

**STUDIES ON SOME DAIRY PRODUCTS
SUBSTITUTES**

By

MOHAMED SAAD ABD-ELHAMED ALI
B.Sc. Agric. Sci. (Dairy Science), Fac. Agric., Cairo Univ., 2004

THESIS

Submitted in Partial Fulfillment of the
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In

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(Dairy Science)

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APPROVAL SHEET

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SUPERVISION SHEET

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Title of Thesis: Studies on Some Dairy Products Substitutes.

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ABSTRACT

The aim of this study was to optimize the best processing techniques for production of oat and barley milks (aqueous oil-in-water emulsions stabilized with oat or barley solids) with acceptable taste and level of anti-nutritional components such as phytic acid, hence can be used whether as substitute to cows' milk in non-dairy beverage flavored with mango juice. The soaking, toasting of soaked oat grains or blanching of soaked barley grains and grinding each with sweet whey at ratio of grains to whey 1:3 were the best techniques for production of reasonable milks with high recoveries of solids and protein. In comparison with cows' milk, oat milk had a significant higher content of total protein, potassium and fibres while barley milk was highest in phosphorus, iron and zinc contents. Nutritionally, consumption of one cup (245g) of oat milk can provide adults with about 10, 17 and 20% of their daily fibre, protein and potassium needs, respectively. While, the same amount of barley milk was able to cover about 51, 58 and 74% of adults daily requirements of iron, zinc and phosphorus, respectively compared to cow milk. Healthily, the diet containing oat milk or barley milk solids showed reasonable blood glucose level reduction in serum blood of the diabetic rats (Reduction was 45.82 and 33.78% respectively) compared with diabetic control rats (547.1 mg/dl). Also, the serum levels of total cholesterol (TC), triglyceride (TG) and LDL-cholesterol decreased being 210 and 217, 126 and 132 , 148 and 156 mg/dl for rats group2 and group 3, respectively, while HDL-cholesterol increased being 36 and 34 mg/dl in the rats fed on high-cholesterol diets containing oat or barley milks solids as compared with the positive control groups (297.89 mg TC/dl, 178.8 mg TG/dl, 231.9 mgLDL-C/dl and 30.24 mg HDL-C/dl). Physically, oat and barley milks had significantly higher viscosity and lower heat stability and specific gravity (2.03 and 1.83cP, 2.53 and 2.46 min, 1.022 and 1.02 respectively) than that of cows' milk (1.37cP, 15.43 min, 1.03 respectively). Practically, oat or barley milk beverages flavored with mango juice had high nutritional value as well as high stability of their organoleptic properties up to 10th day under refrigerated storage (5-7°C) compared with mango juice-cow beverage.

Key words: Oat, barley, cow milk, juice, beverage, cholesterol, glucose, blood.

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