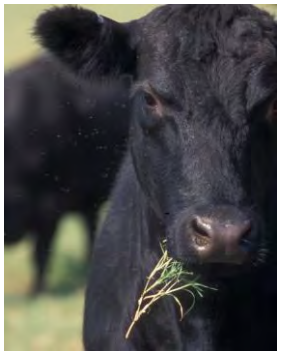
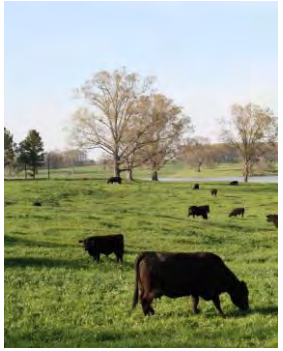
Managing cow nutrition





66th Annual Florida Beef Cattle Short Course

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Photo courtesy of AgWeb

Photo courtesy of Scott Buchanan

Over the next 40 minutes or so…

- My goal is to…
  - Discuss why we actually care about nutrition
  - Utilize results of previous research and extension efforts to focus on how nutrition can be utilized to improve cowherd productivity
  - Leave you with at least one factor to consider when evaluating your nutritional management program

What production trait has the greatest impact on cow/calf productivity?

Why nutrition matters…

- Genotype x environment = phenotype
- Nutrition is the major contributing factor to "environment"

- Interaction between nutrients/nutritional status and genes affect…
  - Growth and development
  - Health
  - Beef composition and product quality
  - **Reproductive outcomes**
    - Reproduction is a lowly heritable trait
    - This means that the environment tends to impact reproduction more than an animal's genetics

Major factors that limit reproduction

- 1) She becomes pregnant, but loses the calf
  - Prior to calving
  - Between calving and weaning

- 2) <u>She doesn't become pregnant in the first place</u>
  - We're going to focus on nutrition's role

Why doesn't she get bred?

- The bull, breeder, transfer tech., etc.
  - ~95 % or more of the time that a viable spermatocyte and oocyte meet, it results in the development of an embryo

- **The cow**
  - <u>She wasn't cycling to begin with</u>
  - Something else happened that prevented her from becoming pregnant

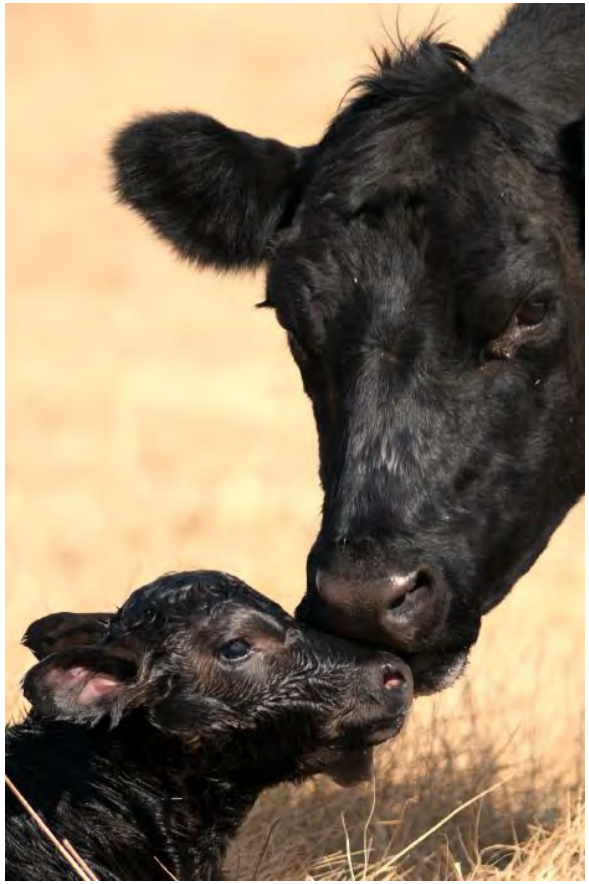


Photo courtesy of Landon Smith

What causes her to cycle again?

- Her nutritional status
  - She has to receive certain hormonal cues
  - They tell her "you're ready to support another calf"
  - When that happens, she starts cycling again
- What drives those signals?
  - Body condition
  - Plane of nutrition

Photos courtesy of Progressive Cattleman Magazine and Matt Hersom, respectively

Nutrient partitioning

Maintenance and lactation

↓

Growth

↓

Existing pregnancy

↓

Estrous cycle and establishment of a new pregnancy

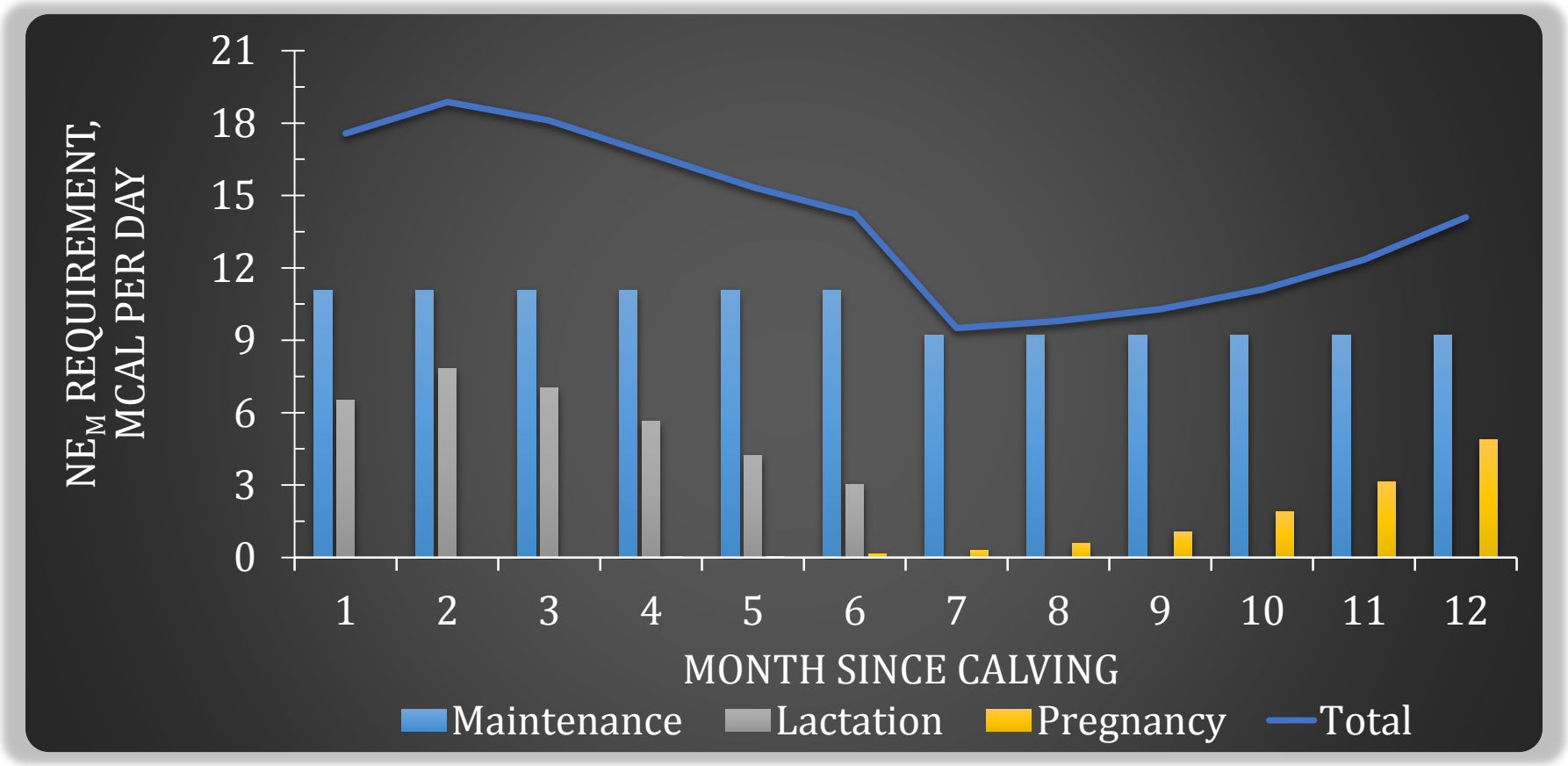
Protein vs. energy

- Protein often gets more credit than it deserves
  - "This feed is better 'cause it's higher in protein"
  - "Nutrition can't be the problem, I feed 16 %"

- Energy drives growth and performance, not protein

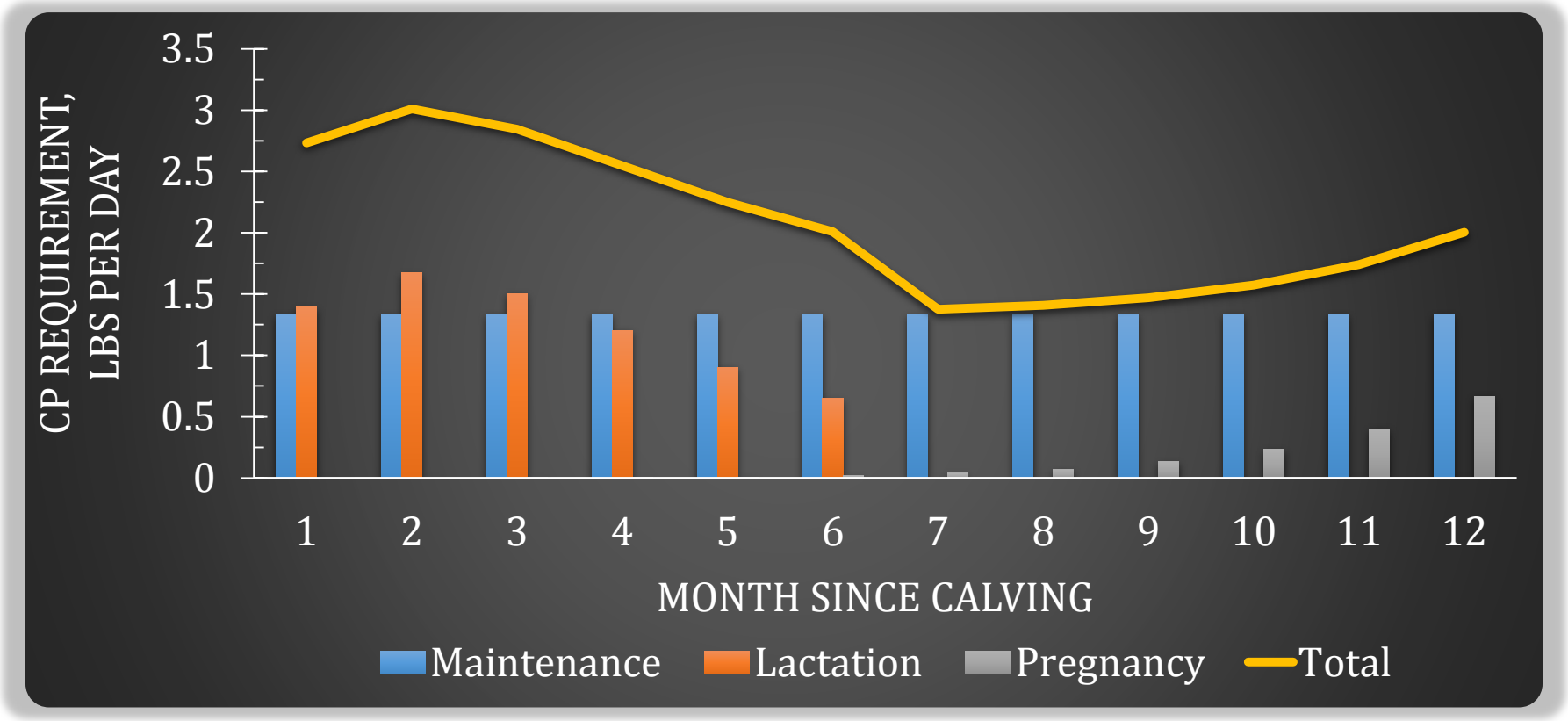
- Protein supports an energy-dependent level of growth and performance

Focus on cow requirements: energy



Calculated for a 5-yr old cow with a mature body weight of 1300 lbs
Adapted from the NRC, 2000

Focus on cow requirements: protein



Assumes enough energy present to support crude to metabolizable protein conversion efficiency of ~60 %
Calculated for a 5-yr old cow with a mature body weight of 1300 lbs
Adapted from the NRC, 2000

The importance of body condition

- Insurance for reproduction
  - When we aren't meeting her energy and protein requirements
  - "Excess" body condition at calving will fill the void
    - Helps to ensure that:
      - She starts cycling within enough time to become pregnant during the breeding season
      - She doesn't sacrifice the pregnancy

What is the ideal BCS at calving?

Effect of BCS at calving on the postpartum interval to return to estrus

BCS	Postpartum interval
3	89 d
4	70 d
5	59 d
6	52 d
7	31 d

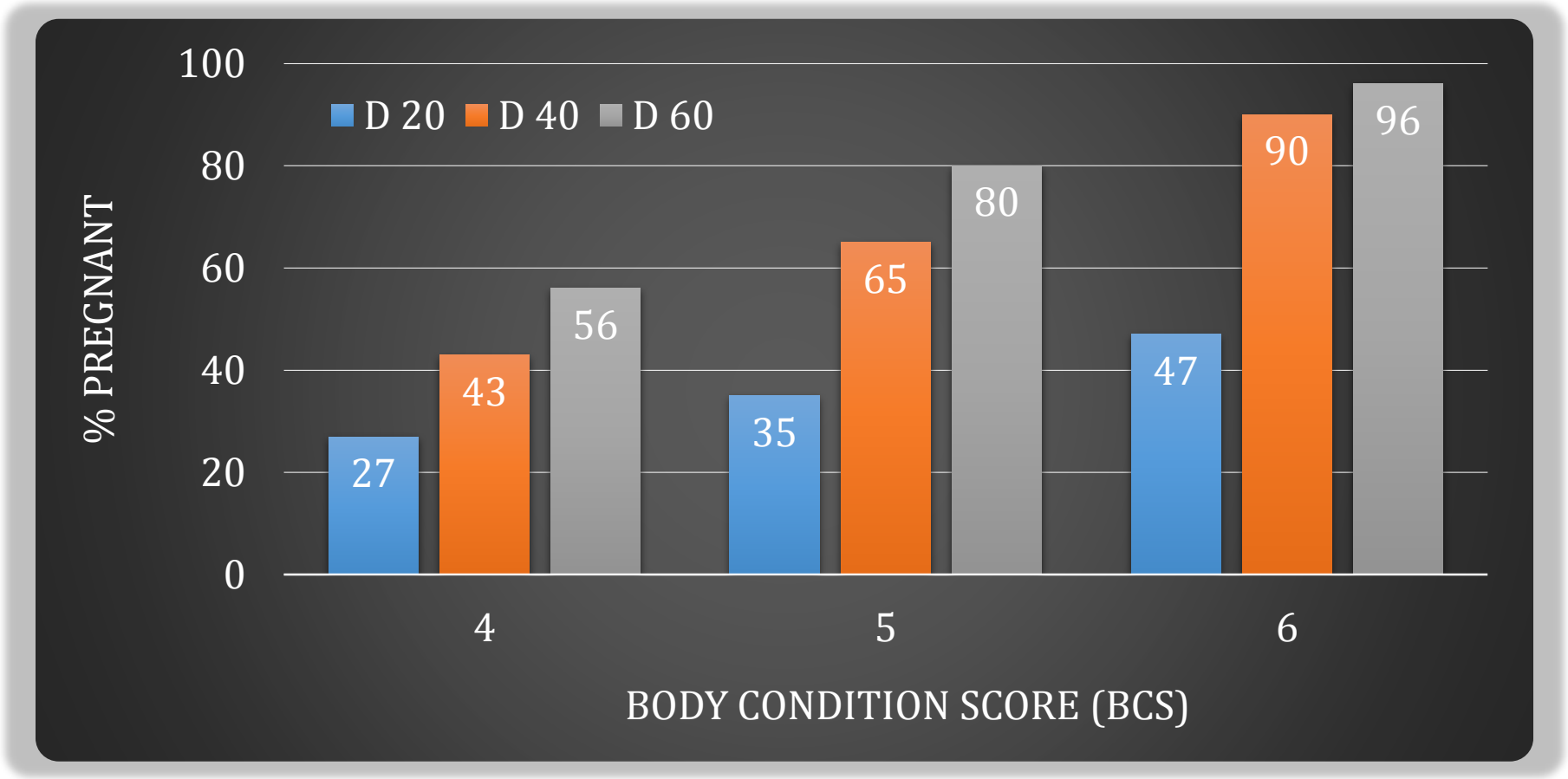
Adapted from Houghton et al., 1990

What is the ideal BCS at calving?

Effect of BCS at **pregnancy diagnosis** on overall pregnancy rate	
BCS	Overall pregnancy rate
2	13 %
3	43 %
4	66 %
5	94 %
6	100 %

Adapted from Kunkle et al., 1994

What is the ideal BCS at calving?

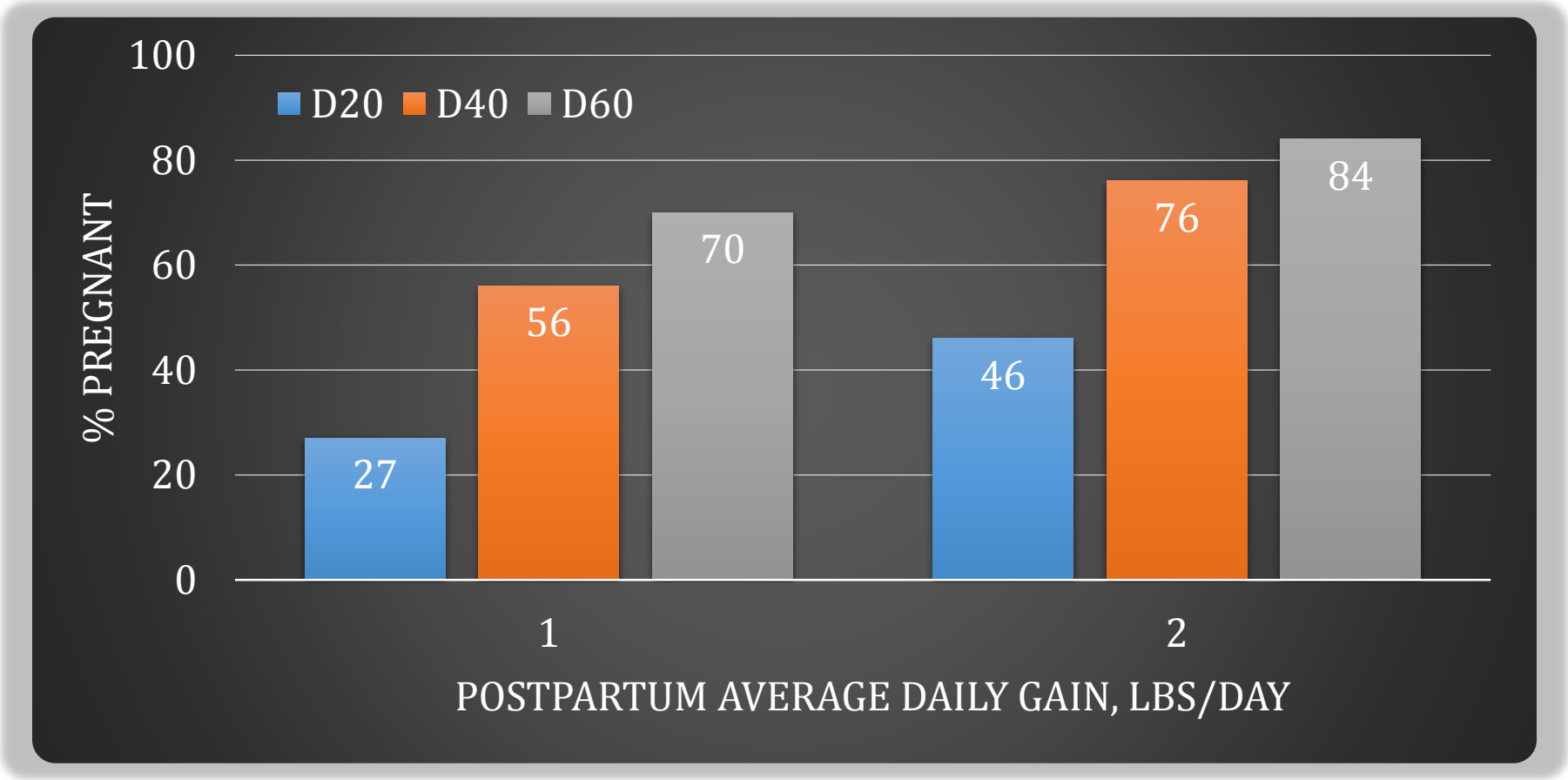


Adapted from Spitzer et al., 1995

General rule of thumb for BCS

- "Ideal" BCS at calving and breeding for mature cows is ≥ 5
- This should be a target, but isn't always possible
- So when it isn't, what's the next best option?
  - Managing cattle on an increasing plane of nutrition
  - Moving them toward that "ideal" state of body condition

Plane of nutrition can be the saving grace



Adapted from Spitzer et al., 1995

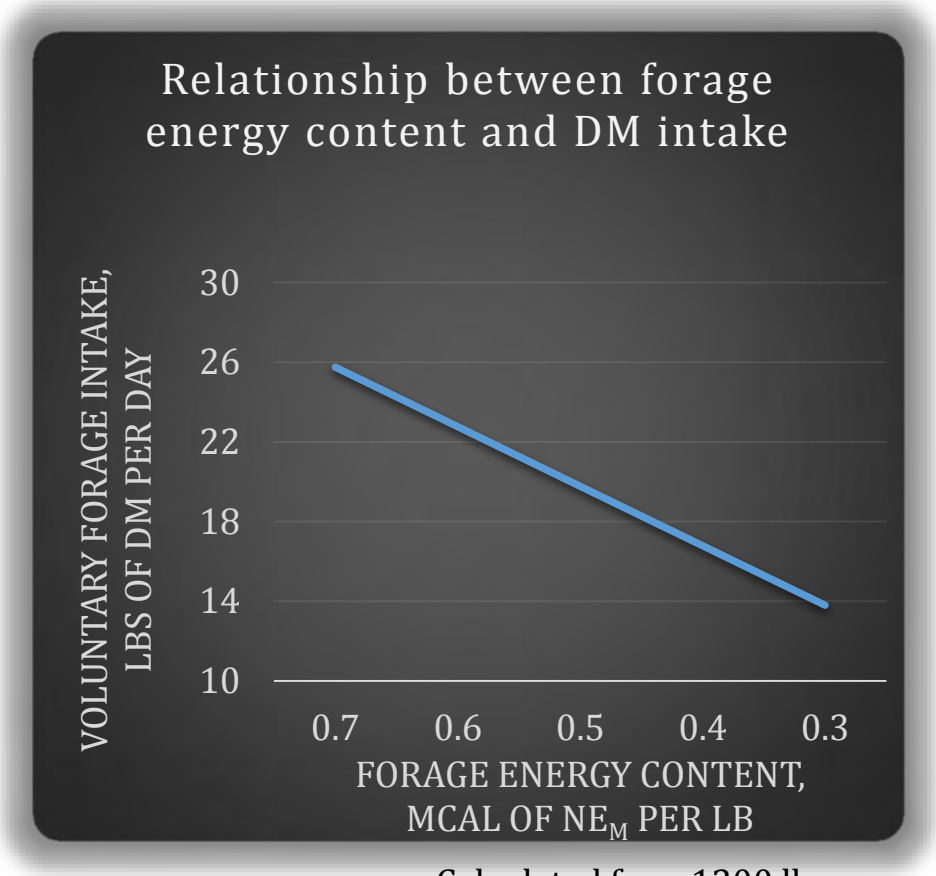
The first-calf heifer conundrum

- Why are those three-year olds so dang hard to get bred back?
  - Because they're different
  - They're still growing until after they've weaned their second calf

- Their energy and protein requirements are ~10 to 15 % greater than mature cows
  - They need to be managed accordingly
    - Need ~10 to 15 % more of it
    - "It" needs to be ~10 to 15 % higher in energy and protein

Can they eat enough?

- Energy content is the primary indicator of voluntary forage intake
- If forage has a low energy content, they may not be able to eat enough to meet their requirements
  - Voluntary intake decreases as energy content decreases



Calculated for a 1300 lb cow
Adapted from the NRC, 2000

Meeting requirements in a forage-based setting

- Forages are generally the most economical means of meeting energy and protein requirements of the cowherd
  - The reality is that they won't always do it

- Need to utilize complementary supplemental feedstuffs that will fill the nutrient void that remains
  - Feed something that will provide enough supplemental nutrient(s)
  - Feed it at a level that will actually fill the void

The issue with supplemental feeds…

- Not all feeds are created equally
- Retail price doesn't always reflect those differences
- Moving forward, we need to consider basing supplementation decisions on nutrient needs and supplement value

Nutrient cost

- Retail price does not paint the entire picture
  - Differences in nutrient content bias the comparison
- Evaluating nutrient cost "levels the playing field"
  - Accounts for differences in nutrient content
  - Allows for an un-biased comparison

$$\text{Nutrient cost} = \frac{final\ cost\ per\ lb\ of\ feed}{amount\ of\ nutrient\ per\ lb\ of\ feed}$$

Retail price comparison

Option	CP content (% as-fed)	Unit of purchase (lbs)	Retail price ($/unit)	Retail price ($/lb)
A	28	200 lbs	$80.00	$0.40
B	16	2,000 lbs	$160.00	$0.08
C	28	2,000 lbs	$180.00	$0.09
D	16	2,000 lbs	$240.00	$0.12

CP = crude protein

Value and total cost comparison

Option	Lb of CP per lb of feed	Lbs required per day[1]	Cost per lb of CP ($/lb)	Total cost[1] ($)
A	0.28 lbs	1.79 lbs	$1.43	$3,571
B	0.16 lbs	3.13 lbs	$0.50	$1,250
C	0.28 lbs	1.79 lbs	$0.32	$804
D	0.16 lbs	3.13 lbs	$0.75	$1,875

[1]To provide 0.5 lb of supplemental CP per cow to 50 cows for 100 days

Sorting through the options

- Four major factors to consider:
  - What options are available to you?
  - Do any of those options act as a vehicle for something else that adds value?
  - Do they require additional expense or lead to savings in terms of time, labor, or storage?
  - Which option is the most economical means of filling the nutrient void?

Mineral supplementation

- Mineral supplementation is crucial
  - Forages + trace mineralized salt will not meet mineral requirements most of the time
  - Provide constant year-round access to a good quality free-choice mineral supplement <u>that complements your forage base</u>
  - There is no “silver-bullet”

Photos courtesy of Drovers CattleNetwork

Mineral supplementation

- Plays an important role in pretty much anything that impacts cow/calf productivity
- Find a formulation that your cattle will consume
- Choose the form that fits your management style
- Don't blend it with salt to reduce consumption
- Ask yourself, is saving a couple bucks per bag for a lower quality product a responsible decision?

Is a couple bucks per bag worth sacrificing product quality?

Option	Price, $ per 50-lb bag	Annual cost[1], $ per cow	Annual savings, $ per cow
A	$23.00	$41.98	--
B	$20.00	$36.50	$5.48 @ $3.00/bag
C	$17.00	$31.03	$10.95 @ $6.00/bag

[1]Assumes a mineral supplement consumption of 4 oz. per head per day

Take-home points

- Focus on managing body condition and meeting nutrient requirements to improve cow/herd productivity
- Do so in the most economical way possible
- If you're looking to cut costs, make sure the benefit outweighs the risk

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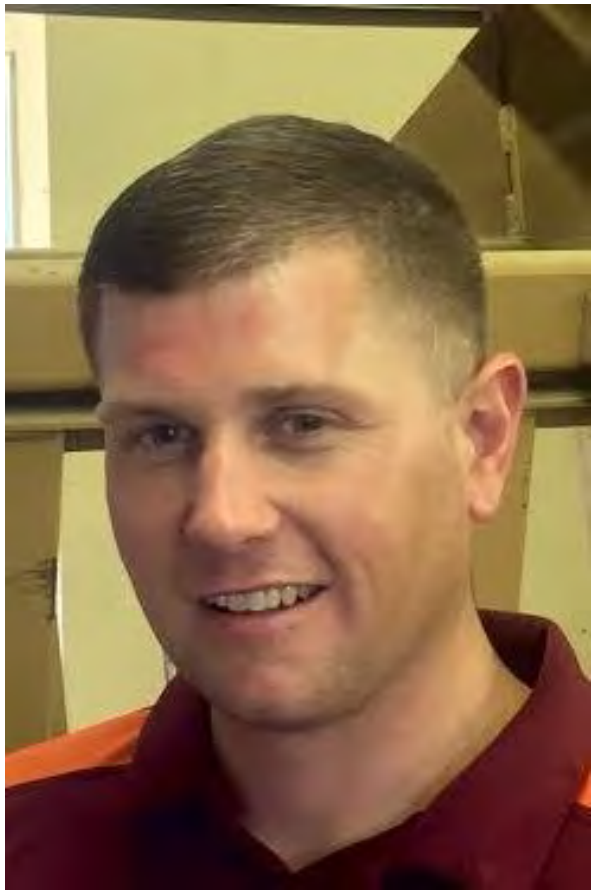

“If you feed them, they will come”