STUDY ON THE MINERAL CONTENT OF SOME EXTRUDED CORN SNACKS ASSORTMENTS

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Abstract: *The aim of the study is to evaluate the nutritional potential of some assortments of corn snacks. Even if they contain simple ingredients such as vegetable oil, corn starch and salt, some ingredients can be a cause for concern, such as saturated fatty acids, sugar, excess salt or a large number of additives. We took 10 assortments of corn snacks from the Romanian market in our study. The X-ray fluorescence (FRX) analysis shows that the corn snacks contain significant amounts of K, Ca and Zn. However, due to the high content of saturated fatty acids, these products should be consumed in moderation.*

Key words*: FRX, nutritional value, saturated fatty acids*

INTRODUCTION

Puffed corn snacks are tasty cereal-based products which have a poor nutritional quality. Some studies show that adding sesame seed, bay leaves, ginger, turmeric or sprouted legume mixture to extruded corn snacks make them more nutritious [6,7].

In addition, the extended shelf life of these plant-based corn snacks ensures that the product is microbiologically safe. Thus, the inclusion of these seeds and plants in extruded corn snacks could make a significant contribution to the field of functional nutrition [1,2,3,4,5,7].

Even if extruded corn snacks provide a feeling of satiety and contain simple ingredients, such as vegetable oil, cornstarch and salt, the consumption of puffs can be harmful, especially for children. Some ingredients can be a cause for concern, such as sugar, saturated fatty acids, excess salt and additives [8,9].

Minerals fulfil a variety of functions in the optimal functioning of the body [7,10,11,12]. In this context, the aim of our study is to evaluate the nutritional potential of some assortments of corn snacks.

MATERIALS AND METHODS

In order to achieve the objectives, were purchased 10 varieties of corn snacks awailable on romanian market: Snack puffs (S1), Corn snack with pizza flavor (S2), Simple corn snack (S3), Corn snack with palm oil (S4), Corn snack without salt (S5), Corn snack with sunflower oil (S6), Corn snack with tomatoes and garlic (S7), Corn snack with vegetables (S8), Corn snack with cheese (S9), Corn snack with hazelnuts (S10).

Energy-dispersive X-ray fluorescence identifies metals and elements in a product by detecting their XRF emission energies. Results are expressed in ppm (mg/kg dry weight).

In order to analyze the mineral content, the samples were dried, ground and then placed in polyethylene bags (figure 1).

Figure 1. The extruded corn snacks samples

RESEARCH RESULTS

In table 1 are presented the nutritional parameters of the extruded corn snack types.

Table 1

The nutritional parameters of the corn snacks assortments

Types of sample	Energetic value Kcal/100g	Lipids g/100g	Carbohydrates g/100g	Proteins g/100g	Salt g/100g	Fiber g/100g
S1	403	16.0	68.0	5.0	1.7	3.4
S2	565	37.8	52.4	3.8	0.8	2.1
S3	425	10.0	76.5	6.5	0.6	2.3
S4	517	29.0	58.0	3.8	1.6	4.4
S5	375	14.0	82.7	5.6	0	1.9
S6	448	13.4	71.2	9.4	1.0	2.5
S7	539	33.0	52.0	5.6	1.6	2.7
S8	478	23.0	62.0	4.8	2.5	4.5
S9	550	35.0	52.0	5.2	1.5	2.9
S10	491	24.0	11.0	14.0	1.7	3.5

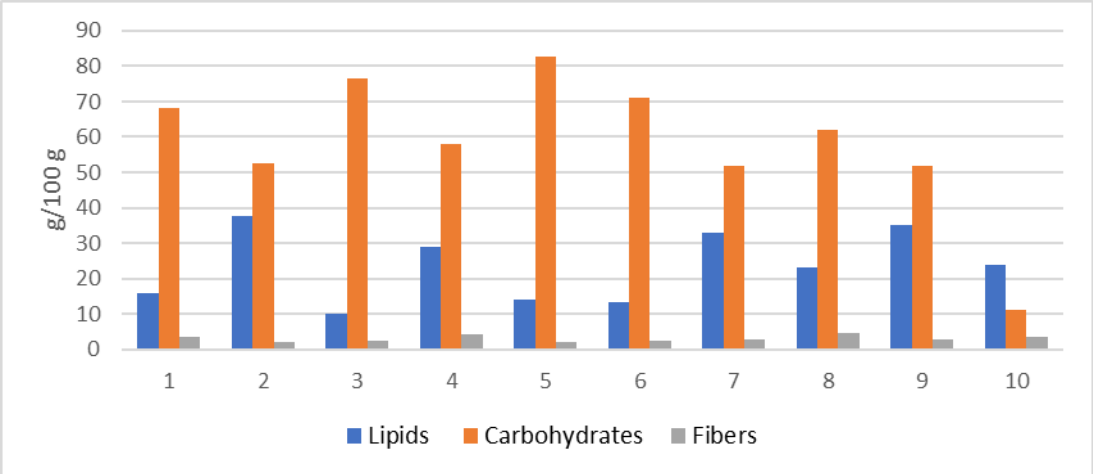

Figure 2. Nutritional parameters of corn snacks samples

Regarding the lipid content (figure 2), the highest value corresponds to the S2 assortment (pizza-flavored puffs) and the lowest to the S3 assortment (plain puffs).

The highest value of the carbohydrate content corresponds to the assortment S5 (Corn snack without salt) and the lowest to the assortment S10 (Corn snack with hazelnuts).

Assortment S10 (Corn snack with hazelnuts) has the highest protein content, and assortment S4 (Corn snack wih palm oil) the lowest.

The highest value of the fiber content corresponds to the assortment S8 (Corn snack with vegetables) and the lowest to the assortment S5 (Corn snack without salt).

The experimental results following the FRX analysis, show that all assortments of puffs have a high content of K. This element is essential for all of the body's functions [13,14,15].

The highest Ca contents belong to the assortments S9 (Corn snack with cheese) and the lowest to the assortment S6 (Corn snack with sunflower oil).

Regarding the Zn content, the assortment S1 (Snack puffs) recorded the highest value, followed by the assortment S10 (Corn snack with hazelnuts).

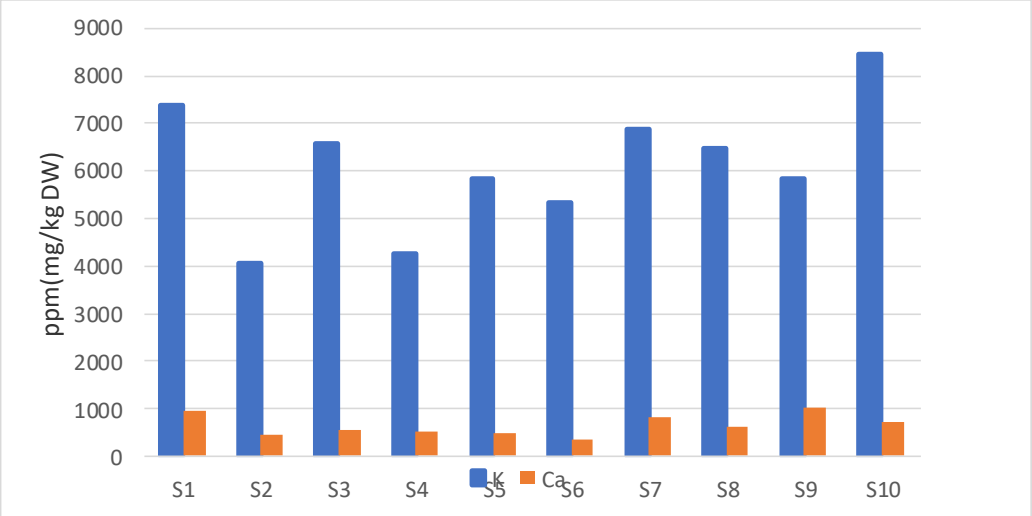

Figure 3. K and Ca contents (mg/kg dry weight) of corn snacks samples

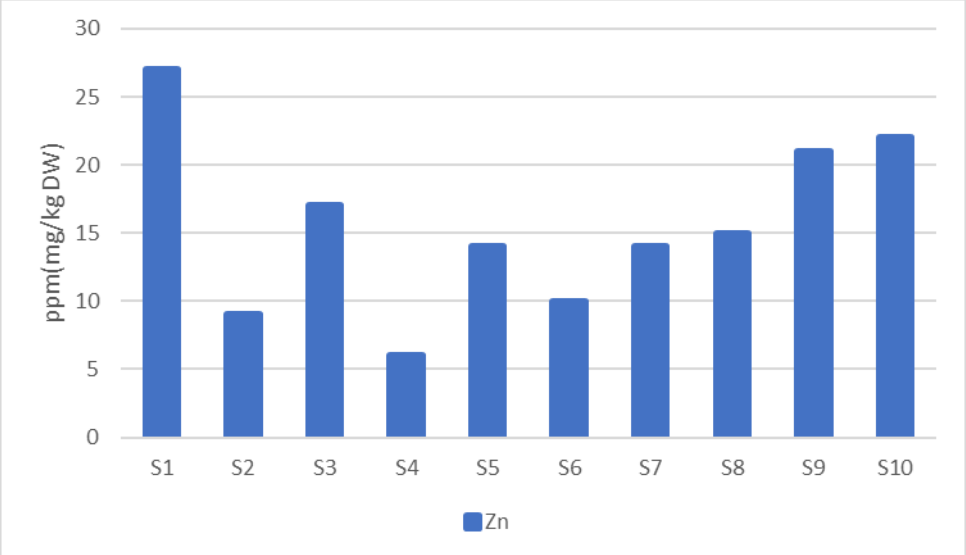

Figure 4. Zn contents (mg/kg dry weight) of corn snacks samples

CONCLUSIONS

FRX analysis shows that the extruded corn snacks contain significant amounts of K, Ca and Zn.

The assortment with cheese recorded the highest Ca content, the assortment with peanuts the highest protein content, and the one with vegetables the highest fiber content. So, by adding different ingredients we can increase the nutritional value of these products. However, due to the high content of saturated fatty acids, these products should be consumed in moderation.

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