Nutrition and Feeding
For Show Animals

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Questions for You
• What is the most important nutrient?
• What nutrient drives body weight gain?
• How much should your animal eat?
• Which minerals help bone formation?
• What is the most limiting amino acid for pigs?
• How do you calculate average daily gain?
• What is the best feed?

GAME PLAN
• Purchase date & show date = time on feed
• Purchase weight & show weight = total gain
• Frame size/growth potential = show weight
• Gain – lbs/day
  – Calves – 3.0 to 4.5 lb/day
  – Hogs – 0.5 to 3.5 lb/day
  – Lambs – 0.5 to 1.25 lb/day
  – Goats – 0.25 to 1.0 lb/day
• Feed requirement – light, moderate, heavy

Important Terms
• Starter/Grower
  – Mission is to grow in size and lean muscle
• Finisher
  – Mission is to finish growing: muscle and fat

Nutrition Terminology

<table>
<thead>
<tr>
<th>Abbrev.</th>
<th>Name</th>
<th>Units</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMI</td>
<td>Dry Matter Intake</td>
<td>lbs, kg</td>
<td>Feed consumption on a dry weight (no water) basis</td>
</tr>
<tr>
<td>CP</td>
<td>Crude Protein (%)</td>
<td>%</td>
<td>Measure of protein content of a feed</td>
</tr>
<tr>
<td>TDN</td>
<td>Total Digestible Nutrients (%)</td>
<td>%</td>
<td>Routine measure of energy content of a feed, applicable for cattle, sheep, goats, horses</td>
</tr>
<tr>
<td>ME</td>
<td>Metabolizable Energy</td>
<td>Mcal/lb</td>
<td>More refined measure of energy content of a feed</td>
</tr>
<tr>
<td>Ca</td>
<td>Calcium %</td>
<td>%</td>
<td>Mineral</td>
</tr>
<tr>
<td>P</td>
<td>Phosphorus %</td>
<td>%</td>
<td>Mineral</td>
</tr>
<tr>
<td>Fiber, Acid or Neutral Detergent</td>
<td>%</td>
<td>Fiber is a component of any plant product, some is digestible and provides energy, other fiber is not digestible</td>
<td></td>
</tr>
<tr>
<td>Crude Fat</td>
<td>%</td>
<td>Measure of fat in a feedstuff</td>
<td></td>
</tr>
</tbody>
</table>
Important Terms

- **TDN (Total Digestible Nutrients, %)**
  - A good way to estimate energy density of a feed
  - Growing beef require between 65-75% TDN
  - Ask your feed dealer for this value (not on feed tag)
  - TDN ≈ 80% - Crude Fiber %

- **Metabolizable Energy (mcal)**
  - More precise way to evaluate energy density of feed, swine and beef cattle
  - How much energy is available for the animal to use

Important Terms

- **CP (crude protein)**
  - Estimates how much protein in a feed, but doesn’t tell how much can actually be used by the animal
  - Amounts different between species and stage of growth
  - Info on feed tag

- **Amino Acids**
  - Specific ones are supplemented for monogastrics

What do feeds provide?

- **What is a nutrient?**
  - Chemical substance that provides nourishment for the body

- **What types of nutrients are there?**

What types of nutrients are there?

- **Protein**
  - Vitamins
- **Carbohydrates**
  - Minerals
- **Fats**
  - **Energy**
- **WATER**

Types of Nutrients...

- **Water** – the MOST IMPORTANT
  - Animal’s body is 70% water
  - Water consumption drives feed intake
    - Thirsty animals don’t eat
  - Important for nutrient transport, waste removal, and digestion
  - Supply CLEAN, FRESH, cool SUPPLY daily!!!
    - If you won’t drink it why should they
Consumption of Water

- Most important nutrient
- Dependent upon environmental conditions
- For the unstressed animal
  - Swine: 1.5 - 3.0 gallons/day
  - Sheep/Goats: 1.5 - 3.0 gallons/day
  - Cattle: 10 - 14 gal/day (~1 gal/100 lbs BW)
  - Horses: 10 – 14 gal/day (~1 gal/100 lbs BW)

Types of Nutrients...

- Carbohydrates
  - Provide ENERGY!!
  - Energy needed to grow and perform
  - Examples include grain, hays
  - Makes up over 80% of growing animal ration

Energy

- Total Digestible Nutrients (TDN) or Metabolizable Energy (ME)
  - Major "nutrient" required by animal for growth
  - Product of digestion of feed, pasture most important source
  - Direct relationship between TDN and quality of feedstuff
  - Low quality feed = low energy and low intake
- What provides energy to animals
  - Carbohydrates
  - Fats/Lipid
  - Some protein

Protein

- Crude Protein (CP)
  - Natural: soybean and/or cottonseed meal, alfalfa, CGF
    - Animal performance: natural>NPN
    - Supply protein, energy, and other nutrients
    - Often fed in dry or pelleted feeds
    - Increased cost/lb but valuable source of protein
  - NPN: urea – ruminants only
    - Works best with medium- and high-energy diets
    - Lacks energy, vitamins, and minerals
    - Management and toxicity issues
    - Dry or liquid feeds
  - Amino Acids
    - monogastrics

Lipids

- Where do they get it
  - Pasture/grass
  - Hay
  - Pellet/Cube
  - Manufactured feed
  - Liquid feed
  - Formulated blocks
- Fat provides energy
- Fat is not the most important nutrient in the diet
- Fat is not main driver for energy
Vitamins

- Where do they get it
  - Pasture/grass
  - Hay
  - Pellet / Cube
  - Manufactured feed
  - Liquid feed
  - Loose mineral
  - Formulated blocks
  - NOT from trace mineral SALT block
    - Salt + color
- Fat Soluble
  - Vitamin A, D, E
  - Need to be supplemented
- Water Soluble
  - B-vitamins, C, K
  - Ruminants make these
  - Hogs need them supplemented

Minerals

- Where do they get it
  - Pasture/grass
  - Hay
  - Pellet / Cube
  - Manufactured feed
  - Liquid feed
  - Loose mineral
  - Formulated blocks
  - NOT from trace mineral SALT block
    - Salt + color
- Macro Minerals
  - Ca, P, Mg, Na, Cl, K, S
  - Occur in large amounts (%)
- Micro Minerals
  - Co, Cu, Fe, I, Mn, Mo, Se, Zn
  - Occur in small amounts (ppm)
  - Cu above 11 ppm toxic to sheep

Nutrient Requirements

- Your animal requires minimum amounts of the various nutrients
- This amount varies based upon
  - Age, weight, breed, exercise/stress level, balance of the other nutrients, etc
- Important to know how your animal’s requirements change over the feeding period

Hierarchy of Nutrient Use

1. Maintenance
   - Survival - bodily functions, digestion, locomotion
2. Growth (young animals)
   - Muscle, fat, and bone growth
3. Lactation
   - Milk production for offspring - energy/protein intensive
4. Reproduction

Growth Curve

1. Prenatal
2. Rapid Growth
3. Fat deposit begins
4. Fat

Growing Animal Intake Requirements

- Intake
- Energy
- Protein

Body Weight, lbs

Intake Requirements
Growing Animal Requirements

Summary

- As BODY WEIGHT INCREASES...
  - Dry Matter Intake INCREASES
  - Energy Needs INCREASE
  - Protein Needs DECREASE
  - Calcium and Phosphorus Needs DECREASE

Nutrient Ranges

<table>
<thead>
<tr>
<th>Animal</th>
<th>Intake</th>
<th>Energy</th>
<th>Protein</th>
<th>Fat</th>
<th>Fiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fowl</td>
<td>50 – 1600 g/week</td>
<td>6200 – 7300 kcal/lb ME</td>
<td>12 – 26% CP</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Cow</td>
<td>1.5 – 3.0% BW</td>
<td>45 – 90% TDN</td>
<td>6 – 18% CP</td>
<td>&lt; 4% total diet</td>
<td>&gt; 8% NDF in diet</td>
</tr>
<tr>
<td>Goat</td>
<td>1.3 – 4.2% BW</td>
<td>53 – 68% TDN</td>
<td>5.5 – 20% CP</td>
<td>&lt; 4% total diet</td>
<td>&gt; 8% NDF in diet</td>
</tr>
<tr>
<td>Horse</td>
<td>1.5 – 3.0% BW</td>
<td>0.9 – 1.40 Mcal/lb DE</td>
<td>8 – 14.5% CP</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Pig</td>
<td>3 lbs to 5% BW</td>
<td>7200 kcal/lb ME</td>
<td>12 – 26% CP</td>
<td>3.5-6.5%</td>
<td>--</td>
</tr>
<tr>
<td>Sheep</td>
<td>1.5 – 5.2 % BW</td>
<td>55 – 80% TDN</td>
<td>9 – 26% CP</td>
<td>&lt; 4% total diet</td>
<td>&gt; 8% NDF in diet</td>
</tr>
</tbody>
</table>

Appropriate Feeds Animals

<table>
<thead>
<tr>
<th>Animal</th>
<th>Pasture Hay</th>
<th>Corn/ Oats</th>
<th>Pellet/Cube</th>
<th>Meal/Mash</th>
<th>Browse</th>
<th>Sweet Feed</th>
<th>Liquid Supp</th>
<th>Loose Mineral</th>
<th>Salt/Mineral Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fowl</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>no</td>
</tr>
<tr>
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<td>XXXX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>no</td>
</tr>
<tr>
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<td>X</td>
<td>X</td>
<td>no</td>
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<tr>
<td>Pig</td>
<td>{X}</td>
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<td>[X]</td>
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</tr>
<tr>
<td>Sheep</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>no</td>
</tr>
</tbody>
</table>

Simple Feed Classifications

<table>
<thead>
<tr>
<th>Roughage</th>
<th>Grains</th>
<th>Protein meals</th>
<th>By-products</th>
<th>Additives</th>
<th>“Bad” Stuff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>Corn</td>
<td>Soybean meal</td>
<td>Corn gluten</td>
<td>Trace minerals</td>
<td>Peanut skins</td>
</tr>
<tr>
<td>Alfalfa cubes</td>
<td>Oats</td>
<td>Cottonseed meal</td>
<td>feed</td>
<td>Vitamins</td>
<td></td>
</tr>
<tr>
<td>Beet pulp</td>
<td>Barely</td>
<td>Corn gluten feed</td>
<td>Dried distillers</td>
<td>Flavors</td>
<td></td>
</tr>
<tr>
<td>Cottonseed hulls</td>
<td>Wheat</td>
<td>Molasses</td>
<td>grains</td>
<td>Probiotics</td>
<td></td>
</tr>
<tr>
<td>Silage</td>
<td>Milo / Sorghum</td>
<td>Fish meal</td>
<td>Wheat midds</td>
<td>Antibiotics</td>
<td></td>
</tr>
<tr>
<td>Stone meal</td>
<td></td>
<td>Rice mill feed</td>
<td>Rice</td>
<td>Urea</td>
<td></td>
</tr>
</tbody>
</table>

Feed Tag Review

- Guaranteed Analysis: CP, Fat, Fiber, Min/Vit TDN?
- Ingredient List
- Feeding Directions
- Caution Statements

TDN = 80% - Crude Fiber
TDN = 70%, different than rough calc of 80%-7%, why?
Table 4. Estimating TDN of commercial feed (base: 13% crude protein, 2% crude fat) using fiber and ash content

<table>
<thead>
<tr>
<th>% Ash on the feed tag</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>86.9</td>
<td>85.1</td>
<td>82.3</td>
<td>81.5</td>
<td>79.7</td>
<td>77.9</td>
</tr>
<tr>
<td>3</td>
<td>86.1</td>
<td>84.3</td>
<td>82.5</td>
<td>80.7</td>
<td>78.9</td>
<td>77.1</td>
</tr>
<tr>
<td>4</td>
<td>85.3</td>
<td>83.5</td>
<td>81.7</td>
<td>79.9</td>
<td>78.1</td>
<td>76.3</td>
</tr>
<tr>
<td>5</td>
<td>84.5</td>
<td>82.7</td>
<td>80.9</td>
<td>79.1</td>
<td>77.3</td>
<td>75.5</td>
</tr>
<tr>
<td>6</td>
<td>83.7</td>
<td>81.9</td>
<td>80.1</td>
<td>78.3</td>
<td>76.5</td>
<td>74.7</td>
</tr>
<tr>
<td>7</td>
<td>82.9</td>
<td>81.1</td>
<td>79.3</td>
<td>77.5</td>
<td>75.7</td>
<td>73.9</td>
</tr>
<tr>
<td>8</td>
<td>82.1</td>
<td>80.3</td>
<td>78.5</td>
<td>76.7</td>
<td>74.9</td>
<td>73.1</td>
</tr>
<tr>
<td>9</td>
<td>81.3</td>
<td>79.5</td>
<td>77.7</td>
<td>75.9</td>
<td>74.1</td>
<td>72.3</td>
</tr>
<tr>
<td>10</td>
<td>80.5</td>
<td>78.7</td>
<td>76.9</td>
<td>75.1</td>
<td>73.3</td>
<td>71.5</td>
</tr>
</tbody>
</table>

1 For 16% protein feed, deduct 0.5% TDN from the estimate in the table
For 10% protein feed, add 0.5% TDN to the estimate in the table
For each 1% fat over 2% add 2.25% TDN to the estimate in the table

Adapted from J. Sprinkle, 1999, Univ. of Arizona Coop. Extension bulletin AZ1054

Feed Tag Review

• Guaranteed Analysis: CP, Fat, Fiber, Min/Vit TDN??
• Ingredient List
• Feeding Directions
• Caution Statements

TDN = ??

Management and Feeding

• Water
• Bunk Space
• Feed Delivery
  - Amount
  - Self vs hand fed
  - Frequency and timing
• Weigh
• Exercise

Show Pig Nutrition

• The feeding program will dictate how your animals will develop and mature
• A good feeding program cannot make up for a lack of superior genetics, but it will allow your animal to reach their genetic potential
• A poor feeding program can cause an animal with great genetic potential to be wasted.
Key Nutrients

- **Protein**
  - 18-22% crude protein, decline with increasing BW
- **Essential Amino Acids**
  - Lysine is 1st limiting for growth
  - Threonine, Tryptophan, Methionine

**Minimum Protein and Lysine Levels**

<table>
<thead>
<tr>
<th>Weight</th>
<th>Ctr</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
</tr>
<tr>
<td>11-25</td>
<td>1.25</td>
<td>1.15</td>
<td>1.05</td>
</tr>
<tr>
<td>25-100</td>
<td>1.20</td>
<td>1.05</td>
<td>0.95</td>
</tr>
<tr>
<td>100</td>
<td>1.15</td>
<td>1.00</td>
<td>0.95</td>
</tr>
<tr>
<td>200</td>
<td>1.00</td>
<td>0.85</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Key Nutrients

- **Minerals**
  - Macro
    - Ca
    - K
    - Mg
    - Na, Cl
    - P
  - Micro
    - Co
    - Cu
    - I
    - Mn
    - Se
    - Zn

- **Vitamins**
  - Fat soluble
    - A, D, E, K
  - Water soluble
    - B1, B2, B3, B5, B6, B7, B9, B12, Niacin, Riboflavin, Thiamin, Pyridoxine, Pantothenic Acid, Folic Acid, Biotin

Manufactured Feeds/Mineral/Vitamin Supplement best bet to provide

Rations

**150 lbs to Show**

- 150 to 200 lbs
- 3-3.5% of BW intake
- Start weighing consistently
- Manipulate diet to achieve goals
- 0.9-1.0% Lysine
- Allow for growth during last 30 days
- Need to gain more weight
  - Frequent small meals
  - Pelleted feed – intake and digestibility
  - Paylean

**Holding**

- 150 to 200 lbs
- Always allow consumption of water
- Use special rations or create your own
- Allow some gain
- Add bulk to diet for satiety, decrease total energy
- Limit feed 2.5-3% BW
- Minimum 4 lbs of feed

Management Stuff

- Water delivery needs to be the same at home and show, performance is only as good as water intake
- **Exercise** at start 1 to 2 times per week for 10-15 min (start just like we do)
- **Feed** consistently - same time 2-3X/day
- **Weigh** your pig-scale or cloth tape, calculate ADG
- **Paylean** – follow directions, understand what it does, over 150 lb BW, last 45-90 lbs of growth

**Fat Levels in Diet**

<table>
<thead>
<tr>
<th>Weight</th>
<th>Ctr</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
</tr>
<tr>
<td>11-25</td>
<td>7</td>
<td>6.5</td>
<td>5.5</td>
</tr>
<tr>
<td>25-100</td>
<td>5.5</td>
<td>5.0</td>
<td>4.5</td>
</tr>
<tr>
<td>100</td>
<td>4.5</td>
<td>3.5</td>
<td>2.5</td>
</tr>
<tr>
<td>200</td>
<td>3.5</td>
<td>2.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Starter**

- 25-100 lbs
- Don’t limit feed intake
- 20-18% crude protein
- 5.5% fat
- 1.2-1.3% Lysine
- Encourage eating

**Grower**

- 50-150 lbs
- Don’t limit feed intake
- 5% of BW intake
- 18-19% crude protein
- 4-5% fat
- 1.2-1.3% Lysine
- Light exercise
- Health and deworming
Estimating Pig Body Weight Without Scales

<table>
<thead>
<tr>
<th>Inches of Clothing Tap</th>
<th>Pig Weight, lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>59</td>
</tr>
<tr>
<td>27</td>
<td>69</td>
</tr>
<tr>
<td>28</td>
<td>79</td>
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<td>29</td>
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<td>30</td>
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<td>31</td>
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<td>32</td>
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<td>33</td>
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<td>34</td>
<td>140</td>
</tr>
<tr>
<td>35</td>
<td>150</td>
</tr>
<tr>
<td>36</td>
<td>160</td>
</tr>
</tbody>
</table>

Measures the distance from the top of the shoulders down and around the chest of the pig just behind the front legs and back up to the starting point. The pigs should be on continuous feed and water to insure accuracy of results.

Growth Requirements

- In goats energy and protein are linked together

<table>
<thead>
<tr>
<th>ADG, lb/d</th>
<th>Add. Intake, lb</th>
<th>TDN, lb</th>
<th>CP, lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.22</td>
<td>0.33</td>
<td>0.44</td>
<td>0.03</td>
</tr>
<tr>
<td>0.44</td>
<td>0.66</td>
<td>0.88</td>
<td>0.06</td>
</tr>
<tr>
<td>0.66</td>
<td>1.00</td>
<td>1.32</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Nutrient Requirements of Goats

<table>
<thead>
<tr>
<th>Growing Lamb</th>
<th>Nutrient Requirements of Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>--------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>BW</td>
<td>Intake, % of BW</td>
</tr>
<tr>
<td>Replacement</td>
<td>66</td>
</tr>
<tr>
<td>Ewe / Ram</td>
<td>88</td>
</tr>
<tr>
<td>&gt;110</td>
<td>2.5 / 3.5</td>
</tr>
<tr>
<td>Market Lamb,</td>
<td></td>
</tr>
<tr>
<td>4-7 month</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>&gt;110</td>
</tr>
</tbody>
</table>
Effect of Growing Lamb BW on Energy Requirement

**Effect of Growing Lamb BW on Protein Requirement**

**Nutrient Requirements of Lambs**

- **Body Condition Score**
  - BCS 1 (Emaciated) No fat between skin and bone. Ewes have no fat and very limited muscle energy reserves. Appear weak and unthrifty. Wool fleeces are often tender, frowsy and lack luster.
  - BCS 2 (Thin) Only a slight amount of fatty tissue detectable between skin and bone. Spinous processes are relatively prominent. These ewes appear thrifty but have only minimal fat reserves.
  - BCS 3 (Average) Average flesh but do not have excess fat reserves. This condition score includes ewes in average body condition.
  - BCS 4 (Fat) Moderately fat. Moderate fat deposits give sheep a smooth external appearance.
  - BCS 5 (Obese) Extremely fat. Excess fat deposits can easily be seen in the breast, flank, and tailhead regions. These ewes have excess fat reserves to the point that productivity may be impaired.

**Mineral Nutrition**

- Copper levels in mineral are important to know.
  - High Cu levels are toxic
- Calcium:Phosphorus
  - 2:1s optimum
  - Pasture can be low in Ca
  - Concentrates generally high in P
- Urinary calculi
- Limestone

- Magnesium special consideration for nursing ewes
- Grass tetany
- Selenium
  - White muscle disease
  - Inorganic vs organic
- Goats need greater S conc.

- Specific minerals mixes for Sheep and Goats

**Estimating Sheep Bodyweight**

https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1053.pdf
**Questions**

- Additional resource UF/IFAS EDIS document: *Growing Calf and Show Steer Feed Management*
  - https://edis.ifas.ufl.edu/pdffiles/AN/AN25400.pdf

**Roughage in Growing/Finishing Diets**

- Rumen function
- Low dietary levels of roughage
  - digestive upsets: acidosis, liver abscesses
- Small amounts: 3-15% roughage
  - ~10% roughage will optimize performance
  - On an energy basis, roughage is one of the most expensive ingredients in the diet.
- Roughage Sources
  - alfalfa hay, grass hay, silage, byproducts (hulls)

**Nutritional Concerns**

- Feeding high concentrate diets upon arrival increases energy intake
- decreases cost of gain
- improves performance
- increases morbidity and mortality
- Good quality hay (free choice) can help overcome the negative health aspects

**Grains in Finishing Diets**

- Grain diets predispose the animal to acidosis
- “Balancing Act”
  - max grain intake & minimize digestive disorders
  - cattle show gray off-color stools
    - indicative of acidosis
- Grains that stimulate acidosis
  - wheat > corn ~ milo > barley
- Greater risk with highly processed grains-fine grind
Ionophores

- Monensin – Rumensin
- Lasalocid – Bovatec
- Laidlomycin proprionate – Cattlyst

Applications:
- Backgrounding
- Stocker
- Replacement heifer development
- Feedlot
- Under utilized in Florida

Implants

- Growth promoting implants are pellets that are implanted under the skin of the ear of growing calves
- Pellets release extremely low concentrations of various hormones
- Improve growth rate, feed conversion, and protein deposition

Table 1. Feeding system adaptation timeline

<table>
<thead>
<tr>
<th>Timeline</th>
<th>Roughage-Hay</th>
<th>Grain-Concentrates, lbs</th>
<th>Predicted Total Intake, lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrival at home</td>
<td>All calves will consume</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Day 1 to 3</td>
<td>All calves will consume</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Day 3 to 5</td>
<td>All calves will consume</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Day 5 to 7</td>
<td>All calves will consume</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Day 7 to 10</td>
<td>All calves will consume</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Day 11 to 12</td>
<td>All calves will consume</td>
<td>7</td>
<td>15</td>
</tr>
</tbody>
</table>

Growing-Finishing Steer-up

<table>
<thead>
<tr>
<th>Time</th>
<th>Roughage-Hay, lbs (% of diet)</th>
<th>Grain-Concentrates, lbs (% of diet)</th>
<th>Predicted Total Intake, lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 5 days</td>
<td>7 (50%)</td>
<td>7 (50%)</td>
<td>14</td>
</tr>
<tr>
<td>2 to 5 days</td>
<td>6 (40%)</td>
<td>9 (60%)</td>
<td>15</td>
</tr>
<tr>
<td>3 to 5 days</td>
<td>5 (30%)</td>
<td>11 (70%)</td>
<td>16</td>
</tr>
<tr>
<td>4 to 5 days</td>
<td>4 (20%)</td>
<td>13 (80%)</td>
<td>17</td>
</tr>
<tr>
<td>5 to 6 months</td>
<td>3 (20%)</td>
<td>80%</td>
<td>Increase daily feed amount</td>
</tr>
</tbody>
</table>

Table 2: Average daily gains in cattle reared in feedlots and Finishing systems

<table>
<thead>
<tr>
<th>Daily Intake</th>
<th>Daily Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>1.2</td>
</tr>
<tr>
<td>0.6</td>
<td>1.5</td>
</tr>
<tr>
<td>0.7</td>
<td>2.0</td>
</tr>
<tr>
<td>0.8</td>
<td>3.0</td>
</tr>
<tr>
<td>0.9</td>
<td>4.0</td>
</tr>
<tr>
<td>1.0</td>
<td>6.0</td>
</tr>
<tr>
<td>1.1</td>
<td>8.0</td>
</tr>
<tr>
<td>1.2</td>
<td>10.0</td>
</tr>
<tr>
<td>1.3</td>
<td>12.0</td>
</tr>
<tr>
<td>1.4</td>
<td>14.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Daily Intake</th>
<th>Daily Gain</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.7</td>
<td>2.0</td>
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<tr>
<td>0.8</td>
<td>2.5</td>
</tr>
<tr>
<td>0.9</td>
<td>3.0</td>
</tr>
<tr>
<td>1.0</td>
<td>3.5</td>
</tr>
<tr>
<td>1.1</td>
<td>4.0</td>
</tr>
<tr>
<td>1.2</td>
<td>4.5</td>
</tr>
<tr>
<td>1.3</td>
<td>5.0</td>
</tr>
<tr>
<td>1.4</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Table 3: Nutrient component requirements of growing and finishing steers

<table>
<thead>
<tr>
<th>Nutrient Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>12%</td>
</tr>
<tr>
<td>Fat</td>
<td>10%</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>70%</td>
</tr>
<tr>
<td>Fiber</td>
<td>20%</td>
</tr>
</tbody>
</table>

Table 4: Relative potency of various implants

<table>
<thead>
<tr>
<th>Component</th>
<th>Category</th>
<th>Relative Potency</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-C</td>
<td>Estrogen</td>
<td>Mild</td>
</tr>
<tr>
<td>E-S</td>
<td>Estrogen</td>
<td>Mild</td>
</tr>
<tr>
<td>T-H</td>
<td>Androgen</td>
<td>Strong</td>
</tr>
<tr>
<td>TE-5</td>
<td>Combination</td>
<td>Mild</td>
</tr>
<tr>
<td>Revalor-200</td>
<td>Combination</td>
<td>Strong</td>
</tr>
</tbody>
</table>

Calf Growth Rate for Show

Nutritional Diseases
- Acidosis – Laminitis - Founder
  - Too much feed / Too much energy / Too quickly
  - Not enough roughage / Not enough time
  - Loose, grey, watery stool
  - Refuse feed/water
  - Increase roughage
  - Decrease fed intake

Rumen Acidosis
- Acute – life threatening
  - ↑ liver abscesses, ↑ laminitis (founder)
- Chronic – ↓ feed intake, performance
- Managerial Control
  - Avoid drastic changes in diet
  - Feed ionophores (Rumensin)
  - Isocalorically replace grain with fat + roughage

Review
- Energy = Average Daily Gain
  - Protein secondary
- Feed enough: 2.5 to 3.0% of BW
- No perfect feed
- Include roughage (hay) in diet
- Monitor Feed Intake and Gain

Questions

Remember you are growing FOOD!!