

New Noodlemaking Wheat in the Works

American-grown hard white wheat may one day capture the hearts and palates of Asian consumers.

Scientists in the ARS Wheat, Sorghum, and Forage Research Unit at Lincoln, Nebraska, are working to develop varieties of hard white wheat that are ideal for making oriental noodles.

Agronomist C. James Peterson says commercial varieties of hard white wheat are now available, but they have qualities needed for making bread—not noodles.

“Our goal is to design hard white wheats for Asian noodle markets,” he says. “The first challenge has been to identify the traits desired most. We’ve rated improving noodle color as top priority, followed by improving textural properties.”

On that all-important issue of color, Craig F. Morris, a cereal chemist in the ARS Wheat Genetics Quality Research Unit at Pullman, Washington, notes, “Asians like a uniformly bright product in various shades of yellow ranging from faint to intense. Any sort of gray, brown, or dull-colored noodle is just rejected.

“We don’t know yet what gives the noodle its color or why some flours discolor,” says Morris. “We do know that when you take a nice, white flour and mix it in an alkaline environment, it turns yellow.”

Since Asians prefer noodles with a soft and chewy texture, the scientists are working to breed a white wheat that is low in amylose—a component of starch that affects texture, says Robert A. Graybosch, a plant geneticist. The three genes responsible for amylose production in wheat have been mapped by Japanese researchers. Identifying their DNA locations raises the possibility that they can be manipulated.

“We know that if you eliminate two out of three of these genes, you can lower amylose production by one-third,” Graybosch says.

Lowering amylose starch is more important than, say, concerns about the protein we know as gluten. Gluten is not a major factor to noodlemakers, who don’t need the same dough strength that breadmakers desire. “Starch quality is more important,” says Graybosch.

Hard white wheat varieties are also finding a place in the American market in low-cholesterol whole-wheat breads that hold greater appeal to consumers, especially children.

Bread made from hard white wheat is lighter colored and “sweeter.” That’s because white wheat’s outer kernel contains fewer of the tannins and phenolic compounds that give red wheat products a stronger flavor.

U.S. production of hard white wheat is currently very limited, and nearly all is used domestically in specialty-market breads. Peterson says that “by modifying and enhancing quality—along with improving disease and insect resistance, baking quality, and overall yield of hard white wheat varieties—we hope to increase U.S. hard white production, as well as open the large Asian market for our wheat growers.”—By **Dawn Lyons-Johnson, ARS.**

SCOTT BAUER (K5451-6)



White wheat.

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