distinguished for having the least brightness and biggest pinkness and yellowness, comparing to control and Ist experimental group.

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CORRELATION OF ESSENTIAL MINERAL ELEMENTS AND MEAT QUALITY INDEXES OF VARIOUS PIG BREEDS

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Lithuanias' processed food sectors', as all European Unions' countries, one of the main aims is to warrant consumers wellness and wellbeing by developing an environment which saves safe, healthful and various foods' production and distribution chain (Staniskienė et. al., 2007). Animal breeding and conversion corporations respectively must manufacture a production of high quality, be aware of factors influencing the quality and the ways of decreasing its' variation (Warner et.al., 2010). Trace minerals are essential for the growth and metabolism of pigs. In practice, extra addition of some vitamins and trace elements can improve the carcass characteristics, including moisture loss, meat color, marble stripes, etc., so the relationship between trace elements and meat characteristics are important for improving meat quality (Guang Zhi et al., Gerber et. al., 2009). The aim of the research - to estimate the connection between essential minerals (Na, Mg, Ca, Ni, Cu, Zn, Ba, Se, Fe) and indexes of meat quality.

Scientific research was performed at Lithuanian Health Sciences University's Veterinary Academy, Animal husbandry departmenS, Laboratory of Meat Characteristics and Quality Assessment and State Food and Veterinary Service Institute of Risk Assessment. Control pigs' growth was performed at Lithuanian National Pigs Breeding Station, in standardized feeding and keeping conditions. 10–12 meat samples of 8 purebreed and crossbreed pigs carcasses' were taken for the analysis: large white (LW); landrace (L); pjetren (P); yorkshire (J); landrce x large white (LxLW); yorkshire x large white (JxLW); yorkshire x pjetren (JxP); landrace x yorkshire (LxJ).

For estimating pigs' meats' quality indexes according to certified methodology, it was determined: dry matter, proteins, intramuscular fat, ash, meat pH, meat color (lightness (L*), redness (a*), yellowness (b*)), meat drip loss, meat rigidity, meat cooking loss.

The amount of mineral content in pigs' meat was estimated in State Food and Veterinary Service Institute of Risk Assessment, laboratory of chemical researches, 48 hours after the carcass meat had been cooled. The amount of samples (10 g per each) taken from *musculus longissimus dorsi* and held in refrigerator in +4 °C temperature.

For estimating the amount of mineral content in pigs meats, according to certified methodology, these were performed: mineralization of samples with microwave system ETHOS 900 (by European standard LST EN 13805:2002. Processed food. Microelement evaluation. Mineralization in high pressure). Minerals' evaluation with inductively coupled plasma mass spectrometry (ICP–MS) (by LST EN 15763:2010. Processed food. Microelement evaluation).

Mineral content were estimated (mg/kg): Natrium (Na), Magnesium (Mg); Calcium (Ca); Nickel (Ni); Copper (Cu); Zinc (Zn); Barium (Ba); Selenium (Se); Iron (Fe). (The amount of Fe was evaluated using DRC (dynamic reaction cell) mode, additionally emited methane gas which eliminates interferences).

The data of analysis were processed with statistical pack „R", 2.0.1. version. Spreadsheets' „Excel" tools of data analysis was used for statistical analysis. Coefficient of correlation (r) was calculated. Disparities were considered to be reliable, when P<0.05.

The correlation of various minerals and indexes of meat quality was low or average (Table 1).

Table 1.

Parameters	Minerals				
	Na	Mg	Ca	Zn	Se
Dry matter	0.011	0.060	-0.018	-0.105	0.030
Proteins	-0.107	0.068	0.047	-0.417**	-0.018
Fat	0.096	-0.188	-0.136	0.499**	0.052
Ash	-0.294*	-0.212	-0.222	0.197	-0.048

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pH	0.134	-0.066	0.095	0.136	-0.023
L*	0.073	0.095	0.138	-0.054	-0.093
a*	-0.030	-0.174	-0.035	0.362**	0.175
b*	0.251*	0.171	0.118	0.012	0.056
Water drip	0.075	-0.225	-0.173	0.396**	-0.023
Cooking loss	0.011	-0.105	-0.059	-0.021	0.050
Rigidity	-0.211	-0.025	-0.133	-0.026	-0.126

Zn and Cu distinguished for having a major mineral matters' correlation with indexes of meat quality. The bigger the amount of Zn in various purebreed and hybrid pigs' meat was, the less amount of proteins ($P<0.01$) there was and a bigger amount intermuscular fat ($P<0.01$) as well, besides that the intensity of meats' redness (a*) ($P<0.01$), moreover the water drip was higher ($P<0.01$).

Table 2. Continuation

Parameters	Minerals			
	Cu	Ni	Fe	Ba
Dry matter	0.049	-0.196	0.134	0.019
Proteins	-0.288*	-0.106	0.067	-0.007
Fat	0.420**	-0.054	0.041	0.089
Ash	0.045	-0.023	-0.259*	-0.161
pH	0.152	0.069	-0.198	0.042
L*	-0.149	-0.262*	-0.044	0.210
a*	0.277*	-0.040	-0.009	0.051
b*	0.033	-0.021	0.211	0.093
Water drip	0.168	-0.020	-0.108	-0.101
Cooking loss	-0.176	0.020	-0.063	-0.023
Rigidity	-0.160	-0.020	-0.254*	-0.080

*– $P<0.05$; ** – $P<0.01$; *** – $P<0.001$*

The bigger the amount of Cu was in various purebreed and hybrid pigs' meat was, the less amount of protein the meat contained ($P<0.05$), and more inter-muscular fat ($P<0.01$), intensity of redness (a*) was also bigger ($P<0.05$). The amount of ash in meat was bigger as less Na ($P<0.05$), Mg, Ca and Fe ($P<0.05$) it contained. When *musculus longissimus dorsi* contained less amount of mineral elements Na and Fe ($P<0.05$), the rigidity of meat was bigger.

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