OPTIMASI KOMPONEN PEMBUATAN SABUN PADAT DARI VCO DAN MINYAK ALPUKAT DENGAN METODE RESPON PERMUKAAN

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INTISARI

Penelitian tentang pembuatan sabun padat dari *Virgin Coconut Oil* (VCO) dan minyak alpukat dengan *Response Surface Methodology* (RSM) telah dilakukan untuk mengetahui nilai optimumnya. Tujuan dari penelitian ini yaitu untuk melakukan optimasi pembuatan sabun padat dengan metode respon permukaan dan mempelajari pengaruh variabel komposisi bahan dasar pembuatan sabun mandi padat terhadap analisis sifat fisik dan kimianya.

Desain eksperimen *Central Composite Design* (CCD) menggunakan 2 variabel bebas yaitu jumlah minyak alpukat (x_1) dan temperatur air (x_2). Variabel tetap yang digunakan yaitu berat minyak total dengan penambahan VCO. CCD memberikan jumlah perlakuan sebanyak 13 sampel. Setiap sampel sabun dibuat sesuai desain eksperimen yang telah ditentukan dan didiamkan selama 4 minggu. Penentuan keadaan optimum meliputi tingkat kekerasan, warna, pH, kadar air, busa, asam lemak bebas dan lemak tak tersabunkan.

Hasil penelitian menunjukkan bahwa jumlah minyak alpukat memberikan pengaruh terhadap respon tingkat kekerasan, warna, asam lemak bebas dan lemak tak tersabunkan dengan nilai $P < 0,050$ dengan kontribusi masing-masing 61,800; 95,700; 95,100 dan 92,700%. Variabel temperatur air hanya berpengaruh pada tingkat kekerasan sebesar 34,200%. Uji regresi ditunjukkan dengan nilai R^2 yang berarti kekuatan tingkat kepercayaan terhadap data hasil penelitian. Nilai optimum yang dicapai masing-masing respon yaitu 7,688 N (tingkat kekerasan); 20,112 (warna); 9,606 (pH); 10,839% (kadar air); 32,507% (busa); 0,298% (asam lemak bebas) dan 0,920% (lemak tak tersabunkan).

Kata kunci: *Central Composite Design*, minyak alpukat, *Response Surface Methodology*, *Virgin Coconut Oil*.

COMPONENT OPTIMIZATION OF BAR SOAP MAKING FROM VCO AND AVOCADO OIL WITH RESPONSE SURFACE METHODOLOGY

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ABSTRACT

Research on the bar soap making from Virgin Coconut Oil (VCO) and avocado oil with Response Surface Methodology (RSM) was conducted to determine the optimum value. The purpose of this research was to optimize bar soap making by RSM and to study the effects to the physical and chemical properties of bar soap making.

The experimental design of Central Composite Design (CCD) used 2 independent variable, the amount of avocado oil (x_1) and temperature of water (x_2). The fixed variable used is total oil weight with the addition of VCO. CCD gives a total of 13 samples. The bar soap making was done by following design of experiment that had been determined and left for 4 weeks. The optimum condition was determined by the level of hardness, color, pH, content of water, foam, free fatty acid and fat unsaponified.

The result showed that the amount of avocado oil had an affect on hardness, color, free fatty acid and fat unsaponified due to the P value < 0.050 with the contribution were 61.800; 95.700; 95.100 and 92.700% respectively. The temperature of water impacts 34.200% to the hardness of soap. The regression tests indicated by the R^2 value that means the strength of confidency level towards the response result. The optimum value achieved by each response was 7.688 N (hardness); 20.112 (color); 9.606 (pH); 10.839% (content of water); 32.507% (foam); 0.298% (free fatty acids) and 0.920% (fat unsaponified).

Keywords: avocado oil, Central Composite Design, Response Surface Methodology, Virgin Coconut Oil.