

**UF UNIVERSITY of FLORIDA**

Range Cattle Research and Education Center - Ona FL

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## Forage Testing

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*Forage Specialist*

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### Nomenclature

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- ✓ Forage nutritive value = chemical composition, digestibility, and nature of digested products of forage
- ✓ Forage quality = product per animal. Forage quality is measured when forage quantity and animal genetic potential are not limiting, and forage is the sole source of energy and protein (Moot and Moore, 1985)

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### Nomenclature

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- ✓ Protein
  - ✓ CP = crude protein (%)
- ✓ Energy
  - ✓ TDN = total digestible nutrients (%)
  - ✓ GE = gross energy (Mcal/lb)
  - ✓ ME = metabolizable energy (Mcal/lb)
  - ✓ NE = net energy (Mcal/lb)

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## Nomenclature

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- ✓ Fiber
  - ✓ NDF = neutral detergent fiber (%)  
(hemicellulose, cellulose, lignin)
  - ✓ ADF = acid detergent fiber (%)  
(cellulose, lignin)

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## Nomenclature

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- ✓ Forage Quality Indicator – Relative Feed Value (RFV)
  - ✓  $RFV = DMI * DDM / 1.29$
  - DMI =  $120 / NDF$  and  
DDM =  $88.9 - 0.779 * ADF$

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## Nutritional Requirement

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- ✓ Beef Cattle DM, TDN, and CP requirements

Class	DM (lbs)	TDN (%)	CP (%)
Dry cow mid preg	27	48	7
Mature cow 10# milk	30	56	9
2 yr old lact cow	21	63	11

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## Supplementation

Necessary corn supplementation to meet the requirement of a replacement heifer receiving hay with different TDN concentrations

Hay (% TDN)	Gain (lb/d)	lb corn/heifer/d	lb corn/100 d	\$/heifer/100d*
48	1.0	4.4	440	52
54	1.0	1.1	110	13
56	1.0	0	0	0

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## Hay

✓ Hay value calculation: \$/ lb TDN

Example: \$ 70 / round bale

Weight (lb)	TDN (%)	TDN/bale	\$/ TDN
1000	60	600	0.12
1000	50	500	0.14 (16%)

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## Forage Nutritive Value



Water (~ 80%)

Dry Matter (~ 20%)

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### Forage Nutritive Value



Hay

- Water (~ 15%)
- Dry Matter (~ 85%)

Silage

- Water (~ 65%)
- Dry matter (~ 35%)

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### Forage Nutritive Value

Dry Matter

- Protein
- Lipids
- Sugars
- Starch
- Pectin
- Cellulose
- Hemicellulose
- Lignin
- Mineral
- Vitamins

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### Forage Nutritive Value

Dry Matter

- Protein (CP) { %N x 6.25
- Energy (TDN) { Cell contents  
Cell wall (Fiber)

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## Forage Nutritive Value

- ✓ Neutral detergent fiber has an inverse correlation with intake
- ✓ Acid detergent fiber has an inverse correlation with digestibility
- ✓ The majority of the laboratories uses ADF for energy determination in forages

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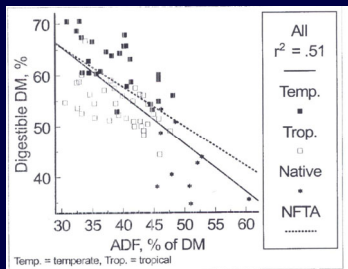
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## Forage Nutritive Value



Moore et al., 1999

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## Forage Nutritive Value

Forage species	ADF		Apparent DDM		Estimate DDM						
	% DM	% DM	% DM	% DM	%						
					Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	NFTA
Stargrass	45.0	51.0	44.2	48.6	53.8	51.2	56.7	48.6	53.8		
Mulato	39.0	64.0	53.5	53.1	58.5	58.1	61.5	53.1	58.5		

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## Forage Sampling

- ✓ The result of the forage testing will be only as good as your sample
- ✓ The sample should be representative and collected correctly

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## Forage Sampling



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## Forage Sampling



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### Forage Sampling



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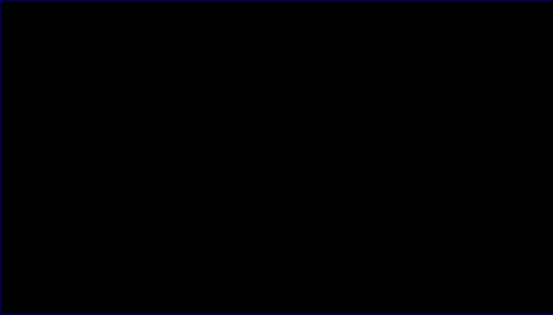
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### Forage Sampling



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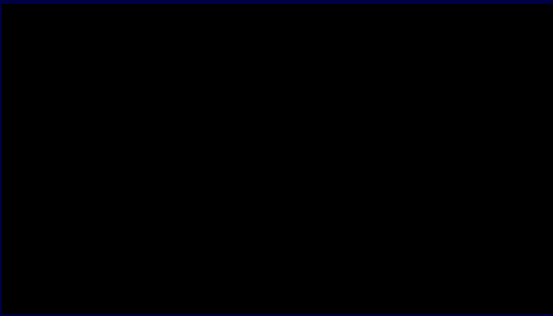
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### Forage Sampling



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## Forage Sampling

- ✓ Samples should be placed in paper or plastic bags and mailed to the laboratory ASAP
- ✓ Fresh forage and haylage/silage may change the composition if stored for long periods of time after sampling

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## UF/IFAS Forage Extension Laboratory

- ✓ Methods
  - CP determined by combustion
  - IVDMD determined by digestion in Ankom bags followed by NDF procedure

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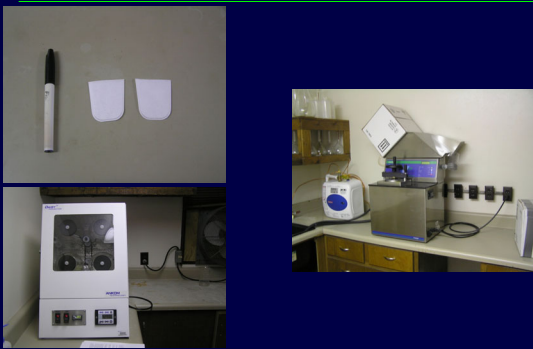
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## UF/IFAS Forage Extension Laboratory



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### UF/IFAS Forage Extension Laboratory

- ✓ Two weeks turn around
- ✓ The FEL charges \$ 7.00 / sample

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### UF/IFAS Forage Extension Laboratory

- ✓ <http://rcrec-ona.ifas.ufl.edu>
- ✓ Forage Extension Lab
- ✓ General form or Dairy check-off form

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**UF FLORIDA** Forage Extension Laboratory  
1645 Experiment Station, Plant City, FL 34686  
Phone (813) 755-2324 ext 228

Mailing Address (please print)  
Name \_\_\_\_\_ Phone \_\_\_\_\_  
Address \_\_\_\_\_  
City/County \_\_\_\_\_ FL Zip \_\_\_\_\_  
Date \_\_\_\_\_ E-mail \_\_\_\_\_

Forage Species: \_\_\_\_\_  
Type of Forage: Please mark one  
 Hay  Haylage  Silage  Pasture  Stocked Forage

Enterprise:  Beef  Dairy  Horse  Hay  Others

Fill in one line per sample and additional sheets for more than 4 samples

Lab Use Only	Sample ID

Amount: \$ 7.00 per sample  
Total: \_\_\_\_\_  
Check \_\_\_\_\_ Money Order \_\_\_\_\_ Cash \_\_\_\_\_  
Checks pay to the order of University of Florida

The Foundation for The Center System  
1645 Experiment Station

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### UF/IFAS Forage Extension Laboratory

- ✓ If the producer would like additional information in the forage testing or the nutritive value of concentrate feed, a different laboratory needs to be considered
- ✓ Please contact the RCREC – Ona, FL for information on additional laboratories

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### Support Publication

- ✓ EDIS – Forage Testing (SS-AGR 63)
- ✓ Average nutritive value for forage samples submitted by producer from Florida

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### Forage Testing Results 2020

Species	CP (%)	TDN (%)
Bermudagrass	10.9	51.7
Stargrass	9.8	51.0
Limpograss	4.1	53.0
Bahiagrass	7.2	50.0
Rhizoma Peanut	14.2	68.8

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