Summary

The aim of the study was to determine the influence of restricted feeding by energy and protein (diet) or only protein in period from 91 to 119 day of life (regulated growth) on the content of fat, fatty acids profile in carcass and muscles, and on the microstructure of chosen ham and loin muscles on 168 day of life. Animals from control group (K) were fed on grower mixture G (12,9 MJ EM and 8,3 g of digestible lysine), *semi ad libitum,* throughout the study. Pigs from experimental groups consumed 35% less energy and protein (grower mixture, groups D and Dad) or 35% less protein (group S), throughout the study. Gilts from group S were fed on a diet containing 13,6 MJ EM, 5,72 g of digestible lysine, what was made by "diluting" mixture G with starch in proportion 2:1. In the growth regulated period, animals from S group consumed the same amount of energy compared with the K animals. The pigs from group S consumed the same amount of protein compared with the D animals. Prom 119 to 168 day of life the pigs from experimental groups were fed in the same way as the pigs from control group (K), *semi ad libitum* (groups D and S) or *ad libitum* (group Dad). In carcass and muscles: *longissimus lumborum* (LL), *semitendinosus* (ST) and *biceps femoris* (BF), which has different growth rate, the chemical composition, fatty acids profile and microstructure on 91, 119, 168 day of life was determined. The growth rate and fattening rate of the chosen muscles were determined throughout the whole period of the study.

On 119 day of life the pigs from group D had less fat in carcass and muscles and they had better fatty acids profile compared to group K. The pigs from group S had more fat and fatty acids from SFA group in carcass and muscles. On 168 day of life the pigs from group D still had less fat, more fatty acids from PUFA group and less from SFA group in carcass and muscles compared to group K, S and Dad· Lower feeding or only protein intake had no influence on red muscles fibre content. Muscles of the pigs from D group had lower white muscles fibre content compared to group K (average 57 vs 60%, respectively, P<0,05). However, muscles of the pigs from S group had less white and middle fibers compared to the control group (average 63 and 23 vs 60 and 29%, respectively, P<0,05). After finishing the study the differences were affirmed only in the content of middle fibres. Muscles of the pigs

- from group Dad and D (average 31%) had more such fibres (P< 0,01) than muscles from the pigs from group K and S (average 27%). In the periods no differences were affirmed in the diameter of muscle fibres between the studied groups. The relationship between the microstructure of the muscles was not showed, with the exception of the diameter of white fibres and fatness of the muscles. The SFA acids were negatively correlated with the content of red fibres, and positively with the content of white fibres. Positive correlation was affirmed between the diameter of all types of muscle fibres and the content of SFA and MUFA acids and negative correlation with PUFA. The growth rate of all muscles in groups receiving periodically less energy and protein or only protein was smaller than in the animals fed according to the demands in the whole period of the growth (b = 0,94; 0,98; 0,99 vs 1,03, respectively in groups D, Dad, S). The growth rate and fattening rate in muscle LL was faster than in BF and ST muscles (respectively, b = 1,00 vs 0,97 and 0,98 and b = 0,52 vs 0,46 and 0,48).

The results show that muscles with more glycolytic metabolism (more white fibres) are more susceptible of the nutritional modification of the fatty acids profile.

Key words: pigs, fat, fatty acids, muscle fibre types