

Stocker Cattle Supplementation What, When, and How Much?



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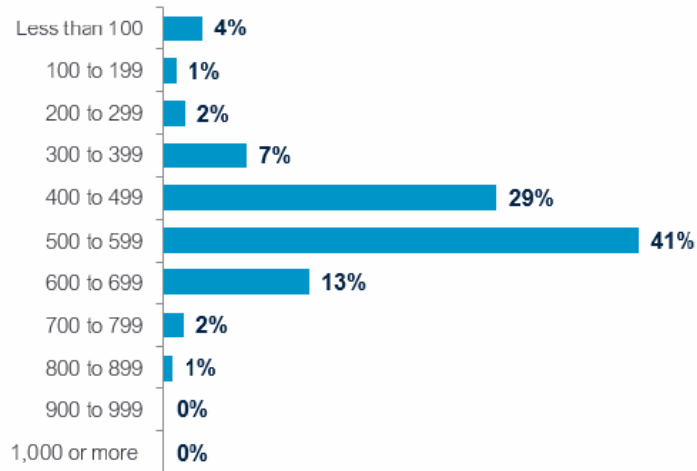
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Before we start

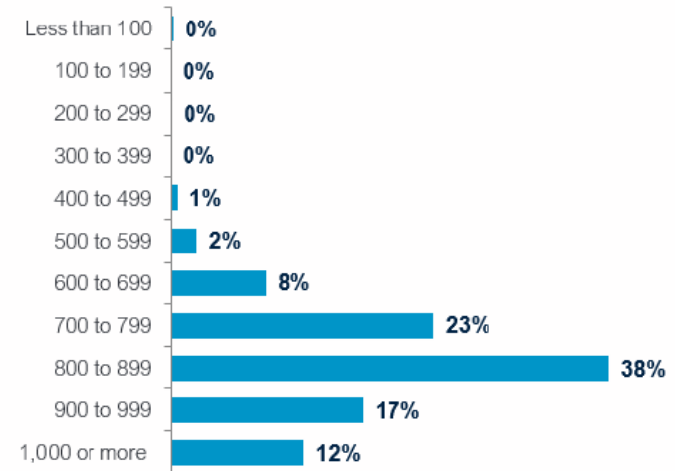
- What is the system?
- What are the resources/logistics/limitations?
- What are the goals?
- What are you marketing and when?

Average Arrival and Departure Weights

Average Pay Weight Upon Arrival



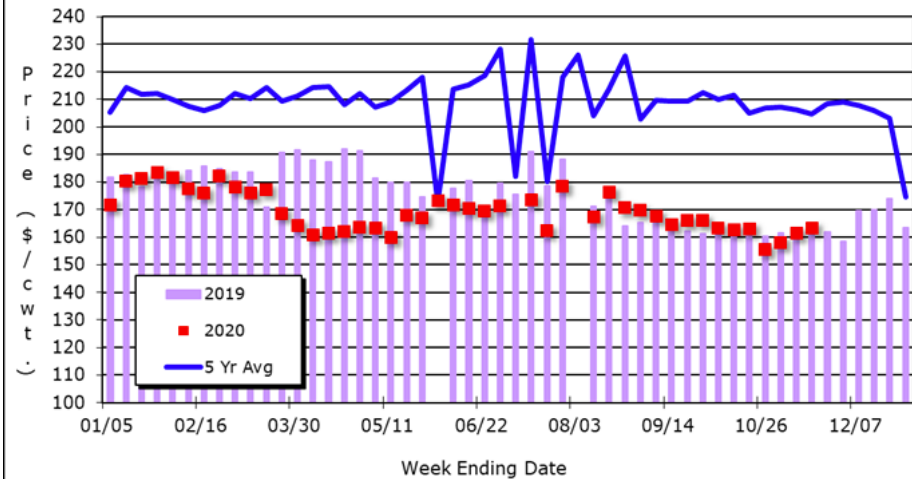
Average Pay Weight Upon Departure



2021 Zoetis National Stocker Survey

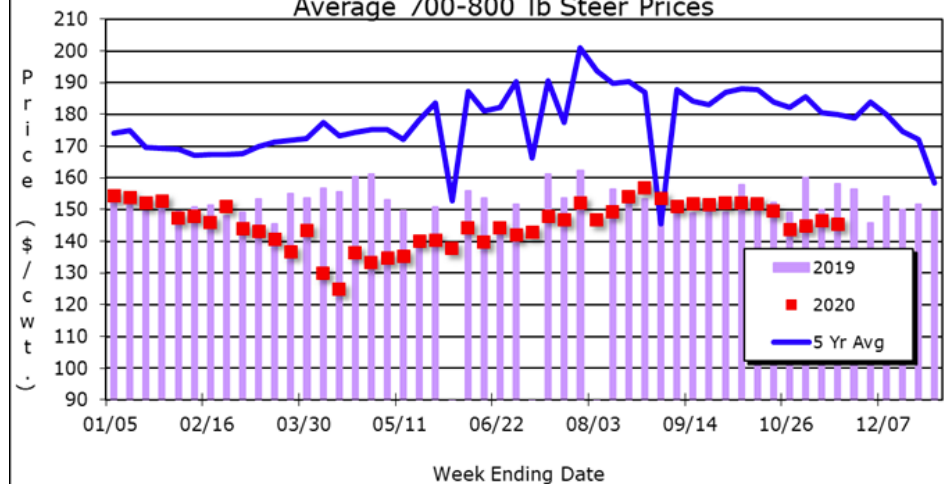
What is your value proposition with supplement?

Nebraska Combined Auction Weighted
Average 500-600 lb. Steer Prices



Source: USDA & K-State Ag. Economics KSU Dept. of Ag Econ
www.agmanager.info

Nebraska Combined Auction Weighted
Average 700-800 lb Steer Prices



Source: USDA & K-State Ag. Economics KSU Dept. of Ag Econ
www.agmanager.info

Value of backgrounding

2019-2020

- Buy October
 - 550 lb * \$160/cwt
 - \$880.00/calf

- Sell March
 - 750 lb * \$145/cwt
 - \$1087.50/calf

- $\$1087.50 - \$880.00 =$
 $\$207.50 / 200 \text{ lbs} =$

- \$1.038 COG

5-year average

- Sell October
 - 550 lb * \$208/cwt
 - \$1144/calf

- Sell March
 - 750 lb * \$170/cwt
 - \$1275/calf

- $\$1275 - \$1144 =$
 $\$131 / 200 \text{ lbs} =$

- \$0.655 COG

Feed ingredient prices expressed as a function of their energy content.

Item	\$/unit	\$/ton (DM)	TDN, %	\$/lb TDN
Sandhills range, stocker	\$60.55/month ¹	\$132.70	63	0.1053
Grass hay	\$100/ton	\$111.11	55	0.1010
Grazed corn residue	\$15/acre ²	\$22.22 ³	55	0.0227
Baled corn residue	\$60/ton	\$66.66	43	0.0775
Corn silage	\$59.01/ton ⁴	\$168.61	70	0.1204
Cracked corn	\$5.25/bushel	\$218.02	83	0.1313
Dried distillers grains	\$226.75/ton	\$251.94	108	0.1166
USDA Daily Ethanol Report 2/1/21	(Breakeven with corn = \$255.24)	(116% price of corn)		

¹Cornhusker Economics for North Region, published March, 2020. Assumes 1.3 AUM/pair and 90% DM.

²Crop residue exchange.

³Assumes 200 bushel/acre corn harvest and 8 lb/bushel forage availability

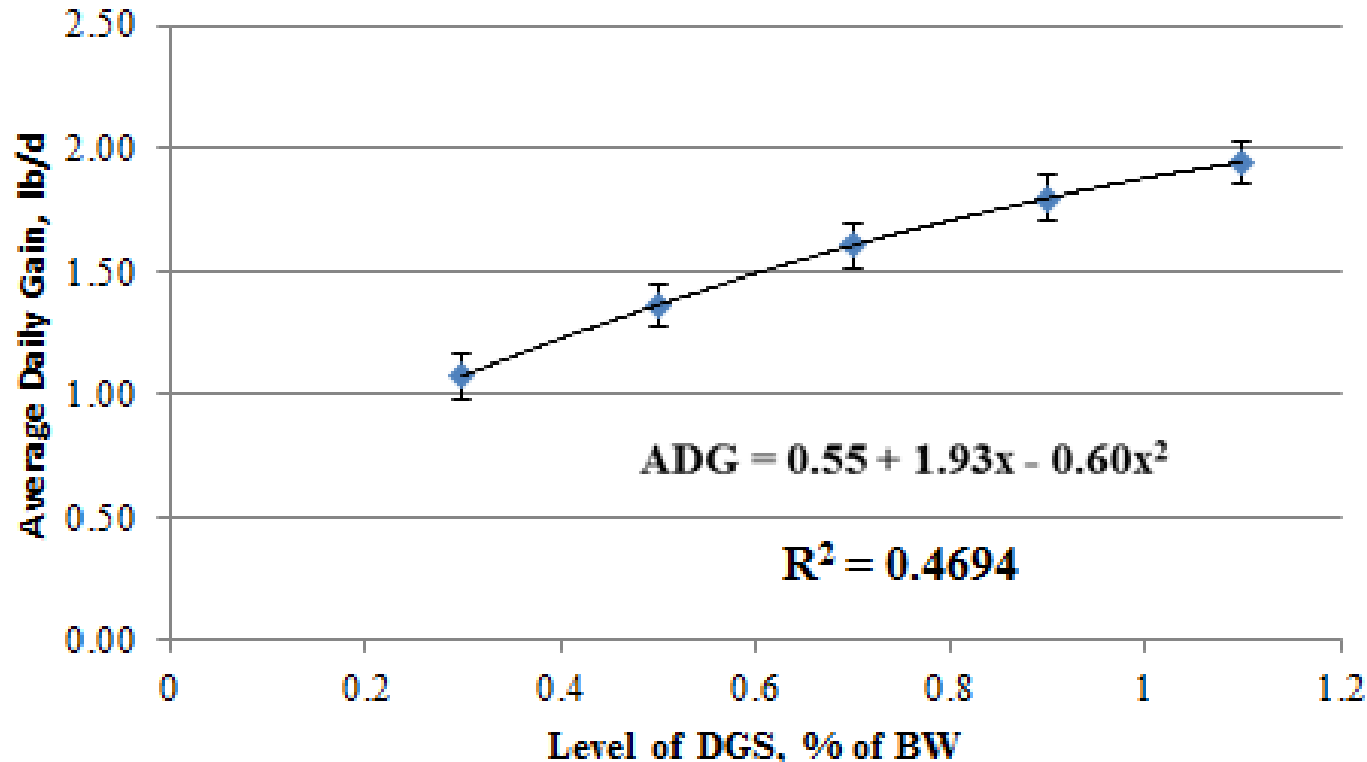
⁴Assumes \$5.25 corn price with a 7.65 multiplier \$10 hauling/packing, and 15% shrink.

Table 1. Energy value of wet distillers grains (WDGS) compared to corn.¹

	Corn	WDGS
% of diet	35.9	23.3
DMI, lb/day	16.5	16.4
ADG, lb/day	2.37	2.48
Feed/gain	6.99	6.67

¹Average of three trials (1 to 2 levels/trial).

DDG supplementation on grazed corn residue – 3 trial pooled summary



Welchons and MacDonald, 2016

0.75% BW of a 650 lb calf is 5 lbs
200 pounds / 120 days = 1.67

Very repeatable for “normal” winter conditions
Beware ice, mud, wet & cold conditions

Cost of gain for backgrounding

2019-2020

- Distillers \$75.58
 - 5 lb/d for 120 d
- Stalk rental \$16.88
 - 1.125 acre = 15 lb DMI
- Yardage \$42
 - \$0.35/day
- Death loss \$17.6
 - 2% of Oct price
- Interest \$12.2
 - 4.2% APR for 120 days
on Oct sale price

Cost of Gain = \$0.8213

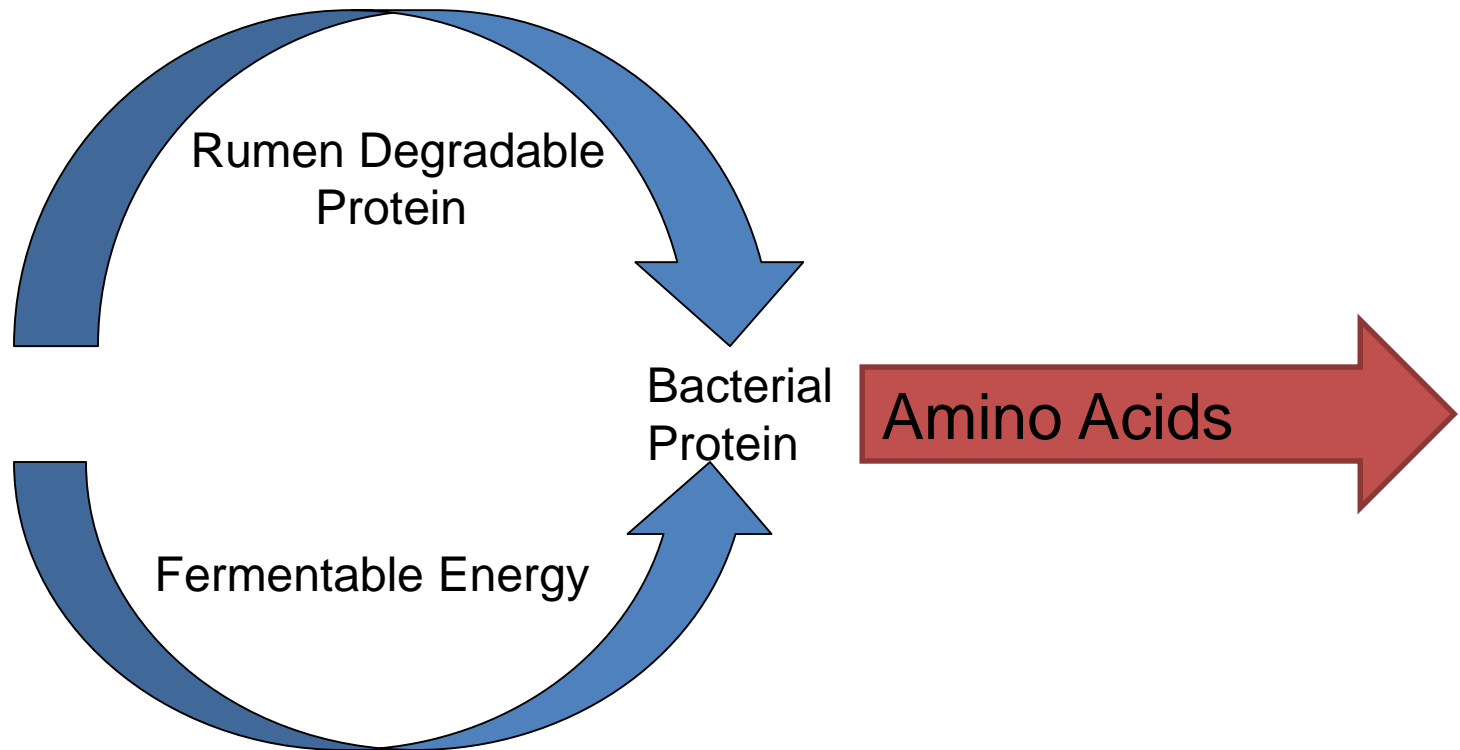
Value of Gain = \$1.038

Diff = \$0.2167

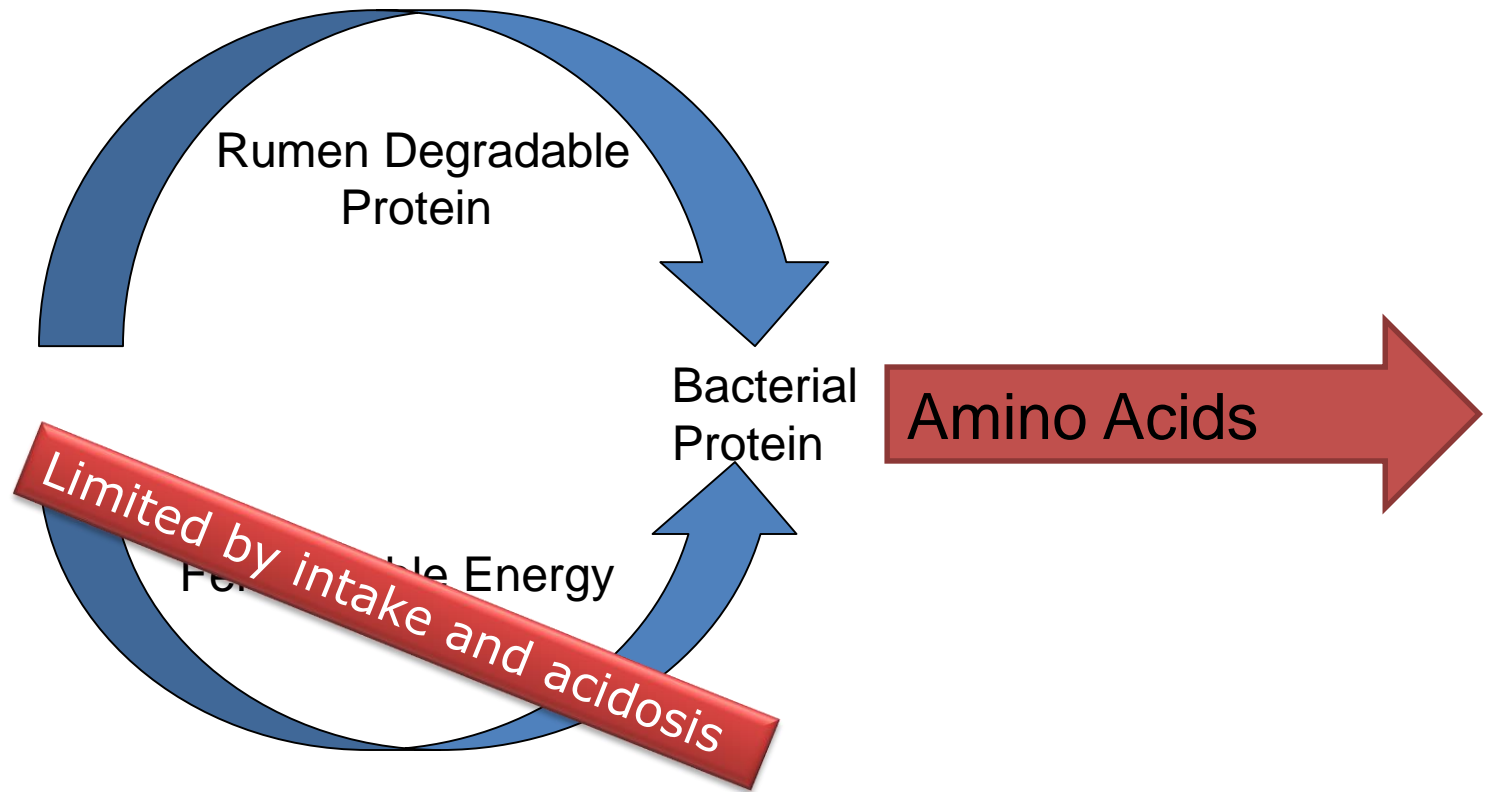
Net of 200 lb gain = \$43.34

$$\text{COG} = \$164.26/200 = \$0.8213$$

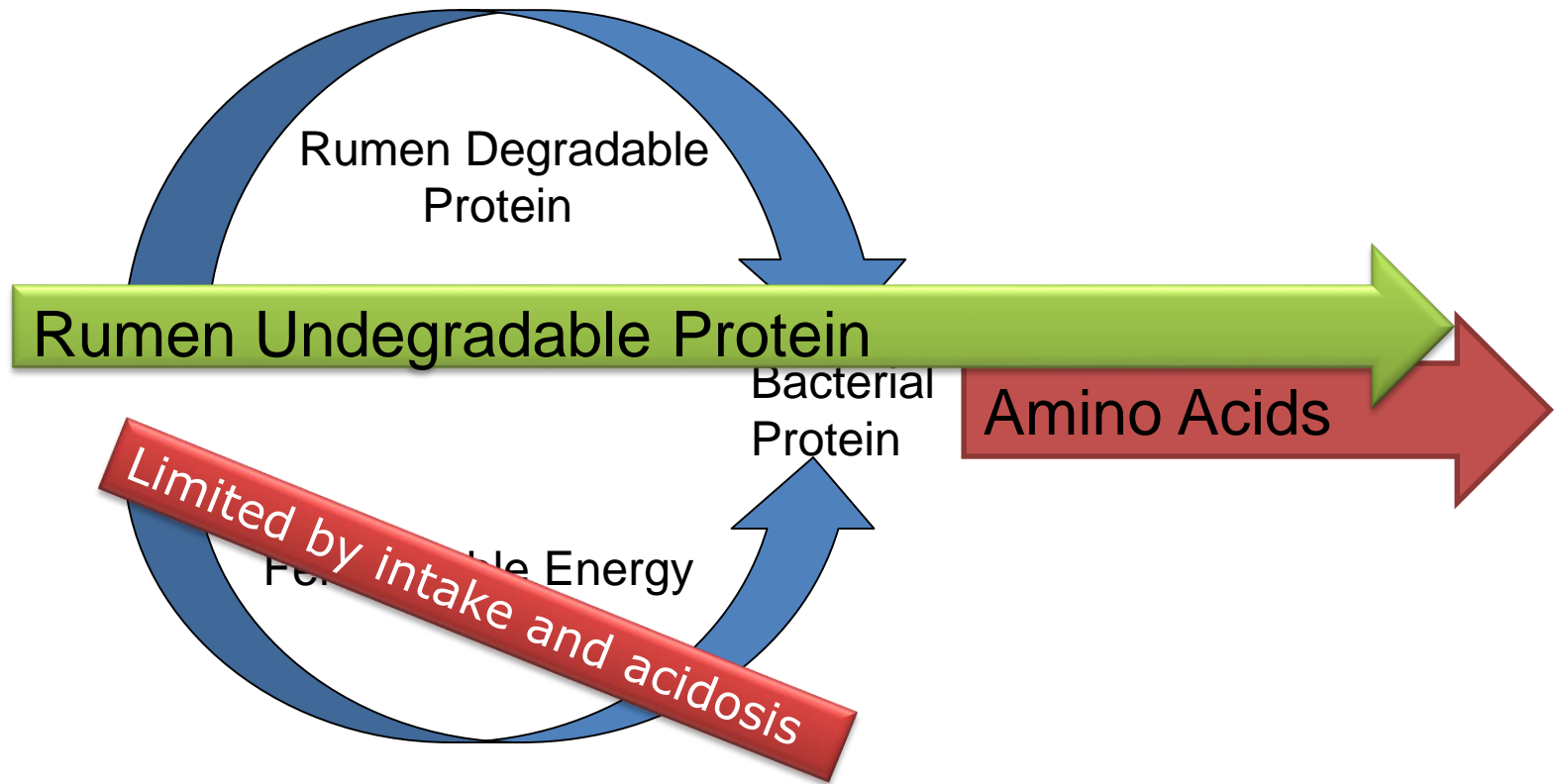
Metabolizable Protein in Ruminants



Metabolizable Protein in Ruminants



Metabolizable Protein in Ruminants



Residue grazing supplementation

	No Suppl.	Corn	Corn-Urea	DDGS	Soypass SBM
Suppl. DM, lb⁶	-	3.75	4.0	3.0	3.5
TDN, %	-	83%	78%	104%	90%
TDN lbs.	-	3.11	3.12	3.12	3.15

Residue grazing supplementation

	No Suppl.	Corn	Corn - Urea	DDGS	Soypass SBM	SEM
Initial BW	516	516	516	516	516	3.5
Ending BW	504 ^a	539 ^b	559 ^c	629 ^d	640 ^e	4.9
ADG	-0.18 ^a	0.31 ^b	0.53 ^c	1.32 ^d	1.48 ^e	0.06

Table 2. Comparison of dried distillers grains and lick tub supplementation for calves grazing corn residue on a dry matter and organic matter basis.

	Dried DGS	Lick tub	S.E.	F-test
Initial BW, lb	529	529	5.82	0.6
Final BW, lb	608	578	9.2	<0.01
ADG, lb/day	1.36	0.83	0.06	<0.01
DM				
Supplemental Intake, %BW	0.52	0.36	0.03	<0.01
Supplemental Intake, lb/head/day	2.94	2.02	0.21	<0.01
Supplemental Efficiency, %	46	43	0.15	<0.01
OM				
Supplemental Intake, %BW	0.5	0.3	0.01	<0.01
Supplemental Intake, lb/head/day	2.82	1.68	0.08	<0.01
Supplemental Efficiency, %	48	50	0.03	0.64

Table 3. Economics of feeding distillers grains at 120% the value of corn when compared to a commercial lick tub.

Item	\$4.00 Corn				\$5.50 Corn				\$7.00 Corn			
	Dried Dgs	Lick Tub	S.E.	F-Test	Dried Dgs	Lick Tub	S.E.	F-Test	Dried Dgs	Lick Tub	S.E.	F-Test
\$/Steer												
steer cost	792.74	793.68	3.57	0.4	792.74	793.68	3.57	0.4	792.74	793.68	3.57	0.4
supplement cost	28.40	55.89	5.14	<0.01	29.52	55.89	5.33	<0.01	33.54	55.89	5.12	<0.01
yardage cost	20.25	12.66	7.59	<0.01	20.25	12.66	7.59	<0.01	20.25	12.66	7.59	<0.01
grazing cost	7.11	7.22	0.18	0.7	7.11	7.22	0.18	0.7	7.11	7.22	0.18	0.7
total feed cost	25.95	63.10	7.12	<0.01	36.63	63.10	5.43	<0.01	40.66	63.10	5.22	<0.01
total steer cost	852.37	862.89	9.43	0.2	853.49	862.89	6.48	0.3	857.52	862.89	7.14	0.5
revenue	955.91	907.52	34.91	<0.01	955.91	907.52	34.91	<0.01	955.91	907.52	34.91	<0.01
net return	103.54	44.63	26.73	<0.01	102.42	44.63	29.26	<0.01	98.40	44.63	28.96	<0.01
\$/lb												
cost of gain	0.75	1.47	0.14	<0.01	0.77	1.47	0.16	<0.01	0.82	1.47	0.16	<0.01

Effect of summer supplementation on summer performance and profit



Effect of summer supplementation on summer performance and profit

Item	Control	Supplement	SEM	P-value
Initial BW, lb	698	698	4	0.92
ADG, lb	1.37	2.03	0.07	<0.01
Ending BW, lb	914	1020	11	<0.01
Cost of Gain, \$/cwt	88.52	84.19	3.27	0.01
Profit, \$/hd	66.90	98.38	12.29	<0.01
Stocking rate (AUM/ac)	0.48	0.57 (19%)	-	-

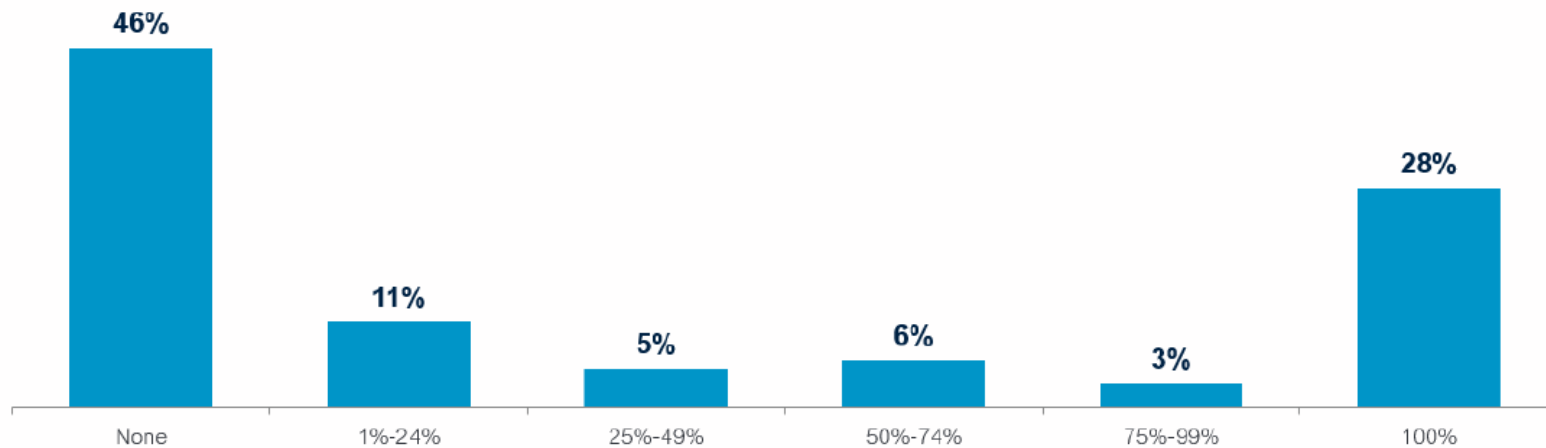
Steers supplemented at 0.6% BW modified distillers grains

Effect of summer supplementation on feedlot performance and profit

Item	Control	Supplement	SEM	P-value
Entry BW, lb	914	1020	11	<0.01
Days on Feed	126	102	1	<0.01
DMI, lb	30.4	30.4	0.4	0.16
ADG, lb	4.01	3.96	0.26	0.07
HCW, lb	894	896	13	0.92
F:G, lb/lb	7.58	7.69	-	0.22
Cost of Gain, \$/cwt	107.87	114.66	7.04	<0.01
Grid Profit, \$/hd	9.22	11.20	29.77	0.44

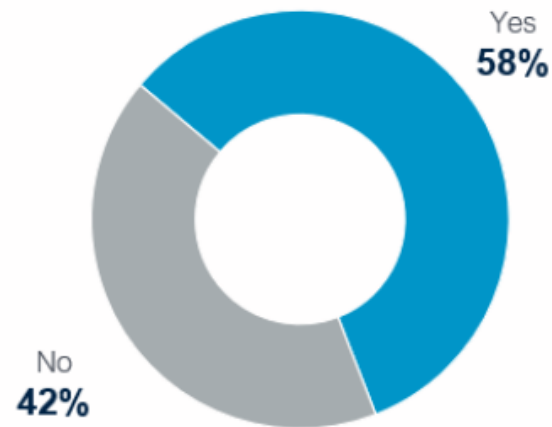
Steers supplemented at 0.6% BW modified distillers grains during summer grazing

Percent of Stockers Retained Through Harvest



2021 Zoetis National Stocker Survey

Feed an Ionophore After Receiving Ration



2021 Zoetis National Stocker Survey

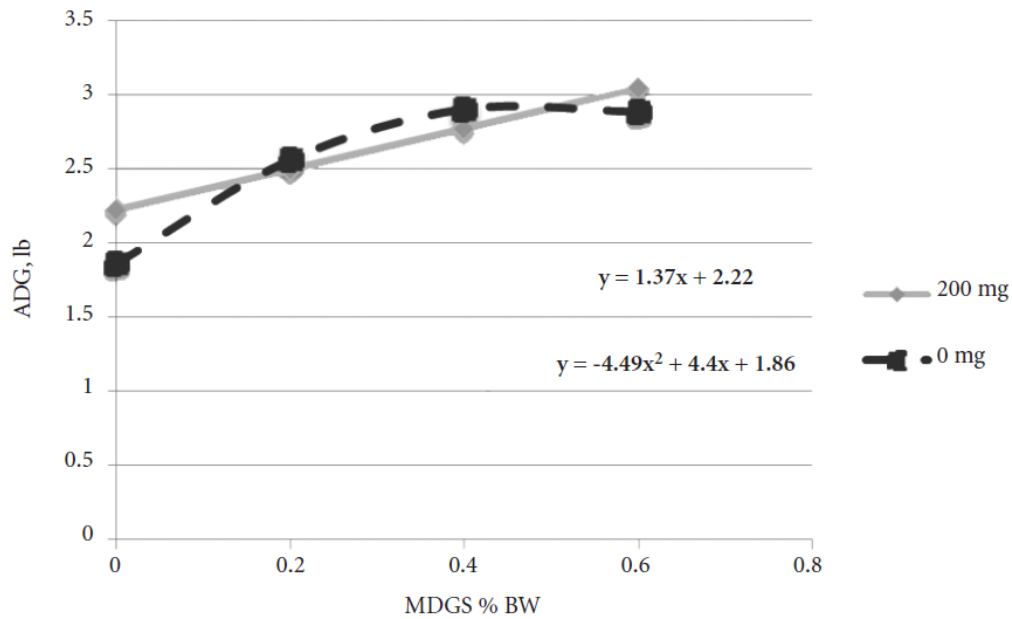


Figure 1. Interaction of monensin and MDGS supplementation on ADG of grazing steers.

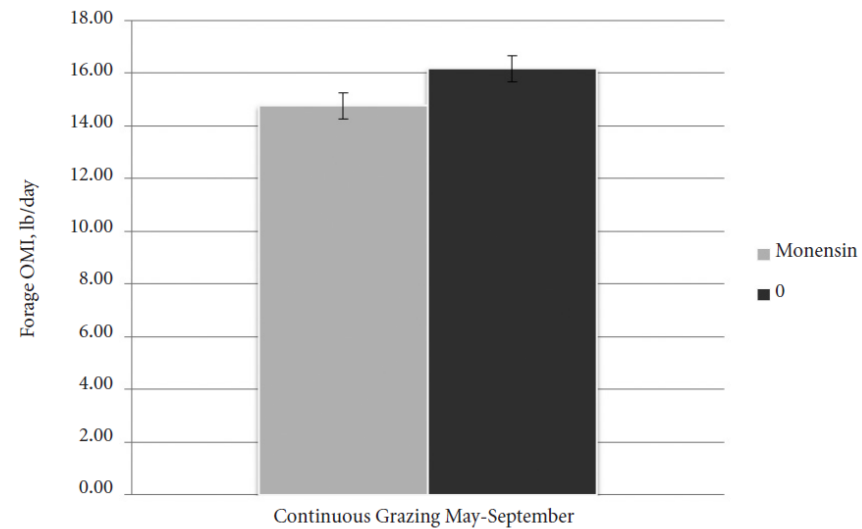


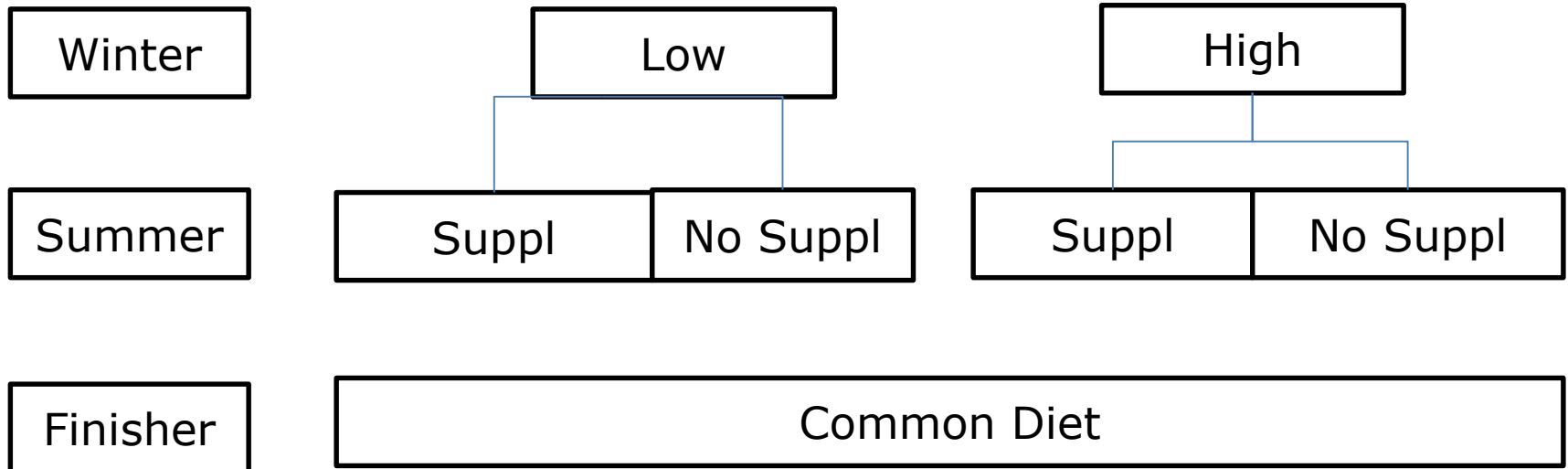
Figure 2. The effect of monensin (200 mg/day) on forage organic matter intake.

Compensatory Gain Example

Item	Restricted	Unrestricted
Weaning BW, lb	550	550
Backgrounded BW, lb	700	800
Final BW, lb	1250	1300
BW difference at end of restriction	-	100
BW difference at end of compensation	-	50
<hr/>		
% compensation	50	-

$$\begin{array}{c}
 \text{\% Compensation} \\
 = \\
 \frac{\boxed{\text{BW difference at end of restriction}} - \boxed{\text{BW difference at end of compensation}}}{\boxed{\text{BW difference at end of restriction}}}
 \end{array}$$

Treatments



2 x 2 factorial

Winter and Summer Performance

	LOW		HIGH	
Item	SUP ⁴	NO SUP	SUP	NO SUP
Winter				
Initial BW, lb	475		472	
Ending BW, lb	622 ^b		712 ^a	
ADG, lb	0.83 ^b		1.37 ^a	
Summer				
ADG, lb	1.72 ^a	1.23 ^c	1.45 ^b	1.01 ^d
Ending BW, lb	830 ^b	783 ^c	886 ^a	840 ^b
Growing System				
ADG, lb	1.22 ^b	1.02 ^c	1.41 ^a	1.25 ^b

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Growing System				
ADG, lb	37% compensation with summer supplement			1.25 ^b

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ADG, lb	1.72 ^a	1.23 ^c	1.45 ^b	1.01 ^d
Ending BW, lb	830 ^b	783 ^c	886 ^a	840 ^b
Growing System				
ADG, lb	37% compensation without summer supplement			1.25 ^b

Finishing Performance

Item	LOW		HIGH	
	SUP	NO SUP	SUP	NO SUP
Final BW, lb	1233 ^b	1210 ^b	1282 ^a	1291 ^a
DMI, lb	27.2	27.3	27.1	27.5
ADG, lb	3.26 ^b	3.45 ^{a,b}	3.30 ^{a,b}	3.63 ^a
G:F, lb/lb	0.120 ^b	0.126 ^{a,b}	0.122 ^b	0.132 ^a
HCW	777 ^b	763 ^b	808 ^a	813 ^a
Marbling score	549	558	555	542
YG	3.12	3.18	3.24	3.15

Gillespie et al., 2013

Finishing Performance

Item	LOW		HIGH	
	SUP	NO SUP	SUP	NO SUP
Final BW, lb	1233 ^b	1210 ^b	1282 ^a	1291 ^a
DMI, lb	27.2			27.5
ADG, lb	3.2			
G:F, lb/lb				
HCW				
Marbling score				
YG	3.12			2.5

Summer Supplementation resulted in 85% compensation!

Gillespie et al., 2013

Winter Supplement Level

	2 lb DDGS	5 lb DDGS
Winter ADG	0.55	1.41
Summer ADG	1.39	1.06
Feedlot ADG	3.96	4.16
Final BW	1231	1313

Winter Supplement Level

	2 lb DDGS	5 lb DDGS
Winter ADG	0.55	1.41
Summer ADG	1.39	1.06
Feedlot ADG	3.96	4.16
Final BW	1231	1313
Profit	\$-9.64	\$46.26
	\$55.90 difference	

(Gillispie et al., 2014)

Winter supplementation rate – Winter Performance

Item	3	5	7	SEM	Linear
2012					
Initial BW, lb	503	499	496	4	0.24
ADG, lb	1.53	1.67	1.91	0.03	<0.01
Ending BW, lb	739	756	790	5	<0.01
2013					
Initial BW, lb	528	531	529	7	0.95
ADG, lb	1.43	1.78	2.06	0.02	<0.01
Ending BW, lb	726	777	812	8	<0.01

Bondurant et al., 2016

Winter supplementation rate – Grazing Performance

Item	3	5	7	SEM	Linear
2012					
Initial BW, lb	739	756	790	5	<0.01
ADG, lb	0.80	0.68	0.50	0.03	<0.01
Ending BW, lb	865	866	874	6	0.36
2013					
Initial BW, lb	726	777	812	8	<0.01
ADG, lb	1.18	1.01	0.88	0.03	<0.01
Ending BW, lb	915	940	954	8	<0.01

Bondurant et al., 2016

Winter supplementation rate – Finishing Performance

Item	3	5	7	SEM	Linear
2012					
Initial BW, lb	865	866	874	6	0.36
ADG, lb	4.11	4.13	3.96	0.1	0.30
DMI, lb	28.5	28.4	28.4	0.4	0.91
F:G	6.95	6.88	7.18	-	0.32
HCW, lb	837	839	832	9	0.67
2013					
Initial BW, lb	915	940	954	8	<0.01
ADG, lb	3.06	3.22	3.19	0.1	0.36
DMI, lb	29.7	30.6	29.8	0.4	0.86
F:G	9.70	9.50	9.34	-	0.25
HCW, lb	820	848	855	11	0.04

Winter supplementation rate – Finishing Performance

Item	3	5	7	SEM	Linear
2012					
Initial BW, lb	865	866	874	6	0.36
ADG, lb	4.11	4.13	3.96	0.1	0.30
DMI, lb	28.5	28.4	28.4	0.4	0.91
F:G	6.95	6.88	7.18	-	0.32
HCW, lb	837	839	832	9	0.67
2013					
Initial BW, lb	915	940	954	8	<0.01
ADG, lb	3.06	3.22	3.19	0.1	0.36
DMI, lb	29.7	30.6	29.8	0.4	0.86
F:G	9.70	9.50	9.34	-	0.25
HCW, lb	820	848	855	11	0.04

Backgrounding in a pen setting

	High	Low	SEM	P-value
Initial BW, lb	543	543	0.7	0.89
Ending BW, lb	838	708	9.4	<0.01
ADG, lb	1.996	1.12	0.06	<0.01
DOF	148	148		
Initial BW, lb	852	721	9.4	<0.01
Ending BW, lb	920	810	11.6	<0.01
ADG, lb	1.31	1.71	0.11	<0.01
Grazing days	60	60		

Butterfield et al., unpublished data

Summary

- What?
- When?
- How much?



NEBRASKA

PLACE
STICKER
HERE

THE BEEF STATE

1. Water
2. Corn Production
3. Ethanol Production (distillers grains)
4. Grasslands (feeder calf supply)
5. Slaughter Capacity

