



**Cattle Nutritional Management Analysis
Using Fecal Sampling, Computer Software,
and Body Condition Scoring**

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Summary:

Nutritional status of grazing cows depends on forage quality, protein and digestibility, and amount of forage available for grazing. NIRS fecal analysis was used to estimate crude protein and digestibility of forage selected by grazing cows. NUTBAL-PRO decision support computer software was used to estimate cow body condition score over a 30-day period and analyze nutritional management options for the cows. Availability of preferred forages appeared to limit cow performance rather than forage quality from June to September and in October.

Objective:

This project was established to demonstrate the use of a nutritional management analysis system. Use of this system can help beef cattle producers determine whether forage quality or forage quantity is the cause of nutritional problems and establish records concerning critical periods for future management use.

Materials and Methods:

This project was started in June, 2002. Monthly fecal samples were collected from mature cows and sent to the Grazingland Animal Nutrition Lab at Texas A&M University in College Station. Crude protein and digestibility of the forage consumed by the grazing cattle was estimated using NIRS analysis of these fecal samples. Fecal samples contain residue of the forage eaten. The characteristics of this residue are used to estimate the crude protein and digestibility of the forage eaten.

The Nutritional Balance Analyzer-PRO (NUTBAL-PRO) decision support computer software was used to estimate the 30-day nutritional status of the cows providing the fecal sample. This nutritional status is estimated by entering the following information in NUTBAL-

PRO: 1) forage crude protein and digestibility estimates from the NIRS fecal analysis, 2) previous and expected minimum and maximum temperatures and relative humidity, 3) a description of the cows including breed, age, days of gestation, days lactating, current body condition score, and calf weaning weights, and 4) any supplemental feed currently used.

At each monthly fecal sampling period, cattle were body condition scored. Each month, these scores were compared to body condition scores estimated by NUTBAL-PRO from the previous month. If NUTBAL-PRO estimates were higher than the observed condition scores, and no other reason for the over-estimate could be found, it was assumed that the forage available to cows was less than expected. Apparent forage intake was then estimated by reducing intake estimated by NUTBAL-PRO until the estimated body condition score matched the observed body condition score. Both average and previous month apparent forage intake were used to determine how well they estimated body condition scores over a 30-day period. The goal is to use these forage intake estimates to improve body condition score estimates.

Results and Discussion:

Forage quality (Figure 1) was fairly level from June through September, with crude protein at 8 to 9% and digestibility at 63%. Forage quality declined in October and November, then increased again in December. This increase appears to correspond to a change in pastures at the end of November. Forage quality declined again in January.

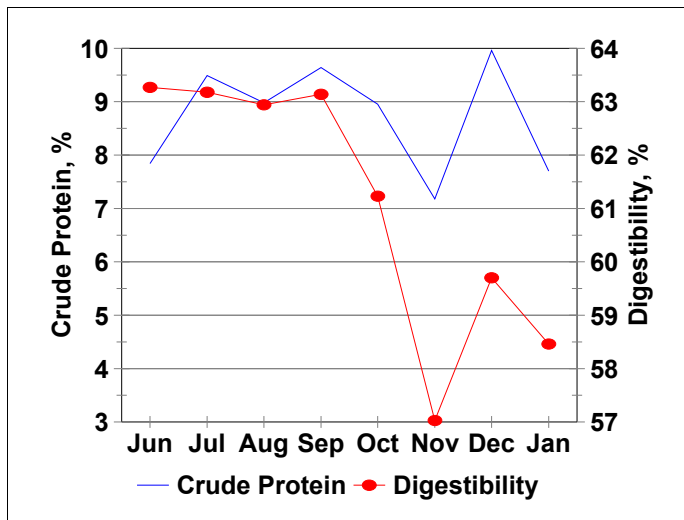


Figure 1. Crude protein and digestibility estimated from NIRS fecal analysis.

Without forage intake adjustments, NUTBAL-PRO overestimated observed body condition scores by more than one-half condition score from July through September and in November

(Figure 2). Using apparent forage intake from each previous month or the cumulative average apparent forage intake from previous months produced NUTBAL-PRO body condition score estimates for August through January that were less than a 0.5 condition score difference from observed scores.

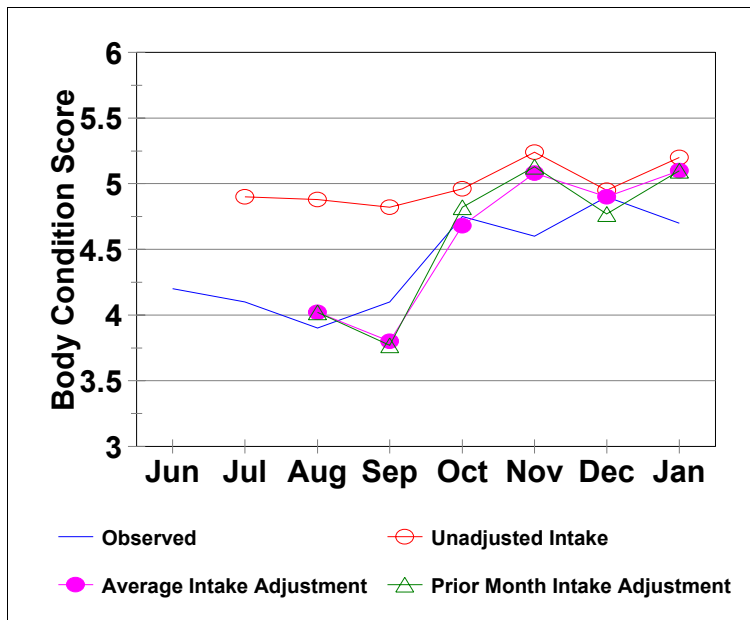


Figure 2. Comparison of observed body condition scores with body condition scores estimated using unadjusted forage intake, average forage intake adjustments, and prior-month forage intake adjustments.

To correct these condition score overestimates, apparent forage intake was calculated to range from 58 to 85% of expected intake from June through October and 63% in December. Only in November was apparent forage intake 95% of expected intake (Figure 3). Although forage quality was increased in December, the amount of this quality forage that was available was limited. Forage available to a cow is not the total standing crop. It is only the portion of the standing crop that the cow chooses to eat. Studies have shown that 80 to 90% of the diet can come from as little as 1 to 6% of the standing crop.

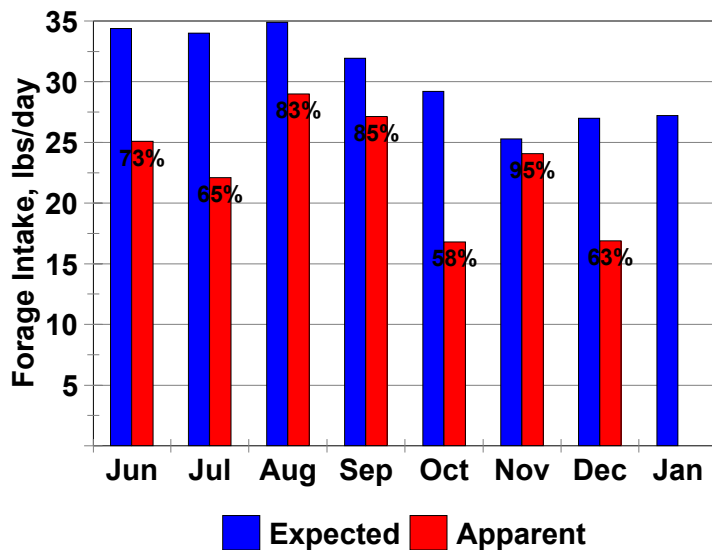


Figure 3. Comparison of expected (unadjusted forage intake) and apparent (adjusted to match observed body condition scores) forage intake. Numbers on bars indicate apparent forage intake as a percentage of expected intake.

CONCLUSIONS

In 4 of 7 months, apparent forage intake was less than 80% of expected intake. This result suggests that the quantity of preferred forage available to cows was more limiting to cow performance than forage quality. Both average and prior-month intake adjustments estimated 30-day body condition scores equally well to this point in the demonstration. Estimates within 0.5 condition score of observed should be acceptable because judging condition scores more accurately is unlikely. Each body condition score averages about 80 to 100 pounds of weight. Therefore, judging condition scores to an accuracy of less than 0.5 condition score would mean judging a difference of less than 40 to 50 pounds.

Acknowledgments:

Appreciation is expressed to Triangle Cross Livestock for providing the cattle and land to conduct this demonstration.

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