CHANGES THAT OCCUR DURING STORAGE OF PROCESSED CHEESE AND THEIR EFFECTS ON PRODUCT QUALITY

By

HASSAN HAMED MOHAMED HAMED
B.Sc. Agric. Sci. (Dairy Science) Al Azhar University, 1997

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ABSTRACT

Hassan Hamed Mohamed Hamed: Changes that Occur During Storage of Processed Cheese and their Effects on Product Quality. Unpublished M.Sc. Thesis, Food Science Department, Faculty of Agriculture, Ain Shams University, 2015.

Processed cheese consumption increased in Egypt in recent years, because it has a high nutritional value, the ability to be saved for long time at room temperature, the great diversity of images, shapes, can consume in different forms (cheese blocks, strips, triangles etc.), cooked from various dairy products, in addition to its high economic revenue. Storage of processed cheese for long periods in the harsh conditions may cause regardless incomprehensible changes in spite of the thermally treatment during the manufacturing process. These changes may result spoke to cut the cheese quality output, leading to considerable material losses. The aim of this study was to find out the reasons for the negative changes that occur in processed cheese during storage and thus, try to reduce them and so improve the production and increase the quality of the product. Therefore, this research was planned to study these changes and the impact of processing conditions used and follow up the enzymatic residues during storage at different temperatures as well as its impact on the quality of the product.

The investigation was designed into two parts: the first part was conducted as survey for many types and shapes of processed cheese in the local market. Twenty six processed cheese samples were collected randomly from different retails outlet in Egypt. The samples were classified depending on the fat source into two groups (milk fat and vegetable fat) and the shape into three groups (triangle, cups, blocks). All processed cheese samples were stored at 5ºC until examined for chemical, physical, texture properties with strength testing and detection of the enzymatic activity of lipase and protease enzymes. In samples containing milk fat, results showed that the moisture and meltability values were higher in cup forms than that of triangles shape while the average value of

oil index in triangles was higher than that of cup forms. Moisture contents of collected processed cheese with vegetable fats indicated that cup forms contained the highest and block form showed the lowest. Block processed samples showed lowest pH values with highest acidity content. Some brands of block forms were not meltale at all while others showed very low meltability. The oil separation index of block form samples was lower than that in triangle or cup form samples.

Part II of this study was conducted to investigate the properties of processed cheese spread produced at different cooking process. Processed cheese spread was produced by using traditional process (95ºC/2min), or UHT process (140ºC /20sec.). The produced spreads were evaluated for chemical, physical, protease and lipase activity as well as sensory properties when fresh and monthly during storage up to 6 months. The results obtained cleared that the traditional method of processed cheese has no effect on TN, fat and lactose contents. Storage of cheese samples significantly affected the content and the ratio decreased with increasing the storage temperature and period. The moisture and pH value were decreased during storage in all samples but the decrease was slightly higher in UHT processed cheese treatment. Soluble nitrogen content and titratable acidity were increased in all stored samples either at 5ºC or 25ºC up to 6 months. Protease and lipase activities were increased during storage in all treatments. The increase was highly pronounced in traditional processed cheese than in UHT cheese samples. Generally, total aerobic bacterial count was increased in all treatments during storage. The increase was more pronounced when the cheese was stored at 25ºC. Total anaerobic spore forming bacterial count was decreased. Results of this work could be useful for setting UHT treatment in order to manufacture processed cheese with high sensory and nutritive quality values.

Keywords: processed cheese, cooking temperature, lipase activity, protease, enzyme residue, traditional process, UHT system

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