

**THE EFFECTS OF RED GINGER (*Zingiber officinale* var. *rubrum*)
ADDITION IN VARIOUS CONCENTRATION ON
PHYSICOCHEMICAL CHARACTERISTIC AND
ORGANOLEPTIC OF LIQUEUR**

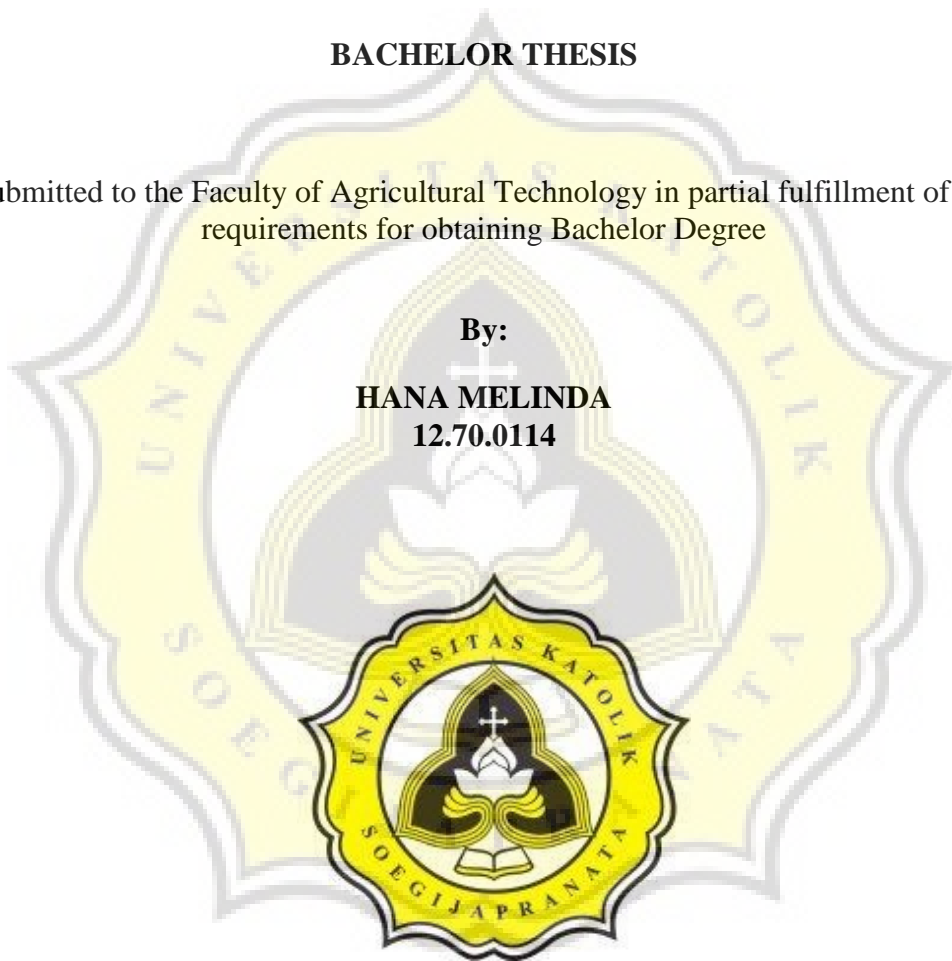
***EFEK PENAMBAHAN JAHE MERAH (*Zingiber officinale* var. *rubrum*)
DALAM BERBAGAI KONSENTRASI TERHADAP KARAKTERISTIK
FISIKOKIMIAWI DAN ORGANOLEPTIK LIQUEUR***

BACHELOR THESIS

Submitted to the Faculty of Agricultural Technology in partial fulfillment of the
requirements for obtaining Bachelor Degree

By:

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12.70.0114**



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SEMARANG**

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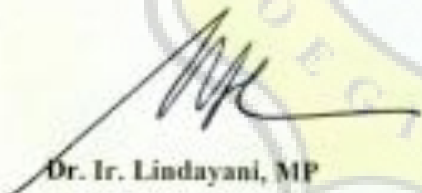
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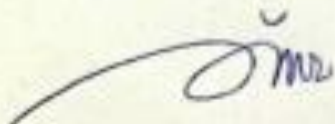
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STATEMENT OF THESIS AUTHENTICITY

I hereby declare that the thesis entitled **“THE EFFECTS OF RED GINGER (*Zingiber officinale* var. *rubrum*) ADDITION IN VARIOUS CONCENTRATION ON PHYSICOCHEMICAL CHARACTERISTIC AND ORGANOLEPTIC OF LIQUEUR”** contains no work that ever proposed to acquire a bachelorship title in a University, and along to my knowledge, there is no work ever written or published by others, except the ones used as references in this thesis and mentioned in the list of references.

If it is proven in the future that partially or whole thesis is the result of plagiarism, therefore I will be willing to be revoked with all the consequences in accordance with the law and regulations applied at Soegijapranata Catholic University and/or valid law and regulations.

Semarang, November 6th 2016

Hana Melinda
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SUMMARY

Nowadays, liqueur as an alcoholic beverage has gained its popularity. Herb liqueur made from extracts of aromatic and medicinal herbs has good effects on human especially for human metabolism. Ginger is one of medical commodity that has good prospect for development. Red ginger (*Zingiber officinale* var. *rubrum*) contains a higher starch and essential oils, also higher extracts solubility in alcohol than white ginger and large white ginger. Moreover, red ginger contains higher gingerol than other kinds of ginger. Spicy flavor of fresh ginger comes from gingerol which causes the pungent taste when consumed. To determine the best level of red ginger addition, red ginger liqueur is made with 4 different concentration of ginger addition. There are 5%, 10%, 15% and 20% ginger from total solution. Also, a different method of making liqueur was done, there are liqueurs which are made by incubating ingredients with diluted alcohol (1 part of 95% food grade ethanol in 1 part of drinking water) and by pure alcohol (95% food grade ethanol). Different incubation time of liqueur (1 week and 2 weeks) was also done. The aims of this study are to determine the proper level of ginger addition to make the products favored by consumers, as well as to determine the proper level of ginger addition in physicochemical characteristic of ginger liqueur. The method of this research is divided into 2 parts, namely the liqueurs making and the main research consisting of physicochemical, microbiological and also organoleptic analysis. All the data from this study were collected and analyzed using SPSS version 20 (Statistical Package for the Social Science for Windows, Version 20) with One-Way ANOVAs, continued with Duncan Model test to assess each sample that is significantly different and to find out the best level of ginger addition for ginger liqueur. Based on results of organoleptic analysis, it was found that the most preferred is liqueur made by adding 15% of red ginger, incubated in mixture of alcohol-water and incubated for 2 weeks, with each attribute value (1 dislike very much to 5 like very much) is for color 3.93 ± 0.83 ; turbidity 4.07 ± 0.94 ; aroma 4.20 ± 0.66 ; sweetness 3.43 ± 0.61 ; taste 4.13 ± 0.78 ; after taste 4.10 ± 0.66 and overall 4.30 ± 0.53 . On physicochemical analysis, most preferred red ginger liqueur has 158.50 ± 0.55 NTU of turbidity; for color analysis 18.80 ± 0.21 of L value, 0.42 ± 0.04 of a^* value and 0.88 ± 0.05 of b^* value; 6.88 ± 0.05 of pH value; 20.75 ± 0.27 of °brix; 41.03 ± 0.57 of antioxidant activity. On microbiological analysis it has $< 10^3$ CFU/ml and 37.34% alcohol. Results shows that by adding red ginger in difference percentages gives effects on the characteristic of ginger liqueur where it is directly proportional with turbidity, color, brix, antioxidant activity and alcohol content but inversely with pH value. The highest total preference for every attribute is in 15% of red ginger with the 1st recipe and 2 weeks incubation time (except sweetness).

RINGKASAN

Saat ini, liqueur sebagai minuman beralkohol telah populer. Herb liqueur yang terbuat dari ekstrak herbal aromatik dan obat memiliki efek yang baik pada manusia terutama bagi metabolisme manusia. Jahe adalah salah satu komoditas medis yang memiliki prospek yang baik untuk dikembangkan. Jahe merah (*Zingiber officinale* var. *rubrum*) mengandung pati dan minyak esensial yang lebih tinggi, juga memiliki kelarutan ekstrak alkohol lebih tinggi daripada jahe putih besar dan jahe putih. Selain itu, jahe merah mengandung gingerol yang lebih tinggi daripada jenis jahe lain. Untuk mengetahui tingkat penambahan jahe merah terbaik, jahe merah liqueur dibuat dengan 4 perlakuan penambahan jahe yang berbeda. Terdapat penambahan jahe 5%, 10%, 15% dan 20% dari total larutan. Juga dilakukan metode berbeda dalam membuat liqueur, ada liqueur yang dibuat dengan menginkubasi bahan dengan alkohol yang diencerkan (1 bagian dari 95% tingkat etanol makanan dalam 1 bagian air minum) dan dengan alkohol murni (95% tingkat etanol makanan). Waktu inkubasi liqueur yang berbeda (1 minggu dan 2 minggu) juga dilakukan. Tujuan dari penelitian ini adalah untuk menentukan tingkat penambahan jahe yang tepat agar produk disukai oleh konsumen, serta untuk menentukan tingkat penambahan jahe yang tepat pada karakteristik fisikokimia liqueur jahe. Metode penelitian ini dibagi menjadi 2 bagian, yaitu pembuatan liqueur dan penelitian utama terdiri dari analisis fisikokimia, mikrobiologi dan juga analisis organoleptik. Semua data dari penelitian ini dikumpulkan dan dianalisis menggunakan SPSS versi 20 (Paket statistik untuk Ilmu Sosial Windows, Versi 20) dengan One-Way ANOVA, dilanjutkan dengan uji Duncan Model untuk menilai masing-masing sampel yang berbeda dan untuk mengetahui tingkat penambahan jahe terbaik pada liqueur jahe. Berdasarkan hasil analisis organoleptik, ditemukan bahwa liqueur yang paling disukai dibuat dengan penambahan jahe merah 15%, diinkubasi dalam campuran alkohol-air dan diinkubasi selama 2 minggu, dengan masing-masing nilai atribut (1 sangat tidak suka hingga 5 sangat suka) adalah $3,93 \pm 0,83$ untuk warna; $4,07 \pm 0,94$ kekeruhan; $4,20 \pm 0,66$ aroma; $3,43 \pm 0,61$ kemanisan; $4,13 \pm 0,78$ rasa; $4,10 \pm 0,66$ rasa setelahnya dan $4,30 \pm 0,53$ keseluruhan. Pada analisis fisikokimia, liqueur jahe merah yang paling disukai memiliki nilai kekeruhan $158,50 \pm 0,55$ NTU; $18,80 \pm 0,21$ untuk analisis warna dari nilai L, $0,42 \pm 0,04$ dari nilai a^* dan $0,88 \pm 0,05$ dari nilai b^* ; nilai pH $6,88 \pm 0,05$; $20,75 \pm 0,27$ brix; $41,03 \pm 0,57$ % aktivitas antioksidan. Nilai total hitungan cawan memiliki $<10^3$ CFU / ml dan alkohol 37,34%. Hasil menunjukkan bahwa dengan penambahan jahe merah pada persentase yang berbeda dapat memberikan efek pada karakteristik liqueur jahe dimana hal ini berbanding lurus dengan kekeruhan, warna, brix, aktivitas antioksidan dan kandungan alkohol tetapi berbanding terbalik dengan nilai pH. Total preferensi tertinggi untuk setiap atribut adalah 15% jahe merah dengan resep waktu inkubasi 1 dan 2 minggu (kecuali atribut kemanisan).

PREFACE

Praise in the name of Lord Jesus Christ, because only by His grace, the author would have the opportunity to finish the report of bachelor thesis research entitled “The Effects of Red Ginger (*Zingiber officinale* var. *rubrum*) Addition in Various Concentration on Physicochemical Characteristic and Organoleptic of Liqueur”. Thesis of this report made to fulfill one of the requirements to obtain a Bachelor's degree of Food Technology at the Faculty of Agricultural Technology, Soegijapranata Catholic University.

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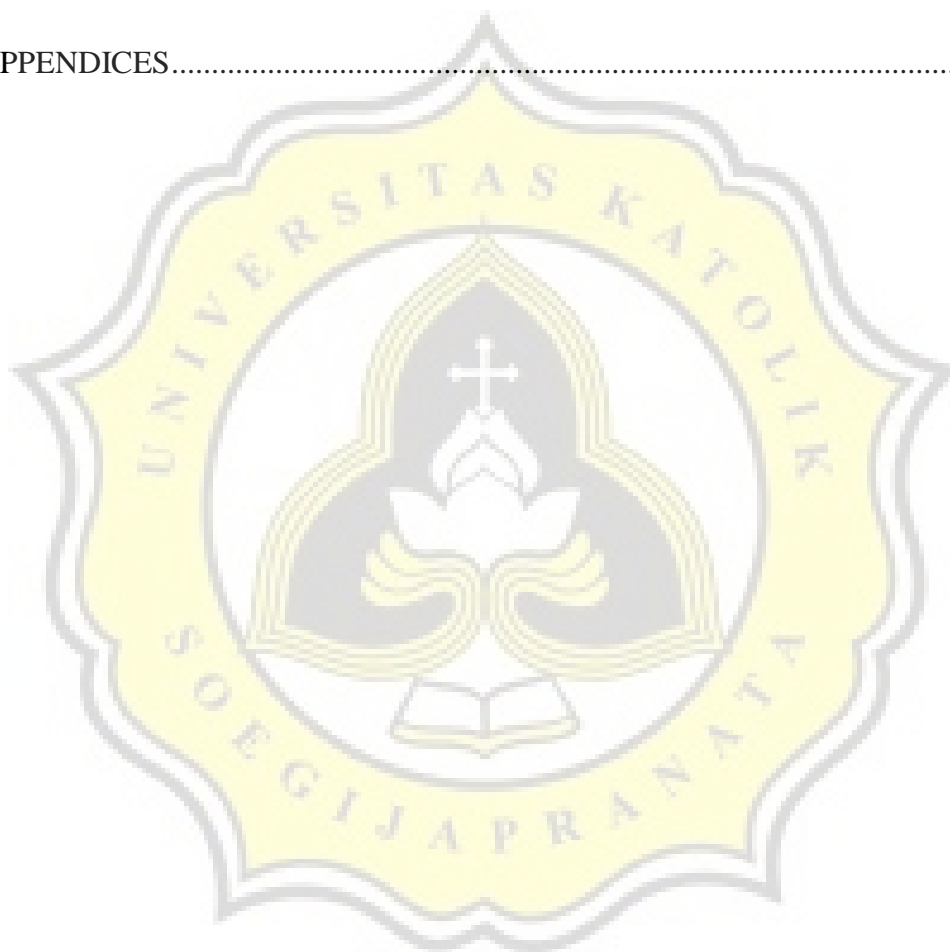
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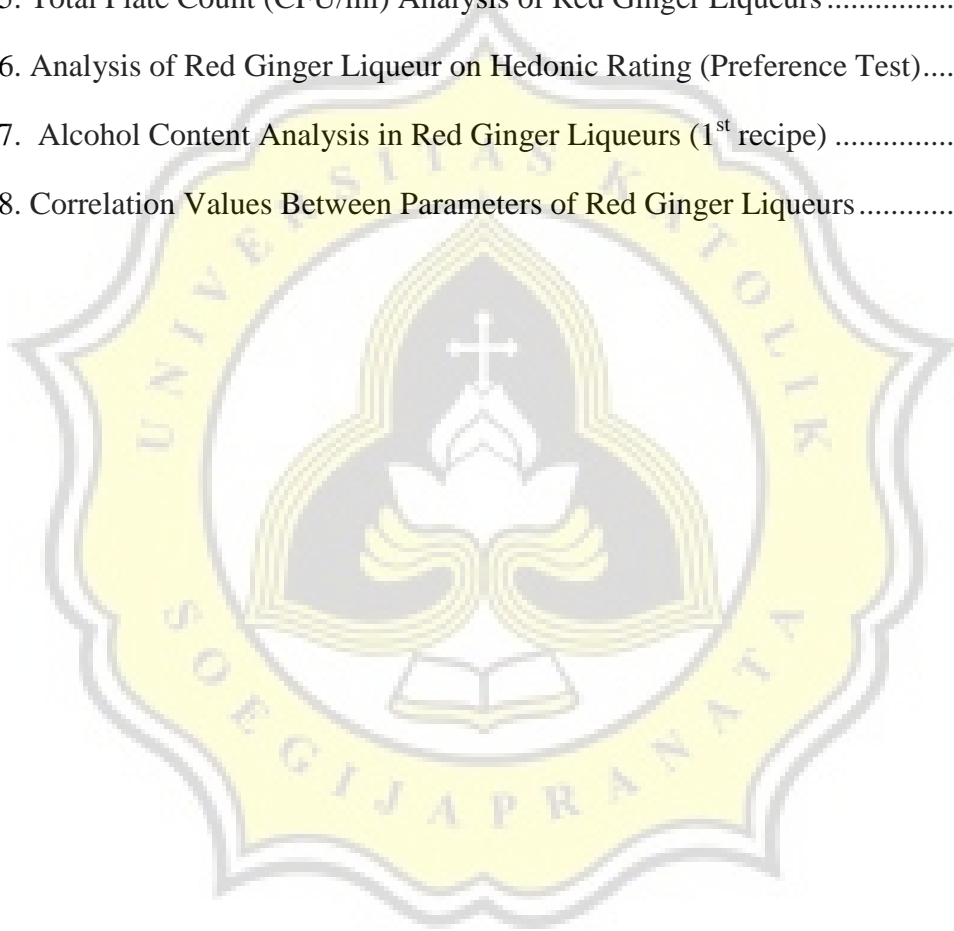
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