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CHARACTERISTICS OF ENERGETIC METABOLISM PARAMETERS IN MANGALICA PIG BREED

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Summary

In our work selected parameters of energetic metabolism in blood serum of pigs of Mangalica breed in two age categories: piglets (28–30 days old) and mature sows (14–18 months old) were evaluated. Based on the considering of the results of biochemical examinations different values in sucklings in comparison to mature sows were found, namely the total lipids (5,01 and 5,50 g/l), total cholesterol (1,64 and 1,42 mmol/l), HDL-cholesterol (0,92 and 1,00 mmol/l), triglycerids (0,71 and 0,42 mmol/l), and glucose levels (7,63 and 6,33 mmol/l). Our results corresponds with the values mentioned by other authors in mature sows. Provided examinations will help for identification of blood serum metabolites in pigs of different age categories and for specification of reference interval.

Key words: pigs, energetic profile, metabolism, Mangalica breed.

Introduction

Important changes in populations of farm animal in the half of the 19th century in consequence of intensive improvement caused creation of many new breed types of animals, mostly in accordance with consumers demand. This way also the creation of Mangalica breed from autochthounous Balkan breed Sumadinka and local Bakony and Szalontay breed in former Ugrian territory was done. After the period of expansion and also falls becomes in present time to renaissance of breeding in several Middle-European countries including the Slovak Republic again. Farms usually consists of small numbered populations on the level of gene reserves in purebred form or on the base of crossbreeding, usually with Duroc breed. Breed is characterized by fat utility type with slow growth and development, good health status, lower level of care needed, lower production and resistance against environmental conditions (Bodó, 2004, Kutvölgyi and Tóth, 2003, Sambraus, 2006, Gancarčíková et al., 2008, Buleca et al., 2006).

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In the context of these tendencies request of deepening the knowledge of biological characteristics of the breed on the level of traits and physiological properties, as well as morphological and utilization attributes is of the big importamce. The study of interior, representing the dynamic homeostasis of metabolism is important particularly from the aspect of production health of organisms. Effort to increase the production properties is moving the parameters of interior ambient outside of the optimum. Together the request of respect of biological needs of organism arise, otherwise metabolic disorders usually comes into the place (Kantíková and Balážik, 2003 and Zöldág et al., 2008, Supuka and Turek, 2005, 2006). Indicators of preclinical stages of metabolic disorders are metabolic profiling tests, based on analytical determination of concentration of metabolites of diagnostic importance, in particular the blood serum (Slanina a Sokol, 1992). Investigation of energetic profile parameters could be classified as on of the most important examinations both from health and production aspects. Individual breed genotypes frequently represent significantly different somatic-metabolic types, mainly from the aspect of different state of breeding and improvement (Beseda, 1990). Identification od referrence values of the parameters of metabolic profile has the importance in differentiation of referrence interval for categorization according to the age as well as inter-breed differences and other categories.

Material and methods

In our work serum parameters of cholesterol and lipid profile (total lipids, total cholesterol, triglycerids, HDL-cholestero and glucose) in 32 pigs of 2 age categories (piglets 28–30 days old (n=24) and mature sows, 14–18 months old (n=8)) were analysed. Animals becomes from farm in the middle part of Slovakia, their body condition and health status was good, blood samples were taken from sinus ophthalmicus in piglets and from vena cava cranialis in mature sows. Biochemical analyses were done spectrofotometricaly using Pliva Lachema Brno kits (Czech Republic), HDL-cholesterol fraction was diagnosed from blood serum using automatic analyser Reflotron (Germany).

Results and discussion

Obtained results of energetic profile serum components and cholesterol fractions examination (Table 1) represents different values in both investigated age categories. Significantly higher differences ($p<0,01$) were found in glucose

levels in benefit of sucklings (7,63 and 6,33 mmol/l). Statistically significant differences ($p<0,05$) in favour of sucklings category were found also in the levels of total cholesterol (1,64 and 1,42 mmol/l) and triglycerids (0,71 nd 0,42 mmol/l). Mentioned values in the Mangalica breed are significantly lower in comparison to reference scale for total cholesterol (2,6–3,9 mmol/l) according to Vrzgula et al. (1990). Values of total lipids were numericaly close and refer to the data mentioned by other authors (Vrzgula et al. (1990), Slanina and Sokol (1992), Vitić and Stefanović (1993).

Table 1: LIPID PROFILE PARAMETERS IN DIFFERENT AGE CATEGORIES OF MANGALICA PIG BREED

Parameter	Sucklings (n=20)		Mature Sows (n=13)		Testing differences
	x±s	v	x±s	v	
Total lipids (g/l)	5,01±0,44	38,83	5,50±0,65	42,32	0,536 ns
Total cholesterol (mmol/l)	1,64±0,08	22,89	1,42±0,06	15,73	0,044*
HDL cholesterol (mmol/l)	0,92±0,05	25,04	1,00±0,05	19,02	0,262 ns
Triglycerids (mmol/l)	0,71±0,10	59,91	0,42±0,09	76,58	0,034 *
Glucose (mmol/l)	7,63±0,31	18,07	6,33±0,34	19,16	0,008 **

Legend: *(p<0,05), **(p<0,01), ns (non-significant)

Our results correspond with the data ot authors: Dixon et al. (1999) (total cholesterol 78,7±3,0 mg/dl, triglycerids 0,34±0,03 mg/dl), Lombardi et al. (2005) (glucose 45,0±1,7 g/l) and Kreuzer et al. (2002) (total cholesterol 0,87±0,22mg/dl). State of energetic metabolism and significant differences in the levels of some markers indicate disunity of metabolism in both age categories of observed genotype of pigs.

Conclusion

Energetic profile parameters analyses were performed in order to consider the interior of metabolism and comparison of values of two age categories of Mangalica breed. Determined results correspond with literature sources in values of total lipids and glucose, values of total cholesterol showed in comparison to other authors lower values. Obtained results of examinations could serve for refinement of physiological values scale and characteristics of inter-breed differences in pigs.

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ZNAČAJKE PARAMETARA ENERGETSKOG METABOLIZMA U PASMINI SVINJA MANGALICA

Sažetak

U našem su radu ocijenjeni odabrani parametri energetskog metabolizma u serumu krvi svinja pasmine Mangalica u dvije dobne kategorije: praščići (28-30 dana starosti) i odrasle krmače (stare 14-18 mjeseci). Na temelju rezultata biokemijskih ispitivanja nađene su različite vrijednosti u sisajućim praščićima u usporedbi s odraslim krmačama, naime ukupni lipidi 5,01 i 5,50 g/l,u ukupnom kolesterolu (1,64 i 1,42 mol/l), HDL-kolesterolu (0,92 i 1,00mmol/l), trigliceridima (0,71 i 0,42 mmol/l) i razinama glukoze (7,63 i 6,33 mmol/l). Naši rezultati odgovaraju vrijednostima drugih autora u odraslih krmača. Ta će ispitivanja pomoći u identificiranju metabolita u krvnom serumu svinja različitih dobnih kategorija i u specifikaciji referentnog intervala.

Ključne riječi: svinje, energetski profil, metabolizam, pasmina Mangalica.

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