

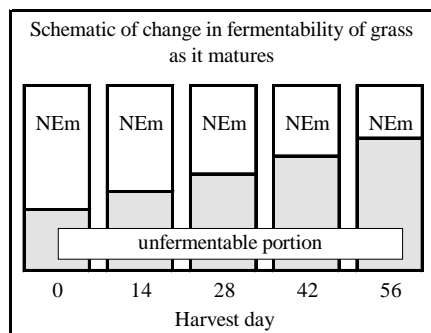
LOW COST COW/CALF PRODUCTION

The Bulletin For Alumni Of The School

June 1997

Burp and Grind

It is the size of the rumen that limits the quantity of forage consumed. When it is full the cow stops eating. The rumen must empty somewhat before she returns to grazing. The rumen empties in two ways: 1) the formation of fatty acids (from the carbohydrate) which are utilized by the microorganisms or escape across the ru-



men wall and 2) the regurgitation of unfermented fiber which is ground to small particles by the teeth, swallowed and passed along the gut to be excreted as feces. With high quality forage, the major path for rumen emptying is across the rumen wall. Low quality forage requires extensive rumination, a slow process. The former results in high consumption and the latter in low. Switchgrass (*Panicum virgatum* L.) hay, harvested five times over 56 days to provide five stages of maturity, was fed to surgically altered steers¹.

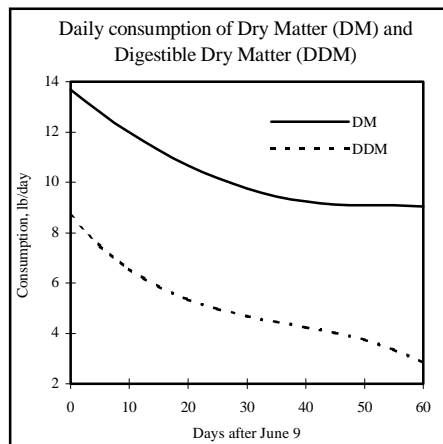
No Surprises

Chemical composition of the switchgrass reflected its maturation. Note that the

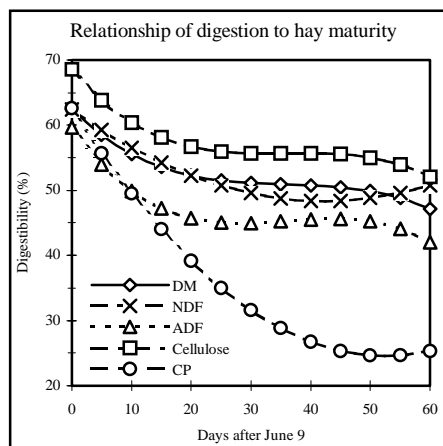
Day	CP	NDF	ADF	LIG
0	11.3	69.3	38.4	5.7
14	3.9	74.5	42.1	6.9
28	5.6	76.1	44.2	7.7
42	4.4	76.8	45.4	8.4
56	4.4	78.8	47.8	9.6

CP: crude protein
NDF: neutral detergent fiber
ADF: acid detergent fiber
Lig: lignin

crude protein declined from 11.3% to 4.4% in just 42 days. Further, ADF, which has an inverse relationship to NEm, increased by about 25% over the 56 day harvesting periods. As might be expected, forage consumption declined as the plants matured. The following chart shows that dry matter consumption fell from about 14



lb per day to a level of 10 lb by the time the forage was most mature. Consumption is generally low but be mindful that



these 660 lb steers were housed in confinement, with some time spent in metabolism stalls. Digestion of the various chemical components of the forage declined with maturation as well. *How about that reduced consumption, reduced digestion and low protein? Degradable anybody?*

In Perpetuity

As discussed in the School, mature forage consumption is lessened because the rumen is full. To state it another way, retention time in the rumen is greater and rate

of passage is slower. This is indicated in the table that follows. The researchers collected masticate via an esophageal cannula (*a bolus/cud as it was being swallowed after chewing*) for hays harvested on 0, 28 and 56 days. The fact that more and more chewing was necessary to grind the hay to sufficiently small particles to pass the ru-

day	MRT hour	ROP %/h	FILL %BW	PS mm
0	64.3	3.25	1.36	2.0
14	73.2	2.82	1.49	
28	82.8	2.31	1.46	1.9
42	85.4	2.30	1.60	
56	93.9	2.14	1.64	1.6

men is apparent under the PS column above. The less mature hay was ground to 2 mm. Because the more mature stuff necessitated extensive rumination and chewing, it was ground to 1.6 mm.

Nature's Intentions?

This whole process of consuming and processing low quality forage requires extensive muscular activity. Thus, a great deal of heat is produced. **Calve when the sun is shining and the grass is green. Stay warm when the snow is blowing.**

Schools In 1997-98

- North Platte, NE September 8 - 11
- Fredericksburg, TX October 6 - 9
- Redding, CA November 10 - 13
- Wichita Falls, TX January 12 - 15
- Red Deer, AB February 10 - 13
- Tucson, AZ March 9 - 12

Dick Diven

Agri-Concepts, Inc.
12850 N. Bandanna Way
Tucson, AZ 85737-8906

(800) 575-0864 FAX (520) 742-2607

¹ Burns, J.C., K.R. Pond, D.S. Fixher and J.M. Luginbuhl. 1997. Changes in forage quality, ingestive mastication and digesta kinetics resulting from switchgrass maturity. J. Anim. Sci. 75:1368.