

Microstructure of Iranian Processed Cheese

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Abstract : The effects of the concentration of trisodium citrate (TSC) emulsifying salt (0.25 to 2.75%) and holding time (0 to 20 min) on the textural, rheological, and microstructural properties of Iranian Processed Cheese Cheddar cheese were studied using a central composite rotatable design. The loss tangent parameter (from small amplitude oscillatory rheology), extent of flow, and melt area (from the Schreiber test) all indicated that the meltability of process cheese decreased with increased concentration of TSC and that holding time led to a slight reduction in meltability. Hardness increased as the concentration of TSC increased. Fluorescence micrographs indicated that the size of fat droplets decreased with an increase in the concentration of TSC and with longer holding times. Acid-base titration curves indicated that the buffering peak at pH 4.8, which is due to residual colloidal calcium phosphate, decreased as the concentration of TSC increased. The soluble phosphate content increased as concentration of TSC increased. However, the insoluble Ca decreased with increasing concentration of TSC. The results of this study suggest that TSC chelated Ca from colloidal calcium phosphate and dispersed casein; the citrate-Ca complex remained trapped within the process cheese matrix. Increasing the concentration of TSC helped to improve fat emulsification and casein dispersion during cooking, both of which probably helped to reinforce the structure of process cheese.

Keywords : Iranian processed cheese, cheddar cheese, emulsifying salt, rheology

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