

Assessment of the nutrient content in selected processed meat products for compliance with the declared nutrient content

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Introduction: Nowadays, consumers are conscious of the nutritional value of meat products since they are particularly aware of the relationship between diet and health. In this respect, nutritional labeling provides information about the composition of products, allowing thus consumers to make an informed, healthy choice. However, many producers calculate the nutrient content of the foods instead of determining the nutritional composition by chemical analysis. Moreover, compositional changes in foods occur naturally due to various parameters taking place from manufacture to consumption. Thus, it is not possible to ensure the precise amounts of nutrients in all batches, and a certain degree of variation is acceptable. However, declared values should not deviate substantially from the actual nutrient content to avoid misleading the consumers.

Aim of the Study: This study aimed to evaluate compliance between declared and analysed values in processed meat products, considering permitted tolerance limits for protein, fat, carbohydrate, and sodium chloride contents.

Materials and Methods: Mini parizers, Frankfurter-type sausages, and canned meat products such as luncheon meat and corned beef were selected. The samples were purchased from four major supermarket retailers. The chemical composition was determined according to the recommended standard methods described in AOAC (2003). Moisture, ash, protein, fat, and sodium chloride contents were determined according to the 950.46, 920.153, 928.08, 991.36, and 935.47 methods, respectively. Summations of the constituents falling within 97 - 103 % of the analytical sample weight were generally considered acceptable. The content of carbohydrate was calculated by subtracting the sum percentage of moisture, ash, protein, and fat from 100. In case negative values for carbohydrate content were found, they were set to zero. Declared values were based on the manufacturers' labels. Data were analysed using descriptive statistics and are presented as average values.

Results and Discussion: Average composition (g/100 g) for each type of sample is as follows; A) mini parizer: declared composition (protein 12.28, fat 13.21, carbohydrate 6.28, salt 2.49) and determined composition (protein 11.50, fat 12.68, carbohydrate 7.22, salt 1.93), B) Frankfurter-type sausages: declared composition (protein 11.93, fat 17.01, carbohydrate 6.97, salt 2.25) and determined composition (protein 12.19, fat 17.13, carbohydrate 5.83, salt 2.39), C) canned meat products: declared composition (protein 15.67, fat 19.18, carbohydrate 2.79, salt 1.97) and determined composition (protein 16.33, fat 17.54, carbohydrate 3.81, sodium chloride 1.62). For mini parizers, it was observed that 9.1, 18.2, 27.3, and 63.6% of the samples were outside of tolerance limits for protein, fat, carbohydrate, and sodium chloride contents, respectively. With regard to Frankfurter-type sausages, 8.3, 25, 41.7, and 16.7% did not comply with the tolerance limits for protein, fat, carbohydrate, and sodium chloride contents, respectively. Finally, in canned meat products, it was found that 36.4% of the samples were outside the tolerance limits for carbohydrate and sodium chloride contents. Regarding the average analysed protein content, the higher content was found in canned meat products, whereas marginally lower content was found in mini parizers and Frankfurter-type sausages. The average determined fat content was lower than the declared content in all products. More than 35% of total samples were found outside the tolerance limits for carbohydrate and sodium chloride contents. For sodium chloride content, it is encouraging that the determined content was lower than the declared content in all cases. On the contrary, determined carbohydrate content was higher than the declared one in all cases. These differences, common in meat products, can be related to their low starch content and to the presence of other food components, such as organic acids that all count as carbohydrate. In mini parizers and Frankfurter-type sausages, deviations were observed in all types of components and are attributed to the greater number of ingredients used in the product formulation compared to canned meat products that deviations were only observed for carbohydrate and sodium chloride contents.

Conclusions: This study examined compliance with tolerance limits between declared and determined chemical composition in terms of protein, fat, carbohydrate, and sodium chloride content in processed products sold in food retailer shops in Greece. Based on the results, greater efforts are required to achieve compliance with declared composition and, in particular, sodium chloride content since meat products significantly contribute to dietary salt intake. Furthermore, food labels should be monitored for deviations from the declared composition to properly inform the consumers and allow them to make a healthy choice according to their nutritional needs and requirements. In future studies, the composition variability in relation to the production batch and declared composition should also be examined.

References:

AOAC (2003). Official methods of analysis (17th Edition; 2nd Revision), published from the Association of Official Analytical Chemists, International, Suite 400, 2200 Wilson Boulevard, Arlington, Virginia 22201, U.S.A.

Key words: Mini parizer, Frankfurter-type sausages, Canned meat, Chemical composition, Nutritional label