

## INFLUENCE OF WATER PHASE CONDITION ON MICROORGANISMS GROWTH IN BUTTER WITH PECTINE ADDITIVE

T.A. Rashevskaya

Ukrainian State University of Food Technologies, Vladimirskaya 68, Kyiv, Ukraine

### ABSTRACT

As a result of scientific work, there was studied the influence of pectine additive on water phase condition and on microorganisms growth in butter. There was fixed high moisture adsorption of pectine in butter plasma, thus increasing the dispersion of moisture in butter. Since the considerable portion of moisture was high-dispersed the amount of microorganisms in butter with pectine additive was decreasing.

### INTRODUCTION

Pectine polysaccharide appears to be an indispensable substance in manufacturing prophylactic and medical nutrition products. The pectine's capability to form complexes using ions of heavy and radioactive metals is well studied. We developed a new kind of butter with pectine additive. Previous researches stated<sup>1,2</sup> that pectine additive favored the formation of plastic consistence of butter and prevented from crumbling and oversolidity defects.

### EXPERIMENTAL

For butter manufacturing we used highly methoxylized dry pectine. The following butter samples were taken for investigation: sample butter with pectine additive and additive free sample. The content of moisture in both samples made 25 percent. Moisture adsorbability of pectine was studied by balancing method, the distribution of water phase (plasma) in butter was examined in passing-through light with the help of microscope with photo nozzle. The attention was paid to following indexes:

- the amount of mesophilic aerobic and optionally anaerobic microorganisms group (MAODnM)
- the amount of bacteria's of intestinal bacilli group (BIBG)
- the amount of proteolytically active microorganisms (PAM).

The butters were investigated: 1-immediately after being manufactured (fresh sample); 2- being stored at 5°C for 30 days; 3-being stored at -18°C for 6 months.

## RESULTS AND DISCUSSION

The research displayed that pectine added to butter adsorbed about 60% of overall water phase in butter plasma. Pectine and adsorbed moisture form high-dispersed system, the amount of dispersed moisture droplets decreased.

Microscopic investigations showed that the content of small plasma droplets ( $< 2 \mu\text{m}$ ) made 88% in butter sample with pectine additive and in additive free butter sample 70%, thus indicating the increasing of plasma dispersion in butter sample with pectine additive.

Microbiological investigation stated the gradually increasing amount of microorganisms irrespectively in additive free butter sample stored at  $5^{\circ}\text{C}$  to their affiliation. On the 30 day of storage the content of MAOAnM, BIBG, and PAM in additive free butter sample had increased correspondingly by 1, 1.4, and 0.4 degrees in comparison with fresh sample. Simultaneously, the content of all groups of microorganisms in butter sample with pectine additive had decreased, the most active decreasing was observed for BIBG and PAM groups by 1 degree.

The storage at  $-18^{\circ}\text{C}$  caused inhibition of microbiological processes in both samples. The amount of microorganisms of all groups in additive free butter sample had remained almost unchanged, while butter sample with pectine additive displayed the intensively decreased amount of MAOAnM, BIBG, and PAM groups accordingly by 0.9, 2.1, and 0.8 degrees.

Microbiological research data showed that pectine additive favoured decreasing microorganisms of all groups both at positive and negative storage temperatures.

The results of carried research stated the considerable influence of pectine additive on water phase condition in butter caused by pectine's high moisture adsorption as moisture is in high-dispersed state, which made the water in butter inaccessible for microorganisms. As a result, the amount of microorganisms in storage process was decreasing.

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## REFERENCES

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