



BIOACCESSIBILITY OF MINERALS (Fe, Ca, Zn and Mg) IN ULTRA- PROCESSED FOODS

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Abstract

The consumption of fresh meat, both swine and cattle, is considered a good source of nutrients and minerals, such as iron (Fe), calcium (Ca), zinc (Zn) and magnesium (Mg), which are fundamental in many fisiologic mechanisms. However, processed foods, such as hamburger and ham, are widely consumed and are present in most Brazilian households, because they represent practicality and affordable prices. For this reason, it is interesting to evaluate, in addition to the mineral composition (Fe, Ca, Zn and Mg) present in these meat products, the fraction that will be available for absorption in the body, through *in vitro* digestion assays.

Key words: Bioaccessibility, minerals, processed meat.

Introduction

In natura meat, both swine and bovine, are sources of proteins of high biological value, in addition to vitamins and minerals, such as iron (Fe), calcium (Ca), zinc (Zn) and magnesium (Mg) ¹. As is known, the minerals have a crucial role in human health and their deficiency leads to an impairment of several biological functions as well as disturbances in growth and development ². For this reason, it is important to evaluate not only the total content of minerals in a food, but also to analyze how much will be available for use in the body. This fact is related to the bioaccessibility concept, which is considered as the fraction of a nutrient to be released into the gastrointestinal tract during digestion making it available for absorption. Thus, through *in vitro* digestion assays it is possible to simulate gastrointestinal digestion of the food, followed by quantification of the mineral of interest through a semipermeable membrane simulating the intestinal wall ³. Therefore, the objective of this study was to evaluate the total Fe, Ca, Zn and Mg content in commercial samples of hamburger and ham followed by the bioaccessibility assay, in order to estimate the amount of these minerals available that could be absorbed into the body when consumed.

Results and Discussion

The samples were mineralized in a digester block at 130°C/4h and later the minerals were determinate by flame atomic absorption spectrometry. The experiments were made using 3 batches of 7 brands for each product.

The levels of Fe, Zn, Ca and Mg in the different brands of hamburger ranged from 1.00 to 2.13; 1.60 to 5.53; 6.17 to 35.40; 14.03 to 34.10 mg/100g, respectively. In the samples of ham, the contents of Fe, Zn, Ca and Mg ranged from 0.58 to 1.09; 1.30 to 2.52; 5.50 to 34.61; 16.35 to 23.88 mg / 100g, respectively, according to the figures 1 and 2. We verified variation in the contents of the evaluated minerals. Except for the Ca and Mg contents, in the hamburger samples, which presented lower levels than those reported in the Brazilian Table of Food Composition. The other minerals are in agreement.

In relation to dialysis percentage (%), we verified a variation from 4.7 to 18.20 for Fe; 11.93 to 21.20 for Zn; 1.46 to 22.60 for Ca; and 9.61 to 37.58 for Mg in the hamburger samples. For the samples of ham, the percentages of dialysis (%) ranged from 1.61 to 6.67 for Fe; 9.15 to 25.19 for Zn; 10.83 to 53.20 for Ca and 12.90 to 32.37% for Mg. Despite the variation, it was verified that there is an available fraction of the evaluated minerals that can be absorbed and contribute

in an effective way with the daily intake of these elements when hamburger and ham are consumed.

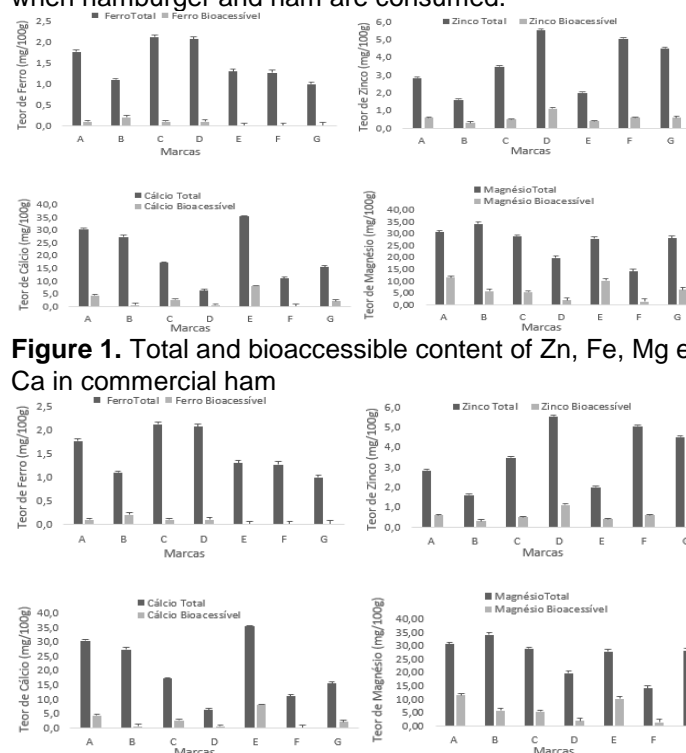


Figure 1. Total and bioaccessible content of Zn, Fe, Mg e Ca in commercial ham

Conclusions

It was possible to develop an analytical method to analyze Fe, Zn, Ca and Mg in samples of hamburger and ham simultaneously. A great variation in both the total and bioaccessible minerals contents was verified, in the different samples evaluated. However, the consumption of hamburger and ham may contribute to the ingestion of the evaluated minerals.

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