

SIFAT FISIK DAN KIMIA EKSTRUDAT BERBAHAN DASAR GRIT JAGUNG DAN TEPUNG GAPLEK YANG DIPRODUKSI DENGAN PERLAKUAN KADAR AIR DAN SUHU *BARREL*

INTISARI

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Jagung dan singkong merupakan tanaman pangan yang jumlahnya sangat melimpah di Indonesia. Keberlimpahan tersebut dapat dioptimalkan pemanfaatannya melalui pengolahan menjadi produk olahan yang populer. Salah satu produk olahan yang banyak diminati ialah camilan ekstrudat. Tujuan utama dari penelitian ini adalah mengkaji sifat fisik dan kimia ekstrudat berbahan dasar jagung dan singkong dengan perlakuan kadar air campuran dan suhu *barrel* ekstruder.

Grit jagung dan tepung gaplek dengan kadar air awal 12% dicampurkan dengan rasio 9:1 divariasikan kadar air campurannya menjadi 14%, 16% dan 18%. Campuran tersebut kemudian diekstrusi dengan variasi suhu ujung *barrel* (T_4) 120°C, 130°C dan 140°C. Sifat fisik ekstrudat yang diukur berupa kadar air, rasio ekspansi, densitas curah, densitas partikel, warna, WAI, WSI, dan kekerasan. Sedangkan sifat kimia ekstrudat yang diuji adalah kandungan protein, lemak, serat kasar dan abu. Analisis yang dilakukan meliputi analisis statistik serta penentuan perlakuan terbaik menggunakan TOPSIS.

Hasil penelitian menunjukkan perlakuan kadar air campuran sangat berpengaruh terhadap sifat fisik ekstrudat. Perlakuan suhu *barrel* pada beberapa sampel tidak menunjukkan perbedaan yang signifikan. Nilai kadar air ekstrudat siap makan berkisar pada 0,8-4,5%wb, rasio ekspansi 2,5-3,3 kali lipat, densitas curah sebesar 0,08-0,18 g/cm³, densitas partikel 0,12-0,33 g/cm³, L* sebesar 81-92, a* sebesar -16,7 hingga -9,9, b* sebesar 36-50, C* sebesar 39-51, h* sebesar 101-113, WAI sebesar 6,2-7,1, WSI sebesar 0,02-0,05, serta tekstur bekisar pada 0,22-0,49 N/mm². Sifat kimia ekstrudat siap makan (sampel 14%120C) yaitu kandungan kadar abu sebesar 0,85 %wb, protein total sebesar 7,54 %wb, lemak sebesar 0,18 %wb, dan serat kasar sebesar 0,39 %wb. Kesimpulannya, perlakuan yang paling baik ialah kadar air campuran terendah (14%) dan suhu *barrel* tertinggi (140°C).

Kata kunci: diversifikasi, teknologi ekstrusi, camilan siap makan, psikokimia, signifikansi, rasio ekspansi., rasio komposisi.

PHYSICAL AND CHEMICAL PROPERTIES OF EXTRUDATE BASED ON CORN GRIT AND CASSAVA FLOUR WHICH IS PRODUCED WITH TREATMENT OF WATER LEVELS AND BARREL TEMPERATURES

ABSTRACT

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Corn and cassava are food crops that are very abundant in Indonesia. This abundance can be utilized optimally through processing into popular processed products. One of the high demands processed product is extrudate snacks. The main objective of this study was to examine the physical and chemical properties of extrudates made from corn and cassava by modification of the mixture water content and the barrel temperature of extruder.

Corn grits and cassava flour with an initial moisture content of 12% were mixed with a ratio of 9:1, the water content of the mixture was varied to 14%, 16% and 18%. The mixture was then extruded with variations in barrel tip temperatures (T_4) of 120°C, 130°C and 140°C. Physical properties of extrudates were measured for the moisture content, expansion ratio, bulk density, particle density, color, WAI, WSI, and hardness. While the chemical properties of the extrudate tested were the content of protein, fat, crude fiber, and ash. The analysis was done for statistical analysis and determining the best treatment variation using TOPSIS.

The results showed that the variation of mixture water content greatly influenced the physical properties of the extrudate. The variation of the barrel temperature treatment on some samples did not show a significant difference. The water content of ready-to-eat extrudates ranges from 0.8-4.5% wb, expansion ratio 2.5-3.3 times, bulk density 0.08-0.18 g/cm³, particle density 0.12-0.33 g/cm³, L* is 81-92, a* is -16.7 to -9.9, b* is 36-50, C* is 39-51, h* is 101-113, WAI is 6.2-7.1, WSI is 0.02-0.05, and hardness is around 0.22-0.49 N/mm². The chemical properties of ready-to-eat extrudate (sample 14% 120C) were ash content of 0.85% wb, total protein was 7.54% wb, fat was 0.18 wb, and crude fiber was 0.39 wb. To conclude, the best treatment variations were the lowest mixture water content (14%) and the highest barrel temperature (140°C).

Keywords: diversification, extrusion technology, ready-to-eat snack, physicochemical, significance, expansion ratio, composition ratio.