

PERPINDAHAN PANAS DAN SIFAT FISIK NASI SORGUM (*Sorghum bicolor* L. Moench) INSTAN DENGAN VARIASI SUHU PENGERING

INTISARI

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Biji sorgum dapat didiversifikasi menjadi nasi sorgum instan yang dapat dikonsumsi melalui penyeduhan dengan air panas. Penelitian ini bertujuan untuk menentukan koefisien perpindahan panas konveksi pada proses pengeringan nasi sorgum instan dan menentukan karakteristik sifat fisik nasi sorgum instan selama proses pengeringan nasi sorgum instan dan hasil dari pengeringan nasi sorgum instan dalam beberapa variasi suhu pengeringan. Alat yang digunakan adalah *cabinet dryer*. Penelitian ini dilakukan dengan variasi suhu pengering 40°C selama 12 jam, 50°C selama 8 jam, 60°C selama 6 jam dan penjemuran selama 11,5 jam. Pengujian sifat fisik meliputi densitas partikel, *bulk density*, daya serap air, tekstur, rendemen dan warna.

Berdasarkan hasil penelitian pada suhu pengering 40°C, 50°C, 60°C dan penjemuran didapatkan: nilai koefisien perpindahan panas konveksi sebesar 4,87 W/m².°C; 9,55 W/m².°C; 12,17 W/m².°C dan 1,24 W/m².°C; kelajuan perubahan warna sebesar 1,62°/jam, 1,86°/jam, 3,02°/jam dan 1,18°/jam; densitas nasi sorgum instan sebesar 0,91 g/cm³; 0,86 g/cm³; 0,77 g/cm³ dan 1,12 g/cm³; nilai *compressibility* sebesar 6,41%; 4,92%; 3,27% dan 4,96%; rasio hausner sebesar 1,07; 1,05; 1,03 dan 1,05; daya serap air sebesar 115,57%; 132,69%; 142,87% dan 107,03%; nilai *hardness* sebesar 713,33 gram, 176,67 gram, 371,33 gram dan 4260,00 gram; jumlah rendemen sebesar 76,48%, 79,80%, 81,27% dan 71,25% serta *hue angle* antara 20° sampai 30° dimana pada diagram *hue angle* menunjukkan warna merah-oranye.

Kata kunci: koefisien perpindahan panas konveksi, nasi instan sorgum, sifat fisik, sorgum

HEAT TRANSFER AND PHYSICAL PROPERTIES OF THE INSTANT SORGHUM RICE (*Sorghum bicolor* L. Moench) BY MANY VARIATIONS OF TEMPERATURE DRYING

ABSTRACT

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Sorghum seed can be diversified into instant sorghum rice that can be consumed through flushing by hot water. This research aimed to determine the convection heat transfer coefficient from the instant sorghum rice drying process and the characteristics of the physical properties of the instant sorghum rice during the instant sorghum rice drying process and the result of the sorghum rice drying process in many variations of temperature drying. This research conducted using cabinet dryer in variation of temperature drying at 40°C in 12 hours, 50°C in 8 hours, 60°C in 6 hours and sun drying in 11,5 hours. The physical properties test include particle density, bulk density, water absorption, texture, yield and color.

From the analysis in variations of temperature drying at 40°C, 50°C, 60°C and sun drying we got: the convection heat transfer coefficient value were 12,17 W/m².°C; 9,55 W/m².°C; 4,87 W/m².°C and 1,24 W/m².°C; the rate of change the color were 1,62°/hour, 1,86°/hour, 3,02°/hour and 1,18°/hour; the instant sorghum rice density were 0,91 g/cm³; 0,86 g/cm³; 0,77 g/cm³ and 1,12 g/cm³; the compressibility value were 6,41%; 4,92%; 3,27% and 4,96%; the hausner ratio were 1,07; 1,05; 1,03 and 1,05; the water absorption were 115,57%; 132,69%; 142,87% and 107,03%; the hardness value were 713,33 grams, 176,67 grams, 371,33 grams and 4260,00 grams; the yield value were 81,27%, 79,80%, 71,25% and 76,48% and hue angle value between 20° to 30° which is at hue angle chart indicated in red-orange color.

Keywords: convection heat transfer coefficient, instan sorghum rice, physical properties, sorghum