

Seasonal Variation in Physico-Chemical Composition of Ghee Processing Marketable Attributes.

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The marketable attributes of ghee are color, flavour, body and texture. These qualities are dependent upon the processes by which ghee is manufactured, methods of storage, natural and seasonal variation in composition of milk fat as affected by breed and feed of the milking animal etc. Thirty-six samples of buffalo ghee spread over one year were collected from Amul and following aspects were studied : (1) The seasonal variation in the fatty acids composition and other properties of ghee as revealed by gas-liquid chromatographic technique (Beckman G.C. 24). (2) The interrelationship amongst the fatty acids and various properties of ghee. (3) The keeping quality of ghee. and (4) Various conditions affecting the granulation of ghee.

Fatty acid composition of ghee:

It was observed that winter ghee contained higher proportions of C12, C14 and total saturated fatty acids and lower proportions of C14:1, C16:1, C18:1 and total unsaturated fatty acids than summer and monsoon ghee. The proportion of C18 fatty acid was found to be higher in winter ghee as compared to summer ghee, while there was no significant difference in this fatty acid between winter and monsoon ghee.

In summer ghee, the amount of C14:1, C18:1 and total unsaturated fatty acid was higher and the amount of C12, C18 and total saturated fatty acid was lower as compared to

winter and monsoon ghee. The amount of C14 fatty acid in summer ghee was lower than winter ghee, while no significant difference was observed in this acid between summer and monsoon ghee.

In monsoon ghee the amount of C14:1, C18:1 and total unsaturated fatty acids was higher than winter ghee. No significant difference was found in C14 and C16:1 fatty acids between summer and monsoon ghee.

Correlation between various fatty acids and properties of ghee.

There was significant positive correlation between short chain fatty acids and R.M. Value ($r=0.457^{**}$), P.V. ($r=0.332^{*}$), grain size ($r=0.559^{**}$), and liquid portion of ghee ($r=0.595^{**}$), but there was a negative correlation between short chain fatty acids and M.P. of ghee ($r=-0.704^{**}$).

Keeping quality of ghee:

The keeping quality of ghee was judged by the development in acidity and peroxide value by holding ghee for one month at 37°C. It was observed that there was no significant seasonal variation in the acidity of ghee, after holding the samples at 37°C for one month.

Various conditions affecting the granulation of ghee:

It was observed that the size of grains vary according to the storage temperature. At 24°C ghee was small grained, but of a compact texture due to minimum liquid portion, while at 34°C ghee was completely in liquid stage. It was observed that better textured and good granulated ghee was obtained by storing ghee at 28° to 29°C for 72 hours.

During the granulation experiment, it was observed that once the ghee was properly granulated, it could resist high or low environmental temperature.