



ASSESSMENT OF NUTRIENT CONTENT IN SELECTED DAIRY PRODUCTS FOR COMPLIANCE WITH THE NUTRIENT CONTENT CLAIMS

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ABSTRACT

The aim of this study was to determine the content of protein, fat, and carbohydrates in selected homogenised cheeses, available on Polish market. Results were compared with the values declared by the manufacturers. The main protein content was equal to 6.6 g/100 g, fat content – 4.7 g/100 g, and carbohydrates content – 11.3 g/100 g. However, content of nutrients varied and depended on the manufacturer and the cheese flavour. Nutrient content claims were often different from the results obtained in our study: protein content resulted from this experiment was generally lower than declared by the manufacturers and obtained in our study fat content was higher than reported at the labels.

Keywords: homogenised cheeses, protein, fat, carbohydrates, content claims

INTRODUCTION

Milk and dairy products play an important role in human diet. Among them, cheeses are one of the most popular dairy products. Cheeses have different organoleptic characteristics such as flavour, texture or colour, and more and more products are produced enriched in certain nutrients and low in fat, to respond to the needs of the customers who pay more

attention to the nutritional value of food products (**Dmytrów et al. 2009; Chandan and Kilara, 2009**).

Homogenised cheeses, produced from raw or defatted milk, besides its flavour and taste, are good source of nutrients. Milk proteins are characterized by good digestibility and a proper amino acid composition (**Zalewski, 2010; Reklewska and Bernatowicz, 2003**). Lactose, a sugar present in homogenised cheeses, promotes absorption of calcium, phosphorus, magnesium, and the trace elements, and also helps in more efficient use of vitamin D (**McSweeney and Fox, 2009**). An important advantage of milk fat is its very high absorption, which reaches up to 99% (**Barłowska, 2008; Cichosz, 2007**). Therefore, in addition to low price of homogenised cheeses, they are willingly bought and consumed by customers (**Ziajka, 2008**). However, the matter is the reliability of the nutrient content claims and whether they thoroughly present the nutritional value of the product.

The aim of this study was to determine the content of protein, fat, and carbohydrates in selected homogenised cheeses, available on Polish market. Results were compared with the values declared by the manufacturer.

MATERIAL AND METHODS

The study was conducted on 28 samples of cheeses, from 12 different manufacturers (marked from A to L), with different flavours (natural, vanilla and strawberry). Among them products intended for children were also investigated (brand C and D).

Determination of proteins, fats, and carbohydrates was performed with MilkoScan FT 120 (Foss, Hillerød, Denmark), according to the standards of the IDF (International Dairy Federation). Preparation of samples involved 50 g of the sample diluted with distilled water according to the instructions of apparatus software. Samples were heated gently in a water bath and then analysed straight in the analyser which also gave final results, expressed as g/100 g.

RESULTS AND DISCUSSION

Protein content

The main content of protein in the analysed samples was equal to 6.6 g/100 g, and ranged from 4.78 g/100 g to 9.59 g/100 g. The highest protein content were found in cheeses

of manufacturer G (8.0 g/100 g), and the lowest in the cheeses B and L companies (4.9 g/100 g).

The highest protein content (8.3 g/100 g) was found in natural flavour cheeses. Vanilla and strawberry-flavoured cheeses characterized by a lower protein content (6.4 and 6.2 g/100 g, respectively).

The achieved results of protein content were different from the values given by the manufacturer (Figure 1). In most cases the values declared by the manufacturer were higher than those obtained in the present study. Only in two cases (J natural cheese and K strawberry-flavoured cheese) the values declared by the manufacturer were slightly higher than obtained in the experiment. The most consistent results were obtained in products of manufacturer C, and the most divergent results have been found in case of cheese produced by E and F companies.

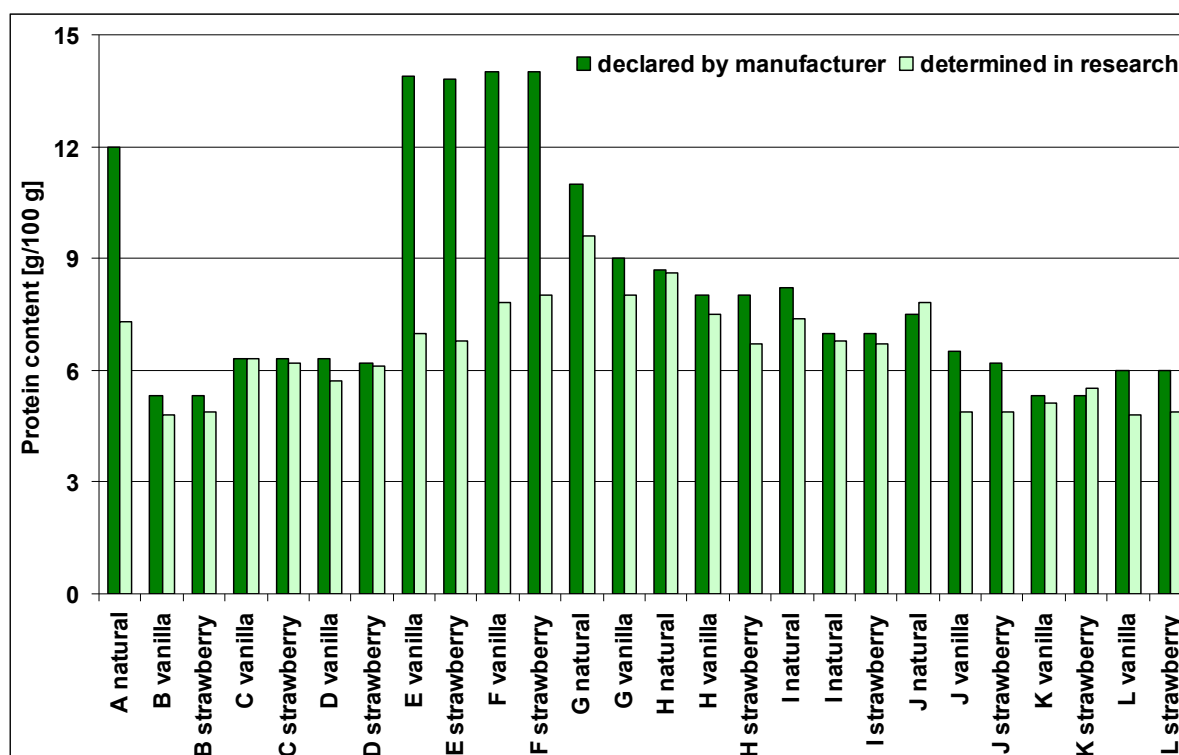


Figure 1 Content of protein in investigated homogenised cheeses

Fat content

The fat content in the investigated samples ranged from 2.3 g/100 g to 8.9 g/100 g with the mean of 4.7 g/100 g. Cheeses of brand E contained the highest content of fat (8.8 g/100 g), while cheeses from D company were characterised by the lowest fat content (2.6 g/100 g).

Comparing the cheeses of the same flavour, but from different manufacturers, it was found that natural cheeses characterized by slightly higher fat content (5.7 g/100 g) than the cheese with vanilla (4.6 g/100 g) and a strawberry flavour (4.3 g/100 g). Higher fat content in cheeses with natural flavour results from the addition of a larger amount of the ingredient (usually in the form of sweet cream with a fat content of 40%) to a natural cheese flavour than cheese with strawberry and vanilla flavours. Moreover, fat in natural cheeses plays an important role in guiding the appropriate organoleptic characteristics. For cheese with vanilla and strawberry flavours an appropriate flavours are introduced, which allow the product to ensure proper taste with a little less fat.

It was found that the fat content in some samples differed from the content declared by the manufacturers (Figure 2). Most manufacturers reported on the label lower fat content than those obtained during our research. The most divergent results were discovered in cheese E, B and G companies, and the most compatible results were observed in the samples of cheeses produced by I and G manufacturers.

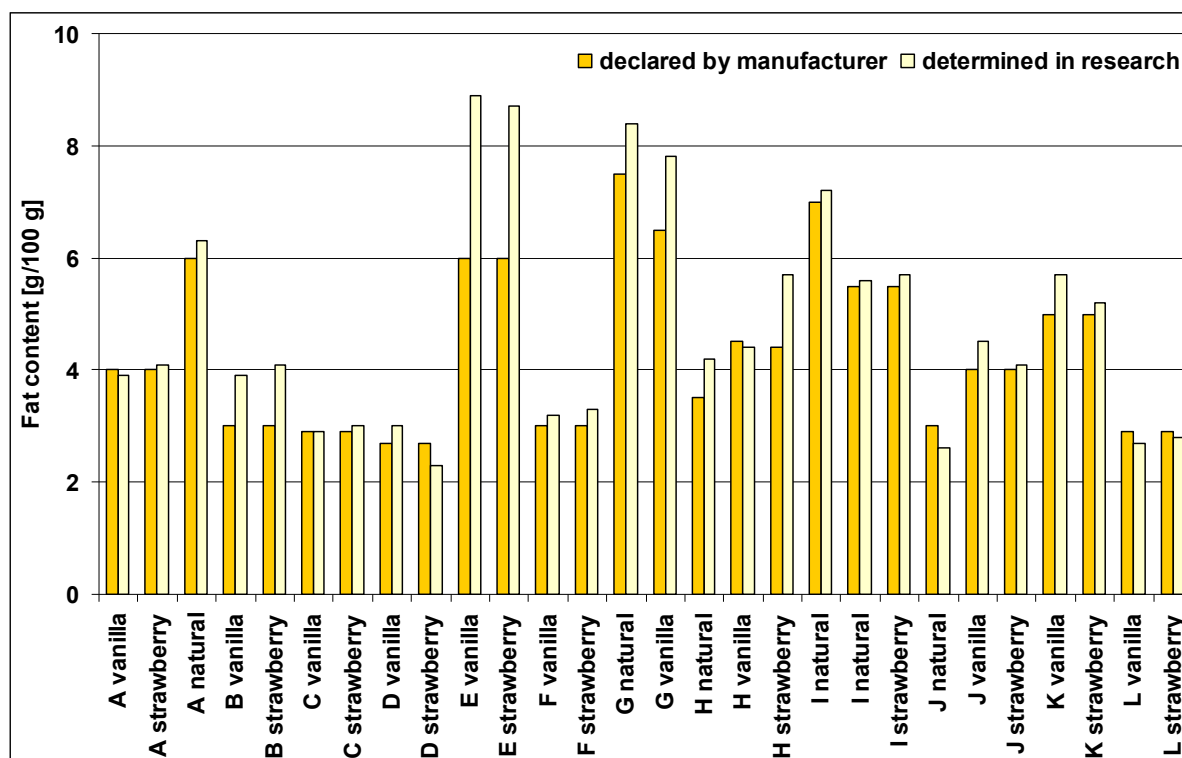


Figure 2 Content of fat in investigated homogenised cheeses

Total carbohydrates content

The mean content of total carbohydrates was 11.3 g/100 g, and ranged from 2.2 g/100 g to 16.7 g/100 g. The highest total carbohydrate content was found in L brand (15.7 g/100 g), and the lowest in products of manufacturer D (11.1 g/100 g). The total carbohydrates content was much lower in cheese with natural flavour (2.7 g/100 g) than in cheeses with vanilla and strawberry flavour (14 g/100 g and 13.2 g/100 g, respectively). It was also found that the natural cheeses characterized by significantly lower sucrose content (0.2 g/100 g) than cheese vanilla (9.9 g/100 g of product) and strawberry flavour (8.4 g/100 g). The higher carbohydrate content in vanilla and strawberry cheeses arise from the addition of sucrose, in order to achieve an appropriate taste. To natural-flavoured cheese sucrose is not added.

Comparing the total carbohydrate content declared by the manufacturer and resulting from the present study, it was found that in many cases, they were not compatible (Figure 3). The most similar values were observed for the cheese G brand, and the most divergent results have been obtained in case of cheese from E company. The values declared by the manufacturer were usually slightly higher than those acquired in our experiment. Only in one case (F company) declared carbohydrate content was much lower than the experimental value.

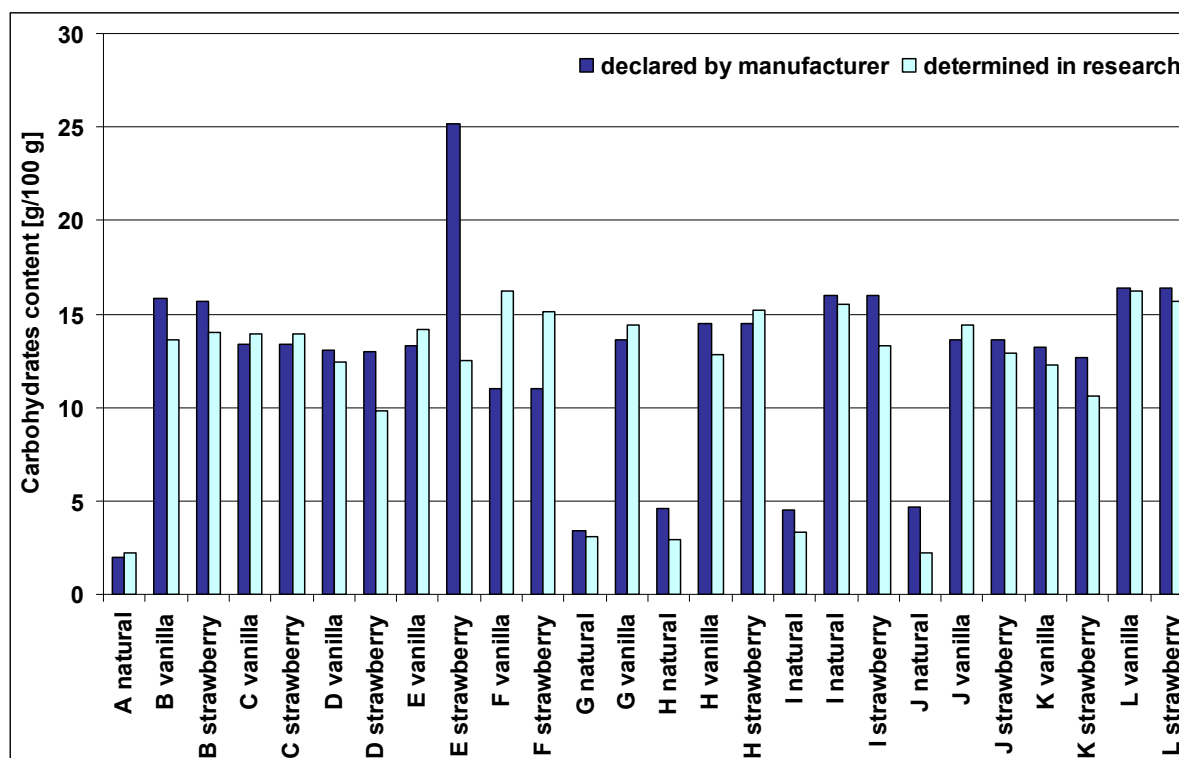


Figure 3 Content of total carbohydrates in investigated homogenised cheeses

CONCLUSION

The main protein content in investigated homogenized cheeses was equal to 6.6 g/100 g and was higher in the natural flavour cheeses. Main fat content was equal to 4.7 g/100 g. Natural flavour cheeses were characterized by a higher fat content than vanilla- and strawberry-flavoured cheeses. The total carbohydrate content was 11.3 g/100g. Vanilla- and strawberry-flavoured cheeses contained more sugars added in the form of predominantly sucrose than natural cheese flavour cheeses, which did not contain sucrose. Declared nutrient content were often different from the results obtained in our study. In general, protein content resulted from this experiment was lower than that declared by the manufacturer and obtained in our study fat content was higher than reported in the label.

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