



GRAIN FEEDING FOR PASTURE-BASED SYSTEMS

Larry Miller

Penn State University

In a recent issue of *Grazing Gazette*, we discussed the supplementation of energy and grain for lactating cows on a grazing system.

The sharply higher feed costs and relatively stable milk prices have dairy producers asking questions: How much can grain feeding be reduced? What feed ingredients can be used to reduce purchased feed costs? What feed ingredients can be eliminated?

The purpose of this article is to address some of these questions and to present some strategies to cope with the current situation.

Pasture Quality And Management

Maintaining high quality pasture through proper grazing management offers the best opportunity to reduce total feed cost. A system with several paddocks and a well-planned rotation provides the opportunity to have high quality forage available to cows at the correct time. Daily observations of pasture availability and planning on which paddocks to graze and which paddocks to harvest is needed. Daily observations of cows and their milk production is also needed.

With good grazing management which keeps pastures in a vegetative growth stage, pasture quality and quantity can be high during the entire growing season. The nutrient composition of an orchard grass-based pasture during a grazing season from a Penn State study is shown in Figure 1.

These results are from well managed pastures that were grazed at a stocking rate of 1.3 cows pre acre and had nine grazing rotations with a 14-day rest period in the spring to a 28-day rest period in the summer. This quality should be typical for a well managed pasture in Pennsylvania.

Total protein remained above 20 percent for the entire grazing season. Neutral detergent fiber (NDF) ranged from 45 to 55 percent, and in vitro dry matter digestibility (IVDMD) estimated in the laboratory averaged about 70 percent.

In general pastures containing some legumes will be higher in nutrient value (lower fiber and higher digestibility) than pure grass pastures. In some of our studies, including alfagraz with a grass pasture decreased NDF about 7 percent compared to the grass pasture. These high quality pastures will have an estimated net energy of lactation (NEL) value of .70 to .78 Mcal/lb of DM.

Clearly, this high quality pasture has a higher nutritive value than most of our stored forages which are usually harvested when the forage is more mature. We need to maximize the utilization and intake of this high quality, low cost forage, particularly during this time of high feed prices.

The dry matter intake (DMI) potential needs to be maximized. With high-quality pasture as the only forage, we expect dairy cows to consume about 3 percent of body weight from pasture DM.

For a 1,300-pound cow, this is

about 40 pounds of DMI per day. Some Irish research and a recent study at Penn State reports DMI greater than 40 pounds/day when grazing management is optimized.

We can expect Holstein cows on only high quality pasture diets to produce about 40-45 pounds of 4 percent milk per day and maintain adequate body condition. Higher production levels will usually be at the cost of body weight and condition loss.

We can minimize the amount of supplemental grain fed in the later part of lactation when Holstein cows are below 40 to 45 pounds of milk per day and have a body condition score of 3.0 to 3.25. However, we still recommend feeding some grain, perhaps 4 to 6 pounds/cow/day in late lactation as a minimum.

Cows that are grazing require 2 to 4 pounds of grain/day just to meet the extra energy needs for walking to and from pastures twice daily. In addition, some grain or rumen available non-structural carbohydrates (NSC) in the grain mix are beneficial to the rumen fermentation and as a carrier for needed minerals.

Nutritional

Limitations To Pasture

Well-managed pastures produce a high quality but not perfect feed for high producing dairy cows. Some of the major nutrient deficiencies or limitations for high producing cows are:

- Inadequate total DMI and nutrient intake, to support high levels of milk production.

- Total protein is high, but is highly degradable in the rumen and not efficiently utilized in the rumen unless NSC is provided to "capture" this protein. Rumen undegradable protein intake may be inadequate.

- The NSC content, which is the major source of energy for rumen microbes, is low compared to needs.

- The total fiber in high quality pasture is often too low in its ability to stimulate adequate cud chewing and rumination, or is low in "effective fiber."

- The amount of minerals including Ca, P, Mg, S, Cu, Zn, Se, and salt are usually inadequate.

These limitations or deficiencies in high quality pasture for high producing cows indicate that we need to:

- Supplement pasture with a properly formulated grain mixture in order to get more total DMI and energy intake. Providing a grain mixture at the rate of 1:4 grain:milk ratio is still profitable with today's feed prices for early lactation, high producing cows. A 1 pound milk response to 1 pound of grain fed is profitable with a milk price of 13¢/pound and grain at 9 or 10¢/pound.

- The grain mixture needs to contain economical grain sources that provide adequate NSC to maximize the utilization of the highly degradable pasture nitrogen in order to maximize rumen microbial protein production.

Feeding a grain mixture that is high in NSC and at a rate of 1:4 grain:milk ratio will get the total ration (pasture & supplement) to about 35 percent NSC. Grains such as corn and barley, and by-products high in starch are the best sources of NSC. Corn gluten feed, hominy, and wheat midds are economical sources. Supplemental corn silage is a good forage to provide NSC and some needed fiber.

- Addition of a small amount of rumen undegradable protein (RUP) or bypass protein to the grain ration should be considered for high producing cows. If we are unable to fully utilize the highly degradable protein in high quality pasture with the NSC provided in grain mixture, then the high producing cow will likely have inadequate protein available to the small intestine. Research at Penn State and other locations indicate that 1 to 1.5 pounds of added RUP may be beneficial for high producing cows. Protein sources such as animal protein, brewers, distillers, and roasted/cooked soybeans are good sources of RUP. Costs need to be considered.

- The low "effective fiber" in pasture, which likely contributes to the low milk fat percent sometimes seen with grazing, suggests a benefit to additional fiber. A few pounds of long hay can help but will not increase the energy density of the total ration. Addition of fermentable fiber sources to the grain ration, such as soyhulls, beet pulp, brewers, distillers, and some by-products is often beneficial. Again, costs of these ingredients must be considered.

Other Considerations

As feed prices and availability change, it is more critical than ever to work closely with a qualified nutritionist. The current relationships of milk prices and feed costs do not call for much reduction in grain feeding for early lactation, high producing cows on most Pennsylvania farms. A separate grain ration or feeding program may be needed for early lactation, high producing cows from those in later lactation. We need to minimize wastage of expensive grain rations. Producers and nutritionists need to more critically look at feed additives that may not be cost effective, particularly for cows in the later part of lactation. Pastures are generally high in vitamins A (beta carotene), D, and E, and cows may do well on considerably less supplementation than is often practiced.

Grazing Calendar

Pasture Walks:

- June 26, John and Julie Mayer, Taneytown, Md. (contact Stan Fultz, 301-694-1594).

- June 27, Daniel Stoltzfus, Lancaster Co. (contact Leon Weber, 610-683-1476).

- June 28, Sam and Larry Fry, Lycoming Co. (contact Dave Hartman, 717-784-6660.)

The 1997 Pennsylvania Grazing Conference is scheduled March 6 and 7 at Carlisle.

Shonsey To Head Merger

GOLDEN VALLEY, Minn. — Ed Shonsey, president and CEO of Northrup King Co., has been named president and CEO of the Novartis Seeds sector's field crops business in the U.S., Canada, and Mexico.

The headquarters of the new company will be in the Minneapolis suburb of Golden Valley. The name of the company and its brand logo will be decided after a worldwide branding team completes its work this summer. Sugarbeet activity will continue to be based at Hilleshog Mono-Hy in Longmont, Colo.

The joint announcement from Sandoz Ltd. and Ciba-Geigy Ltd. included appointments to key global management positions, including several others in the U.S. seeds and field crops businesses.

Fred Fuller, president and CEO of Ciba Seeds, will become presi-

dent and CEO of Vaughan's Seed Company, Chicago. Vaughan's, currently part of Sandoz Seeds, provides flower seeds, plugs, plants and supplies to the commercial greenhouse grower market.

Jerry Hoeh, chief financial officer (CFO) of Sandoz Agro worldwide, was named CFO of the new U.S. field crop seeds company. In addition, Bob Pryce, head of Ciba Seeds - Canada, will become the head of the new company's field crop operations in Canada, reporting to Shonsey.

Tom Francis, who has been heading up Canadian operations for Northrup King, will remain as head of research and will share responsibility for Canadian marketing with Pryce.

These appointments will officially take place when Novartis receives all regulatory approvals in key countries.

4H *** ** * ** * ** * ** * ** *
ers-you've earned
our support.....

BUY, SELL, TRADE OR RENT THROUGH THE CLASSIFIED ADS

PHONE: 717-626-1164 or 717-394-3047

FAX 717-733-6058

Mon., Tues., Wed., Fri. 8 AM to 5 PM; Thurs. 7 AM to 5 PM

1 FARM EQUIPMENT

110 Int. Silage wagon, 3 beaters, 12-ton gear, good condition. Chester Co. 610/932-5873.

12' Pittsburgh disc, all new bearings, \$800. (717)922-3365.

13' Brillion cultmulcher, Brillion 10-tooth chisel. 800/919-3322.

1825 Case Skid Loader w/ Kubota diesel, 48" bucket, good condition, \$4800. 717/354-6706.

1835C Case Skid Loader, 1200 hours, \$10,000. 717/524-7954.

1947 JD B, excellent tin, good rubber, \$1600 firm. 717/744-2495.

1948 Ford 9N tractor, good tires and sheet metal, needs paint, not presently running, many new parts, \$850. 201-839-9053.

1948 JD A, sheet metal, decent, \$1800. Call even. (717)626-9536.

1968 IH 2404 backhoe loader, recently tuned. New tires, new battery. Used for light construction, \$6,000. Carlisle. (717)249-7677.

1971 Int. Cub Tractor w/5' belly mower, excellent condition, \$2500; Woods 5' belly mower, complete for 8N Ford w/13.6-28 turf tires, \$800. 410/655-7094 after 6pm.

1976 Steiger 350hp, 4WD, good condition, \$18,000. 330-898-5381 evenings.

1979 Great Dane refer 48' Thermo King, new brakes, good rubber trailer and unit in very good condition. Phone (302)335-3835.

1980 7720, 30.5 tires, showing 1,950 hrs., nice, just off farm. Trade & Finance. \$24,750. Larry Stalter, "The Combine Man". 1-800-248-2151

1980 Int. tractor model 284, 3pt. hitch, live PTO, 28HP, ex. shape, 1200hrs. \$4,500. (610)932-0779.

1981 JD 4040 tractor, sound guard cab, air conditioning, quad range, 1300 hours, excellent shape, (607)369-9454. After 6 PM, (607)369-5509.

1982 Deere 6620, low hrs., Indiana machine, emmaculate, 90% tires, \$26,650. Call Sam. 717-630-2736

1982 FKS Gleaner, 13', 4-30", very good, \$6,950, plus Freight. Financing Available. Larry Stalter "The Combine Man" 1-800-248-2151

1982 MF 850 hydro combine, w/9115 float head, 1163 corn head, \$18,500. 814-364-1349.

1984 JD 2350, 2WD, w/146 loader, 1650 hrs., very nice. 609-451-2727.

1988 7720 Titan II, 2,016 engine hrs., about 1,400 sep. hrs., big rubber, chopper, heavy adjustable axle, sharp, \$39,500. Trade & Finance. Larry Stalter "The Combine Man" 1-800-248-2151

1995 Deere 6810 cutter, 759 hrs., \$123,500. Trade & Finance. Larry Stalter "The Chopper Man" 1-800-248-2151

1995 JD 6710 forage harvester, 4-30" head, 252 hrs., \$134,900. Trade & Finance. Larry Stalter "The Chopper Man" 1-800-248-2151

1995 Kubota tractor, B2150HSD, 40hrs, bucket and 4' York rake, \$16,500. (908)496-4668.

1R FMC pull-type sweet corn harvester, older machine, good condition. (610)258-9818.

200 gallon 3pt field sprayer, good condition, \$500. (717)445-6976

(2) 1931 JD GP's, (1) restored on steel w/plow; (1) for parts or restore on rubber, \$4800 all. NY 518-392-4096 evenings.

21 EXHAUST FANS- 36" S.S. w/1/4 H.P. motors including shutters. \$100 ea. (717)768-7166.

(2) 300 gallon steel fuel tanks, electric pump, \$55; Hand pump \$40. 215-675-8137.

258 NH rake, dolly wheels, reconditioned, new tires and paint. \$2,500 (914)373-9443

259 hay rake 273 NH baler with thrower hay wagon. Berks Co. (610)562-2090.

28' Hay elevator w/motor and transport, good condition, \$350. Pequea windrow inverter, \$750 717-534-1253.

(2) Firestone 16.9x34 tires on 15" rims. (2) 10.00x16 front tractor tires and wheels. Both in good condition, approx. 60% tread. Make offer (717)445-6976.

2-stage snowblower for JD 750, \$2000; hyd. blade for JD 750, \$750; both \$ 717/469-7110.

(2) Wide Front Oliver 77 row crop tractors: #1 Rebuilt diesel engine, inj pump, injectors. New clutch, brakes & tires, \$2850. #2 Gas, new 12V generator, \$2200. 410/239-0579.

3309 Case IH Discbine, Like New, \$9500. Staunton Tractor, 540/885-7261

3930 Ford tractor w/loader, excellent condition, 4 years old, 330+ hrs., asking \$21,500; Caretree 3pt hitch, 24" tree spade w/2 sets of spades, like new, \$4500 firm. 717-386-4137

(3) Brillion SS 10' packer/seeder. Clearance! Working shape \$1975. As is \$1575. JD #8 backhoe off 850 JD \$3900; Nicholson tedders, \$850-\$1050, IHC 1100 FH or 3pth, like new, \$850; NH 451 mower, \$850; IHC balance head mower trailer type, \$650, Danuser post hole w/12" auger, like new, \$800, NH 30' elevator, 3 years old, \$1850. Thom Wheary Jr., 717-687-0102.

(3) Gehl forage wagons, good condition, (609)259-7494.

3pt. conversion hitches for Farmall tractors and used Farmall parts (814)275-1204.

3pth forklift, \$850. Int 205 combine w/10' hume reel, on steel, \$1,500 (717)532-5918.

3pth HD rotary mowers, 5' & 6' in stock. Cuts rubbish up to 2" in diameter. Pre-season 3pth snow blower sale. Order now get 12% off '95 & '96 list price. (717)286-7851.

(3) White tractors. 4-210 \$9,500; 2-155 \$7,500; 4-150 \$6,300. (717)867-4896.

MILK
AMERICA'S HEALTH KICK