NOTE ON DRY MILLING OF FABABEANS[1]

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Recent studies at the University of Manitoba on the functional properties of fababean (*Vicia faba* L. var Minor) flour and its components (1,2) required the production of flour that was essentially free of the seed coat. Attempts to produce a satisfactory flour in substantial yields by first dehulling the bean by several different dehullers followed by reduction with a variety of mills including hammer, pin, and roller were not successful. After a number of preliminary trials, acceptable results were obtained by first breaking the bean into chunks about the size of wheat kernels and then milling the broken beans in the Buhler MLU 202 Experimental Mill using the standard flour milling flow. This note describes the process used.

The flow diagram of the milling process is shown in Fig. 1. For most efficient removal of the hull from the cotyledons, the bean was milled at fairly low moisture (*ca.* 9%). Tempering at higher moisture tended to increase the adhesion between the hull and the cotyledons. This higher moisture also interfered with efficient reduction and sifting.

The bean was reduced by passing through two sets of break rolls. The first break rolls of the Allis-Chalmers Experimental Mill were used for the prebreak steps. They were set at a spacing of 4 mm for the first pass and 2 mm for the second pass. There was essentially no flour produced in the two prebreaks although a substantial portion of the hull was released from the endosperm. The

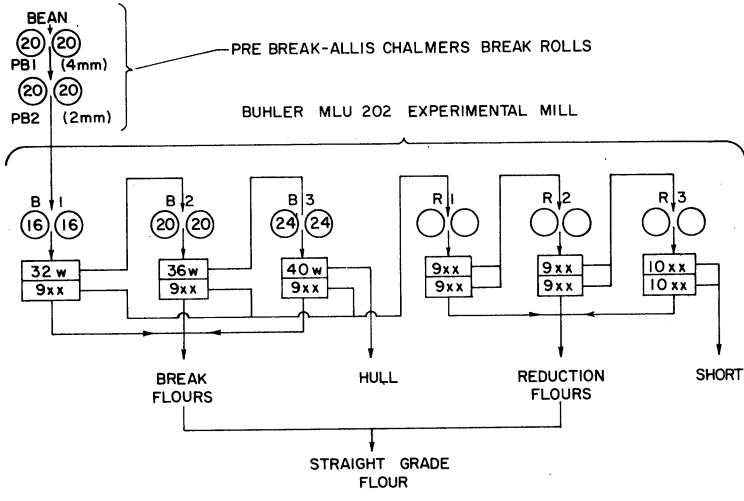

Fig. 1. Flow diagram for dry milling of fababeans.

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TABLE I
Material Balance and Analysis of Milling Products

Stream	Yield %	Protein (N × 6.25) % (d b)	Ash[a] % (d b)	Fiber[b] % (d b)
Beans	100	28.7	3.43	8.3
Break 1 flour	7.2±0.3	32.2	3.49	1.1
Break 2 flour	8.1±0.3	33.3	3.77	1.4
Break 3 flour	0.8±0.1	26.3	2.89	1.7
Reduction 1 flour	27.9±0.3	33.4	3.63	1.0
Reduction 2 flour	20.7±0.6	35.2	4.11	1.2
Reduction 3 flour	11.2±0.7	35.1	3.90	1.2
Straight grade flour	75.9±0.3	32.6	3.95	1.1
Hull	12.3±0.1	5.4	2.42	50.4
Shorts	11.8±0.9	19.2	3.21	28.5

[a]American Association of Cereal Chemists (7th ed. 1969) Method 08-12.
[b]Association of Official Agricultural Chemists. Official methods of analysis (9th ed. 1960). Secs. 22.038 – 22.040, p. 288.

stock from the second prebreak was fed directly into the Buhler Experimental Mill (pneumatic) and milled using roll settings and sieve dressings normally used for milling hard red spring wheat.

Material balance and analysis of the products obtained for one variety of fababeans (cv Ackerperle) are given in Table I. The data for yield are average values of three millings. The analytical data are for material from a single milling. On the basis of fiber content, the flour produced was essentially pure. The fiber content of manually dehulled fababean of the same variety was 1.1% (1). With fababean seed, ash content cannot be used as an indicator of the milling efficiency as in wheat because of the relatively high level of ash normally present in fababean cotyledons. The flour yield of 75.9% is considered acceptable for experimental purposes. An additional 5% of fine flour can be recovered from the shorts by sieving through a 10XX sieve.

Literature Cited

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