

RINGKASAN

Sarapan pagi seringkali diabaikan karena keterbatasan waktu, sehingga diperlukan produk praktis dan bergizi seperti flakes. Sorgum berpotensi dimanfaatkan sebagai bahan baku *flakes*, namun memiliki keterbatasan dalam pemanfaatannya yang menyebabkan karakteristik fisikokimia dan sensoris pada tepung maupun produk olahannya, sehingga diperlukan modifikasi pati. Penambahan tepung kelapa sebagai sumber serat dalam formulasi *flakes* dinilai mampu meningkatkan kerenyahan, memperbaiki mutu sensoris, serta meningkatkan nilai gizi *flakes*. Proporsi tepung sorgum termodifikasi dan tepung kelapa yang tepat berkontribusi terhadap karakteristik *flakes* dengan tingkat kekerasan rendah, daya rehidrasi seimbang serta ketahanan renyah yang optimal. Penelitian ini bertujuan untuk 1) mengetahui formula optimum dari proporsi tepung sorgum termodifikasi dan tepung kelapa pada pembuatan *flakes* 2) mengetahui karakteristik kimia dan sensoris *flakes* yang dihasilkan dari formula optimum.

Penelitian dilaksanakan di Laboratorium Teknologi Pertanian, Fakultas Pertanian, serta Laboratorium Teknologi Hasil Ternak, Fakultas Peternakan Universitas Jenderal Soedirman, Purwokerto. Penelitian dilaksanakan dari bulan Oktober 2024 hingga bulan Juli 2025. Metode yang digunakan dalam penelitian ini adalah Mixture D-Optimal untuk menentukan formula optimal *flakes* tepung sorgum termodifikasi dengan penambahan tepung kelapa dengan respon *hardness*, daya rehidrasi, dan ketahanan renyah dalam susu. Formula optimal yang diperoleh kemudian dilakukan verifikasi dan validasi, serta karakterisasi sifat kimia (kadar air, kadar abu, kadar lemak, kadar protein total, kadar karbohidrat *by difference*, kadar serat pangan, dan total energi) dan sensoris (warna, tekstur, rasa khas sorgum, aroma kelapa, *mouthfeel*, dan penerimaan keseluruhan).

Hasil penelitian menunjukkan bahwa formula optimum diperoleh pada proporsi 50% tepung sorgum termodifikasi dan 5% tepung kelapa dengan nilai *desirability* 0,929 menghasilkan *flakes* dengan *hardness* sebesar 705,67 gf, daya rehidrasi sebesar 40,08%, dan ketahanan renyah dalam susu selama 7,10 menit. Formula optimum memiliki karakteristik kimia kadar air 5,11%, kadar abu 2,10%, kadar lemak 6,40%, kadar protein total 3,36%, kadar karbohidrat *by difference* 86,25%, kadar serat pangan 9,28%, dan total energi 3,30 kkal/g, dengan kadar lemak signifikan lebih tinggi dibanding *flakes* komersial. Secara sensoris, *flakes* formula optimum berwarna kuning kecoklatan (4,00), tekstur renyah (5,65), rasa tidak khas sorgum (3,95), aroma tidak khas kelapa (3,90), *mouthfeel* berpasir (3,65), serta tingkat kesukaan keseluruhan lebih tinggi dibandingkan *flakes* komersial, dengan kategori suka (6,13).

SUMMARY

Breakfast is often neglected due to time constraints, so practical and nutritious products such as flakes are needed. Sorghum has the potential to be used as a raw material for flakes, but it has limitations in its use that affect the physicochemical and sensory characteristics of the flour and its processed products, so starch modification is needed. The addition of coconut flour as a source of fiber in the flake formulation is considered to be able to increase crispness, improve sensory quality, and increase the nutritional value of flakes. The right proportion of modified sorghum flour and coconut flour contributes to the characteristics of flakes with low hardness, balanced rehydration, and optimal crispness. This study aims to 1) determine the optimal formula for the proportion of modified sorghum flour and coconut flour in flake production 2) determine the chemical and sensory characteristics of flakes produced from the optimal formula.

The research was conducted at the Agricultural Technology Laboratory, Faculty of Agriculture, and the Animal Product Technology Laboratory, Faculty of Animal Husbandry, Jenderal Soedirman University, Purwokerto. The research was conducted from October 2024 to July 2025. The method used in this study was Mixture D-Optimal to determine the optimal formula for modified sorghum flour flakes with the addition of coconut flour in terms of hardness, rehydration capacity, and crispness retention in milk. The optimal formula obtained was then verified and validated, and characterized for its chemical properties (moisture content, ash content, fat content, total protein content, carbohydrate content by difference, dietary fiber content, and total energy) and sensory properties (color, texture, characteristic sorghum flavor, coconut aroma, mouthfeel, and overall acceptance).

The results of the study show that the optimum formula was obtained at a proportion of 50% modified sorghum flour and 5% coconut flour with a desirability value of 0.929, producing flakes with a hardness of 705.67 gf, a rehydration capacity of 40.08%, and crispness retention in milk for 7.10 minutes. The optimum formula has chemical characteristics of 5.11% moisture content, 2.10% ash content, 6.40% fat content, 3.36% total protein content, 86.25% carbohydrate content by difference, 9.28% dietary fiber content, and 3.30 kcal/g total energy, with a significantly higher fat content than commercial flakes. Sensory evaluation revealed that the optimum formula flakes were light brown in color (4.00), crispy in texture (5.65), had no distinctive sorghum flavor (3.95), no distinctive coconut aroma (3.90), a sandy mouthfeel (3.65), and a higher overall liking score compared to commercial flakes, with a liking category of 6.13.