

Ammonia knocks aflatoxin from corn

COLUMBIA, Mo. — Scientists have found that ammonia not only knocks the toxin from moldy, cancer-causing corn (thus making it perfectly safe for animal feed), but the treated corn makes better feed than it ever has before.

"We found that ammonia is an effective detoxifying agent for aflatoxin-contaminated corn, a moldy corn that can be carcinogenic," reported Merle E. Muhrer, University of Missouri biochemist.

The USDA regional laboratory at Peoria, Ill., recently ammoniated aflatoxin-contaminated corn. Then Muhrer

and colleague Gary L. Johanning tested the corn's nutritional value at UMC by feeding it to rumen microorganisms and guinea pigs. Scientists at Clemson University in South Carolina are now going to test the ammoniated corn on cows.

"We had outstanding success in our feeding experiments and are enthusiastic about this corn treatment," said Muhrer. "The ammoniation will make valuable use of feed now considered a total loss by farmers."

Muhrer and Johanning first got the idea for the ammonia treatment when they found that dialdehyde starch (DAS) was an "ammonia super slurper." As such, the DAS would allow farmers to feed the cows more urea, a relatively inexpensive non-protein nitrogen source.

"Man can't use these non-protein nitrogen foods for his own nutrition," said Muhrer, "but man can use some of the more expensive protein sources like soybean meal which is often fed to livestock. It's better to feed non-protein products like urea to animals and save the good quality protein for man."

Until the UMC scientists made their discovery about DAS, urea could be toxic to animals, because of the high level of ammonia it released inside the animal. DAS reacts with ammonia, literally slurping it up to detoxify it.

"Aflatoxin's structure is similar to DAS," said Muhrer. "So by adding ammonia to the corn, the ammonia would react with the active parts of the aflatoxin and detoxify it."

Muhrer said scientists in the USDA's Science and Education Administration's regional laboratory in Peoria proved that the theory would work. Agricultural engineers E.B. Bagley and O.L. Brekke designed a system to trickle ammonia into a bin where corn is stored.

"We knew that the treated corn was no longer toxic, but we didn't know if it was any good as feed," said Muhrer.

"However, research with microorganisms showed that the ammonia would improve good corn by increasing the nitrogen and crude protein within it.

"As a result, farmers wouldn't have to add as much expensive, good quality protein to animal rations and thus save more protein for human nutrition.

"Also, the ammoniated corn is even better than untreated corn for cattle and sheep because it is more digestible."

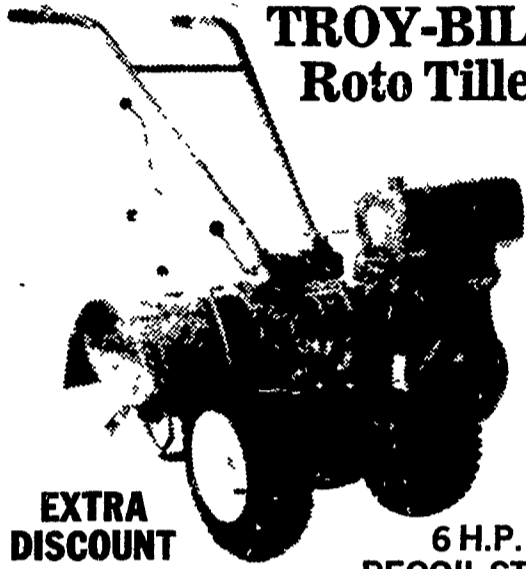
Muhrer said tests on treated corn will be conducted, but he believes the ammonia treatment will be an inexpensive way to boost energy in dairy, beef and sheep rations.



Ammonia not only knocks aflatoxin from corn, it increases the crop's feed value, researchers claim.

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