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Physicochemical and functional properties of chicken meat

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Abstract

The physicochemical and functional properties of chicken meat under commercial processing in Serbia were studied. Samples (n = 48) of broiler breast and thigh muscles from two farms during 2012 were collected for subsequent meat quality analyses. The farm treatments modify significant growth performance, feed intake and the physicochemical properties of chicken meat. Fatty acid (FA) composition in tissues reflected the FA pattern of the diets, although the predominant FAs were monounsaturated FA (MUFA), in comparison to saturated FA (SFA) and polyunsaturated FA (PUFA). Therefore, our results suggest that quality of poultry meat is a complex and multivariate property.

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Keywords: chicken meat; physicochemical and functional properties

1. Introduction

Meat is a concentrated nutrient source, considered essential to optimal human growth and development[1]. Although some epidemiological data has revealed a possible association between its consumption and increased risk

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of several forms of cancer, cardiovascular and metabolic diseases, meat consumption has been major contribution to the risk factors for chronic disease[2]. Poultry meat has many desirable nutritional characteristics, such as low lipid content and relatively high concentrations of polyunsaturated fatty acids, which are considered as a positive and healthy aspect by consumers[3]. The purpose of this study was to determine the quality of meat and to investigate whether chicken meat available, generally gives a good quality product of interest to the poultry industry and food technology.

2. Materials and methods

2.1. Animals and diets

Two homogeneous groups of male and female (50%:50%) Ross 508 and Hubbard broilers were reared under commercial conditions on two farms in Vojvodina in the northern part of Serbia, and fed ad libitum commercial diets for growing broilers with different ingredients. All diets were formulated to meet the minimum requirements for broilers and were proved as mash feed

2.2. Sample preparation

At 39 days old, 12 birds per farm were selected on the basis of live weight within as wide a range as possible, and were slaughtered at a commercial abattoir.After slaughtering and dressing, the hot carcasses were chilled for 2 h at 4°C. The carcasses were weighed and refrigerated for 24 h. The breast with skin (Mm. *pectoralis major*) and thigh meat with skin (Mm. of regio *tibio-femoralis*) were cut, separated and weighed (Table 1). A total of 48 samples of breast and thigh meat were collected and analyzed during 2012.

2.3. Analyses

Meat color was evaluated immediately after deboning using a colorimeter (Minolta Chroma Meter RC-400, Japan). The CIE system color profile of lightness (L*), redness (a*) and yellowness (b*) was measured by reflectance colorimeter using illuminant source D, while pH value was measured 24 h postmortem, by inserting a portable pH meter (Testo 205, AG, Germany). Cooking loss was determined as percentage of weight lost during roasting (220°C for 30 min). Total lipid was determined in raw and roasted breast and thigh meat with skin[4]. Water-holding capacity of muscle samples was measured using the methodology of Wierbicki and Deatherage[5]. FA′s were determined by capillary gas chromatography on GC Shimadzu 2010. Thiobarbituric acid (TBA) was determined according to the method proposed by Tarladgis et al.[6] and Holland[7]. TBA content was expressed as mg of malondialdehyde per kg of meat (mg MAL/kg). Determinations of Fe in meat samples were performed by the method of Jorhem[8].

2.4. Statistical analysis

Data was analysed by descriptive statistics (mean, standard deviation, and range). ANOVA with Tukey's test was performed, in order to determine statistical differences among examined parameters between farms ($p < 0.05$). Pearson′s correlation coefficient (r) was generated using the correlation procedures.

3. Results and discussion

The slaughter traits,oxidative status, Fe content and physical and functional properties, of broiler meat are shown in Tables 1, 2 and 3 and Fig. 1.