

Utilizing Byproducts for Beef Cattle



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Developing a Feeding Strategy

1. Understand your production system
 - Fall Calving
 - Spring Calving
 - Continuous
2. Understand your forage system
 - Pasture
 - Conserved forage
3. Develop an economical supplement

Reproductive Efficiency



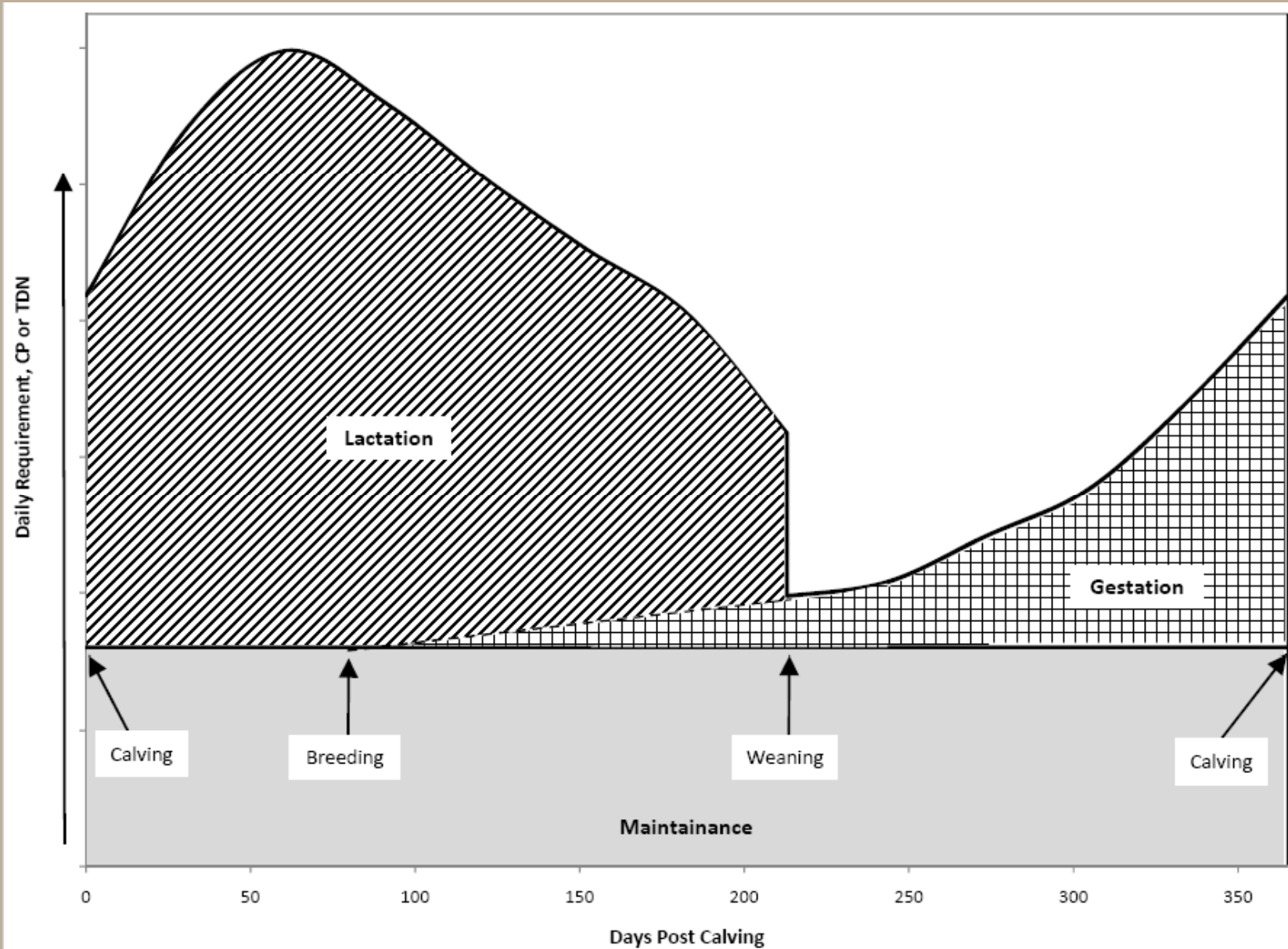
- The most important factor affecting profitability
- Highly dependent on proper nutrition

Nutrient Priorities

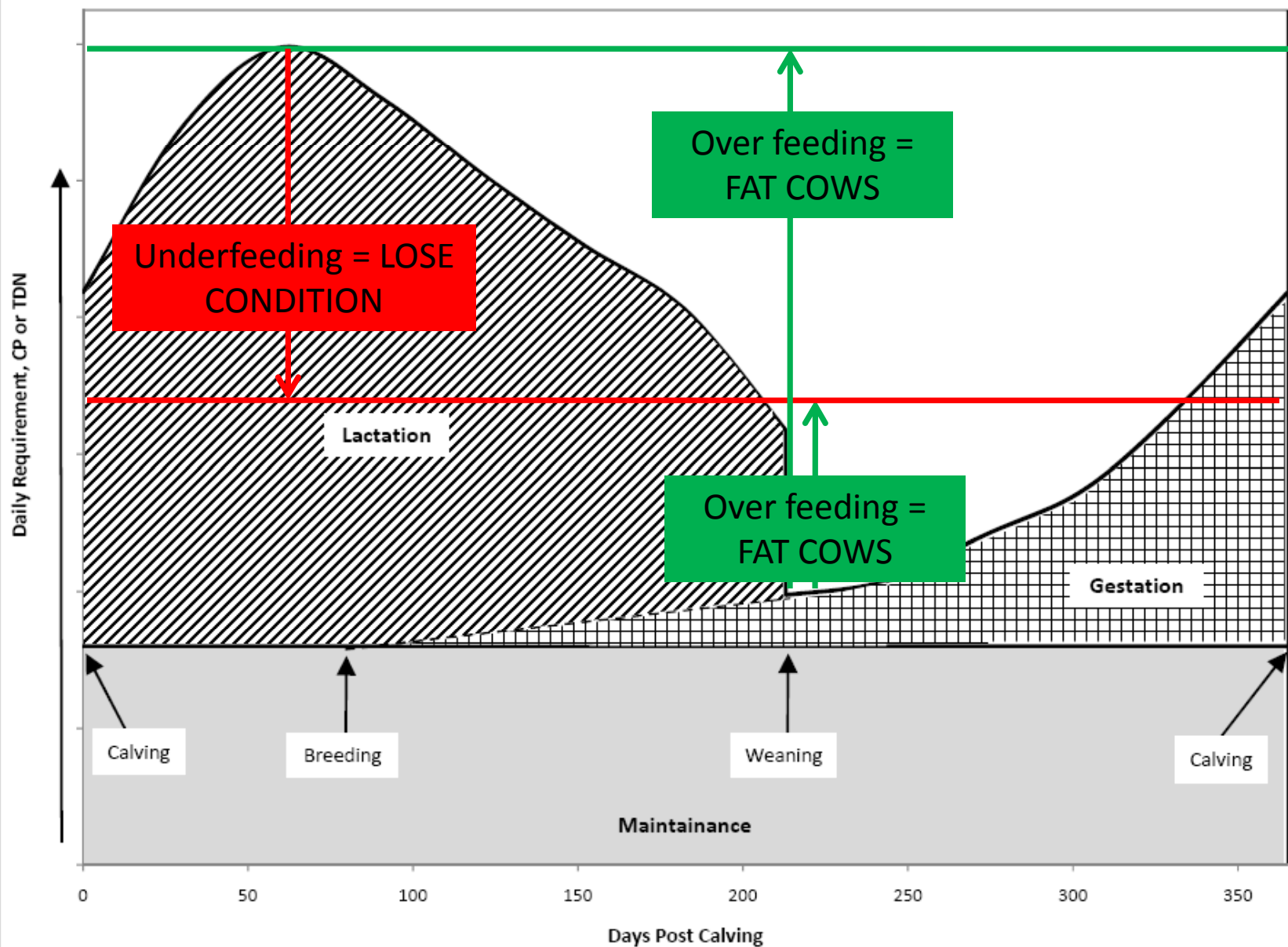
- 1. Maintenance**
- 2. Growth**
(Steers & Heifers)
- 3. Lactation**
- 4. Reproduction**



Brood Cow Nutrient Requirements



Separate Cows Based on Stage of Production



Body Condition Scoring???

- 1-9 – Assess the energy reserve status of a cow.

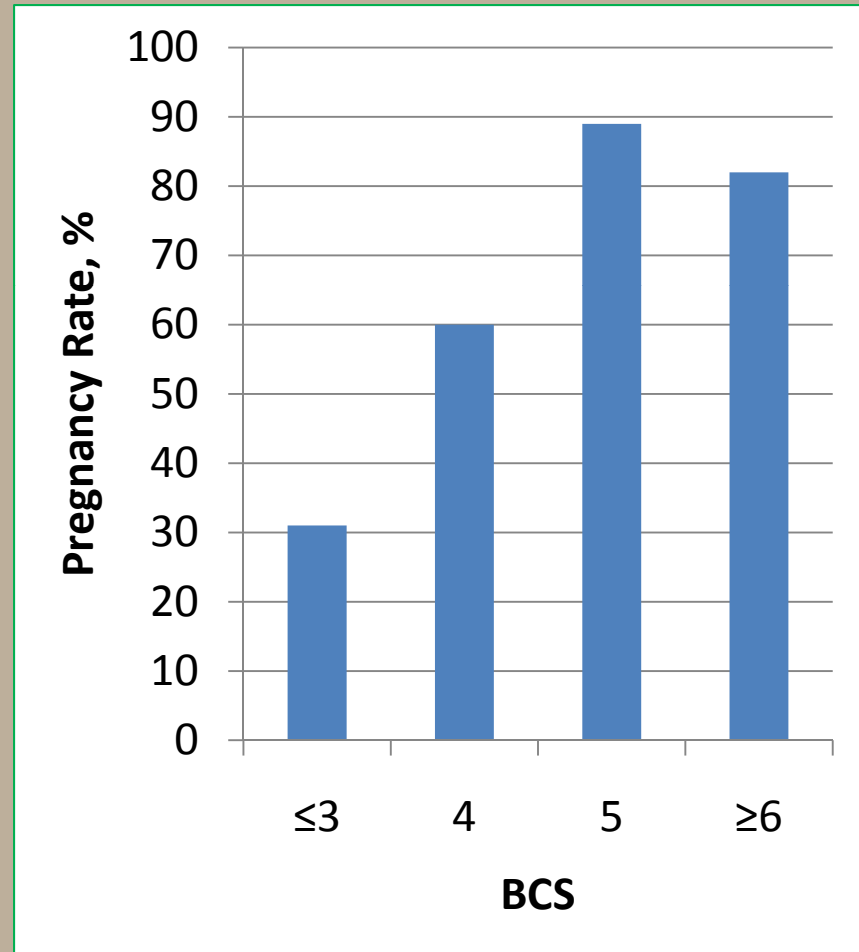


BCS-1

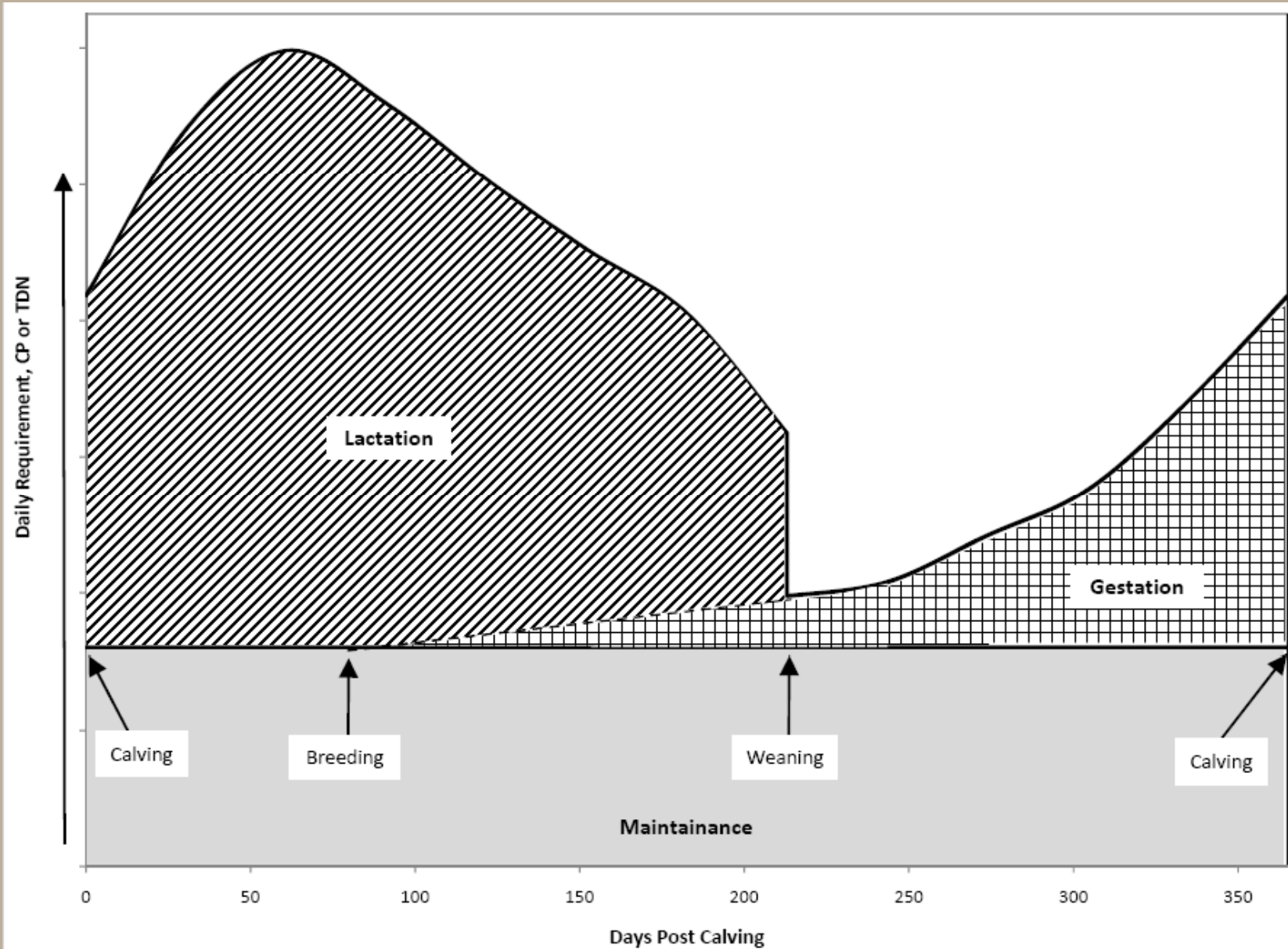


BCS-9

Body Condition Scoring???



Brood Cow Nutrient Requirements



Available Forages

- Stockpiled Fescue
- Corn Silage
- Hay produced
 - Storage
 - Testing
 - Inventory

Hay Cutting

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

TEST FORAGES!!!!

Byproduct Feeding

- **What's available**
- **Price**
 - Evaluate on DM basis
 - Look at \$/nutrient
- **Handling / Storage**
- **Minerals**



Potential Byproducts

1. Grain

- Corn gluten feed
- Distiller's grains
- Soy Hulls
- Wheat middlings

2. Cotton

- Whole seed
- Gin trash
- Hulls

3. Sugar and starch production

- Cane, beet & corn molasses
- Salvage candy

4. Vegetable

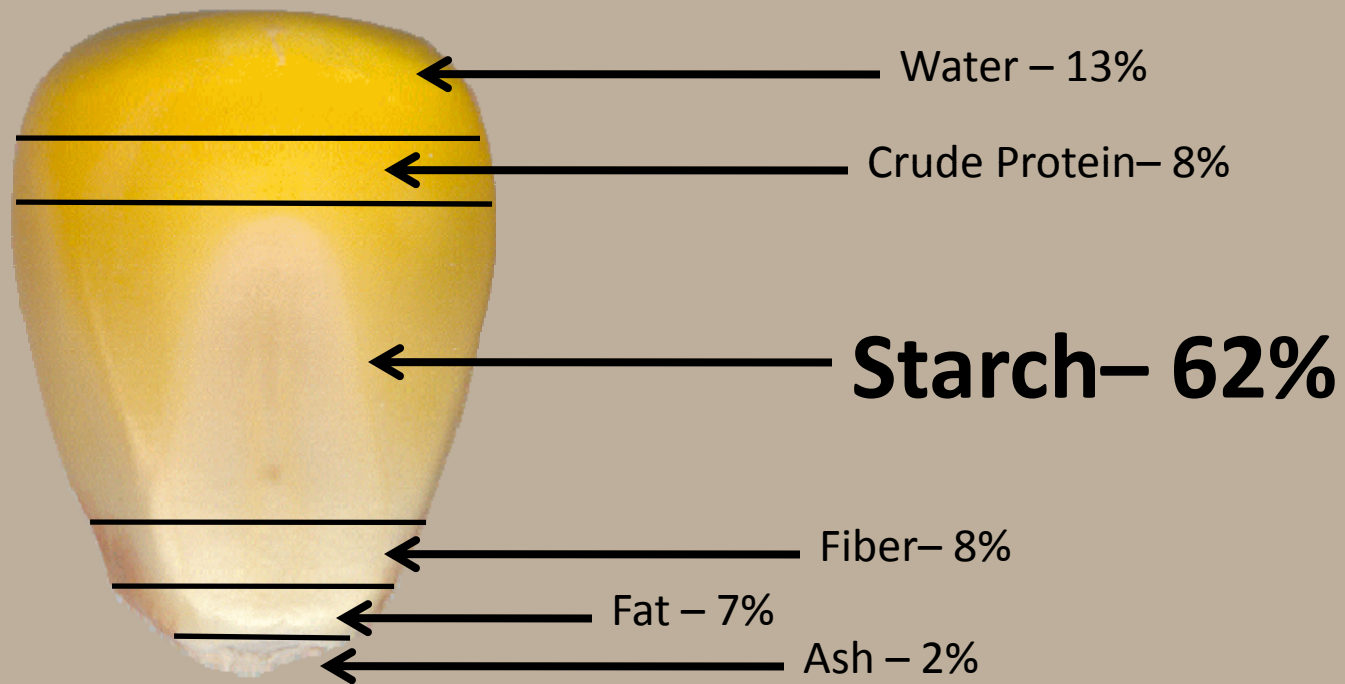
- Cull vegetables

Corn

- Grain is about 10% CP and 90% TDN
- Can also be high moisture or ground ear corn
- Most popular concentrate
- High starch



Composition of a Corn Kernel



Corn Gluten Feed

- Results from wet milling of corn to produce corn starch, oil and syrup. Probably 6 million tons per year.
- About 24% CP and 80% TDN
- Low Calcium; High Phosphorus
- Low starch
- High sulfur
- LIMIT TO 30% of intake



Distiller's Grains

- Byproduct of ethanol production
- Available:
 - Wet (~47% DM)
 - Dry (~90% DM)
- Very similar to corn gluten feed (↑CP, ↑TDN, ↑P, ↑S)
- Higher rumen undegradable protein (bypass protein)



Soybean Meal

- The original byproduct
 - Oil production
- 48-52% CP and 87%TDN
- Utilized in almost all animal production



Wheat

- 105% value of corn
- May pack in stomach if ground too fine
- Generally not over 50% of ration



Wheat Middlings

- Seven million tons of flour by-products available
 - 18% CP, 83% TDN (20 – 30% starch)
 - Do not store well – readily absorbs moisture from the air
- Feed with caution due to the rapidly fermentable starch content
- Low Calcium, High Phosphorus

Whole Cottonseed

- High energy due to oil content
- Excellent source of CP, TDN, and fiber
- Doesn't have to be processed
- Doesn't flow well in feeders; should be fed in troughs



Cottonseed Hulls

- Low TDN and CP
- Good source of roughage
- Doesn't flow



Soy Hulls

- Excellent palatability
- Less starch content than grains; therefore, less negative effect on forage utilization
- Safer, less incidence of founder



Effect of Increasing Corn on Hay Intake and Digestibility

| | Corn, lbs/day | | | |
|------------------|---------------|-----|-----|-----|
| | None | 2.2 | 4.4 | 6.6 |
| Hay DMI lbs | | | | |
| Total DMI, lbs | | | | |
| DOMI, lbs | | | | |
| Hay OM Digest, % | | | | |

Oklahoma State, 1987

JAS 65:557

Effect of Increasing Soybean Hulls on Hay Intake

| | SH, lbs/day | | | |
|---------------------|-------------|-----|-----|-----|
| | None | 2.2 | 4.4 | 6.6 |
| Hay, OMI, lbs | | | | |
| DOMI, lbs | | | | |
| OM Digestibility, % | | | | |

Oklahoma State, 1990

JAS 68:4319

Byproduct Feeding

- **What's available**
- **Price**
 - Evaluate on DM basis
 - Look at \$/nutrient
- **Handling / Storage**
- **Minerals**



Byproduct Pricing

“I can get a ton of wet CGF for \$33 and/or dry pelleted CGF for \$72 a ton. Which one do I get?”



| Item | Wet CGF | Dry CGF |
|-----------------|---------|---------|
| Moisture, % | 60 | 10 |
| DM, lb/ton | 800 | 1800 |
| Price, \$/lb DM | 0.041 | 0.040 |

Byproduct Pricing

| <u>Ingredient</u> | <u>\$/ton</u> | <u>% DM</u> | <u>% CP</u> | <u>% TDN</u> | <u>\$/lb CP</u> | <u>\$/lb TDN</u> |
|-------------------|---------------|-------------|-------------|--------------|-----------------|------------------|
| SBM 48 | \$ 350.00 | 90 | 48 | 87 | \$ 0.405 | \$ 0.223 |

$\text{\$/ton of nutrient} / \% \text{ DM} / \% \text{ nutrient} / 2000 \text{ lb} = \text{\$/lb of nutrient}$

UGA Feed Cost Analyzer

Date 9/23/2009

Farm _____



THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
 Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

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| Ingredients | \$/ton | % DM | % CP | % TDN | \$/CWT DM | \$/lb CP | \$/lb TDN |
|------------------|--------|------|------|-------|-----------|------------|------------|
| Corn | \$ 140 | 90.0 | 10.0 | 90.0 | 7.78 | \$ 0.778 | \$ 0.086 |
| Corn Gluten Feed | \$ 110 | 90.0 | 23.0 | 83.0 | 6.11 | \$ 0.266 | \$ 0.074 |
| Corn Silage | \$ 50 | 30.0 | 8.0 | 73.0 | 8.33 | \$ 1.042 | \$ 0.114 |
| Cottonseed Hulls | \$ 195 | 91.0 | 4.1 | 45.0 | 10.71 | \$ 2.613 | \$ 0.238 |
| Cottonseed Meal | \$ 320 | 91.0 | 46.1 | 78.0 | 17.58 | \$ 0.381 | \$ 0.225 |
| Distillers Grain | \$ 145 | 90.0 | 28.0 | 95.0 | 8.06 | \$ 0.288 | \$ 0.085 |
| Hay, Average | \$ 110 | 90.0 | 10.0 | 52.0 | 6.11 | \$ 0.611 | \$ 0.118 |
| Hay, Excellent | \$ 120 | 90.0 | 13.0 | 58.0 | 6.67 | \$ 0.513 | \$ 0.115 |
| Hay, Poor | \$ 100 | 90.0 | 7.0 | 48.0 | 5.56 | \$ 0.794 | \$ 0.116 |
| Oats | \$ 265 | 88.0 | 13.3 | 77.0 | 15.06 | \$ 1.132 | \$ 0.196 |
| SBM 48 | \$ 350 | 90.0 | 48.0 | 87.0 | 19.44 | \$ 0.405 | \$ 0.223 |
| Soyhulls | \$ 110 | 91.0 | 12.1 | 77.0 | 6.04 | \$ 0.500 | \$ 0.078 |
| Wheat Midds | \$ 150 | 91.0 | 18.4 | 83.0 | 8.24 | \$ 0.448 | \$ 0.099 |
| Wheat Straw | \$ 75 | 90.0 | 3.5 | 41.0 | 4.17 | \$ 1.190 | \$ 0.102 |
| Whole Cottonseed | \$ 235 | 90.0 | 23.0 | 95.0 | 13.06 | \$ 0.568 | \$ 0.137 |
| Wheat | \$ 235 | 90.0 | 12.0 | 88.0 | 13.06 | \$ 1.088 | \$ 0.148 |
| BLANK | \$ 999 | 10.0 | 1.0 | 1.0 | 499.50 | \$ 499.500 | \$ 499.500 |
| BLANK | \$ 999 | 10.0 | 1.0 | 1.0 | 499.50 | \$ 499.500 | \$ 499.500 |
| BLANK | \$ 999 | 10.0 | 1.0 | 1.0 | 499.50 | \$ 499.500 | \$ 499.500 |
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Byproduct Handling/Storage



Byproduct Minerals

- Supplement Ca to for proper Ca:P ratio
 - Avoid urinary calculi
- Monitor sulfur levels
 - Avoid polioencephalomalacia
 - Cu deficiency
- N and P excretion
 - Environmental impact

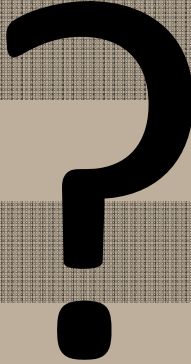


How much do I feed?

| Stage of Production/ Requirement | Poor Forage, 7% CP, 48% TDN | Average Forage, 10% CP, 50% TDN | Excellent Forage, 13% CP, 56% TDN |
|-------------------------------------|--------------------------------|------------------------------------|--------------------------------------|
| | -----lb supplement----- | | |
| Dry Cow | | | |
| | 6% CP, 48% TDN | | |
| Late Gestation | | | |
| | 9% CP, 56% TDN | | |
| Early Lactation | | | |
| | 11% CP, 60% TDN | | |
| Late Lactation | | | |
| | 8.5% CP, 55% TDN | | |

-50:50 mix of corn gluten feed and soyhulls

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| Stage of Production/ Requirement | Poor Forage, 7% CP, 48% TDN | Average Forage, 10% CP, 50% TDN | Excellent Forage, 13% CP, 56% TDN |
|-------------------------------------|--------------------------------|--|--------------------------------------|
| Dry Pregnant | -----lb supplement----- | | |
| Peak Lactation | 7% CP, 48% TDN |  | |
| Late Lactation | 12% CP, 60% TDN | | |
| | 9% CP, 55% TDN | | |

-50:50 mix of corn gluten feed and soyhulls

How do I balance my ration?

Balancer Programs:

- Taurus (UC Davis) \$400
 - animalscience.ucdavis.edu/extension/Software/taurus/
- BRANDS (Iowa State Univ.) \$200-475
 - www.iowabeefcenter.org/content/software_software_brands.html

Evaluator Programs:

- Cattle Grower Ration Balancer (Univ. of Arkansas)
 - www.aragriculture.org/livestock/beef/nutrition/spreadsheets/
- OSUNRC2002 (Oklahoma State Univ.)
 - www.ansi.okstate.edu/software/

CONSULT WITH YOUR COUNTY EXTENSION AGENT BEFORE FEEDING!!!!

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| | 12% CP, 60% TDN | | |
| Late Lactation | | | |
| | 9% CP, 55% TDN | | |

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Pre-conditioning

- Preparing calves for the feedlot after weaning
- Spread out the stress of weaning
- Get health records straight
- Feed for 45 days before it is shipped
- Help uniform group
- Goal ADG ~ 2 lb/d



Rations for Preconditioning

500 lb calves to gain 2 lb/d

Available Forage

Average bermuda hay
9% CP, 52 % TDN

Good bermuda hay
12% CP, 57 % TDN

Fall fescue pasture
12% CP, 61 % TDN

Winter annuals
18% CP, 65 % TDN

Rations for Preconditioning

500 lb calves to gain 2 lb/d

Available Forage

Average bermuda hay
9% CP, 52 % TDN

Good bermuda hay
12% CP, 57 % TDN

Fall fescue pasture
12% CP, 61 % TDN

Winter annuals
18% CP, 65 % TDN

**REMEMBER FORAGE
COST!!!!**

More Rations for Preconditioning

500 lb calves to gain 2 lb/d

| Available Forage | Forage \$/ton | 90:10 Corn Silage:CGF (\$55/ton) | | 60:40 Corn:SBM (\$225/ton) | |
|---|------------------|--|----------------|----------------------------------|----------------|
| | | lb/hd | \$/hd | lb/hd | \$/hd |
| Average bermuda hay 9% CP, 52 % TDN | \$110 | 23 | \$ 0.87 | 6.5 | \$ 1.18 |
| Good bermuda hay 12% CP, 57 % TDN | \$115 | 20 | \$ 0.88 | 5.0 | \$ 1.14 |
| Fall fescue pasture 12% CP, 61 % TDN | \$15 | 16 | \$ 0.64 | 3.5 | \$ 0.69 |
| Winter annuals 18% CP, 65 % TDN | \$20 | 10 | \$ 0.67 | 1.5 | \$ 0.71 |

Take Home Message

- Understand changing nutrient needs throughout production cycle.
- Know your forages.
- Use economic strategies when supplementation is needed
- **NOT ALL FEEDS ARE CREATED EQUAL**

Thank You!



Questions?

Tri-State Cow/Calf Conference



The conference is presented under a grant from the Southern Region Risk Management Education Center with additional support from the University of Tennessee Extension, Virginia Cooperative Extension and North Carolina Cooperative Extension.



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