Junthanee Teravecharoenchai 2014: Development of Layered Snack from Pumpkin, Sweet Potato and Carrot Containing Beta-carotene. Master of Science (Agro–Industrial Product Development), Major Field: Agro–Industrial Product Development, Department of Product Development. Thesis Advisor: Associate Professor Kalmonwan Jangchud, Ph.D. 103 pages.

Pumpkin, sweet potato, and carrot are vegetables which contain high levels of nutrients, especially; vitamin A, a form of beta-carotene; and fibere. The objective of this study was to develop nutritional snacks from pumpkins, sweet potatoes, and carrots, which are acceptable to consumers. The formula for the creation of these snacks consisted of two parts: a layer made up of a combination of pumpkin and sweet potato was produced, along with a carrot sheet. Ratios of pumpkin to sweet potato were studied using the Completely Randomized Design (CRD). Five ratios of pumpkin to sweet potato were investigated: 100:0, 75:25, 50:50, 25:75, and 0:100. The results showed that the optimum proportion of pumpkin to sweet potato was 50:50. The texture of the products was improved by studying the effect of different amounts of maltodextrin. It was found that the optimum amount of maltodextrin was 15% of the total content of the snacks. Regarding the sheet, the impact of five proportions of pumpkin to carrot (100:0, 75:25, 50:50, 25:75, and 0:100) on the quality of the products was researched, again by employing the CRD. The findings showed that the optimum ratio of pumpkin to carrot was 0:100. The influence of gelatine (0, 4, and 8 grams per 100 gram of ingredients) and glucose syrup (0, 8, and 16 grams per 100 gram of ingredients) on the product's quality was studied by using a 3x3 factorial arrangement in CRD. The sensory perception which resulted from consumption of the products was analyzed by applying the Response Surface Methodology (RSM). The optimum amount of gelatine and glucose syrup relative to the total contents of the snacks, were 3.8% and 5.7%, respectively. The 0.2±0.1 cm thickness mixed pumpkin and sweet potato sheet was put on 2 sides of the 0.2±0.1 cm thickness carrot sheet. They overlapped as the alternating layers of the product. A study of the drying time at a temperature of 60±2°C found that the optimum drying time was two hours, resulting in a hardness level of 9.7 N, a_w of 0.732, and 91.7 ug RE vitamin A or 11.5% vitamin A from ThaiRDI (1 serving size = 45 gram). The consumer acceptance test revealed that the product achieved a moderate liking score (7.0) with a consumer acceptance of 81.7%. The shelf life of layered snacks packed in plastic boxes or aluminum foil bag, and stored at 30±2 $^{\circ}$C, was found to be 1 month.

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