Presented by NDSU Extension Livestock Specialists:

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- Gerry Stokka
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Assessing cow (and bull) condition and managing bulls

Lisa Pederson
Extension Livestock Specialist
Extension Beef Quality Assurance Specialist
Central Grasslands Research Extension Center, Streeter
Body condition scoring

1. Look at last two ribs
   - Visible: <5
   - Not visible: ≥ 5

2. Spine
   - Visible: ≤ 3

3. Shape between hooks and pins (thurl)
   - Shallow U: BCS 6
   - Strong U: BCS 5
   - V Shape: BCS 4
   - Strong V: BCS 3
   - Very Strong V: BCS 2

U.S. Beef Body Condition Scores:
Range from 1-9
BCS 1: Starved
BCS 9: Obese

3-Step Body Condition Scoring (BCS) Guide for Range Cattle (B-1294), Scasta, et al, 2016, University of Wyoming Extension
A look at BCS-Cows

Last two ribs visible: BCS <5
Spine visible: BCS ≤3
Shape between hooks and pins is strong V: BCS 3

BCS 3

Last two ribs not visible: BCS ≥5
Spine not visible: BCS >3
Shape between hooks and pins is strong U: BCS 5

BCS 5

Last two ribs visible: BCS <5
Spine not visible: BCS >3
Shape between hooks and pins is V: BCS 4

BCS 4

Last two ribs not visible: BCS ≥5
Spine not visible: BCS >3
Shape between hooks and pins is very shallow or flat U: BCS ≥6

BCS 6+

3-Step Body Condition Scoring (BCS) Guide for Range Cattle (B-1294), Scasta, et al, 2016, University of Wyoming Extension
A look at BCS-Bulls

Last two ribs not visible: BCS ≥5
Spine not visible: BCS >3
Shape between hooks and pins is strong U: BCS 5

BCS 5

Last two ribs not visible: BCS ≥5
Spine not visible: BCS >3
Shape between hooks and pins is very shallow or flat U: BCS ≥6
BCS 6+   (Bull has .26” Backfat at ultrasound)
Spermatogenesis
(Fancy term for “Semen development”)

• 61 days
• Anything that occurred in past two months will impact
  – Semen quality
  – Ability to pass Breeding Soundness Exam
• Think of as a “factory”
  – Anything that happens during production along the factory line results in a “lemon”
Effect of body condition score on semen quality in physically normal bulls
Barth and Waldner, 2002, The Canadian Veterinary Journal

<table>
<thead>
<tr>
<th>Body Condition Score</th>
<th>January-March</th>
<th>April-June</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCS 3</td>
<td>52.6%</td>
<td>70.0%</td>
</tr>
<tr>
<td>BCS 4</td>
<td>60.0%</td>
<td>80.0%</td>
</tr>
<tr>
<td>BCS 5</td>
<td>70.0%</td>
<td>85.5%</td>
</tr>
<tr>
<td>BCS 6</td>
<td>77.8%</td>
<td>84.1%</td>
</tr>
<tr>
<td>BCS 7</td>
<td>47.6%</td>
<td>49.4%</td>
</tr>
</tbody>
</table>
Effect of weight loss, fat loss on breeding soundness exams

Barth, et al, 1995, Canadian Veterinary Journal

Comparison of breeding soundness and weight loss

<table>
<thead>
<tr>
<th>Days after Sale</th>
<th>Satisfactory BSE</th>
<th>Questionable BSE</th>
<th>Unsatisfactory BSE</th>
<th>Weight loss/day (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-42 days</td>
<td>74%</td>
<td>7%</td>
<td>19%</td>
<td>6.2 lbs</td>
</tr>
<tr>
<td>43-85 days</td>
<td>53%</td>
<td>25%</td>
<td>22%</td>
<td>2.7 lbs</td>
</tr>
</tbody>
</table>

Loss of Backfat
2 year old British Bulls from sale to test (50 days ± 3.6)

<table>
<thead>
<tr>
<th></th>
<th>Sale backfat thickness (inches)</th>
<th>Test backfat thickness (inches)</th>
<th>Backfat loss (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.4”</td>
<td>.29”</td>
<td>.11”</td>
</tr>
</tbody>
</table>
Effect of scrotal frostbite on semen quality
1557 bulls
Barth and Waldner, 2002, The Canadian Veterinary Journal

Month of Breeding Soundness Exam

<table>
<thead>
<tr>
<th>Satisfactory semen quality</th>
<th>Questionable semen quality</th>
<th>Unsatisfactory semen quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal bulls All months</td>
<td>72%</td>
<td>14%</td>
</tr>
<tr>
<td>Normal bulls January-March</td>
<td>76%</td>
<td>19%</td>
</tr>
<tr>
<td>Slight frostbite January-June</td>
<td>26%</td>
<td>21%</td>
</tr>
<tr>
<td>Slight frostbite January-March</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Severe frostbite January-June</td>
<td>71%</td>
<td>14%</td>
</tr>
<tr>
<td>Severe frostbite January-March</td>
<td>76%</td>
<td>14%</td>
</tr>
<tr>
<td>Severe frostbite April</td>
<td>72%</td>
<td>14%</td>
</tr>
<tr>
<td>Severe frostbite May-June</td>
<td>71%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Severe frostbite: 1 or more scabs larger than penny
Slight frostbite: 1 or more scabs smaller than penny
Protect the scrotum and testicles from the cold
Summary

• Bulls should be in Body Condition Score of 4-7 (1-9 scale)
  – Pre breeding
  – At turn out

• Maintain young, recently purchased bulls on a similar plane of nutrition/diet as they were on when purchased.
  – Then slowly step down

• Check BCS of herd sires now…
  – Ask someone else knowledgeable about cattle to BCS your herd too
  – Don’t confuse hair, muscle, and/or hay belly with condition
  – Get help developing a ration if you need to add condition
Summary

• Bed bulls
• Provide windbreak
• Breeding soundness exams are very important—have bulls tested just before breeding season
• Don’t save pennies to waste dollars by skipping BSE
• Sperm development: 60 days…
• Semen test only good for day it was taken…
Cold Stress in Calves

Gerald Stokka, DVM, MS
Extension Veterinarian/Livestock Stewardship Specialist
Cold Stress

- Recognition
  - How calves maintain body temperature
- Intervention
  - Heat
- Outcomes
Cold Stress

• Environmental Conditions
  – Wind, rain and snow decrease level of insulation
  – Provide bedding, wind protection
  – Barns if possible
    • Keep clean and fresh bedding
  – Calving Season
Cold Stress

• Cold stress can happen in a range of ambient temperatures
• Behavior
  – Standing hunched up
    • Could also be laying down next to dam
  – No evidence of nursing
    • Teats look dry, hair on udder dry, udder quarters full
  – Cold Mouth!!
    • Death Beller, vocalizing
  – Rectal
    • < 98°F, normal for newborn calf 100° to 102°
    • Severe hypothermia 86°
Calving Season
Cold Stress

• Thermoregulatory
  – Increased metabolic activity, may be 5X that of resting phase
    • Shivering
    • Extended birth process decreases ability to withstand cold temperatures
  – Increase in cortisol
  – Greater availability and utilization of fat, glycogen and protein to create heat.
  – Peripheral vasoconstriction
    • Ears, feet, tail
Calving Ease
Cold Stress

• Brown Fat
  – Calves born to adequate BCS cows will have supply of brown fat
  – Prior to nursing, calves depend on mobilization of tissue glycogen and lipids to supply energy needs
Cold Stress

• Colostrum
  – Thermoneutral requirements in a 40kg (88lb) calf can be met by 2.4 kg (5.3lb, almost 2/3gallon).
  – An additional 125 grams (0.25lb) of colostrum is needed for every 1°C (2°F) below critical temperature.
  – Critical temperature depends on acclimation to cold
Cold Stress

• Frostbite
  – Skin
  – Ears
    • Will be hard, tips will necrose and fall off
  – Feet
    • Very serious, not noticed immediately, 48 hours later feet may be swollen with edema (fluid). Painful. Wait to see if improvement. Not treatable at this stage
  – Tail
Cold Stress

- **External Heat**
  - Heaters, floor heat, blankets
    - Hot Box
    - Requires conducting heat through the hide to raise internal body temperature.
    - The calf must also have the ability to produce heat
    - Need colostrum

- **Warm water**
  - Bathtub, 100° F water
  - Need colostrum
Cold Stress

• Colostrum
  – Fresh the best, some is better than none
    • Head catch, need help, grab tail near the base and move to vertical position to reduce risk of kicking
    • Push your head into flank and milk nearest teat, when and if cow is comfortable can release pressure on tail
  – Frozen colostrum, harvest from own herd if possible
  – Colostrum substitutes
    • Minimum of 100 grams of Ig
  – Brandy, Whiskey for human consumption
Cold (Hypothermia) Calves
Evaluating your nutrition program

- Quality and quantity of base diet
- Production groups
- Time of calving
- Pasture turnout dates
- Condition of cow herd
- Costs, facilities, labor
  - Consider alternatives
## Estimating hay intake

<table>
<thead>
<tr>
<th>Forage Type and Maturity</th>
<th>Stage of Production</th>
<th>Forage DMI, % of BW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low quality forage (&lt;52% TDN)</strong></td>
<td>Dry</td>
<td>1.8</td>
</tr>
<tr>
<td>• Dry winter forage, mature legume and grass hay, straw</td>
<td>Lactating</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Medium quality forage (52-59% TDN)</strong></td>
<td>Dry</td>
<td>2.2</td>
</tr>
<tr>
<td>• Dry summer/fall pasture, late-bloom legume hay, early-bloom grass hay</td>
<td>Lactating</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>High quality forage (&gt;59% TDN)</strong></td>
<td>Dry</td>
<td>2.5</td>
</tr>
<tr>
<td>• Early-bloom and mid-bloom legume hay, pre-boot stage grass hay, lush pasture, silage</td>
<td>Lactating</td>
<td>2.7</td>
</tr>
</tbody>
</table>

For example, lactating cows weigh 1,400 lbs. They can consume **30.8 lbs.** of low quality forage (1,400 lbs. × 0.022 = 30.8 lbs. DMI) or **37.8 lbs.** of high quality forage (1,400 lbs. × 0.027 = 37.8)
Temperature impacts requirements

Thermo-neutral zone

- 32°F with dry winter coat,
- 18°F with heavy dry winter coat
Use effective temperature to adjust energy needs

### Increase TDN by 1% for every degree below LCT
- Dry heavy winter coat = 18°F
- Air temp. = 0°F; wind speed = 20 mph
- WCI = -39
- $18 - (-39) = 57$
- 57% more energy (TDN) needed

### Current energy requirements 17.6 lbs. TDN, feeding hay containing 55% TDN
- $17.6 \times 1.57 = 27.6$ lbs. TDN needed
- $27.6 \div 0.55 = 50.2$ lbs. hay (DM basis)
- $50.2 \div 1400$ lbs. BW = 3.6% of BW

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<table>
<thead>
<tr>
<th>Wind Speed (Miles Per Hour)</th>
<th>50</th>
<th>40</th>
<th>30</th>
<th>20</th>
<th>10</th>
<th>0</th>
<th>-10</th>
<th>-20</th>
<th>-30</th>
<th>-40</th>
<th>-50</th>
<th>-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equivalent temperature °F</td>
<td>-60</td>
<td>-50</td>
<td>-40</td>
<td>-30</td>
<td>-20</td>
<td>-10</td>
<td>0</td>
<td>-10</td>
<td>-20</td>
<td>-30</td>
<td>-40</td>
<td>-50</td>
</tr>
</tbody>
</table>

- **Calm**
- Corresponding WCI values are found in the Zone 2 table.
- **Zone 1**
  - Little danger to mature animals.
- **Zone 2**
  - Increasing danger: will freeze exposed flesh such as teats and scrotums; will stress animals causing latent diseases to appear.
- **Zone 3**
  - Great danger especially to young animals.

Adapted from John Herrick, Iowa State University, Extension Veterinarian
Managing in cold weather

- Provide higher quality forage or grain/by-products
  - Difficult to utilize poor quality feeds when cold
- Feed thin and young cows separately
- Provide windbreaks or shelter
- Feed in late afternoon or early evening
Hay waste

- Round bales minimize labor but increase waste (20-45%)
- If unrolling bales:
  - Limit access
    - 1 vs. 4 day supply on ground reduces waste by 20%
  - Feed on fresh ground if possible
  - Feed low quality hay first

- Reducing waste
  - Processing
    - ↓ particle size → ↑ passage rate → ↑ intake
    - Increased costs
  - Hay feeders
    - Cone feeder - 3.5% loss
    - Bale ring - 6.1% loss
    - Trailer feeder - 11.4% loss
Calculating feed needs

• Average BW × % BW consumed × % waste = lbs./cow/d
  – 1400 lbs × 0.025 × 1.25 = 43.75 lbs./cow/d
  – 43.75 * 60 day feeding period = 2,625 lbs./cow

• Need to know bale weights and dry matter % of hay
  – 1300 lbs. per bale × .9 dry matter = 1,170 lbs. DM per bale

• DM needs per cow = 2,625 / 1170 = 2.2 bales per cow

• May need to adjust based on temperature, cow condition, etc.
Supplementation strategy

• Low quality roughage (< 7% CP)
  – Supplement containing ≥ 20% CP
  – Alfalfa hay, soybean meal, distillers grains
  – Can be fed every 2-3 days

• Better quality roughage (> 7% CP)
  – Energy supplements if required
  – Fiber vs. starch-based supplements
    • Soyhulls, wheat midds, DDG vs. corn, barley, etc.
    • Too much starch (>0.4% BW) reduces digestibility and intake of forage-based diets
## Feed Cost Calculator
Developed by ND Farm Management Education & NDSU Extension

### Feedstuffs

<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>bales/load</th>
<th>lbs/bale</th>
<th>lbs/load</th>
<th>lb/ton</th>
<th>tons/load</th>
<th>$/mi Trucking</th>
<th>$/Ton</th>
<th>Miles</th>
<th>Trucking/Ton</th>
<th>TC/Ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>35</td>
<td>1,350</td>
<td>47,250</td>
<td>2,000</td>
<td>23.625</td>
<td>5</td>
<td>180</td>
<td>60</td>
<td>12.70</td>
<td>192.70</td>
</tr>
<tr>
<td>Wheat Midds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Nutrient Content & Feed Values

<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>DM</th>
<th>TDN</th>
<th>CP</th>
<th>DM</th>
<th>TDN</th>
<th>CP</th>
<th>$/lb DM</th>
<th>$/lb TDN</th>
<th>$/lb CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>90%</td>
<td>53%</td>
<td>8%</td>
<td>1,800</td>
<td>954</td>
<td>144</td>
<td>$ 0.11</td>
<td>$ 0.20</td>
<td>$ 1.34</td>
</tr>
<tr>
<td>Wheat Midds</td>
<td>90%</td>
<td>88%</td>
<td>14%</td>
<td>1,800</td>
<td>1,584</td>
<td>252</td>
<td>$ 0.07</td>
<td>$ 0.08</td>
<td>$ 0.52</td>
</tr>
</tbody>
</table>
Additional considerations

- **WATER**
  - Cold may increase metabolic water use
  - Adequate water required for optimum feed intake/digestion, performance, and health
    - Approx. 1 gallon/100 lbs. of BW in cold weather
  - Consider propane stock tank heaters or water circulators to reduce labor needs in winter

- Evaluate nutrient status using BCS and manure consistency
  - Excess protein
  - Adequate protein
  - Deficient protein
Stretching Limited Hay

John Dhuyvetter
Extension Livestock Systems Specialist
North Central REC, Minot
Cattle Cope With Wind Protection and Full Rumens

OR
CAN
LOSE 3-4 LBS PER DAY
<table>
<thead>
<tr>
<th>Coat</th>
<th>Critical Temp (F)</th>
<th>440</th>
<th>660</th>
<th>880</th>
<th>1100</th>
<th>1210</th>
<th>1320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>59</td>
<td>2.3</td>
<td>2.1</td>
<td>2.0</td>
<td>2.0</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Fall</td>
<td>45</td>
<td>1.5</td>
<td>1.4</td>
<td>1.4</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Winter</td>
<td>32</td>
<td>1.2</td>
<td>1.1</td>
<td>1.1</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Heavy winter</td>
<td>18</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Percent increase per degree (F)

25-35% of open wind speed
35-95% of open wind speed
65-95% of open wind speed
What Happened

• Normal Weather
  – 10F TEMP
  – 5-10 mph WIND
  – 10 TO -10 WINDCHILL
  – 17 to 18 lbs TDN 1400 lb cow – 8TH mon
  – 35 lbs hay (57% TDN) + waste

• Extreme Weather
  – -20F TEMP
  – +20 mph WIND
  – -40+ WINDCHILL
  – 24 to 26 lbs TDN 1400 lb cow – 8TH mon
  – 50 lbs hay (57% TDN) + waste

  – +40-50% MORE HAY
MAKE A PLAN TO
GET THERE IN GOOD SHAPE

Lots of Feeding Before Grass
## Going Forward

- **9th mon GESTATION**
  - 20 lbs TDN 1400 lb cow
  - Hay: 40 30 15
  - Corn: 5
  - Silage: 45
  - Straw: 3 3
  - 60 days hay saving 1 to

- **1st mon LACTATION**
  - 23 lbs TDN 1400 lb cow
  - Hay: 45 30 15
  - Corn: 6
  - Silage: 50
  - Straw: 4 4
  - 1.5 bales per cow till grass
Grain Feeding Guidelines

- Introduce slowly
- Limit to 0.4% of body weight
- Crack wheat and barley
- Balance ration for protein, consider grain byproduct
- Include rumensin
- Balance for mineral

- Distributed so all get a share
Grain Delivery

- Cake box
- Shredder hopper
- TMR
- Other
Feeding Losses

- Feed in bunks in lots and on wet surfaces
- Feed on frozen, scraped, compacted ground or dry sod
- Feed small piles (trip hopper)
- Feed whole grain if not in TMR or bunk
Doing What It Takes
Sources of Alternative and Co-product Feeds for Cattle

Karl Hoppe, Ph.D.
Carrington Research Extension Center
Think of alternative or co-product feeds as supplements to a forage based ration.
North Dakota is a producer of multiple co-product feeds

- Ethanol
- Wheat mill
- Oil Crush
- Malt
- Sugar
- Potato
How much co-product feeds are produced?

• ND State Mill and Elevator, Grand Forks, ND
  – Single largest wheat / durum mill in one location in the world
  – Mills 90,000 bu of wheat / durum daily in to flour or semolina
    – Produces 1000 ton Wheat mids (middlings) daily
    – At 10# per head daily, produces feed for 200,000 head daily
  – 18% crude protein, 83% TDN
Ethanol production in North Dakota is huge

- Five distilleries in North Dakota
  - Produce 3500-4000 tons daily of distillers grain (DM basis)
  - With ND cow inventory at 985,000 head, could feed 7 pounds of DDGS daily to every cow

  - Or feed every mature cow 12 pounds DDGS daily for 7 months of winter feeding

  - 30% crude protein, 86% TDN
Co-product Feeds - Considerations

- Pricing
- Freight
- Other feeds available – grains, hay, other co-products
- Co product feed characteristics - Limitations
  - Long term storability issues
  - Bridging problems
  - Low density, needs pelleting
  - High moisture, mold
Calculating cost per pound of nutrient

• It is easy math… use NDSU AS1182 publication

• Price per pound of nutrient = price per pound of feed divided by nutrient content
  – For ‘as fed’ basis – Use TDN values on ‘as fed’ Basis (not ‘DM basis’)
  – Cost of nutrient being calculated is TDN (energy)
• Cost per lb TDN = $90 / 2000 lbs / 86% TDN
• Cost per lb TDN = $0.0545 / lb / 0.86 TDN
• Cost per lb TDN = $0.0523
## Co-Product Feeds

<table>
<thead>
<tr>
<th>Dried Distiller’s Grains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Distiller’s Grains</td>
</tr>
<tr>
<td>Modified DDGs</td>
</tr>
<tr>
<td>Condensed Distillers Solubles – ‘corn syrup’</td>
</tr>
<tr>
<td>Wheat Midds (durum)</td>
</tr>
<tr>
<td>Corn Gluten Feed</td>
</tr>
<tr>
<td>Wet Corn Gluten Feed</td>
</tr>
<tr>
<td>Soybean Hulls</td>
</tr>
<tr>
<td>Beet Pulp, dried or wet</td>
</tr>
<tr>
<td>Beet tailings – wet</td>
</tr>
<tr>
<td>Canola meal</td>
</tr>
<tr>
<td>Sunflower meal</td>
</tr>
<tr>
<td>Soybean meal</td>
</tr>
<tr>
<td>Linseed meal</td>
</tr>
<tr>
<td>Corn Gluten meal</td>
</tr>
<tr>
<td>Potato Byproduct</td>
</tr>
<tr>
<td>Barley Malt Sprout</td>
</tr>
</tbody>
</table>
Dried Distiller’s Grains with solubles

Tharaldson Ethanol, Casselton
Hankinson Renewable Energy, Hankinson

Dakota Spirit AgEnergy, Spiritwood
Blue Flint Ethanol, Underwood
Red Trail Energy, Richardton

James Valley Ethanol, Groton, SD
Advanced Bio Energy and Glacial Lakes, Aberdeen/Mina, SD
Red River Energy, Rosholt, SD

• Co-product of ethanol industry
  – Mostly corn, but can use other grains
• Very palatable
• Mixes well with other feeds
• High in rumen undegradable protein (bypass)
• High in fat (oil) - 6-9% was up to 15% (DM basis)
• Same energy value as corn
  – wet DDGS - 100-120% energy value of corn
• Limit to 30% of diet on Dry Matter basis
  – Sulfur issues – Toxicity and ‘Polio’
• 30% Crude protein
Wheat Midds

Dakota Growers Pasta Company, Carrington

Minot Milling, Minot

Ardent Milling (Cargill/Conagri), Fairmont

North Dakota Mill and Elevator, Grand Forks

Becktrom Foods, Cando

• Usually 16-18% crude protein;
  • Guaranteed 14.5-15 %CP (DM basis)

• 83%TDN; 0.59 kcal/lb NEg

• 3% fat (oil)

• High phosphorus (1.01%) requires calcium supplementation – need 2:1 ratio for Ca:P

• Pelleted feed is twice as dense as meal

• Absorbs moisture from the air
Corn Gluten Feed – Dried and Wet

- Cargill, Wahpeton, ND
- Co-product from Wet Corn milling
  - Wet corn milling produces high fructose corn syrup used in beverages and other sweetened foods
- 83% TDN, 0.62 mcal/lb Neg
- 20% or higher CP (DM basis) 21-22% CP
- 9% fat (oil)
- Calcium 0.1%; Phosphorous 1.2%
- High sulfur in steep water can result in ‘polio’
  - Polioencephalomalacia – Thiamine deficiency
Soybean Hulls

- ADM, Enderlin, ND

- High energy content
  - 80% TDN (0.57 mcal/lb NEg)
  - Very digestible fiber
  - 8-13% CP

- Very palatable
- High in Calcium
- 0.59% Calcium; 0.17% Phosphorus
- Consider need to supplement protein
Beet Pulp and Tailings

- **American Crystal Sugar**
  - Hillsboro, ND
  - Drayton, ND
  - East Grand Forks, ND
  - Crookston, MN

- **Min-Dak Farmers Coop**
  - Wahpeton, ND

- **United Sugars / Midwest Agri**
  - Moorhead, MN

- Pressed Beet Pulp – 70 -75% water
  - Beet Tailing – 75-80% water

- Pelleted Beet Pulp – 90% dry matter

- 65% TDN (0.40 kcal/lb NEg)
  - Pulp – high in digestible fiber
  - Tailings – high in sugar content, digestible fiber and ash (dirt)

- 9% CP
Protein Sources

- **Canola Meal**, 36% CP
  - ADM, Velva, ND
  - ADM, Enderlin, ND
  - Cargill, West Fargo, ND
  - CHS Northstar, Hallock, MN

- **Linseed Meal**, 34% CP
  - Cargill, West Fargo, ND

- **Sunflower meal**, 35% CP
  - Northern Sun/ADM, Enderlin, ND
  - Cargill, West Fargo, ND

- **Soybean Meal**, 46% CP
  - ADM, Enderlin, ND
Sources and Prices for selected Co-products in North Dakota

For a recent list of prices and contacts go to: https://www.ag.ndsu.edu/CarringtonREC/livestock/livestock-extension
Planning for the 2019 Grazing Season

Miranda Meehan, PhD
Livestock Environmental Stewardship Specialist
Grazing Readiness

- 3-leaf stage
- 3½-leaf stage
Grazing Readiness

- Crested Wheatgrass: Early May
- Bromes: Mid-May
- Post Contract CRP: Late May
- Cool Season Natives: Early June
Grazing Readiness in 2017

- Crested Wheatgrass
- Smooth Bromegrass
- Western Wheatgrass
Early Grazing Strategies

• Supplement on pasture or hayland
• Graze domesticated grass pastures
• Utilize winter annuals for spring grazing
Early Grazing Strategies

• Graze native pastures invaded by Kentucky bluegrass
• Graze native pasture dominated by cool season grasses
Other Considerations

• Flooding
• Drought

Oliver County - Date: 5/14/18
Western Wheatgrass - 1½-leaf stage

Oliver County - Date: 5/9/17
Western Wheatgrass - 3½-leaf stage

• Overgrazing
• Allow time for recovery
Thank you for joining us!

NDSU Extension Livestock Management Team

https://www.ag.ndsu.edu/extension/livestock

For additional information contact your local Extension agent