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Full Length Research Paper

Chemical composition of chicken meat produced in extensive indoor and free range rearing systems

Snezana Bogosavljevic-Boskovic[1]*, Sreten Mitrovic[2], Radojica Djokovic[1], Vladimir Doskovic[1] and Vladan Djermanovic[2]

[1]Department of Animal Husbandry, Faculty of Agronomy, University of Kragujevac, Cara Dusana 34, 32000 Cacak, Serbia.
[2]Institute of Zootechny, Faculty of Agriculture, University of Belgrade, Nemanjina 6, 11080 Belgrade-Zemun, Serbia.

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The present study involves the analysis of the chemical composition of white meat (breast muscles) and dark meat (leg muscles) of broilers in extensive indoor and free range systems. The length of fattening period was 56 days. At 56 days of age, 6 male and 6 female broilers were randomly selected from each rearing system and slaughtered. Cooled carcasses were dissected into primal cuts. Breast and leg muscle (thigh and drumstick) samples were used for chemical analyses. The obtained results suggested that free range rearing system was more favourable than extensive indoor system, as it resulted in a significantly higher protein content and a lower fat content of white and dark chicken meat. Female broilers produced a higher fat content and a somewhat lower protein content as compared to males.

Key words: Chemical composition, chicken meat, rearing system, sex.

INTRODUCTION

The quality of meat in general and hence poultry meat is an extremely complex notion that can be assessed from different points of view. From the standpoint of consumer interests and the slaughter industry, broilers should have not only high slaughter yields and desirable carcass conformation scores but also good aesthetic, sensory and nutritional characteristics. In that respect, the chemical composition of muscle tissue of major primal cuts is an important element of broiler meat quality (Ristic, 1999; Grashorn and Clostermann, 2002; Holcman et al., 2003; Suchy et al., 2002).

The above quality traits are dependent on a number of factors. Genotype, sex and age stand out among biological factors (Lewis et al., 1997; Bokkers and Koene, 2003; Hellmeister et al., 2003). Among numerous non-genetic factors that may substantially affect certain meat quality traits, particular importance has been attached to broiler rearing system in the past years (Ristić, 2003; Holcman et al., 2003; Bogosavljević-Bošković et al., 2006; Fanatico et al., 2005; Fanatico et al., 2006; Dou et al., 2009). Broiler rearing system is gaining importance along with the fact that the modern broiler meat market dominated solely by price competitiveness is undergoing radical transformation into a market equally dominated by both price and quality competitiveness. Free range rearing systems reduce stress while increasing comfort and bird welfare, thus enhancing the flavour (taste and aroma) of products, as compared to conventionally raised birds (Fanatico et al., 2006).

A positive effect of rearing system on certain meat quality traits (breast and thigh yields, improved sensory quality) was reported by Castellini et al. (2002), Fanatico et al. (2005) and Dou et al. (2009). The authors have also observed a reduced content of fat (abdominal fat in particular) in free range broilers as attributable to more intensive locomotor activity. Castellini et al. (2002) reported higher levels of omega-3 and omega-6 fatty acids, and increased levels of total polyunsaturated fatty acids in free range birds, which enhance meat quality and have consumer health benefits of reducing the risk of different types of cardiovascular disease (Betti et al., 2009).

Aiming at improved meat quality traits, certain broiler

*Corresponding author. E-mail: sbb@tfc.kg.ac.rs. Tel: +381 32 303 400. Fax: +381 32 303 401.