The Grazier

Beef Tallow Protects Hay

When Dale Watson of Spickard, MO., cut open the big round bale of hay that had lain out in the rain since summer, he knew he was onto something big. The alfalfa was bright green right to the top of the outer rim. There was no rain damage.

The hay was protected by a thin layer of tallow that formed a tight seal against the weather. Watson, following a brainstorm that he had last summer, coated hay bales with melted beef fat. He's looking for a way to retain the nutritive value of the hay, without having to wrap the bales in plastic or move them into a barn.

Watson had treated the big bales as part of a prelimmary study at the University-of Missouri's North Missouri Research Center. Watson, area Extension livestock specialist with the commercial agriculture program in Carrollton, MO., has been conducting big bale studies at the research center for several years.

Watson credits John Massey, MU Extension livestock specialist, with getting him started on the research. "John had been cutting hay, when he tangled the mower in plastic left from bale covers," Watson says. "He said we need to come up with a better way of protecting the big bales."

During the time of the test at Spickard more than 8 inches of rain had fallen on the bales. Rained on alfalfa hay loses nutitive value and begins to spoil.

For the trial, Watson melted the tallow and applied it with a flower garden sprinkler can. Now he's figuring how to mechanize the application's process. "I already have it worked out in my mind," Watson says. There's an advantage to using the tallow. The cattle will eat it with the hay. There will be no waste disposal problems as there are with plastic. "That plastic will never disappear."

In addition, there's a surplus of tallow. At one time, tallow was used for cooking french fries in fast food chains. But many chains now use vegetable oil.

For his study, Watson used food-grade tallow flakes used by bakers and food processors. The initial test cost more than $3 per bale. But after seeing the results, he figures he can use half as much tallow and possibly use a cheaper material.

In earlier discussions with Massey, Watson talked about using lard, chicken fat, or tallow to shed water from the bales. "We wanted to protect the hay and recycle an agricultural product if we could." He decided to use tallow because it has a higher melting point. "I think it will stay in place under that July sun," Watson says. "But, time will tell."

Encouraged by the prehminary tests, Watson plans a larger test next year. "I'll be right here when the first bale comes out of the baler," he said. He hopes to get a financial grant from tallow suppliers to support the study.

The payoff can mean less wasted hay, better nutrition for beef cows and less plastic waste to dispose of on farms.

Editor's Note: This article from the University of Missouri appeared in *Science of Food and Agriculture* and is reprinted with their permission.

Pasture Rental Rates

Pasture rental rates in the Flint Hills region of Kansas and Oklahoma are often used as a barometer for grazing charges in other areas of the country. On April 24 the Kansas Agricultural Statistics Division released the results of it's annual survey of Flint Hills custom grazers. Following are the average lease prices on a per head and per acre basis.

Class of cattle	Price per head	Acres guaranteed per head	Price per acre
Under 500 lb	$54.70	3.9	$14.02
500-699 lb	$58.50	4.2	$13.93
Over 700 lb	$69.80	4.9	$14.24
Cows with spring calves	$95.20	7.1	$13.41
OVERALL AVERAGE			$13.90

Lease rates ranged from $12.30 to $15.90 per acre, depending upon the services provided by the pasture owner (salt, water, health care, etc.) The overall average of $13.90 is unchanged from the 1991 average rate. The average reported starting dates for the Flint Hills region vary from April 16 to May 2. Average ending date is October 17.

Pasture rental rates in the Lakes States — Michigan, Wisconsin, Minnesota— will generally pencil to be lower than the Flint Hills when figured on a per head basis for the grazing season. In their 1991 survey of pasture rental rates, Doane's Agricultural Service reported an average of $21.70 per acre for Michigan. Assuming a range in carrying capacity of 1 1/2 to 2 1/2 acres par yearling steer, the cost per head could range from $32.55 to $54.25 for the grazing season.

When negotiating a pasture lease for a cow-calf enterprise, one must remember that a typical cow-calf pair will consume 1.5 to 2.0 times as much forage as a yearling steer.

— Harlan Ritchie and Steven Rust, Michigan State University

Tightness of Bale, Air and Sun Important in Hay Preservation

How tightly packed those large round hay bales are and how well drained and aired out the stacking site is will make more difference than the stacking arrangement, says Randy Taylor, Extension farm power and machinery specialist at Kansas State University.

Taylor, K-State animal scientist Dale Blasi, Rooks County Agent John Forshee and Wabaunsee County Agent Carlin Murphy ran large round hay bale storage trials with different hays to compare the effects of different stacking methods.

They tried stacking five bales end to end with ends oriented in a north-south direction and others oriented in an east-

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west direction. They also looked at bales on the bottom stacked on their end with others stacked horizontally on top of them.

They found no difference in dry matter recovery between the stacking methods with either bromegrass in Wabaunsee County or with third cutting alfalfa hay in Kooks county.

Taylor says more important was that newer round baling machinery makes tighter bales and that is as important as any stacking method.

He would recommend tying with plastic twine over sisal twine because sisal twine deteriorates in the sun, allowing bales to loosen up.

"There's just no substitute for building a solid bale if you want to preserve hay quality," he says.

Most of the recommendations for stacking large bales were made 10 to 15 years ago when large baling was relatively new, says Taylor. "Today, the balers are producing tighter bales and we aren't getting so much waste."

The recommendation to stack bale ends in a north-south direction is probably still valid, but more important, would be to stack the ends in the direction of the prevailing winds. "This allows wind to blow through the bales, which will dry out more rapidly," Taylor says.

Another recommendation is to keep bales out of the shade and in the sunlight. "Stacking them under trees won't work. Keeping them out in the open sunlight at a well-drained site where the bales will get a lot of sunlight and drying air will be more beneficial than a north-south stack or any other kind of stacking arrangement," he says.

— ***Lee Jorgensen, Kansas State University Extension News***

What's the Value of Alfalfa Hay?

The following table illustrates the value of alfalfa hay with varying analyses when average quality hay is $75 per ton, corn is $4.65 hundredweight (cwt) and soybean meal is $10 cwt. Average quality hay contains 90 percent dry matter, 35 percent acid detergent fiber and 17 percent protein.

Value of Alfalfa Hay with Varying Analyses Compared To Average Quality Hay Priced at $75 per Ton

Dry Matter	ADF	Protein	Value/Ton
Percent	Percent	Percent	
85	34	19	**$77.83**
90	34	19	$82.41
90	32	20	$87.51
90	30	22	**$95.85**

Source: Kansas State University

Requirements for Accurate Forage Analyses

Results returned to you from the forage testing laboratory are the best information available to predict animal performance on your feed before it is fed. This information also enables you to formulate a balanced ration to provide your livestock with the necessary supplements to achieve maximum performance.

In order for forage analyses to be useful, an emphasis must be placed on timely and accurate forage and feed testing.

The most variable feeds in your feeding program in terms of quality, are likely to be your forages. Hay and silage are often the most inconsistent ingredients in animal diets, so regular testing is especially important for these feeds. Variation in forage quality is evident from year to year, from field to field, and even from bale to bale or within a silo. Because these feeds are so variable, sampling them accurately takes a great deal of effort.

A chemical analysis is only meamngful if the sample sent to the laboratory is representative of what is being fed. Therefore, great care must be taken to provide the lab with the best, most representative sample possible. A good sample is one that represents the entire lot of feed that

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was sampled, whether it was a bag of mineral premix, a ton of hay, or a bunker silo full of corn silage.

Realize that if you sent two samples of the same forage to the forage lab, you would receive slightly different results for each one. A certain amount of variation is involved in sampling forages even when using the most careful procedure.

Once collected, send your sample to the laboratory for analysis as quickly as possible. Recently, research done at Michigan, State has shown that some fiber and protein analyses can be adversely affected by short-term storage of wet samples for more than a few hours at any temperature.

In one experiment, samples of fresh and ensiled corn forage and alfalfa were stored for up to eight days at temperatures between 0 and 100 degrees Fahrenheit. Concentrations of NDF, ADF, and lignin were increased by 15 to 25 percent within the first 24 hours of storage for fresh corn and by 10 to 15 percent within four days for fresh alfalfa across temperatures. Fiber fractions of ensiled corn and alfalfa did not change appreciably.

Do not freeze fresh forage sample as freezing has been shown to increase fiber concentration quite significantly. Storage of forage samples by freezing has been shown to increase NDF and ADF concentrations and to decrease protein solubility.

To minimize the effects of temporary storage, samples should be oven-dried as quickly as possible. Since few farms are equipped with forced-air ovens, the sample should be sent to the forage lab as quickly as possible for drying. An overnight mailing will probably get the samples to the lab most rapidly. Also consider sampling ensiled forage rather than sampling the fresh forage as the silo is filled.

To obtain a sample that accurately represents 10 tons of baled alfalfa hay, it makes the most sense to sample many bales once rather than to sample a few bales many times. Take a diagonal core sample from the knotted end of 20-40 bales randomly located throughout the mow. Combine these core samples in a large clean bucket and mix them well. Sample from the bucket the amount needed to fill the forage lab's mailer envelope or other moisture-proof sample container.

While subsampling, take care to avoid the mistake of shaking the handful of sample before transferring it to the envelope. This bad habit tends to shake small particles out of the sample and alter its composition. Seal the sample in a plastic bag to prevent moisture loss and label it clearly. Send the sample off to the forage lab as quickly as possible.

-Kathleen O'Neil and Michael Allen
Michigan State University

Relative Feed Value Helps You Compare Forages

Relative feed value (RFV) can help you compare similar forages for how well you can expect livestock to consume them and how well they will digest them, says J.R. (Dick) Dunham, Extension dairy specialist at Kansas State University.

RFV has practical application for livestock forage programs where quality is important.

RFV looks at acid detergent fiber (ADF) and neutral detergent fiber (NDF), two components of forages that affect digestibility and intake. Most feed testing laboratories routinely provide readouts.

ADF is an estimate of the cellulose and lignin components and is closely related to digestibility, explains Dunham. NDF is an evaluation of the total fiber content and includes hemicellulose in addition to the cellulose and lignin content. The NDF content is related to intake because it evaluates the bulkiness of a forage.

RFV's are relative calculated values derived from formulas using ADF and NDF. The relative feed value helps producers compare the potential intake of similar kinds of forages, says Dunham.

The RFV of alfalfa will be higher than other high quality forages because the ratio of NDF to ADF is lowest in alfalfa. It's an excellent tool to use in comparing for-

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ages within the same species.

The RFV of excellent quality corn silage will not be as high as excellent quality alfalfa, but that doesn't mean that corn silage is not a usable forage for dairy cows. Corn silage is an excellent source of energy.

The best use of RFV would be for selecting forages to be used in rations that require high nutrient density such as high producing dairy cows.

Alfalfa with an RFV of less than 140 wouldn't be good enough for early lactation cows, but alfalfa with an RFV of between 125 and 140 could be fed to dairy cows in late lactation. Lower RFV hay would be adequate for growing heifers or beef calves.

— ***Lee Jorgensen, Kansas State University Extension News***

New Products

New Cattle Pneumonia Vaccine

Protection against the No. 1 cause of bovine pneumonia and shipping fever is now available through a new vaccine from SmithKline Reecham Animal Health.

One Shot™ Pasteurella Vaccine is a bacterin-toxoid that aids in the prevention of ***Pasteurella haemolytica*** pneumonia by providing antigens against both the bacteria itself and the leukotoxins which destroy the animal's natural defenses and lead to irreversible lung damage.

One Shot provides single-dose convenience, is approved for either intramuscular or subcutaneous injection and comes in 10- and 50-dose sizes. One Shot is designed to be rehydrated prior to use, for maximum efficacy of both the killed bacterin and leukotoxoid components. It is considered safe for use in cattle of all ages.

Trials, including independent tests at Oklahoma State University, have shown One Shot to be more than 90 percent effective against ***Pasteurella haemolytica*** challenges. Intramuscular and subcutaneous administration provide a comparably high level of protection. Pasteurella pneumonia outbreaks are always a threat, since ***Pasteurella haemolytica*** bacteria are present in the nasal passages of most healthy cattle. When animals are stressed these bacteria multiply and descend into the lungs, resulting in pneumonia outbreaks.

One Shot Pasteurella Vaccine is available from veterinarians and other animal health suppliers.

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