Winter Feeding Based on a Forage Test

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NW FL BEEF CONFERENCE

UF | IFAS Extension
UNIVERSITY of FLORIDA

PANHANDLE AG
EXTENSION TEAM

Strategic Winter Feeding

- Determine nutrient demands of cattle
- Determine nutrient content of forage
- Pair cattle and forages based on nutrient content and demand
- Supplement to fill nutritional gaps

Determining Nutrient Demands of Cattle

- Cattle require specific amounts of specific nutrients
  - TDN (energy), CP (protein), etc.
- Cattle can/will only eat so much each day (DMI)
- The DM consumed must contain adequate amounts of the required nutrients (Nutrient Density)

Determining Nutrient Demands of Cattle

- Factors Effecting Nutrient Demand
  - Size/weight
  - Gestation
  - Lactation
  - Growth

Determining Nutrient Demands of Cattle

- Nutritional Requirements are known, assuming you know your cows…

Table 4. Nutrient requirements of 1,200 lb mature cow.

Mature Weight	Nutrient	Months Since Calving											
		1	2	3	4	5	6	7	8	9	10	11	12
1,200	(10 lbs peak milk)												
	DMI, lb/d	24.4	24.9	26.0	25.6	25.1	24.8	24.2	24.1	24.0	23.9	21.4	24.6
	TDN, %	55.3	56.0	53.7	52.9	52.1	51.5	44.9	45.8	47.1	49.3	52.3	56.2
	NEm, mcal/lb	0.54	0.55	0.51	0.50	0.49	0.48	0.37	0.38	0.41	0.44	0.49	0.55
	CP, %	8.43	8.79	8.13	7.73	7.33	7.00	5.99	6.18	6.50	7.00	7.73	8.78
	Ca, %	0.24	0.25	0.23	0.21	0.20	0.19	0.15	0.15	0.15	0.26	0.25	0.25
	P, %	0.17	0.17	0.16	0.15	0.14	0.14	0.12	0.12	0.12	0.16	0.16	0.16
	TDN, lb/d	13.49	13.94	13.96	13.54	13.08	12.77	10.87	11.04	11.30	11.78	11.19	13.83
	NEm, mcal/d	13.18	13.70	13.29	12.80	12.30	11.90	8.95	9.16	9.84	10.52	10.49	13.53
	CP, lb/d	2.06	2.19	2.11	1.98	1.84	1.74	1.45	1.49	1.56	1.67	1.65	2.16
	Ca, lb/d	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.06	0.05	0.06
	P, lb/d	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.04

Chart from *Basic Nutrient Requirements of Beef Cows* By: Hersom; https://edis.ifas.ufl.edu/an190

Determining Nutrient Demands of Cattle

- Individual requirements vs. Herd requirements???
- Management (i.e. defined calving season)
- Grouping (heifers, pairs, etc.)

Determining Nutrient Content of Forages

- Forage quality is highly variable
  - Maturity
  - Species/Variety
  - Rain Damage
  - Storage
  - Fertilization

Determining Nutrient Content of Forages

- Nutrient content of a bale is even harder to determine
- **What is a bale?**
  - Size?
  - Weight?
  - Moisture Content?
- Forage Variability + Bale Variability = Confusion

Determining Nutrient Content of Forages

- To determine the nutrient content of a bale you must…
  - Determine bale weight
    - Scale
  - Determine nutrient content
    - Laboratory forage analysis
  - Together you can determine pounds of specific nutrients per bale

Forage Analysis

UGA extension
Ag & Environmental Services Labs

2015 Certified NIRS by NFTA

Feed and Environmental Water Laboratory
2300 College Station Road
Athens, Georgia 30602-4356
Website: http://aesl.ces.uga.edu

Feed and Forage Analysis Report

(CEC/CEA Signature)

Client Information	Lab Information	Contact
[redacted]	Lab #3556 Received: Sep 28, 2015 Completed: Sep 30, 2015 Printed: Sep 30, 2015 Tests: F2C	**Feed and Environmental Water Lab** 2300 College Station Road Athens, GA 30602 ph: 706-542-7690 e-mail: fewlab@uga.edu

Crop: BERMUDAGRASS
Use: Hay
Species: BEEF
Class/Weight: LACTATING COWS

Variety: Russell
Relative Forage Quality (RFQ): 104.5
Dry Matter Intake (DMI): 2.39% Live Body Weight
Ration Formulation: No

Near Infrared Reflectance (NIR) Analysis

	As-Sampled	Dry-Matter
Crude Protein	10.1 %	12.1 %
Crude Fiber (Estimated)	26.1 %	31.2 %
Neutral Detergent Fiber	57.4 %	68.6 %
Acid Detergent Fiber	31.62 %	37.82 %
Lignin	4.21 %	5.04 %
Non-fibrous Carbohydrates	12.67 %	15.16 %
48-hour Digestibility Parameters		
Digestible Neutral Detergent Fiber	30.25 %	36.19 %
Neutral Detergent Fiber Digestibility	44.07 %	52.72 %
Digestible Dry Matter	55.99 %	66.98 %

	As-Sampled	Dry-Matter
Total Digestible Nutrients	45.0 %	53.8 %
Net Energy of Lactation	0.455 MC/lb	0.544 MC/lb
Net Energy of Maintenance	0.483 MC/lb	0.577 MC/lb
Net Energy of Gain	0.209 MC/lb	0.250 MC/lb
Metabolizable Energy	844 KC/lb	1010 KC/lb
Moisture	16.4 %	0 %
Dry Matter	83.6 %	100 %

Other Analyses

	As-Sampled	Dry-Matter
Nitrates	1647 ppm	1970 ppm

Learning *for* Life

Forage Analysis

- Collect representative sample
- Submit sample to laboratory
  - IFAS
  - UGA
  - Dairy One
  - Waters
- Receive / Interpret Results

Your county Ag Agent can help with all of this

Feed and Forage Analysis Report

(CEC/CEA Signature)

EX. 1

Client Information	Lab Information	Contact
	Lab #3540 Completed: Oct 14, 2013 Printed: Oct 14, 2013	**Feed and Environmental Water Lab** 2300 College Station Road Athens, GA 30602 ph: 706-542-7690 e-mail: soiltest@uga.edu

Crop: BAHIA
Use: Hay
Species: BEEF
Class/Weight: DRY COWS

Variety:
Relative Forage Quality (RFQ): 88.0
Dry Matter Intake (DMI): 2.12% Live Body Weight
Ration Formulation: No

Near Infrared Reflectance (NIR) Analysis

	As-Sampled	Dry-Matter
Crude Protein	6.9 %	8.7 %
Crude Fiber (Estimated)	24.6 %	31.0 %
Neutral Detergent Fiber	54.2 %	68.2 %
Acid Detergent Fiber	32.52 %	40.90 %
Lignin	3.41 %	4.29 %
Non-fibrous Carbohydrates	12.88 %	16.20 %
Water-Soluble Carbohydrates	5.25 %	6.60 %
Digestible Neutral Detergent Fiber	25.81 %	32.46 %
Neutral Detergent Fiber Digestibility	37.84 %	47.60 %
Digestible Dry Matter	56.68 %	71.29 %

	As-Sampled	Dry-Matter
Total Digestible Nutrients	40.6 %	51.1 %
Net Energy of Lactation	0.409 MC/lb	0.514 MC/lb
Net Energy of Maintenance	0.430 MC/lb	0.541 MC/lb
Net Energy of Gain	0.171 MC/lb	0.215 MC/lb
Metabolizable Energy	767 KC/lb	966 KC/lb
Moisture	20.5 %	0 %
Dry Matter	79.5 %	100 %

Feed and Forage Analysis Report

(CEC/CEA Signature)

EX. 2

Client Information	Lab Information	Contact
Agent: Mark Mauldin	Lab #3558 Received: Sep 28, 2015 Completed: Sep 30, 2015 Printed: Sep 30, 2015 Tests: F2C	**Feed and Environmental Water Lab** 2300 College Station Road Athens, GA 30602 ph: 706-542-7690 e-mail: fewlab@uga.edu

Crop: BAHIA
Use: Hay
Species: BEEF
Class/Weight: LACTATING COWS

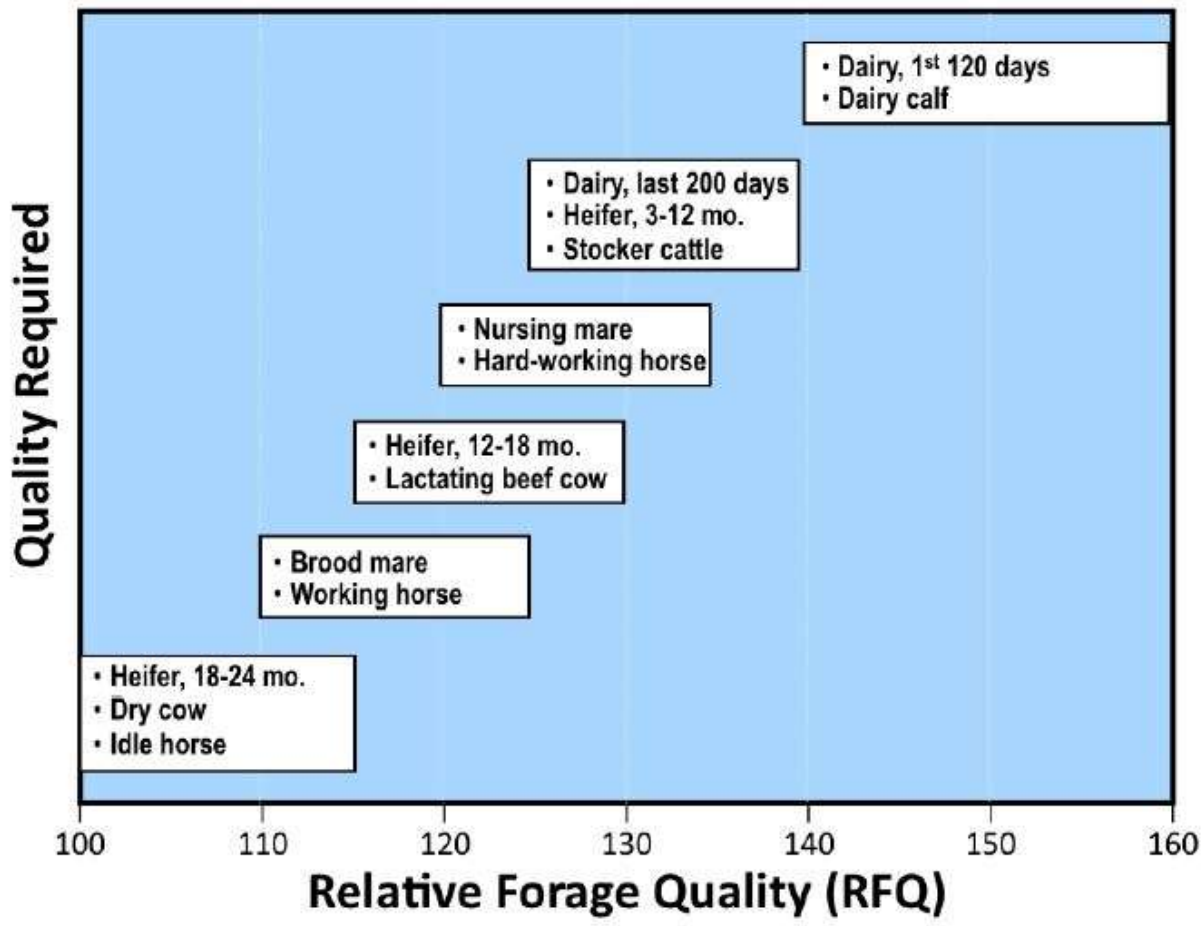
Variety:
Relative Forage Quality (RFQ): 110.6
Dry Matter Intake (DMI): 2.39% Live Body Weight
Ration Formulation: No

Near Infrared Reflectance (NIR) Analysis

	As-Sampled	Dry-Matter
Crude Protein	9.7 %	11.4 %
Crude Fiber (Estimated)	25.3 %	30.0 %
Neutral Detergent Fiber	55.4 %	65.6 %
Acid Detergent Fiber	34.61 %	40.96 %
Lignin	3.41 %	4.03 %
Non-fibrous Carbohydrates	16.75 %	19.83 %
48-hour Digestibility Parameters		
Digestible Neutral Detergent Fiber	31.82 %	37.65 %
Neutral Detergent Fiber Digestibility	48.49 %	57.39 %
Digestible Dry Matter	62.19 %	73.60 %

	As-Sampled	Dry-Matter
Total Digestible Nutrients	48.1 %	56.9 %
Net Energy of Lactation	0.489 MC/lb	0.578 MC/lb
Net Energy of Maintenance	0.522 MC/lb	0.617 MC/lb
Net Energy of Gain	0.246 MC/lb	0.291 MC/lb
Metabolizable Energy	903 KC/lb	1068 KC/lb
Moisture	15.5 %	0 %
Dry Matter	84.5 %	100 %

Comparing / Evaluating Forages



Adapted from Undersander et al., 2011.

Figure 6. The Relative Forage Quality (RFQ) ranges that are suitable to various livestock classes. Adapted from Undersander et al., 2011.

$$RFQ = \frac{TDN \times DMI}{1.23}$$

Figures are from *Understanding and Improving Forage Quality by:* Hancock, et.al. http://extension.uga.edu/publications/files/pdf/B%201425_1.PDF

1,200lbs cow, Moderate Milk, 3mo. Post Calving

- Requirements = 16.36lbs/day TDN
  2.82lbs/day CP
- Ex.1 = 2.12% DMI or 25.44lbs/day DMI
  - 25.44 x 51.1% = 12.99lbs/day TDN (-3.37lbs)
  - 25.44 x 8.7% = 2.21lbs/day CP (-0.61lbs)

1,200lbs cow, Moderate Milk, 3mo. Post Calving

- Requirements = 16.36lbs/day TDN
  2.82lbs/day CP
- Ex.2 = 2.39%DMI or 28.68lbs/day DMI
  - 28.68 x 56.9% = 16.31lbs/day TDN (-0.05lbs)
  - 28.68 x 11.4% = 3.27lbs/day TDN (0.45lbs)

Supplementation

- Make sure you are feeding the right hay to the right cows
  - Match nutrient demand with nutrient content
- Supplement to fill nutritional gaps not cows

Supplementation

- Products used for supplements should have a known nutritional content
- Do the math determine how much they need
- (-3.37lbs TDN), Supplement is 78% TDN
- 3.37 / 78% = 4.32lbs need to fill gap*

Supplementation

- Once you know how much of a supplement will be needed then you can start looking at options based on $$$
- (-3.37lbs TDN), Supplement is 78% TDN 4.32lbs needed @ $0.13/lbs.
  - Cost $0.56/hd./day
- Supplement is 64% TDN 5.27lbs needed @ $0.11/lbs.
  - Cost $0.58/hd./day

Supplementation

- Storage & Feeding Costs
- Waste
- Convenience
- **Consumption** (herd & individual)
  - If they are not eating enough what's the point
  - If they are eating more than they need re-do the math based on actual consumption and see where you are

Winter Feeding Based on a Forage Test **Key Points**

- You must know and manage your cattle
- Forage analysis allows you to quantify the nutritional value of hay (don't forget bale weight)
- Match cattle and forage
- Supplement to fill nutritional gaps
- Monitor consumption (hay and supplement)

Winter Feeding Based on a Forage Test **Key Points**

- Each lot of hay is different and should be tested separately
- Supplement options and prices change frequently
- Don't be scared of the math, we're here to help

Questions

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