Calves

“The First 12 Weeks”

Overview
- 75% of losses during 1st 3 months
- High quality diet a must
- Prone to health problems
- Labor intensive
- Quick Feedback

The First 3 Months
- Period of maximum risk and cost
- Weight Goals

Weight Goals
- Hol/BS 200-250
- Jer 130-160

- Low cost = Low mortality, Early weaning, Economical feeds

Components for Success
1. Dry cow nutrition
2. Calving environment
3. Colostrum management
4. Feeding the pre-weaned calf
5. Transition management

Dry Cow Nutrition

Improper Dry Cow Nutrition
- Neglect due to non-productive state
- Unbalanced rations
- Result
  - Low birth weight
  - Morbidity and lack of vigor
  - Stillbirth rare
**Colostrum Management**

- **Timing**
  - 1st hr of life
  - 12 hr later
- **Quantity**
  - 2 quarts per feeding
- **Quality**
  - Age of dam
  - 1st milking
  - Vaccination of dam
  - High Antibody
  - Older cows
  - 1st milking
  - Vaccination
  - Low 1st milk yield
  - Low Antibody
  - 1st lactation
  - Later milkings
  - No vaccination
  - High 1st milk yield

**Feeding Colostrum (When?)**

- Ig absorption highest at birth and declines to near zero by 24 hours of age
- The intestine has the ability to absorb large molecules for the 1st 3 - 24 hours of life
- Feed as soon as possible (1-2 hours after birth) and 12 hours later

**Feeding Colostrum (How?)**

- Let the calf nurse the dam or bottle feed (or esophageal feeder) the calf?
- 25-40% of calves don’t consume adequate colostrum
- Bottom line – calves that nurse the dam are at greater risk of consuming insufficient colostrum and consuming that colostrum later compared to hand feeding

**Feeding Colostrum (How Much?)**

- Traditional – feed 2 quarts as soon as possible and 2 quarts 12 hours later
- Depends on several factors
  - Antibody (Ig) concentration in colostrum
  - Weight and age of calf

**Colostrometer**

- Measures the specific gravity of milk
- Greater specific gravity is better
- Greater specific gravity means more solids = more Ig

**Milk Composition**

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity</td>
<td>1.056</td>
<td>1.040</td>
<td>1.035</td>
<td>1.032</td>
</tr>
<tr>
<td>Solids %</td>
<td>23.9</td>
<td>17.9</td>
<td>14.1</td>
<td>12.9</td>
</tr>
<tr>
<td>Protein %</td>
<td>14.0</td>
<td>8.4</td>
<td>5.1</td>
<td>3.1</td>
</tr>
<tr>
<td>IgG, g/L</td>
<td>48.0</td>
<td>25.0</td>
<td>15.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Fat %</td>
<td>6.7</td>
<td>5.4</td>
<td>3.9</td>
<td>3.7</td>
</tr>
<tr>
<td>Lactose %</td>
<td>2.7</td>
<td>3.9</td>
<td>4.4</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Frozen Colostrum
- Freeze from older cows - good quality
- Freeze in gallon bags
  - thaw in warm water, not boiling water
  - microwave - medium to low power or defrost

Pre-Weaned Calf
- High quality liquid and dry feeds
- Goals
  - alive and healthy (low mortality and morbidity)
  - growing moderately
  - wean early (6-8 weeks)

Liquid Feeding (Surplus Colostrum)
- Surplus Colostrum
  - Cheap
  - High protein and low lactose
- Storage
  - Frig
  - Small bulk tank
- Feed undiluted at 8% of birth weight

Liquid Feeding (Unsalable Milk)
- Antibiotic and/or mastitic milk
- Composition of mastitic milk
- Pasteurization?
  - Pasteurizer – $8,000 – 10,000
- Personal preference
- Feed at 10% of birth weight

Liquid Feeding (Whole Milk)
- Mother natures best
- Can be expensive
  - 10 – 20% more expensive compared to milk replacer
- Coccidiosis?
- Antibiotics?
- Feed at 8-10% of birth weight

Liquid Feeding (Milk Replacer)
- Cheaper than whole milk
- Convenience
- Medicated – Antibiotics/Ionophores
- Protein – 20 to 24%
- Fat – 10 to 20%
Whole Milk vs. Milk Replacer

- Whole milk
  - Nature’s best (+)
  - Nutrient content and quality (+)
  - Expensive - 10 to 20% higher cost
  - Currently - $1.20/day
- Milk replacer
  - Medicated (+)
  - Nutrient content and quality (-)
  - Convenience (+)
  - Cheaper (+)
  - Currently - $0.96/day

<table>
<thead>
<tr>
<th></th>
<th>Whole Milk</th>
<th>Milk Replacer</th>
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<tbody>
<tr>
<td>Protein</td>
<td>24</td>
<td>20-24</td>
</tr>
<tr>
<td>Lactose</td>
<td>44</td>
<td>40</td>
</tr>
<tr>
<td>Fat</td>
<td>28</td>
<td>10-20</td>
</tr>
</tbody>
</table>

Milk Replacer Protein

<table>
<thead>
<tr>
<th>High Quality</th>
<th>Low Quality</th>
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<tbody>
<tr>
<td>Dried skim</td>
<td>Meat solubles</td>
</tr>
<tr>
<td>Dried whey</td>
<td>Fish protein concentrate</td>
</tr>
<tr>
<td>Soy protein isolate</td>
<td>Wheat flour</td>
</tr>
<tr>
<td>Protein modified soy flour</td>
<td>Soy flour</td>
</tr>
<tr>
<td>Soy protein concentrate</td>
<td>Animal plasma</td>
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</tbody>
</table>

<3 weeks of age – milk based protein
>3 weeks of age – blend of milk and vegetable proteins (50:50)

Milk Replacers

- Ability to stay in suspension
- Protein source
  - Prefer milk sources
  - Processed soy protein getting better
- Energy
  - Lactose only carbohydrate - whey and skim
  - Fat - tallow, lard, hydrogenated vegetable
  - 10% - 20% fat?

Additives

- Oxytetracycline, Chlortetracycline, Neomycin
  - claims for improved gains and lower respiratory disease
- Coccidiostats/cides are a must
  - rumensin, bovatec, deccox
- Acids - propionic, acetic, benzoic, citric

Feeding Management

- Nipple bottle or bucket
- Open pail
- Group - ad-lib feeding w/computer or gang feeder
  - acid preserved, high quality
  - sanitation

Dry Feed Management

- High quality to encourage early weaning
- Why early weaning
  - Cheaper
  - Less labor
- Characteristics of high quality
  - Ingredients
  - Minimum dustiness
  - Taste good
Gain of Calves Fed Milk Only

Calf Starters

Recommended Nutrient Content (DM basis)

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Crude Protein</td>
<td>18%</td>
</tr>
<tr>
<td>Fiber</td>
<td>12%</td>
</tr>
<tr>
<td>TDN</td>
<td>82%</td>
</tr>
<tr>
<td>Ca</td>
<td>0.7%</td>
</tr>
<tr>
<td>P</td>
<td>0.4%</td>
</tr>
<tr>
<td>Vit A</td>
<td>2000 IU/lb</td>
</tr>
<tr>
<td>Vit D</td>
<td>300 IU/lb</td>
</tr>
</tbody>
</table>

Calf Starter Ingredients

- Coarse, bulky, minimum of dust, roughage
- Crimped oats, rolled barley, rolled corn
- Molasses - 5 - 10%
- Antibiotics/Coccidiostats
- Feeding
  - Provide fresh by week one
  - Keep fresh and ad-lib
  - Fresh water

Starter Intake and Gain

Forage

- Hay for pre-weaned calves
- Necessary for rumen development?
- Waste most of it?
- Hampers rumen development
  - Rumen wall uses butyric acid for energy source
  - Little butyric acid production on hay diets, need grain (starch) diet

Weaning – How and When?

- How
  - Feed a fixed amount of liquids from birth – approx 8 to 10% of BW
  - Plenty of fresh, clean, water
  - Quality starter, early, fresh
- When
  - When they are ready
  - Eating 1.5 - 2.0 lb. of starter/day for 3 days
Calf Raising Costs

Success in Calf Feeding

- Colostrum Management
- Pre-weaned Calf Nutrition
  - Quality liquid feed
  - Quality calf starter
  - No hay
- Early Weaning
  - $$