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Influence of microwave heating on microbiological quality of khoa

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Influence of microwave heating with power levels (10 – 100%) and two timings (60 seconds and 80 seconds) on microbiological (SPC and YMC) quality of khoa during storage was studied. The treatments M_4T_1 M_6T_2 were found to be promising based on germicidal efficacy as well as the overall sensory quality of khoa samples. In case of treatments M_7T_2 onwards the multiplication rate of microorganism was quite negligible. It was further noticed the efficacy of killing the Yeasts and mould for the samples was more as compare to the killing other bacterial species. This may be evident from the data on the microbial counts for M_7T_2 in case of SPC and M_4T_2 in case of YMC.

Key words : Khoa, Microwave heating, Storage, SPC, YMC.

INTRODUCTION

Microwave heating refers to the use of electromagnetic waves of certain frequencies to generate heat in a material (Roussy and Pearce, 1995). Microwave energy has been gainfully utilized in the food industry for various applications including food preservation (George, 1997). Microwaveable convenience foods represent a rapidly growing segment of the food processing industry (Mathur and Sachdeva, 2000). Microwaves have been used to varying extent in a number of industrial food processing operations such as baking, blanching, cooking, dehydration, pasteurization, sterilization and tempering (Rosenberg and Bogi, 1987 a). Dairy industry applications of microwave processing include enhancement of pasteurization efficiency, thermizing milk prior to cheese manufacturing, inactivation of bacteriophase, in- package paneer making, clarification of butter into ghee, thermisation of yoghurt, cooking of cheese curd, plastisizing of provolone and mozzarella cheese and thawing of butter etc. (Mathur and Sachdeva, 2000). However, the application of microwave heating on bacteriological preservation of khoa has probably not been attempted. Hence this investigation is planned to utilize the microwave energy for enhancing the microbiological quality of dairy products like khoa.

MATERIALS AND METHODS

The present research work was carried out in the department of Animal Science & Dairy Science during the year 2003-2004, Post Graduate Institute, M.P.K.V. Rahuri, Dist. Ahmednagar (M.S.).

Preparation of khoa :
Khoa samples were prepared using the method of De and Ray (1952).

Application of microwave treatment :
Microwave heating power levels (domestic microwave oven) 100, 90, 80, 70, 60, 50, 40, 30, 20 and 10 per cent and heating time of 60 and 80 seconds were used for exposure for khoa samples.

Packaging of khoa :
The khoa samples, 200 g each were immediately filled into 250 g capacity sterile pp squat and packed with airtight lid.

The khoa samples so exposed were stored at room temperature (32 -37^0 C) throughout the experimental period.

Storage study :
The interval of analyzing samples for SPC and YMC were fixed on day 0, 3, 5, 7 and 10 or until the sample spoiled sensorily.

Microbiological quality :
The Standard plate count (SPC) and Yeast and mould count (YMC) of khoa samples were determined by following the method in IS: 1479 – Part III (1962).

The sensory attributes of khoa samples under different experimental treatments were subjected to using the method described in the IS: 6273, Part - I and II (1971) adopting 9 point Hedonic scale. A panel of 5 semi-trained judges was formulated for this purpose.

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