ABSTRACT

It has been realized that the lack of satisfactory flavour and lack of smooth velvet fullness in mouth, inability of keeping processed cheese blocks at ambient temperature, due to disappearance of sharp edges and rapid drying off followed by consequent rind formation lead to detrimental effects in terms of consumer acceptability of "Highland" processed cheese. Therefore prime objective of this research was to enhance the flavour profile and rheological attributes of "Highland" processed cheddar cheese.

First approach was to reformulate the existing processed cheese recipe, selecting the most appropriate type and amount of natural cheese blend, fat source and emulsifying salt. Changing the proportions of young-mild-matured cheese, fat source (i.e., butter, fresh cream, homogenized fresh cream, ghee) and emulsifying salt (i.e., trisodium citrate, Joha C/Joha T, Joha C/trisodium citrate), 12, 4 and 3 experimental cheese samples were prepared respectively and overall acceptability was assessed by 30 untrained sensory panelists. Highest ratings were observed in cheese blend that contains young, mild and matured cheese in the ratio of 1.5:2.5:3.3, fat source of homogenized fresh cream and emulsifying salt of Joha C/trisodium citrate. Thereupon, different quantities of selected ingredients were incorporated to reformulate the existing recipe. Cheese samples from reformulated recipes and existing recipe were sensed against a popular market sample as a control, showed a relatively lesser improvement. The most acceptable sample showed 41.26% of moisture, 30.5% of fat, 0.6% of acidity and 0.93-0.97 of a_w. One-way ANOVA was performed in statistical analysis.

As the study reveals, processed cheese ingredients have a minor effect in this aspect, in the detailed evaluation on extent of proteolysis and casein breakdown fractions was monitored by Dye-binding method and 12% SDS-PAGE respectively. Relative Casein Content (RCC) of young, mild and matured cheese was 84%, 54% and 37% respectively and for the same of the selected cheese blend was 52%, elaborating poor slicing ability. Percentage proteolysis showed an exactly linear pattern over the period ($R^2 = 96.8$) and reaches 56% at the end of proteolysis. Thus, It could be speculated that enough intensity of flavour precursors have developed during the 4 month ripening. At the onset of maturation two distinct bands appeared in gel-elctrophoretogram, are most probably α-S_1 and β caseins. Proceeding with ripening concomitant increase of α-$S_1$and β caseins derived bands were appeared along with consistent spreading faint stains. This reveals that concentration of small fragments are insufficient, which are responsible in giving rise to better flavour attributes. Since Salt/Moisture ratio undesirably influence the rate of bacterial and enzyme activity, 5.66% of it could govern to above defects.