processor	<ul style="list-style-type: none"> <li>• Nutritive value</li> <li>• Late comer in market</li> <li>• High concurrence</li> <li>• Gluten-free certification</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing focus on sustainability (vegan and local)</li> </ul>	<ul style="list-style-type: none"> <li>• Diversify oat portfolio</li> </ul>
Retailer	<ul style="list-style-type: none"> <li>• High demand</li> <li>• Organic label more important than Swissness</li> </ul>	<ul style="list-style-type: none"> <li>• Accommodate demand</li> <li>• Making own Swiss and organic oat drink</li> </ul>	<ul style="list-style-type: none"> <li>• Propose different oat drinks</li> </ul>

## 1.4.2 Current and foreseen challenges and chances of the value chains

### Seed quality and supply

There is no oat breeding in Switzerland, as the market is too small. It is therefore necessary to test foreign varieties and then evaluate them, before deciding which varieties will be accepted by the cereal branch organisation. However, the small volume of oats needed is produced in such a way that

agronomic tests cannot be carried out in the most suitable way. That is, by testing one variety at several locations. It is therefore a risk to test oats at only one location in Switzerland.

Unlike some niche crops such as legumes, oat seed production is profitable in Switzerland. This is due to lower transport costs and above all to tariff protection. The profitability allows for a reliable supply of seed, even if the new trend towards oat production and the poor harvest in 2021 meant that imports were necessary for the year 2022. However, it is expected that this shortage will not be frequent. Otherwise, it will be necessary either to ensure good contact with oat grain exporters or to increase the seed production area, which would probably be at the expense of other crops.

### ***Swiss production potential***

The reason why oats from foreign countries, especially from the Nordic countries, are preferred by the food industry in Switzerland is not only the low price of oats, but also their higher quality (hectolitre weight (kg/hl) and the grain size) than those from Switzerland. The reason is mainly climatic, as the Nordic countries enjoy cool, long sunny summer days. Why oats should be grown in Switzerland then, one might ask, as in addition breeding is non-existent and agronomic tests are limited in Switzerland. However, Switzerland has a certain production potential and experience, already through the former horse feed business. Moreover, the experience of several actors in the value chain in seed production, milling, processing, means that oat production has some potential in Switzerland. Besides, this crop can be grown extensively, because of lower soil and fertilization requirements, and its competitive power against weeds. Oats contribute to a more diverse crop rotation. Spring oats can loosen up crop rotations, especially in winter cereal heavy rotation.

The doubts about achieving a sufficient weight per hectolitre do not seem to be shared by all actors in the value chain, and the difficulty of this challenge remain unclear for us. For the Swiss oat drink, it seems that the quality parameters (hectolitre weight, kernel content and hullability) of the oat grains are only indirectly important for the output, but that the quality of the product itself is not changed. This would not be the case for oat flakes, however.

### ***Prices and profitability***

In recent media articles, oat drink has been decried as very expensive. On the other hand, the prices paid to producers were perceived as relatively low compared to other crops, such as bread wheat. For them, despite a higher price than oat for feed, the price paid is still too low for being interesting in the long-term and for covering risks. The initial situation with the low prices is challenging. In order to obtain more attractive producers' prices then perhaps a market differentiation (pesticide-free, Swiss origin, health benefits, etc.) should be achieved. In addition, better tariff protection, without jeopardising the quantities imported, could allow higher prices to producers, but a good balance is required. Enhancing tariff protection is, however, contradictory to WTO principles and might not be feasible.

Oat drink would still be expensive in supermarkets for consumers because of small batches handling and ensuring vegan, organic and/or Swiss and/or gluten-free quality. While these costs can be justified, it does lead to a certain decrease in motivation of other actors in the value chain, who sell oats for low prices and observe high prices in shops. For consumers, the price of oat drinks could maybe be lowered through economies of scale and higher competition between oat drinks processors. Of course, the evolution of prices for consumers and producers (not forgetting the intermediate actors in the chain, who admit that prices are low for them, but very high in the shops) will probably take place in the future, if the demand for oat milk continues to increase.



### ***Marketing potential***

The value chain analysed relies on the use of Swiss oats. For the time being, it seems that other criteria than Swissness are important, for example the organic label. However, other sustainable aspects can be highlighted for this beverage, which allows marketing focused on these aspects. For example, it is possible to use the argument of regionality, health (fibre content, antioxidants, minerals and vitamins) as well as veganism to promote the Swiss oat drink.

Another interesting criterion for marketing an oat drink is the gluten-free label. We can imagine that it is difficult to obtain this from Swiss products, as it requires, for example, a reliable separation across the supply chain: a combine harvester, a collection centre infrastructure, transporters, machines, etc. to avoid the contact with gluten<sup>12</sup>. To guarantee Swiss and gluten-free production would therefore be a clear differentiation signal, but this seems challenging and costly.

One criticism of the oat drink is that it is not an ideal substitute for milk. It is in fact less rich in protein and micronutrients. The nutritional argument cannot be used for marketing oat drinks. However, the oat drink can be part of a person's whole diet, which gets its protein and nutrients from another source in the diet. Yet the oat drink market is growing, so criteria such as taste and sustainability seem more important than simply the nutritive criteria "replacing milk".

### ***Certification impacts***

Through our interviews for the oat value chain, but also for the other crops covered in this work, we found that the organic sector is much more "opened" and inclined to work with niche crops and with lower quantities. This value chain is therefore an exception, as oats are produced conventionally. In 2021, organic farming accounted for 17% of the agricultural area (BFS, 2022). Diversification into the conventional sector might have a greater impact on Switzerland's overall agrobiodiversity, because a higher share of agricultural area could be covered by oat.

However, it seems that consumers of oat drink are interested in the organic label, possibly threatening the conventional Swiss oat drink. The competition between the different drinks and their certifications is therefore tough, and it would be desirable if both organic and conventional farming could demonstrate greater agrobiodiversity through oat production. If consumers favour organic over Swissness, then the Swiss oat drink will have to focus on other criteria to attract and retain consumers, such as price, taste and visibility. Remaining competitive is important, in order to enhance agrobiodiversity in conventional farming through oat production.

## **1.4.3 Limitations**

Through our interviews, we were able to obtain a lot of information about the new value chain created for the Swiss oat drink. We believe we have captured the essence of the opportunities and challenges that have been or could be encountered in this value chain. However, some limitations must be mentioned: regarding oat drink sales, we only have statistics from one retailer (important, but only one). Moreover, it was not easy to decide on the real difficulty of obtaining a sufficient weight per hectolitre, as opinions were very divergent. As we only interviewed one producer in this value chain (who did not report any problems with the weight per hectolitre), we are limited on this point. Another limitation is the fact that the demand and market for oat drinks is growing very fast – so this report could be out of date very quickly.

---

<sup>12</sup> See footnote number 11 for more information on gluten-free oats.



## 1.5 Synthesis

In Switzerland as in Europa, the cultivation of oats was widespread in the past, especially for feeding horses. However, cultivation has declined because the number of horses declined significantly and, in parallel, international trade became more important. Currently, 90% of oats consumed by Swiss people is coming from higher quality and cheaper imports. The Swiss food industry is involved the use of oats, for example in the production of oat drinks. The downstream sector seems interested in Swiss oats for producing an oat drink. Through the cooperation of major established players (the main agricultural cooperative with links to the seed market and collection centres, one of the largest milk processors) and significant marketing efforts, an oat drink made from indigenous oats was introduced to the market.

The upstream sector is slowly being created for Swiss oat drink by an agricultural cooperative. If there is no breeding in Switzerland, tariff protection on seeds already allows for the production of oat seeds, ensuring reliable seed supply. Agronomic variety trials are limited, because of small seed market volumes. Oats, even of lower quality than the Nordic countries' oats (due to climate) show some potential in Switzerland, as an extensive crop beneficial to crop rotation already well known from the downstream sector for milling and processing. If the demand for oat drink continues to grow as it is predicted, enhancing production will be mandatory. However, producers prices are too low when compared to other cultures and the risks taken. Higher tariff protection on oats and further differentiation (pesticide-free or organic cultivation, Swiss origin, health benefits, etc.) could potentially play a role in increasing profitability for producers.

The oat drink market is booming. The Swiss oat drink brings with it characteristics, such as its plant-based (vegan) and Swiss origin (Swissness), that serve important trends and consumer needs. However, the organic label seems important to consumers for oat drinks, but enhancing agrobiodiversity in the conventional sector is important. Marketing strategies, in particular certifications should be very well thought in order for the conventional Swiss oat drink to stay competitive in a market with many oat drinks, especially organic and/or gluten-free ones. Thus, the Swiss oat drink, also a latecomer on the market, may have to "compensate" for its non-organic label by a distinctive taste, sharp marketing, or a lower price than its organic concurrent. In the future, strong competition between the oat drinks and economies of scale could bring prices down and hereby offers to open up new market segments.

## References

- Agristat. (2021). *Schätzung der Schweizer Ackerfläche 2021*. Schweizer Bauernverband.  
[https://www.sbv-  
usp.ch/fileadmin/sbvuspch/04\\_Medien/Agristat\\_aktuell/2021/Aktuell\\_AGRISTAT\\_2021-08.pdf](https://www.sbv-<br/>usp.ch/fileadmin/sbvuspch/04_Medien/Agristat_aktuell/2021/Aktuell_AGRISTAT_2021-08.pdf)
- Agroscope. (2022). *Variety lists*. Federal Office of Agriculture. Retrieved 23.05.2022 from  
<https://www.agroscope.admin.ch/agroscope/en/home/news/dossiers/variety-lists.html>
- Ask, L., Nair, B., & Asp, N.-G. (1991). Effect of scalding procedures on the degradation of starch in rye products. *Journal of Cereal Science*, 13(1), 15-26.  
[https://doi.org/https://doi.org/10.1016/S0733-5210\(09\)80024-6](https://doi.org/https://doi.org/10.1016/S0733-5210(09)80024-6)
- BAZG. (2022a). *Swiss-Impex*. Retrieved from <https://www.gate.ezv.admin.ch/swissimpex/index.xhtml>
- BAZG. (2022b). *Swiss working tariff*. Bundesamt für Zoll und Grenzsicherheit. Retrieved from  
<https://xtares.admin.ch/tares/login/loginFormFiller.do?l=en>
- BFS. (2022). *Landwirtschaftliche Strukturhebung 2021. 2021 wurde in der Schweiz mehr Getreide angebaut*. [https://www.bfs.admin.ch/bfs/de/home/statistiken/land-  
forstwirtschaft/landwirtschaft.assetdetail.22644012.html](https://www.bfs.admin.ch/bfs/de/home/statistiken/land-<br/>forstwirtschaft/landwirtschaft.assetdetail.22644012.html)
- Burke, J. I., Browne, R., & White, E. (2001). *Factors Affecting Yield and Quality of Oats*. Teagasc.

- Christoffel, J., & Leuenberger, M. (2016). *Die Wirkung des Grenzschatzes auf die Preise von landwirtschaftlichen Erzeugnissen*.  
[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwig0o\\_e6M\\_4AhWVq6QKHRADDgQQFnoECAoQAAQ&url=https%3A%2F%2Fwww.preisueberwacher.admin.ch%2Fdam%2Fpue%2Fde%2Fdokumente%2Fstudien%2FDie%2520Wirkung%2520des%2520Grenzschatzes%2520auf%2520die%2520Preise%2520von%2520landwirtschaftlichen%2520Erzeugnissen.pdf.download.pdf%2F30\\_06\\_16\\_Bericht%2520Z%25C3%25Bille\\_d.pdf&usg=AOvVaw0UMSouen3z5akPtbGxr6ll](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwig0o_e6M_4AhWVq6QKHRADDgQQFnoECAoQAAQ&url=https%3A%2F%2Fwww.preisueberwacher.admin.ch%2Fdam%2Fpue%2Fde%2Fdokumente%2Fstudien%2FDie%2520Wirkung%2520des%2520Grenzschatzes%2520auf%2520die%2520Preise%2520von%2520landwirtschaftlichen%2520Erzeugnissen.pdf.download.pdf%2F30_06_16_Bericht%2520Z%25C3%25Bille_d.pdf&usg=AOvVaw0UMSouen3z5akPtbGxr6ll)
- EDI. (2017). *Verordnung des EDI vom 16. Dezember 2016 betreffend die Information über Lebensmittel*. Eidgenössische Departement des Innern Retrieved from  
<https://www.fedlex.admin.ch/eli/oc/2017/158/de>
- FAOStat. (2022). *FAOSTAT statistical database*. Food and Agriculture Organization of the United Nations (FAO). <https://www.fao.org/faostat/en/#home>
- Feige, S., Rieder, S., Annen, R., & Roose, Z. (2020). *Evaluation der «Swissness» im Lebensmittelbereich* ( Schlussbericht zuhanden des Bundesamts für Landwirtschaft, Issue.
- Haller, A. (1775). Genera, species et varietates cerealium (part 1). *Novi commentarii Societatis Regiae Scientiarum Gottingensis*, 5, 1-23. [https://gdz.sub.uni-goettingen.de/id/PPN352846038\\_0005](https://gdz.sub.uni-goettingen.de/id/PPN352846038_0005)
- Haller, A. (1776). Genera, species et varietates cerealium (part 2). *Novi commentarii Societatis Regiae Scientiarum Gottingensis*, 6, 1-22. [https://gdz.sub.uni-goettingen.de/id/PPN352846038\\_0006](https://gdz.sub.uni-goettingen.de/id/PPN352846038_0006)
- Haller, A. (1782). Beschreibung der Geschlechter, Arten und Spielarten des Getreides. *Neue Sammlung physisch-ökonomischer Schriften*, 2, 2-95. <https://www.e-periodica.ch/digbib/view?pid=oeg-003%3A1782%3A2%3A%3A101#109>
- Hruskova, M., & Famera, O. (2003). Prediction of wheat and flour Zeleny sedimentation value using NIR technique. *Czech J Food Sci*, 21, 91-96. <https://doi.org/10.17221/3482-CJFS>
- IPI. (2017). *The "Swissness" legislation*. Swiss Federal Institute of Intellectual Property. Retrieved 29.06.2022 from <https://www.ige.ch/en/law-and-policy/national-ip-law/indications-of-source/swiss-indications-of-source>
- Jacomet, S. (2007). *Hafer*. Historisches Lexikon der Schweiz. Retrieved 10.06.2022 from <https://hls-dhs-dss.ch/de/articles/027663/2007-11-20/>
- Koblet, R. (1965). *Der landwirtschaftliche Pflanzenbau. Unter besonderer Berücksichtigung der schweizerischen Verhältnisse*. (Vol. 16). Birkhäuser.
- Londono, D., Van't Westende, W., Goryunova, S., Salentijn, E., Van den Broeck, H., Van der Meer, I., Visser, R., Gilissen, L., & Smulders, M. (2013). Avenin diversity analysis of the genus Avena (oat). Relevance for people with celiac disease. *Journal of Cereal Science*, 58(1), 170-177.
- Ramseyer, N., Steiner, B., Vonlanthen, I., & Brugger, D. (2021). Potential ausgewählter Ackerkulturen in der Schweiz. Bericht zur aktuellen Lage im Ackerbau und den möglichen Entwicklungen.  
[https://www.sbv-usp.ch/fileadmin/sbvuspch/04\\_Medien/Medienmitteilungen/PM\\_2021/Bericht\\_Potential\\_Schweizer\\_Ackerkulturen\\_DE\\_def.pdf](https://www.sbv-usp.ch/fileadmin/sbvuspch/04_Medien/Medienmitteilungen/PM_2021/Bericht_Potential_Schweizer_Ackerkulturen_DE_def.pdf)
- SBV. (2017). *Statistische Erhebungen und Schätzungen über Landwirtschaft und Ernährung*.  
[https://www.sbv-usp.ch/fileadmin/sbvuspch/04\\_Medien/Publikationen/SES/Archiv/SES\\_2017-94.pdf](https://www.sbv-usp.ch/fileadmin/sbvuspch/04_Medien/Publikationen/SES/Archiv/SES_2017-94.pdf)
- SBV. (2020). *Statistische Erhebungen und Schätzungen über Landwirtschaft und Ernährung*.  
[https://www.sbv-usp.ch/fileadmin/user\\_upload/SES\\_2020-97.pdf](https://www.sbv-usp.ch/fileadmin/user_upload/SES_2020-97.pdf)
- Schilperoord, P. (2016). *Hafer*. Verein für alpine Kulturpflanzen.  
<http://dx.doi.org/10.22014/97839524176-e9>
- Seringe, N.-C. (1818). *Monographie des céréales de la Suisse, ou description des Blés, Seigle, Orges, Avoines, Maïs, Millets, cultivés en Suisse, leurs maladies et leurs usages économiques*. Berne. <https://bibdigital.rjb.csic.es/en/records/item/13210-monographie-des-cereales-de-la-suisse?offset=7622>
- Swissgranum. (2021a). *Einfuhr von Getreide*. Retrieved 05.06.2022 from  
[https://www.swissgranum.ch/documents/741931/6119168/2021-08-10\\_Einfuhr\\_Getreide.pdf/56f13e38-7411-3c9b-933d-5cb6aac4bb30](https://www.swissgranum.ch/documents/741931/6119168/2021-08-10_Einfuhr_Getreide.pdf/56f13e38-7411-3c9b-933d-5cb6aac4bb30)

- Swissgranum. (2021b). *Inländische Produktion*. Retrieved 05.06.2022 from [https://www.swissgranum.ch/documents/741931/6810561/2021-12-22\\_Verwendbare\\_Produktion.pdf/e071cb8b-17a4-5b40-079b-eba6f71f2264](https://www.swissgranum.ch/documents/741931/6810561/2021-12-22_Verwendbare_Produktion.pdf/e071cb8b-17a4-5b40-079b-eba6f71f2264)
- Swissgranum. (2021c). *Schwellenpreise oder Importrichtwerte für Rohstoffe (CHF / dt)*. [https://www.swissgranum.ch/documents/741931/6119168/2021-08-10\\_Schwellenpreise\\_Importrichtwerte.pdf/1c1a0cb2-b706-8d2f-0a65-574bddcaa0ae](https://www.swissgranum.ch/documents/741931/6119168/2021-08-10_Schwellenpreise_Importrichtwerte.pdf/1c1a0cb2-b706-8d2f-0a65-574bddcaa0ae)
- Swissgranum. (2022). *Listen der empfohlenen Sorten*. Swissgranum. Retrieved 23.05.2022 from <https://www.swissgranum.ch/sortenlisten>
- Volkart, A. (1912). *Die Zukunft unseres Getreidebaues*. <https://www.e-periodica.ch/cntmng?pid=sng-005:1952:132::744>

## Annexe

Annex A. Overview of some normal tariff protections (duty rates) on oats (Number 1004.XX) and for different usages. Retrieved June 2022.

Usage	Tariff protection in CHF per 100 kg
Seed	42.00 <sup>a</sup>
For the manufacture brewers' malt or beer	0.95 <sup>b</sup>
Other, other, for human consumption within the tariff quota (N°28)	0.00 <sup>a</sup>
Other, other, for human consumption, other	20.00 <sup>a</sup>
Other worked grains (for example, hulled, pearled, sliced or kibbled) of oats for human consumption:	20.00 <sup>a</sup>
- for human consumption, without residues for use as forage	10.00 <sup>a</sup>
- for human consumption, with residues for use as forage	8.40 <sup>a</sup>
- milling oats, hulled, containing approximately 10% of non-hulled grains, for the preparation of milled products for human consumption	0.60 <sup>a</sup>
- put up for retail sale	10.00 <sup>a</sup>
Other, for animal feeding, containing other cereals	Import benchmark <sup>a c</sup>
Other, for animal feed, other	Import benchmark <sup>a c</sup>

From BAZG (2022b). <sup>a</sup> Tariff of 0.00 for "Least developed countries" and Lesotho. <sup>b</sup> Tariff of 0.00 for "Least developed countries", China and Lesotho. <sup>c</sup> The import benchmark is 32 CHF per 100 kg from 2009 to 2021 (Swissgranum, 2021c).