Nutritional Management "How much should I feed my Cattle"

Coordinator: Dr. Jason Banta

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Nutrition and Supplementation Programs for Cow-Calf Operations

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What is the most important part of a nutrition program?

3

4

Forage Systems

5

What is the goal of a forage plan/system?

maximize the number of grazing days
reduce/eliminate supplementation requirements
85% or better weaning rate
good weaning weights

6

Customized to Your Operation, Soil Type, and Resources

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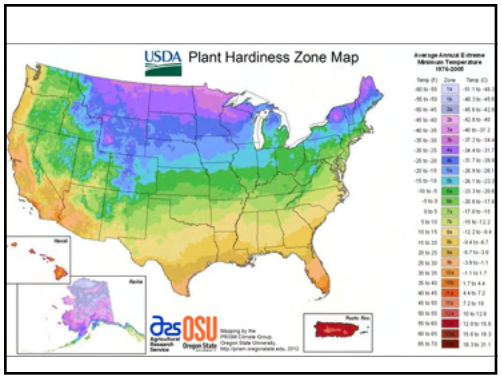

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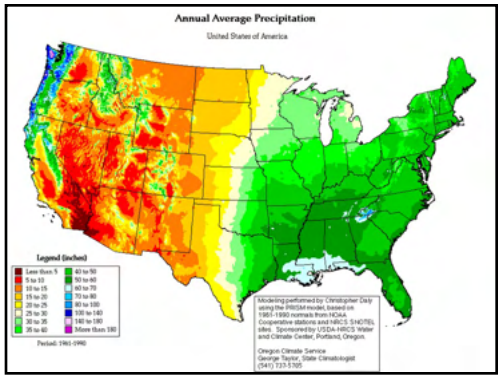

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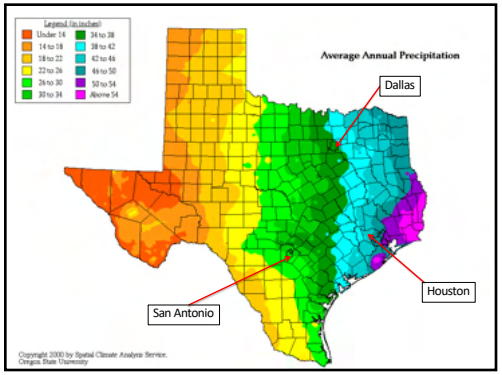

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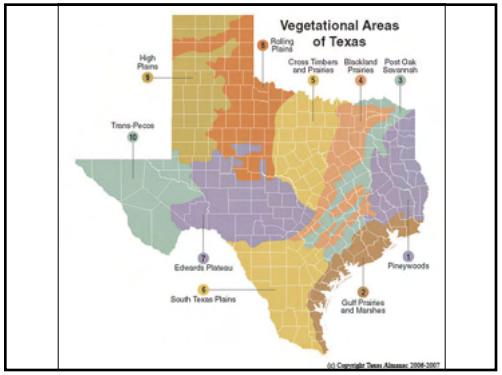

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Cow-Calf Systems are based on Perennial Forages

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Native Range Systems

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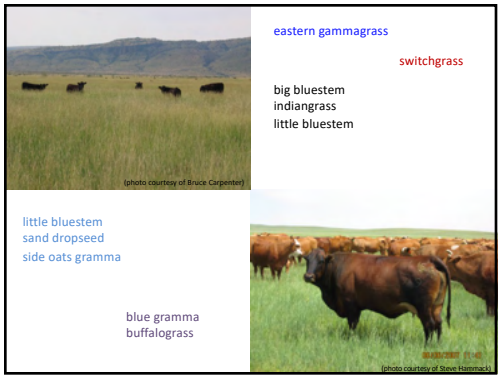

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Protein is often first limiting when quality declines in Native Warm-Season Perennial Forages

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Introduced Forage Systems

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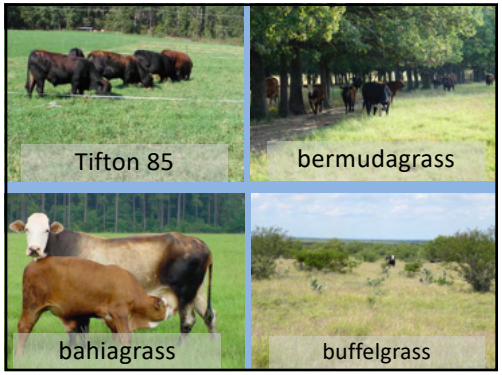

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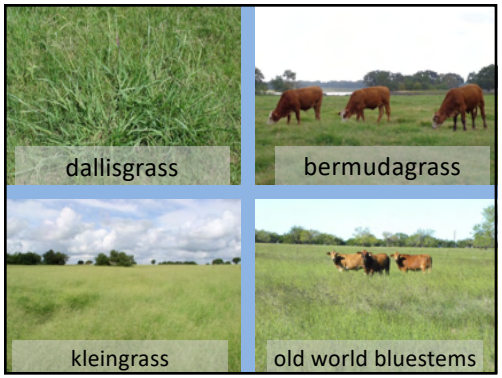

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Energy is often
first limiting when
quality declines
in Introduced Warm-Season
Perennial Forages

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Bahia and Bermudagrass Systems

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How long does
bahia and
bermudagrass grow?

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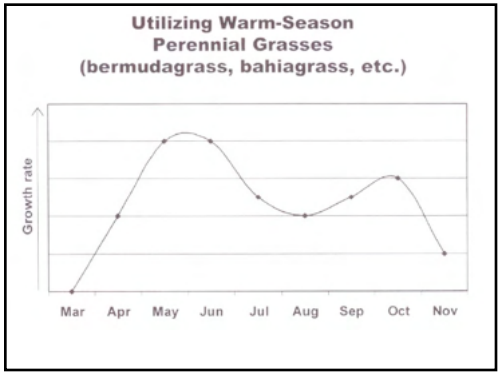

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What about
cool-season annuals?

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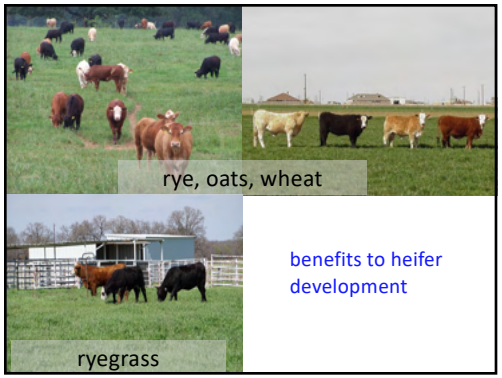

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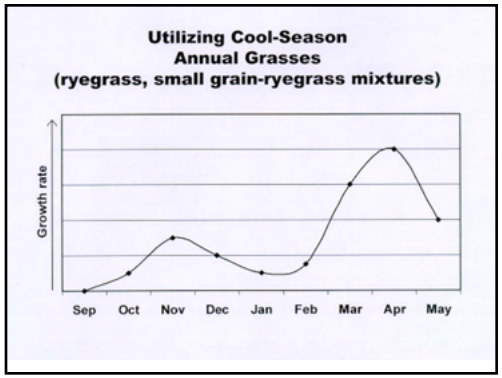

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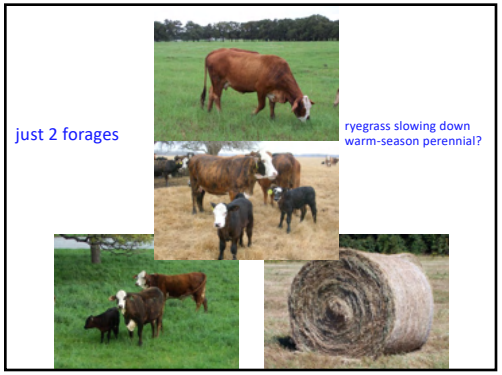

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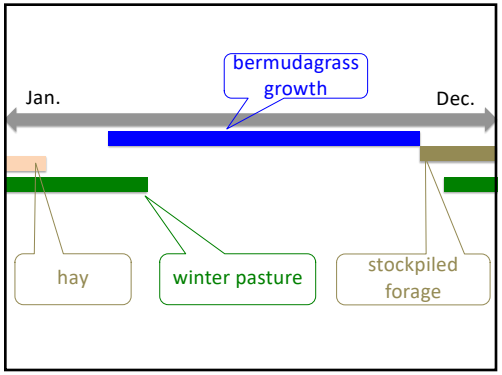

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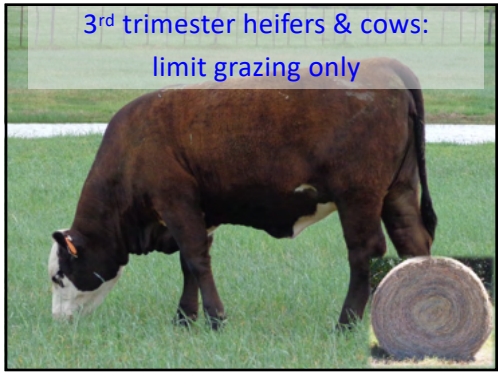

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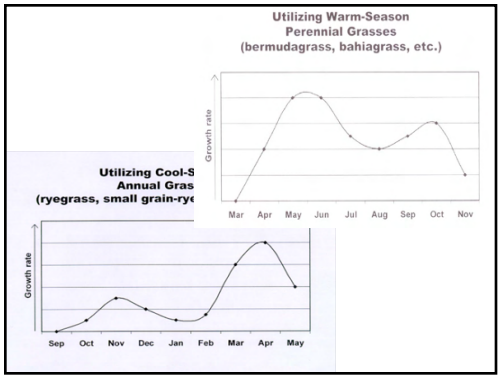

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Management Factors
Affecting
Forage Production

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Grazing Pressure and
Stocking Rate

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Overton Stocking Rate Study: Winter Pasture

- 2 years: 1997-1998 and 1998-1999
- rye/ryegrass overseeded on bermudagrass
- 158 days of grazing: Dec. to May
- 267 lbs of N

initial weight of steer: 600 lbs

low: 1.6 hd/ac = 960 lbs
medium: 2.2 hd/ac = 1,320 lbs
high: 2.8 hd/ac = 1,680 lbs

(Rouquette et al., 2000; Steer performance affected by grazing method and stocking rate)

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Overton Stocking Rate Study

Grazing System (Continuous)	Stocking Rate, hd/ac	ADG, lbs	Gain/acre, lbs
Low	1.6	2.95	743
Medium	2.2	2.12	740
High	2.8	0.96	436

(Rouquette et al., 2000; Steer performance affected by grazing method and stocking rate)

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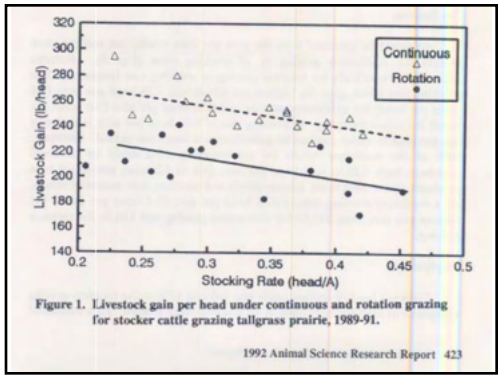

Figure 1. Livestock gain per head under continuous and rotation grazing for stocker cattle grazing tallgrass prairie, 1989-91.

1992 Animal Science Research Report 423

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some level of rotation/ability to rotate is beneficial in most situations

- cutting considerations and management of stored forages
- highly palatable forages
- planting of annuals forages

depending on stubble height targets it is very easy to reduce animal performance with rotation

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Stubble Height and Plant Health

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Stocking
Strategies and Factors

48

How many acres do you need per cow-calf pair?

49

determining grazeable acres

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70% utilization			
Cow Weight	**1,000**	**1,200**	**1,400**
Cow intake, (2.25% of BW)	8,213	9,855	11,498
Calf Intake	1,508	1,810	2,111
Pair Intake	9,721	11,665	13,609
Forage Allowance, let cow consume (70%)	13,887	16,664	19,441
Forage Production, lbs/ac	4,500	4,500	4,500
Stocking Rate, ac/pair	3.09	3.70	4.32

51

native forages: 25% utilization			
Cow Weight	1,000	1,200	1,400
Cow intake, (2.25% of BW)	8,213	9,855	11,498
Calf Intake, lbs/year	1,508	1,810	2,111
Pair Intake, lbs/year	9,721	11,665	13,609
Forage Allowance, let cow consume (25%)	38,884	46,660	54,436
Forage Production, lbs/ac/yr	3,000	3,000	3,000
Stocking Rate, ac/pair	12.96	15.55	18.15

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80%

53

Protein and Energy Supplementation

54

When do we supplement?

for most beef cow-calf operations protein and/or energy supplementation is generally needed

- late summer when forage quality declines
- during the winter

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What 3 primary things affect supplementation of energy & protein?

BCS

nutrient requirements

forage & hay quality

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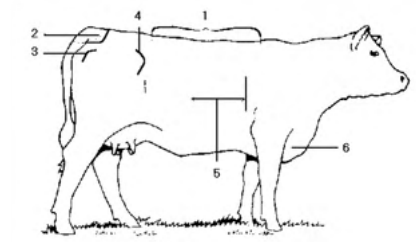
Areas to evaluate Body Condition



1. BACK 3. PINS 5. RIBS
2. TAIL HEAD 4. HOOKS 6. BRISKET

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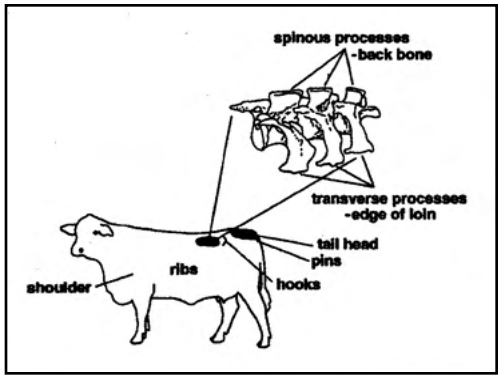

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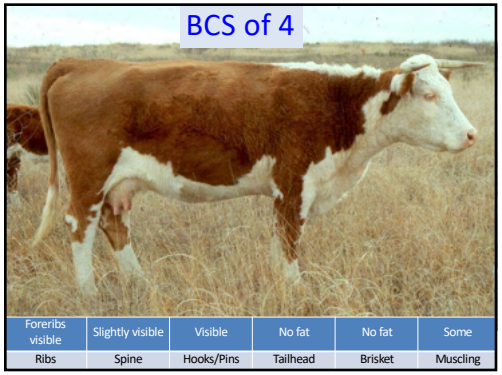

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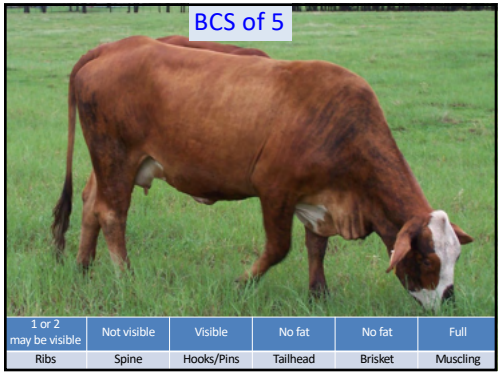

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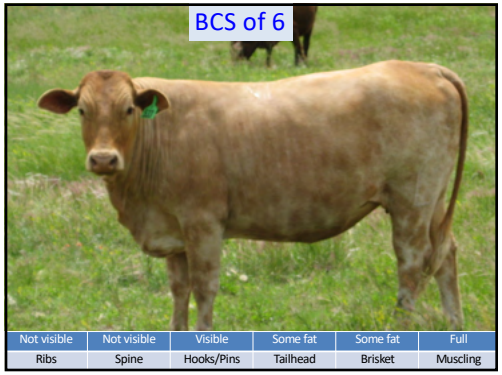

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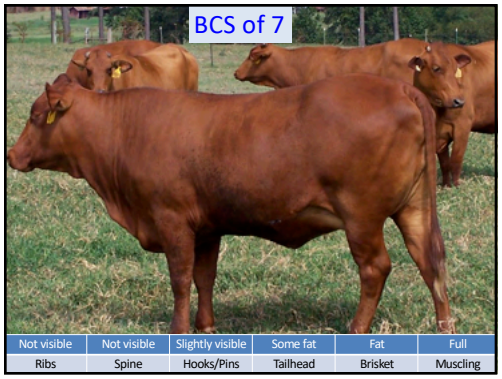

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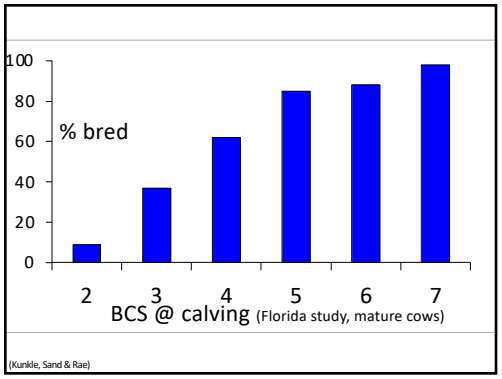

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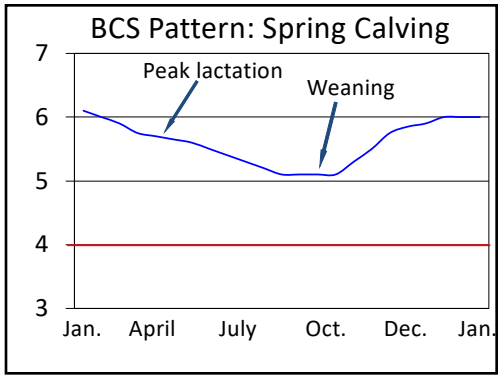

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Nutrient Requirements Cows

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Description	% CP	% TDN	% Ca	% P
2-yr-old lactating cow, peak lactation	11.5	60	0.28	0.18
3-yr-old lactating cow, peak lactation	12.5	61	0.30	0.19
mature lactating cow, peak lactation	12.5	61	0.30	0.19
coming 3-yr-old dry cow, 270 d pregnant	9.0	58	0.26	0.17
mature dry cow, 270 d pregnant	8.5	55	0.26	0.17

*Estimated dietary requirements for high marbling Angus cows with no weather stress. Assumes 1,300 lb mature weight and 25 lb milk potential at maturity (NRC, 2016)

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but….what if the cows look like this?

68

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Nutrient Requirements
Replacement Heifers

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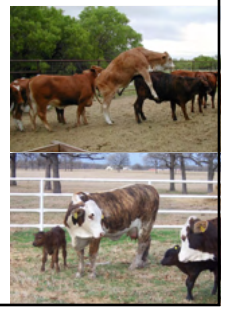
Replacement Heifer Targets

target breeding
- 13.5 - 15 months of age
- 65% of mature weight

example
- 845 lb = 1300 x 0.65



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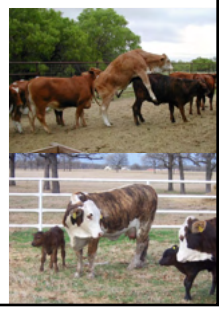
Replacement Heifer Targets

target breeding
- 13.5-15 months of age
- 65% of mature weight

example
- 1300 lb mature weight
- 845 lb = 1300 x 0.65

target calving
- 23-25 months of age
- 85% of mature weight

example
- 1300 lb mature weight
- 1105 lb = 1300 x 0.85



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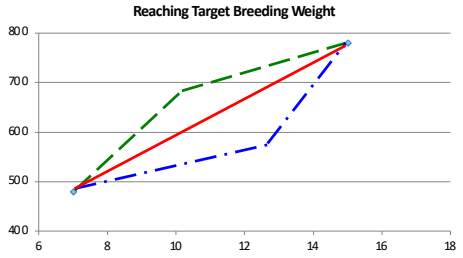
Heifer Development Strategies



udder sensitive to excess condition: 4 to 10 m of age

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Weaning to Breeding

- age
  - weaning: 7 months
  - breeding: 14 months
- weight
  - weaning: 520 lbs (40 % of mature weight)
  - breeding : 845 lbs (assumes 1,300 lb cow)
- target ADG

325 lb ÷ 210 d = 1.55 lbs

75

Weaning to Breeding

- age
  - weaning: 7 months
  - breeding: 14 months
- weight
  - weaning: 520 lbs (40 % of mature weight)
  - weaning: 585 lbs (45 % of mature weight)
  - breeding : 845 lbs (assumes 1,300 lb cow)
- target ADG

325 lb ÷ 210 d = 1.55 lbs
260 lb ÷ 210 d = 1.24 lb

76

Breeding - Calving

- age
  - breeding: 14 months
  - calving: 23.5 months
- weight
  - breeding: 845 lbs
  - calving: 1105 lbs
- target ADG

260 lb ÷ 285 d = 0.91 lbs

77

open heifer: weaning – breeding
Target ADG: 1.55 lb mature weight: 1300 lb

Age, months	Weight	% CP	% TDN	% Ca	% P	DMI, lb
7.0	520	11	61	0.44	0.22	13.0
8.7	600	10	60	0.38	0.20	15.0
10.9	700	8.5	59	0.33	0.18	17.5
13.0	800	8	58	0.29	0.16	20.0
14.0	845	8	57	0.28	0.16	21.1

*Estimated dietary requirements for high marbling Angus heifer with no weather stress. Assumes a 1,300 lb mature weight. (NRC, 2016)

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bred heifer: breeding – calving calf birthweight: 70 lb
target ADG: 1.0 lb age at calving: 24 months mature wt: 1300 lb

Age, months	Days Preg.	Weight	% CP	% TDN	% Ca	% P	DMI, lb
16	45	915	8	56	0.26	0.16	19
18	105	975	8	57	0.26	0.16	20
20	165	1035	8	58	0.26	0.16	21
22	225	1095	9	61	0.34	0.19	22
23.5	270	1155	10.5	67	0.36	0.20	23

*Estimated dietary requirements for high marbling Angus heifer with no weather stress. Assumes 1,300 lb mature weight and 26 lb milk potential at maturity (NRC, 2016)

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Forage Intake and Forage Quality

80

as forage quality declines forage intake decreases

- low quality forage = low intake
- high quality forage = higher intake

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Factors Affecting Forage or Hay Quality

- species and cultivar
- maturity
- temperature
- nitrogen fertilizer
- rained on hay
- hay put up wet

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Some generalizations:

cool-season > warm-season

annuals > perennials

arid environments > humid environments

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warm-season perennials (native)

ADG: 1.0 to 2.25 lb

- big bluestem & indiangrass
- switchgrass
- eastern gamagrass
- little bluestem

part of advantage in ADG is likely due to grazing differences (25% vs 65+% utilization)

84

warm-season perennials (introduced)

ADG: 1.0 to 1.6 lb

- old world bluestems (could be higher under some conditions)
- Tifton 85 (bermudagrass x stargrass)
- johnsongrass (doesn't tolerate grazing well)

ADG: 0.7 to 1.3 lb

- bermudagrass
- kleingrass (doesn't tolerate close grazing for extended periods)
- bahiagrass
- dallisgrass

85

warm-season annuals (introduced)

ADG: 2.0 to 2.75 lb

- sorghum x sudangrass
- sudangrass

ADG: 1.25 to 2.0 lb

- crabgrass
- pearl millet

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cool-season perennials (introduced)

ADG: 1.0 to 2.25 lb

- orchardgrass
- fescue
  - seedhead suppression
  - novel endophyte
- perennial ryegrass

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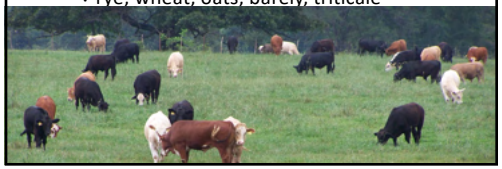
cool-season annuals (introduced)

ADG: 1.5 to 2.85 lb

- ryegrass
- small grains
  - rye, wheat, oats, barely, triticale



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Maturity

Interval between cuttings	% TDN	% CP	Season Yield, tons/acre
3 weeks	65.2	18.5	7.9
4 weeks	61.9	16.4	8.4
5 weeks	59.3	15.4	9.2
6 weeks	58.0	13.3	10.3
8 weeks	54.1	10.7	10.2
12 weeks	51.0	9.0	10.4

- Coastal bermudagrass study in Georgia
- Glen Burton

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benefit of multiple fields that can be cut for hay or grazed

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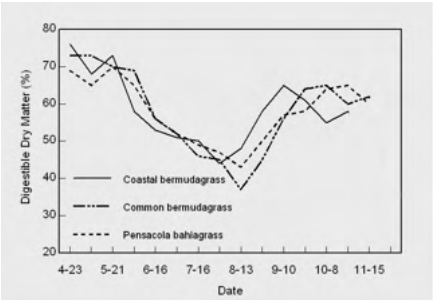
Temperature



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Determining Hay Quality

sample each cutting

- TDN (i.e. energy)
  - summative equations
  - NDF
  - NDF digestibility
  - ash
  - crude protein
  - ADICP
- Crude Protein

92

Components	As Fed	DM
% Moisture	8.0	
% Dry Matter	92.0	
% Crude Protein	11.3	12.2
% Adjusted Crude Protein	11.3	12.2
% Acid Detergent Fiber	37.3	40.6
% Neutral Detergent Fiber	64.8	70.5
% NFC	11.6	12.6
% TDN	50	54
NEL, Mcal/Lb	.38	.41
NEM, Mcal/Lb	.42	.46
NEG, Mcal/Lb	.19	.21

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Forage Testing Laboratories

Dairy One Forage Lab
Ithaca, NY; 800-344-2697
http://www.dairyone.com

- talk to nutritionist
  - analysis may change depending on forage species
  - appropriate lab may change if HCN is needed

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Determining Forage Quality

Pasture:

forage species
growing conditions
fecal consistency

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Supplementation and Hay Feeding Scenarios

- ~~cheap and easy~~
- easiest and least expensive
- frequent labor when needed, less expensive
- less consistent labor, more expensive

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Easiest and Least Expensive

97

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99

Options if Cattle Need Supplementation

100

What type of supplement is needed?

protein energy

a combination of energy and protein

101

Energy Sources

- whole corn
- 11-14% cubes
- soybean hulls
- wheat midds
- rice bran

gradually increase levels in the diet

102

Energy and Protein Sources

- 20% cubes
- corn gluten feed
- distillers grains
- winter pasture
- whole cottonseed (max. 25% of diet)

gradually increase levels in the diet

103

Protein Sources

- cottonseed meal
  - 38 or 40% cubes
- soybean meal
- sunflower meal (look for 35%+ CP)
- canola meal
- winter pasture (limit grazing)
- alfalfa hay
- urea (limited amount in right situation)

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Hand-fed Supplements

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Considerations

- easy to increase or decrease amount
- many options to choose from
- often cheaper per unit of nutrient especially TDN
- may require more labor

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Cottonseed Meal

A 41% plant protein source n
supplement to low quality h

AVAILABLE BAGS: 50 lb

blend of
1/3 cottonseed meal
2/3 corn

~20.8% CP; 84% TDN

gradually increase levels in the diet

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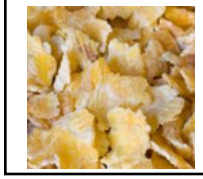

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cubes are generally 3/4 or 7/8

pellets are generally 1/8, 1/4, or 3/8

same formulations and ingredients can be used for both

sizes change based on feeding situation and animal size

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Examples from One Company

110

38% CP, 75% TDN

111

gradually increase levels in the diet

all 20% cubes

differences on feed tag
crude fiber & protein source

20% NP Cube
72% TDN, max CF 10%

20% Hi-Fi NP Cube
57% TDN, max CF 15%

20% EQ Cube; not more than 6.6% CP from NPN
56% TDN, max CF 15%

112

12% crude protein
75% TDN
8% max crude fiber

12% crude protein
55% TDN
18% max crude fiber

gradually increase levels in the diet

113

DDG Cubes

- growing segment of industry
  - find out if they test for aflatoxins
  - corn, grain sorghum, or mix
  - some variation

gradually increase levels in the diet

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More Cube Considerations

- forage extenders cubes are rarely a good option, to low in TDN
- rare for cubes to contain a good effective roughage source
- how is the Ca:P ratio
- is there any K added for dormant native forages

115

Self-fed Supplements

116

Considerations

- may be hard to change amount consumed
- may not be able to supply enough TDN to thin animals or animals consuming low quality forage
- less options to choose from
- may require less labor
- often best to feed all year long

117

molasses or DDG based

118

molasses based
or
distillers solubles based

119

Liquid Feeds and Tubs

- DM intake is generally low
- not the best option for thin cattle
- work better in situations when cows only need a little bit of supplemental nutrition
- generally best to feed year round

120

Custom formulations for higher intake may be available in 48,000 – 50,000 lb load

121

- Our 4' model holds approximately 1300 to 1700 lbs of feed depending on the type of feed being dispensed.
- Our 8' model holds approximately 2600 to 3400 lbs of feed depending on the type of feed being dispensed.
- Our 16' model holds approximately 5200 to 6800 lbs of feed depending on the type of feed being dispensed.

122

Purina and Cargill both make limiters for sale

it is critical to visit with a company nutritionist to get it done right

123

Starting Point

124

Hay: 45% TDN, 5.0% CP

Dry cow
goal: maintain BCS
8 lbs of 20% cubes

Wet Cow
goal: control weight loss
11 lbs of 20 % cubes

125

Hay: 50% TDN, 6.5% CP

Dry cow
goal: maintain BCS
4 lbs of 20% cubes

Wet Cow
goal: control weight loss
6 lbs of 40 % cubes

126

Hay: 55% TDN, 9.0% CP

Dry cow
goal: maintain BCS
hay only

Wet Cow
goal: control weight loss
2 lbs of 40 % cubes

127

Monitor and adjust your supplementation program as performance dictates

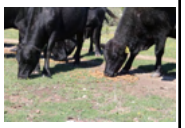
128

Human Safety

129

things to be aware of

- cattle knocking someone over or into something to get to feed
- muddy conditions, when you can't move as well
- cattle fighting over feed
- make sure cattle respect your personal space
- feeding cattle cubes from your hand increases future risk



130

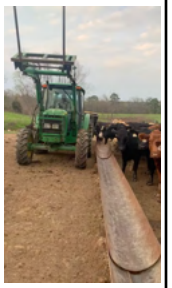
strategies to reduce risk

- carrying sacks or buckets
  - when feeding on the ground
    - spread feed out, piles are better than a line
      - 1 pile per animal is preferred
  - when using feed bunks
    - put feed in bunks while cattle are locked in adjacent pasture or trap
    - if cattle are in pasture, feed and move away
- cube feeders, trip hoppers, etc.
  - prevent accidental cattle contact
  - prevent tripping and falling in muddy or rough conditions

131

cube feeders, trip hoppers, etc.

- mounted to truck, ATV, tractor
- trailer type
- should have good resale value
- tractor mounted units may have advantages in higher rainfall areas



132

Supplementation Frequency

133

Frequency of Supplementation

protein supplements
(no NPN or antibiotics)

- everyday
- 3 times/wk
- 2 times/wk
- 1 time/wk ??

- everyday
  - 2 lbs
- 3 times/wk
  - 4.7 lbs
- 2 times/wk
  - 7 lbs
- 1 time/wk ??
  - 14 lbs

134

Frequency of Supplementation

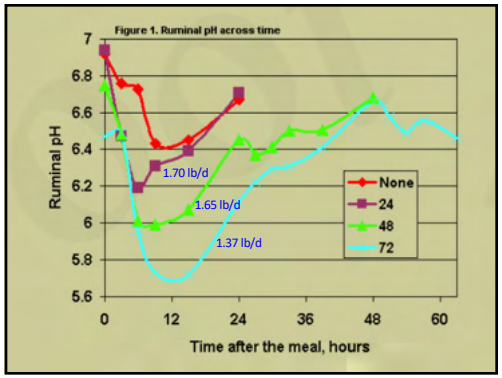
energy supplements

- best to feed everyday
- feeding at less frequent intervals can lead to big problems

feeding 3 times a week reduced ADG by 10% compared with daily feeding (Loy et al., 2008)

- 3 supplements, 2 supplementation levels

135



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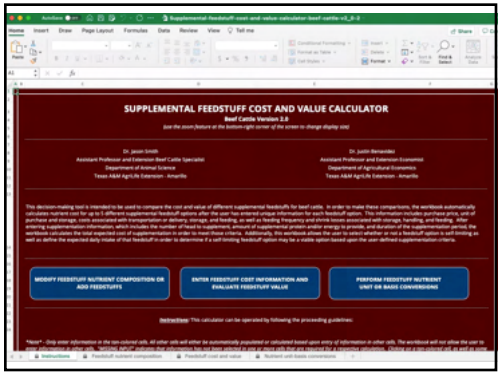
Pricing Supplements

137



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Need Protein

20% CP cube (no NPN)

- $10.30 per 50 lb sack
- 10 lb CP per sack (50 x 0.20 = 10 lb of CP)
- $1.03/lb of CP ($10.30 ÷ 10 = $1.03/lb)

38 % CP cube

- $13.55 per 50 lb sack
- 19 lb CP per sack (50 x 0.38 = 19 lb of CP)
- $0.71/lb of CP ($13.55 ÷ 19 = $0.71/lb)

139

Need Energy

20% CP cube (high energy, 70% TDN, AFB)
- $10.30 per sack
- 35 lb of TDN per sack (50 x 0.70 = 35 lb)
- $0.29/lb of TDN ($10.30 ÷ 35 = $0.294/lb)

38% CP cube (67 % TDN, AFB)
- $13.55 per 50 lb sack
- 33.5 lb TDN per sack (50 x 0.67 = 33.5 lb)
- $0.40/lb of TDN ($13.55 ÷ 33.5 = $0.404/lb)

140

Mineral and Vitamin Supplementation

141

mineral nutrition impacts

- growth
- reproduction
- milk production
- health

PROFITABILITY

142




143

Components of a Complete Mineral Supplement

- salt
- macro minerals
- trace minerals (aka micro minerals)
- vitamins A, D, and E

144

Macro

% of diet
- calcium
- phosphorus
- potassium
- magnesium
- sodium
- sulfur

Trace (micro)

ppm or mg/kg
- copper
- zinc
- manganese
- selenium
- iodine
- cobalt
- iron
- *others*

145

Targeted Intake

2 or 4 oz.

- most are 4 oz.

target of 4 oz.

- average intake of 3 – 4 oz. would be acceptable

Se level

- 4 oz: commonly 25 - 27 mg

146

Common Formulations

- higher-calcium, lower phosphorus
  - 15% Ca, 4% P
  - 16% Ca, 5% P
  - 15% Ca, 7.5% P
- similar Ca & P levels or higher P
  - 14% Ca, 12% P
  - 12% Ca, 9% P
  - 12.5% Ca, 8% P
- winter pasture (moderate to higher Mg)
  - ≥ 5% Mg
  - higher Ca

147

	Example A	Example B	Example C
Calcium	15	15	16.5
Phosphorus	4	7.5	5
Salt	21	20	16
Magnesium	3	1	5
Potassium	-	1	0.1
Copper	1,200	1,200	2,500
Zinc	4,200	3,600	7,000
Manganese	3,600	3,600	4,000
Selenium	25	27	26
Iodine	100	60	250
Cobalt	150	12	20
Vitamin A	100,000	300,000	200,000
Vitamin D	2,500	30,000	20,000
Vitamin E	100	300	200

148

Additives

researched

- IGR
- CTC (requires VFD)
- bovatec (not labeled for cows)
- rumensin

- product A
- product A with IGR
- product A with CTC
- product A with IGR and CTC

149

Additives

not well researched or limited/no benefits

- there is a long list of these
- be cautious of claims
- be aware of selectively reporting research
- many would not justify the added cost

150

Macro Minerals: Geographic & Forage System Considerations

151

Phosphorus Levels

once nutrient requirements are meet, providing extra P will not improve reproduction

NRC requirements are too high for P

152

Native Range

dormant forages

- most mineral concentrations decrease with time especially P & K

protein and energy supplement can greatly impact the Ca:P ratio of the mineral needed

consider K level in protein and energy supplements

153

	AMPT-A	AMPT-P
Calcium	15	12
Phosphorus	4	9
Salt	21	17
Magnesium	3	2.5
Potassium	-	-
Copper	1,200	1,200
Zinc	4,200	4,200
Manganese	3,600	3,600
Selenium	25	25
Iodine	100	100
Cobalt	150	190
Vitamin A	100,000	400,000
Vitamin D	2,500	8,000
Vitamin E	100	400

154

product	intake, lbs	% P	gm P supplied
15:4 mineral (A)	0.25	4	4.5
12:9 mineral (P)	0.25	9	10.2
12:9 mineral (P)	0.125	9	5.1
cottonseed meal	2	1.1	10.0
DDGS	2	0.7	6.4

155

Native Range

Calcium content of the soil

- just because the soil is high in Ca or is sitting on a limestone base doesn't mean the plant will take up more Ca
- bermudagrass average Ca: 0.43%
- native forages average Ca: 0.48%

156

Coastal Regions

mineral intake can be challenging

- try low salt formulations
- molasses based mineral tub
- some work from Florida would suggest we could put the mineral supplement in a cube and feed 1 time per week

157

Winter Pasture

grass tetany concern for cows

- need consistent intake of Mg
  - 5% or greater Mg level
- salt is important for absorption of Mg
- milk fever and grass tetany may both be involved in some cows
  - want higher Ca, lower P level

158

Routine Poultry Litter Fertilization

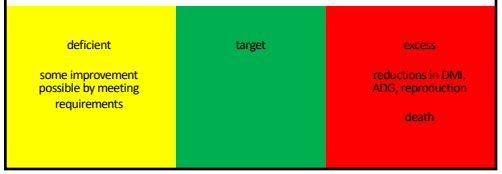
- inverted Ca:P ratio in forage
- milk fever and grass tetany concerns
- may need P free mineral
- potential trace mineral issues

159

Trace Mineral Considerations

160

- copper
- zinc
- manganese
- selenium
- iodine
- cobalt



161

trace mineral supplementation will not overcome inadequate energy and protein intake

energy and protein intake are responsible for the big improvements or changes

trace minerals provide insurance and if deficiencies exist can help with improvements

162

too much trace mineral can cause

- decreased ADG
- decreased WW
- decreased feed intake
- decreased pregnancy rates
- death

be cautious of using multiple products with added trace minerals

excess free copper, zinc, and probably iodine in rumen can reduce fiber digestibility

163

	Requirement, mg/kg of DMI	Maximum Tolerable, mg/kg of DMI	Ratio of Maximum Tolerable: Requirement (mg/kg of DMI)
Copper	10	40	4
Zinc	30	500	17
Manganese	40	1000	25
Selenium	0.10	5	50
Iodine	0.50	50	100
Cobalt	0.15	25	167

164

desirable ratios for Cu – Zn – Mn

- requirement: 10-30-40
- formulate mineral: 1-3-2 or 1-4-2

good targets for copper in most situations

- 1,200 to 1,500 ppm in 4 oz mineral
- many products have way more copper than needed
- higher levels of copper have been reported to:
  - reduce ADG
  - reduce feed intake
  - accumulate to toxic levels and cause death

165

Selenium

requirement

- about 1.40 mg/d for 1,350 lb cow

legal limit

- 3 mg/d
- that is about 2.1 times requirement

toxicity could be a concern if getting added Se from multiple sources

166

Iodine

preferred forms

- EDDI (organic form)
- calcium iodate
- good target ≥ 100 ppm in 4 oz mineral

don't want

- potassium or sodium iodide they are less stable

foot rot

- no benefit beyond meeting requirement

to much iodine has been reported to reduce weight gain and feed intake

167

Cases and Considerations

- poultry litter fertilization: Cu and Zn
  - hay testing considerations
  - $10 wet chemistry add on: Cu, Zn, Mn, Mo
- copper toxicity
  - potential breed differences
- injectable and drenches
- force feeding

168

Cases and Considerations

- changes in coal burning power plants
- hair coat considerations
  - genetics vs mineral

169

Sources of Trace Minerals

170

- inorganic
  - ionic bond
  - copper sulfate, zinc oxide, sodium selenite, etc.
- organic
  - covalent bond to carbon-containing ligand
  - mineral bonded to: amino acid, protein, or CHO
  - zinc methionine, copper amino acid complex, cobalt glucoheptonate, etc.
- hydroxy
  - covalent bond to a hydroxy (OH) group
  - zinc hydroxychloride, basic copper chloride, manganese hydroxychloride

171

inorganic vs. organic vs. hydroxy

all cattle consume some organic trace minerals from forage and other feedstuffs

research is inconsistent on animal growth, reproduction, and health

organic and hydroxy sources may be safer for vitamins added to mineral supplements

172

Vitamins

173

Vitamins

water soluble vitamins	fat soluble vitamins
• "B" vitamins • produced by rumen microbes	• vitamin A • vitamin D • vitamin E • vitamin K • produced by rumen microbes

174

- vitamin A deficiency
  - birth of dead or weak calves
  - frequent occurrence of retained placentas
  - reduced conception
  - impaired spermatogenesis
- precursors to vitamin A are found in green growing forages
- drought concerns

175

Tubs

176

- most need separate source of salt
- most have a similar Ca:P ratio
- most have less Ca then loose supplements

177

	AS 4 CP add Zn & Cu	MAG Mineral Tub
Calcium	4.5	5.5
Phosphorus	4	4
Salt	10	0
Magnesium	1	5
Potassium	1	2
Copper	1,250	650
Zinc	3,750	2,375
Manganese	1,250	1,250
Selenium	10	10
Iodine	68	68
Cobalt	30	30

recommended intake 4 to 8 oz.

need to put salt out with the “MAG” tub

178

Blocks

179

Loose Mineral Products for Comparison	Company A	Company B	Company C
Calcium	16	15	15
Phosphorus	5	7.5	4
Salt	15 - 16	20	21
Magnesium	5	1	3
Potassium	0.1	1	-
Copper	2,500	1200	1,200
Zinc	4,500	3600	4,200
Manganese	4,000	3600	3,600
Selenium	26	27	25
Iodine	200	60	100
Cobalt	20	12	150
Vitamin A	100,000	300,000	100,000
Vitamin D	-	30,000	2,500
Vitamin E	100	300	100

180

181

	Big 6	Se-90	Iodized	Sulfur
Calcium				
Phosphorus				
Salt	96 - 99	95 – 98.5	97 – 99.7	95 - 97
Magnesium				
Potassium				
Sulfur				3
Copper	260 - 380	280 - 420		
Zinc	320	3,500		
Manganese	2,400	1,800		
Selenium		90		
Iodine	70	100	100	
Cobalt	40	60		
Vitamin A				
Vitamin D				
Vitamin E				

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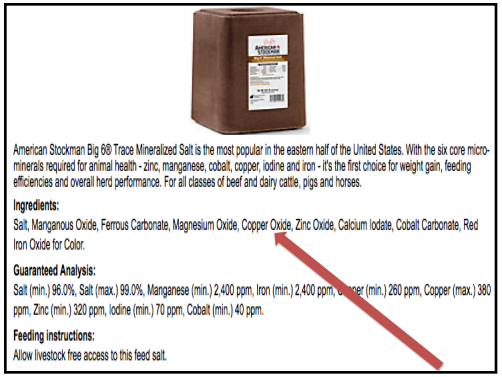

American Stockman Big 6® Trace Mineralized Salt is the most popular in the eastern half of the United States. With the six core micro-minerals required for animal health - zinc, manganese, cobalt, copper, iodine and iron - it's the first choice for weight gain, feeding efficiencies and overall herd performance. For all classes of beef and dairy cattle, pigs and horses.

Ingredients:

Salt, Manganous Oxide, Ferrous Carbonate, Magnesium Oxide, Copper Oxide, Zinc Oxide, Calcium Iodate, Cobalt Carbonate, Red Iron Oxide for Color.

Guaranteed Analysis:

Salt (min.) 96.0%, Salt (max.) 99.0%, Manganese (min.) 2,400 ppm, Iron (min.) 2,400 ppm, [illegible]per (min.) 260 ppm, Copper (max.) 380 ppm, Zinc (min.) 320 ppm, Iodine (min.) 70 ppm, Cobalt (min.) 40 ppm.

Feeding instructions:

Allow livestock free access to this feed salt.

183


Ingredients:

Salt, Sulfur, FD&C Yellow #5 Dye for Color.

Guaranteed Analysis:

Salt (min.) 95.0%, Salt (max.) 97.0%, Sulfur (min.) 3.0%.

184

185

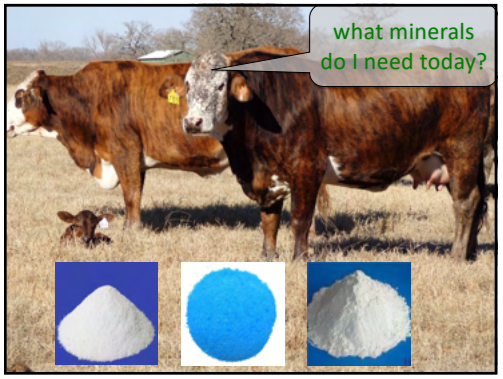
Mineral Feeders

186

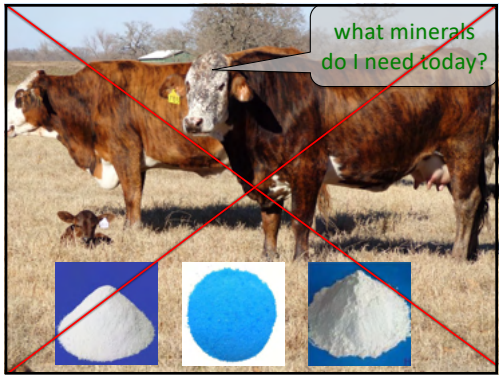
187

Mineral Intake

188



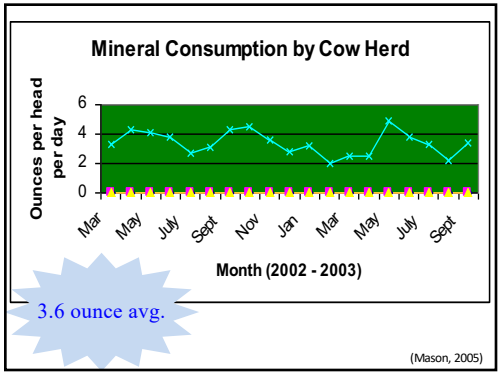
189



190

- focus on average consumption over several weeks
- intake varies over time
- lactation may increase intake, 2 to 2.5x

191



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- if intake is to high
  - provide free choice salt
  - check location of mineral feeder
  - reduce amount of mineral fed
- if intake is low
  - determine if cattle are receiving salt from another source
  - check location of mineral feeder

193

- salt
  - initially encourages intake
  - as salt consumption increases mineral intake is reduce
- phosphorus
  - generally decreases intake
- magnesium
  - generally decreases intake

194

additives that stimulate intake
- molasses, yeast, other flavoring agents
- mineral oil and weatherization products

195

Calculating Mineral Intake

- 35 cows
- put 50 lbs of mineral in an empty feeder
- mineral lasts for 6 days
- 50 lbs ÷ 6 days = 8.33 lbs per day for the herd
- 8.33 lbs per day ÷ 35 hd = 0.24 lbs/hd/d
- 16 oz. x 0.24 lbs = 3.8 oz./hd/d

196

How Many Bags Do I Need Per Month

- 40 cows
- 40 cows x 4 oz/cow/day = 160 oz per day (10 lbs)
- 10 lbs per day x 30 days = 300 lbs per month
- 300 lbs ÷ 50 lbs per bag = 6 bags per month

- if same 40 cows only ate 3 oz per day then, they would consume 4.5 bags per month (this would be alright in most situations)

197

When and What Do I Feed

198

Reputable Company with a Nutritionist on Staff

199

Consider Flexibility

200

Cow-Calf

201

When should I feed a cow-calf mineral?

- year round is best
- last 3, first 3
- provide salt when not feeding a mineral

202

introduced pasture and hay

- higher Ca, lower P

Emerald

AS 5 complete
AS 7.5 complete

AMPT-A

203

growing native range

- higher Ca, lower P

dormant native range (with protein/energy supplement that has some P)

- higher Ca, lower P
- if possible get protein/energy supplement with added K

Emerald

AS 5 complete
AS 7.5 complete

AMPT-A

204

dormant native range (no protein/energy supplement)

- similar Ca & P levels
- make sure intake is adequate

Bronze

AS 12 complete

AMPT-P

205

winter pasture

- higher Ca, lower P
- 5% or more Mg, make sure intake is good

Emerald

Hi-mag complete
AS 5 complete

AMPT-M

206

Growing Animals:
Weaned Calves, Stockers, Replacement Heifers

207

mineral supplementation is basically the same as the cow herd with a few exceptions

Ca needs increase as ADG increases

when grazing cool-season annuals:

- want at least 10 gm/d of added Ca intake
- Mg level is not really a concern, don't want it to high

208

Oklahoma Winter Wheat

<u>4 year average:</u>

no mineral: 1.57 lb/d

with mineral: 1.81 lb/d

0.24 lb/d increase due to mineral

(Fieser et al., 2007, Effects of energy, mineral supplementation, or both, in combination with monensin on performance of steers grazing winter wheat pasture)

209

Ca Intake

mineral with 12% Ca
if intake is 0.15 lbs = 8.1 gm of Ca

mineral with 16% Ca
if intake is 0.15 lbs = 10.9 gm of Ca

mineral with 20% Ca
if intake is 0.15 lbs = 13.6 gm of Ca

210

http://beef.tamu.edu

jpbanta@ag.tamu.edu

211

Estimating Value of Gain

Jason Banta, Extension Beef Cattle Specialist
Texas A&M AgriLife Extension

Estimating value of gain is important to make informed feeding, management, and marketing decisions. Value of gain can be defined as the change in dollar value per pound of additional weight gain. While this sounds simple, the actual value of gain is often not accounted for correctly.

For example, what would be the value of a gain when increasing the weight of a steer by 50 pounds when steers are sold at the prices below?

- 500 lb steer at $135 per cwt (aka $1.35/lb)
- 550 lb steer at $130 per cwt (aka $1.30/lb)

Often it is assumed the value of each additional pound of gain is $1.30 because the 550-pound steer is sold for $1.30 per pound. However, the actual value of additional gain is only $0.80 per pound in this example.

To calculate the value of gain, the change in the value per head is divided by the change in weight. For the previous example:

- 500 lb x $1.35 per lb = $675
- 550 lb x $1.30 per lb = $715
- $715 - $675 = $40.00 (change in animal value)
- 550 lb - 500 lb = 50 lb (change in animal weight)
- $40.00 50 lb = $0.80 per lb

Historically the value of gain of calves has been around $0.75 to $0.80 per pound. However, the value of gain changes as cost of feed and thus cost of gain in the feedlot changes. Generally, as the price of corn goes up the value of gain goes up; feedlots would rather buy heavier cattle and put less weight on them in the feedlot. In contrast, as corn prices decrease the value of gain generally decreases. Thus, there is less value in taking cattle to heavier weights on grass prior to them entering the feedlot.

In addition to being influenced by feed prices, value of gain could vary depending on the starting weight of the animal. For example, the value of gain might be $0.65 per pound for adding 60 pounds to a steer that started at 400 pounds, but it could be $0.80 per pound for adding 60 pounds to a steer that started at 700 pounds. The point to remember here is to estimate value of gain using prices and weights similar to the cattle you have, because value of gain may not be consistent across a range of starting and ending weights.

When calculating value of gain it is good to look at current prices of similar cattle that vary in weight to get an idea of the current value of gain. However, when making feeding and other decisions it is important to consider the current value of the animal and what prices will be when the animal will actually be sold which could be in 2 months, 4 months, or even longer away. The

value of gain may suggest one management decision is best when only looking at the current value of gain, but when future prices are considered the best decision may change. For example, consider what the value of gain might be for a steer after feeding him for 60 days and adding 100 lb, if the following prices are used.

- today's price: 600 lb steer at $124 per cwt
- today's price: 700 lb steer at $117 per cwt
- estimated price 60 days from now: 700 lb steer at $114 per cwt

If only today's prices were used then the current value of gain would be $0.75/lb, but if the selling price 60 days from now is used then the actual value of gain would be $0.54/lb. While it is impossible to know what cattle will sell for in the future it is important to consider what the value of gain could be across a range of selling prices before making decisions. When thinking about future prices, consider current market dynamics as well as historically trends. An excel spreadsheet to help calculate value of gain and evaluate the effect of varying sale prices can be found at http://beef.tamu.edu, click on publications and then look for "Estimating value of gain and evaluating feed cost and feed conversion" under the spreadsheet section.

When looking at value of gain it is best to just consider the change in value due to added weight and not the change in value due to other management practices like preconditioning. The premium for preconditioning is not influenced by how much weight is added to the animal. When looking at value of gain for preconditioned calves make sure to look at a current price from a preconditioned calf and an estimated future price from a preconditioned calf. Don't use a current price for a non-preconditioned calf and an estimated future price for a preconditioned calf, otherwise the value of added weight gain will be over-estimated.