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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم

STUDIES ON EMULSIFYING SALT MIXTURES FOR PROCESSED CHEESE

By
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B.Sc., Agric., Ain Shams University, 1982
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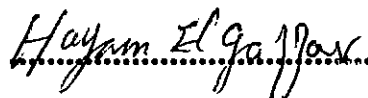
^{The} STUDIES ON EMULSIFYING SALT MIXTURES FOR PROCESSED CHEESE.

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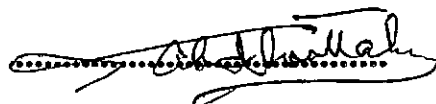
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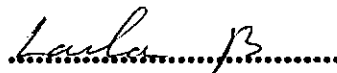
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ABSTRACT

Rezk Azab Awad. Studies on emulsifying salt mixtures for processed cheese. Unpublished Doctor of philosophy dissertation, Food Science Department, Ain Shams University, 1996.

Several emulsifying salt mixtures suitable for either spreadable or block processed cheese were prepared according to the available data on commercial salt mixtures. The pH values were measured in all prepared mixes. SH values were tested in the mixtures expected to be similar to commercial one. Out of the mixes prepared, the recommended salt mixtures for spreadable cheese were 70:30, 80:20, 90:10 of tetra Na-pyrophosphate and Na-polyphosphate (TSPP:SPP) or 60:30:10, 50:40:10, 40:40:20 of tetra Na-pyrophosphate: Na-polyphosphate: Na-tripolyphosphate (TSPP:SPP:STPP) or 30:30:30:10, 40:25:25:10, 50:20:20:10, 60:10:20:10 of tetra Na-pyrophosphate, Na-polyphosphate, Na-orthophosphate and Na-tripolyphosphate (TSPP:SPP:SOP:STPP). The recommended mixtures for block processed cheese were 40:50:10, 30:40:30, 30:30:40 of tetra Na-pyrophosphate, Na-polyphosphate and Na-tripolyphosphate (TSPP:SPP:STPP) or 50:20:20:10, 40:10:20:30, 30:10:20:40 of Na-polyphosphate, Na-citrate, Na-orthophosphate and tetra Na-pyrophosphate (SPP:SC:SOP:TSPP).

Spreadable processed cheese treatments were carried out to study their properties using the above recommended salt mixtures for spreadable cheese. Acidified Ras cheese (2 months old) was used as the cheese base blend with 2.5% salt mixture. Spreadable cheese was also made with commercial mixtures Joha S10, S9s and NO as a control treatments. The values of non-sedimentable nitrogen, peptidization, pH, SN, oil index, and meltability were significantly affected by the salt mixture used. Buffering capacity, viscosity & shear stress and texture profile analysis were related to the individual salt in the emulsifying mixtures. The commercial salts presented

higher values of pH, SN, ash, Na, P and viscosity & shear stress than the treatments with formulated mixtures. The colour parameters as well as the microstructure (LM and TEM) were also studied. The sensory evolution of spreadable cheese exhibited that the most acceptable cheese can be produced using the ratios 70:30 of TSPP + SPP, 60:30:10 of TSPP + SPP + STPP, and 50:20:20:10 of TSPP + SPP + SOP + STPP.

Block processed cheeses were also made using the recommended salt mixtures of (i) TSPP + SPP + STPP or (ii) SPP + SC + SOP + TSPP and compared to commercial mixtures Joha SE or PZO respectively. The cheese was examined for moisture, fat/dry matter, TN, NSN, NCN, peptization, ash, mineral (Na, K, P, Mg & Ca), pH, SN, oil index, meltability and water activity. Shear stress, acid-base titration, colour, texture, microstructure (LM & TEM) and sensory evaluation of cheese were also done. Differences among the treatments followed the same trends in spreadable cheese but in different intensities. The block cheeses showed lower peptization, NSN and water activity values than that of spreadable cheese whereas the oil index was higher. Block processed cheese can be produced with highest score using salts of mixture (i) in the ratios 30:40:30 or mixture (ii) in the ratios 50:20:20:10. Samples of processed cheese (spread & block) were stored at both $7 \pm 2^\circ\text{C}$ or $20 \pm 2^\circ\text{C}$ and analyzed for the previous characteristics. Most of cheese properties showed pronounced changes at room temperature ($20 \pm 2^\circ\text{C}$).

Key words:

Processed cheese - emulsifying salts - spreadable cheese - block cheese - physical properties - chemical composition - microstructural properties.

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