

Ammonia can help improve livestock forage

NEWARK, Del. — European dairy farmers have found a way to improve the palatability, digestibility and feed value of mediocre hay, straw, cornstalks and other forages by treating them with liquid or gaseous ammonia. Delaware dairy farmers observed the practice in Scandinavia last summer during a tour of Norway and Denmark. University of Delaware extension dairy specialist George Haenlein, who organized the trip, says the practice can also be profitable for U.S. dairy, beef or sheep farmers.

In contrast to older forage treatment methods which used corrosive sodium hydroxide or acids, Haenlein says the new ammonia procedure is cheaper, simpler and safer. Besides predigesting the fiber, it also improves feed value by increasing available energy and protein. The practice is very timely for U.S. producers, the specialist says, because of feed shortages stemming from last year's drought and winter kill of annual forages.

The practice is a good way to stretch available poor quality forage supplies and improve herd performance — especially of heifers and dry cows.

Hikes digestibility

Typical U.S. research results have shown increases of 100 to 150

pounds per ton in dry matter digestibility and protein concentration after treatment with 60 to 80 pounds of ammonia per ton of forage dry matter. Results varied with type of forage but generally were equal to medium quality hay.

The following procedures were developed by agronomy and dairy researchers K. Moore and E. Jaster at the University of Illinois Agricultural Experiment Station. Haenlein recommends that Delmarva beef and dairy farmers use this system if they want to try treating their forage. The only supplies needed are a sheet of 6- to 8-mil plastic large enough to cover the stack, or plastic bags to hold large round bales, plus reservoirs for the ammonia, a hose and regulator.

The size of the stack to be treated depends on the farmer's feed requirements, but for practical reasons, is limited to the amount of forage that can be covered by a 40 x 100-foot sheet of plastic. This equals about 1,500 small square bales, or 70 large round bales. The bales can be stacked directly on the ground, but it's better to place them on a concrete slab or sheet of plastic. Choose a site that drains away from the stack.

Treatment procedure

"As you stack the bales," says Haenlein, "place the reservoirs

within the pile at equal distances from each other and from either end. The size and number of reservoirs required will depend on the amount of residue to be treated. About 20 percent of the liquid ammonia injected will vaporize immediately. The rest will remain in the containers as a liquid, vaporizing over time."

Ammonia weighs 5.14 pounds per gallon, so about 9.5 gallons of reservoir capacity is needed for every ton treated at the recommended rate of 60 pounds per ton. For bigger stacks, two large watering tanks will work. Since ammonia will corrode galvanized tanks, use older ones and line them with plastic. For smaller stacks, 55-gallon barrels open at one end will do the job. Run a hose from each tank to an area outside the stack where it will be connected to a regulator. It's a good idea to anchor the reservoir end of the hose with a brick since the ammonia will be discharged under pressure.

After stacking the bales, cover them with plastic. "This is easier to do on calm days with the help of a few extra hands," the specialist says. "Leave enough plastic around the edges so that you can anchor it with crushed limestone, soil, or loose bales. If you stack on top of another sheet of plastic, roll the edges together before sealing. The seal must be tight enough to prevent ammonia loss. On large stacks, weight the top with a few loose bales or old tires to keep the wind from whipping the plastic."

Follow safety tips

Next, punch a hole in the plastic for each hose and pull it through. Tie the plastic securely around the hose with a piece of twine. Connect the hose to the regulator and set the gauge for a flow rate of 600 pounds per hour. At this rate,

applying 60 pounds of ammonia will take 6 minutes per ton of hay. The plastic will billow with pressure created by the vaporizing ammonia. Watch for leaks and patch them with duct tape as they occur.

After treatment, the forage must remain covered for a period of time to obtain the full benefit of the ammonia. At ambient temperatures above 60 degrees F this will take three to four weeks; at lower temperatures, four to eight weeks. "Leave the stack covered until it's needed," Haenlein ad-

vises. "But be sure to uncover and aerate it for at least 24 hours before feeding."

Remember that anhydrous ammonia is hazardous to work with. Make sure all hose connections are tight. Wear goggles and gloves while handling the material, and keep plenty of water close by just in case.

Haenlein says plans are being made to demonstrate this practice during the 1984 Delaware-Maryland Forage Council Field Day at Hickory Hill Farm near Dover this summer.

Weir is honored



Joel Weir, of Carnation Genetics, right receives Distinguished Alumni Award from Raymond K. Pruss, Alumni President of Delta Theta Sigma ag fraternity at Penn State.

Weir, from East Petersburg, Lancaster County, was honored at a recent banquet in State College for his continuing support of Pennsylvania agriculture and his work as National Secretary of Delta Theta Sigma.

Weir is a representative of Carnation Genetics.

Treanor receives award

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