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Development of low calorie, vegan gummy candy using isomalt and gellan gum and quality evaluation

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The research was conducted to develop a low calorie vegan gummy candy using gellan gum (replacer for gelatin) and isomalt (replacer for sugar). Gellan gum (E418) possesses rapid setting properties at lower concentrations, gel clarity and better flavour release. Three types of gummy candies with mango pulp were developed: sugar and gelatin (SGC), isomalt and gelatin (IGC) and isomalt and gellan gum (VGC). Proximate composition (AOAC), water activity, texture (compression and penetration), energy value, microbiological parameters and sensory texture evaluation were conducted. The storage study (ambient temperature, 28 ± 2 °C) was conducted. Energy values in gummy candies IGC and VGC types were 1.103 ± 0.02 kJ/g and 1.502 ± 0.02 kJ/g respectively. The values were 68% and 56% lower than in SGC type gummy candy (3.404 ± 0.02 kJ/g). IGC candy possessed significantly lower ($p < 0.05$) moisture (23.36 ± 0.10 % w/w) and water activity (0.872 ± 0.002) with significantly higher ($p < 0.05$) compression (0.1027 ± 0.0038 kN) and penetration (0.0109 ± 0.0002 kN) texture compared to SGC type gummy candy. This obviously occurred due to the combination of gelatin with low hygroscopic isomalt. IGC gummy has shown a significantly better ($p < 0.05$) hardness, chewiness, gumminess, appearance and overall acceptability compared to SGC type gummy candy due to less absorption of moisture (24.12 ± 0.15 % w/w) even after five months. Aerobic plate counts of all three types were increased during storage within acceptable limits. Incorporation of isomalt or gellan gum did not significantly influence the pH of IGC (4.25 ± 0.02) or VGC (4.31 ± 0.01). Gelatin has directly contributed to significantly higher ($p < 0.05$) protein values in SGC (7.82 ± 0.11 %) and IGC (7.53 ± 0.12 %) compared to VGC candy (0.35 ± 0.00 %). Replacement of sugar by isomalt has resulted in lower moisture content, lower water activity and higher hardness. Replacing gelatin by gellan gum has retained more moisture. Therefore, developed VGC vegan gummy candy, (combining gellan gum and isomalt) has resulted in better quality gummy candy with soft gel texture.

Keywords: Vegan candy, low calorie, gel texture, isomalt, gellan gum, water activity

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