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It All Begins With Nutrition!

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Maximizing Profits From Your Bull
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Saskatoon Inn

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Outline



- Goals and Management
- Nutrients
- Requirements
- Managing young bulls
- Post breeding management

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Goals for Bull Development Program

- Bull has 2 functions in a breeding herd:
 - To impregnate cows and heifers
 - To pass on genes to progeny
- Bulls must be **fertile**, have **high libido** and be **free of physical defects** which might prevent breeding
- Focus of feeding program should be on rapid growth without excessive condition
- Puberty in bulls influenced by age, weight and breed

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100 **Nutrients in Feed** UNIVERSITY OF SASKATCHEWAN

- Water
- Energy – TDN, Nem, Neg, ME
- Protein (N X 6.25)
- Fiber (form critical for rumen function)
 - Acid detergent fiber
 - Neutral detergent fiber
- Fat (x 2.25 = energy value)
- Minerals
- Vitamins – A, D, E, B12

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100 **4 Compartments of Ruminant Stomach** UNIVERSITY OF SASKATCHEWAN

The diagram shows the internal organs of a ruminant stomach. The Rumen is the largest compartment, followed by the Reticulum, Omasum, and Abomasum. The Esophagus leads into the Rumen. The Small Intestines are shown at the bottom left.

100 **Published Nutrient Requirements** UNIVERSITY OF SASKATCHEWAN



Nutrient Requirements of Beef Cattle
Seventh Revised Edition, 2000
Subcommittee on Beef Cattle Nutrition
National Academy Press

The book cover is green with a yellow band across the middle. The text on the cover reads: 'NUTRIENT REQUIREMENTS OF BEEF CATTLE' and 'UPDATE 2000'. At the bottom, it says 'NUTRIENT REQUIREMENTS OF DOMESTIC ANIMALS'.

 **Energy and Protein** 

- **Feed energy sources**
 - Carbohydrates, fats
 - Forages, hay, greenfeed, pasture
 - Cereal grains, DDGS
- **Feed protein sources**
 - Forages
 - Canola meal, DDGS



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 **Macro Minerals** 

- **Entire Diet, DM Basis**
 - Salt, 0.3%
 - Calcium, 0.5-0.6%
 - Phosphorous, 0.25-0.30%
 - Calcium to phosphorus ratio not be below 1.6:1
 - Magnesium, 0.10%
 - Potassium, 0.60%

Source: NRC 2000

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 **Trace Minerals** 

- **Entire Diet, DM Basis**
 - Copper, 10-15 ppm
 - Zinc, 30-45 ppm
 - Manganese, 20 ppm
 - Iron, 50 ppm
 - Selenium, 0.2 ppm

Source: NRC 2000

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Feeding Bulls

- Anticipate nutrients bulls will receive from different feed sources
- Determine nutrient requirements for the appropriate stage of production
 - Growing
 - Puberty
 - Breeding
- Test all feeds – do not guesstimate!
- Use body condition scoring (BCS) to monitor success
 - Scale 1 to 5 (Lowman et al. 1976)
- Determine supplemental needs
- Know the costs involved


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Managing and Developing Young Beef Bulls

- As many ways to feed and develop young beef bulls - as there are producers!
- Whether bulls developed on the ranch, in a commercial facility, or at a central bull test station
 - Usually fed to gain 2.5 to 3.0 pounds daily from wean to yearling
- Common complaint from beef producers is the run-down condition of young bulls after first breeding season
 - Most young bulls will loss condition and weight during their first breeding season
- However, minimizing loss of body weight and condition will extend bull's usefulness and productivity especially during initial breeding season




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Bull Nutrition Management

- Young bulls need adequate diet for growth and development
 - Determine desired level of performance
- Have 160 days to grow from wean to yearling (1000 lb)
 - Need forage with energy supplementation
 - 600 lb bull calf – 5-6 lb supplement
 - 13-14% CP; 65-70% TDN





Bull Nutrition Management

- **Similar diet for 120 days from yearling to breeding**
 - Ration should include concentrate fed at 0.8 to 1% body weight
- **Bulls will use energy body stores and can lose > 200 lb during breeding season**
- **Feed bulls to achieve BCS of 3.5 (1=emaciated; 5=obese) at start of first breeding season**
- **BCS of 3.5 equates to body fat of about 20% to 23%**




Table 1. Daily nutrient requirements for growing large frame beef bull calves after weaning (Gaining 2.5 lbs per day).

Weight of bull (lb)	Dry Matter Intake (lb)	Protein Intake (lb)	ME Mcal/lb	NE _m Mcal/lb	NE _g Mcal/lb	TDN (%)	Ca (%)	P (%)
600	15.5	1.82	1.09	0.69	0.42	66.5	0.51	0.26
700	17.4	1.90	1.09	0.69	0.42	66.5	0.44	0.24
800	19.2	1.97	1.09	0.69	0.42	66.5	0.40	0.23
900	21.0	2.04	1.09	0.69	0.42	66.5	0.36	0.21
1000	22.7	2.11	1.09	0.69	0.42	66.5	0.33	0.20

Table 2. Daily nutrient requirements for maintenance and slow rate of growth (regain body condition) of young and mature bulls.


Weight of bull (lb)	Ave. Daily Gain	Dry Matter Intake (lb)	Protein Intake (lb)	ME Mcal/lb	NE _m Mcal/lb	NE _g Mcal/lb	TDN (%)	Ca (%)	P (%)
1300	1.0	25.4	1.9	0.92	0.53	0.28	55.8	0.22	0.19
1300	1.5	26.1	2.0	0.98	0.59	0.33	59.7	0.24	0.19
1300	2.0	26.2	2.2	1.05	0.65	0.39	64.0	0.26	0.20
1600	0.0	26.5	1.8	0.79	0.41	—	48.4	0.19	0.20
1600	1.0	29.7	2.2	0.92	0.53	0.28	55.8	0.22	0.19
2000	0.0	31.3	2.1	0.79	0.41	—	48.4	0.21	0.21

Source: NRC 2000




Reproductive efficiency


- **Nutrition has a huge impact – over feeding vs under feeding**
 - Attempts to improve reproductive management with suboptimal nutrition (or other management considerations) will fail
 - Bulls in moderate condition at breeding will have good libido and be most fertile

Purchased Bulls 


Over vs Under Conditioned

- **Over-Conditioned:**
 - Expect to lose condition during breeding season
 - Over-conditioned bulls enter breeding season may be less active during the breeding season, especially if the breeding season occurs during the heat of summer
 - Gradual return to normal condition allows for recovery of fertility and libido
- **Under-conditioned:**
 - Bulls activity may be limited
 - Hard to feed up a condition
- **Develop bulls "ready" for the breeding season**
 - They are ready to "work" and perform their duty



Post Breeding Management 


- Care of young bulls post breeding season important
- Bulls should weigh 75 to 80% of MBW at start of 2nd breeding season
- Mature weight of young bull estimated at 2000 lb
- At beginning of first breeding season bull is 1300 lb (65% MBW) and can loose 200 lb during first breeding season
- To be 75% - 80% of MBW at start of next breeding season (1650 lb)
 - Animal needs to gain 400 to 500 lb




Post Breeding Management 


- Between end of 1st breeding season and start of 2nd breeding season
 - Young bulls need to gain about 2 lb/day
- Pasture quality peaks and starts to decline in July and August
- Gain only about 1.5 lb/day without supplementation
- Young bulls will need supplemental energy and protein before the second breeding season
- Do not wait until prior to 2nd breeding season to get young bulls back to desired weight
- For spring/summer breeding season
 - Consider feeding these bulls - protein and energy beginning mid winter feeding program

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100 **Post Breeding Management** 


- Starting early allows to put weight back on gradually with smaller amounts of a high energy feed
- This can be in drylot or - or when the bulls are in extensive winter grazing programs
- Allow young bulls a chance to be productive and remain in the herd as long as possible
- The Bull Battery is an expensive investment
 - Manage both young and older bulls so you get a reasonable return on the investment




100 **Effect of temperature on DMI** 


Cold	% Change		Heat	% Change
15 to 20	0		15 to 20	0
2 to 15	+3%		20 to 30	-10%
-10 to 2	+5%		> 32	-10%
-20 to -10	+7%			
< -20	+16%			

Source: NRC 2000 20

100 **Nutrition by Reproduction Interactions** 


- High energy diets in post-pubertal bulls can harm reproductive performance
 - Reduced epididymal reserves
 - Reduced daily sperm production
- Backfat thickness is negatively correlated with fertility
 - Decreased – sperm production, semen quality, overall fertility



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- Why?
 - Impaired thermoregulation
 - Hormonal imbalance
 - Other environmental concerns
 - Frostbite, sunburn, biting insects, severe dermatitis, infections or disease that cause fever

“Degree of the injury is proportional to the severity and duration of the insult.”
Coulter. 1993. Matching Beef Cattle to Western Environments



Thank you!

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