

## Relative Forage Quality (RFQ): A new tool to encourage quality based hay marketing

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## What is quality?

## Crude Protein and Hay Quality

- Crude Protein is possibly the most overrated hay measure available!
- Tells you very little about energy content
- Tells you nothing about form nitrogen is in
  - Protein (AA), Bound Protein, Nitrates etc.
- Protein requirements of beef cows are (typically) easily met
- Still important- just overemphasized

## Energy (calories) are typically limiting animal performance.

- “Quantitatively, energy is the most important item in an animals diet, and all feeding standards and ration formulation are based on some measure of energy with *additional* inputs on protein...” (Church, 1991)
- Problem: Energy is difficult to measure accurately

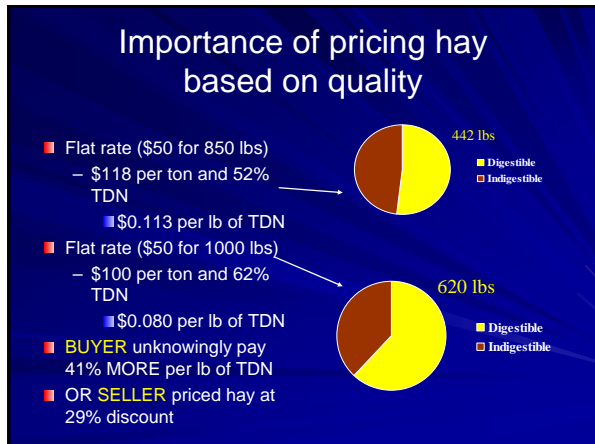
## Where are we now?

- Presently, hay is marketed predominantly on a per bale basis
  - Weight and quality are rarely accounted for
- Even in drought situations of 2007, weight was rarely considered in purchases...
- Will we ever get to weight-based marketing?
  - Fertilizer, fuel, squeeze on forage inputs may eventually *force* us!

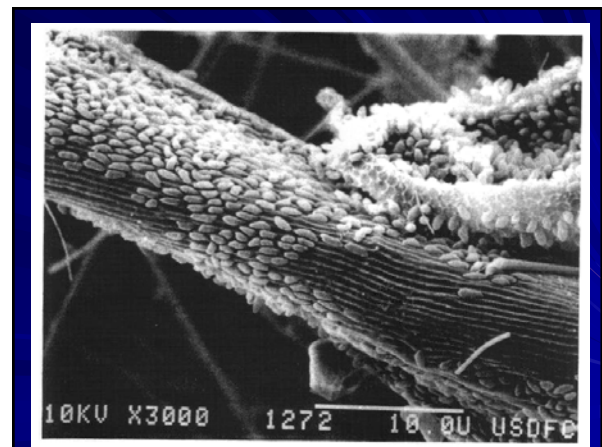
## Why should we be concerned about quality-based marketing?

- “Typical” \$7.00 square bale
  - \$7 for 45 lb bale
    - \$311 per ton
  - \$7 for 60 lb bale
    - \$233 per ton
- “Typical” \$50 round bale
  - \$50 for 850 lb bales
    - \$118 per ton 52% TDN
  - \$50 for 1000 lb bales
    - \$100 per ton 62% TDN





- ### Why haven't we adapted quality-based marketing?
- The present "system" is easy
    - Decreases need to educate customers
    - Eliminates need to keep hay lots separate
    - Eliminates need to sample and test hay lots
  - Consumers currently don't appear to care
    - Is it possible to get a premium?
    - Most beef producers look for cheapest bales
    - Horse customer definition of "high-quality" hay = green, dust/weed-free and fine-stemmed
  - Past hay quality definitions have been difficult to understand, relatively inaccurate, and therefore difficult to price

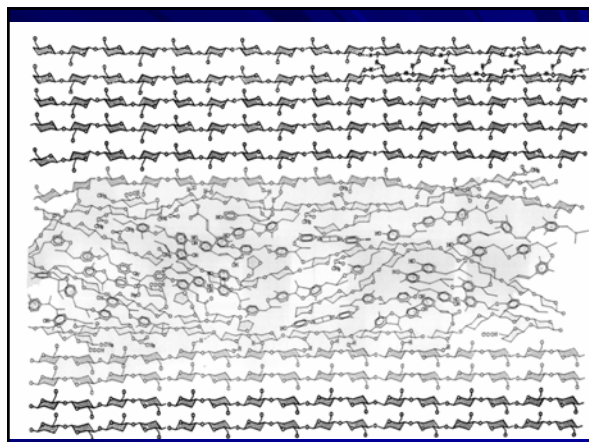


- ### Current Commercial Lab Equations
- No practical and economical way to measure hay quality directly
  - Fiber-based system developed in the '70s based on cool season plants
    - As fiber concentration increases, hay energy content decreases
    - Fiber is constructed differently in cool season forages
  - Absolutely no consideration given to fiber *quality*
  - What about Tifton 85???

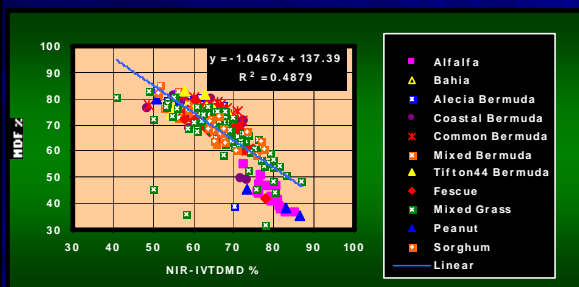
## Fiber content and digestibility of bermudagrass

| Variety   | NDF % | Predicted Digestibility* | Actual Digestibility % |
|-----------|-------|--------------------------|------------------------|
| Coastal   | 66.4  | 60.2                     | 57.3                   |
| Tifton 85 | 69.2  | 58.4                     | 61.1                   |

\*Eq. 10 from Moore et al. 1998  
Data from (Hill et al., 2000)



## NDF vs. NIR-IVTDM



## Now that we're all confused... How can we simplify this?

- Relative Forage Quality (RFQ)
  - Predicts energy based on fiber quality and intake
  - Single number
    - RFQ of 100 is roughly equal to full-bloom alfalfa
    - Allow hay to be easily assigned to appropriate physiological stage
    - Relative Forage Quality should allow comparisons to be made across forage species

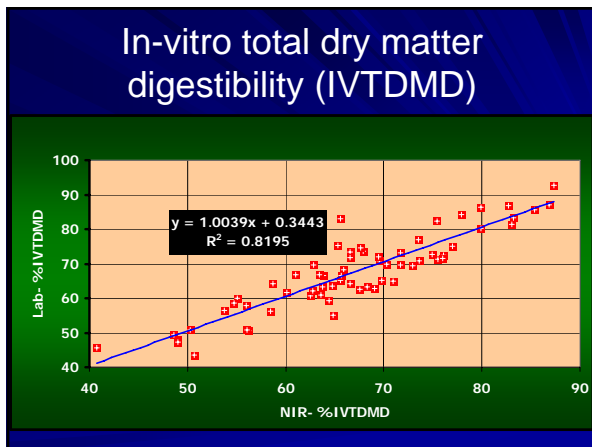
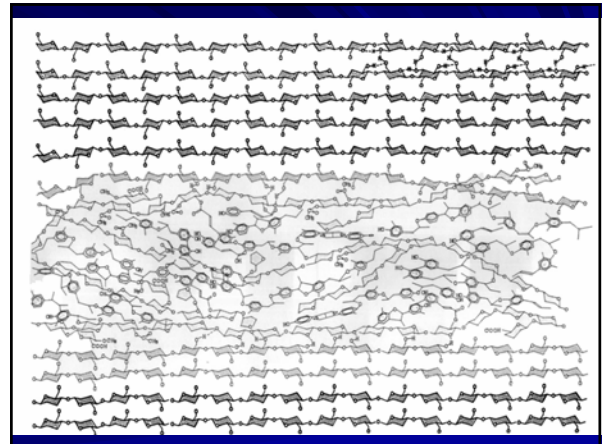
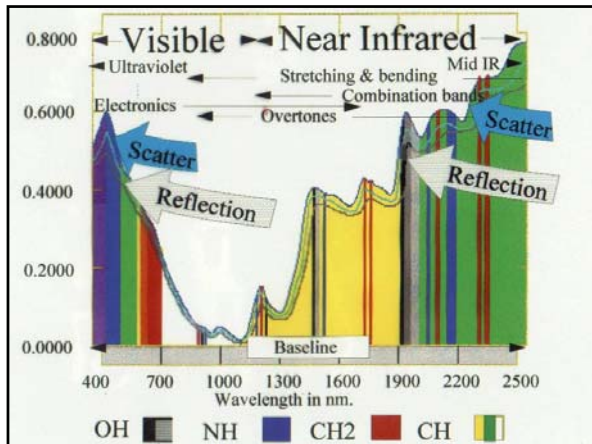


## How does this work?

## Near Infra-Red Reflectance (NIR) Lab



- Less expensive alternative to wet chemistry
- More rapid
- Non destructive to the sample
- However, no minerals by NIR



### Forage Quality Needs of Cattle by RFQ

| Cattle Type                                  | Relative Forage Quality |
|--|-------------------------|
| 18-24 mo heifer<br>Dry cow                   | 100                     |
| 12-18 mo heifer<br>Beef cow-calf pair        | 115-130                 |
| Dairy, last 200 days lact<br>3-12 mo heifers | 125-150                 |
| Stocker cattle                               |                         |
| Dairy, 1 <sup>st</sup> 3 mo lactation        | 140-160                 |

Source: D. Undersander

### Can we expect premiums?

- We have tried to PUSH quality based hay pricing for years with no success.
- How do we get consumers to realize the value of (and pay for) quality hay?
- Encouraging pricing using this system will likely need a PULL approach.
  - Hopefully can educate hay consumers to ask for nutrient analysis

### What's this going to cost me?

## Cost Comparison (UGA)



| Measurement                                | NIR       | Wet Chemistry |
|--|-----------|---------------|
| CP, NDF, RFO, TDN, NEm, NEg, NEI, Moisture | \$8       | \$21          |
| + Nitrate                                  | \$10      | \$23          |
| + Minerals                                 | \$20      | \$28          |
| + ADF                                      | No charge | \$38          |
| + Lignin                                   | No Charge | \$53          |