# BREEDING OF PŘEŠTICE BLACK PIED PIGS – REVIEW

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## Abstract

Autochthonous animal breeds retain many valuable traits, such as a high degree of adaptability to environmental conditions, resistance to climate stress, local parasites and pathogens, and better use of local feed sources. On the contrary, modern breeds, which have been bred for intense reproductive and productive performance, lose these properties. Original breeds are a source of genes useful for improving the health and other characteristics of intensive breeds. In the Czech Republic, the genetic resources of farm animals include the breed of pigs of Preštice Black Pied. This breed originates in western Bohemia in the region of the towns Přeštice, Domažlice and Klatovy. It is characterized by good reproductive performance and adaptability for breeding conditions and nutrition. The breed is characterized by a medium body frame and a very strong constitution. The colour is black and white without the definition of body parts for black and white. The ear is flopped. Adult boars reach 260-280 kg, sows 215-235 kg of live weight. Under normal intensive fattening conditions, it is characterized by less favourable carcass value and cannot be compared with performance of modern meat breeds and hybrids (Matoušek et al., 2013).

**Key Words:** Přeštice Black Pied breed, reproduction, carcass value, growth

## Origin of the breed

From the historical point of view, pigs have been kept since ancient times on the territory of the Czech Republic. In the 15th century, documents about pig breeding are known. Pigs were kept in extensive conditions, on pastures, fields after harvest and in oak and beech forests. By the middle of the 19th century only local pigs were bred in the Bohemian and Moravian regions. After 1848, foreign breeds from England, Germany, Austria, Poland and Hungary were imported in order to increase the performance of domestic pigs (Pařízek et al., 1960). Březinová et al. (1961) states that the Přeštice Black Pied pig was created by crossbreeding of local pigs with colour breeds from England and Germany, especially Cornwall and Berkshire. There are known evidence of crossbreeding with the Swabian-Halls breed. In the 20th century, a new breeding regulation was introduced. The breeding of the Přeštice pigs was restricted. During World War II breeding of this breed was forbidden and it was kept secretly. In 1952 the process of regeneration of the breed was started, the process was terminated in 1964 with the declaration of the Přeštice Black Pied pig as a separate breed. Then the improvement of the breed was started in order to increase its fattening and slaughter value. The Pietrain, German Saddleback, English Saddleback and Welsh breeds were used for this purpose. The breeding of Přeštice Black Pied pigs was restricted in the late 1980s and early 1990s. This situation was mainly due to the higher demands of consumers on lean meat in pig carcasses. In 1992, the Preštice Black Pied breed was included among the genetic resources and since 1996 it is bred as a closed population (Fiedler et al., 2004).

## Breeding aim

According to the Methodology of Breeding of the Přeštice Black Pied breed, which is valid for the period 2017-2021, the objective of breeding work is stabilization and maintaining of the performance (Table 1) and the firm constitution. The goal of breeding is not to increase productivity. Herds of Přeštice Black Pied pigs are not only concentrated in Western Bohemia, but in the last few years a number of herds have been established in Moravia. To apply a valid breeding program for this breed, 200-450 sows of 40-80 breeding boars are required as a basic population. In 2017, the Přeštice Black Pied pigs were kept in 21 herds, including 482 sows. The largest three herds include 199 sows, it is 41% of the total number, and the remaining herds are

smaller but important for maintaining the breed's diversity. In 2017, 50 boars were registered in herd book. These boars are divided into 10 genealogical lines. Breeding herds are divided into two categories - nucleus and reserve. The minimum number of animals in reserve herds is 7, in the nucleus 15. Nucleus herds are those of high importance to the population of Přeštice Black Pied pigs, they produce gilts and boars for her own herd rebuilding and for other breeders, they are PRRS free and every year they pass through rating and control. Currently, 3 herds are recognized as nucleus (Genetic Resources Annual Report, 2017). Only 121 sows were kept in 2010, which was historically the lowest number. Thanks to the support of the Ministry of Agriculture and the involvement of other organizations, the numbers of animals reach the present level, which is considered optimal for the implementation of the breeding program.

## Reproduction parameters

The implementation of the hybridization program was started in Czechoslovakia in 1972. At this time, the breed of the Přeštice Black Pied pigs had an equal status with the Landrace breed. Expressed as a percentage of maternal breeds, the largest breed was Large White, which accounted for 58% of the population, Landrace 18% and Přeštice Black Pied 16%. At the end of the 80's, the Přeštice Black Pied breed was kept in 8 breeding farms and 1600 sows were under control of performance. From the total of 21 genealogical lines of the boars, 16 were used extensively. In 2013 only 8 % of the sow population of the Přeštice Black Pied breed was registered in the herd book, the number of boar lines was reduced to 10 (Fiedler et al., 2004; Genetic Resources Annual Reports). From the point of view of reproductive performance, the breed, like other original breeds, is at a lower level than other modern intensively used breeds. Comparing reproduction results, it is obvious that the pig is lagging about 2 piglets / litter (Table 2). It is worth mentioning the sow P746 Sena (Figure 1), which has contributed to the preservation of the breed in the 60s of the 20th century. This sow reached a total of 13 litters. Its average yield was 14.77 live piglets and 10.77 weaned piglets/ litters. The development of reproductive performance of sows of the Přeštice Black Pied breed is shown in Table 3 (Fiedler et al., 2004; Association of Pig Breeders, Databases of Institute of Animal Science).

***Table 1. Breeding aim of Přeštice Black Pied pigs***

| | | |
|---|---|---|
| **Reproduction parameters** | | |
| Number of piglets born alive/litter | 11 | |
| Number of piglets (21 days of age)/litter | 10 | |
| Parturition interval (days) | 165 | |
| **Parameters of growth and carcass value (performance test)** | | |
| | Gilts | Boars |
| Average daily gain (g) | 540 | 560 |
| Backfat thickness (mm) | 10-12 | |
| Lean meat (%) | 58-59 | |

***Table 2. Comparison of reproduction parameter of Přeštice Black Pied, Czech Landrace and Czech Large White breeds (year 1983 and 2017)***

| | 1983 | | | 2017 | | |
|---|---|---|---|---|---|---|
| | CLW | CL | PC | CLW | CL | PC |
| Number of total born piglets/litter | 10.3 | 10.7 | 10.5 | 14.8 | 14.8 | 10.8 |
| Number of piglets born alive/litter | 9.7 | 9.7 | 9.8 | 13.4 | 13.6 | 9.9 |
| Number of weaned piglets/litter | 8.9 | 9.0 | 8.7 | 11.7 | 11.5 | 9.1 |

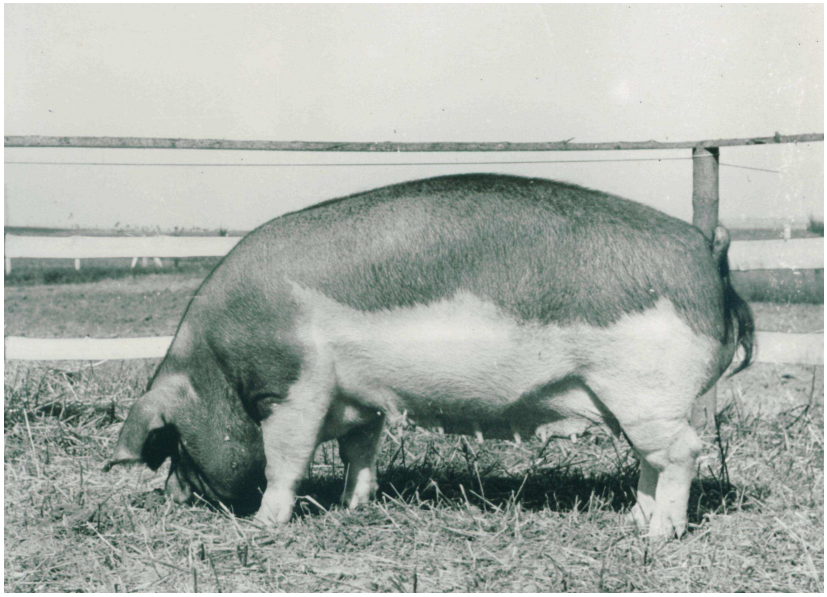
Source: Fiedler et al., 2004 ; Association of Pig Breeders – Annual Report 2017
CLW—Czech Large White, CL—Czech Landrace, PC—Přeštice Black Pied bred

***Table 3. Development of reproduction parameters of Přeštice Black Pied breed***

| Parameter | Year | | | | |
|---|---|---|---|---|---|
| | 1956 | 1971 | 1983 | 1998 | 2015 |
| Number of total born piglets/litter | 11.2 | 10.9 | 10.5 | 11.3 | 10.7 |
| Number of piglets born alive/litter | 10.4. | 10.4 | 9.8 | 10.4 | 9.9 |
| Number of weaned piglets/litter | 9.5 | 9.4 | 8.7 | 9.3 | 9.1 |
| Weight of litter in age 21 days | 48.8 | 53.1 | 50.9 | 53.0 | 56.5 |

Source: Fiedler et al., 2004, Databases of the Institute of Animal Science

***Figure 1. Přeštice Black Pied Sow P746 Sena***



Source: Databases of the Institute of Animal Science

## Production parameters

When evaluating the results of performance test, the differences between the current modern breeds and the Přeštice Black Pied breed (Table 4) is again very clear. The Přeštice Black Pied breed is characterized by lower growth intensity, lower lean meat content and higher backfat thickness. According to a number of studies, the original breeds are characterized by certain properties that determine the quality of the meat, especially the higher the percentage of fat, higher juiciness and tenderness of meat. The content of fatty acid is also different in original breeds compared to modern pig breeds. These parameters are important for particular group of consumers choosing meat and meat products made from local and native breeds. In many countries native pig breeds can provide suitable material for the good-quality products from pork (Serrano et al., 2008). Developments in production performance are also apparent in the breed itself (Table 5), especially in increasing growth intensity, increase in lean meat content and decrease of backfat level. These changes are mainly related to breeding practise in the past years, for example improving with the Pietrain breed. The Přeštice Black Pied pigs reach worse parameters in fattening, that´s why it cannot expand into regular pork market. The SEUROP system is disadvantageous for breeders. They must look for new opportunities, for example in regional products.

***Table 4. Comparison of production parameters in Czech Large White, Czech Landrace and Přeštice Black Pied breeds***

| | Breed | | | | | |
|---|---|---|---|---|---|---|
| | CLW | | CL | | PC | |
| | gilts | boars | gilts | boars | gilts | boars |
| Average daily gain from the birth to the end of performance test (g/ day) | 670 | 713 | 698 | 719 | 555 | 576 |
| Lean meat content (%) | 63 | 63.6 | 63 | 63.9 | 1.11 | 60.1 |
| Backfat thickness (cm) | 0.7 | 0.69 | 0.7 | 0.67 | 58.5 | 1.06 |

Source: Association of Pig Breeders, www.schpcm.cz)

***Table 5. Production parameters of Přeštice Black Pied pigs (performance test)***

| Year | Gilts | | | Boars | | |
|---|---|---|---|---|---|---|
| | Average daily gain (g) | Backfat thickness (cm) | Lean meat (%) | Average daily gain (g) | Backfat thickness (cm) | Lean meat (%) |
| 1970 | 505 | 2.91 | * | 541 | 2.65 | * |
| 1980 | 532 | 2.39 | * | 564 | 2.13 | * |
| 1990 | 511 | 1.54 | * | 577 | 1.56 | * |
| 2000 | 525 | 1.26 | 56.4 | 603 | 1.23 | 58.2 |
| 2005 | 520 | 1.10 | 58.5 | 580 | 1.26 | 58.3 |
| 2010 | 547 | 0.82 | 61.3 | 596 | 0.86 | 61.8 |

Source: Fiedler et al. (2004), Databases of the Institute of Animal Science

## Carcass value and meat quality

Prior to World War II., Přeštice Black Pied pigs were slaughtered at a weight of 70-80 kg and used for the production of smoked products, especially Prague ham, which was exported to European countries and also overseas. The Přeštice Black Pied pigs were originally a meat-fat type, during the regeneration and improving by other breeds there was a shift to the type fat-meat. Thanks to funding by the Ministry of Agriculture, several projects was realised to analyse the growth, slaughter value and quality of the breed. The population of this breed has been compared with the hybrid combinations used in the Czech Republic. For this breed, a lower weight gain in fattening period, a higher intramuscular fat content and a lower lean meat content are typical. In traditional breeds the values of backfat thickness are in general much higher than those obtained from modern breeds that are selected for leaner carcasses. Lower content of lean meat was measured in Polish original breeds, in Zlotnicka Spotted pigs Szulc et al. (2011) found the average value of 43.99% in live slaughter weight of animals 114 kg. Also Candek-Potokar et al. (2003) reported in Krškopolje breed lower lean meat content compared to modern breeds. According Matoušek et al. (2016), lower growth ability, early and

higher adipose tissue development and lower carcass value were characteristic of Přeštice Black Pied breed during fattening in standard rearing conditions. With increasing slaughter weight the average backfat thickness, weight of meat cuts and belly and loin eye area increased, while lean meat content decreased. Dostálová et al. (2012) states that at the same length of fattening period, the Přeštice Black Pied pigs reach a lower weight, at the age of 186 days the weight of hybrid pigs of the combination (BUxL) x (HxPN) is 114 kg, but in Přeštice Black Pied pigs 92 kg. This corresponds to the average weight gain of 860 resp. 650 g/day. Higher proportions of intramuscular fat in the meat of Přeštice Black Pied pigs are confirmed by Hyšplerová et al. (2013), which for this breed is 2.73% and 1.52% for hybrid pigs. Václavková et al. (2014) found at slaughter weight 114 kg intramuscular fat content of 2.32% and only 51.14% of lean meat in the pig carcasses. Dostálová et al. (2012) recommend Přeštice Black Pied pigs for outdoor conditions due to its resistance and adaptability to environmental conditions and due to its lower nutrition demands.

The breeding herd of Přestice Black Pied pigs was established in the Institute of Animal Science in Kostelec nad Orlicí in 2009. In 2016 it obtained the status nucleus herd. The herd consists from 17 sows in 2018. There is insemination station for Přeštice Black Pied boars for production of insemination doses for farmers, breeders and also for experimental purposes. The cryopreservation of boar semen is also realised.

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