

Best management practices for newly received calves

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How can cow/calf producers set calves up for success?



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Setting Calves Up for Success

- Vaccinated with 2 series (initial & booster) of clostridial & viral vaccines
- Weaned for 45 d prior to marketing
- Castrated & healed
- Dehorned & healed
- Exposed to feeders & waterers



Receiving Calf Health starts at Weaning

- Accustom to feed other than mom's milk
- Weaning strategies:
 - Easy = separate calves from cows
 - Fenceline



Picture: OZFarmer



Picture: FMB.com



Weaning Strategy & ADG

2 weeks pre-weaning to 28-d post-weaning

Weaning Method	ADG, lb/d
Abrupt weaning	0.85
Nursing prevention tool	1.1
Short term separation	1.3
Fenceline weaning	1.5

OSU College of Vet. Med.

Adapted from Beck 2023
OSU Cow-Calf Corner



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Suckling Calf Implant



36 mg Zeranol > No implant

Avg. BW Gain = **+ 22 lb**

Avg. % ADG Increase = **9.9 %**



Days	No Implant ADG	36 mg Zeranol ADG	% ADG Advantage Zeranol
57	1.23	1.89	34.9
97	1.86	1.94	4.1
98	1.94	2.12	8.5
102	1.73	2.02	14.4
103	1.73	1.83	5.5
105	1.68	2.03	17.2
134	1.28	1.37	6.6
134	0.94	1.05	10.5
140	2.12	2.23	4.9
147	1.61	1.93	16.6
179	2.27	2.46	7.7
205	1.47	1.51	2.6
205	2.26	2.34	3.4

Data provided by Merck Animal Health Technical Bulletin



Pre-Conditioning Calves

Effects of preweaning vaccinations on performance of freshly weaned calves

Trait	None	PreVac
Number of Steers	1,250	2,315
Initial BW, lb	565	602
ADG, lb/d	1.87	2.24 +16.5 %
Feed:Gain	8.20	7.56 +8.5 %
Lynch et al., 1997		



Cow/Calf Best Management Practices = Profitability



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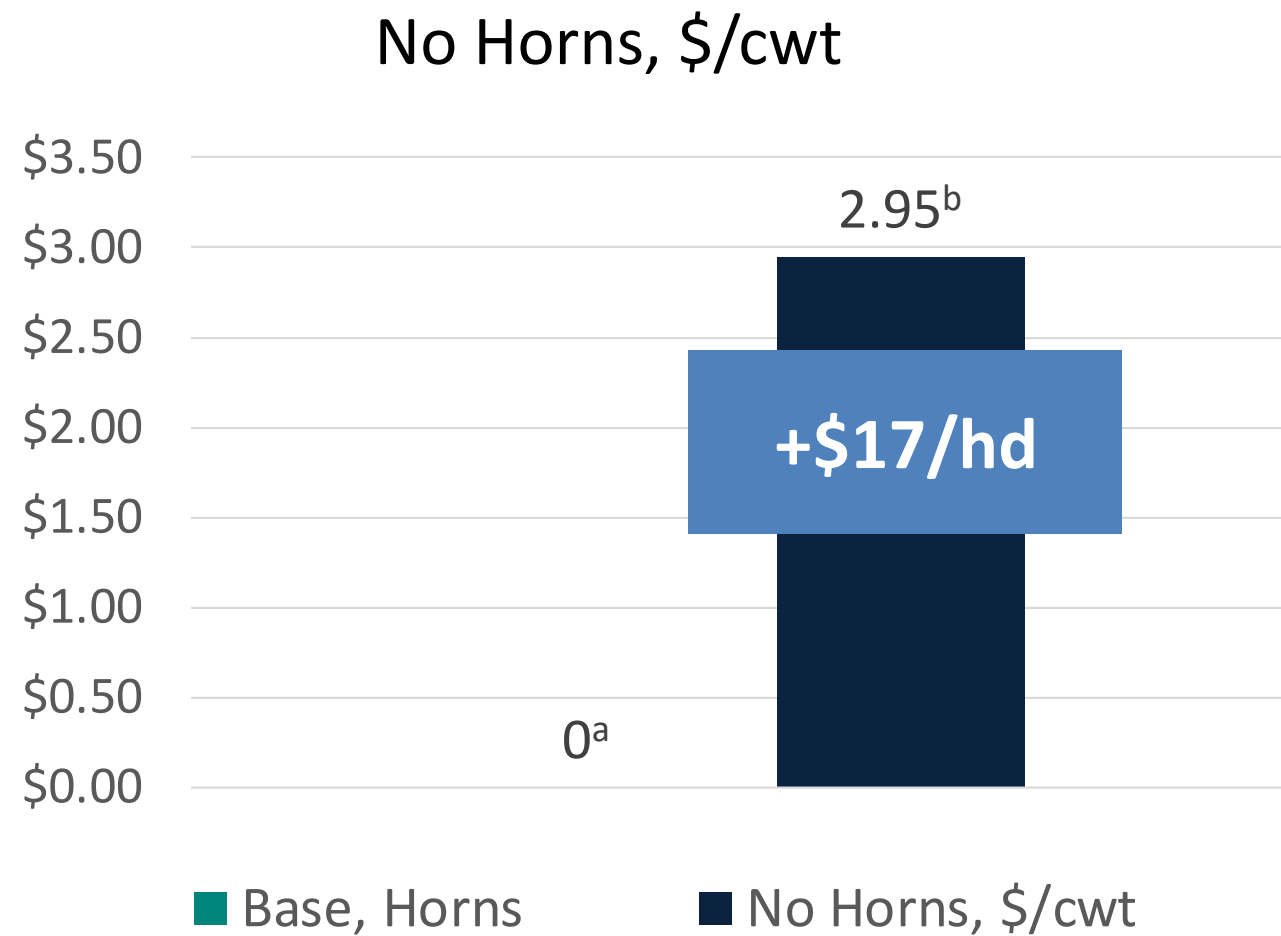
Best Management Practices = Profitability

- **National Calf Database**
- **Sales from Jan-Dec 2023**
- **7,612 lots (898,500 head)**
- Mean weight of 571 lbs.
- Mean lot size of 118 head
- Individual traits were evaluated relative to a base with all other factors being held constant

Hutcheson (2024) Merck Animal Health
Superior Livestock Database



Best Management Practices = Profitability



Hutcheson (2024)
Merck Animal Health & Superior Livestock Auction



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Implant \$\$\$ Opportunity

44% (3,322 out of 7,612 lots) of the calves are not in a program that bans implants.

Ralgro® (zeranol implants) implanted once at 2 months of age or older = + 23 lb WW

23 pounds x \$2.63/cwt

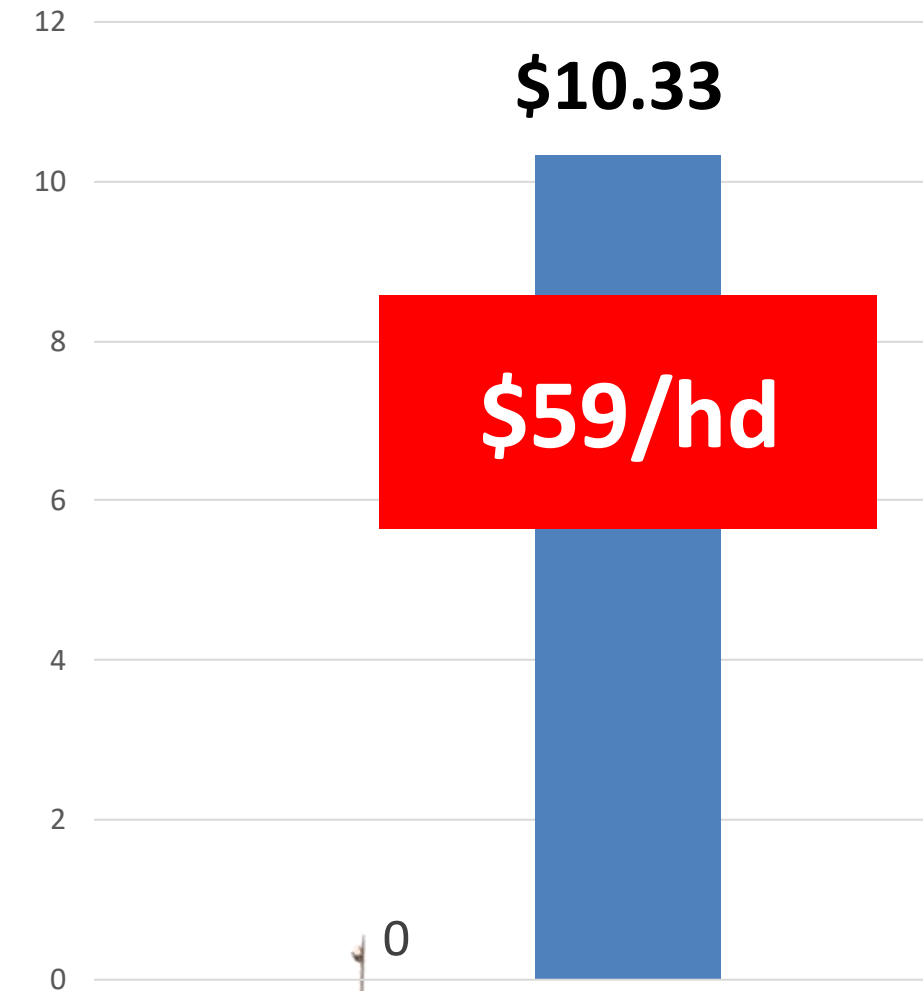
-\$1.50/dose

= \$59/head (+\$10.33/cwt)

Hutcheson, Renter, Tonsor (2024)

Merck Animal Health x Superior Livestock Database

Implanting Opportunity,
\$/cwt

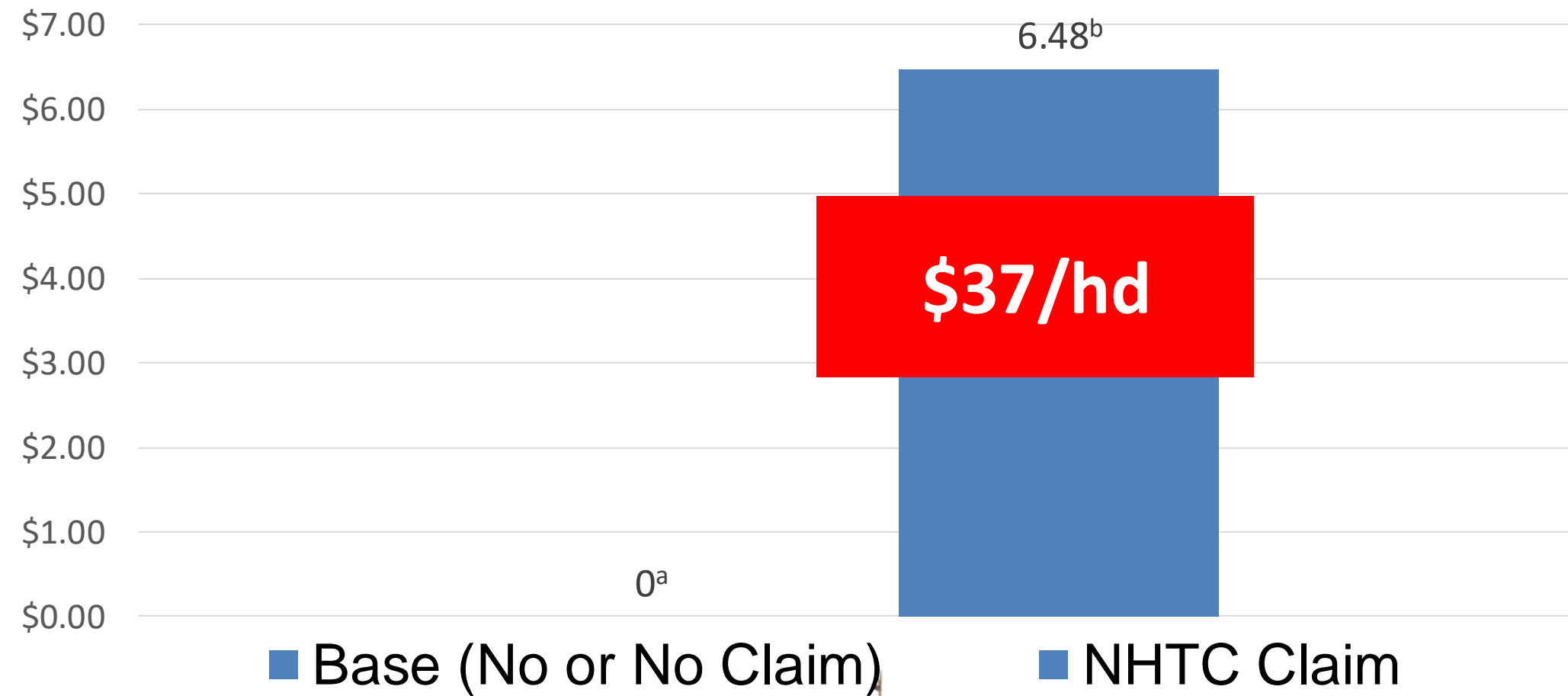


NHTC \$\$\$ Opportunity



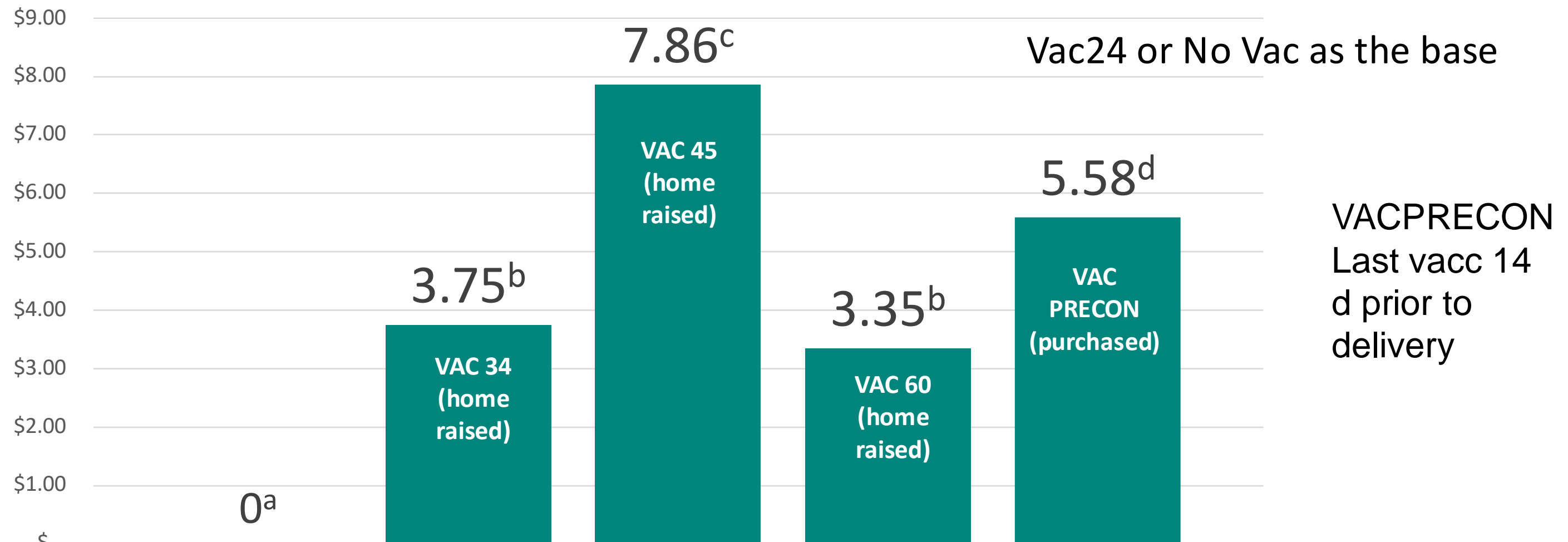
Hutcheson, Renter, Tonsor (2024)
Merck Animal Health x Superior Livestock Database

NHTC, \$/cwt



Best Management Practices = Profitability

Value Added Health Programs, \$/cwt



VACPRECON
Last vacc 14
d prior to
delivery

Hutcheson (2024)
Merck Animal Health & Superior Livestock Auction

VAC34, 45, 60

2 doses clostridial

\$-

2 doses modified live viral 5-way

1 or 2 doses *Mannheimia haemolytica* and/or *Pasteurella multocida*

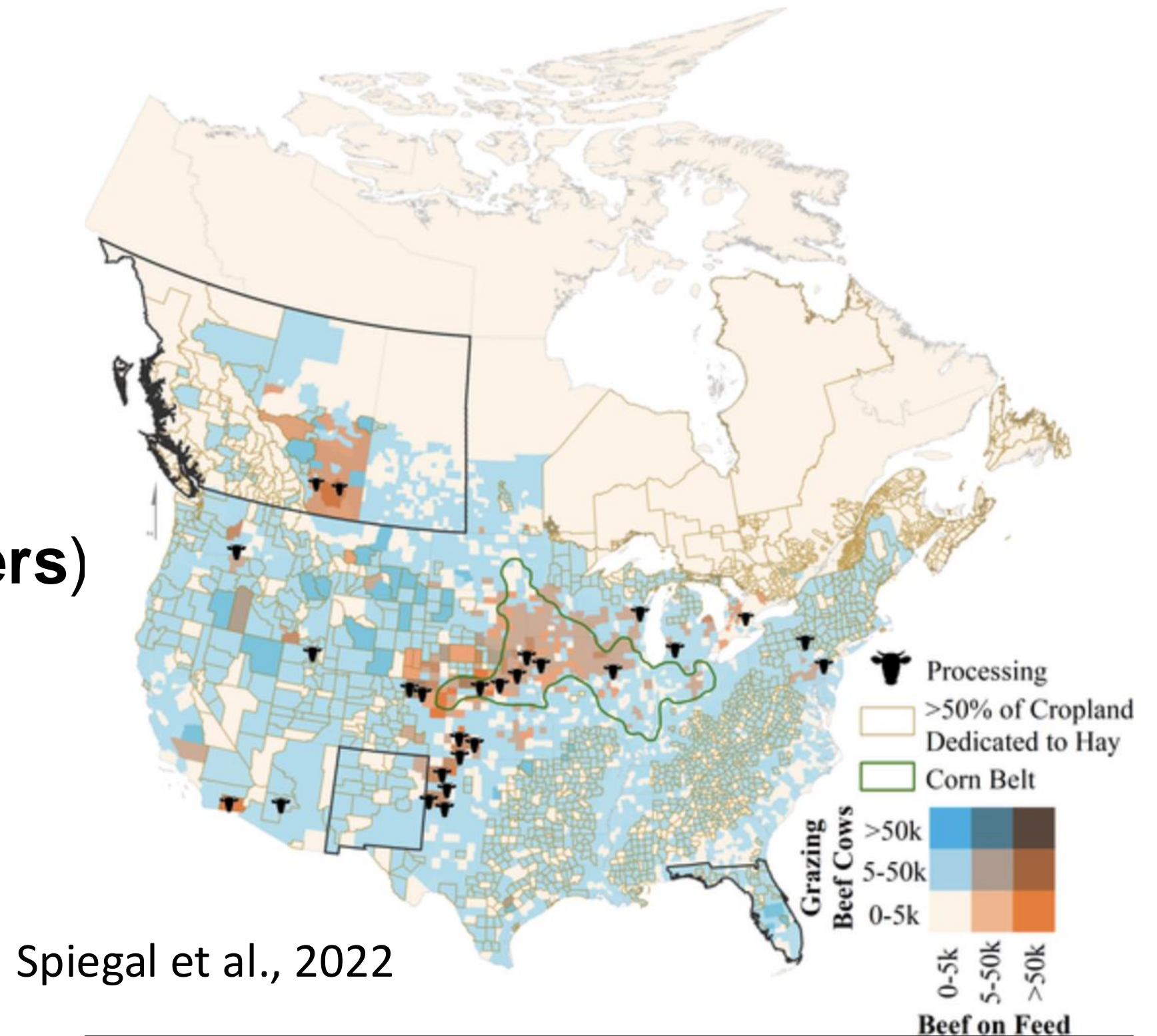
45 or 60 d weaned



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Challenges for the Calf

- Weaned, comingled, trucked
- Separated from dam
- New environment
- Transported (**distance matters**)
- Stressed
- Immunocompromised
- Exposed



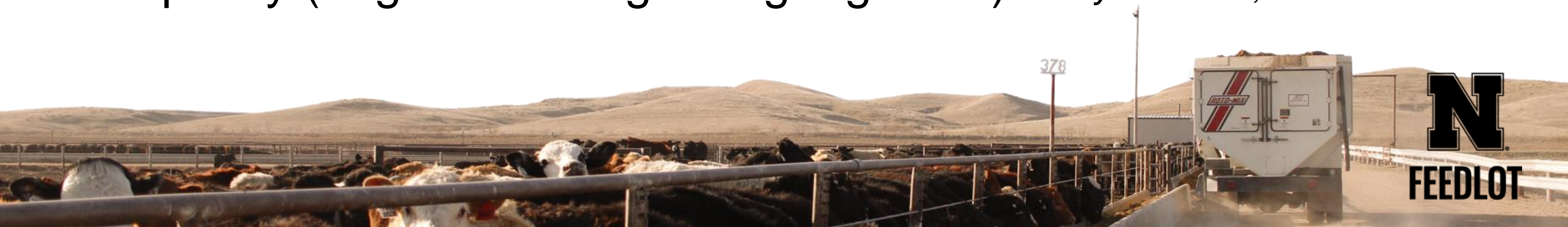
Receiving Period: 4 to 8 week period in which relocated cattle adapt to their environment

Richeson et al., 2019

Most challenging time nutritionally & health-wise

Cattle may arrive in catabolic state:

- Inflammation from marketing & transport
 - Stressors cause immune system suppression = pathogen replication
- Feed & water deprivation negatively impact rumen fermentation capacity (negative on high roughage diet) - *Galyean et al., 1981*



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Calves May Exhibit Signs of Anorexia

Anorexia for first 1-7 days

- 0.5 to 1.5% of BW (Hutcheson & Cole, 1986)

# of Calves	Arrival Date	Morbidity Rate, % (1 trt min in 56 d)	Intake (lb/d)	% Unshrunk BW
99	June 17	30.3.	6.59	1.52
99	August 17	50.5	5.07	1.24
99	Sept 17	24.2	5.53	1.36
96	Jan 18	53.1	9.45	1.66
96	Feb 18	39.6	7.86	1.47
96	May 18	10.4	9.14	1.79
96	June 18	27.1	7.91	1.59

Richeson, Samuelson & Tomczak, 2019

doi: 10.1093/jas/skz159



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Challenge with Newly Received Calves

- Low intakes on newly received calves are common

Dry matter intake of stressed calves; first 28 days

Week	lb/hd/d	% of BW
1	5.5	1.15
2	8.9	1.84
3	11.8	2.46
4	14.8	3.07
1 to 4	10.3	2.13



Challenges with Newly Received Calves

Managing health & optimizing performance

High enough roughage level
to mitigate ruminal acidosis

vs.

Low feed intake =
Difficult to achieve nutrient
requirements (every bite counts)



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Challenge with Newly Received Calves

Bovine Respiratory
Disease (BRD)
Clinical symptoms

=

Acute Acidosis
Clinical symptoms

**** Likely that acidotic cattle are incorrectly diagnosed with BRD**



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Challenges with Newly Received Calves

Higher starch diet at receiving:

↑ Performance improvement

↑ Morbidity

VS.

Lower starch diet at receiving:

↓ Performance improvement

↓ Morbidity



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Economic Loss from BRD

Treated 1x	Treated 2x	Treated 3x +
(\$40.64)	(\$58.35)	(\$291.93)

Fulton et al., 2002



Early Health Challenges = Lasting Impacts

Steers (n = 15,631) and heifers (n = 5,897) fed at 18 feedlots (total confinement, partial confinement, or open lots) in southwest Iowa between 2002 and 2006

	Steers, # of treatments			Heifers, # of treatments			P-Values	
	0	1	> 1	0	1	> 1	Linear	Quadratic
n	12,601	1,638	1,072	4,765	615	274		
Initial BW, lb	672	650	645	631	597	591	*	*
ADG, lb/d	3.59	3.15	2.89	3.28	2.80	2.40	*	**
HCW, lb	739	732	725	691	682	676	*	
Marbling	432	419	404	452	443	431	*	
LM Area, cm ²	12.42	12.35	12.20	12.20	12.09	11.90	*	

**P* < 0.001

Reinhardt et al., 2009



Early Health Challenges = Lasting Impacts

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n	12,601	1,638	1,072		
Initial BW, lb	672	650	645	*	*
ADG, lb/d	3.59	3.15	2.89	21.6% *	**
HCW, lb	739	732	725	14 lb *	
Marbling	432	419	404	*	
LM Area, cm ²	12.42	12.35	12.20	*	

**P* < 0.001

Reinhardt et al., 2009



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1st Step - Risk Assessment

For magnitude of stress encountered & likelihood of BRD development

- Assess either at purchase or arrival
- High Risk = Light weight naïve calves
- Medium Risk = Preconditioned/
Weaned calves/early weaned calves
- Low Risk = Yearlings, single-sourced



1st Step - Risk Assessment

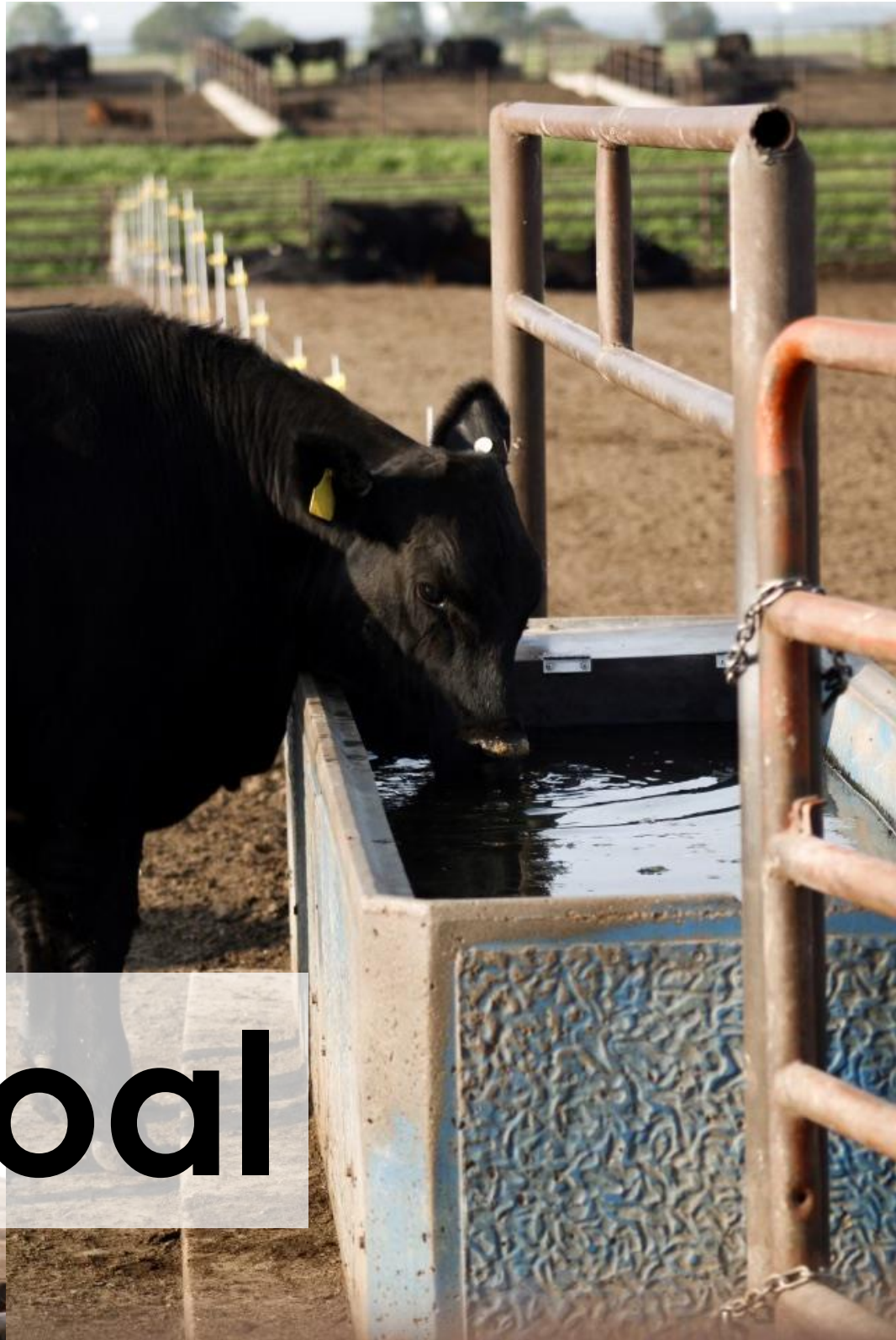
For magnitude of stress encountered & likelihood of BRD development

- Calves that have spent multiple days in marketing chain: develop BRD soon after arrival
- Calves direct sourced: may get sick 2-4 weeks later



What's his risk?





Goal

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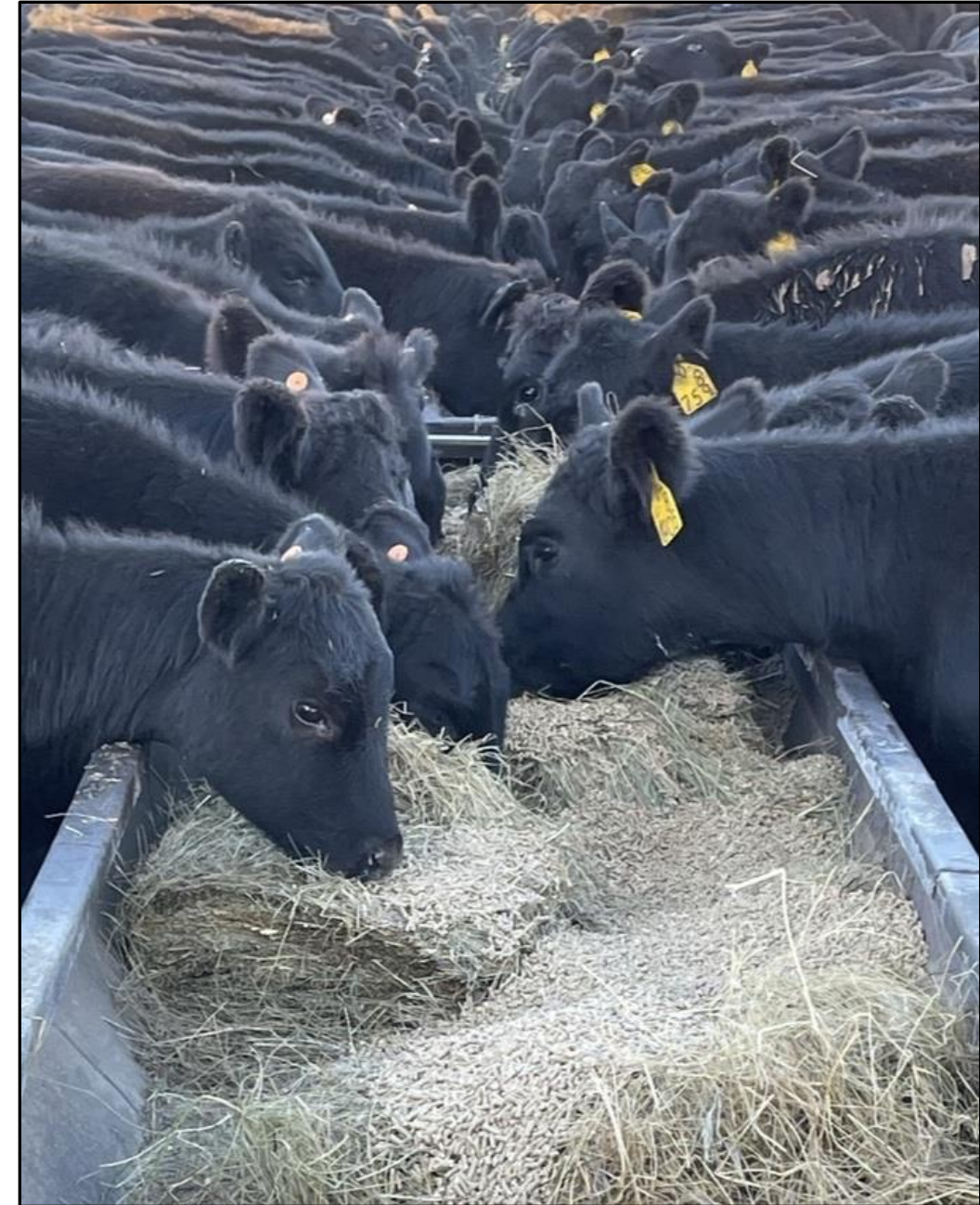


Consuming Feed

- Offer familiar feedstuffs in 1st 7 days
 - Long-stem grass hay
- “Bunk Break” cattle
- **High quality** forages are important to get adequate energy into the diet when intakes are depressed
- Target 16-18” bunk space/hd

Adaptation Diets

- Referred to as “step up” diets
- Increase in energy over course of the feeding period
- Allows calf’s rumen to adjust to changes in diet
- In general:
 - Increases concentration, decreases roughage
 - Hold byproduct constant



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Adaptation

- Gut fill controlling intake to energy limitation
- Days on each step (3 to 7 d)
- Total period: 18 to 28 days traditionally
- Decrease **10% units** in roughage maximum
- Slower towards the end
- Keep cattle full (non-aggressive) during transitions
- Mistakes can last the entire feeding period

Example Step-Up Period

Days	d 1-5	d 6-12	d 13-19	d 20-26	d 27-173
Total days fed	5	7	7	7	
Adaptation	1	2	3	4	Finisher
Roughage, % diet DM	40	30	20	10	8
Grain, % diet DM	50	60	70	80	82
Other feedstuffs + Supplement	10	10	10	10	10

52-58 Mcal/cwt NEg



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Advantage of Organic Trace Minerals

1) Inorganic trace mineral supplemented at equivalent concentrations as in the ORG treatment for 42 d (ING). 2) Trace minerals from an organic source (Avalia4; Zinpro Corp.) at 7 grams/steer/day for the entire 42-day receiving trial (ORG), 3) ORG for entire 42 days plus AvaliaZn (Zn amino acid complex, Zinpro Corp.) to provide 1,000 mg Zn/steer/day for the first 14 days (ORG+Z)

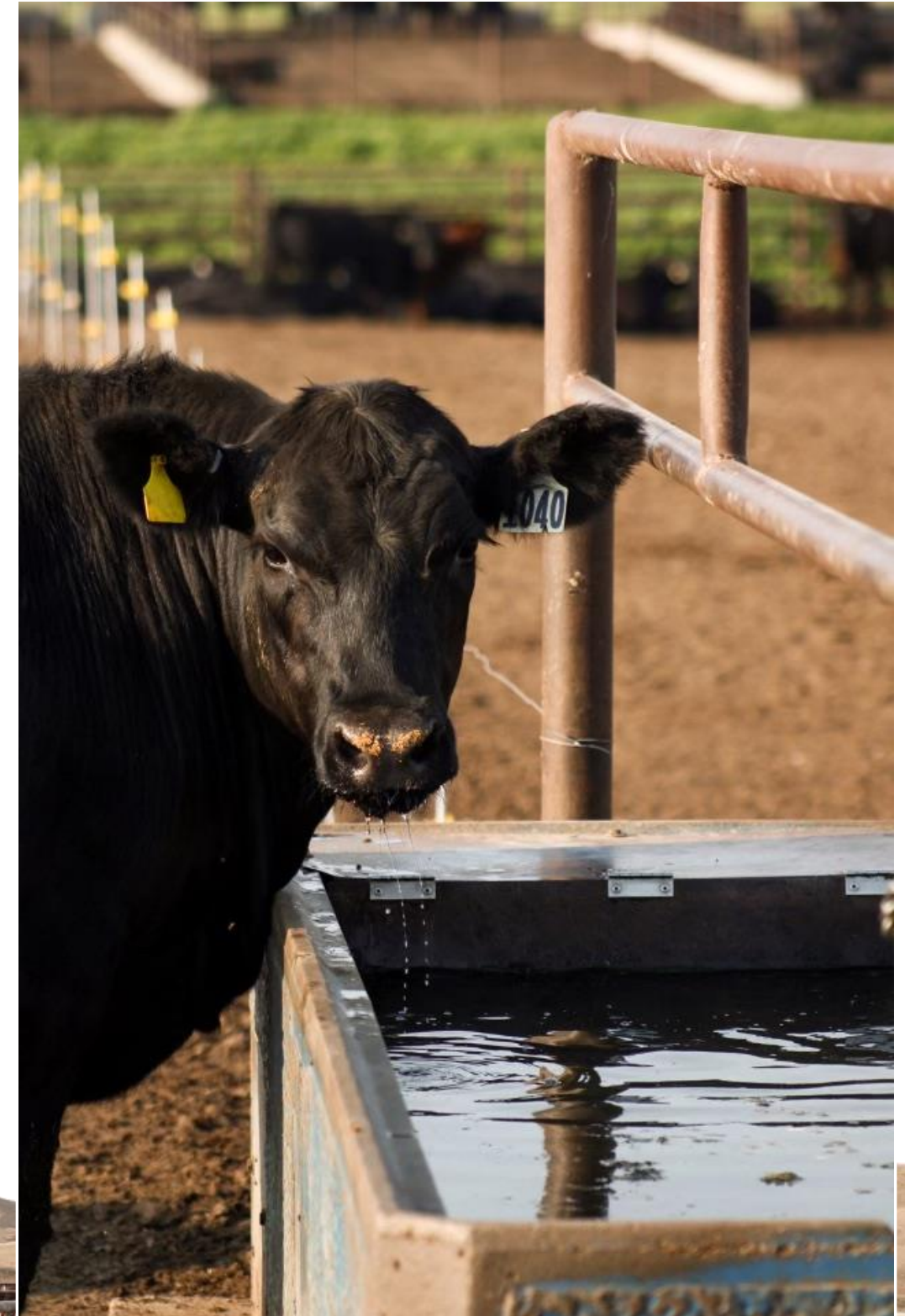
	Inorganic	Organic	Organic + Zinc	P-value
ADG, lb/d	3.93 ^y	4.28 ^x	4.39 ^x	0.07
DMI, lb/d	19.43	19.71	18.57	0.21
Feed:Gain	5.18 ^b	4.61 ^a	4.33 ^a	0.01

Adapted from Smerchek et al., 2023



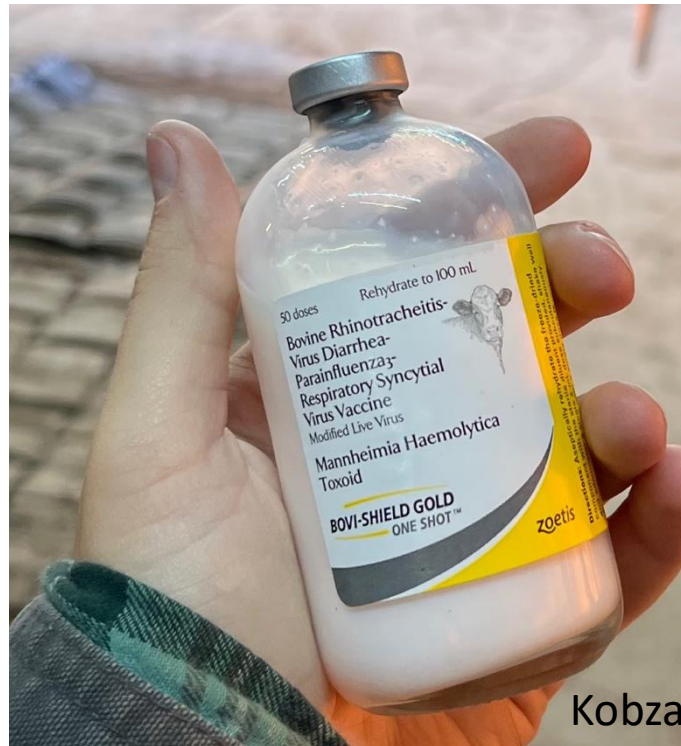
Water Intake

- Water intake drives feed intake
- Target 1-3" of water space/hd
- 1-2 gallons per 100 lb of BW
- Calves may need to be oriented to where water tank is located
 - Allow tank to overflow for short period



Initial Processing

- Recommended to allow cattle 12-24 h after delivery before processing



- Control for cocci
- Sorting cattle
- Castrating
- Dehorning



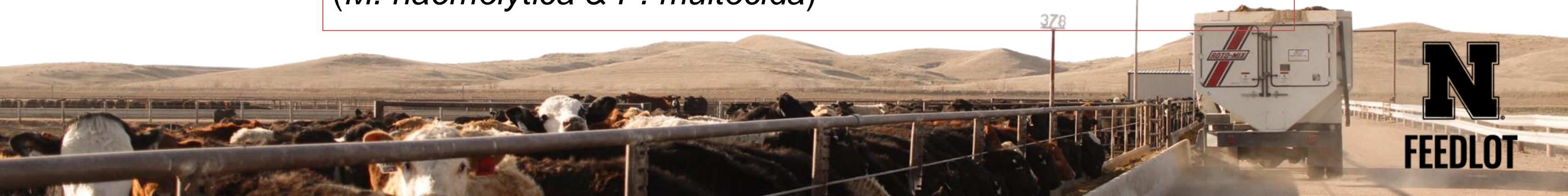
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Administration of Viral & Clostridial

Consult your veterinarian for animal health protocol

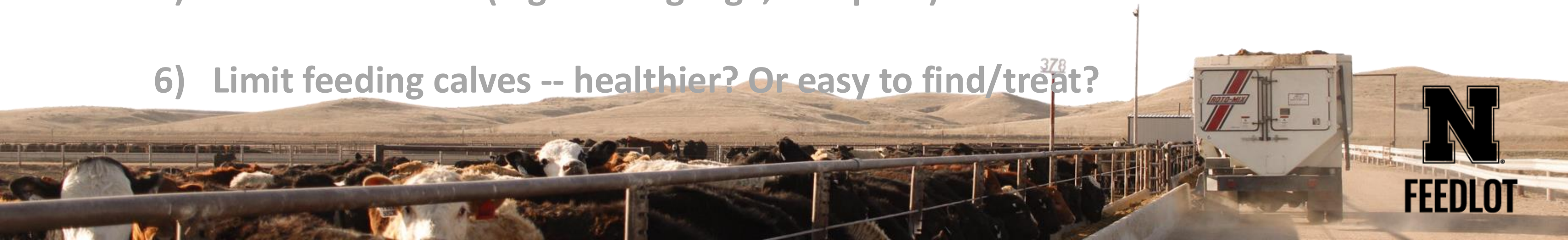
Responses from US Feedlot Survey 2011 (NAHMS, 2013)

Virus/Bacteria	% USA Feedlots
BVDV	96.6
Infectious bovine rhinotracheitis (IBR)	93.7
Bovine respiratory syncytial virus (BRSV)	89.1
Parainfluenza 3	85.1
Clostridial Vaccine	84.4
BRD bacteria (<i>M. haemolytica</i> & <i>P. multocida</i>)	66



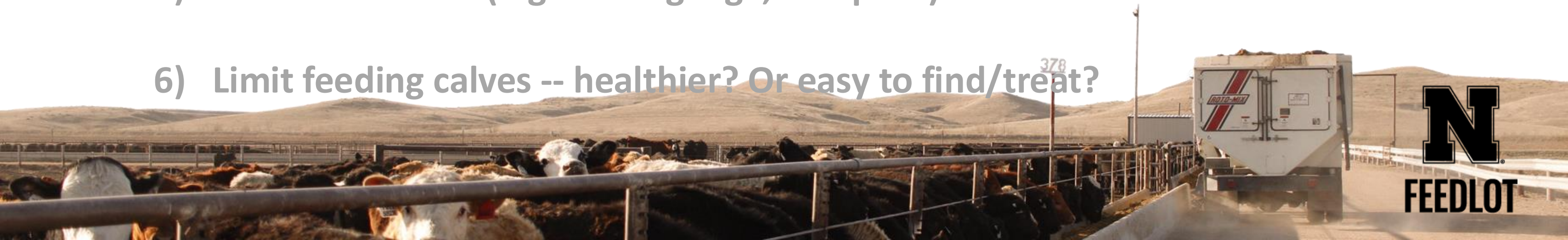
Field Observations on Receiving & Starting Newly Received Calves

- 1) **Lead animals: Yearling animals or cows penned with new arrivals**
 - Gibb et al. (2000) trainer cow had no impact on morbidity for calves & reduced ADG for calves early in feeding period
- 2) **Short fencing pens: Move the back fence up to keep calves tighter to bunk**
- 3) **Mass medication (Metaphylaxis) -- costs:benefits *Discuss w/ veterinarian***
- 4) Received outside feedyard for 25 to 40 days grass, wheat pasture, etc
- 5) Diet evaluations (higher roughage, less pulls)
- 6) Limit feeding calves -- healthier? Or easy to find/treat?



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Advantage of Receiving Calves to Pasture

Freshly weaned calves

Item	Feedlot	Pasture	
Initial BW, lb	589	585	• Reduced ADG
Revac BW, lb	635	621	• Lower morbidity
Ending BW, lb	661	627	
ADG, lb/d	2.36	1.26	
BRD, %	11.0	7.4	

Bremer et al., 2007 Nebraska Beef Report



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Impact of Reducing Sickness

Gardner et al., 1998

Performance Traits of Steers

Treated for Respiratory Complications

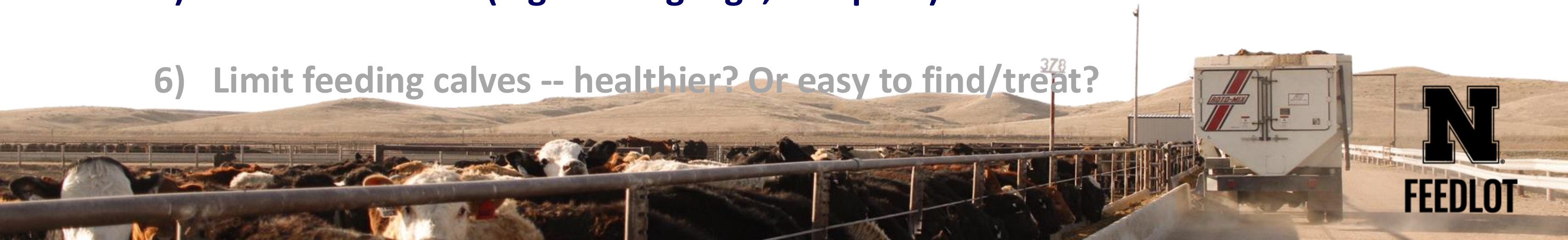
Trait	0	1	>1
Number of Steers	102	89	13
Initial Weight, lb	646	635	646
Final Weight, lb	1153	1131	1098
ADG, lb/d	3.37	3.28	2.98
		2.7 %	10.1 %



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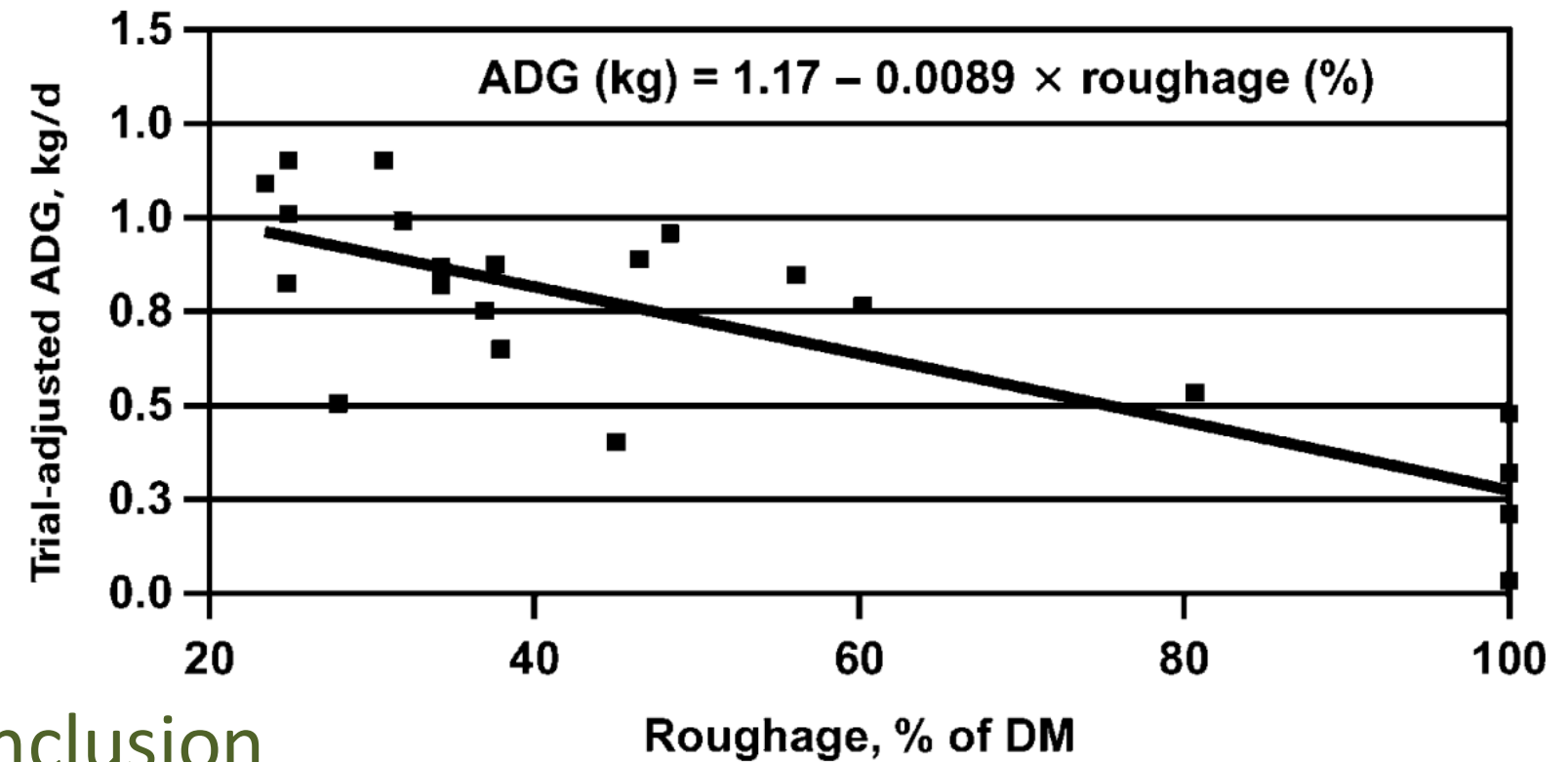
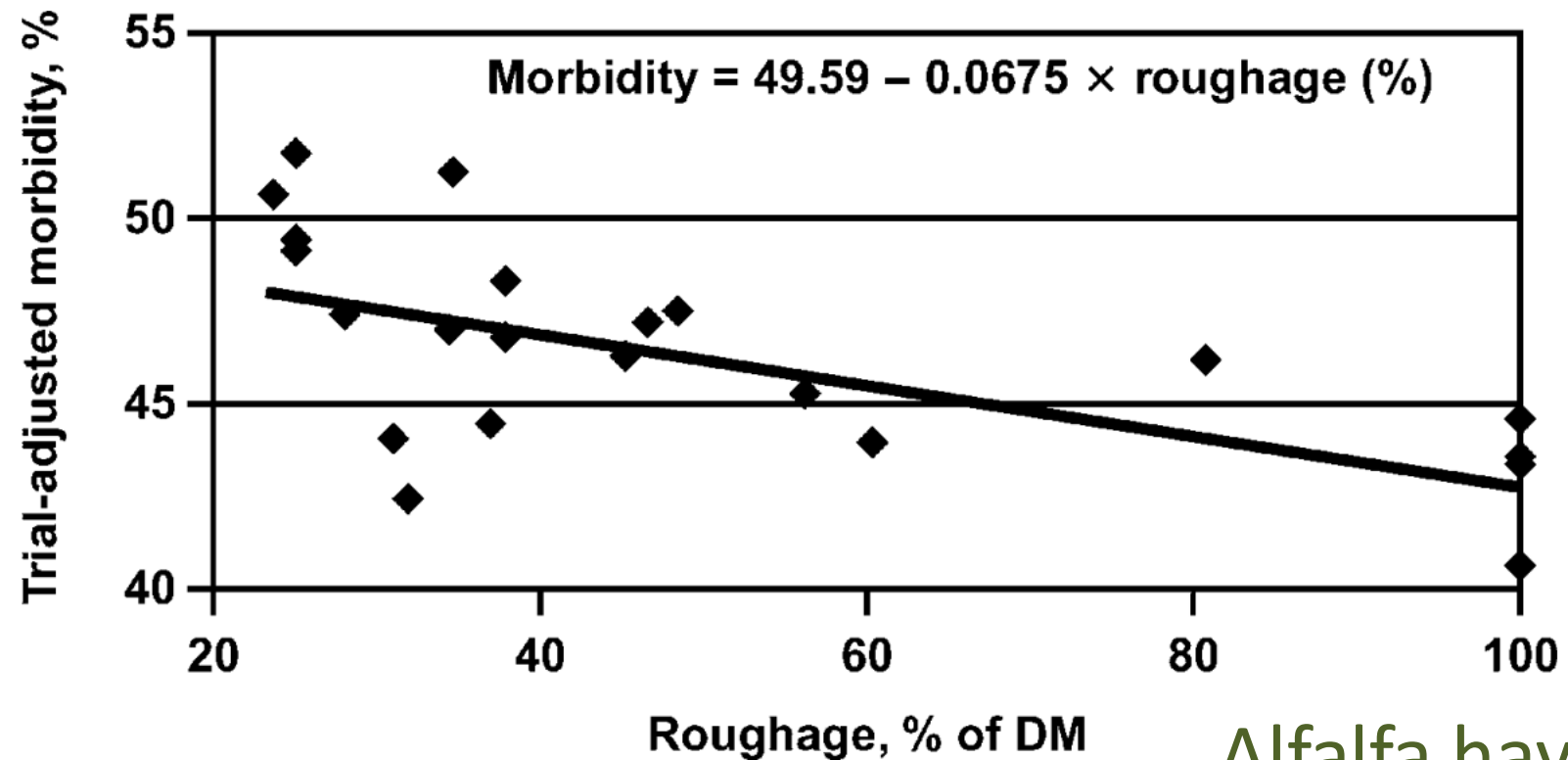
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Roughage Inclusion & Health

Increasing roughage inclusion reduces morbidity & ADG



Alfalfa hay inclusion

Rivera et al., 2005

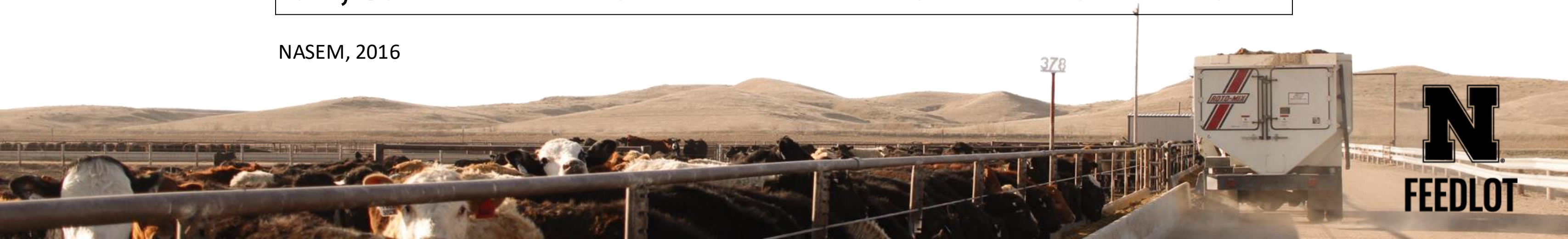


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Roughage Quality

	Corn Silage	Barley Silage	Brome Hay	Alfalfa Hay	Oat Hulls
DM, %	35	34	88	87	92
TDN, % DM	68	61	50	55	56
Starch, % DM	33	9	2.6	3	16
NDF, % DM	43	55	66	42	65
CP, %	8	12	8	20	6

NASEM, 2016



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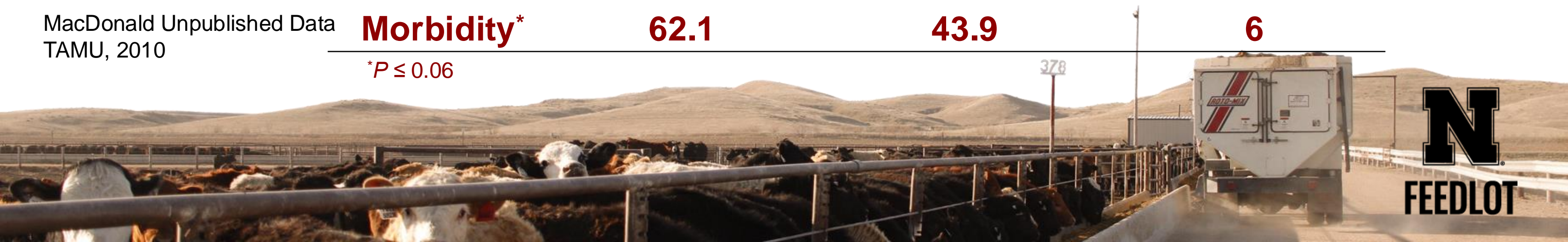
Roughage Quality & Health

Higher quality (energy) roughage = Improved performance
Lower quality roughage = Reduced morbidity

35 DOF, 132 steers	30% Alfalfa Hay	30% Cottonseed Hulls	SE
Initial BW, lb	365	371	4
Final BW, lb	455	457	6
DMI, lb*	9.87	11.17	0.27
ADG, lb	2.59	2.43	0.50
F:G*	3.83	4.61	0.17
Morbidity*	62.1	43.9	6

MacDonald Unpublished Data
TAMU, 2010

* $P \leq 0.06$



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Limit Fed vs. Ad Libitum Feeding for Newly Received Calves

Does limit feeding newly received calves improve overall health & reduce BRD incidence?



Receiving Calf Performance and Health: Implications of Ad libitum vs. Limit-fed Management

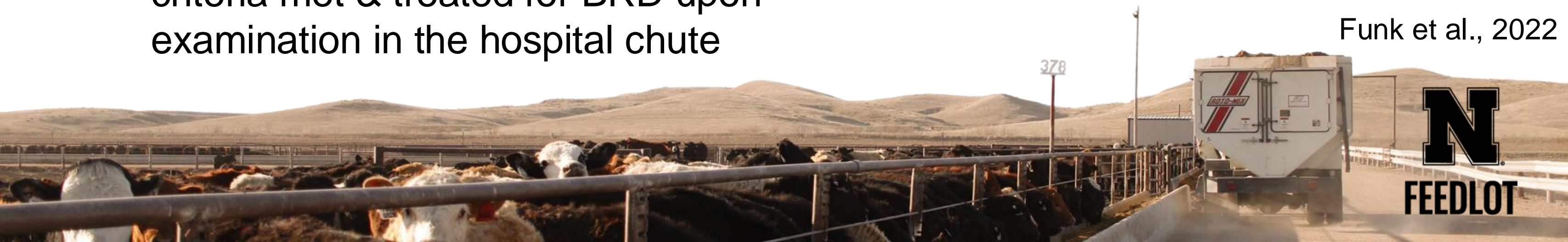
- **Same diets**
- **Limit-fed:** 2.2% of initial BW for 28 d
- **Ad libitum:** Fed according to bunk call
- Pen riders observed cattle 2-3 h post-feeding (blind to trt)
- Calves deemed BRD case once pull criteria met & treated for BRD upon examination in the hospital chute

Receiving Diet Formulation

Grass Hay	36%
Dry Rolled Corn	30%
Sweet Bran*	30%
Supplement	4%

*Cargill, Inc; Blair, NE

Funk et al., 2022



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Receiving performance – 28 DOF

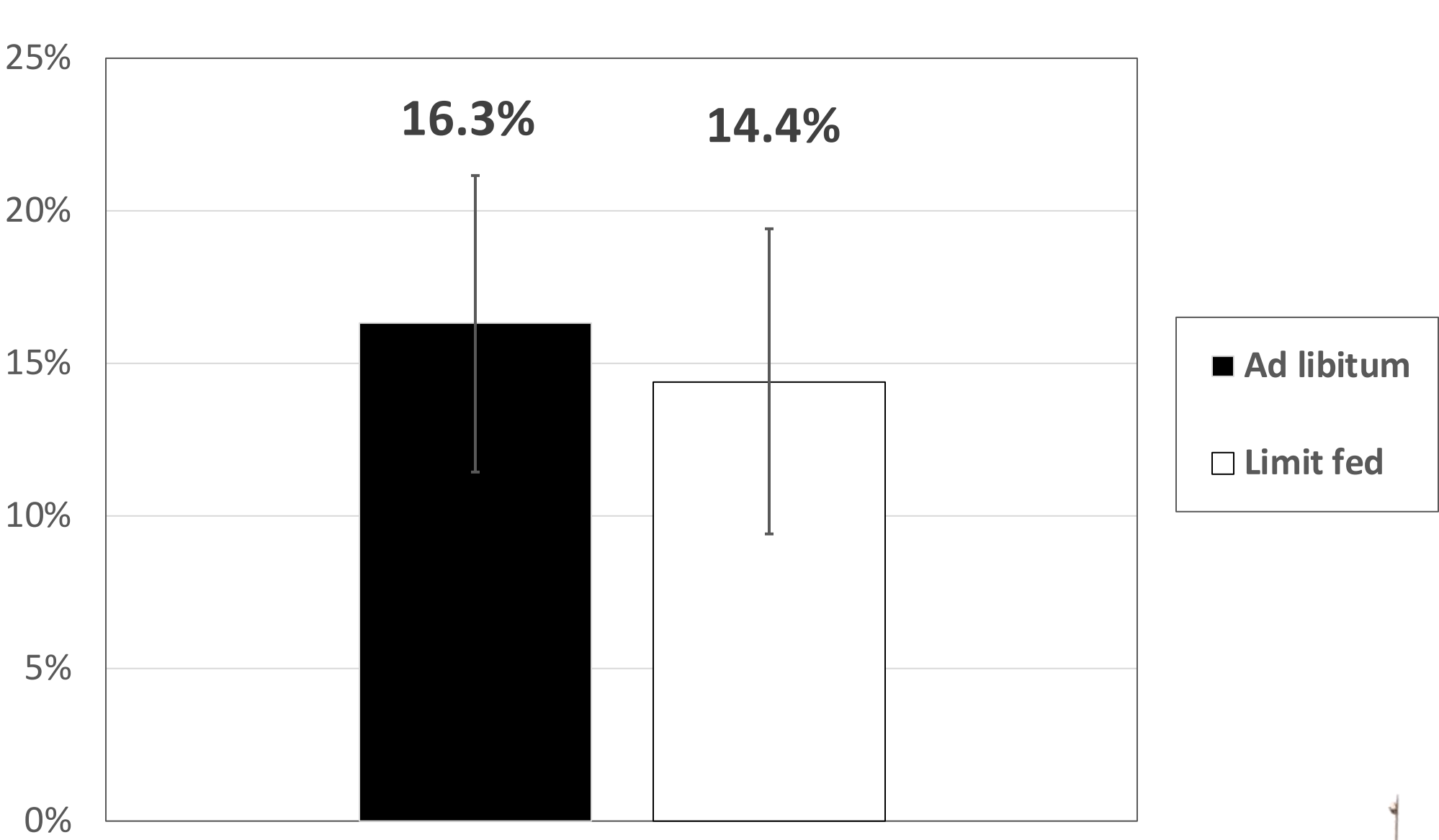
Funk et al., 2022

	Ad Libitum¹	Limit-Fed¹	SEM	P-Value
Pens (n)	22 (352)	22 (352)		
Initial BW, lb	577	577	3.2	0.89
End BW, lb	665	638	4.2	< 0.01
Gain, lb	86	62	1.8	< 0.01
DMI, lb/d	15.7	11.0	0.10	< 0.01
ADG, lb	2.80	2.03	0.058	< 0.01
F:G²	5.62	5.43	-	0.28

¹ LF = limit-fed calves at receiving for first 28 days with intake targeted at maximum of 2.2% of receiving body weight.

BRD Incidence during first 28 DOF

Funk et al., 2022



**
BRD Treatment Failures (retreats): 0.88% (1 hd)

Mortality: 0.66% (5 hd)

Not enough data points to analyze

Morbidity rates for ad libitum and limit-fed calves during the 28-day receiving period. Error bars represent the 95% confidence interval for incidence rate. **P = 0.58**



Maternal Bovine Appeasing Substance

FerAppease

Active Ingredient: 5%

MBAS

5mL applied topically to
nuchal area (behind poll)

5mL applied to skin above
muzzle

Cost: \$3/hd per dose



Courtesy of Fera Diagnostics & Biologics Corp.



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FerAppease Impact on Receiving High-Risk Calves

Pickett et al. (2024) J. Anim. Sci.

120 intact Angus-influenced bulls – transported 12 h to College Station, TX

Rested for 24 h | initial processing on day 0

Vaccines, dewormer, implant, metaphylaxis, castration

Assigned to receive FerAppease or control (60 hd per trt)

Distributed in drylot pens with 12 steers of treatment

Vaccine + FerAppease booster on day 14

BW and sampling on days 0, 14, 28, 42, and 60

Feed intake and incidence of BRD monitored daily



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Pickett et al. (2024) J. Anim. Sci.

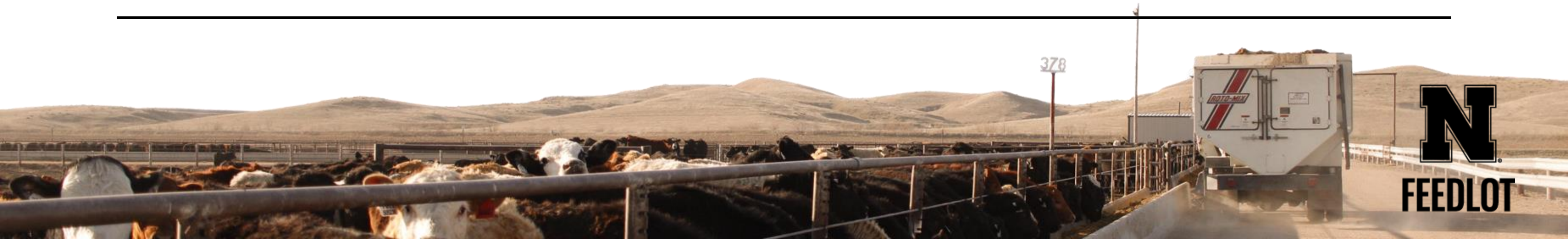
Item	CON	FERA	SEM	P
Steers treated for respiratory disease, %	56.7	56.7	6.4	0.99
% sick steers that required 1 treatment	47.0	70.6	8.3	0.03
% sick steers that required 2 treatments	26.5	20.6	7.3	0.59
% sick steers that required 3 treatments	5.88	2.94	3.5	0.56
% sick steers required 4 treatments(removal)	2.94	2.94	2.9	0.99
Overall mortality, %	10.0	1.66	3.0	0.04
Steers treated for respir. disease	17.6	2.94	5.1	0.03
Overall mortality + removals, %	11.6	3.3	3.3	0.05
Steers treated for respir. Disease	20.6	5.88	5.8	0.04



FerAppease Impact on Receiving High-Risk Calves

Pickett et al. (2024) J. Anim. Sci.

Item	CON	FERA	SEM	<i>P-Value</i>
Initial live BW, lb	440	440	3.92	0.92
Final live BW, lb	568	560	8.55	0.46
ADG, lb	2.08	1.93	0.119	0.40
Feed intake, lb/d	10.54	10.54	0.211	0.99
F:G	5.067	5.46	0.015	0.20



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Summary

- Assign risk status
- Offer feed & water on arrival
- Determine profitability: Performance or morbidity targets
- Make management decisions that fit your operation



<https://beef.unl.edu>

2025 Nebraska Beef Report

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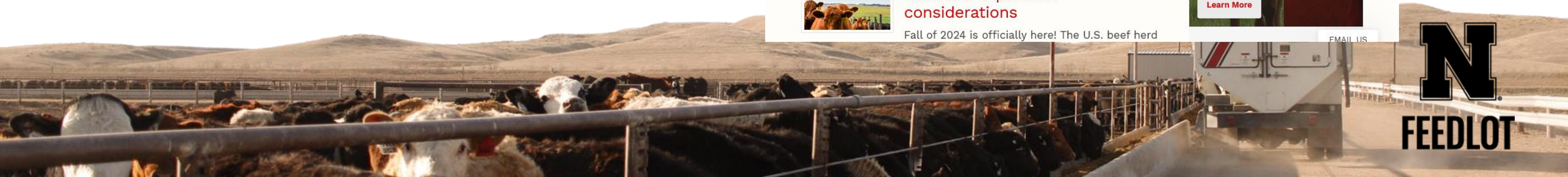
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Questions?

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