STUDIES ON THE CHEMICAL AND TECHNOLOGICAL ASPECTS OF BUTTERMILK

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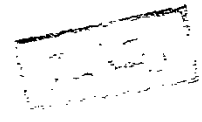

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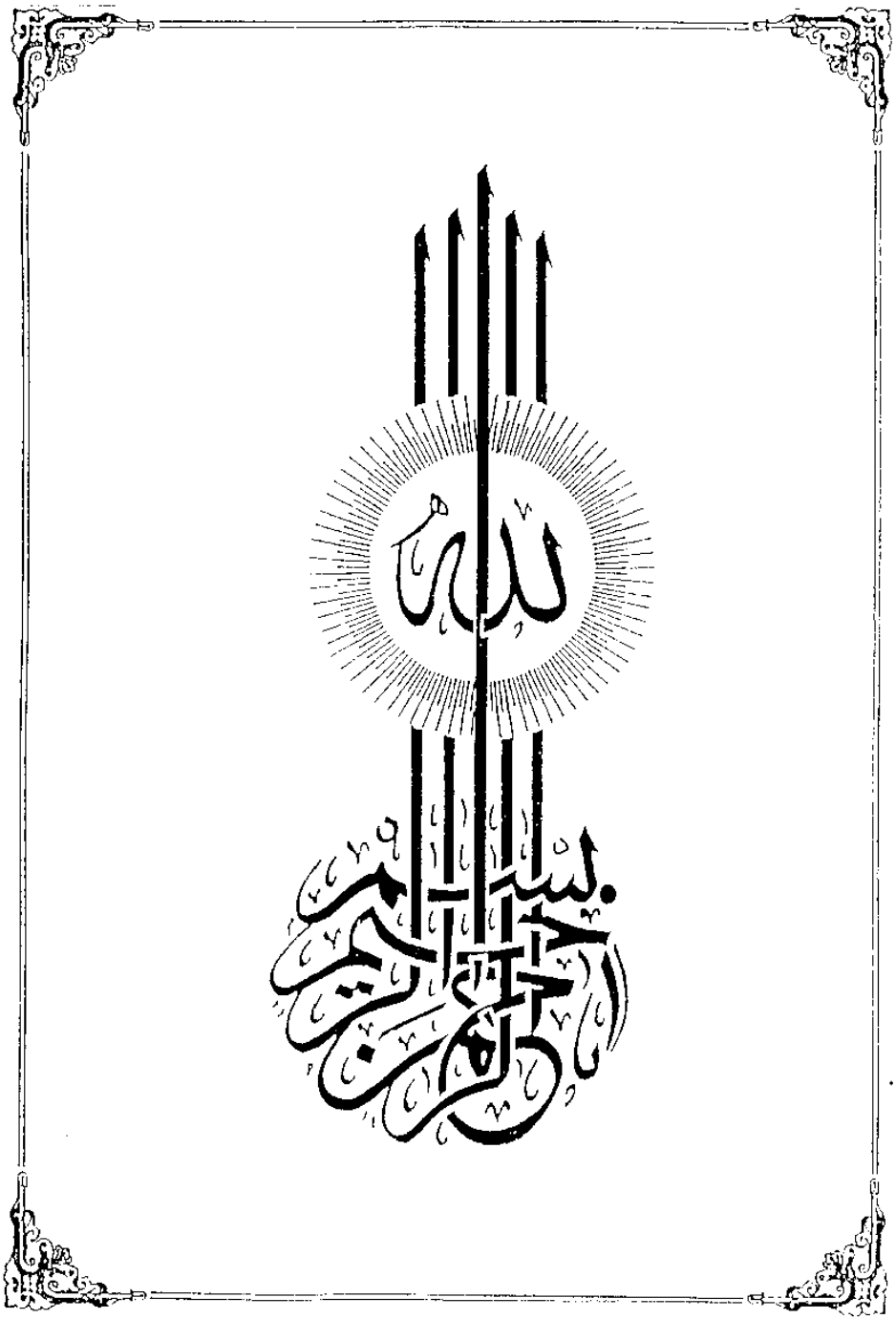

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C O N T E N T S

INTRODUCTION

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Butter production in Egypt utilizes a large amount of samples milk which could not easily marketed as liquid milk at production Localities transportation problems. About 0.2 million tonnes of 'Buttermilk" per year are produced as a by-product during butter manufacture from both sweet and sour cream. Buttermilk nutrients approximate almost the same as those of skimmilk, and contain mostly water (90%), lactose (4.4%), lactic acid (0.6%), protein (3.5%), ash (0.7%), fat(2%) and phospholipid residues (Gonc, 1977 and Muller,1981).

The fat content is somewhat higher, but in the case of buttermilk from sour cream, the lactose content is lower. In sour-cream buttermilk, about 10-15% of the original sugar has been changed into lactic acid through the activity of bacteria. The acid content expressed as lactic acid usually does not exceed 0.8% but may reach 1.0% if certain types of bacteria have taken part in the fermentation.

It could be stated that the large amount of buttermilk in Egypt is a farm house type which manufactured

by the farmer, through churning his sour milk or cream and consequently buttermilk produced in farm and villages is highly acid. In recent years there are also large quantities of sweet buttermilk produced in the big dairies where milk is partially separated and standardized before pasteurization, the majority of the extra cream is made into table butter. In this connection, it may be mentioned that such dairy plants can make use of their buttermilk in making other dairy product, (Abd El-Malek and Demerdash, 1970).

A fairly large amount of buttermilk is condensed and, in this form, sold for animal feeding purposes under various trade names. Recently, there has appeared on the market a good deal of condensed and dried buttermilk which are derived from the churning of sweet cream. These products have some especially desirable qualities and are used almost exclusively in connection with the preparation of human foods, including ice cream, yoghurt like, labneh, and milk beverage.

Economically, the utilization of buttermilk in making a product such as cultured buttermilk would

increase its value, and then would rise the income of the producer. From the nutritional point of view, processing buttermilk, which is almost now a waste, into such a fermented dairy product would be a way to make full use of the animal protein, butterfat and other nutrients that buttermilk contains. Also large varieties of cultured dairy beverage are sold under the label of buttermilk in some countries.

Generally, buttermilk utilization is not a well developed program in Egypt and as such the commodity is being disposed of as a waste without useful utilization. This food loss is a double edged sword, thus in addition to the decrease in the income its direct disposal creats serious problems regarding environmental polution. Therefore, this work was carried out to achieve the following objectives:

1. Survey for the chemical composition of different buttermilk samples.

2. Using the buttermilk in producing fermented products such as buttermilk yoghurt or

buttermilk labnah.

3. Using the buttermilk in making soft drinks fortified with Natural flavours 'i.e.cocoa, banana, Guava.

REVIEW OF LITERATURE

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I. The Chemical Composition of Buttermilk:

Hunziker (1940), studied the distribution of buttermilk fat , he found that the fat is derived from three principal sources namely fat globules that are too small to churnout, fat globules entrained in the curd particles and fat in the form of butter granules that are sufficiently small to pass through the buttermilk strainer. He noted that a part of fat persent in the buttermilk is dispersed in the serum portion and the remainder is contained in the curd portion. The ratio of fat in serum to fat in curd varies widely with diserse factors in manufacture, such as original acidity of cream, acidity of cream when pasteurized, kind of neutralizer, manner of neutralization and temperature of pasteurization. He found also that in buttermilk the butterfat globules in addition to true butterfat, contain a very thin surface layer of complex fatty materials consisting mainly of Lecithin-phosphorus complexes and to a lesser extent of sterols, such as cholesterol.

These fatty compounds that are not true butterfat are generally known as lipins. When milk is skimmed they follow the fat globules and reappear mostly in the cream. The lipins remain with the fat globules until the globule membrane material becomes wholey or partially ruptured due to the concussion in churning. When the globules unite to form butter granules, a considerable portion of the lipins breaks away from the fat globules and is carried into the buttermilk, causing the buttermilk to contain a relatively large part of the lipins originally contained in the milk and cream.

Aspeslet (1968), studied the effect of churning procedures on fat losses in the buttermilk at the two plants in south Alberta. Seasonal fluctuations were found to exist. Losses ranged from 0.72% to 3.0% with averages of 1.11 and 1.57% at the two plants. The temperature of the buttermilk at time of draining was quite important, 15°C being the maximum permissible to prevent greatly increased losses. A churning time of 45 to 60 minutes appeared to give minimum fat losses although churning times below 45 minutes showed a greater tendency to high losses than did those in excess of 60 minutes.