

GERMAN POTATOE: ANALYSIS TOWARDS SUSTAINABILITY

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Potato cultivation in Germany has expanded enormously over the last thirty years. The aim of the study is to carry out an analysis of the current situation of the potato with a view to the future of a sustainable consumption. The supply chain and the consumer, their advances, problems, and needs, as well as the role of social, economic, and cultural actors in making a coordinated contribution to sustainable development are investigated. A view through information collected from governmental and non-governmental agencies, statistical reports, and fieldwork on the supply of potatoes, and information available to the consumer is provided. As a result, it concludes with the importance of emerging local initiatives and the need of public policies that enforces a conscious consumption in the citizens.

biodiversity / conscious consumer / potato / supply chain / sustainability



Figure 2. Traditional market in the city of Hannover, Adretta. Source: Aldana Bouzas Mendoza, 2019.

Potato cultivation has expanded enormously in the last thirty years. The potato is considered a gift of nature with a great influence on food security due to its interesting nutritional qualities and its capacity to adapt to different soils. The great economic development that has taken place in many countries around the world highlights its potential.

In the European Union, the potato production harvested in 2018 was 51,9 million tons. Germany was the largest potato producer with 8,9 million tons, corresponding to 17,2% of the European Union total (Eurostat 2019). With a cultivation area of around 113,900 ha, Lower Saxony is the Federal German state with the largest potato cultivation area, followed by Bavaria with around 41,700 ha. The third in the alliance is North Rhine-Westphalia where potatoes are grown on around 27,000 ha (LSN 2019).

The different food products have diverse environmental, economic, and social effects. Seasonal products that have been produced organically and locally are the most ecological and climate friendly option. Reliable information on food composition and quality is a prerequisite for responsible consumption. This implies, on the supply aspect, making accurate data available and, on the demand side, taking a proactive approach to the proper interpretation of what you read, hear, or see. A selection of evidence-based and results-oriented initiatives is contained in the

guidelines published by FAO for the 20 actions (FAO 2018).

If the goal in the future is to create sustainable consumption, it is necessary to consider both the producer and the consumer. For sustainable consumption to be a viable option, production must be possible. The producer must be supported through incentive schemes or by considering their products in particular and, for example, by setting appropriate minimum standards according to it. From the consumer's point of view, sustainable consumption is only possible through the provision of information and education. For people to be able to reflect on their daily purchases and their behaviour as users, they need true and easily understandable information.

VARIETIES

Today in Germany it is difficult to find old varieties of potatoes in the market, very few consumers know that potatoes offer such a large variety, and there is currently no market large enough for them. The standard offer of discount stores makes it possible for the customer to get used to buying large, clean, yellow tubers with a uniform taste. About half of German households prefer predominantly Gala or Agria cooking varieties, followed by varieties such as Belana (BZFE 2019). As revealed (Fig. 1.2,3 by the information collected on the main supermarkets and markets in the city of Hannover, the most popular varieties to be found are the following: Adretta, Gunda, Melina, Christa, Désirée, Agria, Gala, Agata, Marabel, Princess, and Linda.

The choice of planting seed that gives high yields at the cost of sacrificing biodiversity is predominant. Many of the potato varieties harvested in the past simply do not fit into the rigid commercial quality scheme that is currently regulated. Certain natural varietal characteristics, such as deep eyes or tubers, do not affect the taste, are unknown to the consumer, and initially require additional work when processing them at home. In this case, today, the law and regulations correspond to the interests of large companies and commercial chains.

There are more than 4,000 varieties of potatoes, 221 varieties are allowed in Germany but only a fraction of them end up in the supermarket. Not all types of potatoes arrive because many of the potatoes that are processed such as Fontane, Arcade, or Challenger are grown and processed into ready-to-eat products such as crisps and snacks (BSL 2019).

In Germany, not all potatoes can be sold for human consumption or as seeds. The Seed Potato Ordinance regulates which varieties of potato can be labelled as seeds. The Federal Plant Variety Office decides which fruit and vegetable varieties



Figure 3. Marketing strategies, Hannover supermarket. Source: Aldana Bouzas Mendoza, 2019.

are on the shelves.

The variety descriptive lists issued by the Federal Plant Variety Office (BSL 2019) describe permitted, protected, and other important varieties in terms of their cultivation and use characteristics.

In order to fight pests and diseases, increase production, and maintain cultivations on marginal lands, today's potato-based farming systems need a steady supply of new varieties. This requires access to the entire gene pool of the potato. However, potato biodiversity today is at risk; old varieties have been lost due to various diseases, climate change, or social conflicts (FAO 2008).

It should be noted that the efforts of organic farmers and horticulturists to support the cultivation of various varieties prevented the valuable genetic material from disappearing forever. As far as the consumer is concerned, there is a tendency to value unique flavours or variations in consistency, nuances such as nut, butter, or cream. Due to this reason a market for the old potato varieties has emerged. As an alternative there is the possibility of making visible or emphasising the direct marketing route and the possibility for consumers to approach farms and thus have a more conscious consumption.

FLOW

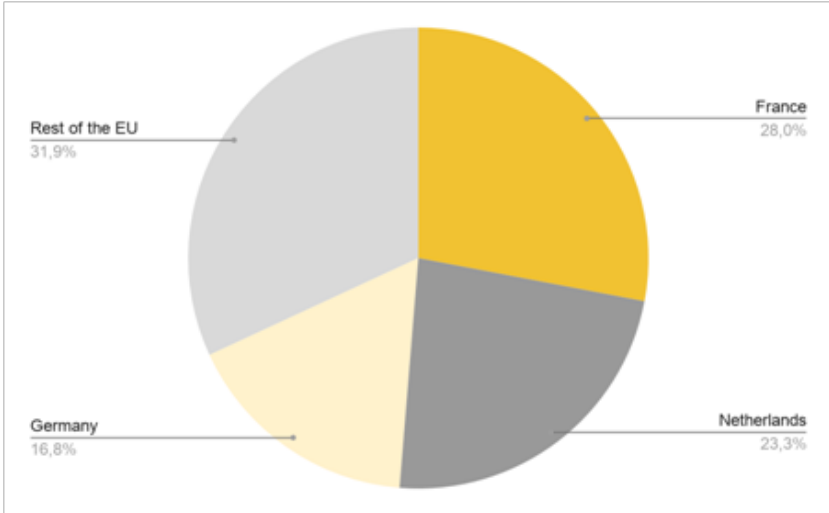


Figure 4. Intra-Community potato exports in value terms (Eurostat 2019).

The European Union Member States marketed around 7,000,000 tonnes of potatoes in 2018 with a market value of 1,7 million euros. Standard table potatoes accounted for two thirds (65,5%) of total intra-Community potato exports in terms of value, seed potatoes represented a quarter (25,2%) of the total, early potatoes constituted 7,6% and starch potatoes the remaining 1,8% (Eurostat 2019). Three member countries were responsible for two-thirds of intra-Community potato exports in value terms (Fig. 4).

While France and Germany were the main exporters of primary potatoes (36,8% and 21,7% of total intra-EU trade in value terms), the Netherlands alone accounted for more than half (58,2%) of the value of all seed potatoes traded within the EU, and Cyprus (24,9%) was the main intra European Union trader in early potatoes (Eurostat 2019).

Other countries outside the European Union are becoming important exporters of fresh potatoes, such as China, Pakistan, India, and Egypt. A considerable example of a country that is strongly developing its potato sector at a national level is Egypt. From 2007 to 2017, the country almost doubled its fresh potato exports to 652,000 metric tons, quadrupled its exports of frozen processed potatoes, and is one of the

largest importers of seed potatoes in Europe. (Rabobank 2019)

It is important to note that due to a change in consumer behaviour corresponding to the desire for fresh products, a year round supply of fresh potatoes must be guaranteed. The marketing put the interests of the market before the environmental impact and the consumer is not aware of the impact. The quantities produced in Germany are not sufficient. Therefore considerable quantities of potatoes are imported annually. On the supermarket shelves you can find early potatoes from Morocco, Tunisia, Egypt, Israel and Cyprus from January, from Spain and Italy from April, and then from France and other countries. The local harvest on the fields usually begins in June and ends at the beginning of October.

Reports from the State Statistical Office show that the Niedersachsen potato is on demand all over the world, not just in Germany. In 2014, with a value of 510 million euros, around 900,000 tonnes of potatoes and potato products were exported. The tubers from Lower Saxony reached 135 countries on all continents. The main exporters are the Netherlands, Denmark, Italy, Poland, and the United Kingdom, making it an important production region (Proplanta 2016).

A remarkable number of these 2014 results can be collected for analysis. Despite producing large quantities of potatoes, Lower Saxony imported around 150,000 tonnes of potatoes and potato products that year, including early potatoes and sweet potatoes. This illustrates that even in the region with the largest potato cultivation there is a considerable flow of imports, mainly driven by the objective of meeting consumer preference (Proplanta 2016).

The trade has an impact and therefore there are more and more initiatives aimed at putting the issue of climate change on the trade agenda; while this could generate restrictions, it could also be seen as an opportunity for countries to start adopting more efficient processes with lower carbon footprint.

Food supply chains need to become intelligent, supporting and prioritising local agricultural production. If small producers are involved, this should be done through direct interaction between producers, businesses, and consumers, thus creating more informed consumers (EIT Food 2019).

PUBLIC POLICIES AND LOCAL INITIATIVES

The current production system is the result of the industrialisation of agriculture, which allowed fewer farmers to produce more food, coupled with government policies that subsidised the investment needed for consumers to continue buying. Now this system faces a major challenge: the supply chains of the future need to

produce healthy and nutritious food that can be grown in an ethical and environmentally friendly way, while at the same time it needs to cope with the important demands posed by population growth, climate change, and diminishing natural resources (EIT Food 2019).

There is growing attention in Europe for the social and environmental conditions in areas of production. Most European buyers have a social code of conduct, which they expect suppliers to adhere to. Social compliance is important, although public policies and local initiatives have the highest priority. The objective is a sustainable and efficient management of biodiversity resources, soil, water, and climate protection.

The German government is encouraging people to eat in a healthy and sustainable way. To this aim, the German Nutrition Society (Deutsche Gesellschaft für Ernährung, DGE) has developed general regulations and quality standards for the public sector catering. The idea is to incorporate sustainability factors into the federal government's guidelines for food served in public sector canteens in accordance with its Sustainability Measurement Programme (INFORM 2019).

Social innovations for sustainable consumption comprise new organisational procedures, services, products and practices, which are able to make consumption habits more sustainable. They can help solve social problems and injustices in the field of sustainable management, consumption, and lifestyles by working on the level of everyday life. Examples include cooperatives, urban gardening initiatives, and swapping platforms. The Lower Saxony Chamber of Agriculture, Solidarische Landwirtschaft (Fig. 6), and Einkaufen auf dem Bauernhof, are just a few such organisations operating at public body level.

CONCLUSION

The consumer usually buys large and clean yellow tubers with a uniform flavour. Technical progress in agriculture does not take into account activity-specific factors such as diversity, soil conservation, agrototoxic contamination and takes into account only short-term productivity and market outcomes.

Numerous genetic attributes of the potato are present in the old varieties. Due to the qualities these varieties possess, such as resistance to biotic and abiotic factors, the choice to preserve the biodiversity of the potato is a decision at the service of food security.

Consumer interest in product safety, quality, and authenticity opened the door to direct sales, supported by digitisation and cooperation of urban initiatives.

Nowadays, for the consumers maintaining a direct relationship with the producers

represents a bonus that adds value to their purchases' experiences. Thanks to the boom of new technologies such as mobile apps and different digital platforms this connection can be achieved, reaching equilibrium between the offer and demand. Substantial public and private investment are needed to improve the value chain, especially improving programmes and infrastructure to support and coordinate activities along the chain.

Today it is necessary to have committed nutrition councils, programmes to support agricultural investment and develop the exchange of knowledge between local authorities and producers.

It is important to reflect in the long term on the form of agriculture that will favour our health and social welfare, especially when we talk about a food product with such a high quality world importance as the potato is.

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