Abstract

ABSTRACT

Lactose intolerance is the inability to digest lactose which leads to gastrointestinal symptoms. These symptoms hinder nutrient absorption and cause discomfort. The objective of the study was to determine lactose intolerance and determine the effect of lactose hydrolysed milk (LHM) supplementation to lactose intolerants among the children, adults and the elderly population in urban Vadodara and conduct organoleptic evaluation of food products developed from standard dairy milk and lactose hydrolysed milk.

A semi-structured questionnaire was developed to assess gastrointestinal symptoms post consumption of various foods in 994 subjects. Hydrogen breath analyser test (HBT) was conducted to determine lactose intolerance in 181 subjects until 30 subjects were obtained in each of the age groups namely- children, adult and elderlies and subjects were further divided into mild, moderate and severe categories. Lactose intolerants were supplemented with lactose hydrolysed milk (LHM) for 6 weeks. Standard methods were used to develop six food products namely *cold cocoa, rose milk, white sauce pasta, veg au gratin, Sandesh and kheer.* Organoleptic evaluation was performed in duplicates using nine-point hedonic scale by 25 semi-trained panel members who qualified the threshold test.

Among children, gastrointestinal symptoms were observed post consumption of milk and milk products, vegetables, fruits, cereal products, fermented foods and pulses in 36.4%, 18.3%, 15.4%, 5.8%, 4.04% and 1.01% of subjects respectively. Among adults, gastrointestinal symptoms were observed post consumption of milk and milk products, vegetables, pulses, fermented foods, fruits and cereal products in 18.4%, 13.5%, 7.7%, 6.2%, 5.2% and 2.9% of subjects respectively. Among elderlies, gastrointestinal symptoms were observed post consumption of milk and milk products, vegetables, fermented foods, fruits, pulses and cereal products in 37.4%, 10.95%, 10.04%, 9.1%, 7.3% and 2.7% of subjects respectively.

With respect to milk and milk products, maximum children (17.7%) reported gastrointestinal symptoms were observed post consumption of cheese whereas maximum adults (61.3%) and elderlies (65%) suffered from gastrointestinal symptoms post milk consumption.

Results of HBT revealed highest prevalence of lactose intolerance among elderlies (56%), followed by adults (48%) and children (46%).

With respect to nutrient status, among children, post supplementation with LHM there was an increase in moderately overweight category by 3%. With respect to BMI, among adults and elderlies there was an increase in normal category increased by 7% respectively.

With respect to the nutrient intake among children, post supplementation with LHM, the protein, carbohydrate, fat, calcium and carotenoid increased by 4%, 7%, 3%, 6%, 35%, 0.61% respectively. Among adults, post supplementation with LHM, the protein, carbohydrate, fat, calcium and carotenoid increased by 8%, 4%, 7%, 59%, 2% respectively whereas among elderly population, protein, carbohydrate, fat, calcium and carotenoid increased by 3%, 7%, 4%, 7%, 44%, 4% respectively.

Feedback received from the subjects regarding acceptability of LHM revealed except of the smell of the LHM milk which was disliked by 20% of children, all the other organoleptic parameters such as sight, taste and mouthfeel were accepted by the subjects of all the three age groups. Hundred percent of children's parents and elderlies expressed desire to purchase LHM whereas 67% of adults expressed their desire to purchase LHM.

Organoleptic evaluation of beverages revealed, cold cocoa prepared from both standard dairy milk and LHM were highly accepted for all the organoleptic attributes. However, rose milk prepared from LHM was slightly less accepted in terms of after taste and taste which was statistically significant ($p< 0.05$). Veg au gratin prepared from standard dairy milk and LHM were accepted for all the organoleptic attributes. However white sauce pasta prepared from LHM was slightly more acceptable in terms of mouth feel and overall acceptability which was statistically significant. No significant difference was observed in the organoleptic qualities between desserts (Sandesh and kheer) prepared from both standard milk and LHM. However, panellist mentioned, dessert made from LHM was sweeter compared to dessert prepared from standard dairy milk.

From this study it can be concluded that maximum gastrointestinal symptoms from milk consumption occurred in adults. Lactose intolerance was detected maximum among elderlies followed by adults and children. A wide variety of food products can be developed from lactose hydrolysed milk without compromising on its organoleptic properties at both household and commercial level for consumption by the lactose intolerant subjects.