Soil Fertility, Cropping Systems, and Beef Production with Forages

NRCS Little Beaver Conservation District

SOIL HEALTH WORKSHOP

Baker, MT

Doug Landblom

February 3, 2015

Today' Goal

1. Soil nitrogen fertility following cover crops
2. Backgrounding Calves with unharvested corn (Drought Mgmt)
3. Yearling steer graze to slaughter using forage sequence
4. Forage developed replacement heifers
5. Extending the grazing season for stock cows with cover crops, stockpiled tame grass, and crop residues
6. Fattening cull cows for slaughter grazing unharvested corn

5 Year Crop Rotation

Year 1 - Spring Wheat

Year 2

Winter Triticale/Hairy Vetch (Hay)

7-Way Cover Crop (Dry Gestating Cows)

Year 3 - Forage Corn (Yearlings)

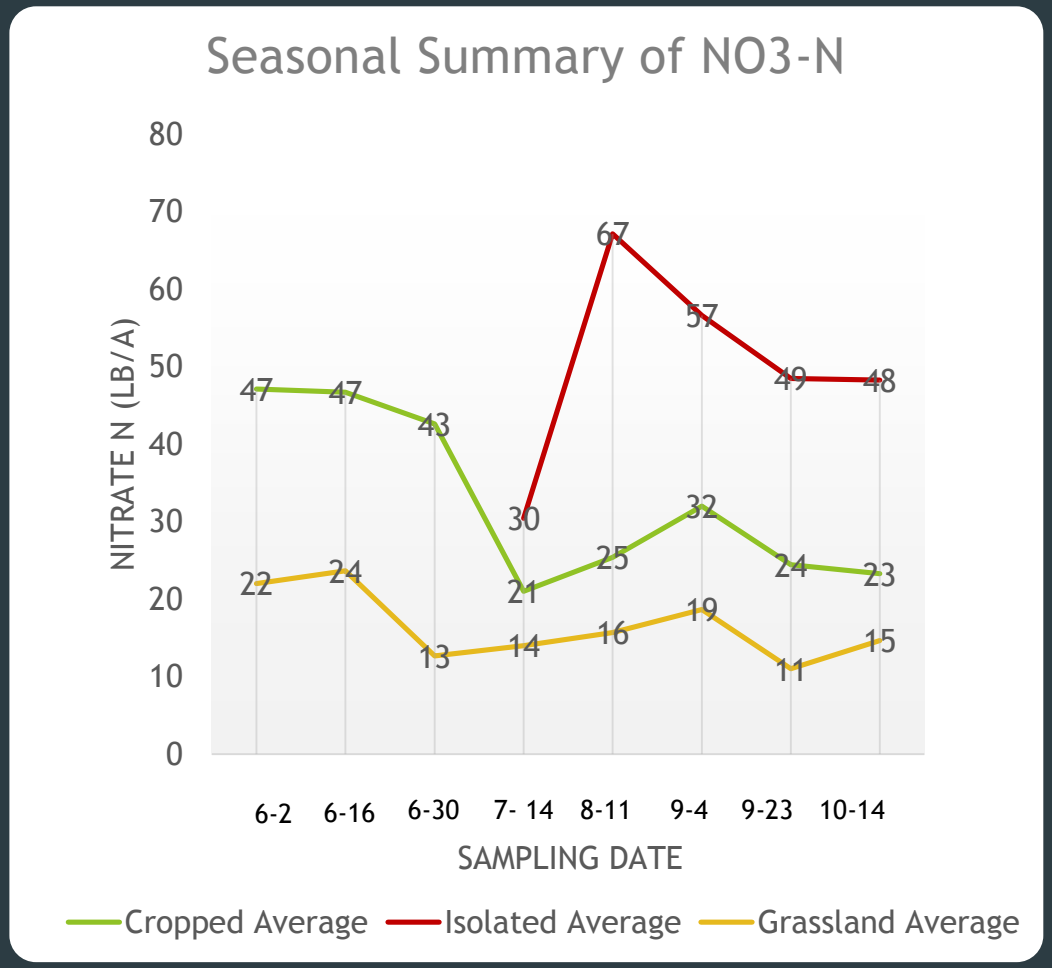
Year 4 - Pea-Barley (Yearlings)

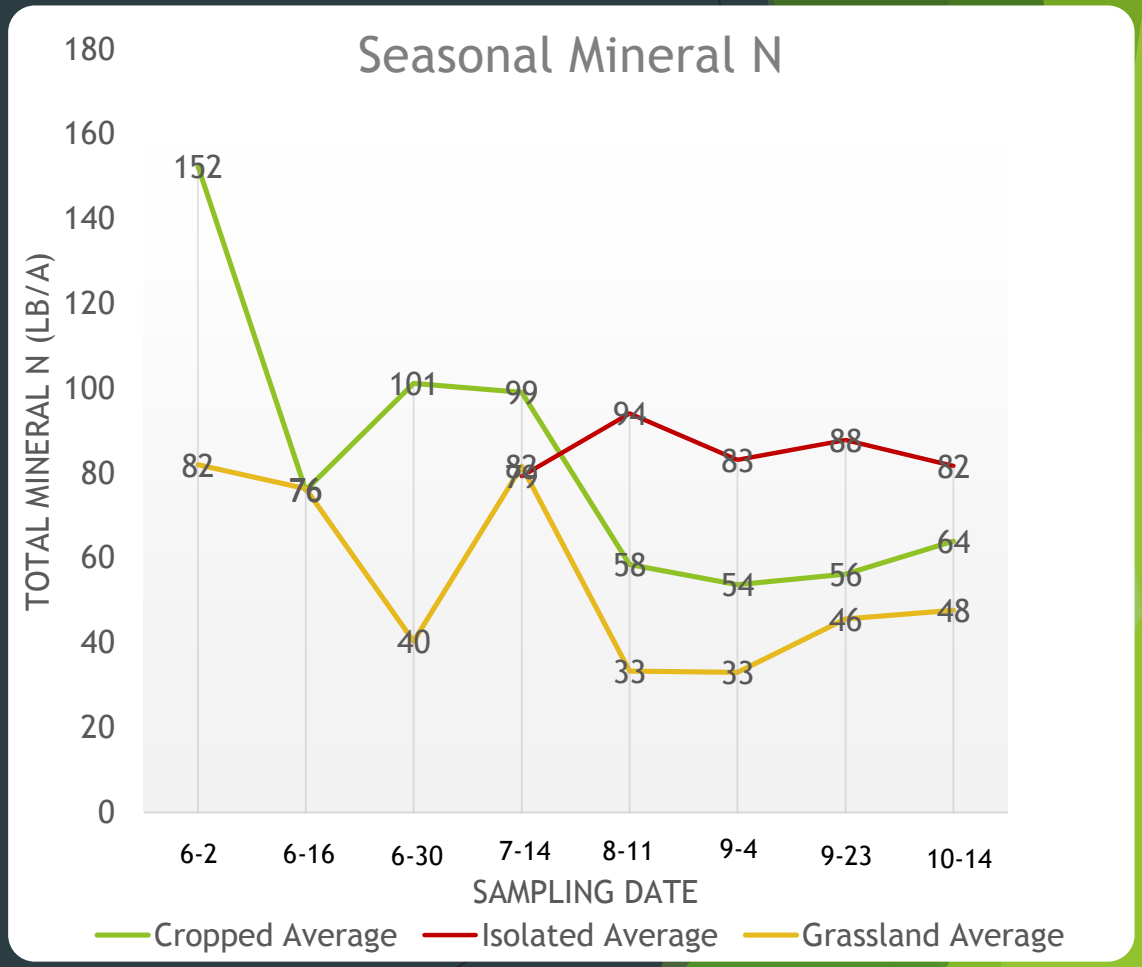
Year 5 Sunflower

Soil Nitrogen Fertility

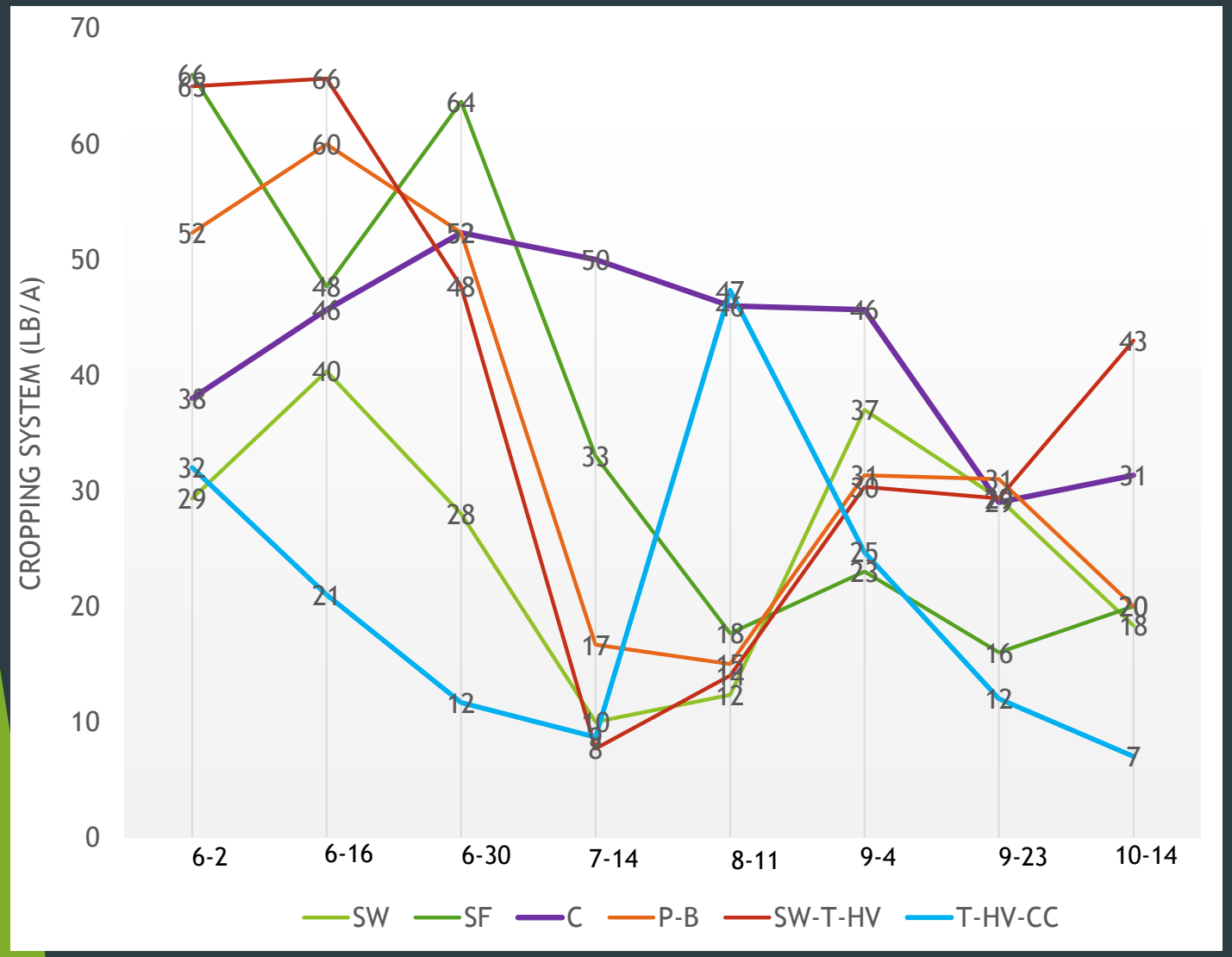
- Soil sample depths:
  - 0-6”
  - 6-12”
  - 12-24”
- 8” x 24” Irrigation pipe inserted for root restriction
- Samples collected inside and outside of the cylinders
- Data provides estimate of:
  - Nitrogen change over growing season
  - Nitrogen plants are scavenging
  - Leaching
  - Denitrification

Total Mineral Nitrogen –



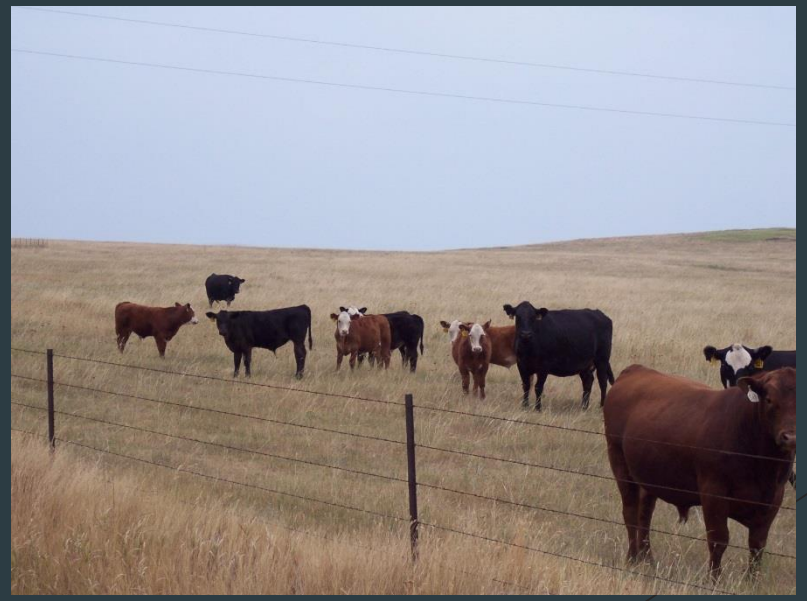


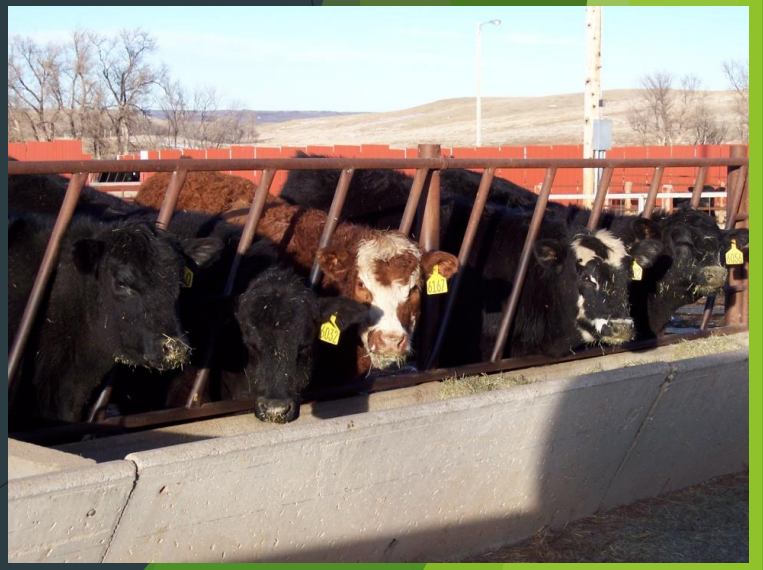
Cropping System Nitrate-N (NO_3-N) – Outside Enclosures



Drought Strategy: Background Calves with Unharvested Corn

- Early weaned calves grazed unharvested corn starting in mid-August
- Normal weaned calves grazed unharvested corn starting in early-November
- Similar early and normal weaned groups were put into the feedlot at the same time
- Control calves were not weaned





Applying Information to the Farm

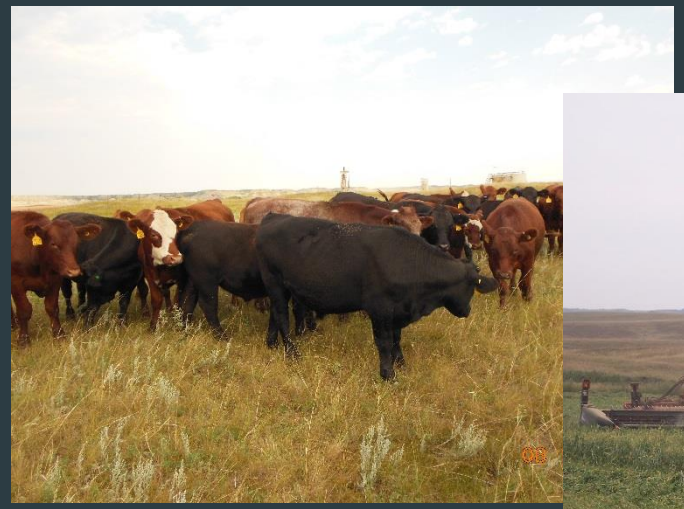
Cows

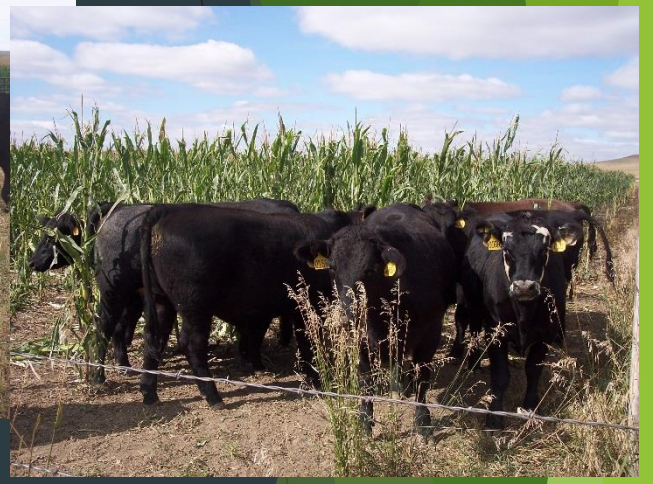
- Corn grazing can be used as a management technique during drought for early weaning
- Early weaning reduced cow and pasture stress. Terminating lactation reduces cow nutrient requirement by approximately 30%.
- Early weaning will reduce native pasture forage disappearance by approximately 36%.

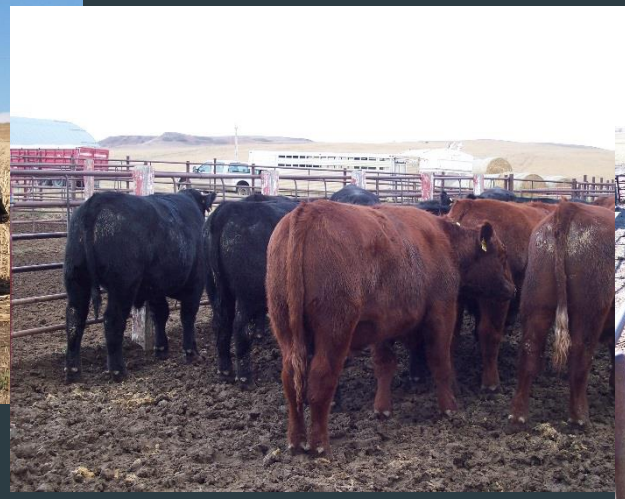
Backgrounded Calves

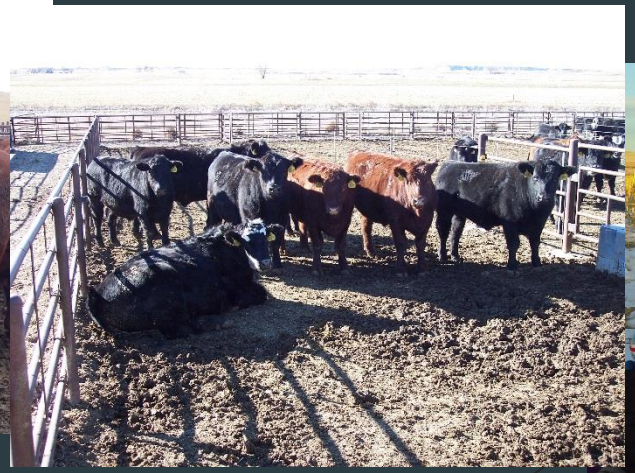
- ADG: 2.2 Lb/day
- Acres of Corn/Steer/Month:
  - Early Wean – 0.21 ac/Str/Mth
  - Normal Wean – 0.44 ac/Str/Mth
- After frost, corn shrinks 1.25 T/A
- Calves grazed the highest quality material
- Cows followed the calves and grazed corn stalk residue.
- Stalk residue provided 28 days of grazing for a 1200 lb cow

Graze to Slaughter Forage Sequence



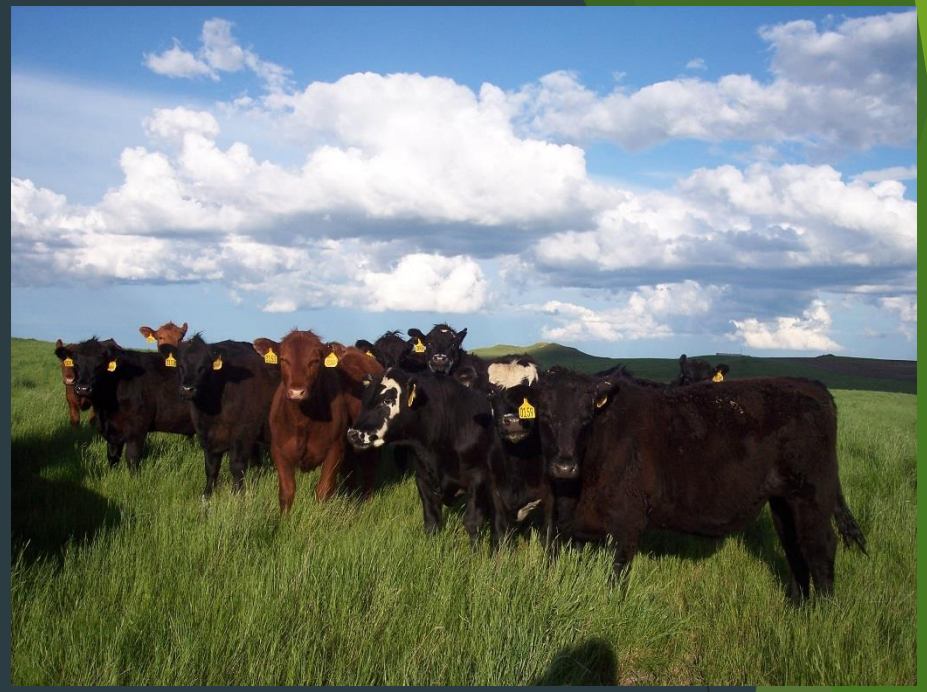






Grazing Sequence Perennial Pastures

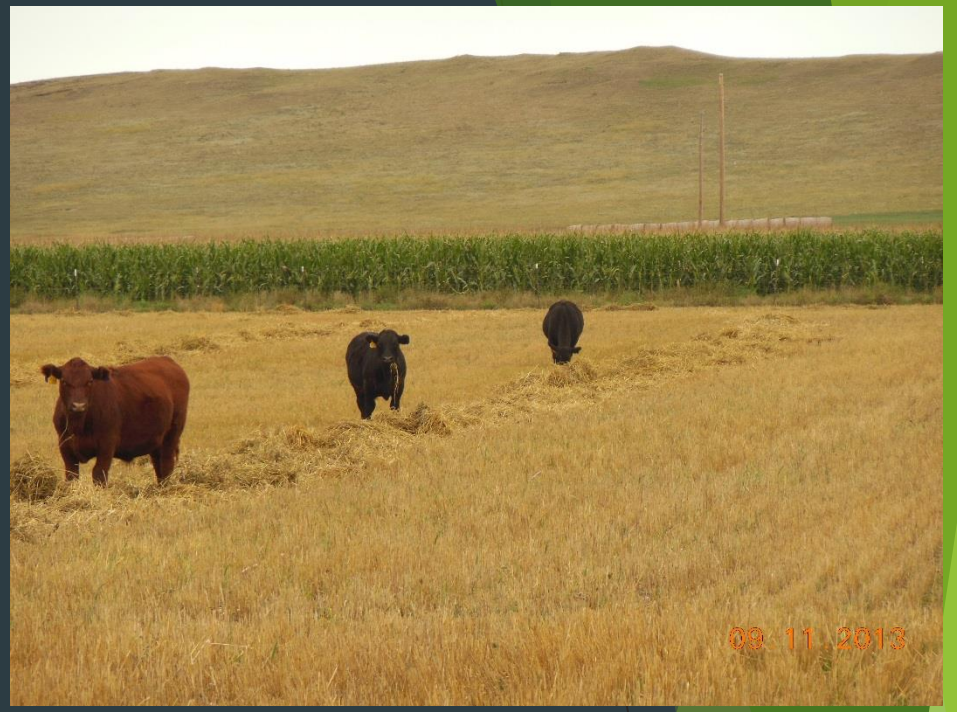
- Early May
  - Crested Wheatgrass
  - (39 Days)
- Mid-June
  - Native Range
  - (61 Days)

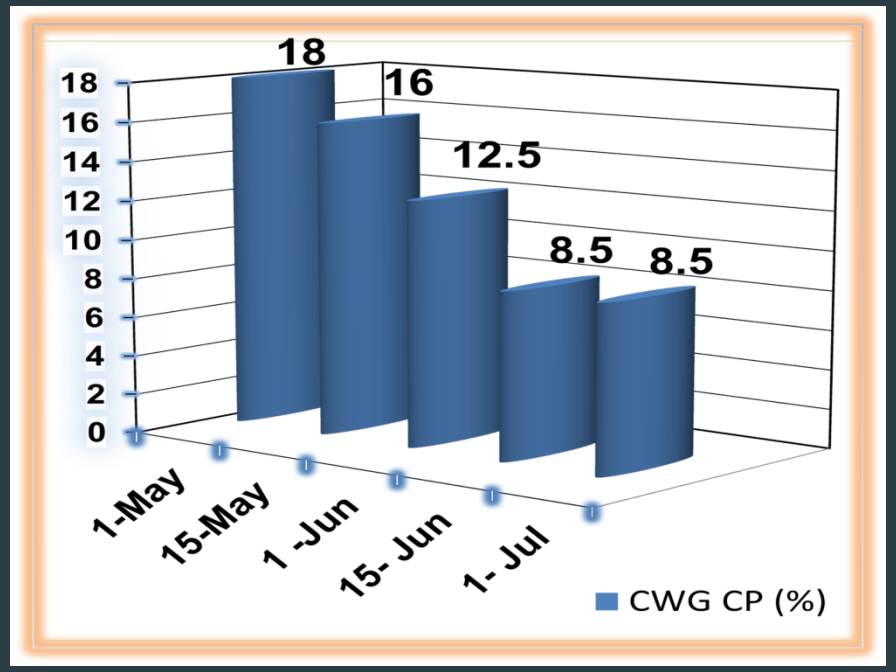


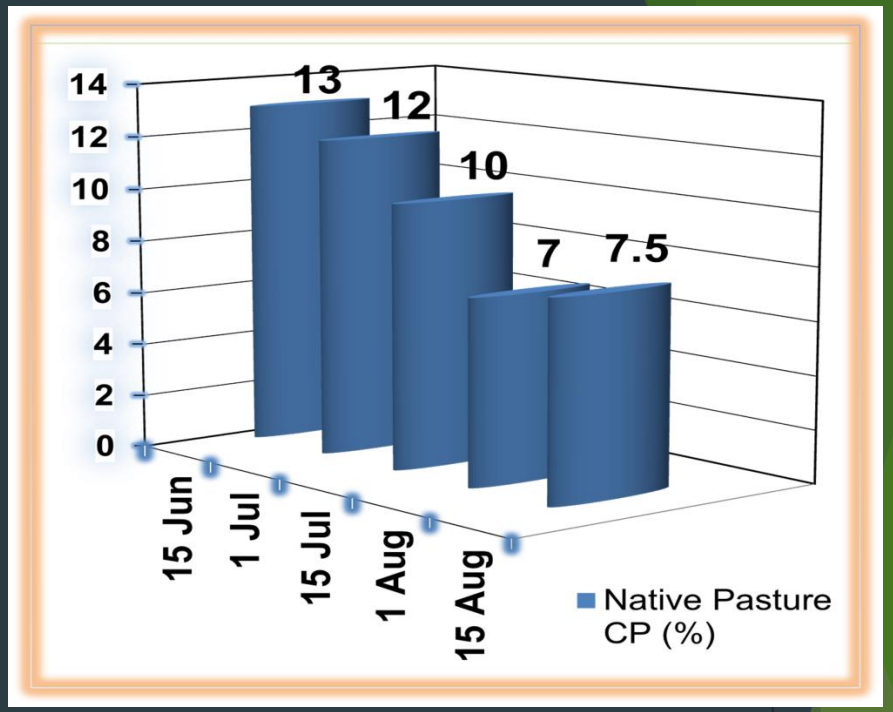
Grazing Sequence (Annual Forage)

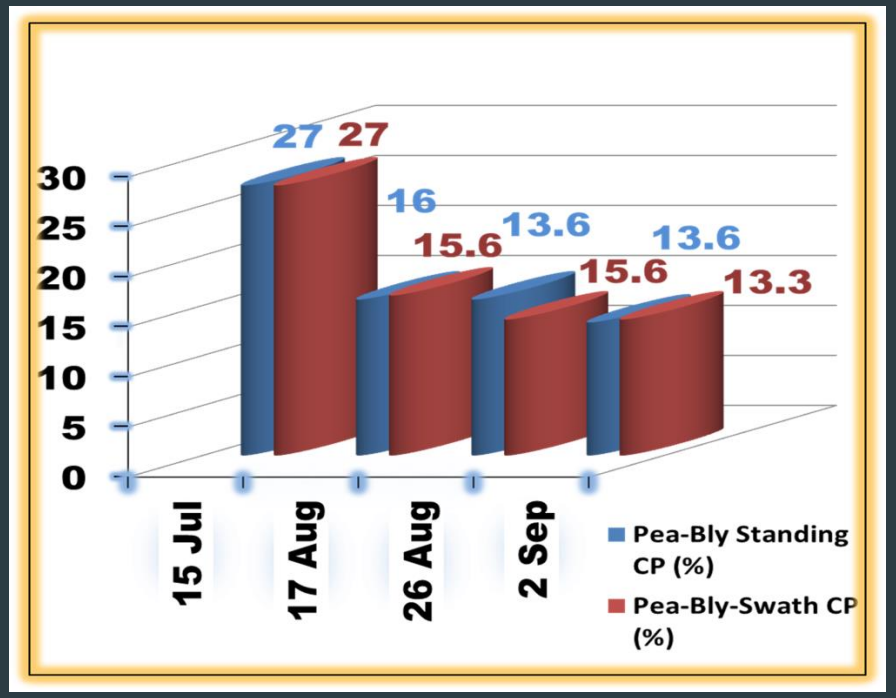
- Mid-August
  - Pea-barley
  - Protein bridge
  - (27 Days)

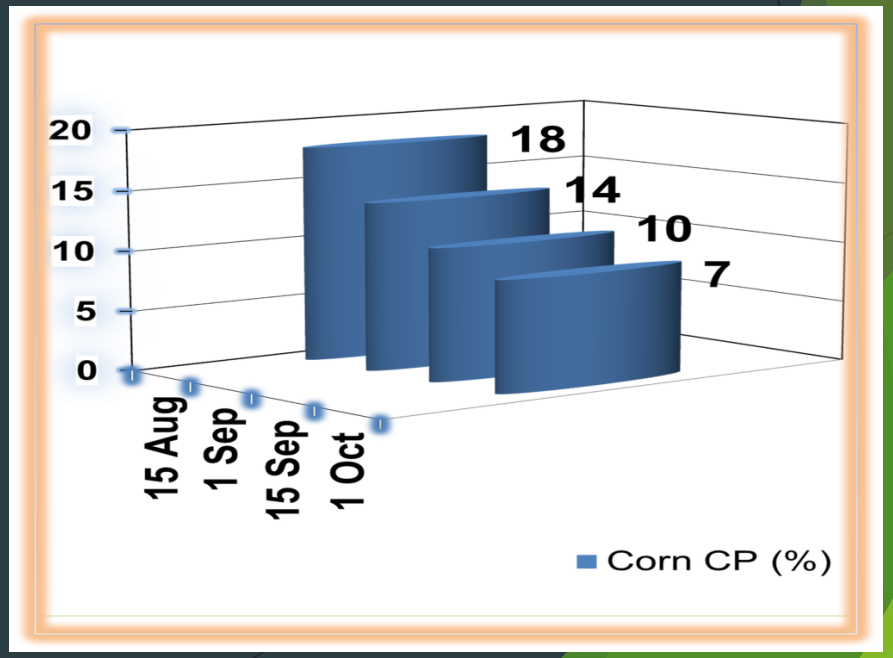
- Mid-September
  - Unharvested corn
  - (55-77 Days)




18
16
12.5
8.5
8.5
18
16
14
12
10
8
6
4
2
0
1-May
15-May
1 -Jun
15- Jun
1- Jul
CWG CP (%)

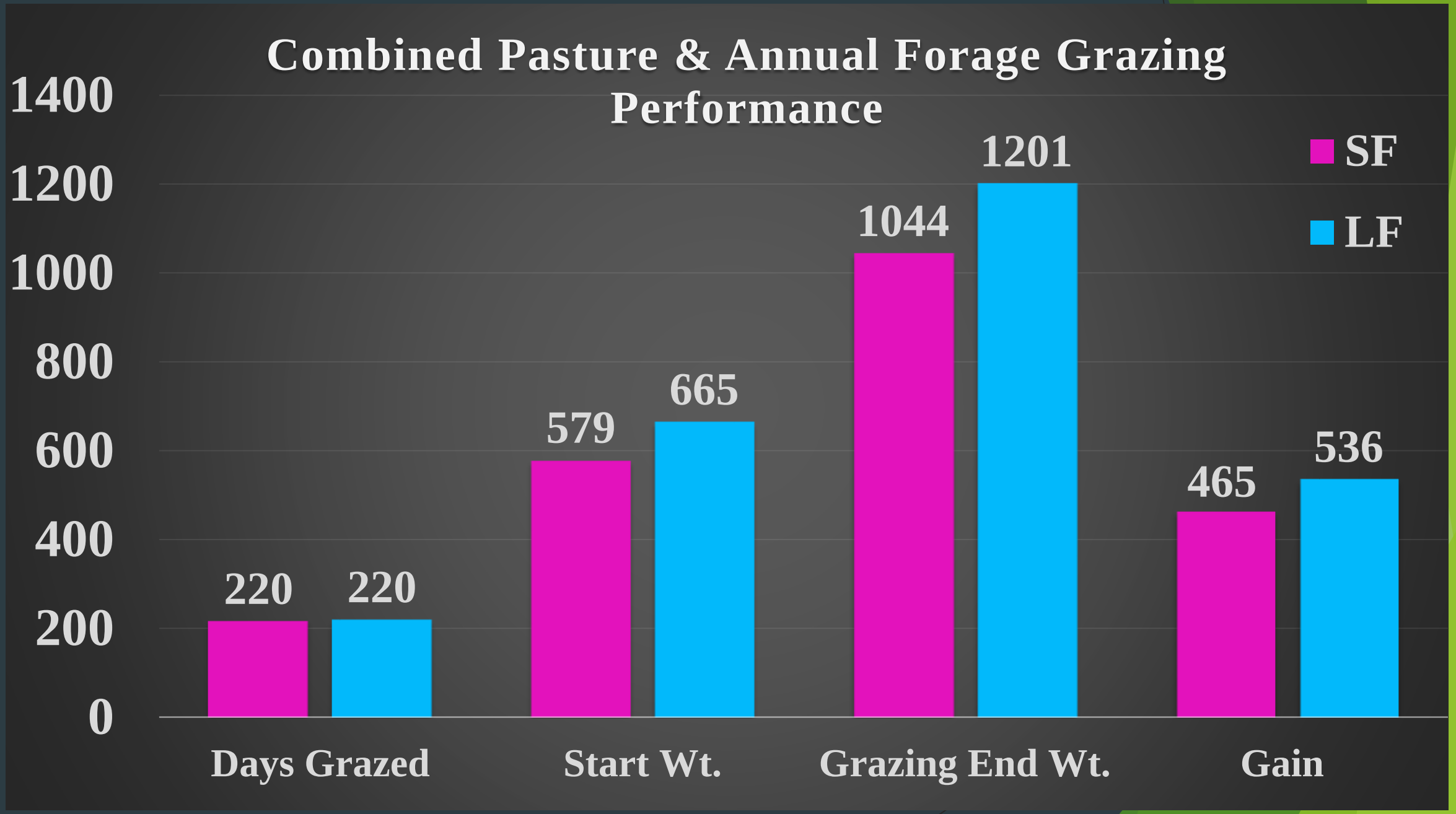

13
12
10
7
7.5
14
12
10
8
6
4
2
0
15 Jun
1 Jul
15 Jul
1 Aug
15 Aug
Native Pasture CP (%)

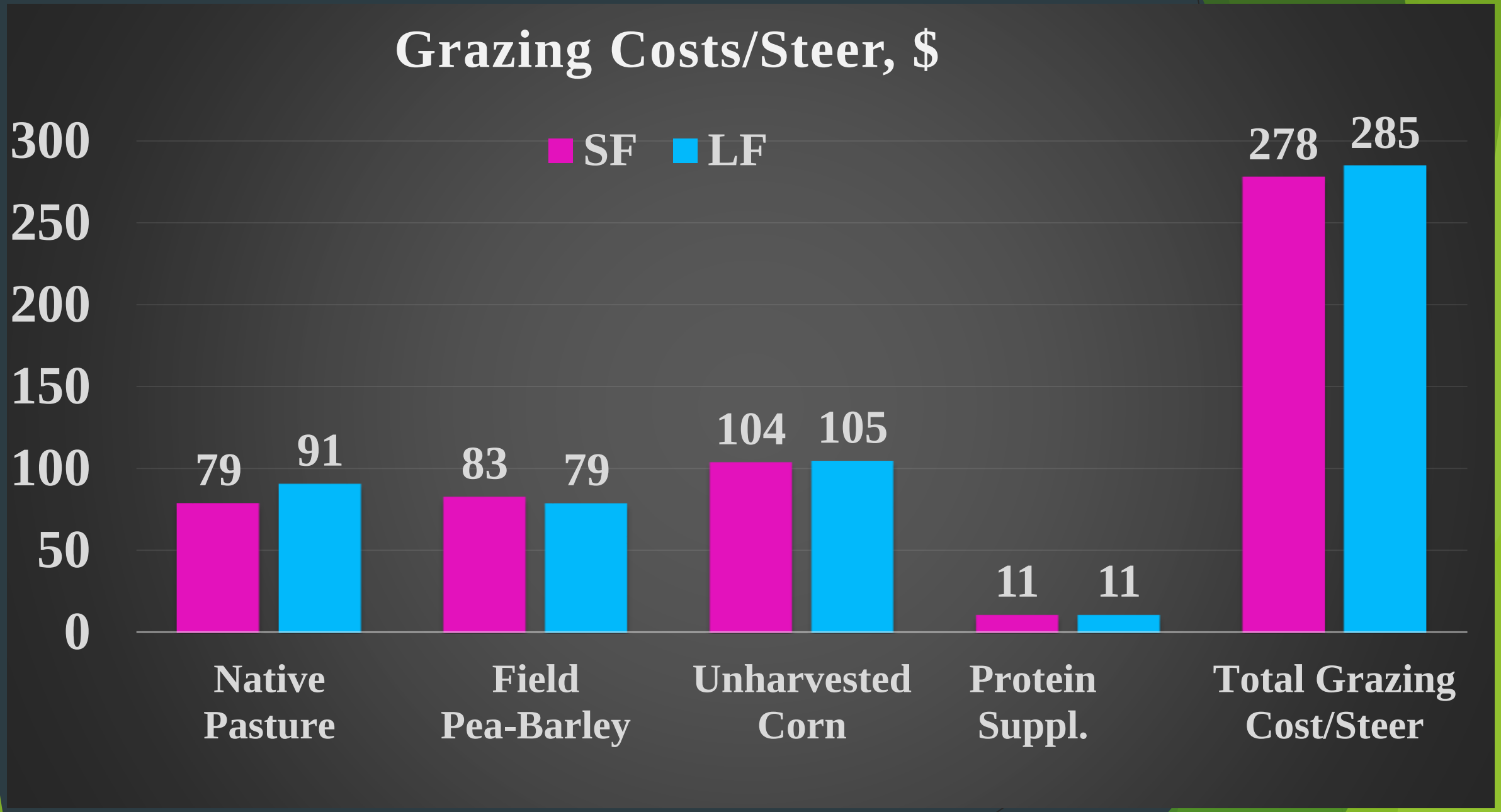

27
27
16
15.6
13.6
15.6
13.6
13.3
30
25
20
15
10
5
0
15 Jul
17 Aug
26 Aug
2 Sep
Pea-Bly Standing CP (%)
Pea-Bly-Swath CP (%)

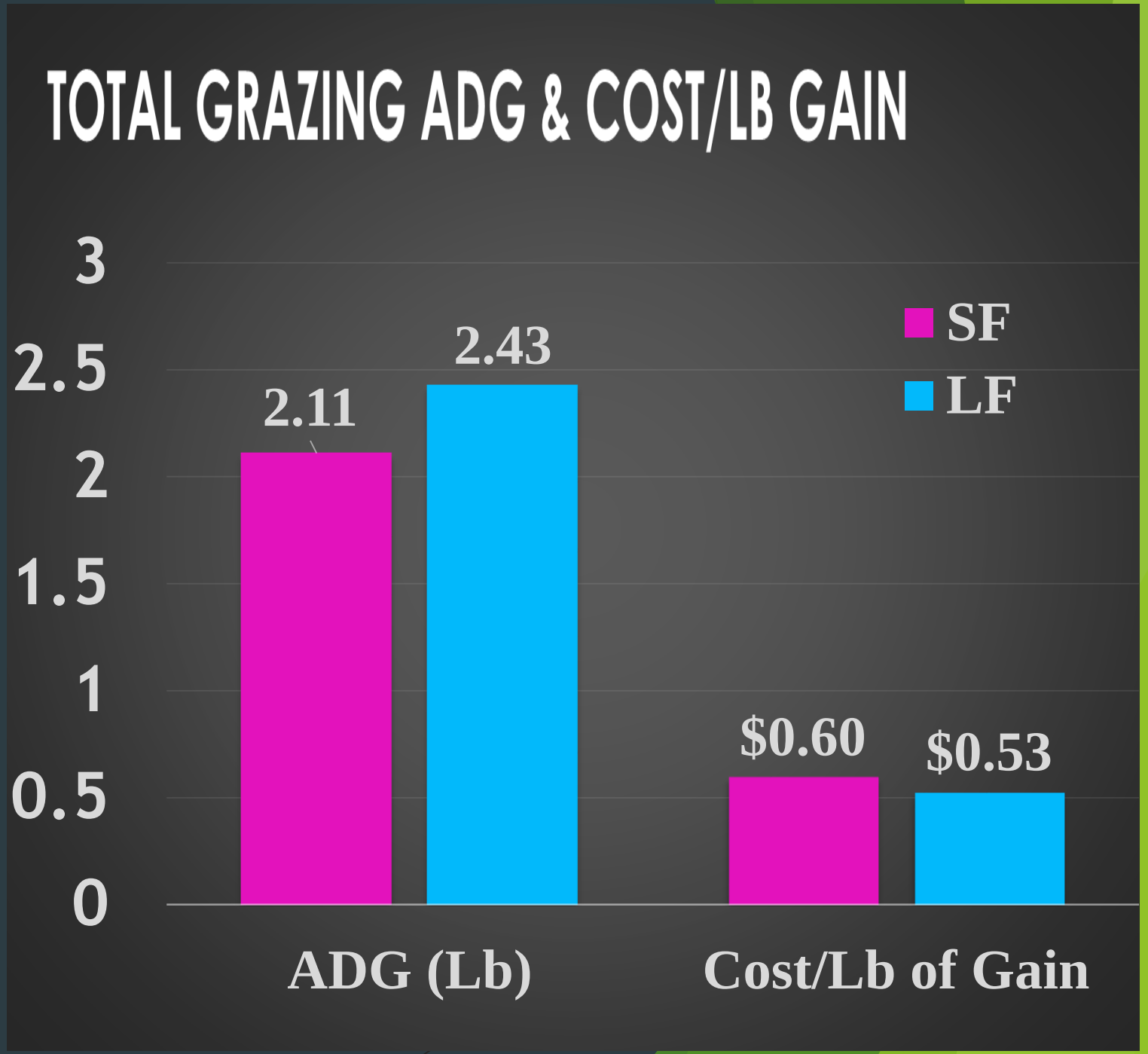

18
14
10
7
20
15
10
5
0
15 Aug
1 Sep
15 Sep
1 Oct
Corn CP (%)

Grazing and Annual Forage Effect on Muscling and Intramuscular Fat Deposition

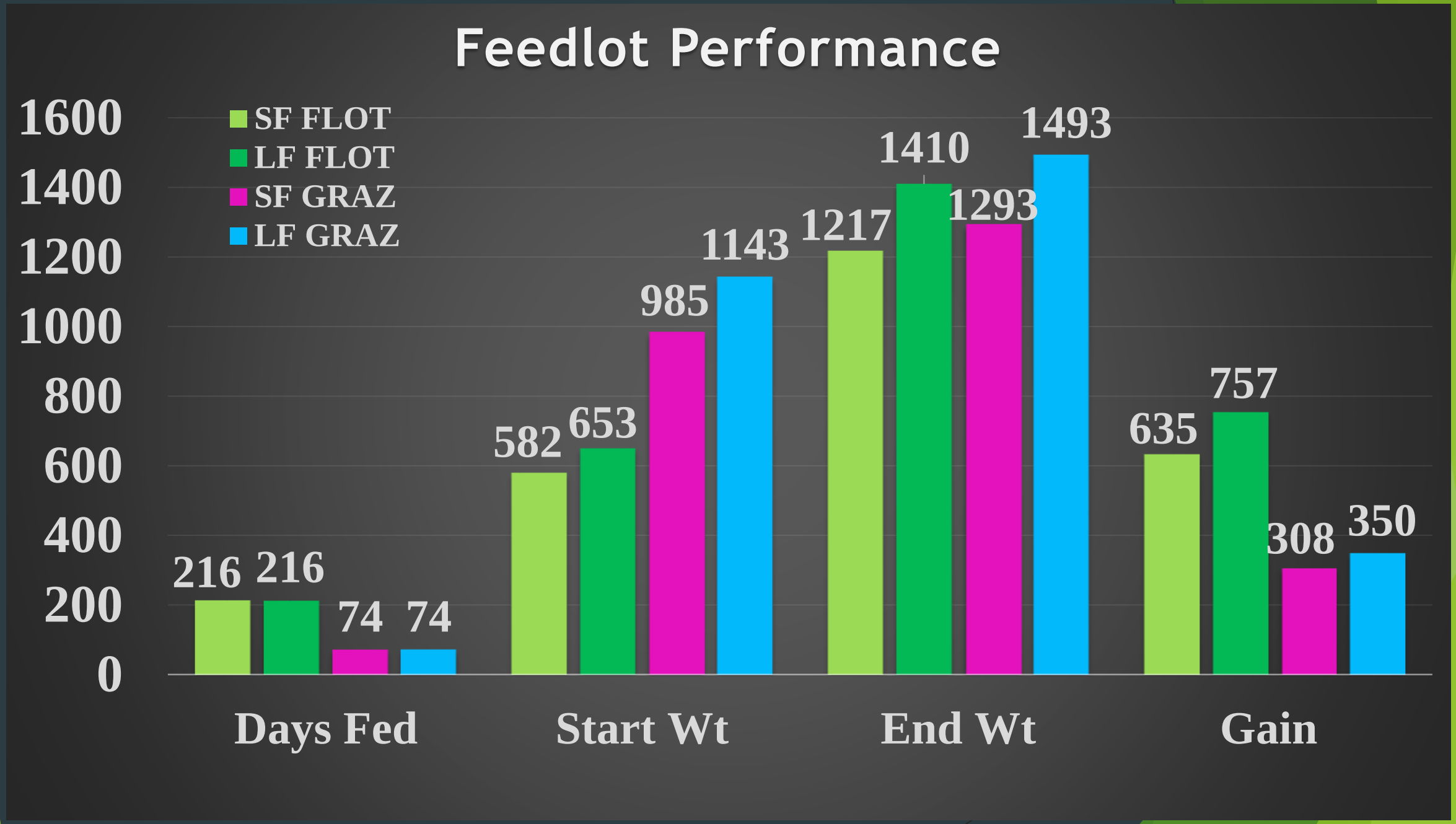
	PST	Ann
Rib-eye Area, (Sq. In.)	8.66	10.86
Percent Intramuscular Fat, %	3.22	4.13
Feedlot DOF, days	91	66


Combined Pasture & Annual Forage Grazing Performance
1400
1200
1000
800
600
400
200
0
220
220
579
665
1044
1201
465
536
SF
LF
Days Grazed
Start Wt.
Grazing End Wt.
Gain

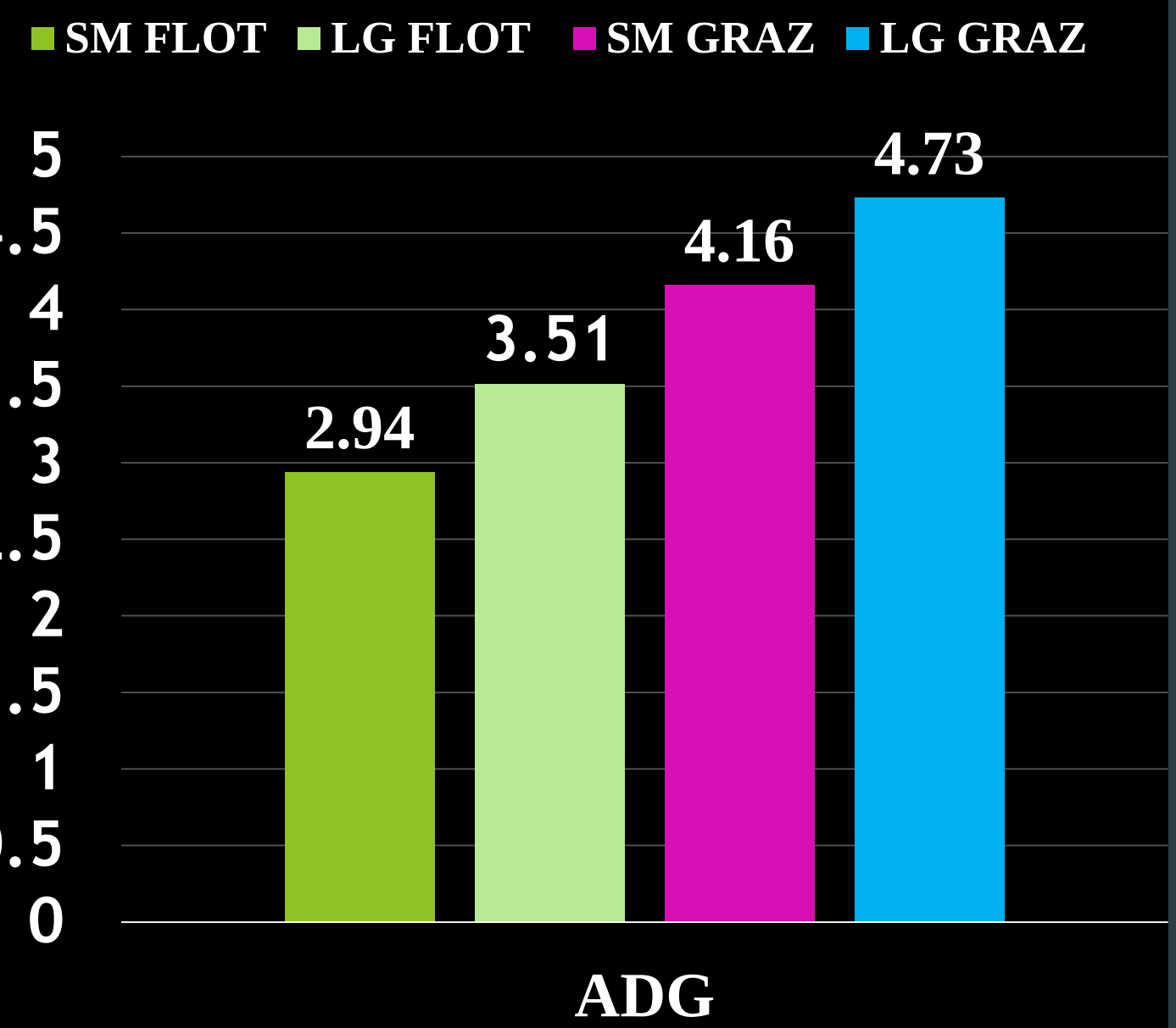

Grazing Costs/Steer, $
SF
LF
300
250
200
150
100
50
0
79
91
83
79
104
105
11
11
278
285
Native Pasture
Field Pea-Barley
Unharvested Corn
Protein Suppl.
Total Grazing Cost/Steer


TOTAL GRAZING ADG & COST/LB GAIN
3
2.5
2
1.5
1
0.5
0
2.11
2.43
$0.60
$0.53
SF
LF
ADG (Lb)
Cost/Lb of Gain

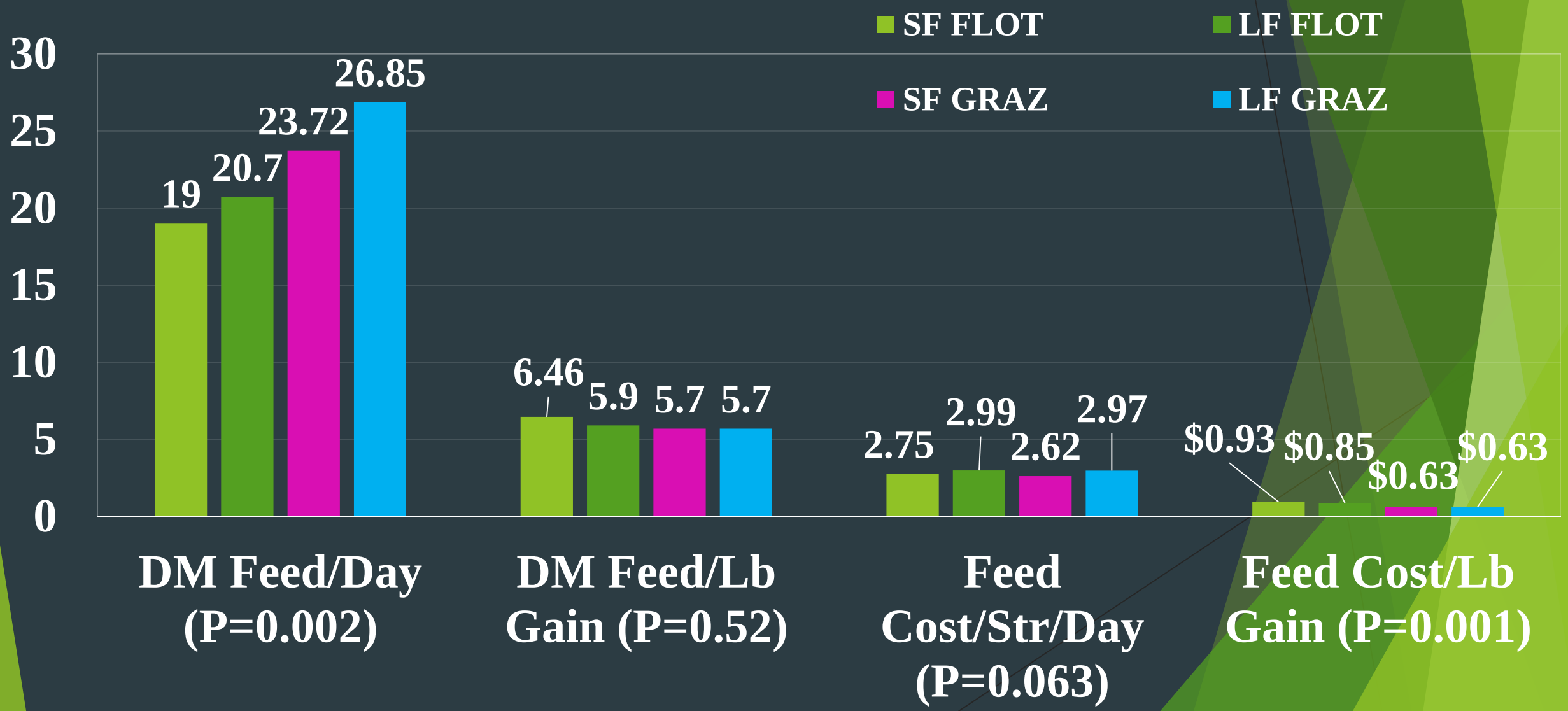
Feedlot Performance

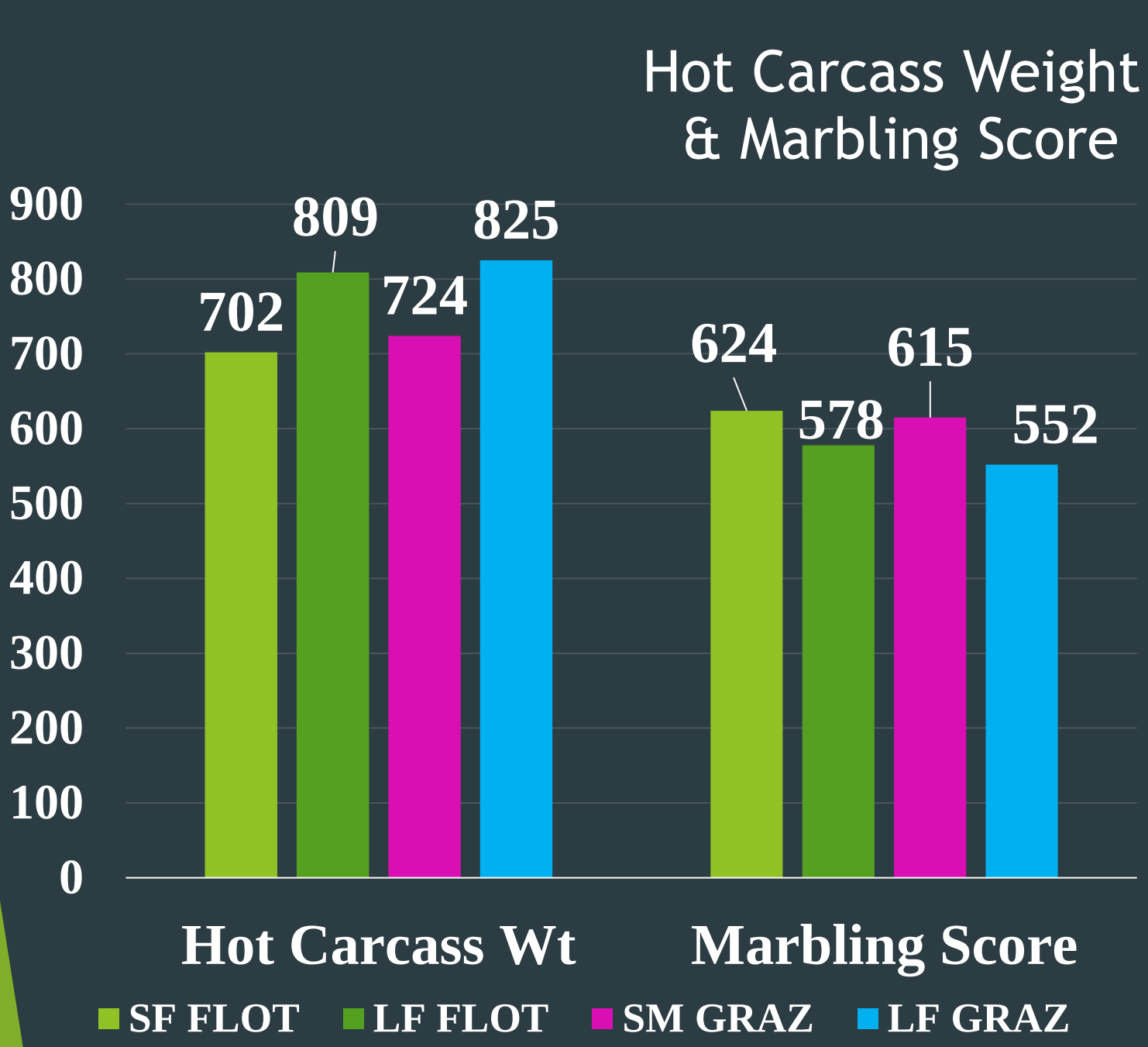


Feedlot ADG

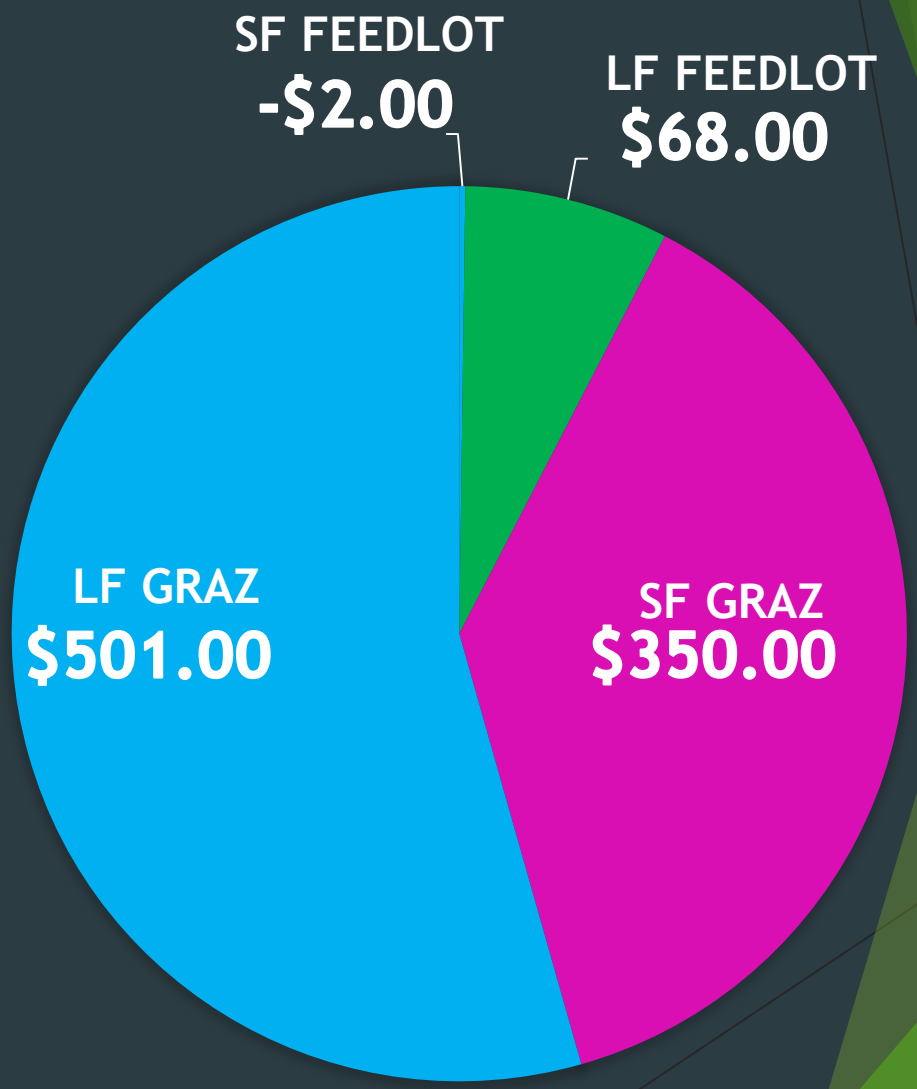

SM FLOT
LG FLOT
SM GRAZ
LG GRAZ
5
.5
4
.5
3
.5
2
.5
1
.5
0
2.94
3.51
4.16
4.73
ADG

Feedlot DM Feed Intake and Efficiency



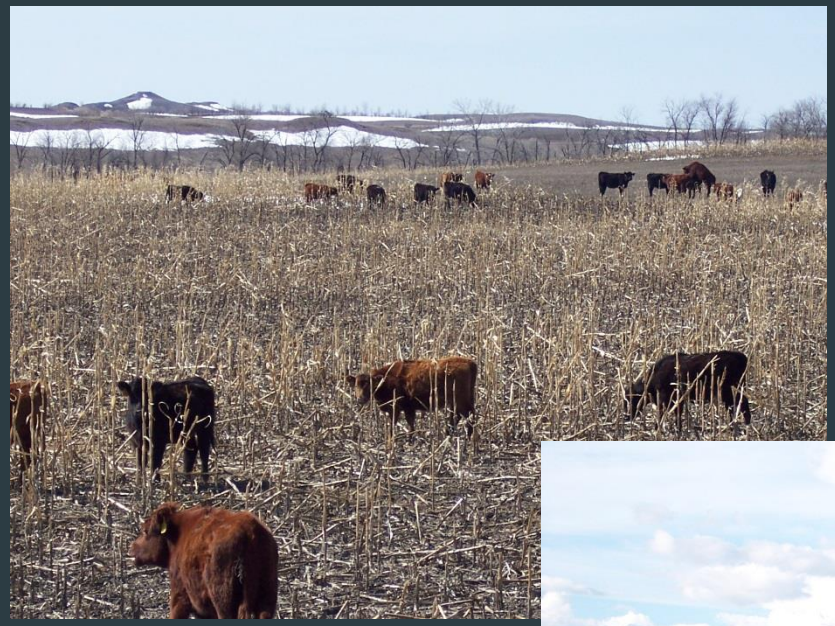

Hot Carcass Weight
& Marbling Score
900
800
700
600
500
400
300
200
100
0
702
809
724
825
624
578
615
552
Hot Carcass Wt
Marbling Score
SF FLOT
LF FLOT
SM GRAZ
LF GRAZ

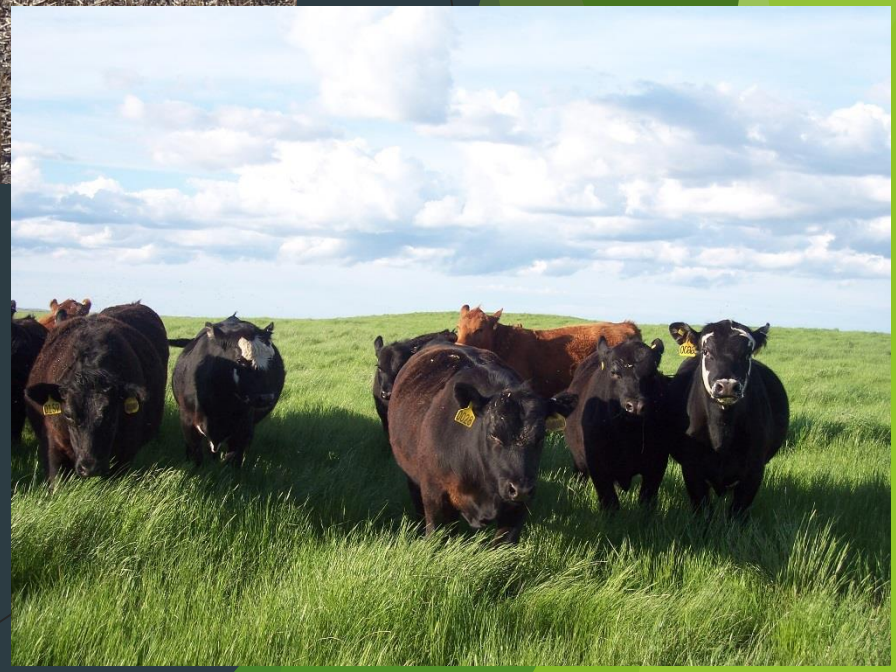
SYSTEM NET RETURN

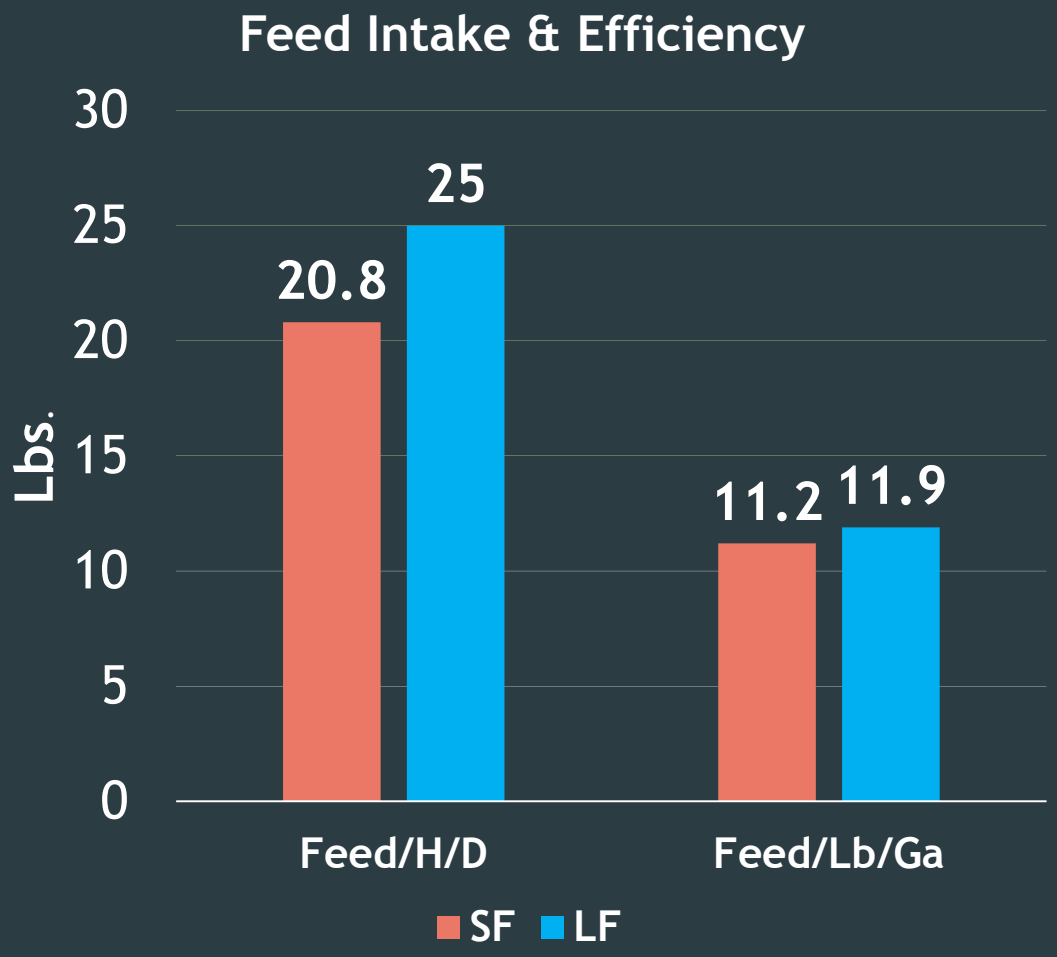


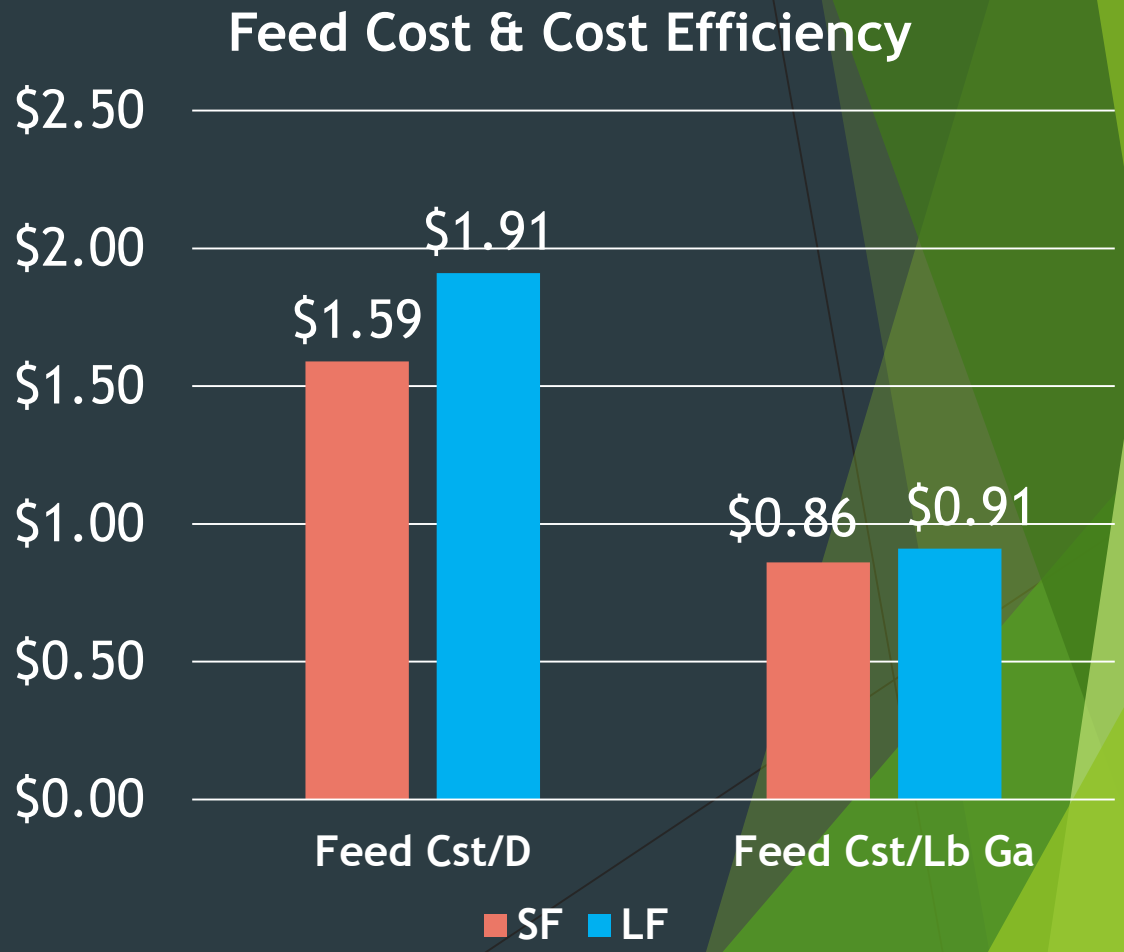
Forage Developed Replacement Heifers
(Effect of Frame Score on Growth, Fertility and Economics)

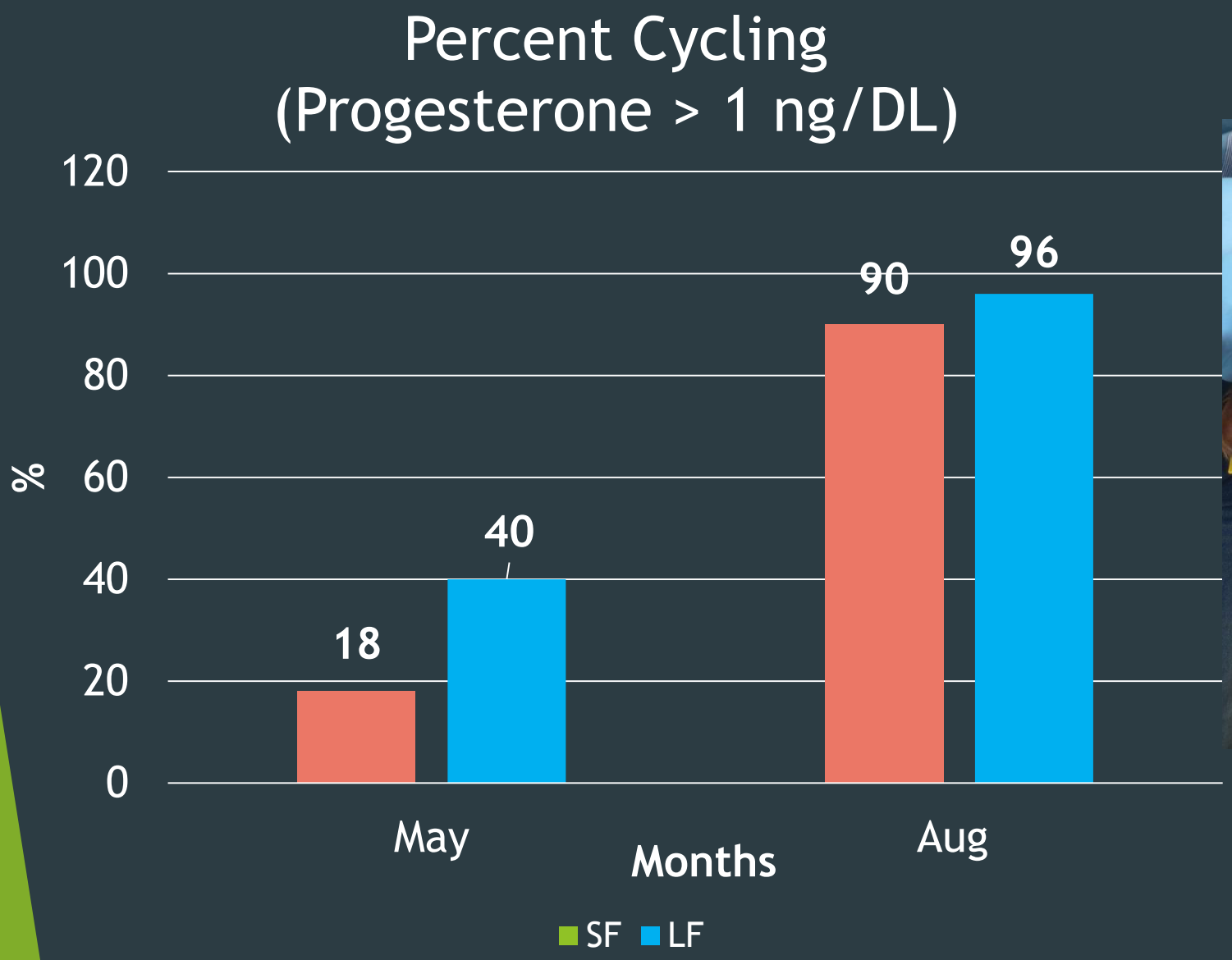
- Frame Score Groups:
  - Small 3.5; Large 5.6
- 3 increasing gain growth phases:
  - Phase 1 (209 days: Oct 13 – May 10)
  - Wintered at modest gain – 0.60 Lb/Day
  - Unharvested corn and hay
  - Phase 2 (58 days: May 10 – July 6)
  - Grazed crested wheatgrass
  - ADG: SF – 1.03; LF – 1.33 Lb/day
  - Phase 3 (85 days: July 6 – Sept 29)
  - Feedlot: TMR - 80% alfalfa and 20% (21% CP Supplement)
  - ADG: SF – 1.87; LF – 2.14

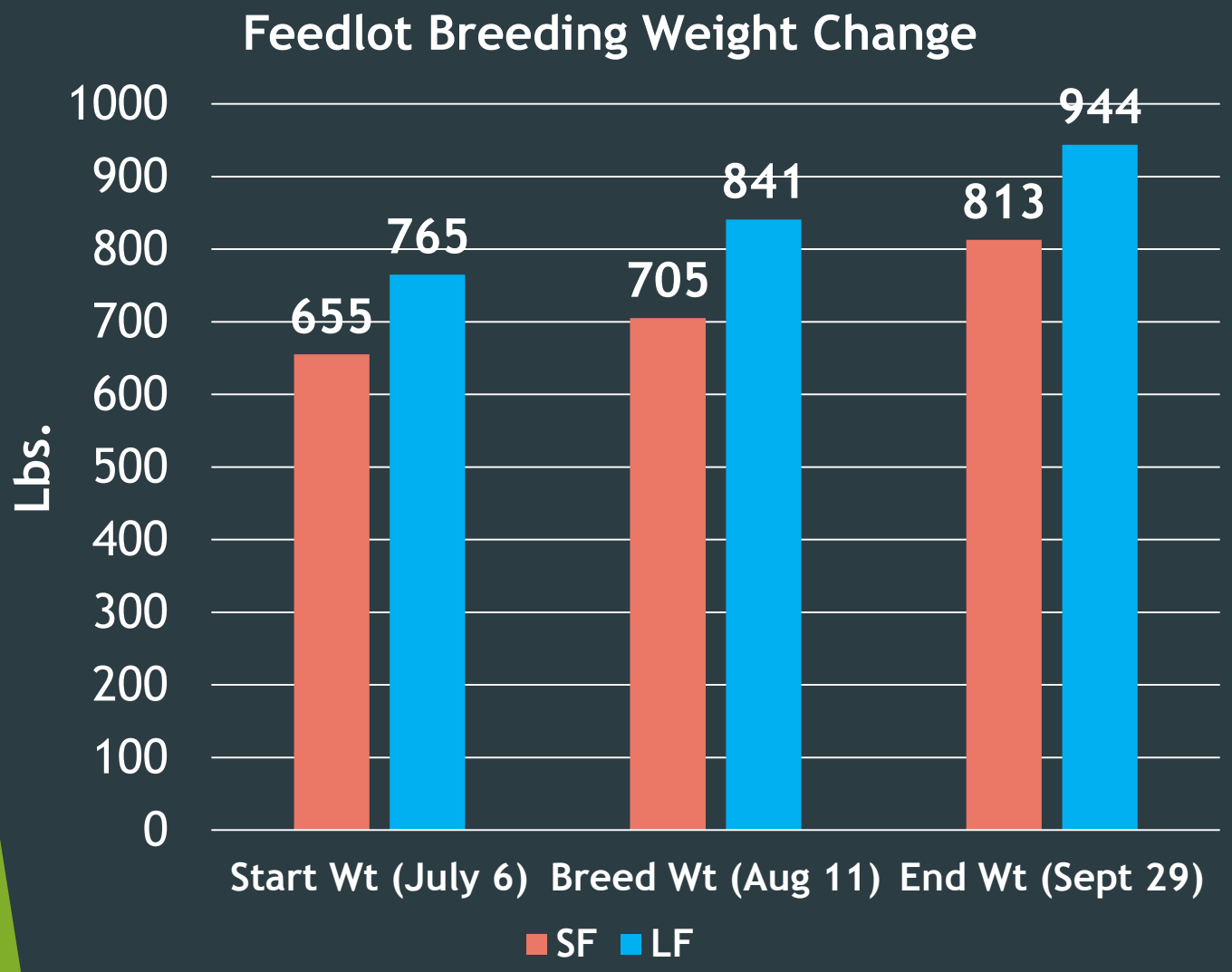


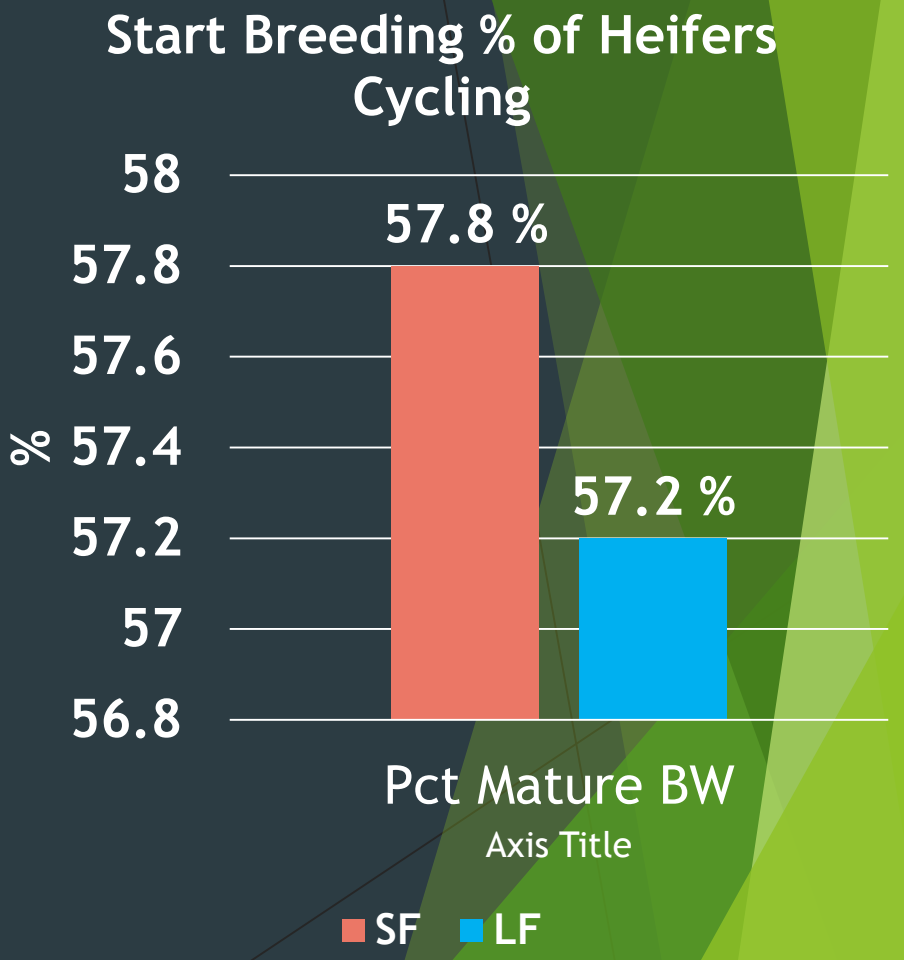


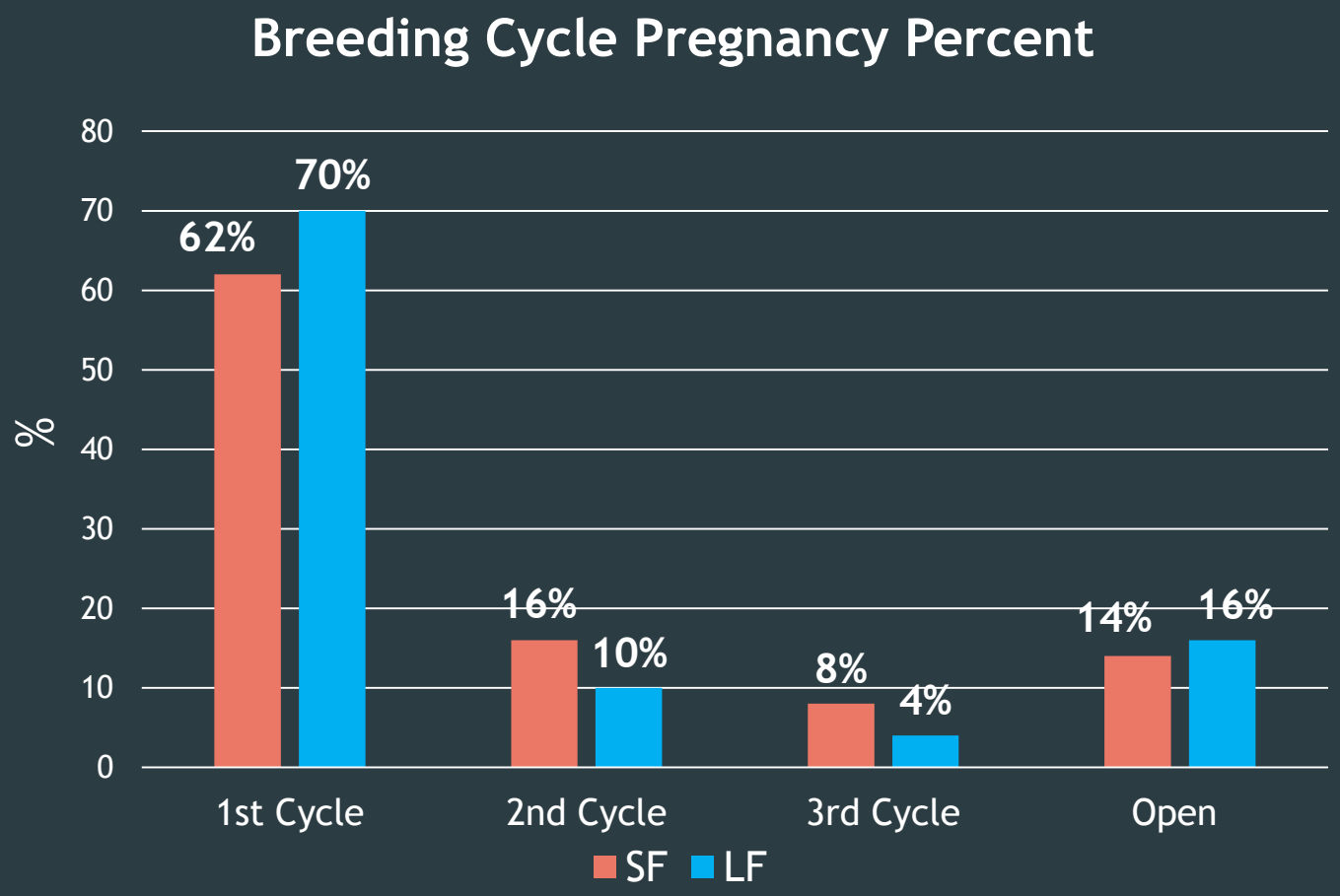

Feed Intake & Efficiency
30
25
20
15
10
5
0
Lbs.
20.8
25
11.2
11.9
Feed/H/D
Feed/Lb/Ga
SF
LF

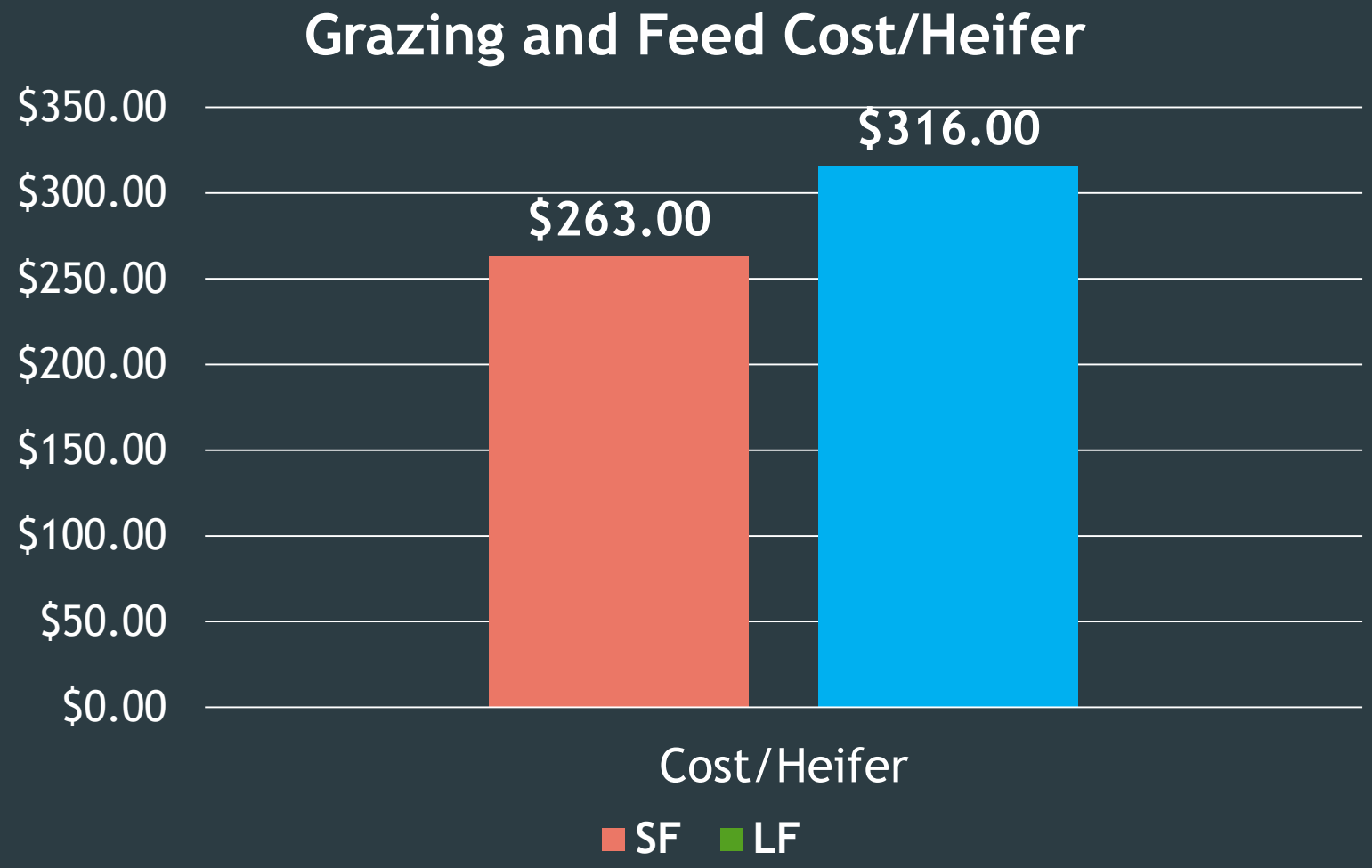

Feed Cost & Cost Efficiency
$2.50
$2.00
$1.50
$1.00
$0.50
$0.00
$1.59
$1.91
$0.86
$0.91
Feed Cst/D
Feed Cst/Lb Ga
SF
LF


Percent Cycling
(Progesterone > 1 ng/DL)
120
100
80
60
40
20
0
%
18
40
90
96
May
Aug
Months
SF
LF


Feedlot Breeding Weight Change
Lbs.
1000
900
800
700
600
500
400
300
200
100
0
655
765
705
841
813
944
Start Wt (July 6)
Breed Wt (Aug 11)
End Wt (Sept 29)
SF
LF

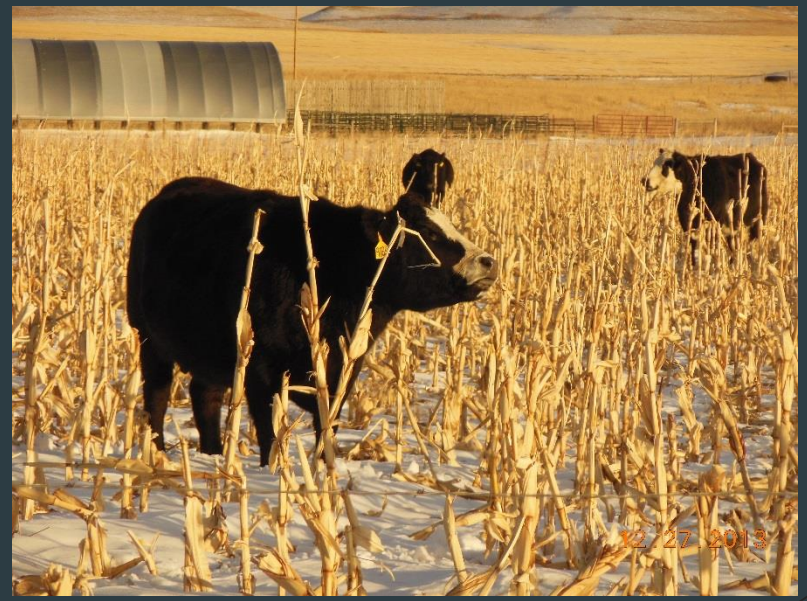

Start Breeding % of Heifers Cycling
%
58
57.8
57.6
57.4
57.2
57
56.8
57.8 %
57.2 %
Pct Mature BW
Axis Title
SF
LF

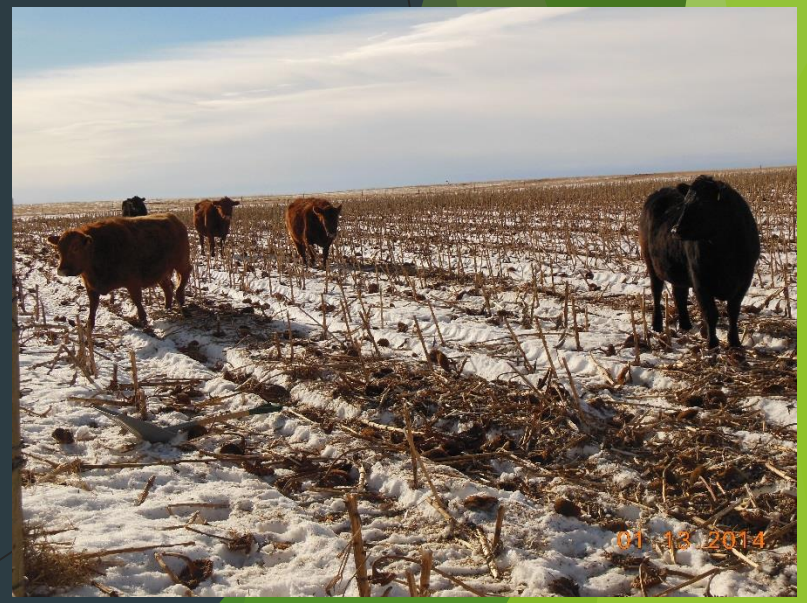

Breeding Cycle Pregnancy Percent
80
70
60
50
40
30
20
10
0
%
62%
70%
16%
10%
8%
4%
14%
16%
1st Cycle
2nd Cycle
3rd Cycle
Open
SF
LF


Grazing and Feed Cost/Heifer
$350.00
$300.00
$250.00
$200.00
$150.00
$100.00
$50.00
$0.00
$263.00
$316.00
Cost/Heifer
SF
LF

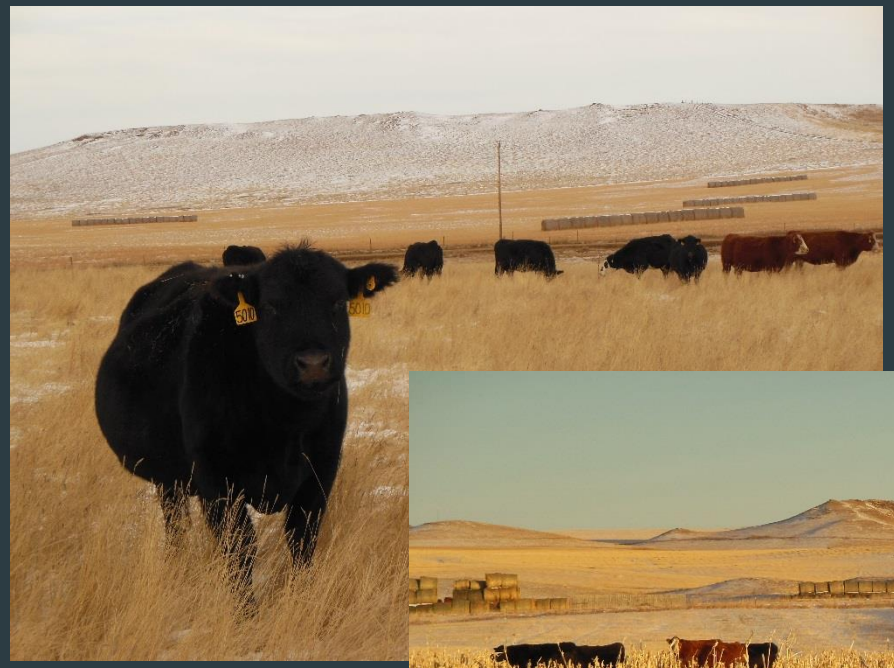
Cows: Extending the Grazing Season

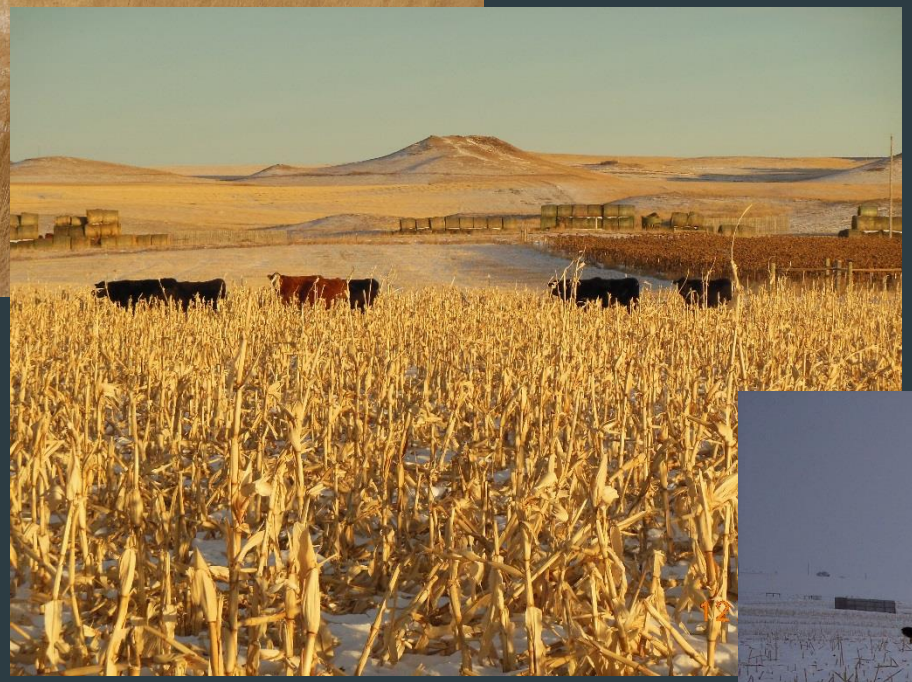
- Grazing cover crops and crop residue





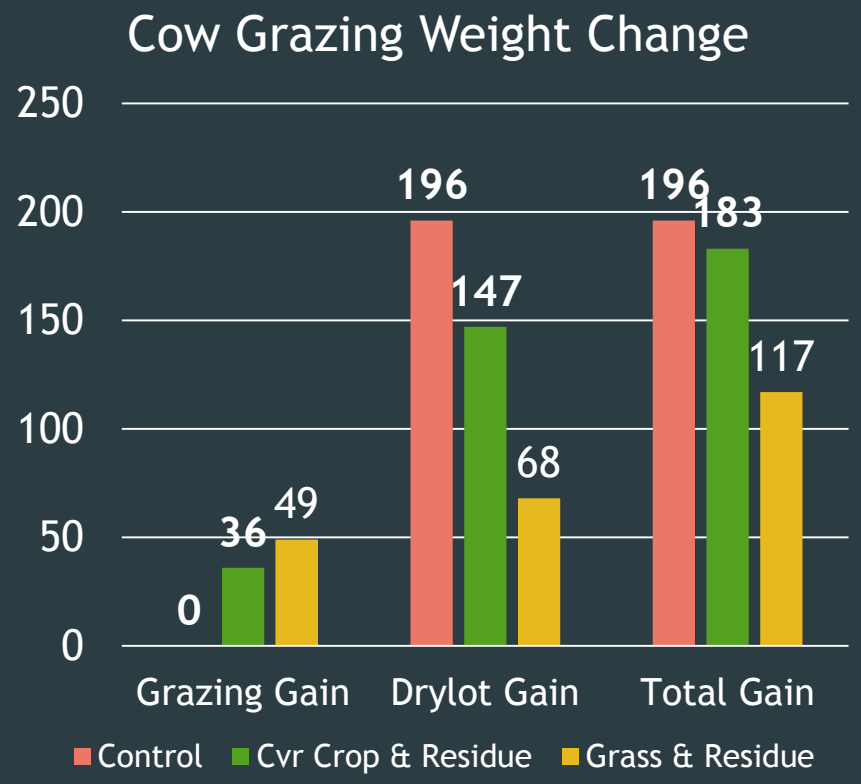
Cows: Extending the Grazing Season

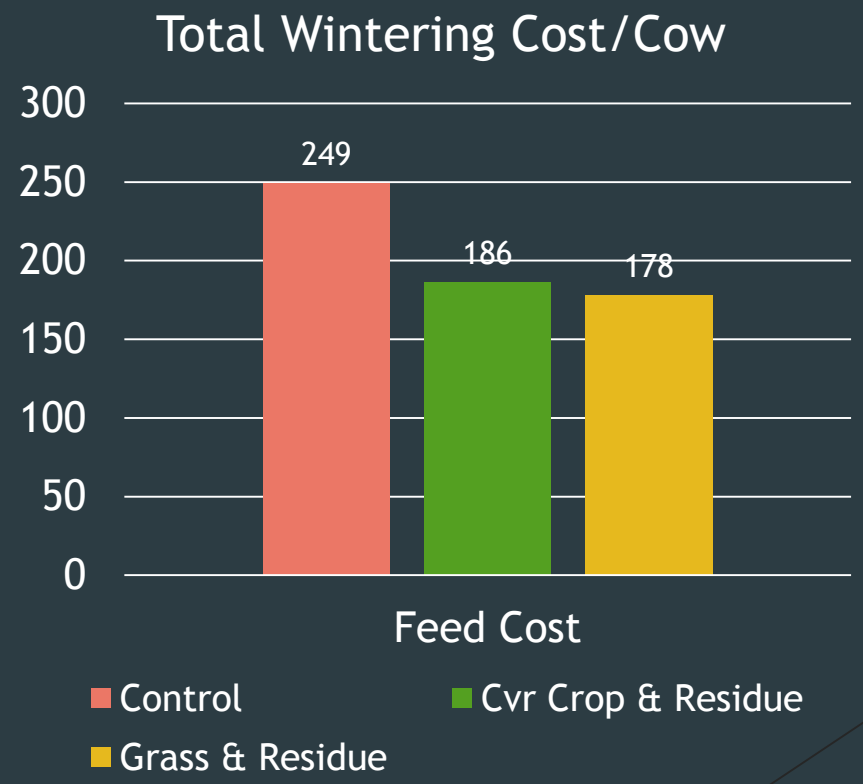


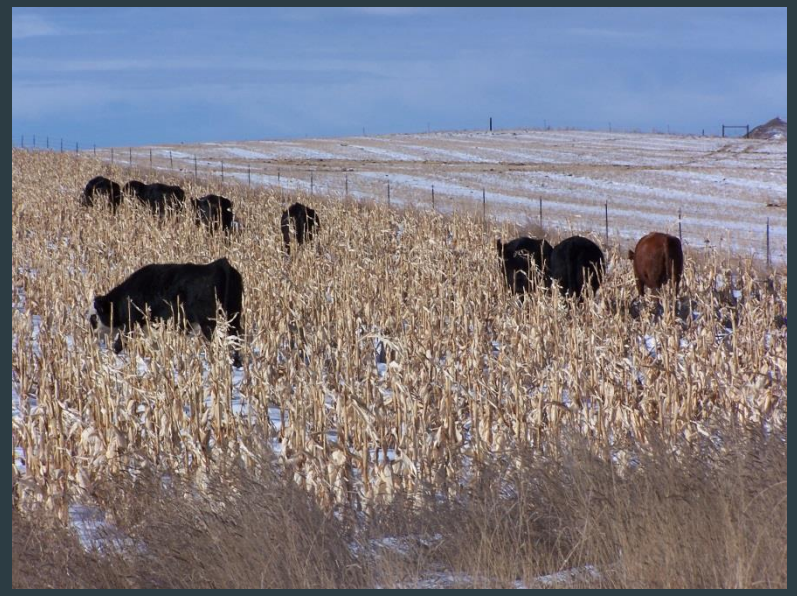


- Grazing stockpiled mixed pastures of bromegrass and crested wheatgrass followed by corn stalk residue

Cows: Extending the Grazing Season







Cull Cow Fatten to Slaughter

- ADG Range: 2.2 – 3.0 lb/day
- Corn Requirement: 0.20 - 0.30 Ac/Cow/Month
- Ending BCS 7 – 8


2154
Thank You
09.11.2013