

COMMUNICATION TO THE EDITOR

Yield and Chemical Composition of Fractions from the Dry Milling of a High-Lysine Grain Sorghum

TO THE EDITOR:

Cereal Chem. 54(4): 855-856

We have applied the NRRC integrated milling process (1) to the dry milling of a sample of high-lysine grain sorghum. The sorghum sample is an open-pollinated opaque sorghum grain, P721, and was obtained from D. P. Mohan, Agronomy Department, Purdue University, West Lafayette, Ind. The P721 high-lysine sorghum is unique when compared to most other strains, in that it resulted from treatment with a chemical mutagen to produce a higher lysine content in the grain (2). As in many new seed introductions, there was considerable variability in grain size and shape of P721. The kernel endosperm was characteristically soft and floury compared to that of a regular sorghum hybrid. The protein content ($N \times 6.25$) of the high-lysine grain was three to four percentage points higher than that found in most hybrids, and the lysine content was also somewhat greater.

The milling of the grain involved the removal of hulls by abrasion, cracking the kernel by impact milling to release germ, sizing the ground kernel particles, and then separating the grits and germ by gravity separation. Results of the brief milling study are found in Table I.

Yield of grits from the high-lysine sorghum was 54.4%. From a normal sorghum hybrid, 70 to 74% of grits were recovered by the same milling process. The lower yield was partially caused by unevenness in kernel size and probably more by the floury character of the endosperm. Fat content of the two grit fractions was twice that of grits from a normal hybrid. This could be due to both the character of the endosperm and contamination of small germ particles. The

TABLE I
Yields and Chemical Composition of
Dry-Milled Fractions from a High-Lysine Sorghum

	Yield %	Fat ^a % MFB	Fiber ^a % MFB	Protein ^a % MFB	Lysine ^b g/16 g N
Whole grains	...	4.2	2.5	13.7	3.12
+14 Grits	23.1	1.5	1.2	12.7	1.85
+20 Grits	31.3	1.0	0.9	12.5	1.85
Flour	12.1	2.3	1.0	11.9	2.92
Germ	16.2	10.5	4.0	18.2	4.25
Feed	17.3	5.5	6.0	13.7	3.51

^aReference (3).

^bDetermined by Technicon TSM Amino Acid Analyzer.

variability of kernel size was reflected in the higher fiber content of grits from high-lysine sorghum; grits from normal sorghum will contain only about 0.2% fiber. Because of the many different sized kernels, dehulling of the grain was difficult and not uniform. A substantial amount of flour was obtained, reflecting the softer endosperm. As would be expected, the protein content of the grits and flour was decreased, as well as their lysine contents. Low fat content of germ was largely caused by contamination of soft endosperm particles. Lysine content was highest in the germ fraction, but the feed, which is composed mostly of hulls, some small germ particles, and an abraded dust, also contained considerable lysine.

We would expect that, as the agronomic development of high-lysine sorghums continues, their milling properties should become more like those of a normal sorghum hybrid.

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