STUDIES ON (U.H.T.) MILK IN LOCAL MARKET

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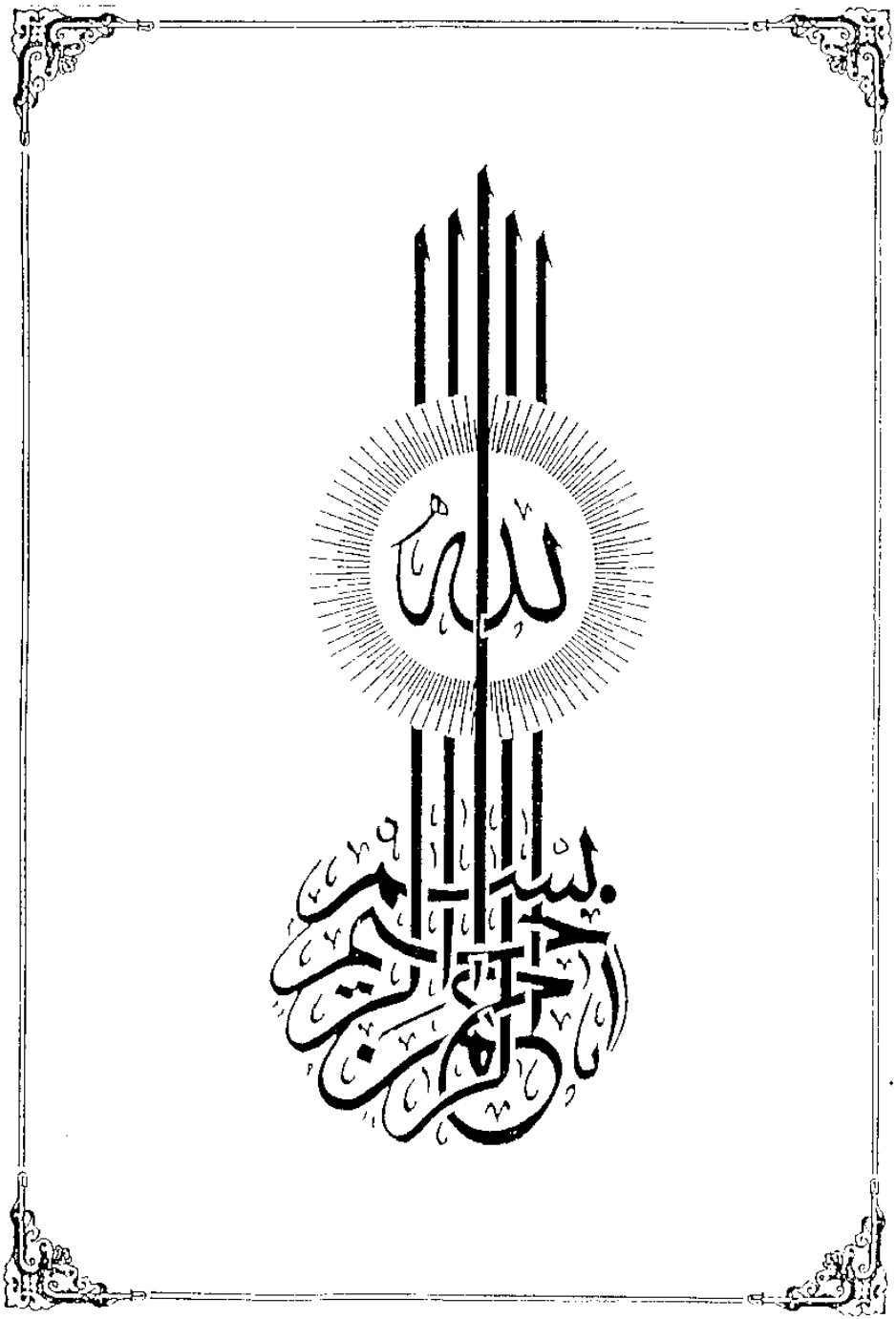

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C O N T E N T S

INTRODUCTION

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The last decade has witnessed several and radical changes in the processing and marketing of milk and dairy products in Egypt. A remarkable change in the marketing system of liquid milk has been a continuous move from house door renders towards retail pakage system especially in large cities. Although pasteurized milk has been introduced to the Egyptian dairy industry long time ago, the marketing system has not been equally developed to meet the special need for efficient distribution of pasteurized milk i.e. keeping at low temperature from processing to consumption. Therefore, pasteurized milk suffers from rapid spoilage in summer time.

Search for suitable technology that can provide the Egyptian consumer with liquid milk of acceptable quality and in the near time can stand the harsh conditions of marketing led the National dairy industry to a dopt the technology of UHT processing in the last few years.

The UHT, or Ultra-high-temperature, or Ultra-heat treatment, process for the treatment of milk can be regarded as a continuous flow system of sterilization followed by aseptic packaging. The basis of the process is rapid heat transfer where the product is heated to temperatures in the order of 135 to 150°C for a few seconds and then rapidly cooled. The results of this heat shock is a high sterilizing effect with little change on the physical, chemical and neutritional qualities of the product.

The UHT processing meet the need of the Egyptian marketing system. It enables milk to be packaged, transported, stored and displayed at retails autlets and kept at home for months without refrigeration.

Although bacteriological problems associated with the keeping quality can be eleminated by proper UHT processing, UHT milk suffers from physical and chemical changes that determine its shelf life. Storage induced changes affected to a very large extent by storage temperature.

The rate at which most of these changes occur is reduced as the storage temperature decreases. As addition to the storage temperature, the heating system used, i.e. direct or indirect, the type of package play determined rate in the storage induced changes.

The Egyptian experience with UHT processing of milk is still new and incomplete. Several processing systems have been introduced, the use of wide variety of raw materials and packages has been adopted without critical evaluation of their effect on the product. In addition, the ambient temperature in Egypt is comparatively high and can accelerate the rate of the reported changes in UHT milk or induce additional changes. Therefore, it is left necessary to initiate a thorough investigation along this growing area of vital importance to Egyptian dairy industry and consumer.

The present study is an attempt to cover some topics i.e. effect of storage under prevailing conditions in Egypt on UHT milk available in the market.

The results has been presented in separate parts each deals with a specific brand. A general discussion for the whole data has been presented.

It is hope that the informations presented in this thesis will benefit Egyptian Dairy Industry and regulation authorities.

REVIEW

OF

LITERATURE

REVIEW OF LITERATURE

Aoki and Imomura (1974), prepared two types of sterilized skim milk; one was HTS-1 milk which was heated at 130°C flashly and the other was HTS-2 milk which was heated 130-135°C for 75 sec. The changes in casein complex during storage of the two milks were examined and compared with those of AUT milk which was heated at 120°C for 15 min. Visible sediment was formed in HTS-1 and HTS-2 milks after 8 and 14 months of storage respectively, while no sediment was observed in AUT milk after 15 months of storage. The amount of calcium in the ultracentrifugal wheys of HTS-1 and HTS-2 milks decreased gradually with prolonged storage, while that of AUT milk was kept constant after 1 month of storage. They reported, almost no differences among the three samples in the increments of Ca/N ratio of ultracentrefuged casein complex during storage. They also mentioned that the soluble casein content increased in AUT milk during storage, but decreased in HTS-1 and HTS-2 milks.

Cheeseman and Knight (1974), studied the size distribution of sub-micellar casein aggregates by gel

filtration on sepharose 6-B. They used this technique to compare the elution profiles obtained for fresh, UHT treated, and stored UHT milks. They found that prolonged storage of UHT milk gave rise to an increase in proporation of casein aggregates excluded from sepharose 6-B, but no increase in size of included casein aggregates.

Aoki and Imomura (1975), examined the effect of heat treatment for sterilization and storage temperature on changes in casein complex of sterilized milk during storage four samples were prepared. They heated the milk at 130°C flashly and then stored at 30°C (I) and at 5°C (II) respectively also milk was sterilized at 130°C flashly (III) and at 130-135°C for 15 sec, (IV) and then stored at 30°C. They observed visible sediments in sample I an the 60th day of storage, while in sample II gelatial occured without formation of visible sediments on the 150 th day of storage. The amount of destabilized casein complex increased at latter stage of storage in II than in I. In sample II the amount of soluble casein increased till the 30th day of storage and kept constant thereafter, though it increased

in sample I also after the 30th day of storage. The amount of destabilized casein complex increased at earlier stage of storage in IV than in III. The increment of soluble casein was larger in sample IV then in III till 30th day of storage but the relation was reversed there after. At the early stage of storage, the increase in soluble casein seemed to be correlated with the increase in destabilized casein complex, but did not seem to be correlated with the changes of calcium and magnesium in the ultracentrifugal whey.

Möller et al. (1977a) found that casein samples from stored UHT milks were more resistant to proteolysis; by pronase, than casein from unheated milk. They observed a reduced release of all amino acids from samples taken after storage at 37°C for 12 months or longer and for lys, Arg and Asn residues from samples taken after storage at 30°C for 14 months. They attributed the resistance to proteolysis to the Maillard reaction between milk proteins and lactose during storage of UHT milk.

Möller et al. (1977b) investigated four chemical