

**PENGARUH PENAMBAHAN JAHE MERAH BUBUK (*Zingiber officinale* var. *Rubrum*) TERHADAP KARAKTERISTIK MINUMAN FUNGSIONAL DARI KAKAO BUBUK (*Theobroma cacao* L.) SERTA PENGARUHNYA TERHADAP RESPON IMUN MENCIT (*Mus musculus*)**

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**FAKULTAS TEKNOLOGI PERTANIAN  
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PADANG  
2022**

**PENGARUH PENAMBAHAN JAHE MERAH BUBUK (*Zingiber officinale* var. *Rubrum*) TERHADAP KARAKTERISTIK MINUMAN FUNGSIONAL DARI KAKAO BUBUK (*Theobroma cacao* L.) SERTA PENGARUHNYA TERHADAP RESPON IMUN MENCIT (*Mus musculus*)**

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**Pengaruh Penambahan Jahe Merah Bubuk (*Zingiber officinale* var. *Rubrum*) Terhadap Karakteristik Minuman Fungsional dari Kakao Bubuk (*Theobroma cacao* L.) Serta Pengaruhnya Terhadap Respon Imun Mencit (*Mus musculus*)**

Muhammad Iqbal, Fauzan Azima, Novizar Nazir

**ABSTRAK**

Penelitian ini bertujuan untuk mengetahui pengaruh penambahan jahe merah bubuk terhadap karakteristik mutu minuman fungsional dari kakao bubuk, serta pengaruhnya terhadap respon imun mencit. Penelitian ini menggunakan Rancangan Acak Lengkap (RAL) dengan 5 perlakuan dan 3 ulangan. Analisis data dilakukan dengan Analisis Ragam (ANOVA) dan dilanjutkan dengan Duncan's New Multiple Range Test (DNMRT) pada taraf 5%. Pengamatan terhadap minuman fungsional kakao jahe merah terdiri dari analisis kadar air, kadar abu, aktivitas antioksidan, waktu larut, angka lempeng total, dan uji organoleptik. Perlakuan pada minuman fungsional yaitu penambahan jahe merah bubuk sebanyak 0, 0.5, 1, 3, dan 5 g. Parameter uji *in vivo* terdiri dari jumlah total leukosit, persentase leukosit, aktivitas dan kapasitas fagositosis sel makrofag. 15 ekor mencit putih jantan dibagi menjadi 5 kelompok dosis, yaitu minuman kakao 100%, minuman jahe merah 100%, dan minuman fungsional kakao jahe merah dengan variasi dosis 30%, 50%, dan 70% / 20 g BB mencit. Hasil penelitian menunjukkan penambahan jahe merah bubuk berpengaruh nyata terhadap aktivitas antioksidan dan waktu larut minuman fungsional yang dihasilkan. Tetapi berpengaruh tidak nyata terhadap kadar air, kadar abu, angka lempeng total, dan uji organoleptik. Berdasarkan analisis fisikokimia dan mikrobiologi minuman fungsional kakao jahe merah, perlakuan terbaik adalah penambahan 5 g jahe merah bubuk dengan kadar air 2.56%, kadar abu 2.13%, aktivitas antioksidan 88.96%, waktu larut 64 detik, dan angka lempeng total  $1.5 \times 10^3$  koloni/g. Hasil uji organoleptik minuman fungsional terbaik yaitu penambahan 3 g jahe merah bubuk dengan skor warna 3.93 (suka), aroma 3.90 (suka), dan rasa 3.30 (biasa). Selanjutnya, pengujian *in vivo* menunjukkan perbedaan dosis minuman fungsional yang diberikan berpengaruh nyata terhadap jumlah total leukosit, aktivitas dan kapasitas fagositosis sel makrofag mencit. Tetapi berpengaruh tidak nyata terhadap persentase leukosit. Variasi dosis minuman fungsional kakao jahe merah dapat meningkatkan jumlah total leukosit 10.733, 12.200, dan 13.133/  $\mu$ L darah, aktivitas fagositosis makrofag sebesar 65.33%, 71.66%, dan 78.66%, sedangkan kapasitas fagositosis makrofag sebanyak 110.33, 143.33, dan 178.33 sel. Penelitian ini menunjukkan bahwa minuman fungsional kakao jahe merah ini berimplikasi sebagai immunomodulator yang dapat meningkatkan respon imun mencit.

*Kata kunci* : Jahe merah, kakao, minuman fungsional, antioksidan, immunomodulator

# **The Effect of Addition Red Ginger Powder (*Zingiber officinale* var. *Rubrum*) to the Characteristics of Functional Drinks from Cocoa Powder (*Theobroma cacao* L.) and Its Effect on the Immune Response of Mice (*Mus musculus*)**

Muhammad Iqbal, Fauzan Azima, Novizar Nazir

## **ABSTRACT**

The aim of this research was to determine the effect of red ringer powder toward quality of functional drinks from cocoa powder, and its effect on the immune response of mice. The research using a completely randomized design (CRD) consisted of 5 treatments and 3 replications. Data was analyzed statistically using ANOVA that followed by a test of Duncan's New Multiple Range Test (DNMRT) at the 5% significance level. Observation of cocoa-red ginger functional drinks consisted of moisture content, ash content, antioxidant activity, soluble time, total plate number, and sensory test. The treatment used of functional drinks were addition 0, 0.5, 1, 3, and 5 g of red ginger powder. Meanwhile in vivo test consisted to the total number of leukocytes, the percentage of leukocytes, activity and phagocytic capacity of macrophage cells of mice. 15 white male mice divided into 5 treatment group, namely the control group of mice was given 100% cocoa drinks, 100% red ginger drinks, and cocoa-red ginger functional drinks with various dosage of 30%, 50%, and 70% / 20 g bw. The results showed that the addition of red ginger powder significantly affected the antioxidant activity and soluble time of functional drinks. However not significantly affected on moisture content, ash content, total plate number, and sensory test. Based on physicochemicals and microbiology analyzing of cocoa-red ginger functional drinks, the best treatment was the 5 gram addition of red ginger powder with 2.56% moisture content, 2.13% ash content, 88.96% antioxidant activity, 64 sec. soluble time, and  $1.5 \times 10^3$  CFU/g total plate number. Beside, the best sensory test of functional drinks was the 3 gram addition of red ginger powder with acceptance value was color 3.93 (like), aroma 3.90 (like), and taste 3.30 (normal). Furthermore the results of in vivo test showed that the various dosage of functional drinks significantly affected the total number of leukocytes, activity and phagocytic capacity of macrophage cells of mice. But not significantly affected the percentage of leukocytes. Various dosage of cocoa-red ginger functional drinks can increase the total number of leukocytes by 10.733, 12.200, and 13.133/ $\mu$ L blood, phagocytic activity of macrophages increased by 65.33%, 71,66%, and 78.66% each. The phagocytic capacity of macrophages showed were 110.33, 143.33, and 178.33 cells. This research showed that cocoa-red ginger functional drinks implicated as immunomodulator that increased immune response of mice.

*Keywords* : Red ginger, cocoa, functional drinks, antioxidant, immunomodulator