

# Southeast Cattle Advisor – Agent Trainings

## Byproducts Utilization

### Utilizing Byproducts and Balancing Rations



### What we want



### What we DO NOT want



### 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



# Southeast Cattle Advisor – Agent Trainings

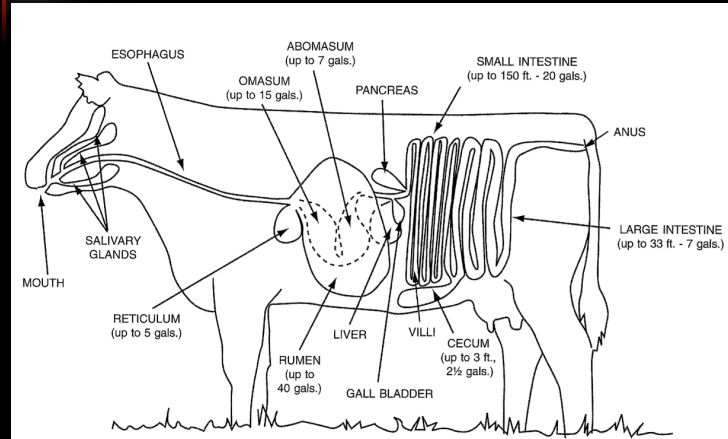
## Byproducts Utilization

### Basic Nutrition

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



### The Beef Cow Digestive System



### How do we visualize nutrition?

- Compare animal production barrel.
- Slats = nutrient component
- Water capacity
- Animal Performance
- Performance as good as limiting nutrients

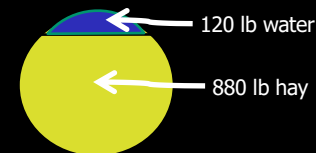


123rf.com



### 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?



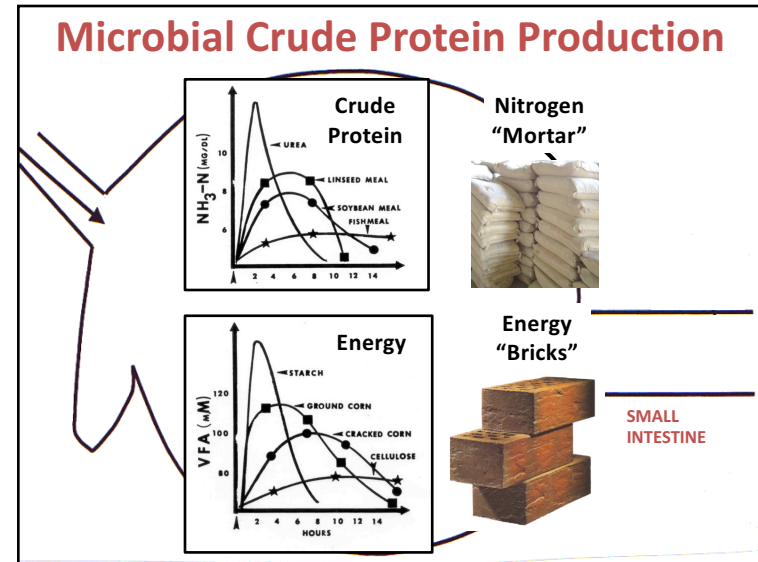
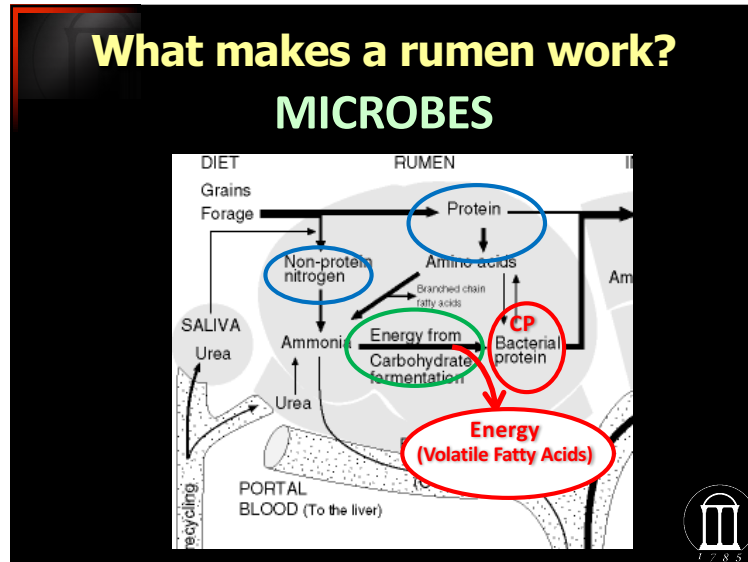
#### RULE OF THUMB for Nutrients:

- DM to AF → multiply by %DM  
 $12\% \text{ CP} \times 0.88 = 10.6\%$
- AF to DM → divide by %DM  
 $10.6 \div 0.88 = 12\%$



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## Byproducts Utilization



### Reproductive Efficiency

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

A photograph of a brown cow and her calf in a field. A small logo is visible in the bottom right corner.



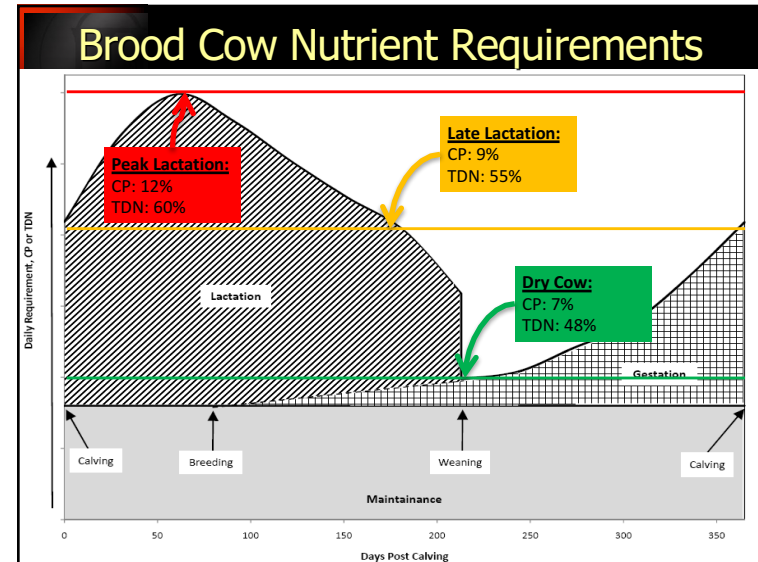
# Southeast Cattle Advisor – Agent Trainings

## Byproducts Utilization

### Nutrient Priorities

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






### Nutritional Requirements of Weaned Calves

Medium-frame steer calves

Wt (lb)	Daily Gain (lb)	Crude Protein (%)	TDN (%)
400	1.5	11.5	63.0
	2.0	12.7	67.5
	2.5	14.2	73.5
600	1.5	9.8	63.0
	2.0	10.5	67.5
	2.5	11.4	73.5
800	1.5	8.8	63.0
	2.0	9.8	67.5
	2.5	9.3	73.5



- Know the requirements to keep calves gaining
- Remember:
  - Gain and health = \$\$\$\$
  - Health is a function of **immunity** and **nutrition**

### Available Forages

- Hay produced
  - Storage
  - Testing
  - Inventory

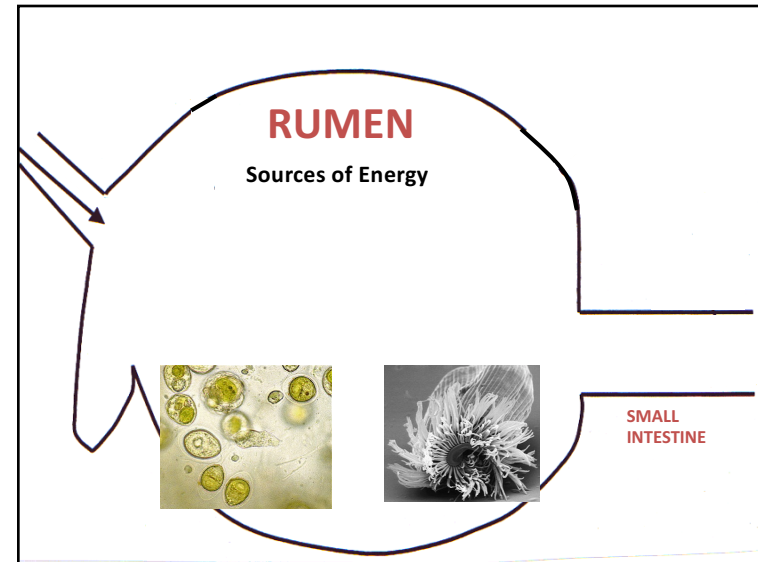
Hay Cutting	Production Phase
1. CP 14% TDN 60%	Dry Cow
2. CP 10% TDN 55%	Late Gestation
3. CP 6% TDN 47%	Early Lactation

TEST FORAGES!!!!



# Southeast Cattle Advisor – Agent Trainings


## Byproducts Utilization



### Effect of Increasing Corn on Hay Intake and Digestibility

	Corn, lbs/day			
	None	2.2	4.4	6.6
Hay DMI lbs	19.3	18.0	14.1	11.2
Total DMI, lbs	20.9	21.1	18.6	17.2
DOMI, lbs	7.5	8.4	7.1	7.3
Hay OM Digest, %	36.5	35.1	23.6	18.9


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	21.4	22.3	21.6	19.9
DOMI, lbs	10.6	11.8	12.3	12.7
OM Digestibility, %	45.8	46.2	46.6	48.6

Oklahoma State, 1990      JAS 68:4319



# Southeast Cattle Advisor – Agent Trainings

## Byproducts Utilization

### Byproduct Feeding

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



L. Stewart, UGA Extension

### Potential Byproducts

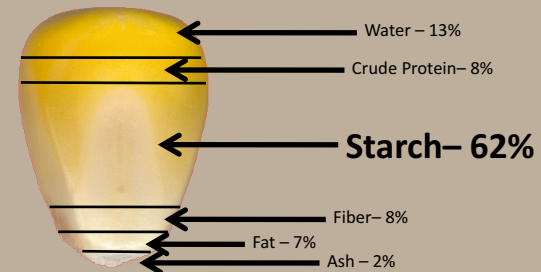
1. Grain
  - Corn gluten feed
  - Distiller's grains
  - Soy Hulls
  - Wheat middlings
2. Cotton
  - Whole seed
  - Gin trash
  - Hulls
3. Sugar and starch production
  - Cane, beet & corn molasses
  - Salvage candy
4. Vegetable
  - Cull vegetables

### 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



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## Byproducts Utilization

### *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





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## Byproducts Utilization

### *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



### *Soybean Hulls*

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



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## Byproducts Utilization

### Byproduct Feeding

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



L. Stewart, UGA Extension

### Byproduct Pricing

“I can get a ton of DDGS for \$250 and/or cull carrots for \$45 a ton. Which one do I get?”

Item	DDGS	Carrots
Moisture, %	10	88
DM, lb/ton	1800	240
Price, \$/lb DM	0.139	0.188



L. Stewart, UGA Extension



### Byproduct Pricing

Ingredient	\$/ton	% DM	% CP	% TDN	\$/lb CP	\$/lb TDN
SBM 48	\$ 415.00	90	48	87	\$ 0.471	\$ 0.274

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

[www.ugabeef.com](http://www.ugabeef.com)

L. Stewart, UGA Extension

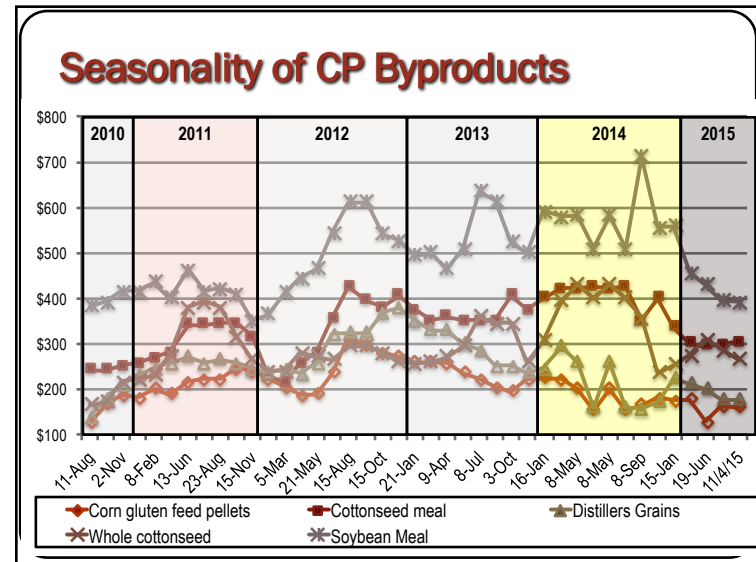
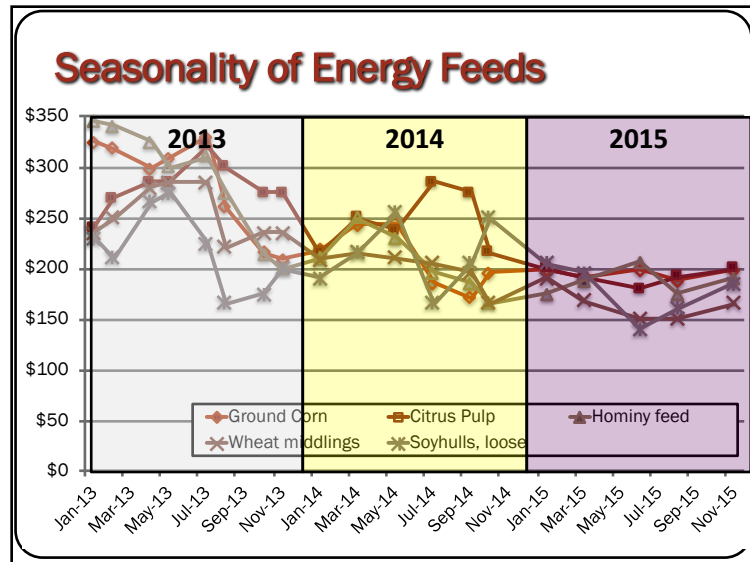
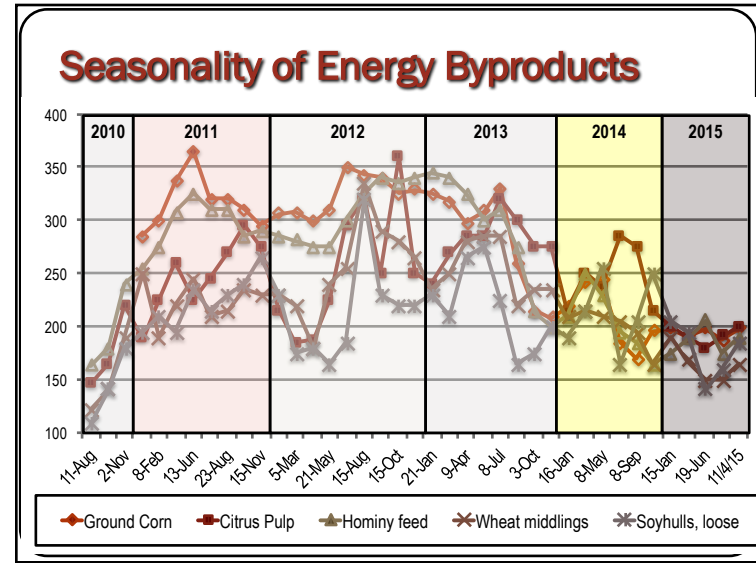


### When do I procure feeds?



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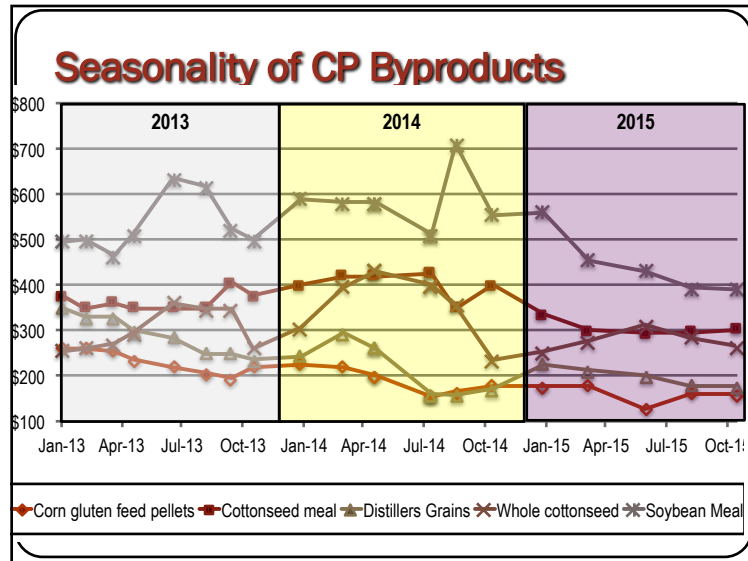
## Byproducts Utilization






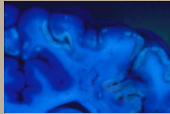

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## Byproducts Utilization



### 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

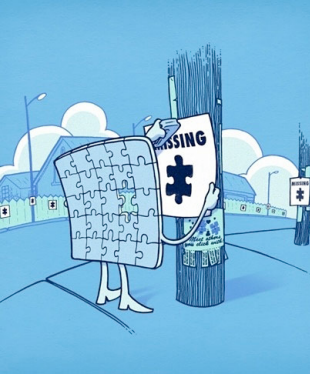




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## Byproducts Utilization

### So Now What?




A cartoon illustration of a person standing in a field, holding a large puzzle board. One piece is missing and is labeled 'MISSING'. The person is looking at the board with a concerned expression. In the background, there are farm buildings and a fence.




### 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
Dry Pregnant	-----lb supplement-----		
7% CP, 48% TDN			
Peak Lactation			
12% CP, 60% TDN			
Late Lactation			
9% CP, 55% TDN			
-50:50 mix of corn gluten feed and soyhulls			

?

L. Stewart, UGA 




### How do I balance my ration?

**Balancer Programs:**

- Taurus (UC Davis) \$400
  - [animalscience.ucdavis.edu/extension/Software/taurus/](http://animalscience.ucdavis.edu/extension/Software/taurus/)
- BRANDS (Iowa State Univ.) \$200-475
  - <http://www.iowabeefcenter.org/brands.html>

**Evaluator Programs:**

- Cattle Grower Ration Balancer (Univ. of Arkansas)
  - <http://www.uaex.edu/farm-ranch/animals-forages/beef-cattle/nutrition-feeding.aspx>
- OSUNRC2002 (Oklahoma State Univ.)
  - [www.ansi.okstate.edu/software/](http://www.ansi.okstate.edu/software/)



### How do I balance my ration?

- Putting it together can be overwhelming
- Programs are available to aid in decision making
- Some are free, some cost \$\$\$

**Program Provides:**

- Pre-populated feed library
- Feed cost analyzer
- BASIC ration balancer
- Ration Analyzer

**Now Available:**  
UGA BASIC BALANCER PROGRAM

UGAb beef.com

# Southeast Cattle Advisor – Agent Trainings

## Byproducts Utilization

Feeds	DM	CP	TDN	Ca	P	\$/ton*
1 Bermudagrass Hay, Good	85	12	60	0.38	0.22	\$100
2 Bermudagrass Hay, Average	85	10	54	0.36	0.18	\$90
3 Bermudagrass Hay, Poor	85	6	48	0.34	0.18	\$80
4 Tall Fescue Hay, Good	85	16	60	0.43	0.32	\$120
5 Tall Fescue Hay, Average	85	13	55	0.42	0.31	\$100
6 Tall Fescue Hay, Poor	85	10	50	0.41	0.3	\$80
7 Pennum Hay	88	11	54	1.20	0.15	\$90
8 Bermudagrass Pasture	25	13	64	0.4	0.27	\$8.75
9 Bahiagrass Pasture	25	10	58	0.46	0.22	\$8.25
10 Summer annual Pasture	25	12	60	0.5	0.44	\$8.50
11 Small Grains Pasture - Vegetative	22	18	70	0.45	0.35	\$12.50
12 Small Grains Pasture - Mature	25	12	58	0.4	0.3	\$12.50
13 Ann. Ryegrass Pasture - Vegetative	22	20	72	0.65	0.41	\$10.00
14 Ann. Ryegrass Pasture - Mature	25	12	58	0.6	0.35	\$10.00
15 Tall Fescue Pasture	25	14	62	0.44	0.33	\$8.00
16 Corn Silage	29	9	72	0.28	0.22	\$50
17 Cottonseed Hulls	90	4	45	0.15	0.09	\$123
18 Gin Trash	85	12	47	0.90	0.20	\$35
19 Peanut Hulls	80	8	25	1.20	0.10	\$20
20 Soybean Stubble	85	5	40	1.20	0.15	\$20
21 Wheat Straw	89	4	44	0.18	0.50	\$50
22 Alfalfa Hay	83	21	68	1.27	0.32	\$110
23 Ryegrass Baleage - Vegetative	50	18	70	0.6	0.35	\$30
24 Ryegrass Baleage - Mature	50	12	58	0.6	0.35	\$30
25 BLANK	100	0	0	0.00	0.00	\$999

### 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
Dry Pregnant 7% CP, 48% TDN	0	0	0
Peak Lactation 12% CP, 60% TDN	15.5	11.5	5.8
Late Lactation 9% CP, 55% TDN	7.6	5.8	0

-----lb supplement-----


### 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



# Southeast Cattle Advisor – Agent Trainings

## Byproducts Utilization



**Southeast Cattle Advisor**

For up to date information on:  
**Beef cattle outlooks**  
**Marketing**  
**Production information**

[www.seattleadvisor.com](http://www.seattleadvisor.com)

MEL & LEL A, B, J CREEP GAIN INDEX	
2002-2008 Average Values	
2008	100
2007	100
2006	100
2005	100
2004	100
2003	100
2002	100

Item	Price
<b>SALES PRICES</b>	
GA 500-600 lbs. steer (B/Cat)	\$176.47
GA 500-600 lbs. steer (B/Cat)	\$181.00
GA 600-700 lbs. steer (B/Cat)	\$184.00
GA 700-800 lbs. steer (B/Cat)	\$187.00
GA 800-900 lbs. steer (B/Cat)	\$190.00
GA 900-1000 lbs. steer (B/Cat)	\$193.00
GA 1000-1100 lbs. steer (B/Cat)	\$196.00
GA 1100-1200 lbs. steer (B/Cat)	\$199.00
GA 1200-1300 lbs. steer (B/Cat)	\$202.00
GA 1300-1400 lbs. steer (B/Cat)	\$205.00
GA 1400-1500 lbs. steer (B/Cat)	\$208.00
GA 1500-1600 lbs. steer (B/Cat)	\$211.00
GA 1600-1700 lbs. steer (B/Cat)	\$214.00
GA 1700-1800 lbs. steer (B/Cat)	\$217.00
GA 1800-1900 lbs. steer (B/Cat)	\$220.00
GA 1900-2000 lbs. steer (B/Cat)	\$223.00
GA 2000-2100 lbs. steer (B/Cat)	\$226.00
GA 2100-2200 lbs. steer (B/Cat)	\$229.00
GA 2200-2300 lbs. steer (B/Cat)	\$232.00
GA 2300-2400 lbs. steer (B/Cat)	\$235.00
GA 2400-2500 lbs. steer (B/Cat)	\$238.00
GA 2500-2600 lbs. steer (B/Cat)	\$241.00
GA 2600-2700 lbs. steer (B/Cat)	\$244.00
GA 2700-2800 lbs. steer (B/Cat)	\$247.00
GA 2800-2900 lbs. steer (B/Cat)	\$250.00
GA 2900-3000 lbs. steer (B/Cat)	\$253.00
GA 3000-3100 lbs. steer (B/Cat)	\$256.00
GA 3100-3200 lbs. steer (B/Cat)	\$259.00
GA 3200-3300 lbs. steer (B/Cat)	\$262.00
GA 3300-3400 lbs. steer (B/Cat)	\$265.00
GA 3400-3500 lbs. steer (B/Cat)	\$268.00
GA 3500-3600 lbs. steer (B/Cat)	\$271.00
GA 3600-3700 lbs. steer (B/Cat)	\$274.00
GA 3700-3800 lbs. steer (B/Cat)	\$277.00
GA 3800-3900 lbs. steer (B/Cat)	\$280.00
GA 3900-4000 lbs. steer (B/Cat)	\$283.00
GA 4000-4100 lbs. steer (B/Cat)	\$286.00
GA 4100-4200 lbs. steer (B/Cat)	\$289.00
GA 4200-4300 lbs. steer (B/Cat)	\$292.00
GA 4300-4400 lbs. steer (B/Cat)	\$295.00
GA 4400-4500 lbs. steer (B/Cat)	\$298.00
GA 4500-4600 lbs. steer (B/Cat)	\$301.00
GA 4600-4700 lbs. steer (B/Cat)	\$304.00
GA 4700-4800 lbs. steer (B/Cat)	\$307.00
GA 4800-4900 lbs. steer (B/Cat)	\$310.00
GA 4900-5000 lbs. steer (B/Cat)	\$313.00
GA 5000-5100 lbs. steer (B/Cat)	\$316.00
GA 5100-5200 lbs. steer (B/Cat)	\$319.00
GA 5200-5300 lbs. steer (B/Cat)	\$322.00
GA 5300-5400 lbs. steer (B/Cat)	\$325.00
GA 5400-5500 lbs. steer (B/Cat)	\$328.00
GA 5500-5600 lbs. steer (B/Cat)	\$331.00
GA 5600-5700 lbs. steer (B/Cat)	\$334.00
GA 5700-5800 lbs. steer (B/Cat)	\$337.00
GA 5800-5900 lbs. steer (B/Cat)	\$340.00
GA 5900-6000 lbs. steer (B/Cat)	\$343.00
GA 6000-6100 lbs. steer (B/Cat)	\$346.00
GA 6100-6200 lbs. steer (B/Cat)	\$349.00
GA 6200-6300 lbs. steer (B/Cat)	\$352.00
GA 6300-6400 lbs. steer (B/Cat)	\$355.00
GA 6400-6500 lbs. steer (B/Cat)	\$358.00
GA 6500-6600 lbs. steer (B/Cat)	\$361.00
GA 6600-6700 lbs. steer (B/Cat)	\$364.00
GA 6700-6800 lbs. steer (B/Cat)	\$367.00
GA 6800-6900 lbs. steer (B/Cat)	\$370.00
GA 6900-7000 lbs. steer (B/Cat)	\$373.00
GA 7000-7100 lbs. steer (B/Cat)	\$376.00
GA 7100-7200 lbs. steer (B/Cat)	\$379.00
GA 7200-7300 lbs. steer (B/Cat)	\$382.00
GA 7300-7400 lbs. steer (B/Cat)	\$385.00
GA 7400-7500 lbs. steer (B/Cat)	\$388.00
GA 7500-7600 lbs. steer (B/Cat)	\$391.00
GA 7600-7700 lbs. steer (B/Cat)	\$394.00
GA 7700-7800 lbs. steer (B/Cat)	\$397.00
GA 7800-7900 lbs. steer (B/Cat)	\$400.00
GA 7900-8000 lbs. steer (B/Cat)	\$403.00
GA 8000-8100 lbs. steer (B/Cat)	\$406.00
GA 8100-8200 lbs. steer (B/Cat)	\$409.00
GA 8200-8300 lbs. steer (B/Cat)	\$412.00
GA 8300-8400 lbs. steer (B/Cat)	\$415.00
GA 8400-8500 lbs. steer (B/Cat)	\$418.00
GA 8500-8600 lbs. steer (B/Cat)	\$421.00
GA 8600-8700 lbs. steer (B/Cat)	\$424.00
GA 8700-8800 lbs. steer (B/Cat)	\$427.00
GA 8800-8900 lbs. steer (B/Cat)	\$430.00
GA 8900-9000 lbs. steer (B/Cat)	\$433.00
GA 9000-9100 lbs. steer (B/Cat)	\$436.00
GA 9100-9200 lbs. steer (B/Cat)	\$439.00
GA 9200-9300 lbs. steer (B/Cat)	\$442.00
GA 9300-9400 lbs. steer (B/Cat)	\$445.00
GA 9400-9500 lbs. steer (B/Cat)	\$448.00
GA 9500-9600 lbs. steer (B/Cat)	\$451.00
GA 9600-9700 lbs. steer (B/Cat)	\$454.00
GA 9700-9800 lbs. steer (B/Cat)	\$457.00
GA 9800-9900 lbs. steer (B/Cat)	\$460.00
GA 9900-10000 lbs. steer (B/Cat)	\$463.00

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