STUDY ON NUTRITIONAL QUALITY OF SOME PRODUCTS FROM FRESH PORK

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Abstract

The study had as purpose an analysis of the nutritional quality of two products from fresh pork (seasoned scruff and seasoned spare ribs) based on the raw chemical composition and respectively their energy value. Were analyzed 40 samples (20 samples for each type of product under study). The water, proteins, lipids and collagen content was determined using the automated analyzer Food Check (infrared spectrophotometer); mineral substances were determined by calcination, and carbohydrate content and energy value were established by calculation, using conventional formulas. Following conducted analyzes (on the scruff muscles and intercostal muscles), was observed a high variability in fat content of the two products studied: 12.55 g/100g lipids for the scruff muscles and 24.49g/100g lipids for intercostal muscles. This has resulted in a higher energy value for spare ribs (295.17 kcal/100g), this one containing with 11.94 g/100g more lipids compared to the scruff (198.67 kcal/100g). The average amount of protein varied less for the two products studied, with differences of 2.75 g/100g (19.51 g/100 g for pork scruff and 16.74 g/100 g for intercostal muscles). The data obtained were statistically processed by classical methods.

Key words: pork, scruff, spare ribs, proteins, lipids

INTRODUCTION

Modern consumers are continuously searching for tasty, nutritious, easy to cook or ready to eat meals. Manufacturers meet these requirements and diversify the assortment range offered to customers.

Considering the consumer's increasing demand for healthier foods in recent years, more focus has been placed on meat quality assessment. This can represent a great challenge (or opportunity) to the marketing of pork commodities. Although quality expectations may vary among various stakeholders along the pork production chain, it is important that the satisfaction of the various quality perceptions is balanced to enhance market sustainability and profitability for processors alongside safety and quality for consumers [8]

Pork is one of the most commonly consumed meats worldwide, and its consumption continues to increase [10].

The factors that affect fresh pork quality are breed, sex, growth promoters, age or weight at slaughter and carcass processing parameters [8].

The consumers' interest in pork products is maintained and based upon many factors. Composition of pork and its nutritional value, sensory perception, especially its fine taste, softness, crispness and juiciness, together with a variety of culinary preparations may serve as the examples. Consumers consider that a quality meat is the meat which has an optimum composition regarding its nutritive value. Meat is a very rich and universal source of nutrients based especially on proteins content [4, 9, 10, 11]

Nowadays consumers are concerned about environmental impact of animal husbandry, food safety and food quality, sensory proprieties and nutritional and health value [11]. In niche markets highlighting the quality of products is fundamental and product label could be an ideal means to underline its proprieties [1].

Pork ribs are very popular and widely consumed in China [3, 5], in USA and in European country.

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The manuscript was received: 01.10.2018
Accepted for publication: 13.03.2019

The most popular/consumed pork products (with tradition in Romania) are the spare ribs and scruff in various forms (fresh, seasoned, smoked etc.).

The study had as purpose an analysis of the nutritional quality of two products from fresh pork (seasoned scruff and seasoned spare ribs) based on the raw chemical composition and their energy value respectively.

MATERIAL AND METHODS

Two products from fresh pork (seasoned scruff muscles -*neck muscle* and seasoned spare ribs -intercostals muscles) have represented the samples taken in this study. Were analyzed 40 samples (20 samples for each type of product under study) bought from stores from Iasi.

After purchase, the samples were kept at refrigeration temperature (2°C) and then prepared to determine the crude chemical composition: the ribs were deboned and intercostal muscles were harvested, while the scruff muscles was cut into smaller pieces. The intercostal muscles and the scruff muscles were chopped and homogenized with an electric chopper.

The content of water, proteins, lipids, and collagen were determined with the automatic analyzer Food Check (infrared spectrophotometer); the mineral substances were determined by [12] calcination (in a furnace at 550 °C), and nitrogen free extract (NFEs) and energy value were determined by calculation, using conventional formulas. The conversion factors for kcal were: for proteins 4.27, for lipids 9.02 and for nitrogen free extract 3.87 (after FAO, 2003) [2].

RESULTS AND DISCUSSION

Following the determinations made for the two products analyzed, were observed the greatest differences in lipid content (with mean values of 12.55 g/100g for scruff muscles and 24.49g/100g for intercostal muscles). It has also been noticed and high variability in fat content, the coefficient of variation exceeding the threshold of 20% for both product categories, being found minimum values of 9.70 g/100g and maximum values of 20.3 g/100g lipid for the scruff muscle (Table 1); for intercostal muscles were determined minimum values of lipids content of 16.6 g/100g and maximum of 35.4 g/100g (Table 2).

Table 1 Chemical composition and energy value for seasoned pork scruff

Chemical components	$\overline{X} \pm s_{\overline{X}}$	CV%	Min.	Max.
Lipids%	12.55±0.85	29.51	9.70	20.30
Proteins%	19.51±0.19	4.26	17.70	20.30
Collagen%	3.46±0.07	8.50	2.80	3.71
Water%	66.25±0.65	4.18	61.30	70.20
Ash%	1.09±0.01	2.88	1.05	1.14
Salt%	0.8±0.04	7.52	0.4	1.2
Dry matter%	33.75±0.65	8.66	29.80	38.70
Organic matter%	32.66±0.64	8.89	28.74	37.56
Carbohydrates %	0.61±0.44	18.42	0.21	1.39
GE kcal/100g	198.67±6.56	14.73	169.81	256.99
GE Kj/100g	831.24±27.45	14.73	710.50	1075.27

GE = Gross Energy

The amount determined of the proteins had closer values for the two muscle groups studied compared to that of lipids, with differences of 2.75 g/100 g (19.51 g/100 g for the scruff muscle and 16.74 g/100 g for intercostal muscles).

The amount of collagen (reported to total protein content) was higher for scruff muscles (3.46 g/100g) compared with spare ribs muscles (2.51 g/100g), with almost one gram difference between the two analyzed products (0.95 g/100 g).

As regards the salt content, a higher amount was observed for spare ribs, for the intercostal muscles (1.67 g/100g) compared to scruff muscles (0.8g/100 g).

The water content was higher in scruff muscles (66.25g/100g) and lower in spare ribs (56.11 g/100g) with difference of 10.14 g/100 g. The water content of analized muscles varies inversely proportional with the amount of fat, but also the amount of protein is influenced by the proportion of lipids.

In intercostal muscles was observed a lower quantity of water and proteins compared with scruff muscles (were the proteins quantity was 19.51 g/100g, the one of lipids was 12.55 g/100g and of water was 66.25 g/100 g).

Table 2 Chemical composition and energy value for seasoned pork spare ribs

Chemical components	$\overline{X} \pm s_{\overline{x}}$	CV%	Min.	Max.
Lipids%	24.49±1.60	27.71	16.60	35.40
Proteins%	16.74±0.36	9.24	14.20	18.50
Collagen%	2.51±0.12	9.57	1.75	3.07
Water%	56.11±1.24	9.07	49.50	64.00
Ash%	1.94±0.11	15.53	1.50	2.30
Salt%	1.67±0.06	14.18	1.45	2.07
Dry matter%	43.89±1.24	12.44	36.00	50.50
Organic matter%	41.95±1.19	12.50	34.55	48.43
Carbohydrates %	0.72±0.08	8.43	1.27	0.05
GE kcal/100g	295.17±12.70	18.61	228.03	375.44
GE Kj/100g	1234.99±53.15	18.61	954.09	1570.84

GE = Gross Energy

The higher energy value for spare ribs (intercostal muscles), of 295.17 kcal/100g product, is based on the difference in lipid content, the higher proportion in its calculation being attributed to this content (220.90 kcal/100g).

We recommend the moderate consumption of this product because the high caloric value is mainly given by the fat content (predominantly unsaturated). After cooking maybe the quantity of lipids are lower but still remains higher.

CONCLUSIONS

Following conducted analyzes (on the scruff muscles and intercostal muscles), was observed a high variability in fat content of the two products studied: 12.55 g/100g lipids for the scruff muscles and 24.49g/100g lipids for intercostal muscles. This has resulted in a higher energy value for spare ribs (295.17 kcal/100g), this one containing with 11.94 g/100g more lipids compared to the scruff muscles (198.67 kcal/100g). The average amount of protein varied less for the two products studied, with differences of 2.75 g/100g (19.51 g/100 g for pork scruff and 16.74 g/100 g for intercostal muscles). The level of lipid content for both products reveals a high inhomogeneity, probably due to bread, age, gender and the different weights of animals that have been slaughtered and from which the analyzed samples were taken.

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