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Development of High Fibre Okara-Wheat Bran Cereal Flakes

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Structured Abstract

Background: Okara is a by-product of soymilk processing, presenting a significant opportunity to enhance the nutritional profile of cereal products, specifically wheat bran flakes, through its high fibre content and other components. Despite of its high concentration of dietary fibre, proteins, lipids and bioactive components including antioxidants, okara is frequently underutilized and discarded. This study focuses on development of breakfast cereal with incorporation of different percentages of okara.

Methods: Five formulation of okara-wheat bran cereal flakes were developed by varying okara paste concentration (0, 10, 20, 30, and 40%). The physicochemical and functional properties of formulated okara-wheat bran cereal flakes were investigated.

Results: Addition of okara into wheat bran cereal flakes exhibit the largest, roughest and more porous surface as reported by SEM micrograph. It results in lower bulk density (0.17 to 0.20 g/cm^3), which lead to denser and firmer flakes. Moreover, dietary fibre in okara contributes to strong water-binding properties, resulting in significant ($p < 0.05$) increased in water absorption index (WAI) as okara levels increased. It allows physical and retention of water molecules in okara-wheat bran cereal flakes. In contrast, the rehydration ratio decreased from 84.18% (control) to 76.63-49.54% (okara addition) due to the high amount of fibre entrap less water in cereal. The increase in colour (L*, a*, b*) properties as okara levels increase was due to the natural pigment in okara and mild thermal reaction occur during production of cereal flakes.

Conclusion: Addition of okara up to 40% provides desirable physicochemical and functional qualities of high fiber okara-wheat bran cereal flakes.

Keywords: Okara, cereal flakes, physicochemical properties

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