
University of Nebraska Lincoln
Implications of nutritional management for beef cow/calf systems
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IANR


West Central Research & Extension Center
Est. 1903
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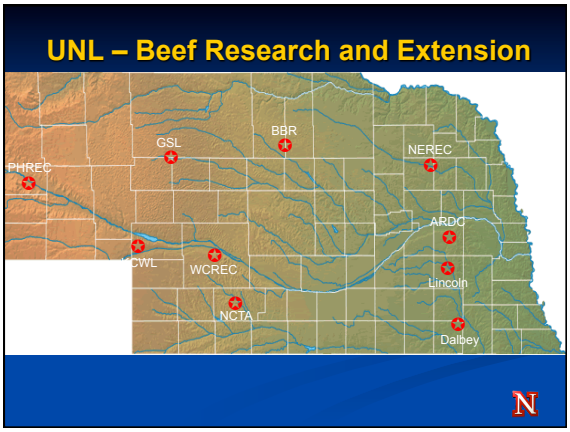
UNL – Beef Research and Extension
PHREC
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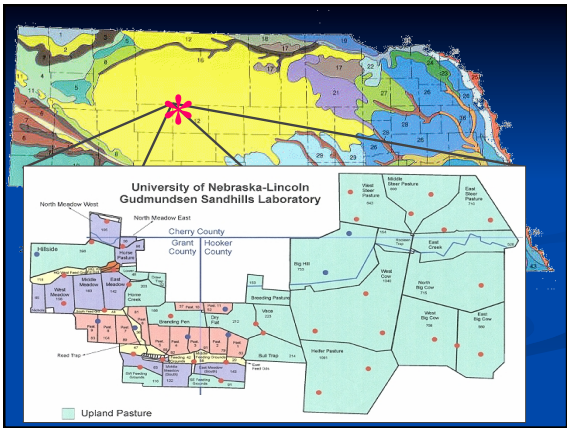
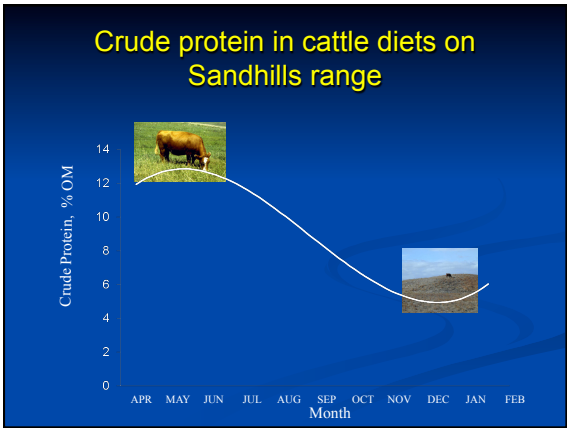
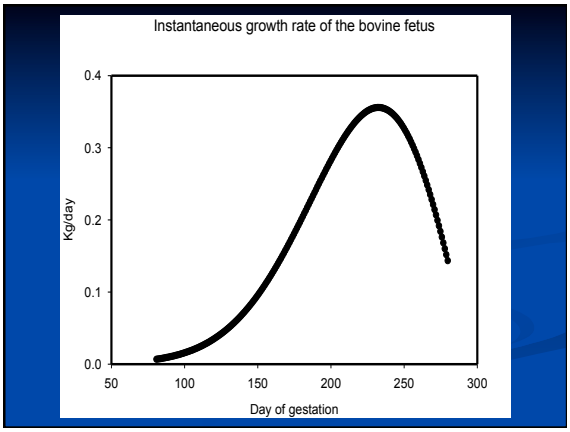

University of Nebraska-Lincoln
Gudmundsen Sandhills Laboratory
North Meadow West
North Meadow East
Cherry County
Grant County
Hooker County
Upland Pasture


BEEF
SYSTEMS
RESEARCH





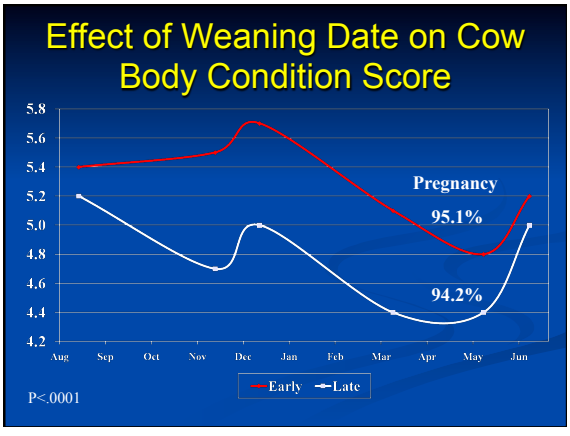
Weaning and Supplement Treatments for March Calving Cows

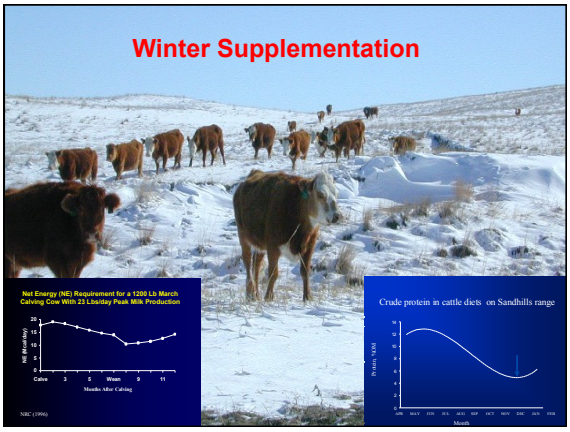
August weaning

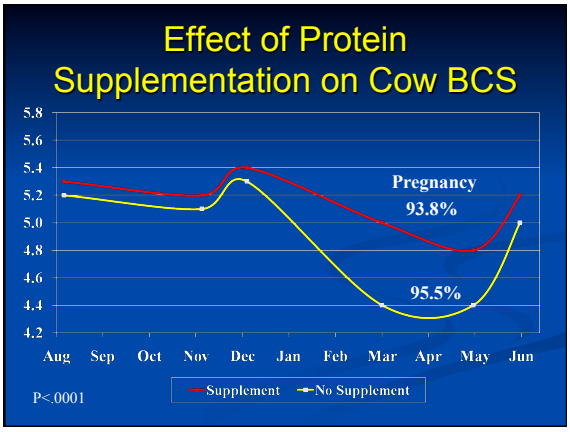
1. No protein supplement during winter grazing
2. Protein supplement during winter grazing

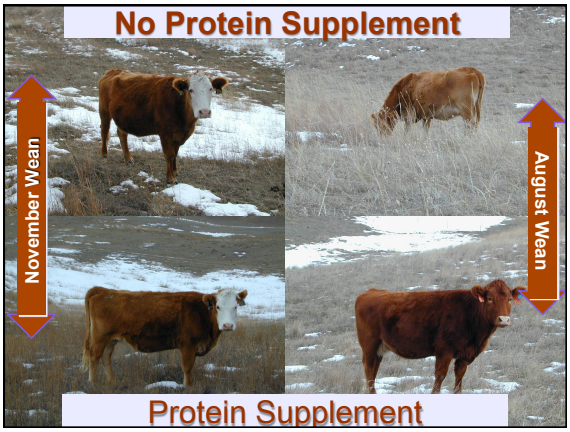
November weaning

1. No protein supplement during winter grazing
2. Protein supplement during winter grazing



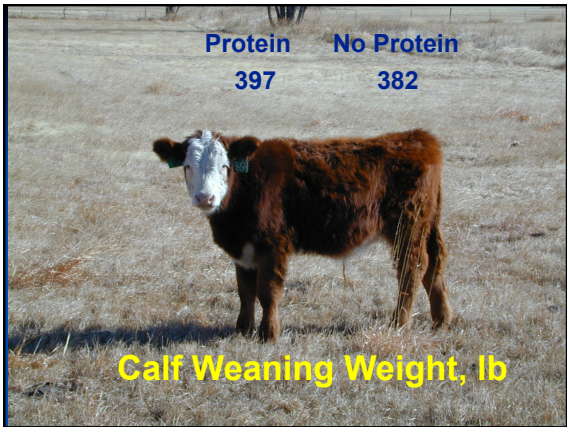

Winter Supplementation
Net Energy (NE) Requirement for a 1200 Lb March Calving Cow With 23 Lbs/day Peak Milk Production
Crude protein in cattle diets on Sandhills range


Effect of Protein Supplementation on Cow BCS
5.8
5.6
5.4
5.2
5.0
4.8
4.6
4.4
4.2
Pregnancy
93.8%
95.5%
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
P<.0001
Supplement
No Supplement

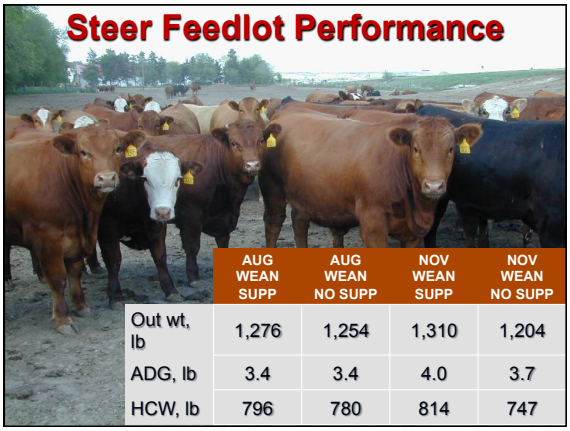

No Protein Supplement
November Wean
August Wean
Protein Supplement


NOV Wean, Winter Supplement
NOV Wean, NO Winter Supplement


August
November
432
518
Calf Weaning Weight, lb


Protein
No Protein
397
382
Calf Weaning Weight, lb

Steer Feedlot Performance



	AUG WEAN SUPP	AUG WEAN NO SUPP	NOV WEAN SUPP	NOV WEAN NO SUPP
Out wt, lb	1,276	1,254	1,310	1,204
ADG, lb	3.4	3.4	4.0	3.7
HCW, lb	796	780	814	747

Costs and Net Revenues After Finishing

	August Wean		November Wean	
	Supp.	No Supp.	Supp.	No Supp.
Costs, $/hd				
Calf	471	449	474	451
Feed	326	301	269	249
Yardage	74	74	59	59
Trucking	2	2	3	3
Processing	25	25	25	25
Total Cost	898	851	830	787
Revenue, $/hd				
Steer	872	858	877	810
Net/cow exp	-9	3	22	11

Winter / Spring

Objectives

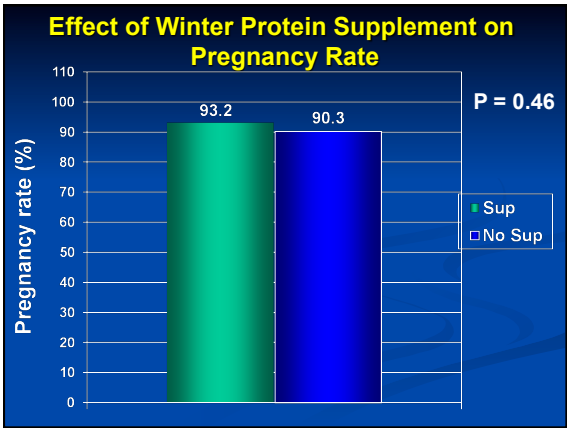
Determine if supplemental protein during late gestation or early lactation plane of nutrition of cows influences future growth or reproductive performance of their heifer calves.

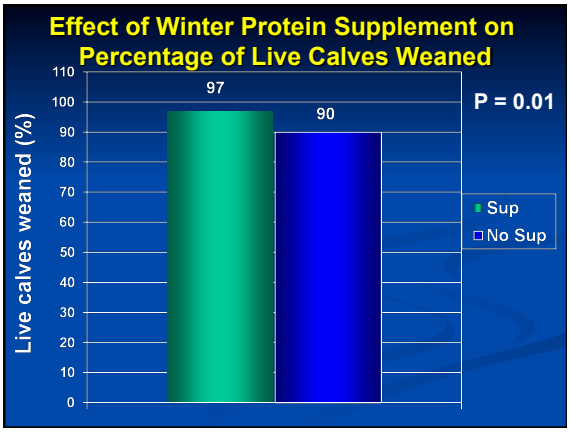
Materials & Methods

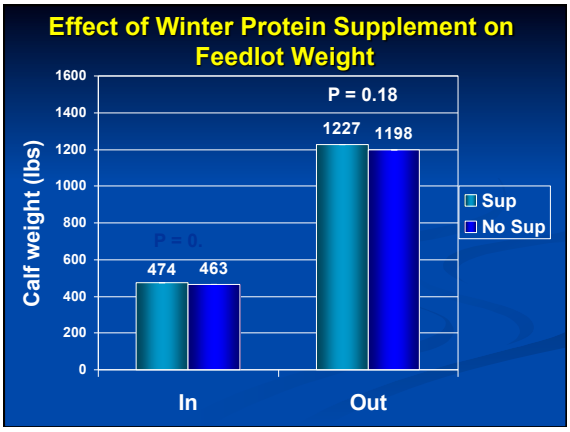
- Gudmundsen Sandhills Laboratory, Whitman, NE
- Red Angus x Simmental Cows
  - 3 to 5 yr of age
  - Calving season March 1 to April 20
- Natural service breeding

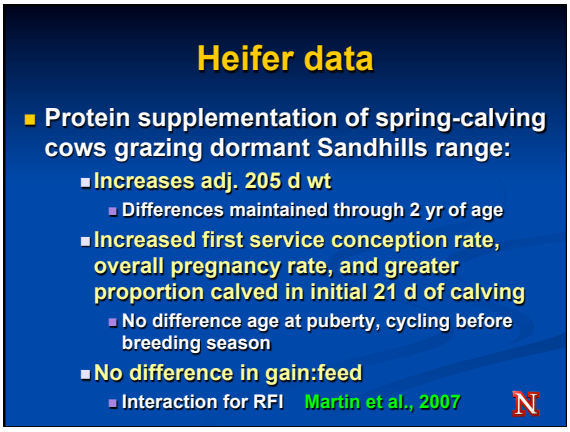
Materials & Methods Supplementation

- Treatments applied to dam
- Last trimester of gestation:
  - 1 lb/d of 42% CP cake delivered 3 times per week
  - No supplement
- Early lactation
  - Dams grazed meadow or fed meadow hay after calving
- No further treatment applied to heifers


Effect of Winter Protein Supplement on Pregnancy Rate
Pregnancy rate (%)
110
100
90
80
70
60
50
40
30
20
10
0
93.2
90.3
P = 0.46
Sup
No Sup


Effect of Winter Protein Supplement on Percentage of Live Calves Weaned
Live calves weaned (%)
110
100
90
80
70
60
50
40
30
20
10
0
97
90
P = 0.01
Sup
No Sup


Effect of Winter Protein Supplement on Feedlot Weight
Calf weight (lbs)
1600
1400
1200
1000
800
600
400
200
0
P = 0.18
1227
1198
474
463
Sup
No Sup
In
Out


Heifer data
Protein supplementation of spring-calving cows grazing dormant Sandhills range:
Increases adj. 205 d wt
Differences maintained through 2 yr of age
Increased first service conception rate, overall pregnancy rate, and greater proportion calved in initial 21 d of calving
No difference age at puberty, cycling before breeding season
No difference in gain:feed
Interaction for RFI
Martin et al., 2007

Effect of Prepartum Nutrition on Heifer Development

3-yr	No Supplement	Supplement
BW	77	79
WW	455	469
ADJ 205d Wt	480	499
Preg Check Wt	851	882

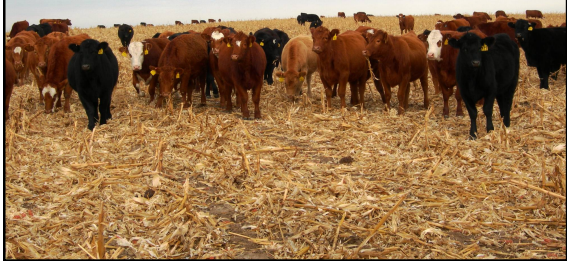
Pregnancy and Calving Data

3- yr	No Supplement	Supplement
Age at Puberty	334	339
Cycling (%)	67	61
Calved 1st 21 d (%)	49	77
Final Preg, %	80	93
Calving Date	75	71

Effects of winter grazing system and supplementation on beef cow and progeny performance

R. N. Funston , J. L. Martin, D. C. Adams, and D.M. Larson

Corn crop residue provides a reasonably priced alternative to grazing dormant winter range

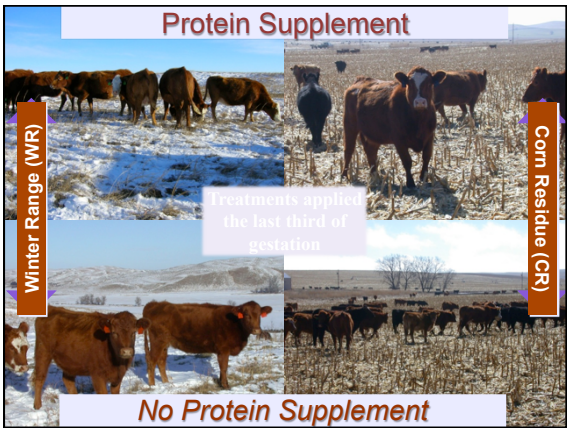


Objectives

- Determine if supplementing beef cows grazing range or corn residue during the last third of gestation affects cow or progeny performance.

Materials & Methods

- Completely randomized design
- 2 x 2 Factorial treatment arrangement
- Treatments applied only to dam
  - Winter grazing mid-Nov. to mid-Feb:
    - WR – winter range
    - CR – corn crop residue
  - Last trimester of gestation:
    - PS - 0.45 kg/d of 28% CP cake
    - NS - No supplement



Materials & Methods
Cow Management

- Gudmundsen Sandhills Laboratory, Whitman, NE (GSL)
- n = 342, 3rd yr in progress
  - 5/8 Red Angus, 3/8 Simmental cows
  - 3 to 5 yr of age at beginning of trial
  - Within age group, stratified by previous calf WW
  - Remain on treatment throughout experiment
    - Numbers maintained by adding 3 yr old cows each fall
- Natural service breeding
  - Calving season begins March 1

Supplement Composition
DM Basis

Dried distillers grains	62.0
Wheat middlings	10.6
Cottonseed meal	9.0
Dried corn gluten feed	5.0
Cane molasses	3.0
Calcium Carbonate	3.0
Urea	2.1
VTM, binder, etc.	5.4
Monensin, mg/kg	178

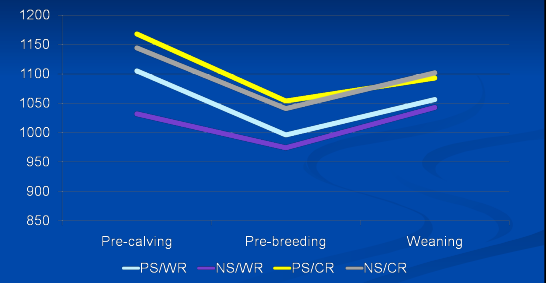
Materials & Methods
Steer Progeny

- n = 172
  - Weaned at GSL
    - Transported to West Central Research & Extension Center, North Platte, NE (WCREC) feedlot 10 d later
  - 221 DOF

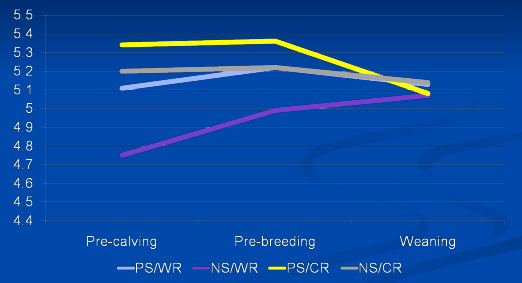
Materials & Methods
Heifer Progeny

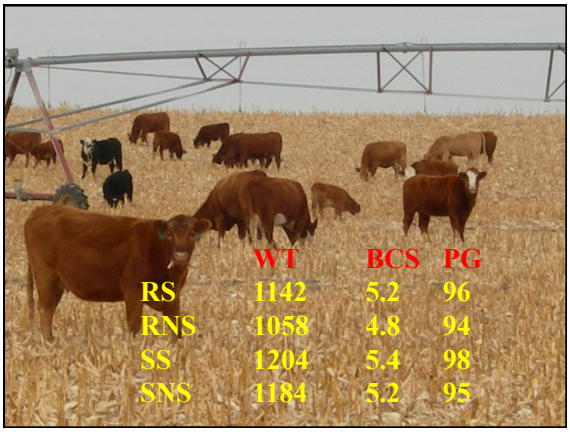
- n = 164
  - 3 yr reproductive data
  - 3 yr growth, FE data
- Weaned at GSL
  - Transported to WCREC 10 d later
  - Wintered in drylot
    - Heifers from WR cows individually fed
    - Heifers from CR cows pen fed
- Age and weight at puberty determined
- Transported back to GSL

Cow Body Weight



Cow BCS



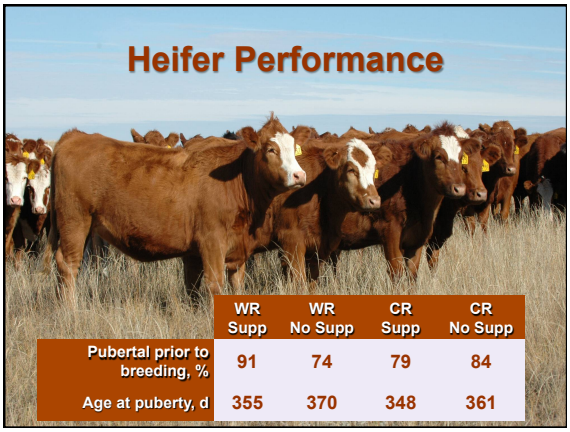


Cow Performance

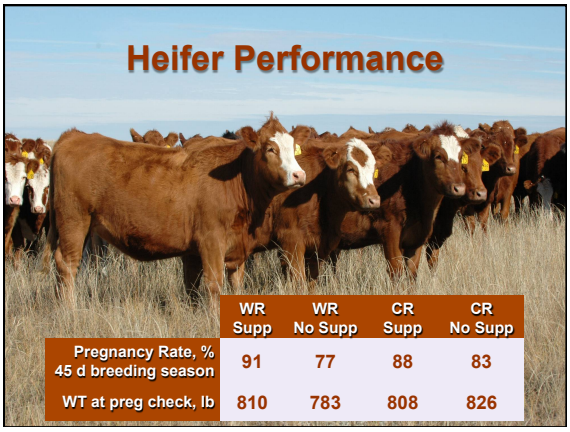
	Treatment				P-value		
	PS/ WR	NS/ WR	PS/ CR	NS/ CR	Sys	Sup	S*S
Cow Weaning BW, lb	1058	1045	1096	1105	<0.001	0.74	0.23
Cow Weaning BCS	5.1	5.0	5.1	5.1	0.54	0.44	0.18
Pregnancy Rate, %	96	94	98	95	0.46	0.20	0.95
Calved 1st 21 d	83[a]	62[b]	78[a]	80[a]	0.20	0.07	0.03

Steer Feedlot Performance

Final Live Weight and ADG



	WR Supp	WR No Supp	CR Supp	CR No Supp
Pubertal prior to breeding, %	91	74	79	84
Age at puberty, d	355	370	348	361



	WR Supp	WR No Supp	CR Supp	CR No Supp
Pregnancy Rate, % 45 d breeding season	91	77	88	83
WT at preg check, lb	810	783	808	826

Heifer Performance

	Treatment				P-value		
	PS/ WR	NS/ WR	PS/ CR	NS/ CR	Sys	Sup	S*S
ADG	1.85[a]	1.81[a]	1.54[b]	1.79[a]	0.02	0.14	0.02
DMI	16.5	17.0	15.9	16.3	0.74	0.95	0.16
Gain:Feed	0.113[a]	0.112[a]	0.09[b]	0.108[a]	<0.01	0.03	0.02
RFI, kg/d	-0.10	-0.06	0.03	0.21	0.19	0.40	0.61

Conclusions

- Grazing CR
  - Cow performance
    - Increased BW, BCS pre-calving
    - Increased calf birth weight
    - Increased BW, BCS pre-breeding
    - No affect on milk production
    - Increased cow BW at weaning
    - No effect on pregnancy rate

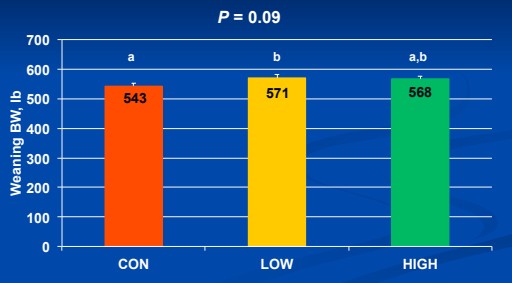
Conclusions

- Protein Supplementation
  - For cows grazing WR
    - Increased BW, BCS pre-calving
    - 7 d earlier calving date
    - 21 % more calving in 1st 21 d
    - Increased calf weaning BW and adj. 205 d BW

Conclusions

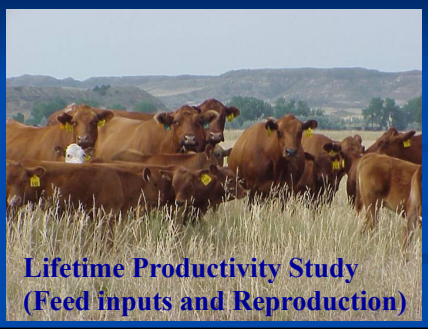
- Protein Supplementation vs NS
  - Decreased post weaning sickness
  - Improved Quality grade in both systems
  - Increased % pubertal before breeding
  - Increased pre breeding BW for WR
  - Improved pregnancy rates
  - Decreased feed efficiency in heifer progeny

Effect of late gestation supplementation on progeny weaning BW

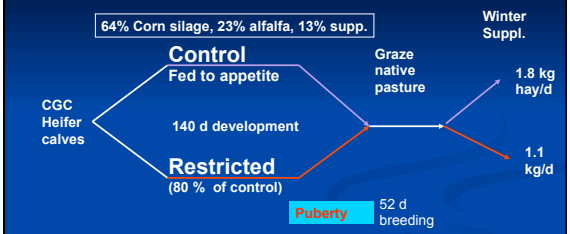


CGC Composite

50% Red Angus, 25% Charolais, 25% Tarentaise



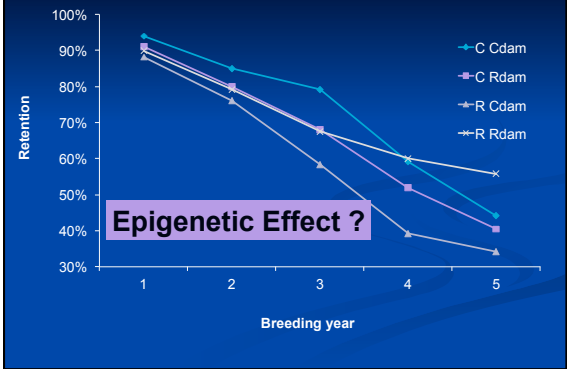
Experiment Design



What about offspring?

COW	Daughter
Control	Control
	Restricted
Restricted	Control
	Restricted

Retention of CGC heifers



What about calf Birth Wt

Dam	Cow	
Control	Control	35 kg
	Restricted	35 kg
Restricted	Control	35 kg
	Restricted	34 kg

What about calf Wean Wt

Dam	Cow	
Control	Control	225 kg
	Restricted	222 kg
Restricted	Control	223 kg
	Restricted	216 kg

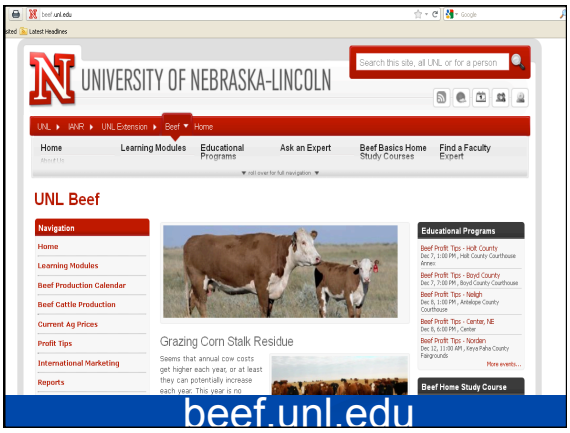
Restricted Heifer Development

- Improved efficiency
- Reduced feed/pregnant heifer
- Improved longevity?

Replacements from Restricted Cows

- Improved longevity (↑ 5 & older)
- Improve drought resistance?
- Matching genotype with environment (↓ Milk?)


Fetal Programming: Stimuli experienced during fetal development may impact postnatal growth and physiology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