Cow Calf Technical Bulletin

Targeting Cowherd Supplementation Needs

Cowherd nutrition directly impacts calf performance, reproductive efficiency, and herd health. At the same time, feed typically represents 50-75% of cow/calf production costs. A key management goal, then, must be to match the nutrient supply to cow requirements, while striving to maximize returns on this investment.

The forage portion of a diet is typically dictated by what is currently available, either in the field or pasture, or harvested and stored from the previous season. Therefore, feeding management focuses on matching the right supplement to available forages, in order to meet requirements for desired production.

An underlying goal, in most situations, is to maximize utilization of available forage. In other words, supplementation programs need to be developed that allow the cow to meet as many of her needs as possible with low-cost forage. The "right" supplement can achieve this by stimulating both increased intake and digestion of low– or moderate-quality roughages. Cows then get more protein and energy from the forage, plus specific needed nutrients directly from the supplement

The "Right" Supplement

A review of published research shows that " high protein" (i.e., containing 20% crude protein, or CP) supplements will boost voluntary intake of low-quality (<8% CP) forages AN AVERAGE OF 40%. The study summarized at the right illustrates a typical response.

Protein Supplementation of Low-Quality Hay			
	- Lbs Supplemental Protein -		
	0	1/3	2/3
Hay intake, lb/hd/day	15.4	19.4	22.1

Mathis et al., 1999
Kansas State University

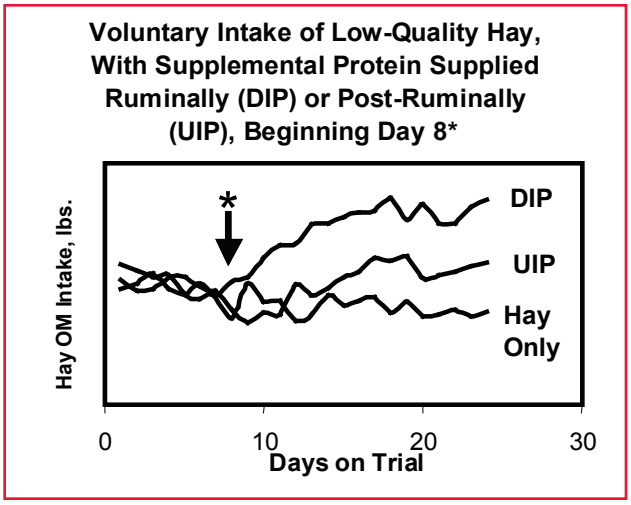
Supplementation of Low-Quality Hay			
	- Lbs Supplemental Protein -		
	0	0.4	0.8
OM Digest., %	44.6	54.3	54.2
Fiber Digest., %	50.3	58.7	59.9
Hay intake, lb	7.4	12.1	14.5

Köster et al., 1999
Kansas State University

Not only does protein supplementation allow the cow to consume more hay - - it can also let her get more good out of each bite she does eat. The data to the left comes from a group of 1200-lb beef cows, consuming a low-quality prairie hay, offered free choice.

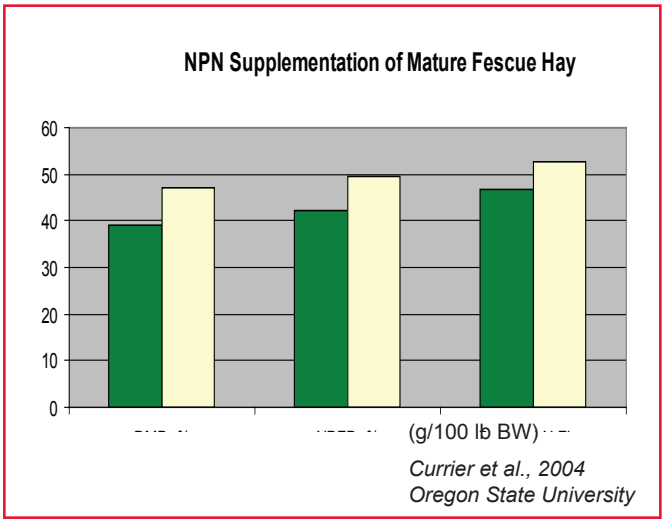
Degradable protein (DIP) vs. "By-pass" (UIP)

The positive results seen with protein supplementation are a result of meeting the critical need of the rumen microbes for additional crude protein. It only makes sense, then, that rumen-degradable supplemental protein would be most effective at triggering these responses. For by-pass protein to serve the same purpose, it must first be digested, with a portion of the freed nitrogen then returning to the rumen as "recycled" blood or salivary urea. The chart shows how much more efficient degradable protein is at stimulating forage intake.

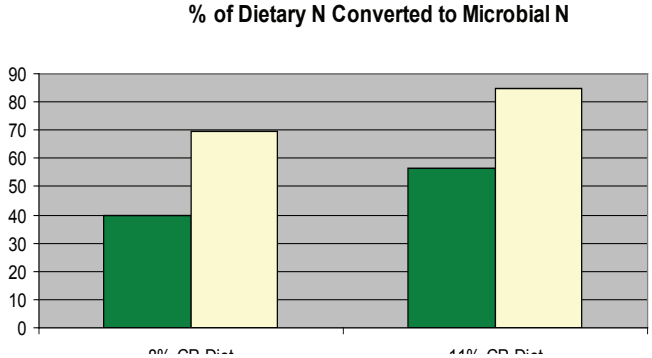


Amino acid ("natural") protein vs. Non-Protein Nitrogen (urea)

The primary need of the rumen microbes is for nitrogen - - not for protein per se. In the rumen, urea readily breaks down into ammonia, a nitrogen source that is actually preferred or even required by many fiber-digesting bacteria. Therefore, having at least some supplemental CP provided as urea can further boost forage digestibility. Increased microbial activity translates into greater numbers of ruminal microorganisms and a higher volume of microbial cell protein flowing to the small intestine for the animal's use.



Currier et al., 2004
Oregon State University



Griswold et al., 2003
The Ohio State University

"Protein" Supplements vs. "Energy" Supplements

A couple pounds of corn may be an easy way to boost a cow's energy intake. However, such high -starch supplements cannot trigger the same desirable increases in forage intake and digestion. And when fed at higher levels - - say more than four or five pounds per day with a forage -based-diet -- forage utilization is significantly decreased. In fact, energy supply from hay or grazing may be reduced enough to more than offset the direct energy contribution of the grain.

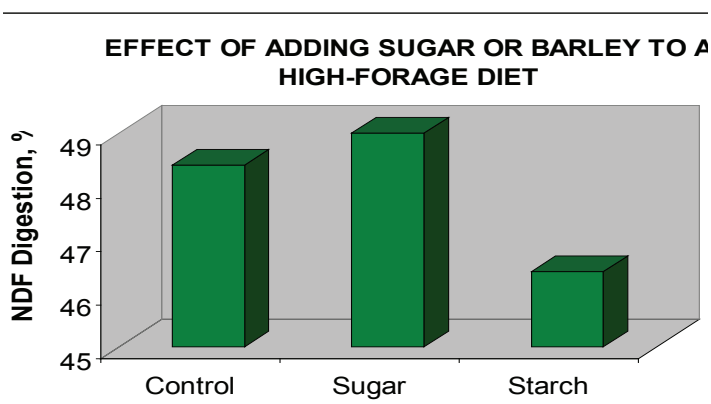
Cows on Winter Grass, Various Levels of Supplemental Corn				
	- Lbs Corn Fed -			
	0	2.2	4.4	6.6
Hay intake, lb	19.3	18.0	14.1	11.1
Total intake, lb	20.8	21.1	18.6	17.2
Fiber digest.%	39.6	38.5	29.9	25.6
Hay digest.%	36.5	35.1	23.6	18.9

Chase & Hibberd 1987
Oklahoma State Univerity

Steers Fed Prairie Hay ad libitum with or without Different Supplements			
	Control	Grain-Based Supplement	27% Protein Supplement
Forage intake, % of body weight	.74	.78	1.22
Microbial N flow, g/day	8.6	30.1	41.1
Fiber (NDF) digestibility, %	54.2	48.5	59.7
Total VFA, mM	51.9	69.5	84.1

Hannah et al, 1991
Kansas State Univerity

However, the energy density of a "protein" supplement can be effectively increased with sugar, or soluble fiber, sources. Supplying these readily-available carbohydrates, WITH THE NEEDED PROTEIN, can further stimulate the microbial fermentation that leads to increased intakes and digestion. The resulting improvement in overall nutrition is reflected in calf performance.



Piwonka et al, 1994
The Ohio State University

QLF LIQUID SUPPLEMENTS for beef cows are designed to complement forage-based diets. Relatively high in protein, they are formulated with rumen-degradable CP sources. This includes a mix of NPN and "true" proteins, as well as the sugar energy supplied by molasses (and in come products, condensed whey). These supplements are commonly offered free choice, bringing the producer convenience, flexibility, and often an economic advantage.

	No Molasses	Molasses During Breeding	Molases During Calving& Breeding
Weaning%	77.2	84.0	82.9
Wean Wt	553	551	577
Lb calf weaned/cow	427	463	479

Pate et al., 1985
University of Florida

Quality Liquid Feeds
3586 Hwy 23 North
Dodgeville, WI 53533
1-800-236-2345
www.qlf.com

#TB-8001