

THESIS
ORANGE SWEET POTATO *CRACKERS*
WITH SUBSTITUTION OF TEMPE FLOUR AND PUMPKIN
AS A SUPPLEMENTARY FOOD FOR TODDLERS
WITH VITAMIN A DEFICIENCY
*(Analysis of Energy Content, Protein Levels, Fat, β -Carotene,
and Organoleptic Properties)*



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PONOROGO

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THESIS DEFENCE

It is hereby stated that the thesis with the title :

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TEMPEH FLOUR AND PUMPKIN AS A SUPPLEMENTARY FOOD FOR
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Properties)*

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It has been reviewed and recommended to meet scientific standards, in terms of both
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It has been approved to presented on: Thursday, 13 February 2025

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VALIDITY SHEET

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ABSTRACT

ORANGE SWEET POTATO *CRACKERS* WITH SUBSTITUTION OF TEMPE FLOUR AND PUMPKIN AS A SUPPLEMENTARY FOOD FOR TODDLERS WITH VITAMIN A DEFICIENCY

(Analysis of Energy Content, Protein Levels, Fat, β -Carotene, and Organoleptic Properties)

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Vitamin A and micronutrient deficiencies in toddlers can impair vision function, growth, and immune resistance. One possible innovation is the development of supplementary foods based on local ingredients such as orange sweet potatoes, tempeh flour, and pumpkin. This study analyzes the differences in energy content, protein, fat, β -carotene levels, and organoleptic properties of orange sweet potato *crackers* by substituting tempeh flour and pumpkin. This research employs a true experimental laboratory design using a Completely Randomized Design consisting of two treatment samples (F1 and F2) and one control (F0), with three repetitions. The formulations consist of orange sweet potato: tempeh flour: and pumpkin, as follows: F0 (100:0:0) grams, F1 (80:5:15) grams, and F2 (55:15:30) grams. The methods used include energy content analysis (*Atwater*), protein content (*Kjeldahl*), fat content (*Soxhlet*), β -carotene content (*UV-Vis spectrophotometer*), and organoleptic testing with 50 untrained panelists comprising 25 mothers of toddlers and 25 toddlers. Nutrient content data analysis was conducted using *One Way ANOVA* followed by *Duncan's post hoc test*, while organoleptic test data were analyzed using the *Kruskal-Wallis* test. The results of the nutrient content analysis of orange sweet potato crackers showed significant differences in energy content, protein, fat, and β -carotene (p -value=0.000). The organoleptic test data analysis indicated significant differences between the formulations (F0, F1, and F2) in terms of energy content, protein content, fat content, β -carotene content, and organoleptic properties.

Key words: *Crackers, orange sweet potato, tempeh flour, vitamin A deficiency, pumpkin.*

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ABSTRAK

CRACKERS UBI JALAR *ORANGE* DENGAN SUBSTITUSI TEPUNG TEMPE DAN LABU KUNING SEBAGAI MAKANAN TAMBAHAN BALITA DEFISIENSI VITAMIN A

(Analisis Kandungan Energi, Kadar Protein, Lemak, β -karoten, dan Organoleptik)

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Kekurangan vitamin A dan makronutrien pada balita dapat mengganggu fungsi penglihatan, pertumbuhan, dan daya tahan tubuh. Salah satu inovasi yang dapat dilakukan yaitu pembuatan makanan tambahan berbasis pangan lokal seperti ubi jalar orange, tepung tempe dan labu kuning. Penelitian ini bertujuan untuk menganalisis perbedaan kandungan energi, kadar protein, lemak, β -karoten dan organoleptic crackers ubi jalar orange dengan substitusi tepung tempe dan labu kuning. Penelitian ini menggunakan jenis penelitian true experimental laboratorium. Desain penelitian menggunakan Rancangan Acak Lengkap (RAL) yang terdiri dari 2 sampel perlakuan (F1 dan F2) dan 1 kontrol (F0) dengan 3 kali pengulangan. Formulasi terdiri dari ubi jalar orange : tepung tempe : labu kuning, yaitu F0 (100:0:0) gram, F1 (80:5:15) gram, F2 (55:15:30) gram. Metode uji kandungan energi (*atwater*), kadar protein (*kjeldahl*), kadar lemak (*soxhlet*), kadar β -karoten (*spektrofotometer uv-vis*) dan uji organoleptik dengan panelis tidak terlatih berjumlah 50 orang yang terdiri dari 25 ibu balita dan 25 balita. Analisis data zat gizi dengan One Way Anova dilanjutkan dengan post hoc Duncan dan data uji organoleptik menggunakan Kruskal Wallis. Hasil penelitian analisis kandungan zat gizi crackers ubi jalar *orange*, menunjukkan perbedaan yang signifikan pada kandungan energi, protein, lemak, dan β -karoten dengan (*p-value*=0,000). Hasil analisis data uji organoleptik menunjukkan bahwa terdapat perbedaan yang nyata antara (F0, F1, dan F2) terhadap kandungan energi, kadar protein, kadar lemak, kadar β -karoten dan organoleptik.

Kata Kunci: *Crackers*, ubi jalar *orange*, tepung tempe, kekurangan vitamin A, labu kuning.

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The author realizes that this report still has shortcomings and limitations regarding content and presentation. Therefore, with utmost humility, the author apologizes for any errors or imperfections in writing this final project. Constructive criticism and suggestions are highly appreciated for improving this work. Moreover, the author hopes that this final project can contribute to the development of health sciences, particularly for the benefit of society.

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Ngawi, January 16, 2025



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STATEMENT OF RESEARCH AUTHENTICITY

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I declare with full responsibility that this thesis is my original work, not a copy or result of other people's research. This thesis has never been submitted to any university to obtain a graduate degree. In addition, this work has not been published previously, except for references included in this manuscript and recorded in the bibliography. I am aware that if it is later proven that there are elements of plagiarism in this thesis, I am ready to accept academic sanctions by applicable regulations. I make this statement truthfully and without any pressure from any party.

Ponorogo, 9 January 2025

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