BISCUITS WITH FLOUR OF LUCUMA, SPELT AND CAROB FOR PROPHYLACTIC AND DIETARY NUTRITION

Albena Durakova[1], Tzvetana Gogova[2], Stefka Vladeva[3], Adelina Vasileva[4*], Anton Slavov[5], Velichka Yanakieva[6], Milena Temelkova[7]

[1]Department of Process Engineering, Technical Faculty, University of Food Technologies - Plovdiv, Maritza Blvd. 26, 4002 Plovdiv, Bulgaria
[2]Department of Technology of Grain, Fodder, Bread and Confectionery Products, Technological Faculty, University of Food Technologies - Plovdiv, Maritza Blvd. 26, 4002 Plovdiv, Bulgaria
[3]Department of Endocrinology and Metabolic Diseases, Multifunctional Hospital for Active Healthcare "Caspela", Sofia Str. 64, 4000 Plovdiv, Bulgaria
[4]Department of Mechanical and Instrument Engineering, Faculty of Mechanical Engineering, Technical University - Sofia, Branch Plovdiv, Tsanko Duistabanov 25, 4000 Plovdiv, Bulgaria
[5]Department of Organic Chemistry and Inorganic Chemistry, Technological Faculty, University of Food Technologies - Plovdiv, Maritza Blvd. 26, 4002 Plovdiv, Bulgaria
[6]Department of Microbiology, Technological Faculty, University of Food Technologies - Plovdiv, Maritza Blvd. 26, 4002 Plovdiv, Bulgaria
[7]Department of Language Training Centre, University of Food Technologies - Plovdiv, Maritza Blvd. 26, 4002 Plovdiv, Bulgaria

[*]e-mail: adelina.bogoeva@abv.bg

Abstract

The present study examines a recipe for biscuits with flour of lucuma, spelt and carob designed for prophylactic and dietary nutrition. Conducted literature research characterizes flours of lucuma, spelt and carob as expedient to be used in nutrients, designed for prophylactics and dietary nutrition. The presence of data for the conducted *in vivo* examinations gives us a reason to think that a combination of the products in a certain proportion is expedient for a product, intended for consumption from people with diabetes mellitus type 2, which is the main motivation for the present study.

Raw materials for biscuits were - whole meal spelt flour type 1750 - 356 g; lucuma flour - 356 g; carob flour - 71.2 g; and margarine "Bella" - 569.8 g. They were kneaded and shaped in round rings 6 mm thick and 17 g weight. The biscuits are baked for 8-10 minutes at 180 ^{0}C. The antioxidant activity of the ready biscuits is reported in four different by mechanism methods - methods: 2,2-diphenyl-1-picrylhydrazyl - DPPH, 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) - ABTS, fluorescence recovery after photobleaching - FRAP and cupric reducing antioxidant capacity - CUPRAC. The quantity of soluble and insoluble dietary fiber is analyzed through BDS 11374:1986. Their microbiological indices - *Escherichia coli*, *Salmonella* spp., coagulase positive *Staphylococcus*, pathogen microorganisms, fungi, mesophilic aerobic bacteria and facultative anaerobic bacteria, are examined, according to the Bulgarian state standard. In the Department of endocrinology at multifunctional hospital for active healthcare "Caspela" Plovdiv Bulgaria, initial *in vivo* examinations are conducted and the glycemic control and the fatty profile of 15 people with diabetes mellitus type 2 with a very good control of the illness - blood sugar on empty stomach average 7.0 mmol/L and normal indices of the serum lipids. A control group from 8 healthy people is differentiated. The age range is from 43 to 81 years.

The basic physicochemical indices of the biscuits and of the powdered products of the recipe are specified. The soluble and insoluble dietary fibre content in the biscuits with flour of lucuma, spelt and carob is 16.43% ± 1.02 and 3.15% ± 0.77. 0.77. The ready biscuits' presence of antioxidant activity is proved with the four methods used. The traced microbiological indices of the biscuits for one month in refrigerating conditions, packed in copolymer foil designed for the food industry do not establish *Escherichia coli*, *Salmonella* spp.; coagulase positive *Staphylococcus*, pathogen microorganisms, moil, mesophyll aerobic and facultative anaerobic bacteria are below the admissible norms.

The data from the study indicates that the new product, biscuits with flour of lucuma and spelt, do not decay the glycemic control and the fatty profile of the examined people and they are with very good receptivity.

Key words: *Lucuma, Subtropical fruit, Biscuits.*