V. CONCLUSIONS AND RECOMMENDATION

A. CONCLUSIONS

The effect of spray drying condition on physical and chemical properties of dried green tea extract were observed. It were found that different solid concentration of 3, 6, 9% in feed and inlet air temperatures of 180, 200, and 220°C affected the variation of physical and chemical properties of green tea powder. An increase inlet air temperature, resulted in a significant decrease (p<0.05) in bulk density, hygroscopicity, total polyphenols and antioxidant activity. An increase of solid concentration in feed gave an increase in tea powder solubility, L, a, b value, and antioxidant activity. However, the total polyphenols contents were not affected by the increase of solid concentration.

For spray drying process, an increase in inlet air temperature gave an increase in recovery and amount of water removal. On the other hand, it gave a shorter time of drying and a higher reduction of energy consumption. An increase in solid concentration of feed yielded a decrease in recovery, and resulted the variation in the amount of water removal. It also allowed a short time of drying and reduce of the energy. The powder which has the best physical and chemical properties is that produced by the application of 3% solid concentration in feed and inlet air temperature 220°C. It has a low of bulk density 0.4262 ± 0.0011 g/mL, a high L value 71.14 ± 0.29, a low a value 3.86 ± 0.09 and b value 31.97 ± 0.62, a high solubility 80.03 ± 0.04%, a low hygroscopicity 8.84 ± 0.33%, the highest total catechins 23.23 ± 2.28 g/100g db with a high amount of EGC, EGCG, and GC, the highest of caffeine content 5.64 ± 0.47, a high recovery of spray drying 59.09%, the highest of water removal 1.98 kg/hr, and a low energy consumption. The powder has an antioxidant activity 218.80 ± 0.1 mmol Trolox/100 g db.

B. RECOMMENDATIONS

The recomendations for this study are using another technique for increasing the concentration of feed, example vacuum evaporator, in order to decrease the loss of product during concentrate the sample. Besides, the addition of drying aids, like maltodextrins, modified starches, and arabic gum are needed in order to obtain good product recovery and stability.