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Development and Nutritional Evaluation of a Bread Type Crouton Supplemented with *Moringa oleifera* Leaves and Sweetened with *Stevia rebaudiana*.

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Abstract

People with diabetes require high care to balance their food, insulin and oral medications, and exercise, to help control their glucose level. *Moringa oleifera* is recognized for its many functional properties, one of which is the control of the blood glycemic index. Similarly, Stevia is a 100% natural sweetener, which contains no calories and virtually no carbohydrates. As a result, there is no adverse effect on the glycemic index. Therefore, the investigation of new products including *Moringa oleifera* and Stevia could benefit people looking for new alternatives to control their blood sugar. This study aims to investigate the development of a new bread product ideal for people with diabetes. The breads was carried out in 3 batches, M1: control, with 100% white flour sweetened with commercial sugar, M2: was added whole wheat flour and flour white in 1: 1 ratio and sweetened with Stevia, M3: addition of 100% whole wheat flour, sweetened with Stevia. Samples M1 and M2 were added with *Moringa oleifera* leaves.

Keywords: Diabetes; Moringa, Stevia

Introduction

Moringa oleifera, commonly known as moringa, is a small fast-growing tree that usually reaches 10-12 meters in height **[1]**. The leaves, flowers, fruits and roots are appreciated for their nutritional value and can be used in human foods. The leaves are rich in vitamins A, B and C, calcium, iron and essential amino acids **[2]**. In vitro studies showed that moringa leaves fruits and seed extracts can protect living cells from oxidative DNA damage associated with aging, cancer and degenerative diseases due to their antioxidant properties **[3].** It is currently used as a nutritional supplement for pregnant women, children and adults and in a homeopathic way for more than 300 diseases, including hypercholesterolemia, hypertension, diabetes, neurodegenerative diseases, anemia, fertility problems, liver and kidney diseases, skin disorders and even cancer **[4].**

Sweeteners are used as sugar substitutes in treatments for obesity and diabetes, diseases that can lead to the development of multiple conditions, especially chronic degenerative types **[5]**. Stevia in particular is a low-calorie food additive, and is therefore a potential drug suitable for diabetic patients **[6].**

At present, the bakery industry has a large number of products of different shapes, sizes and flavors. However, many of these products are not suitable for diabetic people due to the components they contain such as refined grains flours and synthetic sweeteners. Incorporating components such as Moringa and Stevia to the development of these bakery products will increase their beneficial properties by converting them into functional foods, and will foster a greater focus of this industry for people with diabetes.

Functional foods are defined broadly as foods that provide more than simple nutrition; they supply additional physiological benefit to the consumer. The genesis of the functional foods industry has occurred for a number of reasons; consumers are aware of the possible positive role diet can play in disease risk management; Additionally, regulatory bodies have become increasingly cognizant and supportive of the public health benefits of functional foods, and governments looking at regulatory issues for functional foods are more aware of the economic potential of these products as part of public health prevention strategies, however, to date the cost savings that might be realized have not been assessed **[7]**.

Materials and Methods

Three formulations of moringa, stevia and whole wheat flour were developed for the development of a crouton bread. M0 control made with 100% refined flour and sweetened with commercial sugar was evaluated. Sample M1 was prepared with 50% whole wheat flour, 1% *Moringa oleifera*, and sweetened with *Stevia rebaudiana*, and M2 sample with 100% whole wheat flour, 2% of *Moringa oleifera*, and sweetened with *Stevia rebaudiana*. The dough was allowed to stand with the respective formulations, molding was performed, and breads were baked at 45 ° C for 30 minutes in a baking oven of the SERVINOX brand model HG170. Moringa leaves were collected in the city of Tekax, Yucatan, Mexico, dried at 90 ° C for 1 hour in a drying oven DIDATEC TECHNOLOGIE model DT-D50, pulverized for about 1 minute at a speed of 20,000 rpm in an IKA MF 10 analytical mill, and filtered with a mesh of 297 microns opening to obtain a fine powder collected in a glass jar to be stored until use. Fresh leaves were used to obtain the stevia extract, crushed and then macerated, allowed to stand for 24 hours, filtered with a Whatman paper filter of 125 mm pore size, and filtered to be stored in a glass jar until use.

Moisture, minerals, protein (Kjeldahl method), fat (Soxhlet method), fiber and total carbohydrate tests were performed on each sample.

Results and Discussions

A crouton-type bread with added *Moringa oleifera* leaves and sweetened with *Stevia rebaudiana* was made. The results of the bromatological analyzes performed on each of the samples (M_0, M_1, M_2), can be seen in (**Table 1)**.

Table 1: Bromatological components of crouton-type breads.

Components (%)	M_0	M_1	M_2
Proteins	7.84	10.22	13.14
Fiber	33.20	34.50	37.30
Minerals	1.50	5.38	10.52
Carbohydrates	38.80	18.24	14.94
Fat	18.20	23.38	18.46
Humidity	0.45	8.25	5.61

It was observed that the M2 sample contains a higher concentration of proteins (13.14 g / 100 grams), a high amount of fiber (37.3 g / 100 grams), higher concentration of minerals (10.52gr / 100 grams) and lower amounts of carbohydrates and fat in comparison to the other samples. High protein and fiber values can be attributed to the greater addition of *Moringa oleifera*. There are studies that show that the plant has a high nutrient content **[2]**. These results suggest that such a bread product could be consumed by diabetic people. Although the results demonstrate the functionality of the product, it is important to carry out more research regarding the side effects and prevention of diseases that this type of food could have.

References

1. Liñán F (2010) *Moringa oleifera* el árbol de la nutrición. Ciencia Y Salud Virtual. 2: 130-138.
2. Fahey J (2005) *Moringa oleifera*: a review of the medical evidence for its nutritional, therapeutic, and prophylactice properties. Part I. Trees Life Journal. 2: 1-5.
3. Singh BN1, Singh BR, Singh RL, Prakash D, Dhakarey R, *et al.* (2009). Oxidative DNA damge protective activity, antioxidant and anti-quorum sensing potentials of *Moringa oleifera*. Food Chemical Toxicology. 47: 141-146.
4. Gowrishankar R1, Kumar M, Menon V, Divi SM, Saravanan M, *et al.* (2010). Trace Element Studies on *Tinosporacordifolia* (Menispermaceae), *Ocimum sanctum* (Lamiaceae), *Moringa oleifera* (Moringaceae), and *Phyllanthusniruri* (Euphorbiaceae) Using PIXE. Biological Trace Element Research. 13: 357-363.
5. Salvador R, Sotelo M, Paucar L (2014) Estudio de la Stevia (*Stevia rebaudiana* Bertoni) como edulcorante natural y su uso en beneficio de la salud. Scientia Agroecuaria. 5: 157-163.
6. Yang YH, Huang SZ, Han YL, Yuan HY, Gu CS (2014) Base substitution mutations in uridinediphosphate-dependent glycosyltransferase 76G1 gene of *Stevia rebaudiana* causes the low levels of rebaudioside A Mutations in UGT76G1 A key gene of steviol glycosides synthesis. Plant Physiol Biochemical. 80: 220-225.
7. Vera-Guerrero L, Villarreal-Portillo D, et al. (2019) El papel de la nutrigenómica y los nutracéuticos en la prevención de las enfermedades cardiovasculares. Revista Cubana de Cardiología y Cirugía Cardiovascular. 25: 1-3.

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