TITLE: FERMENTED MILK ADDED OF GRAPE PEEL FLOUR: DEVELOPMENT AND CHARACTERIZATION

Authors: Neves, J.E[1]; Santos, V.A.Q.[1], Cunha, M.A.A.[1]

Institution: [1] Universidade Tecnológica Federal do Paraná – Departamento de Química - CEP - 85503-390 Pato Branco, Paraná.

Abstract: The development of food products with potential benefits to health is object of intense worldwide research. Such foods are known as functional, since it provide nutrients to the body and act as health promoters, preventing diseases like cancer, diabetes and hypertension. Probiotic microorganisms in fermented milks and yogurts are responsible by functional characteristics, which associated with nutritional properties make these products attractive to contemporary consumer. New food ingredients to increase the nutritional quality of the formulations have been the subject of study by industries. In this context, different agro-industrial byproducts can be studied as potential ingredients to new food formulations. Grape peels contains appreciable amounts of bioactive compounds, such as anthocyanins and phenolics and a potential strategy for the use of this biomass could be the processing into flour for use as an ingredient in food products. In the present study, tree formulations of fermented milk drink added of grape peel flour (*Vitis labrusca* L.) were development. Mixed lactic acid bacterial culture containing *Lactobacillus acidophilus* LA-5®, *Bifidobacterium* sp. BB-12®, e *S. thermophilus* (BioRich, Chr. Hansen A/S, Dinamarca) was used as starter culture (0.4 g/L). The formulations consisted of standardized milk, powdered milk, commercial sugar, grape pulp, grape peel flour (10 g/L, 30 g/L ou 60 g/L) and potassium sorbate. The grape peel flour was characterized through analysis of anthocyanin content, antioxidant activity (DPPH, ABTS and FRAP methods) and physical-chemistry parameters. The lactic culture viability in the formulations (stored at 5 ºC) was evaluated during 21 days, as well as the microbiological quality and physicochemical composition of the formulations. Grape peel flour was characterized as a high fiber content biomass (57.6 g/100g), protein (9.95 g/100g) and mineral residue (10 g/100g). Similarly, high content of anthocyanin-3-glucoside (36.76 mg/100g) and high capacity to scavenge DPPH radicals (137.34 µmol trolox/g) and ABTS-radical cation (171,78 µmol trolox/g), as well as ferric reducing antioxidant power (482,05 µmol $Fe^{+2}g^{-1}$ – FRAP) were observed. Count of lactic acid bacteria indicates that culture remained viable during the storage time (between 0 and 21 days) and showed counts between 1 x 10^9 and 9.2 x 10^9 CFU/mL. Likewise, the three formulations showed microbiological quality (coliforms at 35 ° C and 45 ° C < 3.0 MPN / mL / g and absence of *Salmonella* sp) in agreement with Brazilian legislation. The physicochemical analysis showed relevant nutritional aspects as high fiber content (between 5 and 35 g/100g) and low fat content (between 1.3 and 2.7 g/100g). All formulation of fermented milk had good sensory acceptance and high purchase intent index (higher than 70%) suggesting commercial potential for the developed products.

Keywords: Cell viability. Microbial quality. Dairy product. Antioxidant activity.

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