


**DEVELOPING BREEDING BULLS  
FOR THE COMMERCIAL  
CATTLEMAN**

APPLIED REPRODUCTIVE STRATEGIES IN BEEF  
CATTLE 2017

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1



**HOW TO GET BULLS FAT ENOUGH  
TO SELL WITHOUT RUINING THEIR  
FEET, FAILING A SEMEN TEST, AND  
MELTING DURING BREEDING?**

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2

**Bull Salesmanship**

- “I don’t want to sell/buy an over-fat bull”
- What is “over-fat”
  - Depends on environment, number of cows serviced, pasture size, breed, etc.
  - In general 0.20-0.25 inches is adequate for energy reserves, growth and semen production
  - Unfortunately the norm is greater

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3

**Opening Thoughts**

- Very little practical, applied research data
  - Some mineral data
  - Mostly field experience and personal observation
  - Must bring feedlot management to bull development
- More anecdote/magic for developing bulls than any segment besides show cattle
  - Needs to be basic, practical

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4

**A Few Beefs (Pun Intended)**

- Bull tests
  - Can be a great avenue to compare genetics
  - Must not seek maximum gain, rather allow genetic expression
- Specialty feed additives
  - Way more marketing than science
  - Offer a Band-Aid to poor management and ultimately create a dysfunctional bull

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5

**A Few Beefs**

- Self feeder development
  - Destroys more bulls than a castration knife
  - No way to control intake
  - Create an environment that fosters acidosis
- Intake limiting technologies are not effective
  - Are a substitute for good management
  - No way to ACCurately control intake

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6

## Goals

- Low cost of production
- Low risk
- **Low reproductive failure rate**
- **Longevity**
- **Salability**

**Repeat customers!**

## Key Challenges/Hurdles

- Overfeeding/improper feeding (acidosis, founder, reduced longevity)
- Underfeeding (do not meet needs for growth) - **RARE**
- The little things (trace minerals, vitamins, body condition)
- Keeping the goal in mind (environment)
  - Talk about later

## Stages of Development

- Pre-weaning (creep)
  - Has definite impact on age at puberty, weaning weight and yearling scrotal
- Post-weaning development
  - Area of most focus
- Post-sale/Pre-breeding
  - Huge impact on lifelong productivity
- Breeding Season (same as cows)
- Post-Breeding follow up
  - Often forgotten

## Fetal and Calf Development

- Fetal programming
  - Similar to enhanced fertility in heifers from supplemented dams, is the same true for bulls? (Funston et al. 2010)
  - Similar question for bulls from early born dams, is epigenetics at work?
- Bulls from multiparous dams have larger yearling SC (Lunstra et al, 1988)
  - Related to weight, due to milk production

## Pre-Weaning (Creep Feeding)

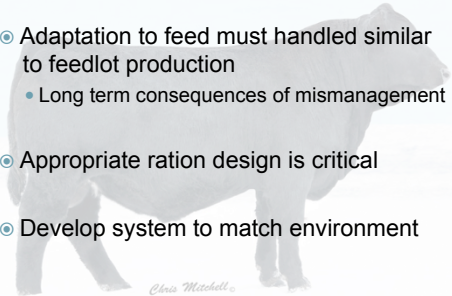
- Testis size may be determined pre-weaning, 20-25 weeks (Bagu, et al. 2004)
  - Creep feeding may increase SC, acceptable if it doesn't create excess fat
- Increase in yearling SC may be transient
  - Bulls grown slower might have smaller testicles at a year due to energy, but can be fertile at maturity

## Pre-Weaning

- Creep feeding
  - Long term use generally not recommended for optimal bull longevity
  - Definitely oversold
  - It is often rewarded on the auction block
- If used, use a weaning tool (2-4 weeks < weaning)
  - 900 lb weaning weights are impressive but not critical
  - Increase in SC is not likely relevant long term

## Post-Weaning

- Adaptation to feed must be handled similar to feedlot production
  - Long term consequences of mismanagement
- Appropriate ration design is critical
- Develop system to match environment



13

## Post-Weaning/Pre-Sale

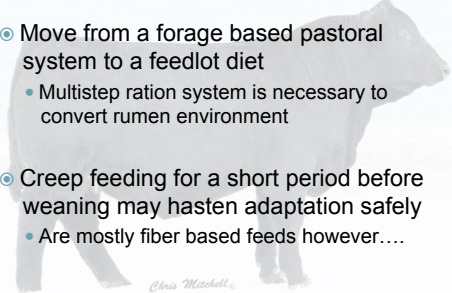
- Controlled** adaptation and intake are critical
  - Often bulls are pushed up on feed too quickly for gain testing



14

## Post-Weaning Adaptation

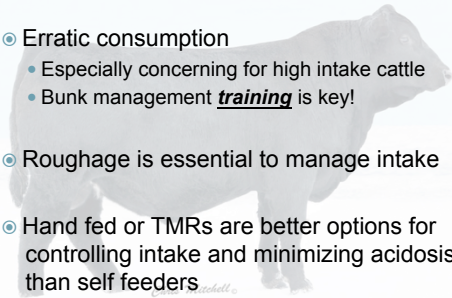
- Move from a forage based pastoral system to a feedlot diet
  - Multistep ration system is necessary to convert rumen environment
- Creep feeding for a short period before weaning may hasten adaptation safely
  - Are mostly fiber based feeds however....



15

## Adaptation Key Points

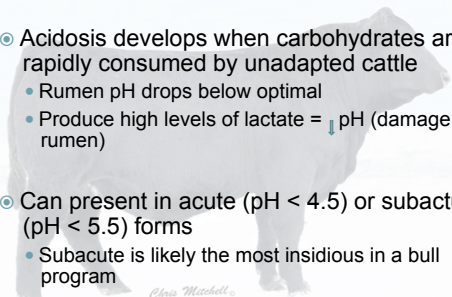
- Erratic consumption
  - Especially concerning for high intake cattle
  - Bunk management **training** is key!
- Roughage is essential to manage intake
- Hand fed or TMRs are better options for controlling intake and minimizing acidosis than self feeders



16

## What is Acidosis

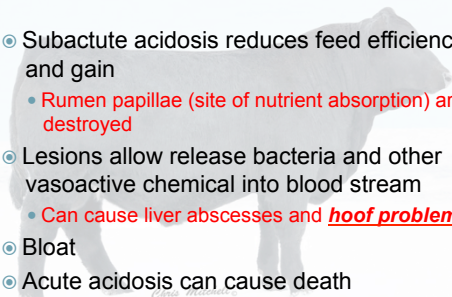
- Acidosis develops when carbohydrates are rapidly consumed by unadapted cattle
  - Rumen pH drops below optimal
  - Produce high levels of lactate = ↓ pH (damage rumen)
- Can present in acute (pH < 4.5) or subacute (pH < 5.5) forms
  - Subacute is likely the most insidious in a bull program



17

## Associated Problems

- Subacute acidosis reduces feed efficiency and gain
  - Rumen papillae (site of nutrient absorption) are destroyed
- Lesions allow release bacteria and other vasoactive chemical into blood stream
  - Can cause liver abscesses and **hoof problems**
- Bloat
- Acute acidosis can cause death



18

## Laminitis and Claw Deformities



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19

## Laminitis in Bulls

- ◉ Acidosis causes both short term and long term hoof impacts
  - Challenged bulls will have shorter productive lifespan
- ◉ Bull buyers must be aware of bulls with trimmed feet
- ◉ A hoof trimmer has no place in a well managed bull operation

20

## Feeding to Manage the Rumen

- ◉ Increase particle size of grains
  - Reduce passage rate and risk
- ◉ Reduce particle size of roughage
  - Minimize sorting
- ◉ Adapt cattle to high concentrate diets
- ◉ Feed consistently
- ◉ Utilize high fiber energy sources
  - Corn byproducts, oats, wheat midds, etc.

21

## Roughage (Fiber)

- ◉ Control dietary energy
  - Will represent a source of energy, dependent on quality
- ◉ Provide protein
- ◉ Included at 25-75% of ration
  - Depends on goals and customer preference
- ◉ Appropriate particle size is essential
  - Sorting leads to acidosis

22

## Post-Weaning Growth Targets

- ◉ Wean off around 50-60% of the dams mature weight
- ◉ Grow at 2.5-3.25 lb/day depending on breed and environment
  - Perhaps ramp up ADG a bit for test, then back off
- ◉ Excellent performing bulls will express genetic potential

23

## Basic Needs

- ◉ NRC (Adjusted)

Age, Months	NEg Mcal/lb	Crude Protein, %	Calcium %	Phosphorus %	Zinc ppm	Copper ppm
8-12	0.55	14.0	0.80	0.35	80	20
12-15	0.54	13.0	0.80	0.35	80	20

- ◉ Larger framed breeds need more energy than smaller framed breeds (Simm vs. Herford)  
Pruitt and Corah (1985)

24



## Trace Minerals

- NRC requirements are likely too low
- Chelates
  - May improve scrotal circumference in challenging situations
  - Especially important if iron, molybdenum, or sulfur levels are high in forage or water
- Zinc, manganese and copper are most important for sperm production

## Chelated Trace Minerals

- Organic sources of trace minerals may improve semen characteristics (Arthington et al. 2002 and Rowe 2010)
  - Compared with inorganic sources
- My suggested target is 80 ppm total Zn and Mn (40-50% chelated) and 20-25 ppm Cu (in order to overcome an imperfect world)
- Also critical to develop hoof and foot integrity for a long breeding season

## Production Targets

- Create lean growth to achieve 50-60% of mature weight by 1 year of age
  - Continue to gain about another 5-10% before breeding
- Develop minimal fat in the scrotum
- Feed to express marbling without excess fat
  - Difficult in young bulls to feed in marbling, needs to be genetically inherent

## Fat Effect on Semen Quality

- Scrotum maintains testes several (4-5°) degrees cooler than body
  - Necessary for sperm maturation, a process that requires 50-65 days
- Fat can insulate scrotum, affecting sperm
  - Effect will be noted even 45 days after fat reduction
  - Work bulls down before turnout

## Dietary Effects on Scrotal Circumference

- Higher energy diets, pre and post weaning result in larger SC at one year
  - The increase is due in part to fat (Seidel, et al 1980)
  - Smooth, undefined testicles are indicative of excessive fat
- The increase in SC at a year isn't necessarily related to mature SC
  - Barth et al. 2008

## Why Do We Get Them SO Fat?

Buyer Perception  
**Seller Predisposition**

What does all that extra condition cost?  
Consider two scenarios

## Monetary Cost of Overfeeding

- High (1500 lb yearling) vs moderate (1250 lb yearling) – Fed 150 days
  - High group receive creep for 100 days plus high energy diet
  - Moderate group received creep for 28 days plus moderate energy diet
- Projected gain
  - 4.25 for high energy group
  - 3.25 for moderate energy group

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31

## Monetary Cost of Overfeeding

- Creep cost (\$300/ton)
  - High energy (8 lb intake) - \$120
  - Moderate energy (4 lb intake) - \$17
- Ration cost (150 days on feed)
  - High energy – \$1.44/day = \$216 total
  - Moderate energy – \$1.23/day = \$185 total
- Cost of extra (unnecessary? condition)

**\$134/bull****Is it worth the money, to take it off?**

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32

## Hardening Bulls Prebreeding

### Overfed bulls will lose weight on pasture!

- Reducing weight from March (on feed) to June (on pasture)
  - Increased percent motile sperm
  - Increased percent normal sperm
  - Reduced aged acrosomes (improved viability)
- Begin at least 80 days before turn out
  - SC may be reduced and be accompanied by a transient reduction in semen quality

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33

## Post Breeding

- Physical maturity doesn't occur until 30-36 months of age
- Bulls require adequate condition after breeding to ensure second season
  - Target a BCS of 6 prior to breeding
- Follow up with customers to ensure bull viability

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34

## Management Concerns

- Excellent hygiene/pen maintenance is critical
  - Prevent reproductive system infections
  - Improve feed efficiency
- Allow plenty of exercise (600-800+ ft<sup>2</sup>/animal)**
  - Develop more athletic bulls
  - Movement toward confined bull development needs close monitoring – little exercise

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35

## Environmental Considerations

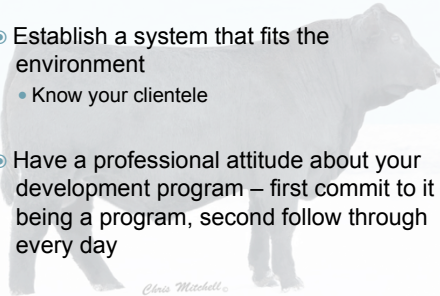
- Bedding during cold weather
  - Will improve efficiency by as much as 30%
  - Also prevent frozen testicles
- Keep bulls off concrete if possible
- Virgin two year olds and fall bulls
  - If possible, run them on pasture all summer and only feed for a shorter period before sale. Will maintain foot health and keep them fresh.

NDSU Carrington Research and Extension Center report

36

## Development System

- Establish a system that fits the environment
  - Know your clientele
- Have a professional attitude about your development program – first commit to it being a program, second follow through every day

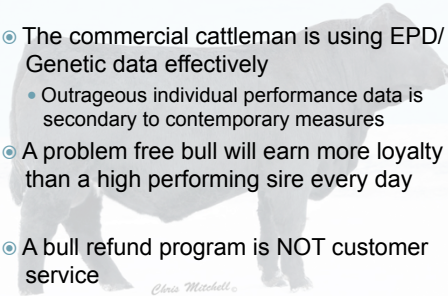


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37

## Closing Thoughts.....

- The commercial cattleman is using EPD/ Genetic data effectively
  - Outrageous individual performance data is secondary to contemporary measures
- A problem free bull will earn more loyalty than a high performing sire every day
- A bull refund program is NOT customer service



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38

## Any Questions?



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39