

## **Development of traditional pork (Mangalitza) production value chain**

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The Hungarian Mangalitza (Mangalitsa, or Mangalitza) pig is a fat-type breed, which was the most prominent swine breed in the region until the 1950s. The number of these hogs in Hungary in 1943 was about 30 thousand. Few decades ago, their number sharply decreased due to the breeding of modern commercial pigs and the changing of the consumer habits. Nowadays the valuable characteristics of Mangalitza pigs such as disease resistance, excellent adaptability to extensive housing conditions, good fertility, and excellent meat quality have been recognised. During the last few years, efforts have been made to save and propagate this breed.

Mangalitza pigs are directly descended from wild boar populations. Hungary has been one of the leading countries in preserving the traditional breeds. Intensive breeds did not completely replace the traditional ones; therefore it was possible to preserve the traditional Hungarian breeds together with social and agricultural traditions for historical, cultural and scientific reasons. Recently the popularity of eco-farming and organic food has made an increasing demand for indigenous animals, especially for Mangalitza pigs. There is a smaller consumer group, which needs the food products from traditional breeds. These populations can be called genetic breeds or genetic reserves. Mangalitza, being a fat type hog, is a good example: with the production of meat type pigs, Mangalitza totally went out of fashion, and one could never have imagined that today it has an increasing market.

The development of the Mangalitza breed is one of the most important aims of the Hungarian National Mangalitza Breeders Association. The breeding of indigenous animals is also encouraged by many international organizations such as Food and Agricultural Organization (FAO), World Wide Fund (WWF), European Association of Animal Production (EAAP), Rare Breeds International (RBI), Savegarde of Agricultural Varieties in Europe (SAVE), Danubian Countries Alliance for Conservation of Genes in Animal Species (DAGENE).

Mangalitza pig is distinguished by its rich and curly coat, which can be blond, black (swallow bellied) and rarely red.

The *blond Mangalitza* is the most popular one, it has an excellent feed conversion property, can be reared extensively or also in-door. It is good for fat and meat production, too. More variations are known, because the races were influenced by the various nutrition and housings. It is very resistant to the severe climate conditions; its feed can be very cheap and is very well adapted to the conditions of the Carpathian basin.

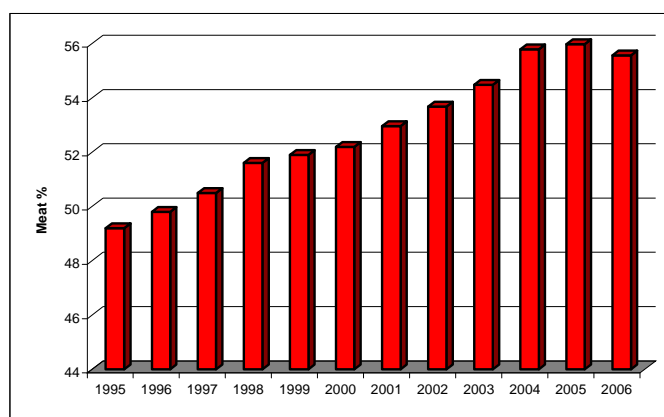
The *red Mangalitza* derives from the blond and the curly haired “szalontai” pig. It can reach higher weight and is more productive than the blond one.

The *swallow bellied* is originated from the crossbreeding of blond and black Mangalitza. Its belly is blond and its back is black. It has a smaller body size but it is more productive than the blond pig.

The black Mangalitza was characteristic for the south part of Hungary. It was formed from “szerémségi” black pig and blond Mangalitza. It was more resistant but less productive than the blond one; it disappeared at the first part of the XX century.

The wild Mangalitza, a crossing of blond Mangalitza and wild boar, was very rare and was predominant in the mountains.

In 1870, Mangalitza farms were formed in Budapest and Győr. In 1895, the pig plague appeared, which lasted 20 years and caused the death of 4,5 million animals of which 95% were Mangalitza. After this period, western breeds were imported to Hungary. These animals did not need extensive breeding but only the in-door housing. The consumers’ need was changed from fat to meat. After a long breeding period, between 1920 and 1960, meat type breed called Hungarian large white was “created”. The large white dominates the national pig production (60%). At the end of the XX<sup>th</sup> century the consumers need for lean meat sharply increased.



**Fig. 1:** The change in lean meat content of pigs

The average lean meat content of Hungarian pigs is at present about 55%, as generally known, excessive values induce unfavourable sensory properties.

Nowadays the renaissance of Mangalitza breed can be observed in Hungary. Some farmers believe in the outstanding qualities of the meat and in the increase of the conscious consumers demand.

The comparison of some characteristics of Mangalitza and large white meat type pigs can be seen in Table 1.

**Table 1:** Comparison of slaughter characteristics

<b>Characteristics</b>	<b>Mangalitza</b>	<b>Hungarian large white</b>
Breeding period (month)	13	6
Slaughter weight (kg)	130	100
Reproduction	6	8
Fat thickness (mm)	40	20
Muscle thickness (mm)	28	46
Lean meat (%)	37	52

The breeding of traditional animals is still unprofitable. Native Mangalitza in open house rearing is characterized by slow growing and fattening and its slaughter weight is also higher. It can easily survive the hard climate and nature conditions. Due to the extensive breeding it has a very tasty meat and fat.

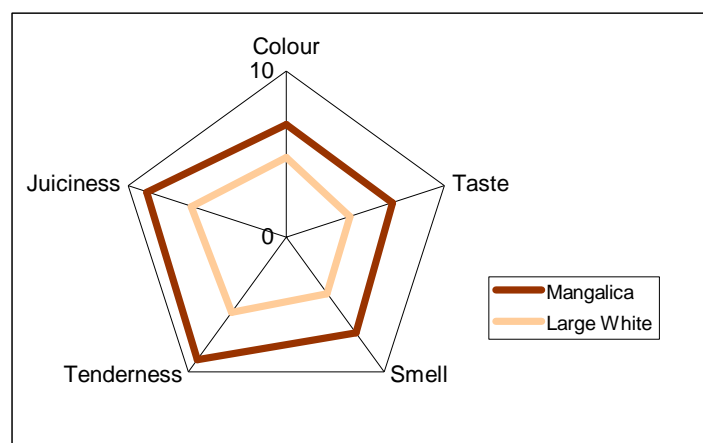
The chemical composition of the Mangalitza and Large white meat is shown in Table 2.

**Table 2:** Chemical composition

Properties	Mangalitza	Hungarian large white
Protein (%)	23,8	24,4
Intramuscular fat (%)	9,7	4,2
Cholesterol (mg/100 g)	52	51
Vitamin A ( $\mu\text{g}/100\text{ g}$ )	850	501
Vitamin B <sub>2</sub> ( $\mu\text{g}/100\text{ g}$ )	180	140
Iron ( $\mu\text{g}/100\text{ g}$ )	1000	750
Zinc ( $\mu\text{g}/100\text{ g}$ )	2900	1900

There is no difference between protein contents, but the fat content of Mangalitza is double that of the large white one. There is no difference in cholesterol level; however, owing to the long fattening period the vitamins and minerals have enough time to accumulate in the Mangalitza tissues. The latter ones are of crucial importance for human health and represent an added value to the Mangalitza meat and meat products, creating a competitive advantage compared to the commercial food products.

The cooking (frying) loss is less for Mangalitza, and the shear force is also lower. This means that the Mangalitza meat is more tender and softer. The colour of Mangalitza (instrumental colour measurement) is darker and more intense (due to its higher iron content). The sensory attributes can be seen below (Fig. 2).



**Fig. 2:** Sensory evaluation of grilled meat

The colour of grilled Mangalitzza meat is darker; it is more tasteful, palatable, tender and juicy and has a more pleasant smell than the Hungarian large white. Moreover, they hadn't got the unpleasant off-flavour regularly occurring with the control samples.

During the culinary preparations, the fat content of the Mangalitzza meat can be partly or totally discarded. There are also meat parts like shank, shoulder and ribs, which are prepared (cooked) together with their fat.

The Mangalitzza meat and fat does not contain less cholesterol than any other pig types. Cholesterol is the natural component of each cell. Cholesterol is the base of vitamin D and steroid hormones. Also human organism produces cholesterol. The cholesterol content of meat is relatively low (50-90 mg/100 g) compared with other foods like liver (200-900 mg/100 g), egg yolk (1190 mg/100 g) or brain (3000 mg/100 g).

We can state that extensively reared Mangalitzza pig is suitable for the manufacture of organic meat products. The fresh meat as a retail cut can be a product itself. The value added, special quality and traditional Mangalitzza meat products have an increasing market; they are present more frequently on the shelves of the markets.

Starting with the Mangalitzza value chain from the farmers, the Primagro Blond and Red Mangalitzza Breeding Farm, Kozárd and the Hortobágy non-profit Company for Nature Conservation and Gene Preservation must be mentioned.

The Hortobágy National Park, established in 1973, became part of the World Cultural Heritage. Organic farming in Hortobágy started in 1992; where beside Mangalitzza other traditional species can be found, such as Hungarian Gray cattle, Racka sheep, Buffalo, Nonius breed of Hungarian race horses etc.

The farm of Kozárd and the blond Mangalitzza stock breeding was founded in 2000. On 2001 Farmer Expo Kozárd won the prize of "The most beautiful reared boar of the Expo" and the second prize for Mangalitzza stock farm.

From Mangalitzza special organic meat and meat products can be manufactured. These are mainly regional or local products. When we talk about special Hungarian regional products, we use the word "Hungaricum". Hungaricums include not only foods but also other products made by famous Hungarian companies or persons, such as Rubic's cube, Biro's pen, Hungarian winter salami, porcelain of Herend and others.

The local, traditional meat products manufactured of indigenous animals, such as Mangalitza, constitute just a minor part of the actual Hungarian food market. The lack of interest is mainly due to the high difference in the prices between the high quality and mass products. The difference comes from the non economic, extensive breeding of the animals, the higher production costs, the complicated authorization and licenses processes and the difficulties in transportation and distribution of the small quantities of these products. However in the whole EU, there is a trend of sharply increasing needs for the value added, special, high quality, organic food products. So, new agro-food policy of EU is orientated in this direction.

In Hungary especially farmer's ham, paprika sausages and traditional salami are prepared. At the beginning of the XX century, the world-famous Hungarian products, such as Pick and Herz winter salami, and sausages of Csaba and Gyula, were based on Mangalitza meat. There is worth to mention some Mangalitza products manufactured for the domestic trade: Vas Mangalitza dry sausage, -liver paté, -smoked delicate bacon, -lard; Gyula Mangalitza sausage, -chuck and -bacon. Today, several Mangalitza meat products are present on the selves of supermarkets (such as: Metro, Spar, Interspar, Kaiser's, Auchan, Tesco, Cora, Match, CBA, Reál, COOP). Some products of the Pick Salami Company: Mangalitza smoked liver paté, Mangalitza paired sausage, Mangalitza salami, Mangalitza smoked and paprika bacon, Mangalitza lard.

Mangalitza meat is the raw material for the Spanish Monte-Nevada ham, too.

The Mangalitza pig is a Hungarian national treasure, and the high quality traditional Mangalitza products are examples of widening the variety of the EU food market. As each EU country, Hungary also possesses a remarkable heritage of agricultural commodities and foods with old traditions and local manufacturing methods. The protection of these origins and traditions is also the protection of our future.

The Hungarian Parliament in 2004 accepted the regulation for protected, indigenous animals of high genetic value.