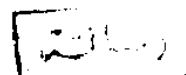


PRODUCTION OF SOME DIETETIC DAIRY PRODUCTS

BY

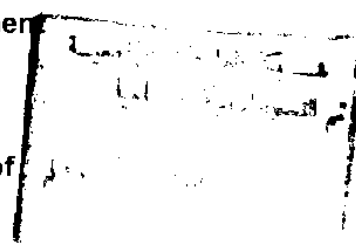
NABIL MOHAMED SAMY SAIED ABD RABOU



A thesis submitted in partial fulfillment

of

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DOCTOR OF PHILOSOPHY

IN

Agricultural Science

(Dairy Science and Technology)

Department of Food Science

Faculty of Agriculture

Ain Shams University

1994



APPROVAL SHEET

PRODUCTION OF SOME DIETETIC DAIRY PRODUCTS

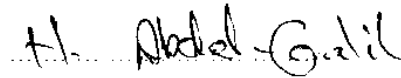
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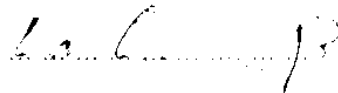
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Abstract

Dietetic dairy products has been developed to help special group of people. The dietetic milk products are produced either by reducing one component or more such as low fat, low lactose and low cholesterol dairy products; or by fortification with special component from external sources such as vitamins and minerals.

So, this research was planned to produced some new dietetic dairy products for special functions and special people. The study was dealt with iron fortification of yoghurt and white cheese for overcoming the iron-deficiency anemia. For producing the light dairy products, this study was concerned with using diafiltrated milk; which had a low lactose content; in manufacturing of ice-milk with replacement of sucrose with another sweetener such as high fructose corn syrup. The research had been carried-out under three parts. Yoghurt made from buffalo's milk and fortified with different source of iron, electrolytic iron, ferric chloride, ferrous sulphate, at three ratios of 40, 60, and 80 mg/kg. White soft cheese made from UF buffalos milk retentates with different types of iron at the same ratios. Manufacture of ice milk from diafiltrated milk and high fructose corn syrup 90 instead of sucrose. results showed that:

- 1- Fortified yoghurt with electrolytic iron and ferric chloride causing nor or ; minor effects , on the produced yoghurt either flavour or colour
- 2-The effect of iron source and concentration had a highly significant effect on chemical composition of all resultant yoghurt where acidity, npn and diacetyl were increased freshly and during consumed period by increasing the iron concentration . While pH, lactose, and acetaldehyde were decreased .
- 3- The iron fortification of white soft cheese had highly significant effect on the acidity of cheese where acidity percent was increased by increasing the iron concentration.
- 4- Fat, salt and total nitrogen content were increased in all treatment white soft cheese after 15 days of consumed period.
- 5- The fortified cheese with different types and concentration of iron had increasing in their TBA values and PV during consumed
- 6- The resultant white soft cheese fortified with electrolytic iron (T2) by 80 mg Fe/kg gave the high scoring point, followed by cheese fortified with ferric chloride T3 at the same ratio, the both cheese possessed good body & texture with desirable flavour and acceptable colour . No off -flavour was appeared along 15 days consumed period .
- 7- Increasing of added HFCS 90 had a highly significant increase in the acidity percent and viscosity of treatments than control
- 8- specific gravity and weight per gallon of the mix as well as the resultant ice milk were decreased as the percentage of HFCS 90 increased .
- 9- Combining sucrose and with HFCS 90 was found to posses a lowering effect on the organoleptic properties of resultant ice milk .

Key words :

Iron-yoghurt; yoghurt, Fe-fortification, white cheese, UF-cheese, iron-cheese, nutrition-cheese,dairy products; ice milk, DFF-milk, sweeteners , fructose, HFCS, diabetic ; dietetic dairy products .

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INTRODUCTION

The dramatic changes in the lifestyle during the last two decades, have created an increasing demand for healthier foods. Product developers were quick to respond and a range of new products have been launched to meet this trend. The concept of product diversification is becoming even more widespread. Therefore, milk was once the only beverage rich in calcium, yet suddenly a selection of products with added calcium are available in the world market to compete with milk.

The dairy scientists, technologists and industry responded to this new trend in food consumption, by presenting new dairy products of special function and characteristics. New fermented milk products with selected dairy products and dietetic preparations are available now in the markets.

The demand for dietetic foods is growing. These foods may be formulated for people suffering from nutritional diseases, physiological disorders or for healthy people with additional needs. Dietetic food has to meet the following requirement :

- develops a special physiological action to cure people suffering from nutritional disorders.
- disposes a special composition which corresponds to actual knowledge in nutrition science
- corresponds to the national legislation regarding dietetic products.
- carefully manufactured; as low as possible heat mechanical treatments
purity of the raw materials and additives and quality of the final product.
- reduce the quantity of non milk additives to a minimum level (better digestibility).

Dietetic milk products are produced either by reducing the content of a special component or components or by fortification with special component /components from external sources. As an example for the first group are low fat or lactose dairy products and for the second group fortification with dietary fibers vitamins and minerals.

Although milk and milk products are considered as rich source of calcium , magnesium , phosphorus, zinc , iodine and selenium, they are poor in some other elements particularly iron . Iron deficiency in the diet results in anemia, a nutritional disease, widely prevalent in Egypt particularly between preschool children whose rapid growth increases their need for iron . A recent surveillance (Nutrition institute, 1978) revealed that 40 % of school children were suffering from iron deficiency anemia .

Iron fortification has long been practiced in milk formulation for bottle fed babies.

The popularity of cheese and fermented milk products made them as natural candidates for iron fortification considering their ability to deliver rare combination of two vital nutrients ; namely calcium and iron . An active and intensive research abroad resulted in the development of iron fortified cheddar cheese. The bioavailability of iron from this iron fortified cheese best dietary sources of iron.

Despite its importance, iron fortification of dairy products may affect the quality and storage stability of the fortified products. Therefore, a thorough investigation on the possible effects of iron fortification and ways to combat these problems are needed before any recommendation can be given for its use in milk products.