

CHAPTER 5

Conclusions and Recommendation

5.1 Conclusions

This study utilized a qualitative focus group interview technique to obtain Northern Thai consumers attitudes toward sodium reduction in foods and development of reduced sodium salts using odor-induced saltiness enhancement (OISE). The majorities of participants were aware of the sources of salty taste in foods and the adverse health effects of high salt intake, and knew how to reduce salt in their diets. The concept of reduced sodium salt was well received by participants, and could provide alternatives or more choices of salts currently available in the market. The participants identified sixty seven odor, ingredient, and food items that were associated with salty taste/flavor perception. The most mentioned odors such as fish sauce and soy sauce should be further used as an odor for saltiness enhancement. Some desirable attributes and packaging of reduced sodium salt prepared with OISE were identified. The findings would provide useful information for the development of reduced sodium salts using OISE.

Only, food items available in the market from focus group and literature review were selected to further investigate the effect of Thai consumer's age and gender on salty intensity rating for food odor items of OISE through self-administrated questionnaire. Four-hundred and ten consumers participated to estimate salty intensity using 0-9 scale. The finding from this study indicated that fish sauce, fermented fish, salted fish salt crab, soy sauce, dried shrimp, and lime as Thai condiments items group were mostly related to salty taste perception. The effect of gender and age on response toward saltiness perception of food items was investigated. Only age differences had influence on salty taste intensity of food odor items.

This study demonstrated that tasteless soy sauce odor could induce and enhance salty taste perception in water and salt solution models, respectively. To our knowledge, this is the first time the absolute (4.35 ppb), saltiness recognition (28.45 ppb) and saltiness difference (122.71 ppb) threshold values of soy sauce odor in water and salt solutions were reported. We observed that increasing soy sauce odor concentrations increased recognizable salty taste perception. However, OISE became less effective in 0.02M salt solution compared with water; this finding should be taken in account when utilizing OISE in development of low-sodium food products.

Effects of OISE with modified salt particle on salty perception and consumer acceptance were investigated. Soy sauce odor powder was utilized to study this influence. The samples with different levels of commercial salt (30, 50, 70 and 100 %) and soy sauce odor powder content (0, 30, 50 and 70 %) were examined to determine saltiness intensity by trained panelists and submitted to consumer acceptance testing. The saltiness intensity decreased in roasted peanut sample with lower salt content. All oil roasted peanuts with a lower salt content partially replaced by soy sauce odor were significantly saltier than low salt samples at the same salt content. For consumer liking scores in all attributes of samples with soy sauce odor at 30 and 50% were not different from the normal sample (100% salt).

The 50% soy sauce odor level was then used to investigate the effect of two modified salts (spray dried salt and foam-mat salt). The difference between two modified salt in physical and chemical properties were examined. For spray dried salt, most of spraided dry salt particles are typically small cubic shaped crystal with smooth surface and some part of particles are irregular shaped. Size of this spray dried salt analyzed by mastersizer tests varied in range 6.42-27.04 μm . The result showed that no significant difference between two modified salts on perceived saltiness and consumer liking. However, the perceived saltiness intensity and consumer acceptance tended to slightly increase more than those of the samples with foam-mat salt. Then spray dried salt was utilized as a model representation to study the influence of OISE on oil roasted peanut quality. The two factors (type of salt and the amount of soy sauce powder) affected perceived saltiness and consumer liking. There were significant interaction between the type of salt and percent of soy sauce odor powder in overall liking and

overall flavor. The perceived salty intensity and consumer liking were slightly increased in samples containing soy sauce odor powder with spray dried salt. The spray dried salt with soy sauce odor in this research contained 7.11 % moisture, 0.656 water activity and 0.63 g/mL bulk density. Sensory evaluation of oil roasted peanut with spray dried salt: soy sauce odor at 1:1 evaluated by 200 consumers using label affective magnitude scale (LAM) revealed that mean hedonic scores of all attributes were between like moderately and like very much (72.9-75.0). Therefore, a combination of OISE and spray dried salt could be an alternative method that is possible to reduce sodium intake.

5.2 Recommendation

In order to improve the efficiency of OISE, many strategies may be considered to apply with OISE in real food models in future studies such as salt substitutes and flavor enhancers. Moreover, this OISE technique can be used and applied extensively in other solid foods.



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