Abstract of Jakub Lasek doctoral dissertation entitled:

"Genetic improvement of meat quality in selected Polish pig breeds"

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Over the years in Poland, breeding work focused on improving slaughter and fattening parameters. That gave measurable effects on meat content in pig carcasses, daily weight gains and feed conversion ratio. So far, meat quality traits have not found their place in breeding programs implemented for individual breeds and lines of pigs in Poland. In recent years. the quality of pork, in contrast to fattening and slaughter performance, especially in relation to the content of intramuscular fat, has deteriorated. The growing consumer awareness and expectations of the availability of high-quality pig meat are a premise to take action to improve the quality parameters.

The aim of the study was to analyse the characteristics of meat quality in relation to the fattening and slaughter performance and to examine whether it is possible to improve the quality parameters genetically without a negative impact on the breeding progress already achieved. The research was carried out on Polish Large White and Polish Landrace pigs (both are material breeds), evaluated post-mortem at Pig Test Stations. The number of research material included 3720 animals. Genetic parameters for selected traits of fattening, slaughter and meat quality were estimated, i.e. heritability coefficients of the examined traits and their mutual genetic relationships as well as phenotypic relationships. The main emphasis was placed on meat quality characteristics. The background necessary for future breeding work aimed at improving the quality traits, was fattening and slaughter performance.

The studies showed a high heritability of slaughter traits (h^2 from 0.40 to 0.59) and meat quality parameters (h^2 from 0.36 to 0.73), except for the intramuscular fat content, for which the heritability was low ($h^2 = 0, 13$). The heritability of fattening traits was lower than analysed slaughter traits. Relationships between meat quality characteristics and slaughter and fattening parameters were analysed. Genetic correlations were found between the weight of the loin and the level of IMF ($r_G = -0.27$), and, the surface of the "eye" of the loin and the color parameter *b ($r_G = 0.34$). Other correlations between meat content and meat quality parameters were at a very low level. The highest genetic correlation was found between feed conversion/kg of body weight (kg/kg) and color lightness L* ($r_G = -0.72$). Other genetic

relationships between fattening performance and meat quality oscillated from r_G = -0.14 to 0.46. Mutual genetic correlations between the meat quality traits were at a very diverse level, reaching the maximum value of r_G = 0.84, but many of them were close to 0. A high genetic relationship was demonstrated between the intramuscular fat content and the active acidity of the tenderloin and ham, measured 45 minutes after slaughter (r_G from 0.35 to 0.47). The phenotypic and genetic correlations between meat quality traits and slaughter performance were low, which may indicate that the introduction of one-way selection to improve meat quality will not result in deterioration of meatiness. The results allowed to propose three models of meat quality improvement. In each of the models, the level of intramuscular fat content was taken into account, which among all the analysed qualitative features differs most from the optimal values. Other parameters of qualitative features are within the normal range or are close to the lower limit of the standard.

To conclude, the most favourable variant for improving the quality traits in the breeding population would be the variant in which all meat quality characteristics (9) would be taken into account. The expected breeding progress would be 1.2 in relation to the parental generation. Assuming that the average breeding value of the parental generation for the adopted set of qualitative traits is 100, the average breeding value of the next generation would be 101.2. The obtained results indicate that there are possibilities of genetic improvement of pork quality characteristics.