Evaluation of Selected Fungal Milk Coagulants for Manufacture of Buffalo Milk Cheddar Cheese (1981)

Submitted to Gujarat Agricultural University

by
K.G. Upadhyay

Department of Dairy Technology,
Sheth M.C. College of Dairy Science,
Gujarat Agricultural University,
Anand Campus, Anand

The present study was planned and conducted to evaluate two fungal milk coagulants, namely, Rennilase (R) and Meito (M) for manufacture of buffalo milk cheddar cheese using calf rennet (C) as control. They were used alone or in 50:50 combinations (i.e. CM, CR and MR). Cheddar cheese was made from pasteurized-standardized buffalo milk, using slightly higher amount of starter (1.5%), cooking at lower temperature (36°C) and following early and high piling during cheddaring. The cheeses were ripened at 5-6°C and 12-13° C for a period of 180 days.

The performance of the above rennets during cheese making was evaluated by determining curd firmness, setting time, acid development, composition of whey and fresh cheese and yield of cheese by using standard routine methods. During reipening, cheeses were analysed at 60, 120 and 180 days for moisture and salt-in-moisture; titratable acidity and pH; proteolytic changes by measuring increase in soluble nitrogen, tyrosine content, formol and shilovich ripening indices and by starch gel electrophoresis (at 0 time and at 180 days), lipolytic changes by measuring release of total volatile fatty acids (TVFA) and bacteriological changes by counting numbers of acid producers, lactobacilli and enterococci. The cheeses were also scored organoleptically at 60, 120 and 180 days.

The curd firmness, setting time, behaviour of curd and acid development obtained with different rennets was comparable to calf rennet. Yield of cheese and composition of whey and cheese did not differ significantly between rennets.

During repening Meito rennet and its blends showed significantly higher moisture retention. All rennets exhibited significantly higher acidity and lower pH values compared to calf rennet throughout the ripening at both the temperatures.

Mucor rennets and the mixtures showed significantly greater proteolysis and higher release of TVFA compared to calf rennet. Higher temperature of curing had significant effect on these changes. The above observations on proteolysis were confirmed electrophoretically on starch gel.

Cheddar cheese made with Mucor rennets and the blends were significantly superior to calf rennet organoleptically. Among the Mucor rennets, Meito rennet gave the best product organoleptically. No bitterness was detected. In contrast, cheeses made with calf rennet, Rennilase and its blends exhibited bitterness. Higher temperature of curing significantly increased the rate and extent of curing in all the cheeses.

The type of coagulant had no significant effect on counts of different groups of bacteria.

Use of Meito rennet in association with higher temperature (12- 13°C) of curing is recommended for faster flavour and body developments in buffalo milk cheddar cheese.

(Received on 26th March, 1990)