

NOTE ON VARIATIONS IN RESIDUAL BRAN IN INDIVIDUAL RICE GRAINS FROM BATCHES POLISHED TO DIFFERENT DEGREES¹

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The removal of bran from rice in milling is a chance process, and variations in the residual bran from grain to grain are, therefore, to be expected. Examination of individual grains in the white varieties of rice grains after staining the bran with methylene blue (1) or in varieties with a colored pericarp brings out these differences sharply. A quantitative evaluation of this variation is described here.

A variety of rice with a red pericarp (Kar-S.1043) was chosen for study since the bran color could be extracted easily and measured in individual grains. Samples (2-9 in Fig. 1) polished to different degrees

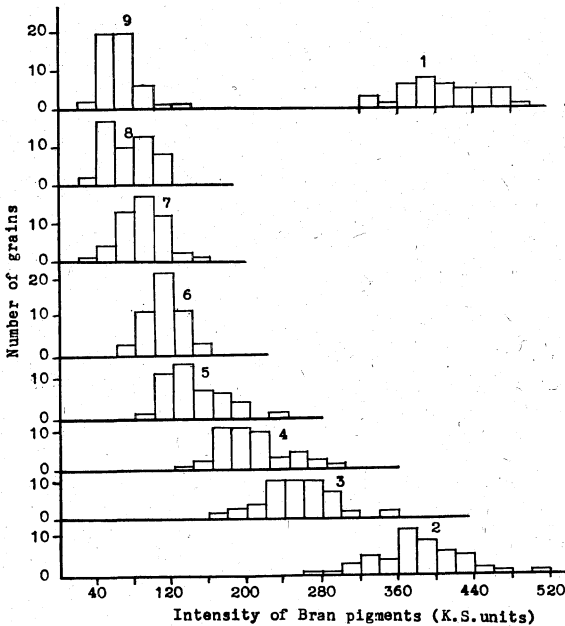


Fig. 1. Histograms for intensity of residual bran pigment in individual grains from batches polished to different degrees. 1, Hand-dehusked rice; 2, rice dehusked in mechanical sheller; 3-9, samples milled to different degrees in a polishing cone. (Analytical data for samples 2-9 are given in text. Data for sample 1 could not be obtained because the sample was lost.)

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in a commercial polishing cone contained, respectively, in increasing order of polishing 2.59, 2.19, 2.01, 1.44, 1.08, 0.95, 0.89, and 0.86 mg. per g. of phosphorus and 3.06, 2.04, 1.97, 1.19, 0.96, 0.89, 0.71, and 0.58 γ per g. of thiamine. A small sample was dehusked by hand for comparison.

Fifty grains were selected at random from each lot of polished rice and the color of the bran was extracted from each grain by boiling it for 20 minutes with 3 ml. of 2% sodium bicarbonate solution. It was made up again to 3 ml., filtered, and color measured in a photoelectric colorimeter using micro attachment with No. 42 filter. To allow for differences in weight of individual grains, the color intensities were recalculated to a standard weight of 25 mg. The data are presented as frequency diagrams for the distribution of bran color intensity of rice grains at various stages of polishing (Fig. 1).

At each stage of polishing, there was variation in the color intensity of bran from the grains, which indicated the disparity in the degree of bran removal suffered by individual grains. It is interesting to note that even in unpolished rice (samples 1 and 2) there was large variation in the bran color intensity among the grains. This can be ascribed to the inherent variation in pigment deposition in grains. The variances at different stages of polishing were subjected to Bartlett's test and were found to be significantly different ($P < 0.001$), indicating that there was a real variation in color intensity caused by differences in milling apart from those due to natural causes. The rate of bran removal was faster in the early stages of polishing than in the final stages.

Literature Cited

1. DESIKACHAR, H. S. R. Determination of the degree of polishing in rice. I. Some methods for comparison of the degree of milling. *Cereal Chem.* 32: 71-77 (1955).