

# Note on the Evaluation of Hard White Winter Wheat Bran

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Cereal Chem. 56(2):118-119

For use in human food, bran from white wheat is preferred because it is lighter in color and possibly milder in taste than bran from other classes of wheat. The recent development of hard white winter wheat breeding lines by Kansas State University (anonymous 1977, Heyne 1977) has raised a question regarding the use of those brans for human food. This note compares the chemical composition, color, and flavor of the most agronomically promising hard white winter wheat with similar data for a hard red winter wheat, a hard red spring wheat, and a white club wheat.

## MATERIAL AND METHODS

The hard white winter wheat was a selection from CIMMYT spring wheat crossed to Scout winter wheat (KS75216) from the 1977 crop. The hard red winter wheat, hard red spring wheat, and white wheat varieties were Newton, Waldron, and Moro, respectively, all from the 1977 crop but not comparably grown. Newton and KS75216 wheats are selections from the same cross.

The wheat was milled on an experimental Allis mill with a four-break system. The bran represents the overs of a 24-wire screen. Moisture, ash, protein, and crude fiber were analyzed by AACC methods. Neutral detergent fiber was analyzed by the method of Van Soest and Wine (1967).

Color of the bran was measured on a Hunterlab Model D-25 color difference meter with a yellow Hunterlab standard 025-931 as a reference color and on an Agtron Model M-500-A Reflectance Spectrophotometer with a yellow filter. Differentiation among samples was greatest when these instruments were used with the yellow reference color and a yellow filter, respectively. The total color difference recorded for the Hunterlab color difference meter was  $\sqrt{(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2}$  where  $\Delta$  is the difference and L, a, and b are components of color. The Agtron meter was calibrated with No. 12 and 63 standard discs to read 0 and 100% reflectance, respectively, for the yellow spectral line. Relative reflectances of bran samples were read directly.

For evaluation of the taste of bran by a triangle discrimination test, one tablespoon of bran was moistened with one tablespoon of water and served to each tester. Each sample was identified with a three-digit code, and red lights were used to mask differences in

TABLE I  
Chemical Composition<sup>a</sup> of Bran Samples

Bran <sup>b</sup> Source	Test Weight of the Wheat				Crude Fiber (%)	Neutral Detergent Fiber (%)
	(lbs/bu)	Moisture (%)	Ash (%)	Protein (%)		
Moro	62.1	8.9	3.1	14.3	10.4	49.4
KS75216	60.4	9.3	5.2	14.3	8.4	44.8
Newton	61.8	9.3	3.7	14.1	9.0	47.6
Waldron	61.1	8.3	5.6	18.3	10.7	53.5

<sup>a</sup> 14% moisture basis.

<sup>b</sup> Moro was obtained from Washington state, KS75216 and Newton from Kansas, and Waldron from North Dakota.

TABLE II  
Color of Bran Samples

Bran Source	Agtron Color Reading	Hunter Color-Difference Meter Reading
Moro	81.5	47.7
KS75216	70.5	49.9
Newton	53.5	52.9
Waldron	48.8	53.4

TABLE III  
Triangle Discrimination Tests for Bran Flavor

Bran Source	Judges Correctly Identifying the Odd Sample
KS75216 vs. Newton	7 of 19 (NS)
KS75216 vs. Moro	8 of 20 (NS)
Newton vs. Waldron	10 of 20 (Significant)

appearance and color. The order of testing was rotated to prevent position bias. Each tester was asked to indicate the odd sample; chance probability of the tester being correct is 33 1/3%.

## RESULTS AND DISCUSSION

Composition did not differ markedly among the bran samples (Table I). Color was lightest for Moro bran and darkest (visually judged red) for Waldron bran (Table II). The KS75216 bran was not as light in color as Moro but was much closer in color to Moro than to Newton bran.

Taste panel triangle discrimination tests (Table III) showed no significant difference in flavor between KS75216 and Newton brans or between KS75216 and Moro brans. Testers were 91% confident that Waldron and Newton brans differed in flavor, however. Testers were not able to describe the flavor difference between Newton and Waldron bran but comments suggested that the Newton bran may have a stronger flavor than Waldron bran. Significance is given according to Roessler, Warren and Guymon (1948).

## CONCLUSION

The stronger flavor of Newton bran compared with Waldron bran indicated that variety may be important in determining bran flavor. This limited test indicated that the bran from hard white winter wheat could be suitable as a human food; larger scale tests by food companies appear to be warranted when sufficient hard white winter wheat is available in 1980.

## ACKNOWLEDGMENTS

The author is grateful to L. C. Bolte for milling the samples and to G. E. Germann for arranging for the triangle discrimination tests.

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[Received August 4, 1978. Accepted November 30, 1978]