LOW COST COW/CALF PROGRAM

The Bulletin ***For Alumni Of The School***

Volume 10 **Number 4**

GPS and Cows

Sound crazy? Not if you want to get good estimates of grazing time, distance traveled, maximum distance from water, cow distribution and the frequency of visiting the supplement feeder. This was the approach taken by Oregon State U researchers at the Eastern Oregon Agricultural Research Center, Burns, Oregon[1]. This area is known as the northern Great Basin. Average annual precipitation is 7.2″. Average maximum temperature is 61.7° F and the average minimum is 29.7°. If you want to get a good feel for the lay of the land, do a Google search for Google Earth and click on "Google Earth - System Requirements." If your computer has the wherewithal, you can find the program at the bottom of the page. *We checked for viruses and found it clean.* Once loaded, search for Hines, OR. Then, move the picture NE and/or the mouse SW until you find Lat 43°19' N and Long 119°43' W. Paiute Butte should be in the forefront, slightly to the SW. Elevation of the pastures varied from 4600 to 5320 ft. Vegetation is dispersed – juniper, a shrub layer of low sagebrush and big sagebrush. Herbaceous plants include wheatgrass, bluegrass and fescue, among others. Average growing season is May through September.

Methods

One hundred twenty pregnant (60 ± 45 d), non-lactating cows were divided into three groups; each group was allotted a 2000-acre pasture. Experimental periods were 84 d, beginning Aug 9 and concluding Nov 1, for each of three years. Four cows in each of the three groups were fitted with global positioning-system collars. The collars also were equipped with head forward/backward and left/right movement sensors. *Nothing on the tail to measure fly swatting*. Collars were programmed to take position readings at 10-min intervals for three 6-d periods, in each of the three-year replications. The 6-d readings were taken d 18 through 23, 48 through 53 and 72 through 77, each year. The experimental treatments were frequency of feeding cottonseed meal. The control (**CON**) treatment was unsupplemented, a second (**D**) group was fed 2 lb daily and the third group (**6D**) was fed 12 lb every 6 d. The supplements were put out at 8:00 am and an audio device was sounded (horn, whistle?). Supplement feeders and water were situated near the center of every square pasture. Rumen-cannulated steers were used for forage sampling to determine quality. Forage was clipped to estimate quantity. Four cows in each treatment group were dosed with chemical markers to estimate intake and digestibility.

	Treatment		
Measurement	CON	D	6D
BW gain, lb	37.5	112.4	94.8
Initial BCS	4.67	4.63	4.67
Final BCS	4.68	5.08	4.99
Grazing Time, h/d	9.57	7.08	7.87
Distance Traveled, yd/d	6473	6370	6458
Max Distance from Water, yd/d	2092	2099	1925
Distribution, %	70	69	67
Dry Matter Intake, lb/d	25.8	22.1	19.2
Dry Matter Digestibility, %	50.7	49.4	45.3
Harvest Efficiency, lb DMI/min grazing	0.0466	0.0549	0.0435
Supplement events frequented,%	---	66	70

Did the cows get lost?

These guys collected a lot of data, which they converted into good information. Only a small portion is discussed here. The average crude protein contained in the forage was 7.4%. The authors calculated a dietary deficiency of degradable protein for all treatments but an excess of metabolic protein. With this excess, the urea cycle provided adequate degradable protein for maximum formation of microbial protein. Performance results are summarized in the above table. BW gain includes the products of conceptus. These cows were on study late in their first trimester and well into their second. The 37 lb gained by the CON cows were mostly fetal growth, as indicated by no change in BCS. Thus, the net gain (by the D cows) was about 75 lb and the 6D cows 57 lb. What jumps out in this study is the hours spent grazing. The CON group spent 2 h more roaming the pasture than did the two supplemented groups. The extra time spent grazing is reflected in the dry matter consumption. The CON group consumed about 25.8 lb daily, while the D cattle consumed 22.1 lb and the 6Ds ate 19.2 lb. This would suggest that the energy contribution of the CSM provided some degree of appetite satiety. The authors credit the increased intake of metabolic protein for the reduced forage intake. The distance traveled by the cows is fascinating although there was no impact from supplementation. The 6,473 yd traveled by the CON cattle are more than 3.6 miles. And they probably walked farther than that. The locations from the GPS were taken at 10-min intervals. The authors had no choice but to assume a straight line from point to point. It is unlikely that the cows complied with this necessity. The maximum distance that the cattle moved away from the water was about 2000 yd, which suggests they weren't just hanging out at the trough. To obtain the cow distribution data, the researchers used a computer grid - marked off in hectares. The results are stated as percentage hectare occupied per pasture per year. There were no differences. No treatment differences were found for harvest efficiency. Harvest efficiency was measured as lb of dry matter intake per minute of grazing. The percentage supplementation events frequented was determined as the percentage of collared cows within 160 ft of the feeder, within 20 min of tootin' the horn. There was no difference in behavior between the two supplemented groups. This suggests that the cows fed supplement once every six days got fooled the other five (Pavlov?). The CON cows either ignored the audio device or couldn't hear it. Overall, cattle performance was similar for both groups of supplemented cattle. Therefore, offering a CSM supplement once every six days is about as good as daily offerings. The next study should be summer-calving cows, equipped with a high-tech compass, grazing through the winter with a calf at their side.

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Pierre, SD August 15 -- 18

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[1] Schauer, CS, DW Bohnert, DC Ganskopp, CJ Richards and SJ Falck. 2005. Influence of protein supplementation frequency on cows consuming low-quality forage: Performance, grazing behavior and variation in supplement intake. J. Anim. Sci. 83:1715.