



Ridin' Herd

► by **Rick Rasby**, Extension beef specialist, University of Nebraska

Plan now for winter feeding program

As producers plan for their winter feeding program, a question that is frequently asked is, "How much will my cows eat on a daily basis?" Although there is no nutrient requirement for feed intake, knowing amounts that a cow consumes daily is essential in planning a winter feeding program, evaluating rations and supplements, and predicting animal performance. With dry conditions this summer and harvested forages at a premium, closely estimating the amount of feed needed to get through the winter will be important to contain cost. In addition, cattle have a certain requirement for specific nutrients such as protein, energy, and minerals and vitamins. The necessary concentration of the nutrients in the diet to meet the animals requirement is determined by the amount of feed consumed.

Dry-matter vs. 'as is' basis

When determining daily feed or forage intake, intake is commonly determined on a dry-matter (DM) basis. Intake on a DM basis means that it doesn't include moisture. We know that cattle eat feeds that include moisture and, by the same token, not all feeds contain the same amount of moisture.

So if intake can be determined on a DM basis, it can easily be converted to an "as is" or "as-fed" basis.

As an example, if it were determined the daily dry-matter intake (DMI) of a 1,200-pound (lb.) cow is 24 lb. and the hay she is consuming is 88% DM, the cow would

consume about 27 (24 lb. ÷ 0.88) lb. per day on an as-fed basis.

If the same 1,200-lb. cow is fed a ration where part of the ration called for corn silage to be fed at 10 lb. per head per day on a DM basis and the corn silage is 35% DM and 65% moisture, the pounds of corn silage in the diet would be 28.5 (10 lb. ÷ 0.35) lb. per head per day on an as-fed basis.

Determinates of daily intake

There are a number of different factors that determine the daily intake of a cow. The primary factors are cow weight, forage or diet quality, and stage of production. Cows that weigh 1,300 lb. will consume more on a daily basis compared to cows that weigh 1,100 lb. In addition, cows that are lactating will consume more feed than cows that are not lactating (see Fig. 1), and intake is different for cows in early lactation compared to late lactation.

Forage quality affects DMI of cattle (see Fig. 2). As forage quality increases, indicated as an increase in total digestible nutrients (TDN) content of the forage, the amount of the forage that the cow can consume also increases. As forage quality increases, there is likely more leaf as compared to stem. When quality is low there is more stem, therefore more cell wall contents. In addition, as forages increase in maturity, there is an increase in lignin content. Lignin is not digested by the rumen microbes.

A good example of how forage quality affects the amount a cow can consume daily is wheat straw. Wheat straw is low in protein and energy, containing 4.0% crude protein (CP) and 40% TDN. When cows have full access to wheat straw, they don't quit eating it because they don't like it, they quit eating it because they can't stuff any more into their rumen. Straw has such a low digestibility that it takes extra time in the rumen for it to be digested and passed through the rumen.

Daily intake on a DM basis may be 1.6%-1.8% of her body weight. When straw is ammoniated, the ammoniation process begins to break down the cell wall contents and, when fed to cattle, intake will increase 16%-19% compared to nonammoniated wheat straw.

Table 1: Guidelines for daily feed/forage capacity of beef cows

Forage type	Class of cattle ¹	DM capacity ² , %	DM capacity ³ , lb./head/day
Low-quality forages (52% TDN: dry native range, straw, stalks)	Dry cow	1.8%	20-22
	Lactating cow	2.0%	22-24
Average-quality forages (53%-59% TDN: native hay, bromegrass hay, alfalfa)	Dry cow	2.0%	22-24
	Lactating cow	2.3%	25-28
High-quality forages (>59% TDN: alfalfa, boot-stage hay)	Dry cow	2.5%	28-30
	Lactating cow	2.7%	30-33
Green pasture	Dry cow	2.5%	28-30
	Lactating cow	2.7%	30-33
Silages	Dry cow	2.5%	28-30
	Lactating cow	2.7%	30-33

¹1,100- to 1,200-lb. cow.
²Capacity as a percent of body weight.
³Total daily intake on a DM basis.

In comparison, corn silage will typically be about 70% TDN, and lactating cows could easily consume 2.5%-2.7% of their body weight on a DM basis of this feed.

Other factors

There are other factors that affect forage or feed intake of cattle. There are data that would suggest fleshy cows consume 3%-10% less feed or forage compared to moderate to thin cows. Also, cold stress increases DMI of cows, and heat stress reduces DMI. For planning purposes, these factors are more difficult to factor in.

Table 1 contains some rules of thumb to help estimate daily feed intake on a DM basis of cows consuming forages of differing quality when they are either gestating or lactating. When forage quality is low (52% TDN or less) and cows are not lactating, they will consume 1.8% of their weight on a DM basis. If the forage quality is average (TDN content is between 52% and 59%), non-lactating cows will consume about 2.0% of their body weight daily on a DM basis of this forage.

As an example, if the forage were 55% TDN and lactating cows on the average weigh 1,200 lb., then it could be estimated they would eat 28 lb. ($1,200 \text{ lb.} \times 0.023$) of hay daily on a DM basis. If the hay were 88% DM, on an as-fed basis cows would eat about 32 ($28 \text{ lb.} \div 0.88$) lb. If there were 200 head of cows in the herd, it would take about 3.2 ton of this hay per day [$(200 \text{ head} \times 32 \text{ lb. per head per day}) \div 2,000 \text{ lb.}$] not accounting for any waste.

To take the use of feed intake one more step, the 1,200-lb. cow the first 90 days postcalving producing 20 lb. of milk at peak milk production needs to consume 2.7 lb. of protein daily on a DM basis (nutrient requirements are on a DM basis). If the hay is 8.0% CP and the cow consumes 28 lb. of hay DM, she will eat 2.24 lb. of protein ($28 \text{ lb.} \times 0.08$). This hay after calving will need to be spiked with some protein to meet the protein requirement. Likewise, if she needs 16.0 lb. of TDN daily, then 28 lb. of a forage that is 55% TDN yields 15.4 lb. of TDN consumed. This forage will need to be spiked with some energy.

A small amount of a good-quality alfalfa could fit the need. If other feeds are needed, knowing this will allow time to shop around for the best buy of a supplement that fits the needs of the feeding program. It is interesting that a 1,200-lb. lactating cow can eat 30 lb. per day DM of silage, and if the silage is 35% DM, on an as-fed basis she could eat about 86 lb. daily. That's a lot of silage, but remember the silage is 65% water. In addition, because corn silage is about 70% TDN, cows will not need a "full-feed" of corn silage to meet their energy requirement.

determine how much inventory is needed will help enhance the profit potential of the cow-calf enterprise.

Drought happens somewhere in the U.S. every year. In fact, it occurs somewhere in Nebraska every year. This is nothing new for cow-calf producers, and it seems that in these situations, it is critical to push the pencil on every aspect of management practices to get through these times.



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Editor's Note: "Ridin' Herd" is a monthly column written by Rick Rasby, professor of animal science at the University of Nebraska. The column focuses on beef nutrition and its effects on performance and profitability.

Final thoughts

Estimating daily feed intake of your cow herd is the first step in determining the amount of forage you need for the winter feeding program. When forage availability is tight, like it is during drought, being able to

Fig 1: DMI expressed as a percent of body weight, cows consuming a medium- to low-quality forage

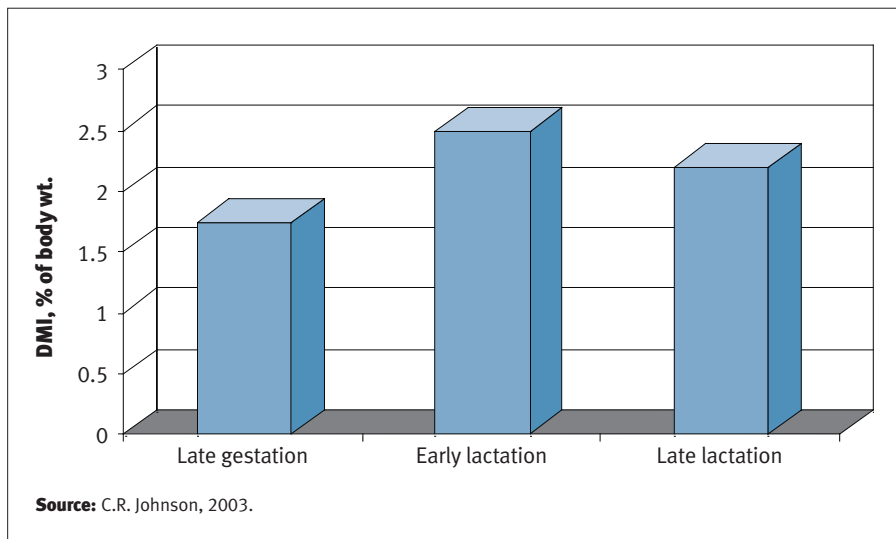


Fig 2: Relationship of forage digestibility to DMI of beef cows

