ABSTRACT

Cereal foods are the staple foods all over the world. Cereals are known to contain all the nutrients which are essential for the maintenance of good health, so these are considered to be fundamental source for the energy and protein needs. As wheat is the key ingredient in the production of noodle and pasta products, there lies some drawbacks. Noodles are not recommended for the diabetic population because of its rapid release of glucose to the blood during absorption process. So, there is a need to make the noodle low glycemic index (GI), as it is becoming popular now a day among all the group of population. On this basis, present study was aimed to develop a low glycemic index noodles with modified ingredients. Different low GI ingredients such as green pea, rajma, oats, guar and guar seeds were selected for the study. Ingredients were modified chemically and enzymatically to reduce the starch digestibility and also glycemic index. Different chemicals were used according to FDA regulations to modify both wheat and also low GI ingredients. Modification increased farinograph water absorption because of the internal polymerization structure, justified by the scanning electron microscopic studies. Among the several modification techniques most effective were taken for the GI analysis using volunteers with the Human Ethical Clearance from the University of Mysore. Results indicated that T. durum modified with succinic anhydride reduced GI up to 27% from control. 24% reduction was seen in T. dicoccum. RF (Rajma flour) and GP (Guar powder) samples also showed reduction in GI up to 13% and 14% respectively. Modification with enzymes revealed that modification with branching enzyme showed increased amylograph gelatinization temperature and also increased farinograph water absorption. HPSEC (High performance size exclusion chromatography) results indicated the increase in the amylopectin peak area with modification. In vitro analysis indicated the increase in the SDS (Slowly digestible starch) and RS (Resistant starch) of the samples after modification. Samples given for the glycemic index analysis indicated positive reduction in postprandial blood glucose levels in the healthy subjects. Samples were with good product quality and acceptable by the sensory panellists. Effective samples were taken for the shelf-life study under two different conditions and revealed that samples were shelf stable for 180 days at ambient condition. It can be concluded that the effective methods for the modification of the ingredients to be used in low glycemic index noodle processing may be with succinic anhydride, octenyl-succinic anhydride and with branching enzyme.