

STUDIES ON ULTRAFILTERED CHEESE

BY

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SUMMARY AND CONCLUSIONS

The objective of this study was to investigate the possibility of making a good quality soft cheese from ultrafiltered milk replace with concentrated recombined milk (CRM) at levels of 10, 20 and 30 % and recombined milk protein concentrate (RMPC) at levels of 20, 30, 40 and 100%. Also, to investigate of using the natural preservative (lemon grass and parsley) to prolong the shelf life of UF-white soft cheese in consideration not altering its organoleptic properties.

Hence, this study was designed to include the following three parts, which are summarized as follows:

PART 1: Impact of replacement of ultrafiltered milk with concentrated recombined milk on the properties of UF-white soft cheese.

IN this part, UF-white soft cheese was manufactured from standardized buffalo's milk concentrated by UF technique at 50°C to factor 3X and was replacement with concentrated recombined milk (CRM) at ratio of 10, 20 and 30%. Resultant cheese was stored at 5 -7°C for 30 days and analyzed when fresh, 15 and 30 days for some chemical composition, microbiological examination and organoleptic evaluation.

Obtained results can be summarized as follows:

- 1-Chemical composition, namely, moisture, fat, ash, total nitrogen contents of all cheese treatments were significantly affected for different treatments and slight effect was due to the lowering of moisture content.
- 2-Moisture content of all cheese treatments were gradually decreased all over the storage period. The acidity was gradually increased by the advancing the storage period. The acid development was proportional to the percentages of the added CRM to retentate during cheese preparation and storage period.

- 3-Water soluble nitrogen content in UF-white soft cheese was slightly lower than in cheeses contained CRM. On the other hand, the W.S.N./T.N% was proportional of the percentage of CRM added.
- 4-Microbiological examination of all cheese treatments recorded increase in total bacterial count and spore formers during the storage period (30 days) at 5-7°C. Cheeses contained CRM were contained the lowest count as compared with control. This could be attributed to the development of the acidity in cheese. Coliform were not detected all over the storage period in all cheese treatments. Moulds and yeasts were absent at the beginning and appeared at 15 days of storage at 5-7°C. On the other hand, yeasts and moulds counts were higher in control than that in treated cheeses with CRM.
- 5-Sensory evaluation for the produced treated cheeses showed that cheese contained 10 and 20% CRM were the best treatments.

PART 2: Impact of replacement of ultrafiltered milk with recombined milk protein concentrate on the properties of UF-white soft cheese.

In this part, UF-white soft cheese was manufactured from UF retentate and was replacement with recombined milk protein concentrate (RMPC) at ratio of 20, 30, 40 and 100%. Resultant cheese was stored at 5 -7°C for 30 days and analyzed when fresh, 15 and 30 days for some chemical composition, microbiological examination and organoleptic evaluation.

Obtained results can be summarized as follows:

- 1-Chemical composition, namely, moisture decreased while fat, ash, total nitrogen (%) and W.S.N.% of all cheese treatments were gradually increased throughout the storage period.
- 2- The rate of increase in T.A% was higher in cheese contained RMPC than in control one.

- 3-Increasing the concentrations of RMPC in the cheese milk gave cheeses with slightly more average moisture content.
- 4- Fat% and fat/DM% are less in cheese contained RMPC than control cheese.
- 4- Ash content (%) of fresh UF-white soft cheese was slightly higher than cheeses contained RMPC either in fresh or during the storage period.
- 5-Total nitrogen (%) in UF-white soft cheese (control) was slightly lower than in cheeses contained RMPC. On the other hand, W.S.N.% and W.S.N./T.N.% were slightly lower in cheese contained RMPC as compared with control cheese
- 6-Firmness of all cheese treatments were gradually decreased throughout the storage period and the penetration readings of cheese samples of all treatments recorded a higher values at the beginning of the storage period. On the other hand, from the observed data it was clear that T₅ (100% RMPC) had the highest penetration value and hence the least firmness when fresh and all over the storage period. However, T₁ (control) recorded the lower values than all treatments, either when fresh or during the storage period.
- 7-Microbiological examination of all cheese treatments recorded increase in total bacterial count and spore formers during the storage period (30 days) at 5-7°C. Cheeses contained RMPC were contained the highest total count as compared with control. Coliform were not detected all over the storage period in all cheese treatments. Moulds and yeasts were absent at the beginning and appeared at 15 days of storage. On the other hand, yeasts and moulds counts were lower in control than that in treated cheeses with RMPC.
- 8-Sensory evaluation for the produced cheese showed that cheese contained 100% RMPC was the lowest total score as compared with all other cheese treatments. While, cheese contained 40% RMPC

exhibited the highest total score followed by that contained 30 and 20% RMPC, respectively.

PART 3: Impact of using some spices extract as natural preservative on the properties of UF-white soft cheese.

This part of study aimed to explore the possibility of using lemon grass and parsley extracts as a natural preservative to prolong the shelf life of UF-white soft cheese and its effects on organoleptic properties.

In this part, the essential oils were added to cheese milk before addition of rennet at ratio 100 and 150ppm/kg from lemon grass extract and 150 and 200ppm/kg from parsley extract. Resultant cheese was stored at 5 -7°C for 30 days and analyzed when fresh, 15 and 30 days for some chemical composition, microbiological examination and organoleptic evaluation.

Obtained results can be summarized as follows:

- 1-Acidity and pH were affected with adding either lemon grass or parsley extract. With storage, the increase in acidity and decrease in pH values of cheese from different treatments were adversely proportional to plant extracts concentrations (lemon grass or parsley).
- 2- Addition of plant extract had a negligible effect on the cheese moisture and ash contents of the resultant cheese.
- 3- Addition of lemon grass or parsley extract had slight decrease in fat content in all resultant cheese treatments.
- 4-Addition of lemon grass or parsley extract had slight effect on soluble nitrogen content in UF-white soft cheese. Since it was slightly lower than in cheeses contained plant extract. On the other hand, the W.S.N. % and W.S.N./T.N.% were proportional of the percentage of plant extract added.
- 5-Microbiological examination of all cheese treatments recorded increase in total bacteria count during the storage period (30 days) at

5-7°C while the total count decreased with increasing the concentration of essential oils. On the other hand, parsley at 200ppm/kg led to a marked decrease in microbial growth compared to control and lemon grass. Sporeformers were detected in treated and untreated cheese, however, the addition of essential oils reduced the numbers of sporeformers in all resultant cheeses at various rates compared with the control. Coliform were not detected all over the storage period in all cheese treatments. Moulds and yeasts were not detected at the beginning and appeared at 15 days of storage. On the other hand, The highest rate of increased was observed in control samples followed by treatments with extracts of lemon grass and parsley, respectively. Cheese contained 200ppm/kg parsley showed that the lowest increase rate, which could be attributed to the inhibitory effect of this extract.

6-Sensory evaluation for the produced cheese showed that UF-white soft cheeses made with lemon grass had the lowest total scores, while cheeses made with parsley had the highest total scores in the sensory evaluation and more acceptable from the taste panels as compared with UF-white soft cheeses made with lemon grass during the storage period at 5-7°C. In another means, the best ones were those contained parsley followed by lemon grass.