

Batter Up!

Face it. Fried chicken is finger-lickin' good because of the oil and batter it's cooked in.

But that taste-tempting combination comes at a price: added fat in our diets. Not surprisingly, the pressure is on the fast food industry to curb its products' fat content.

One solution is now cooking in New Orleans, surprisingly, where the cuisine is as hot, rich, and lively as the city itself. There, scientists-turned-chefs have concocted a new rice flour batter that absorbs 60 percent less oil than standard commercial batters made from wheat.

A&B Ingredients, a Fairfield, New Jersey, company, is exploring the rice batter's commercial potential under a cooperative agreement with the developers—Frederick F. Shih and Kim W. Daigle. They're both chemists at ARS' Southern Regional Research Center in New Orleans.

"Our product uses flour from regular long-grain rice as the main ingredient," says Shih, who is in the center's Food Processing and Sensory Quality Research Unit. "But we're also looking at other types of rice," like short- and medium-grain varieties.

Currently, wheat flour holds sway as the chief ingredient in commercial batter products. Plunged into the deep fat fryer, wheat gives fried chicken, fish, and other foods a crispy, golden coat and mouth-watering flavor.

But it can also make food greasy, thanks in great part to the gluten it contains. This key wheat protein component not only keeps batter fluffy and firmly attached to food, it

also binds tightly with oil molecules, boosting the food's fat content, explains Shih.

For example, 3 ounces of batter-fried chicken breast (meat only) contains 160 calories and 4 grams of fat, according to ARS' Nutrient Data Laboratory in Riverdale, Maryland. With skin and breading included, that number jumps to 220 calories and 11 grams of fat.

But Shih and Daigle's studies found that the proteins and starch in rice flour are chemically different from those in wheat, retaining a weaker grip on oil. Another plus: "It's less allergenic than other grain flours," says Shih.

In experiments, they fried up various rice batter formulations coated onto skinless chicken breast nuggets. They then gently peeled off the coating and subjected it to a solvent extraction procedure

that whisks away the oil for weighing and analysis.

"One thing you have to look for in a batter is whether it forms a slurry well," says Shih. "It also has to be adhesive enough to stick to the chicken, but it can't be overly thick."

Though the normal rice batter cooked well and absorbed substantially less oil than wheat-based batters, it initially didn't puff up as well. Nor did it always stay coated on the meat.

Shih and Daigle overcame the problems by modifying the rice flour with enzymatic and other treatments. This produced a better batter with cooking properties similar to wheat's.

The scientists have since applied for patent protection and are helping A&B Ingredients further evaluate the rice batter's oil-uptake properties.

"If we can show definitively that there's a decrease in the fat content," says Robert Bost, company president, "we'll take that information to key fast-food interests."

Bost envisions a broad market for meats like chicken, fish, and shrimp, as well as vegetables like fried okra and onion rings.

But ultimately, the true measure of the batter's success lies in the taste buds of consumers. — By **Jan Suszkiw**, ARS.

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Biochemist Kim Daigle and chemist Fred Shih demonstrate fried chicken coating made from low-fat-uptake rice flour batter.