

Influence of supplementation organic or mineral Selenium on content Selenium in fresh, cooked, roasted and grilled loin (muscle longissimus dorsi) and ham

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Abstract— The objective of this study was comparison of Selenium content between fresh, cooked, roasted and grilled loin (muscle longissimus dorsi) and ham (muscle semimembranosus) with or without supplementation Selenium in fatteners feed. Analyses were carried out on 45 samples of the *longissimus dorsi* muscle from fatteners divided into 3 groups, of which each was represented by a different Selenium supplementation organic or mineral (experimental groups) and the control group without Selenium in pigs feed. Fatteners coming from the first

experimental group (organic Selenium) were characterized in most cases by the higher content of Selenium in both muscles regardless of treatment method, than both muscles from the second experimental (mineral Selenium) and control group. Obtained results indicate that supplementation fatteners feed with organic Selenium results higher content of Selenium in meat and treatment method had no influence on this dependency.

Keywords— mineral Selenium, organic Selenium, loin, ham, pigs

I. INTRODUCTION

The consumption of pork meat is strongly related to climate and cultural feature in Poland and should not expect in the future a serious decline in this relationship. Given such a high consumption of pork meat in Poland per capita would therefore improve the nutritional and health value of this meat. Using the for feeding to pigs supplementation various bioactive components, selecting appropriate animal genotypes of pigs and maintenance systems can look for opportunities to enhance this basic kind of meat on the domestic market such as antioxidants, minerals, polyunsaturated fatty acids and vitamins. Selenium is a trace element necessary for the proper functioning of the human body and animals. The primary function is to act in selenium antioxidant and immune system. Clinical studies have shown beneficial effects of selenium in reducing cancer risk (Hathcock, 2004; Mahan, 2005). The deficiency and excess both in the diet leads to many diseases (such as Keshan syndrome, liver necrosis, increased risk of cancer, anemia, atrophy of internal organs, skin diseases) (Debski, 2007; Hathcock, 2004). The recommended daily level of selenium is for women 55 micrograms, 70 micrograms for men, or 1 mg Se / 1 kg / day (Wasowicz et al., 2003). The source of selenium for humans are cereal products, meat and

meat products, vegetables, milk, eggs and fish. The study by Polish authors (Marzec et al., 2002) that respectively 19.6% and 16.5% of selenium intake comes from meat and meat products. The level of selenium in meat can be increased with the feeding of animals for slaughter addition of this element in the form of inorganic (sodium selenite, sodium selenate) or organic (yeast selenium-containing selenomethionine and selenocysteine). Higher consumption of animal products rich in selenium may lead to improve the status of Se in the diet of people which has been so far poor in this element (Daun and Akesson, 2004).

The objective of this study was comparison of Selenium content between fresh, cooked, roasted and grilled loin (muscle longissimus dorsi) and ham (muscle semimembranosus) with or without supplementation Selenium in fatteners feed.

II. MATERIALS AND METHODS

Analyses were carried out on 45 samples of the *longissimus dorsi* and *semimembranosus* muscles from fatteners of the same genotype (wbp x pbz x Duroc) divided into 3 groups, of which each was represented by a different Selenium supplementation organic or mineral (experimental groups) in the same dose (5 mg pro 1 kg pigs feed) in the second stage of fattening and the control group without Selenium in pigs feed. After the daily cycle of cooling during the cutting samples were

collected *longissimus dorsi* and the *semimembranosus* muscles. Samples of meat have been subjected to thermal treatment (cooking, roasting, grilling), then in each sample was determined selenium content.

III. RESULTS

Mean results in the evaluation of the selenium content in loin and ham from the tested groups are presented in tab. 1 and 2. Fatteners coming from the first experimental group (organic Selenium) were characterized in most cases by the higher content of Selenium in both muscles in fresh meat and also regardless of treatment method, than loin (tab. 1.) and ham (tab. 2) from the second experimental (mineral Selenium) and control group.

IV. DISCUSSION

Comparison of organic and mineral selenium in the diet fed to pigs on the Selenium content in meat indicates on the advantageous effect of this element in organic form (Munoz et al. 1996; Mahan et al., 1999; Henmann, 2004; Dunshee et al., 2005, Mateo and al., 2007). The results of the investigations many authors (Batorska and Wiecek, 2009; Dyba, 2009) confirmed the increase of Se in the muscle *longissimus dorsi* and darkening of meat color, when in feed for pigs used organic selenium supplement of 0.5 mg / kg of feed only in the second period fattening.

V. CONCLUSIONS

Obtained results indicate that supplementation fatteners feed with organic Selenium results higher content of Selenium in meat. This results are the preliminary part of the project and need further studies.

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Tab. 1. The results of selenium content (mg) in *longissimus dorsi* muscle

Group	Method of thermal treatment meat		
	cooked	roasted	grilled
Control	0,262	0,184	0,099
With the addition of organic selenium	0,477	0,304	0,193
With the addition of mineral selenium	0,195	0,231	0,099

Tab. 2. The results of selenium content (mg) in *semimembranosus* muscle

Group	Method of thermal treatment meat		
	cooked	roasted	grilled
Control	0,179	0,113	0,076
With the addition of organic selenium	0,368	0,240	0,133
With the addition of mineral selenium	0,157	0,114	0,086

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