NUTRITION AND FAT DEPOSITION IN FATTY PIGS WITH SPECIAL ATTENTION ON MEAT, FAT AND PRODUCT QUALITY – CASE STUDIES IN KRŠKOPOLJE PIG

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The Slovenian autochthonous breed Krškopolje pig (KKP), is a fatty pig breed, for which interest has increased in the past years. Several recent studies on this breed evaluated different nutritional regime and compared KKP with lean breed. The comparison of KKP with modern pigs (MP) in extensive (outdoor) system showed a better adaptability of KKP to the external environment, which was reflected in higher growth rate and fat deposition. The KKP also had higher levels of saturated (SFA) and especially monounsaturated (MUFA) fat which was associated with higher stearoyl-CoA desaturase gene expression. Despite the higher adiposity, KKP had lower lipogenic enzymes activity at the end of fattening, which is related to the earlier physiological maturation of the breed. In contrast, rearing KKP in intensive conditions (indoor) resulted in slower growth compared to MP, but at the same time greater carcass fatness, higher intramuscular fat, more SFA and MUFA and less PUFA, both in backfat and muscle. The lipogenic enzymes activities were highly dependent on the examined tissue (i.e. larger in BFT, lower in liver). Except for colour, the meat quality parameters were similar between the breeds. The production of dry-cured ham from KKP compared to MP showed lower processing losses, higher colour intensity and softer texture, as well as an effect on the volatile substances (more aldehydes and acids, less esters).

A comparison of conventional (indoor, commercial feed) and organic (outdoor, additional voluminous feed) rearing in KKP did not show any major differences in growth and carcass characteristics, but indicated darker meat with lower water binding capacity and more unsaturated fats (consistent with diet and exercise), exhibiting also lower oxidative stability. Except for a slightly darker colour and harder texture, the products (dry-cured ham, pancetta) from organic (EKO) did not differ from those produced from conventionally reared KKP pigs (CON). The impact of rearing practice was greater in dry-fermented sausages, where lower fat saturation resulted in higher yields (due to more smearing), softer texture, more intensive oxidation and less volatile substances causing more negative sensory perception. The response of KKP to a reduction in the protein content of the diet was also investigated in pigs kept either outdoors in organic or indoor conventional housing. In indoor housing, the KKP fed a low-protein diet were less meaty and fatter than KKP fed a standard diet. In organic farming, the pigs fed a low-protein diet grew more slowly and had less fat deposition. When the diet was equalized in the final fattening phase, the differences diminished.

From the research results it can be concluded that KKP show a pronounced adaptability and fat deposition compared to modern breeds or with different rearing and feeding practices. The observed effects on growth, fat deposition and composition can be used to improve the breed's potential for specialized and sustainable production. Funding by Slovenian Research and Innovation Agency (grants P4-0133, J4-3094, V4-2201, L7-4568) and the GEroNIMO project (EU H2020 GA No. 101000236) is acknowledged.