

"Microflora of Acidic Milk Products in India and their Probable Activity in the Products."

Submitted to Gujarat Agricultural University
1978

J. M. Dave

Department of Plant Pathology and Bacteriology B. A. College of Agriculture, Gujarat Agricultural University, Anand 388 001

Cheddar cheese made from buffalo milk retains less moisture and is slow in ripening. One of the several approaches made to hasten the ripening process is through use of selected micro-organisms added to the cheese milk alongwith starter bacteria. Use of more proteolytic strains of bacteria have been often suggested in the current literature. The present study was conducted to study the microflora of buffalo milk cheese and to select a few isolates of different types, characterize them taxonomically and biochemically and choose some for use as an additive to normal cheese starter for the said purpose.

The methodology used included counting, isolation and identification of viable bacteria, enterococci and lactobacilli from cheddar cheese. The proteolytic ability of the selected isolates in cow and buffalo skim milk was studied. Cell free protease of one isolate *Str. liquefaciens-8* was characterized—using current techniques. The same isolate was used in cheese making from buffalo milk. The cheese was analysed chemically and graded organoleptically.

Buffalo milk cheese examined during the investigation had pH values between 5.2 to 5.6 during the maturation period of seven months. The total colony count of the cheese varied between 76×10^5 to 12×10^7 /g. The enterococcus counts varied between 1×10^4 to 88×10^4 /g. The lactobacillus count varied between 30 to 500×10^5 /g. of cheese.

The total 105 isolates of lactobacilli included *L. casei*, *L. plantarum*, *L. buchneri*, *L. fermenti*, *L. brevis* and *L. collobiosus*. *L. casei* was the most dominant species.

The enterococcus isolates included *Str. faecium*, *Str. liquefaciens*, *Str. faecalis*, *Str. durans*, *Str. bovis* and *Str. equinus*, *Str. faecium* was the most dominant species.

Proteolytic ability of the isolates of enterococcus type and of lactobacillus type varied with the strains and with the type of milk i.e. cow or buffalo.

Str. liquefaciens-8 among the enterococci and *L. casei-3* among the lactobacilli exhibited highest proteolysis.

Extracellular protease isolated from *Str. liquefaciens-8* had optimum pH of 7.0 and temperature of 35° C. It hydrolysed alpha and kappa fractions of buffalo casein and did not affect beta fraction. Cheddar cheese was made using 0.5% and 1% additive of *Str. liquefaciens-8* along with Hansen's starter CH₂₅₃.

In organoleptic judging the cheese added with 0.5% *Str. liquefaciens-8* was awarded highest score at maturation of two months. Then after it developed bitterness. The other lot containing 1.0% additive developed bitterness earlier.

Str. liquefaciens-8 showed potential of use as an additive, an accelerating the ripening process and in enhancing the flavour.