Chapter 4
Agricultural and Food Heritage of the Moravian Region

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Abstract This chapter describes food and agriculture in the Moravian region (South Moravia and the Moravian–Silesian Region of the Czech Republic) with regards to cultural heritage. The main interest is focused on traditional crops, animals, and national cuisine of this region and it deals with their development through a decades-long period. The beginning of this period is marked by the work of Johann Gregor Mendel (1822–1884), the most prominent scientist related to the Moravian region. The first available records of crops in the area nowadays located within the Czech Republic date back to 1846. Results of the long-term development of culinary technologies and changes in agriculture are closely connected with the traditional national cuisine. The region's food base and cultural habits also include typical flavours of prepared dishes (seasonings and condiments). The decisive influence was clearly attributable to the cuisine of the pre-industrial rural self-supplying households or to the gradually expanding bourgeois households. Local food sources were used primarily in rural cuisine. Cereals (wheat, rye, and barley) were the base, as a source of protein supplemented by legumes (peas and lentils). Since the eighteenth century, the use of potatoes was expanding gradually and this trend has increased even more strongly during the nineteenth century, and potatoes have partly replaced the importance of cereals in people's diet. To summarize, our research highlights the advantages of cuisine and agricultural products typical for cultural heritage with a focus on bioactive compounds and their health benefits and other related aspects.

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J. Hernik et al. (eds.), *Cultural Heritage—Possibilities for Land-Centered Societal Development*, Environmental History 13,
https://doi.org/10.1007/978-3-030-58092-6_4

Keywords The Czech Republic · Fruit trees · Prunus domestica · Folk cuisine · Production

4.1 Czech Republic—Basic Characteristics and Agriculture

The Czech Republic is a landlocked country in the central part of Europe with an area of 78 866 km^2. It is located on the border of two mountain systems—the Bohemian Massif and the Western Carpathians—and it is surrounded by Austria, Slovakia, Germany, and Poland. The territory of the Czech Republic is characterized by varied soil and climatic conditions (Forchtsam and Prchal 1960). The oldest ethnic group was the tribes of Boii, and based on that, the territory was named *Bohemia.* Agriculture is an important sector of the country. The main role of agricultural production in the national economy of the state is the production of food for human consumption and raw materials needed for industry (Forchtsam and Prchal 1960). In 2016, the agricultural land fund made up 53.4% of the country's total area (URL 1). Development and changes in the agricultural and food industry in the Czech Republic are influenced by weather, market conditions, agricultural policy, and primarily by overall societal, especially governmental support of the Czech agrarian sector (URL 1). According to the EU typology, the most important type of production focus of Czech agriculture is the breeding of animals on a forage diet, field production, and mixed production. Enterprises specialized in these issues represent 98% of the agricultural land fund of the Czech Republic (URL 2) (Picture 4.1).

Picture 4.1 Fields of the South Moravian region

Picture 4.2 View of Moravian landscape

The Czech Republic is divided into 14 regions. The South Moravian Region with its area of 7 188 km^2 is the fourth largest one. Within the Region, there are located extensive cave complexes. The south is mostly flat and consists of fields, meadows, vineyards, and floodplain forests. An important part of South Moravia is the Pálava and Lednice–Valtice Complex. The dominant feature of the eastern part is the White Carpathians (URL 2). Agriculture is an important component of the Region with a long tradition. Agricultural land accounts for up to 60% of the Region's area. The most cultivated crops are cereals, rape, and sugar beet. The Region has excellent prerequisites for activities centred on viticulture, fruit, as well as vegetables. Vineyards in this Region make up 90% of the entire vineyard area of the Czech Republic. An important sector of animal production is pig and poultry farming (URL 2). Agricultural production, forestry, and fishing employ about 98 thousand workers. In agriculture alone, the estimate is approximately 84 thousand. In 2015, agricultural production accounted for 1.68% of total GDP, and food production for 2.19% of GDP (URL 1) (Picture 4.2).

4.2 Historical Changes in Animal Production and Animal Output

The oldest data on the agrarian sector in the Czech Republic and its regions date back to the 1950s. The development of agriculture since 1949 can be characterized

as the transition from private small-scale farming—so-called "family farms"—to successful socialist large-scale production. This trend continued for 25 years, during which agricultural production steadily increased (in 1936, there were 1,530,000 private farms in Czechoslovakia; in 1976, there was a total of 2206 collective farms and 230 state farms) (Grolig 1979). Concurrent with to the intensification of agriculture, the spectrum of plants and animals central to conventional agriculture was significantly reduced. Profitable plant varieties and highly productive animal breeds came to the fore. The low level of diversity posed a risk to the future sustainability of agriculture and that was the reason to establish a national programme for the conservation and use of plant, animal, and micro-organism genetic resources important for food and agriculture (Ministry of Agriculture 2017). The difference between livestock farming in the past and present centuries has been in the approach to grazing. In the last century, grazing was an essential component of livestock breeding not only for health reasons, but also in terms of reduced production costs (Forchstam and Prcahala 1960). The year 1995 was an important period in agriculture. As shown by Chart 4.1, there was a sharp decline in cattle breeding after 1995, a decline of up to 38–40%. In 1996, the number of animals was expected to stabilize. However, this expectation did not come true and the significant decline in the number of animals continued until 2005 (Charts 4.1 and 4.2).

These sharp declines occurred in the Czech Republic over five years as a result of a reduction in previous state intervention in milk and meat prices, price liberalization, and a significant reduction in product consumption. At the same time, a complicated process of agricultural transformation began. Over the years, more than 90% of the almost exclusive forms of state and cooperative ownership were transferred to the private sector (Sereda et al. 1997).

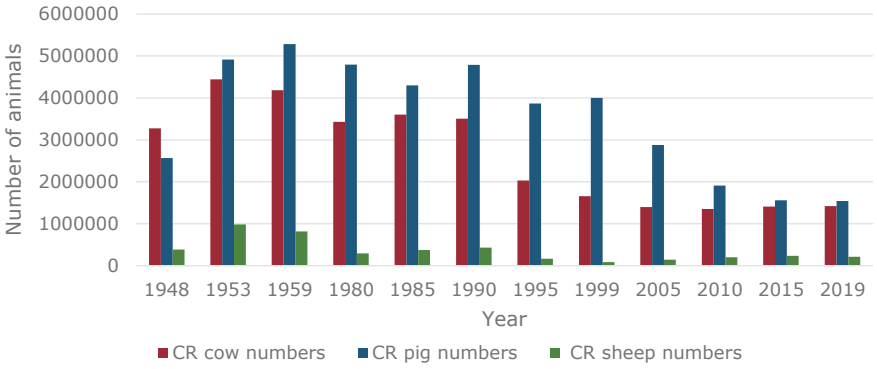

Chart 4.1 Trends in the number of cows, pigs, and sheeps during 1948–2019

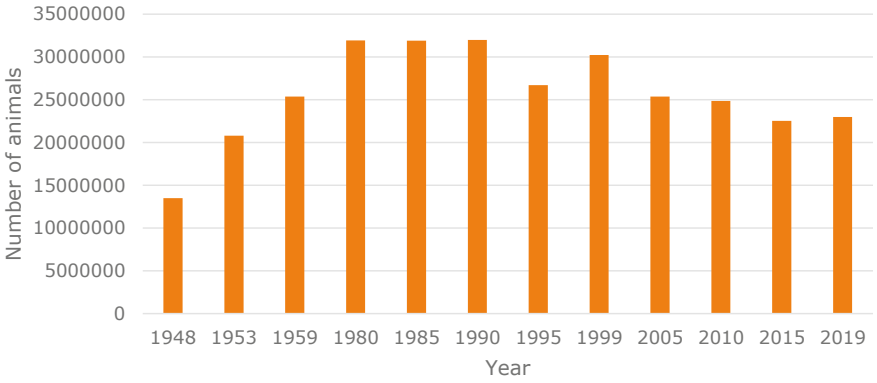

Chart 4.2 Trends in the number of poultry during 1948–2019

4.3 Specific Animals in the Region

4.3.1 Cattle

The original cattle breed in the territory of the Czech Republic was represented by brachycerous red cows. In the nineteenth century, various cattle breeds and varieties started to enter Bohemia and Moravia in particular from Austria-Hungary and they formed the basis of future Czech Fleckvieh Cattle (twentieth century). During the 1960s and 1970s, this breed was improved at first by Ayrshire and later by Red Holstein sires with the objective of increasing its milk production. (Jandurová 2005). Czech Pied Cattle originated from the original cattle by crossbreeding mainly with Simme and Bernese Cattle (Forchstam and Prcahala 1960). Czech Pied Cattle belong phylogenetically to the group of breeds of European Pied Cattle which is the largest and most powerful world bovine population of bilateral production orientation. It is one of the most widespread dairy breeds in the Czech Republic and it has been bred for a long time for both milk as well as meat yields (Hřeben 2019). The milk yield of Czech Pied Cattle ranged from 2200 to 4500 kg around 1960 with an average fat content of 3.8–4.0% (Forchstam and Prcahala 1960). Over the past 60 years, an average of 7344 kg of milk has been achieved with a fat content of 4.05% and a protein content of 3.55% (Andrýsek et al. 2018).

The *Bohemian Red Cattle* breed (the original breed in Bohemia and Moravia was called Bohemian Red Cattle, Silesian Red Cattle, Líštňany Red Cattle, etc.) should be considered as a cultural–historical part of breeding in the Czech lands. It is a so-called "rural" breed with a combined yield. The current population has a medium–strong skeleton, wedge-shaped head, rather short light horns sometimes with dark tips. The fur is red, sometimes with a yellowish tinge. It is characterized by constitutional strength and long life. The milk yield of the current population found on the first lactation is 1500–3000 kg, on subsequent lactations up to 4400 kg at a fat content of 3.6–3.8% and a protein content of 3.4–3.6% (Majzlík 2019).

4.3.2 Sheep

Sheep were the first domesticated animals in the nation formerly called Czechoslovakia. The oldest sheep in Bohemia belonged to the mouflon-like type of Ovis staderi, termed also as "sheep of the copper era". The first publication dealing with sheep breeding in our country was issued in Prague in 1561. The high standards of Bohemian sheep breeding can be documented by the fact that in 1769 breeding ewes were delivered from Bohemia to upper Austria to improve the flocks there. The reduction of wool prices after 1990 strongly influenced the decrease of the sheep population (Sereda et al. 1997).

Wallachian sheep got into the Czech territory together with the Wallachian colonization of the Carpathians, which began in the fourteenth century and reached Silesia and Moravia in the Beskydy area in the fifteenth–sixteenth centuries. At the turn of the 40–50 s of the last century, the process of grading up Wallachian sheep began and it was completed in 1982 by recognizing the Wallachian Improved Sheep breed in Slovakia. The breed is well adapted to the conditions of breeding in mountain areas. The characteristic feature is a dual fleece with a short and fine undercoat, and long coarse guard hair. Limbs under the wrist and hock as well as head have no wool, except the tiny scalp of wool on the top of the head and forehead. Wallachian sheep can be used primarily in the context of the maintenance and use of mountain pastures by extensive grazing. They produce specifically traditional products, such as mountain cheese, lean meat with tender muscles, and skin with attractive long hair (Milerski 2019).

The new breed named ***Improved Wallachian sheep*** was publicly announced in 1982. In 1949, an intensive cross-breeding programme started to improve meat and wool production (Jandurova 2005).

4.3.3 Goat

White shorthaired goats were derived by crossbreeding of domestic farm goats between 1895–1950 with a white Saanen goat from Switzerland and Germany, first in Moravia and later in the entire territory of the Czech Republic. According to regionalization, it was intended for intensive production conditions. The breed is durable and suitable for both individual and intensive systems of breeding, and it is pure white coloured with significantly short, smooth hair. It achieves a high milk yield, an average of 710 kg in 280 days, and the best animals produced by individual studs can reach around 1400 kg of milk (Mátlová et al. 2019).

4.4 Traditional Crops in the Moravia Region

Since time immemorial, the main aim of agricultural production has been to achieve the highest yields of cultivated crops. Over the ages, the production process has gradually improved and, in addition to high yields, environmental friendliness is increasingly emphasized. Crop rotation and sowing procedures play a key role in both agricultural production goal-directed methods. With regard to the settlement of the Czech Republic, all basic methods of farming were gradually replaced within the framework of agricultural activities. In the early days of settlement, it was mainly a system of deforestation, slashing, and burning steppe vegetation. The gradual increase of population in the territory of the Czech Republic resulted in a situation such that this system was no longer viable and a fallow system was introduced in the eighth–ninth century. From the eighteenth–nineteenth century, this production system was replaced by a crop rotation system. New crops (potatoes, maize) as well as fodder crops and other improving crops, such as oilseeds and sugar beets, were incorporated into the sowing procedures. (Procházka 2009).

Even the crop rotation system underwent a number of changes and, from complicated 9- or 8-field sowing procedures (Forchstam and Prcahala 1960), crop rotation was gradually stabilized with the 4-field sowing procedures using also intensive exogenous inputs in the form of mineral fertilizers and plant protection products. Climate change also has an impact on crop rotation; it makes the growing of thermophilic crops, such as corn and soybeans, possible especially in the South Moravian Region. The changing subsidy policy and the fluctuating purchase price of agricultural crops also have a negative impact on crop rotation, where farmers are forced by economic pressure to fail to comply with appropriate crop rotation (Šmikmátor 2009), and thus, for example, the disappearance of legumes from the sowing procedure. Growing vegetables fertilized with organic fertilizers can also be considered as improving crops. Their inclusion in the sowing procedure is supported by the fact that the interest in self-harvesting crops is increasing, especially in suburban areas; vegetables are an ideal commodity for this form of agricultural activity.

The main crop in Czech agricultural production is cereals. They are mainly used for human nutrition (wheat, rye, and barley) and for feeding livestock (barley, oats, and corn). Traditionally, cereals are grown in winter varieties or less frequently in spring varieties (Forchstam and Prcahala 1960). The cultivation of varieties is constantly changing and the emphasis is on higher production. For example, the original winter wheat varieties of Kaštická osinatka, Židlochovická osinatka, Hadmerslebener Qualitas, Fanal, Diana, and Pavlovická 198 were grown until 1965 yielding 2.5–3 tonnes/ha and were gradually replaced by Nela, Brea, and Niagara yielding from 7–8.7 tonnes/ha in South Moravia (Haná area) (Kulovaná 2001). Lists of recommended varieties of agricultural crops for each year are issued by the Central Institute for Supervising and Testing in Agriculture (ÚKZÚZ) under the authority of the Administrative Council of the Community Plant Variety Office (CPVO) to carry out tests of variance, uniformity, and stability for the purposes of granting Community Plant Variety Rights in compliance with the Council Regulation (EC) 2100/94 in

selected plant species. In the Czech Republic, proceedings on the registration of a variety are carried out in compliance with Act No. 219/2003 Coll. (Act on the Circulation of Seeds and Planting Material), as amended by Act No. 444/2005 Coll. and Act No. 178/2006.

In addition to cereals common at present, we can also come across growing of alternative cereals and pseudo-cereals to a lesser extent. The traditional alternative cereals include millet which is characterized by a short growing time and low demands for moisture. In the past, it was one of the main Slavic cereals (Kulovaná 2001). Traditionally grown varieties included Hanácka Mana (registered 1940) and Slovenské červené, while current newly registered varieties include Rubikon and Rupro. For warmer areas, sorghum is a suitable traditional crop, but it has higher fertilization requirements than millet. In the past, however, no varieties were registered in the Czech Republic for sorghum and mainly Hungarian and Soviet sorghum varieties were grown. Since 2013, new varieties of Great Millet and Súdánská tráva or their hybrids were gradually approved. Buckwheat has been cultivated in the Czech Republic since the sixteenth century. It was especially popular in Těšín, Moravian Wallachia, and Beskydy areas. The greatest boom of cultivation was until the seventeenth century. In the eighteenth century, interest in growing buckwheat was declining and its cultivation remained only in Moravian Wallachia. The original varieties include the variety called Doksanská (Moudrý 2005; Kulovaná 2001). At present, its cultivation is increasing mainly within organic farming and new varieties of Zita (registered in 2009), Zoe (registered in 2010), Zamira (registered in 2014), and Fages 4 rosa (registered in 2017) are also grown (Central Institute for Supervising and Testing in Agriculture 2019).

The situation in the cultivation of fruit trees and small fruits is different. Fruits are a product of several years old trees or herbs, thus by their very nature, it is not possible to grow them on a rotational basis. Therefore, requirements on the quality, soil type, and climate in the given area are often more important for planting them than for annual crops. The selected planting location should provide suitable conditions for growing dwarf trees (very small rootstock) for twenty-five years, for growing standard trees and espaliers (medium and large rootstock) for 50 years. (Forchstam and Prcahala 1960). It is the longevity and vegetative form of propagation that makes it possible to preserve the original varieties of fruit trees that have been preserved in the Czech Republic even considering the import of new fruit tree varieties. Fruit cultivation has a long tradition in the Czech Republic. The first evidence of fruit growing dates back to the Middle Ages. In the period between the thirteenth–fifteenth centuries, a number of apple and pear varieties began to appear, not only in the chateau and monastery gardens, but also as products of individual cultivation. In the seventeenth century, the first fruit nurseries were established. An important development occurred in the eighteenth century when the fruit growing industry developed organized fruit associations. Since the nineteenth century, we can talk about intensive fruit growing in the Czech Republic, which was supported by a number of pomological guides. After 1918, new forms of fruit cultivation were introduced into large-scale fruit production and the peak of intensive fruit growing was in 1970–1980 (Neč 2019). Plums have probably the most important history and foreign reputation in Moravia.

Plums represent 13% of all intensively grown fruit species and rank second, while the first rank is held by apple trees with 51% (Nesrsta 2016). A plum tree requires fertile soils; alluvia are suitable. It ripens to consumer maturity in areas up to 450 m above sea level. Plum trees tolerate heavier and very moist soils, but they can also be grown in poorer and drier soils on myrobalan rootstocks. The differences in soil requirements are also determined by the individual cultivars. Greengages are rather demanding in habitat selection compared to mirabelles and most other plums which have high yield even under deteriorated conditions (Forchstam and Prcahala 1960). Generally, it is recommended to grow varieties suitable for conditions in the selected geographical area. The most widespread original plums of Moravia are the varieties of Domácí velkoplodá and Wangenheimova registered since 1954. The old varieties can also include the Greengage of Althanova and Zelená renklóda as well as Mirabelle de Nancy, likewise registered since 1954. The cultivation of new varieties such as Čačanska lepotica (registered since 1991) is also widespread (Central Institute for Supervising and Testing in Agriculture 2019).

4.5 Use of Ruminant Meat in Folk Cuisine of Moravia and Silesia

Although the beef was the most frequently consumed type of meat among the population of the Lands of the Bohemian Crown in the Middle Ages, after the seventeenth century, its consumption gradually decreased. In the nineteenth century, butchers were still classifying the following as beef: (a) ox meat (the meat from oxen 3–4 years old was considered very good); (b) cow meat; (c) bull meat (it is reported that bull meat is not as tasty as ox meat or cow meat) (Rošický 2015).

In the folk kitchen, beef was mainly bought for soups. The beef was often consumed cooked. (The traditional recipe for beef rib preparation was as follows. Pour water into the pot, add salt, and bring to a boil. Rinse the rib, knock it a little, put it in the boiling water, cover it with a lid, and boil slowly until soft. Remove the clot that formed on the surface. About half an hour before the meat softens, add cleaned vegetables and whole onions, as well as spices, and the cooked rib should be brittle but not too soft).

In certain regions of Moravia, the influence of neighbouring Slovakia, which was part of Hungary as part of so-called Austria-Hungary for centuries, manifested itself. Goulashes from Hungary gradually became a popular meat dish in the Lands of the Bohemian Crown as well. To prepare beef, mainly ground sweet paprika and onion are used. The use of sweet paprika requires caution, it must not be rendered in hot fat, as the sugar in the paprika caramelizes, turn brown, and the paprika loses not only its nice colour but also gets a bitter taste.

Goulash preparation takes time (up to 3 h) since the collagen in the connective tissue needs to dissolve into gelatine. (Clean meat from stiff membranes and tendons, cut it into rather large pieces, and roast it in hot fat in a pot. Add salt, diced onion,

crushed garlic, paprika, and occasionally water/broth to stew the meat until it is semi-soft. Let the juice then partially clear off, sprinkle with flour, fry it, add some more broth, and stew until soft).

In the foothill and mountain areas of Moravia, sheep were most commonly bred. Mutton with bone (e.g., breast) was used to prepare soups. In addition to mutton meat, root vegetables, onions, potatoes, dried mushrooms, garlic, and pepper were used to cook Wallachian mutton soup (Faktor and Žantovská 2017). Meat dishes from the Wallachian region include mutton stew. For four servings, one needed 1 kg of mutton with bone, root vegetables, 0.5 kg of potatoes, an onion and garlic, and for spices, ground sweet and hot paprika, allspice, bay leaf, ground pepper, and marjoram. (Cook the meat with the mix of spices in water until semi-soft. Prepare the paprika base. Add the cooked meat, vegetables, potatoes, paprika, and marjoram. Cook everything until soft). In Wallachia, mutton stews were often cooked in cabbage.

The popularity of fruit growing was also reflected in traditional Czech cuisine. The processing of ripe plums gave rise to a special plum jam called powidl. The consistency of powidl is only achieved by evaporating water from the overcooked fruit mash. The traditional method used is to overcook and thicken the fruit mash in copper cauldrons or stone pots (Pisch 1902). This method of processing has been preserved to the present day. However, contemporary sources also mention other methods of plum processing, such as the preservation of sloes in vinegar or the steaming of fruit, but those traditions have gradually disappeared.

Fruit with a high content of pectins (apples) has traditionally been processed into so-called jelly. Typically, this method of processing utilized red fruit, inferior quality fruit, and fruit trimmings processed for other purposes. The processing mainly involved boiling the fruit most often in copper cauldrons, followed by filtration (through a canvas or sieve made of horse hair) and adding sugar. Further cooking resulted in a reduction of the water content and reaching the desired consistency. Egg white was traditionally added for clarification and, if desired, the jelly was stained red with alkermes juice, green with chlorophyll, or blue with indigo (Pisch 1902).

4.6 Conclusion

The Czech Republic is a landlocked country in the central part of Europe. It is characterized by varied soil and climatic conditions. For much of history, primarily local food sources were used in rural cuisine. Cereals were the base, as a source of protein supplemented by legumes. From the eighteenth century onward, the use of potatoes expanded gradually. Fruit cultivation has a long tradition in the Czech Republic. The first evidence of fruit growing dates back to the Middle Ages. In the period between the thirteenth-fifteenth centuries, a number of apple and pear varieties began to appear. The most important foreign reputation about fruit arose from plum trees. At the present time, apple trees and plum trees are the most important fruit species. The most notable difference between livestock farming in the past and present has been in the approach to grazing. In the last century, grazing was an

essential component of livestock breeding for health and economic reasons. In 1995, there was a sharp decline in cattle breeding but the number of these animals has stabilized at present. The original cattle breed on the territory of the Czech Republic as the brachycerous red cow. The Bohemian Red Cattle breed should be considered as a cultural–historical component of combined yield breeding in the Czech lands. The traditional goat derived by crossbreeding of domestic farm goats is the white shorthaired goat. The oldest traditional breed is the Wallachian sheep which is well adapted to the conditions of breeding in mountain areas. The breed had an impact on food, e.g., in traditional dishes like Wallachian mutton soup as well as cooked meat with paprika and a cabbage base. In addition to the role of local food sources in cultural heritage, attention to local food sources may suggest possible assets for purposes of tourism and export, beyond solely local significance.

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