

## ABSTRACT

India has a unique trend of producing several indigenous dairy products of which *paneer* is one of the most popular and nutritious item. It has been estimated that about 5% of the total milk produced in India is converted into *paneer*.

Traditionally, milk is first heated near to boiling, cooled to coagulation temperature and acidified to obtain coagulum called as *chhana*. The *chhana* is pressed in a hoop and the pressed *chhana* is dipped in chilled water for 2-3 hours for obtaining the '*paneer*'.

A *paneer* press was developed for conducting experiments on pressing of *chhana* by traditional methods. A whirling bucket centrifuge was used for conducting experiments on centrifugal method of *paneer* production. For both the traditional and centrifugal methods, initial thickness of *chhana*, applied pressure and time of pressing were optimized for maximum moisture retention, maximum hardness and minimum solid loss in pressed *chhana*. For the chilling of pressed *chhana*, initial thickness of pressed *chhana*, rotational speed of centrifuge and time of chilling were also optimized.

Based on this study, a 'double wall basket centrifuge' with 1 kg *chhana* handling capacity was developed. The double wall basket centrifuge was tested for *paneer* production and was found to work satisfactorily within the reasonable limits of predicted values.

For the pressing of *chhana* and chilling of pressed *chhana*, the double wall basket centrifuge required considerably less time (24 min) as compared to traditional methods (144-185 min). For industrial production of *paneer* by using the double wall centrifuge, the time required for scaled-up production was also calculated.

The *paneer* prepared using the centrifugal process was found to have better sensory score than the *paneer* prepared by traditional methods and the *paneer* available in local market. After frying and cooking, *paneer* samples obtained by centrifugal method had the higher values of hardness. The *paneer* samples prepared by different methods were found to have approximately the same behaviour for moisture and hardness changes when stored at low temperature in polyethylene bags or when covered under moist cloth.

## KEY WORDS

*Chhana*, pressed *chhana*, *paneer*, Degree of whey protein denaturation, recovery of solids, yield of *chhana*, traditional method, centrifugal method, immediate pressing, delayed pressing, centrifugal chilling, initial thickness, amount of pressure, time of pressing, rotational speed, time of chilling, moisture ratio, solid loss ratio, hardness ratio, diffusivity of water during chilling, yield of *paneer*, organoleptic, frying, cooking and storage properties.