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EFFECT OF ENERGY INTAKE ON LIPID PROFILE IN PIGS

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Summary

The lipid profile in relation to the various levels of energy in feed ratio was studied in the pigs of the hybrid population Seghers slaughtered in the High-standard Testing Station of Fattening and Carcass Value (HTSFCV) in Nitra. The contents of total lipids, cholesterol and glucose in blood serum were non-significantly higher in the group of the pigs fed by the feed ratio containing 12,699 MJ/kg ME comparing to the group provided with the feed ratio containing 12,975 MJ/kg ME. At the same time, the concentration of triglycerides was significantly higher in the first group of the pigs.

Key words: pigs, blood serum, total lipids, triglycerides, cholesterol, glucose

Introduction

Pigs via their physiological attributes are predestined for economical and effective meat production. Therefore, careful attention must be given to the biological principles of pork production and the breeding objectives in the matter of meat quality.
Proteosynthesis volume is affected by optimal nitrogen intake as well as optimal and balanced intake of metabolizable energy (ME).
Interior status of organism is regulated by control mechanisms and, at the same time, many factors, from which nutrition cannot be excluded, are associated with its changes within the physiological range (Sommer, 1998; Kollárová, 1997).
Performance of pigs depends, beside other factors, on the intensity of nutrient metabolism. The earlier studies have confirmed that the animals with more intensive metabolism performed higher meat production, whereas the animals with lower intensity of metabolism showed tendency to fat production (Vrzgula et al., 1982; Schenk and Kolb, 1991).
The objective of this study was to evaluate relationship between ME intake in feed and content of selected lipid parameters in blood serum of pigs.

Materials and methods

The pigs of the hybrid population Seghers were submitted to the experiment in the HTSFCV equipped by a phase system of feeding mixture preparation controlled by computer. The 1st group of pigs was fed by 12,699 MJ/kg LBW (live body weight) of ME; 9,515 g/kg LBW of lysin and 29,796 g/kg LBW of fibre from 76 to 100 kg of live body weight. The 2nd group received feed with higher level of nutrition composed of 12,975 MJ/kg LBW of ME; 10,482 g/kg LBW of lysin and 28,095 g/kg LBW of fibre. Mean weight gain in the 1st group was 898,33 g/day and in the 2nd group 829,0 g/day. Backfat thickness in the 1st group was 1,87 cm and in the 2nd group 1,75 cm. The pigs were slaughtered when they reached 100 kg LBW, and the blood samples were collected in order to measure the levels of total lipids (TL), triglycerides (TG), cholesterol (CHOL), glucose (GL), cortisol (COR) and thyroxin (THYR).

Results and discussion

In the both groups the levels of all the measured parameters did not exceed the physiological limits (SOVA, 1981). All the parameters reached higher rates in the 1st group. The serum content of total lipids was 3,03 g/l whereas total lipids in the 2nd group were non-significantly lower. Significantly higher amount of triglycerides was found in the group of pigs fed by lower level of energy. The average rate in this group reached 1,05 mmol/l and in the 2nd group it was 0,08 mmol/l lower. Serum of the pigs in the 1st group contained also higher amount of cholesterol (2,73 mmol/l) although the difference between the groups was not significant. Glucose level was rather similar in the both groups.
Intensity of metabolism depends on hormonal regulation therefore the amounts of cortisol and thyroxin in blood serum of the pigs were evaluated by RIA method.
The levels of cortisol and thyroxin were lower in the pigs of the 1st group that refers to metabolism with tendency to lipogenesis. This theory was confirmed by higher backfat thickness in this group. On the other hand, the higher daily weight gain of these pigs can be attributed to more efficient feed conversion. However, lower intensity of metabolism caused that especially adipose tissue benefited from this effect as it has been described by Schenk and Kolb (1991).

References

Kollárová, E.: Aktuálne problémy riešené v poľnohospodárstve. Nitra : SPU, 1997, s. 65-67, ISBN 80-7137-620-5.
Schenck, M., Kolb, E.: Základy fyziologickej chémie. Príroda, Bratislava, 1991, s.276-277, ISBN 80-07-00418-1.
Sommer, A.: Slovenský chov, roč. 3, 1998, č. 6, s. 5.
Vrzgula, L. et. al.: Poruchy látkového metabolizmu hospodárskych zvierat a ich prevencia. Príroda, Bratislava, 1982, s.427.

Table 1 Statistical values of lipids and hormones in blood serum of pigs

Parameter	n	x	s	v	T
Total lipids [g/l]	26	3,03	0,55	18,16	-
	31	2,94	0,44	14,93	
Triglycerides [mmol/l]	26	1,05	0,20	18,60	+
	31	0,97	0,12	12,76	
Cholesterol [mmol/l]	26	2,73	0,40	14,64	-
	31	2,61	0,41	15,85	
Glucose [mmol/l]	26	4,36	0,35	7,96	-
	31	4,33	0,34	7,86	
Cortisol [ug.10^2/l]	26	1,68	0,76	45,17	
	31	1,81	0,82	45,70	
Thyroxin [ug.10^2/l]	26	1,14	0,63	55,77	
	31	1,29	0,11	8,86	

GEESE GENOFOND RESCUE IN SLOVAKIA

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Summary

After the only geese breeding pen in Slovakia had extinctioned, problem with biological material for multiplication farms occurred. Agriculture enterprise Tešedíkovo had been requested to elaborate project of geese genofond rescue. First stage of this project was aimed to create conditions for stepping over multiplication to breeding farm status, as well as the new geese type creation based on Tešedíkovo geese genofond (Ivagees 003 mated inter se) and genofond from imported geese, eligible for large - scale conditions. Revitalization project starts in 1996, when geese selection based on health status, constitution and body conformation was realized within breeding pen. In 1997 were imported ganders of 2891 type from Czech republic, appointed to cross with Tešedíkovo geese with concern to increase growing and slaughtering characteristic of the progeny. Arisen crosses of F1 generation (2891 ganders x Tešedíkovo geese) and original Tešedíkovo goslings were both tested for fattening characteristic and results mutually compared. In 1998 were imported ganders of Babati type from Hungary to improve further growing and slaughtering quality of Tešedíkovo geese. In 1999 30 geese groups were composed (10 groups TxBa, 10 TčxTč, 10 TčxBa). In breeding pen individual control of reproductive parameters and its progeny were tested in growing tests. Obtained results were analyzed and evaluated. Based on these results heritability value of each parents combination within breeding pen were stated. In the year 2000 after fulfilling every criteria has been this farm acknowledged as on breeding. We suppose, that in 2004 cultivation of this commercial type will be brought to an end and admitted as an official geese type.

Keywords: Geese, cultivating, reproductive, fattening and growing parameters