

## Don't try to wear it — cotton's now edible

By GLENN WHITLEY  
Battalion Staff

What looks like sunflower seeds, tastes like peanuts, and grows from cottonseed?

TAMUnuts, brought to you by your local Oilseed Products Research Center at Texas A&M University.

Tamunuts are defatted glandless cottonseed that have been roasted, toasted or fried. They can be eaten as snacks or used in candies, cookies and other bakery items. There is even tamunutbutter.

Tamunuts are not the only foods produced from cottonseed. A recipe book printed by the oilseed lab at Texas A&M using the products they helped develop, gives ways to use cottonseed cooking oil, flour, textured meat extender, whipped topping and a high protein beverage. The book lists such favorites as chocolate chip cookies, meat loaf, pudding, Waikiki appetizers and Italian meatballs.

In all these recipes, flour or textured meat extender either takes the place of or supplements the main ingredient.

Cottonseed has long been studied as a possible source for low-cost, high-protein foods. Cottonseed flour has more than five times the protein value in wheat flour.

The presence of pigment glands in ordinary glandless cottonseed has been a deterrent to its use in human foods in the past. These tiny glands

store gossypol, which if not removed is poisonous to humans.

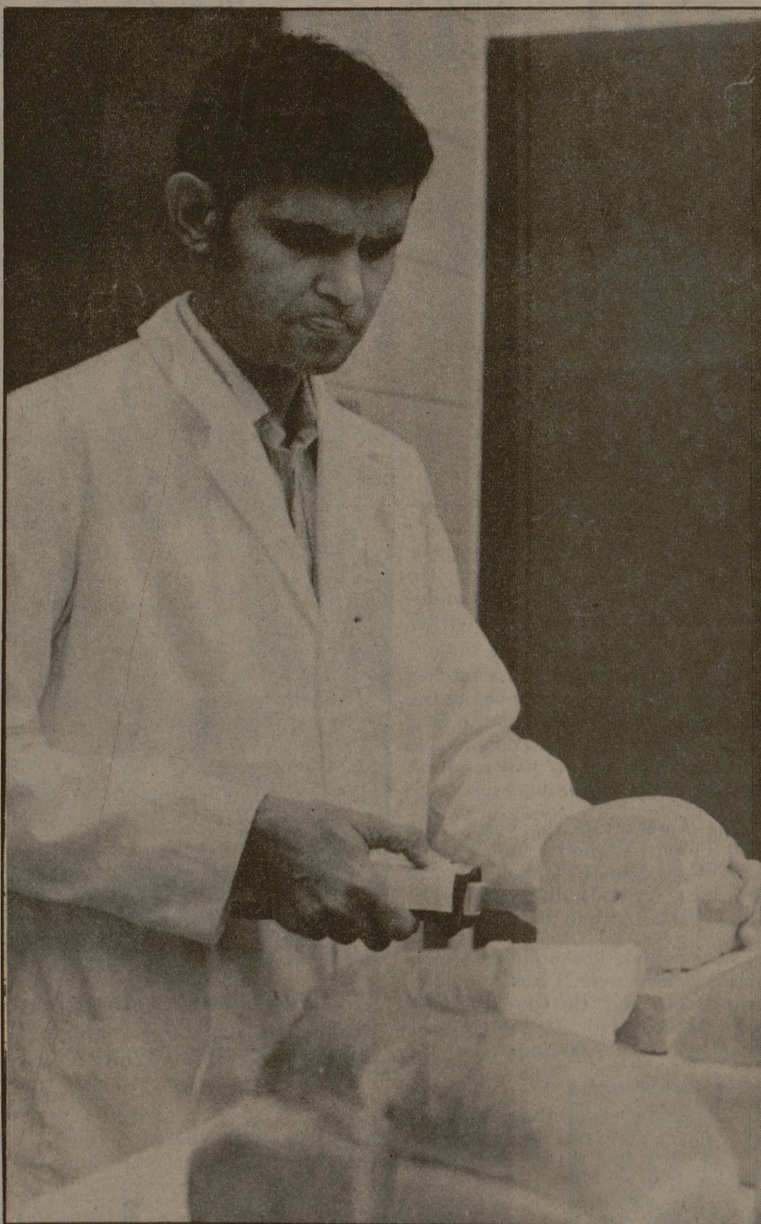
Glandless cottonseed, (without gossypol) was developed by crossing different strains of cotton plants. Consequently, cottonseed can now be seriously considered as a major food possibility.

There are a few problems, however, with using cottonseed products. Cottonseed flour properties are very different from those of wheat flour, which allows it to expand as in the case of bread. Therefore, the flour cannot be used as a 100 percent replacement in breads without a significant loss in volume.

But cottonseed flour is 60-70 percent protein, while wheat flour is only 10-15 percent protein. By replacing 25 percent of the wheat flour in a chocolate chip cookie, the protein content of the cookie is doubled.

In addition to better nutrition through the addition of protein, cottonseed flour offers many positive factors such as longer shelf life and less fat absorption in products such as doughnuts.

Cottonseed flour can also be textured to make a product that can be blended with ground beef to extend a meat product. It will not alter the total protein content, yet it costs only about one-fourth as much and will reduce the fat loss in a recipe by 10 percent.



Dr. Mir Khan, A&M researcher, slices a piece of bread made with beef blood plasma. Breads are just one of the foods that can be enriched with protein from the plasma.

## Beef blood plasma useful protein additive in baking

by JOHNNIE HENDON

Discarded in the past, beef blood can now be turned into a useful by-product of cattle slaughtering.

Three Texas A&M researchers are collaborating to use plasma protein isolate in food products such as bread and cake. Dr. Mir Khan, has been working since 1975 on the project along with Dr. Lloyd Rooney of the Cereal Quality Lab. Dr. C. W. Dill provides the necessary plasma protein from the animal science department.

"We don't like to use the term 'blood protein' because of aesthetics," Kahn said. "When people hear the word blood, they think red. Plasma protein isolate is a white powder which doesn't add any coloring to foods."

It does however, add valuable nutrients to the foods to which it is added, Khan said.

He said it is 99 percent protein and contains all the essential amino acids needed by humans.

Khan first used the plasma protein isolate as a substitute for the usual wheat flour in bread. He substituted as much as 10 percent and got good loaves of bread, with no

problems in the baking process. He added that with more than four percent substitution, there were problems with taste.

Khan is now substituting plasma protein isolate for egg whites in angel food cake because it has the same foaming properties.

"We can substitute as much as 30 percent in the cakes with no flavor problems," Khan said, probably because of the other strong flavorings added to the cakes.

The cost of dry solid egg whites is \$2.80 per pound, while the plasma is about \$1.50 per pound. Khan hopes the lower cost and high protein will help the market potential of the plasma.

He noted that companies such as

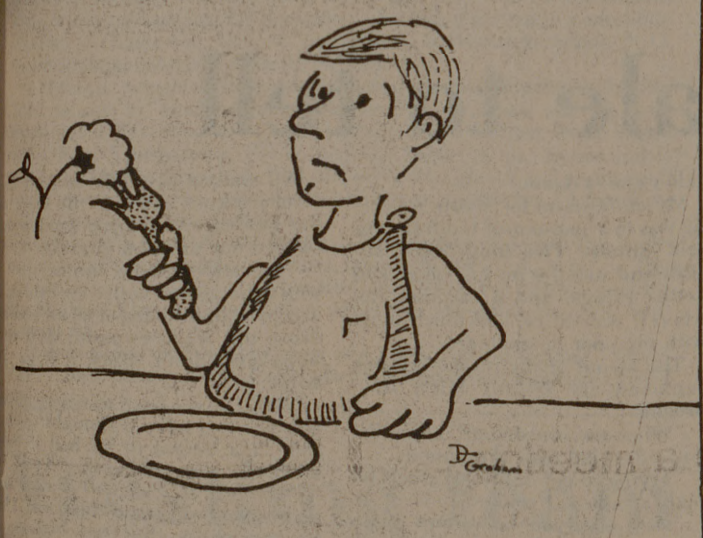
General Foods and General Mills had shown interest when he presented a paper on the qualities of plasma protein isolate last year, but none are using it in the United States yet.

The blood is collected from local slaughter houses, and only beef blood is used.

"We have to collect the blood under completely hygienic conditions, and keep it cool until it is processed," emphasized Khan.

The flavor is still the main concern, since when used at high substitution rates some of the aroma and flavor of blood is noticeable.

"We can make a certain product however, that has no flavor problems at all," Khan said.



Battalion photos by Susan Webb

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