What we want

- Six Key Nutrients
  - Water
  - Protein
  - Carbohydrates
  - Fats
  - Minerals
  - Vitamins

What we DO NOT want

Nutrient Requirements

The amount of nutrient that an animal needs to perform a specific purpose.

- Determined by: weight, sex, age, growth rate, stage of production.

Basic Nutrition

Dry Matter

- The % of a feed stuff that is not water.
- Rations will come in as pounds of dry matter (DM) or As Fed (with water).
- For example: If hay is 88% dry matter then a 1,000 pound bale of hay would be 880 lbs of dry matter.
**Crude Protein**

Proteins are the building block for animals and are chains of amino acids.

Crude protein is determined by the amount of Nitrogen (N) in a feed multiplied by 6.25.

N is used to determine the amount of protein, because the N is critical part of the amino acid structure and makes up approximately 16% of the protein structure.

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**Energy**

Energy is defined as the capacity to do work.

Common measurements of energy in ration formulation:
- Grass Energy (GE) – total amount of energy in a feed source
- Digestible Energy (DE) – Energy absorbed by the animal after consumption
- Metabolizable Energy (ME) – Energy that is available through feed consumption
- Net Energy (NE) – Broken into maintenance, growth, lactation, etc.
- Total Digestible Nutrients (TDN) – A method that calculates energy based all sources of energy.

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**Characterizing fiber in forages**

Neutral Detergent Solubles (Cell Content)
- Ash
- Lipids
- CP, NPN

Acid Detergent Fiber (ADF)
- Cellulose
- Lignin

Neutral Detergent Fiber - NDF (Cell Wall)
- Cellulose
- Hemicellulose
- Lignin

Associate with dry matter intake
- NDF = ↓ DMI
- ADF = ↑ DMI

Associate with digestibility
- NDF = ↓ Digestibility
- ADF = ↑ Digestibility

---

**Fiber and Nutritive Quality**

<table>
<thead>
<tr>
<th>Early maturity</th>
<th>Late maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thin Cell Wall</td>
<td>Thick Cell Wall</td>
</tr>
</tbody>
</table>

Cell Content
- NDF = ↓ DMI
- ADF = ↑ Digestibility

Cell Wall
- NDF = ↑ DMI
- ADF = ↓ Digestibility

---

**Developing a Nutritional Program**

1. Understand your production system
   - Fall Calving
   - Spring Calving
   - Continuous

2. Understand your forage system
   - Amount produced
   - Nutritive value

3. Develop a supplement to meet nutrient requirements

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Dr. Lawton Stewart, Extension Beef Nutritionist
2011 Southeast Hay Convention
Forage Quality I: Nutritional Quality

Reproductive Efficiency

- The most important factor affecting profitability
- Highly dependent on proper nutrition

Nutrient Priorities

1. Maintenance
2. Growth (Heifers)
3. Lactation
4. Reproduction

Brood Cow Nutrient Requirements

Separate Cows Based on Stage of Production

Understand your forage system

Typically focus on ability to produce hay
- Why?
  • Large source of nutrients during winter
  • Great insurance policy
  • High quality forage??

How do you determine Quality?

Can we use:
- Look?
- Feel?
- Smell?

Test Your Forages!!!
How do you determine Quality?

Let the animals tell you:

1. Low body condition score
2. Manure piles (hard, dry, and tall)

Low quality browse is over grazed

Available Forages

- Hay produced
  - Storage
  - Testing
  - Inventory

Hay Cutting
1. CP 14% TDN 60%
2. CP 10% TDN 55%
3. CP 6% TDN 47%

TEST FORAGES!!!!

Take home example

<table>
<thead>
<tr>
<th>Hard size, # of head</th>
<th>May 1</th>
<th>May 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow size, lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily hay intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2% of BW), lb/h/d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 d hay intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(peak lactation), tons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total forage cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>($50/1,000 lb roll)</td>
<td></td>
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</tr>
<tr>
<td>Forage analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily supplement,</td>
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<td></td>
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<td>lb/h/d/Head</td>
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-50:50 mix of corn gluten feed and soyhulls ($240/ton)

Take Home Message

- Understand changing nutrient needs throughout production cycle.
- Know your forages.

Test your forage

Herd size, # of head | May 1 | May 2 |
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