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Chemical composition and cholesterol content in *M. longissimus dorsi* from free-range reared Swallow-belly Mangalitsa: the effect of gender

Danijela Vranic[a,*], Dragica Nikolic[a], Vladimir Koricanac[a], Nikola Stanisic[b], Slobodan Lilic[a], Jasna Djinovic-Stojanovic[a], Nenad Parunovic[a]

[a]*Institute of Meat Hygiene and Technology, Kacanskog 13, 11000 Belgrade, Serbia*
[b]*Institute of Animal Husbandry, Autoput 16, 11080 Belgrade-Zemun, Serbia*

Abstract

The objective of this study was to determine chemical composition and cholesterol content in *M. longissimus dorsi* (MLD) of Swallow-belly Mangalitsa, free-range reared, and to investigate possible effects of gender on these quality parameters of its meat. Average moisture and fat contents were significantly different in male and female pig muscles. The differences in average values of ash, protein and cholesterol contents between the two groups (genders) of meat samples were not significant. In MLD samples of female pigs, total fat had a significant influence on cholesterol content, while this influence was not established in MLD of male pigs.

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Keywords: Mangalitsa; *m.longissimus dorsi*; chemical; composition; cholesterol; gender

* Corresponding author. Tel.: +381-11-2650-655; fax: +381-11-2651-825.
E-mail address: daniv@inmesbgd.com

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1. Introduction

In the recent years, there has been an increasing demand for products obtained from so-called "organic", "natural" or "biologic" livestock production systems. Such animals are habitually free-reared and the principal differences from traditional indoors production systems are the environmental, biodiversity and animal welfare respects, and the procurement of high quality foodstuffs[1]. Consumers today are more interested in healthy, tasty meat with high nutritional quality. In the group of three native autochthonous pig breeds registered in Serbia (Mangalitsa, Moravka and Resavka), the first one is the most common. Mangalitsa is characterized by dark color, robust constitutions and slower growth rate with higher adiposity and reduced lean deposition compared to modern white pigs. It is one of the fattest pigs in the world, as generally 65-70% of the carcass is lard and with only 30-35% lean meat compared to over 50% in modern breeds. It is reared in farm conditions or in open systems and fed using complete mixtures or in traditional ways, respectively. Meat and products from traditional breeds, like Mangalitsa pig, have a good image and promotion in the public and media in Serbia, particularly over the last few years.

The objective of this paper was to establish proximate chemical composition and cholesterol content in *M. longissimus dorsi* (MLD) of Swallow-belly Mangalitsa (autochthonous pig breed), free-reared, typical for its pig breed. An assessment of possible effect of gender on chemical composition and cholesterol content in selected pork muscles was an integral part of the study.

2. Materials and methods

The study included 16 Swallow-belly Mangalitsa fatteners (9 male castrated pigs and 7 female pigs) reared in the open system (Bojcin forest, Srem, Vojvodina). They were free-reared being feed on grass, leaves, acorns, etc, with addition of a small quantity of corn during winter. During night and bad weather conditions, animals were kept in a wooden facility. Live weight (LW) of animals was measured at the farm and warm carcass weight (WC) was measured in the slaughterhouse. After dissection of left carcass sides, samples (around 300 g) of MLD were collected, marked and homogenized. Protein content (Kjeldahl nitrogen) was determined by using Kjeltec^{TM} 8400 Analyzer Unit (Foss, Sweden). Analyses of moisture, ash and total fat were determined according to standard ISO procedures[2,3,4]. Cholesterol determination was performed by using HPLC/PDA according to Maraschiello et al.[5] In order to investigate the influence of gender, a statistical analysis of the data was performed using One-Way Anova procedure of SPSS software (IBM corp., version 20.0). Additionally, Pearson's correlation coeffient (r) was determined by using the above mentioned software for mean values of the investigated variables.

3. Results and discussion

The results of live weight and warm carcass weight of pigs, proximate composition (content of moisture, total fat, ash and protein) as well as cholesterol content in MLD from Mangalitsa pigs are shown in Table 1.

Table 1.Live weight (LW), warm carcass weight (WC) and proximate chemical composition and cholesterol content in *M. longissimus dorsi* (MLD) of Swallow-belly Mangalitsa (mean±SD) and significance of differences between pig genders.

	Male (M) (n = 9)	Female (F) (n = 7)	p-value
LW, kg	64.67±12.80	87.71±37.89	0.108
WC, kg	51.89±9.89	70.14±29.54	0.103
Moisture content, %	64.60±5.08	69.81±3.09	0.032
Total fat content, %	12.75±5.94	6.93±4.31	0.047
Ash content, %	1.01±0.21	0.94±0.10	0.394
Protein content, %	20.82±1.73	22.31±2.18	0.150
Fat:protein ratio (calculated)	0.63±0.34	0.32±0.25	0.062
Cholesterol content, mg/100g	80.51±12.19	78.26±19.03	0.777