

RINGKASAN

Ubi jalar madu merupakan salah satu umbi yang mengandung karbohidrat dan beta karoten cukup tinggi sehingga memiliki potensi tinggi untuk dimanfaatkan menjadi olahan pangan bernilai ekonomis seperti *french fries*. Akan tetapi, ubi jalar madu juga mengandung gula reduksi tinggi yang membuat *french fries* ubi jalar madu memiliki warna cukup gelap dan tekstur yang dihasilkan kurang renyah. Perendaman dalam larutan kalsium dengan pengaturan pH dan lama perendaman kemungkinan akan memengaruhi warna dan tekstur produk. Penelitian ini bertujuan untuk mengetahui pengaruh pH larutan perendam, lama perendaman, dan interaksi keduanya terhadap karakteristik fisikokimia dan sensori *french fries* ubi jalar madu.

Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) faktorial dengan faktor yang dicoba terdiri dari pH larutan perendam (P1 = pH 3, P2 = pH 4, dan P3 = pH 5) dan lama perendaman (S1 = 15 menit, S2 = 30 menit, dan S3 = 45 menit) yang dilakukan sebanyak 3 ulangan. Variabel yang diamati yaitu variabel karakteristik fisik, kimia, dan sensori. Variabel fisik terdiri dari kapasitas penyerapan minyak, warna, dan tekstur menggunakan *texture analyzer*. Variabel analisis kimia terdiri dari kadar air, abu, lemak, protein, karbohidrat, beta karoten, dan asam lemak bebas. Variabel analisis sensori dilakukan dengan menilai atribut sensori yang terdiri dari warna, tekstur, aroma, rasa manis, *aftertaste* asam, dan kesukaan. Hasil pengujian karakteristik fisikokimia dianalisis menggunakan analisis ragam dan diuji lanjut dengan DMRT pada taraf kepercayaan 95%. Hasil analisis karakteristik sensori dianalisis menggunakan Uji Friedman dan penentuan perlakuan terbaik menggunakan metode Indeks Efektivitas.

Hasil penelitian menunjukkan bahwa penggunaan pH larutan perendam yang semakin rendah meningkatkan kadar air, abu, nilai warna L, dan b*, sedangkan kadar lemak, protein, karbohidrat, dan kapasitas penyerapan minyak menurun seiring dengan rendahnya pH larutan. Kombinasi perlakuan terbaik adalah *french fries* yang dibuat dengan perendaman dalam larutan pH 4 selama 45 menit (P2S3) dengan karakteristik kadar air sebesar 34,47% bb, kadar abu 1,89% bk, kadar lemak 12,02% bk, kadar protein 2,84% bk, kadar karbohidrat *by difference* 48,78% bk, asam lemak bebas 1,24% bb, beta karoten 1,87 mg/100g, kapasitas penyerapan minyak 9,15%, nilai L 59,94, nilai a* 2,24, nilai b 47,21, *hardness* 57,16, *crispiness* 199,55, dan *crunchiness* 84,03, warna 4,1 (kuning), tekstur 3,0 (sedikit renyah), aroma 4,8 (khas), rasa 4,1 (agak manis), *aftertaste* asam 6,1 (tidak asam), dan kesukaan 4,5 (suka). Kesimpulan dari penelitian ini adalah perlakuan pH larutan perendam berpengaruh nyata terhadap kadar air, abu, lemak, protein, karbohidrat, kapasitas penyerapan minyak, warna L, dan warna b*, sedangkan perlakuan lama perendaman tidak berpengaruh nyata terhadap karakteristik fisikokimia *french fries* ubi jalar madu. Ubi jalar madu dapat dikembangkan menjadi *french fries* ubi jalar madu dengan perlakuan pendahuluan pH larutan menggunakan asam sitrat dan CaCl₂.

SUMMARY

Sweet potato is one of the tubers that contains high levels of carbohydrates and beta-carotene, making it highly potential for use in the production of economically valuable food products such as French fries. However, sweet potato also contains high levels of reducing sugars, which cause sweet potato French fries to have a fairly dark color and a texture that is less crispy. Soaking in a calcium solution with controlled pH and soaking time may affect the color and texture of the product. This study aims to determine the effect of the pH of the soaking solution, soaking time, and the interaction between the two on the physicochemical and sensory characteristics of honey sweet potato french fries.

This study used a factorial Randomized Block Design with factors consisting of the pH of the soaking solution (P_1 = pH 3, P_2 = pH 4, and P_3 = pH 5) and soaking time (S_1 = 15 minutes, S_2 = 30 minutes, and S_3 = 45 minutes), which was repeated three times. The variables observed were physical, chemical, and sensory characteristics. Physical variables included oil absorption capacity, color, and texture, measured using a texture analyzer. Chemical analysis variables included moisture content, ash, fat, protein, carbohydrates, beta-carotene, and free fatty acids. Sensory analysis variables were assessed by evaluating sensory attributes, including color, texture, aroma, sweetness, sour aftertaste, and preference. The results of the physicochemical characteristic testing were analyzed using Analysis of Variance and further tested with the DMRT at a 95% confidence level. The results of the sensory characteristic analysis were analyzed using the Friedman test, and the best treatment was determined using the Effectiveness Index method.

The results of the study indicate that the use of lower pH immersion solutions increases water content, ash content, L value, and b^* value, while fat content, protein content, carbohydrate content, and oil absorption capacity decrease as the pH of the solution decreases. The best treatment combination is French fries made by soaking in a pH 4 solution for 45 minutes (P_2S_3) with the following characteristics: moisture content of 34.47% dry weight (dw), ash content of 1.89% dw, fat content of 12.02% dw, protein content of 2.84% dw, carbohydrate content by difference 48.78% dry weight, free fatty acids 1.24%, beta-carotene 1.87 mg/100g, oil absorption capacity 9.15%, L value 59.94, a^* value 2.24, b value 47.21, hardness 57.16, crispiness 199.55, and crunchiness 84.03, color 4.1 (yellow), texture 3.0 (slightly crispy), aroma 4.8 (distinctive), taste 4.1 (slightly sweet), sour aftertaste 6.1 (not sour), and preference 4.5 (liked). The conclusion of this study is that the pH treatment of the soaking solution significantly affects moisture content, ash, fat, protein, carbohydrates, oil absorption capacity, L color, and b^* color, while the soaking time treatment does not significantly affect the physicochemical characteristics of honey sweet potato french fries. Honey sweet potatoes can be developed into honey sweet potato french fries using a preliminary pH treatment of the solution with citric acid and CaCl_2 .