

## ABSTRACT

Gabriella Permata Heru (00000013008)

### **OPTIMIZATION OF SOLAR AND MECHANICAL DRYNG METHOD TO OBTAIN THE OPTIMUM FLAVOR AND ANTIOXIDANT ACTIVITY IN THREE TYPE OF GINGER (*Zingiber officinale*) POWDERS**

Thesis, Faculty of Science and Technology (2019)

(xvi + 160 pages: 24 tables, 16 figures, and 27 appendices)

Ginger is Indonesian spices which has specific taste and aroma, it is beneficial for its antioxidant content. However, the flavor and antioxidant activity of ginger rapidly decreased during processing of ginger powder. In this research, drying method was optimized to obtain optimum flavor and antioxidant activity. The optimization was done by Design Expert 11 using Response Surface Methodology (RSM). The optimization of slicing size (between 5 mm to 25 mm) and pre-treatment method (un-soaking or soaking with 0.6% sodium metabisulfite) were also done. The optimum slicing size was 5.7 mm with soaking method. It was chosen over optimum water activity and IC<sub>50</sub> value. The optimization of drying methods was done in solar (open sun drying and sun screen) and mechanical (oven and cabinet drying) drying. The soaking time was optimized between 60 to 90 minutes, while the optimization of drying time for solar drying was between 4 to 7 days, and 17 to 24 hours for mechanical drying. The optimization was chosen over IC<sub>50</sub> value and hedonic (aroma, pungency, and bitterness) test. The optimum condition for soaking time, drying time, and drying methods were 90 mins, 4 days 17 hours with sun screen and 90 mins, 23 hours with cabinet drying. The optimum solar and mechanical drying method of *jahe gajah* had IC<sub>50</sub> value of  $1506.9 \pm 12.6$  ppm and  $1355.9 \pm 62.6$  ppm, the acceptability of aroma, pungency, and bitterness were like nor dislike. *Jahe merah* and *jahe emprit* were also dried with optimum drying methods. Three types of ginger powder from sun screen had significantly give better result in sensory properties, while ginger powders from mechanical drying had significantly give better result in antioxidant activity.

Keywords : ginger powder, solar drying, mechanical drying, antioxidant activity, RSM

References : 87 (1993 – 2017)