A B S T R A C T

An investigation carried out to identify the micro-organisms present in milk-curd transported to Colombo from different areas of Sri-Lanka revealed the invariable presence of streptococci, lactobacilli and yeast in all the samples tested.

All bacterial strains isolated were able to curdle milk in pure cultures with an accompanying change in the pH of the milk from 6.8 to about 4.0. The rates of acid production and the final pH reached by streptococci and lactobacilli were different. Relative abundance of streptococci and lactobacilli in curd also changes with the maturation of the curd indicating the higher acid tolerance of the lactobacilli.

Identification experiments done as described by E. Elisabeth Sharpe, revealed that all bacterial strains belonged to the group of lactic-acid-bacteria. Those identified were two strains of Streptococcus lactis, four strains of Thermobacteria and two strains of Betabacteria.

When pure cultures of streptococci and lactobacilli were inoculated into milk or into an artificial medium of pH 6.8-7.0, the lactobacilli

showed a prolonged initial lag period which was not observed with streptococci. This and similar observations led to the assumption that the lactobacilli were relatively more acidophilic compared to the streptococci.

The two bacterial types differed in their preferred pH range and always occurred together in commercially available curds. The efficiency of acid production in milk, by Streptococcus lactis and the thermobacterial strain(B) were tested separately and in combination to investigate whether there was a cumulative effect. However, neither a stimulatory nor an inhibitory effect on each others rates of acid production was observed when they were grown in combination.

The methods of E.W. Beech et.al. (4) were used in the identification of yeasts present in milk. These identifications were confirmed with the help of the Food Research Institute, Colney Lane, Norwich, U.K. Strains identified were Candida parapsilosis and C. Krusei.

None of the yeast strains grew in pure cultures in milk, other than when in combination with bacteria. It seems to be that milk alone does not provide a suitable medium for the growth of the yeasts. The yeasts did not ferment lactose and perhaps they depend on bacterial hydrolysis of

lactose or other compounds for their carbon source, However, even in the absence of bacteria the yeast strains were capable of growing in milk to some extent if the pH of the milk was lowered.

The growth of yeasts together with a Streptococcus lactis strain apparently had very little effect on enhancing the growth of bacteria. However, the growth of yeasts in combination with the thermobacteria apparently had a stimulating effect on the growth of the bacteria. This possibility, however has to be investigated further.

The rates of alcohol production of the yeasts isolated were studied using an Eubilliometer. Significant differences in the efficiency of alcohol production by the different yeasts were observed. An analysis of variance of the data confirmed that a significant difference exists at least between some of the types tested.

Experiments were carried out to isolate and identify as many as possible different flavour compounds occurring in the milk-curds using curd samples prepared with S. lactis and thermobacteria.

Gas-liquid chromatographic analysis of the flavour extracts showed that ethanol and ethyl-acetate were present in both extracts. Thin layer chromatographic analysis revealed the presence of

butanal, propanone and ethanal, and the absence of methanal pentanal and butanone in the flavour extracts. It was also observed that some of the flavour compounds differed quantitatively in extracts made with Streptococcus lactis and thermobacteria.

A consumer preference/difference test was carried out with a taste-panel using curds prepared by a Streptococcus lactis strain and a thermobacterial strain. The taste-panel was of unanimous opinion that there was a difference between the curd samples.

However, as the normally available curds contain both bacteria and yeasts a Ranking test was also conducted with the taste-panel using curds prepared with different combinations of the isolated micro-organisms. The results indicated that the taste-panel preferred the laboratory-prepared curd, using different combinations of the isolated micro-organisms to the commercially prepared curd, and also that the best curd sample was prepared by using a single bacterial species viz. Streptococcus lactis.