

Edible cotton: How genetically modified cottonseed could revolutionize food and feed production



ere's a somewhat boring fact you might already know about cotton: It doesn't make a good food, for humans or animals. Glands throughout the plant produce a toxic pigment called gossypol that limits its use as feed stock.

For humans, we only use cottonseed oil, the processing of which negates the toxin. As a feedstock, cottonseed meal and crop residue is useful, but you have to be careful about rations to avoid toxicity. It's safe for cattle, but not for hogs or poultry. You can let cattle graze a cotton field after harvest, but you don't want to let your bull join in for a reason we're about to get to. [General signs of acute toxicity](#) are similar among animal species and include respiratory distress, impaired body weight gain, anorexia, weakness, apathy

ground into flour or blended to make glandless cottonseed butter similar to peanut butter, the company said.

Texas A&M University has published a 48-page 'Cottonseed Cookery' cook book. Recipes include everything from cotton-fried chicken and cottonseed-stuffed fish to burritos, soups, salads, breads and pralines.

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Edible cottonseed research at Texas A&M

Unfortunately, the early version of glossypol-free cotton did not catch on. Though that shouldn't have come as a surprise. Cotton produces glossypol for a reason. It doesn't just induce sterility in bulls and men. It produces sterility in insects that nibble on cotton. This isn't quite the pest control strategy of producing a neurotoxin like caffeine in coffee or cacao (which also produces theobromine, the reason you don't feed chocolate to dogs) or nicotine in tobacco, which kills those nibbling insects. But creating sterility in your predatory rivals is

commercialization of production. For the seeds to be sold as food or feedstock still requires approval from the FDA.

As to the [potential for the project](#), “It’ll taste like hummus,” Rathore said. “It’s not at all unpleasant.”

It will be several years before farmers can grow it commercially, as seed supplies have to be ramped up starting next season, said Kater Hake, a vice president at Cotton Inc., which does research and marketing for growers and funded the project.

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Dr. Keerti Rathore, Texas AgriLife
Research scientist, examines cotton
growing in a field near College Station.
Rathore is breeding cotton plants that have
almost no gossypol in the seed which
would make them edible for humans and
mono-gastric animals. (Texas AgriLife
Research photo by Kathleen Phillips)

There’s a lot of protein in cottonseeds—enough to meet

experimented by making cottonseed milk, crackers, cookies, nut butters and chopped-nut substitutes, Hake said. The protein could also be extracted and made into a powder that can go into energy bars or flours, Rathore said.

The industry is also targeting aquaculture, according to Hake, because cottonseeds can be fed to carnivorous fish like salmon and trout that eat ground-up fish. Cotton would be a low-cost alternative that can replace up to half of all fishmeal. It'll also help farmers, who will be able to sell the seeds, currently considered a near useless byproduct.

Rathore points out "The world produces 44 million metric tons of cottonseed each year. Cottonseed typically contains about 22 percent protein, and it's a very high-quality protein."

In all, about 10 million metric tons of protein are contained in that amount of seed.

[It's no coincidence](#) that it was an Indian born researcher who made his way to Texas A&M to pick up the mantle of the breeding work that began there in

fixation for any crop seem to verge on science fiction for their ambition, it remains the case that those dreams merely involve moving what nature already does into a wider range of crops.

Climate change and a growing, increasingly well-fed population pose novel challenges every day. It's a bit of a paradox that meeting those challenges so often involves solving problems that have been with us for a long, long time.

Marc Brazeau is the GLP's senior contributing writer focusing on agricultural biotechnology. He also is the editor of Food and Farm Discussion Lab. Follow him on Twitter [@eatcookwrite](https://twitter.com/eatcookwrite)