

Precision Livestock Management on Western Rangelands: *Self-Fed Supplementation*

Tim DelCurto

Professor & Nancy Cameron
Chair

Range Beef Cattle Nutrition &
Management

**2021 Rancher's Thursday
Luncheon Seminar Series**

OSU Extension



A black and white cow is grazing in a field of dry grass and shrubs. In the background, there are rolling hills under a clear sky. The text "Land & Forage Resources in the Western US" is overlaid on the image in a blue, italicized font.

*Land & Forage
Resources in the
Western US*



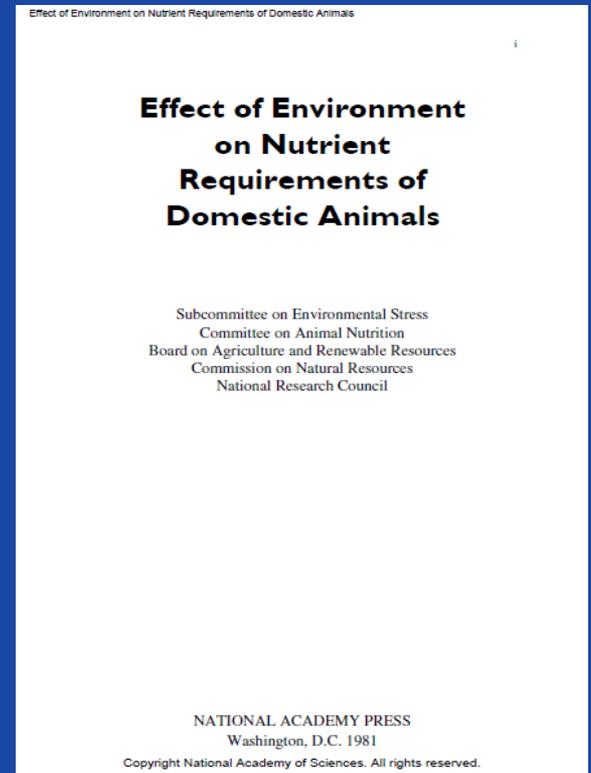
Beef Cattle Performance, Grazing Behavior, & Distribution

Montana Winter of 2017-2018 & 2018-2019



Environment and Nutrient Requirements

- Most of the models for environment are based on 1981 NRC Publication
- Most are focused on energy requirements
 - Protein, minerals & vitamins?
- Relate to temperature and hair coat
 - Limited in respect to precipitation and/or wind conditions
 - Wind Chill equivalent?





Current/Future Research

- Strategic Supplementation
 - Optimal nutrient delivery systems
 - Optimal use of Low-Quality Forages
 - Optimal use of Rangelands



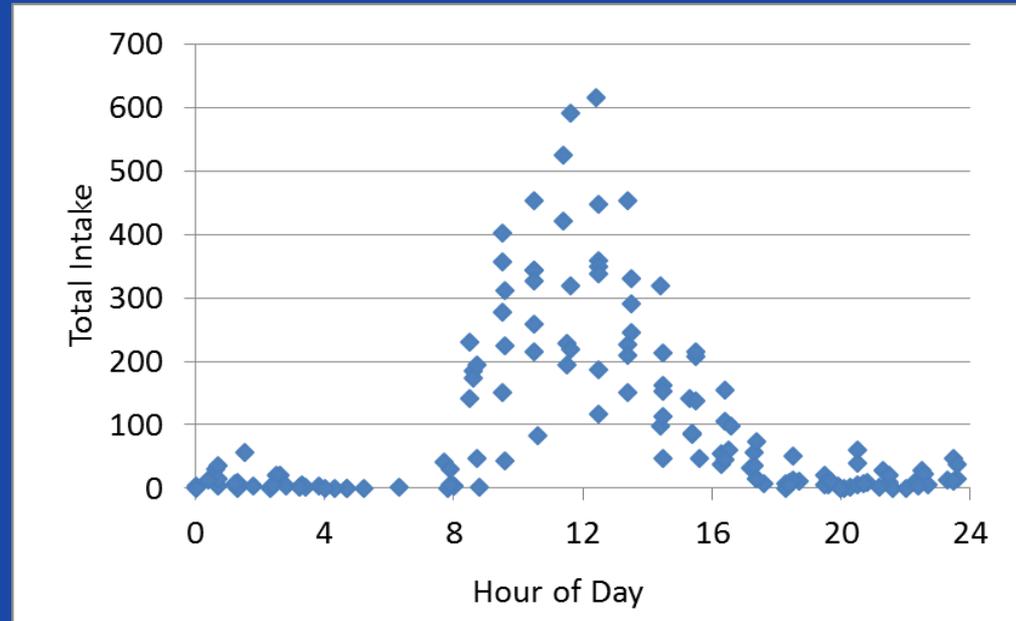
Winter Grazing Research at Havre

- Winter of 2016/2017 and 2017/2018

- Influence of Supplement Intake and Cow Age on Grazing Behavior and Rangeland Use Patterns
 - Sam Wyffels, Jan Bowman, Lance McNew, Darrin Boss, Cory Parsons, Julia Dafoe, Alyson Hicks-Lynch, and Tim DelCurto

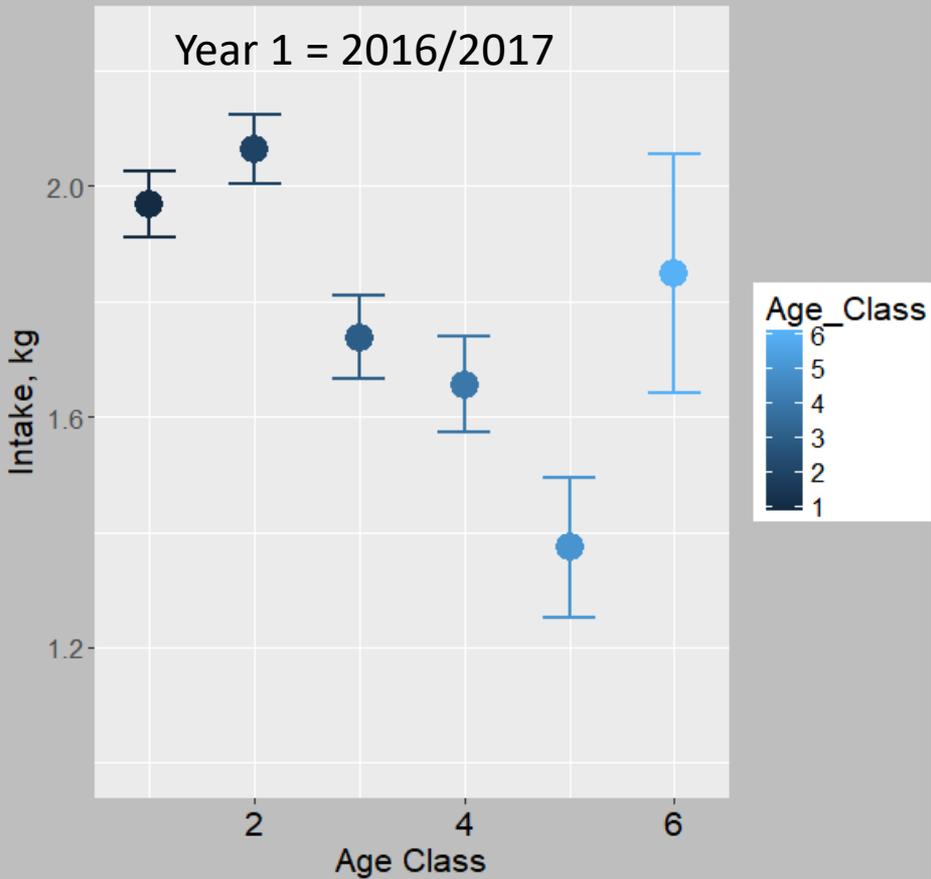
Feeding Bout Data

- 45 d (yr 1) & 60 d (yr 2):
 - 42,472 visits yr 1 & 65,873 yr 2
 - Cow EID read
 - Time of day
 - Entry and exit are recorded
 - Coupled with weather station and GPS collar data
 - Avg Supple Intake = 2.75 lbs (1.25 kg)
 - 264/272 (yr 1) and 302/306 (yr 2) cows were recorded



Variation in Supplement Intake

Year 1 = 2016/2017



Variation in Supplement Intake

Year 2 = 2017/2018

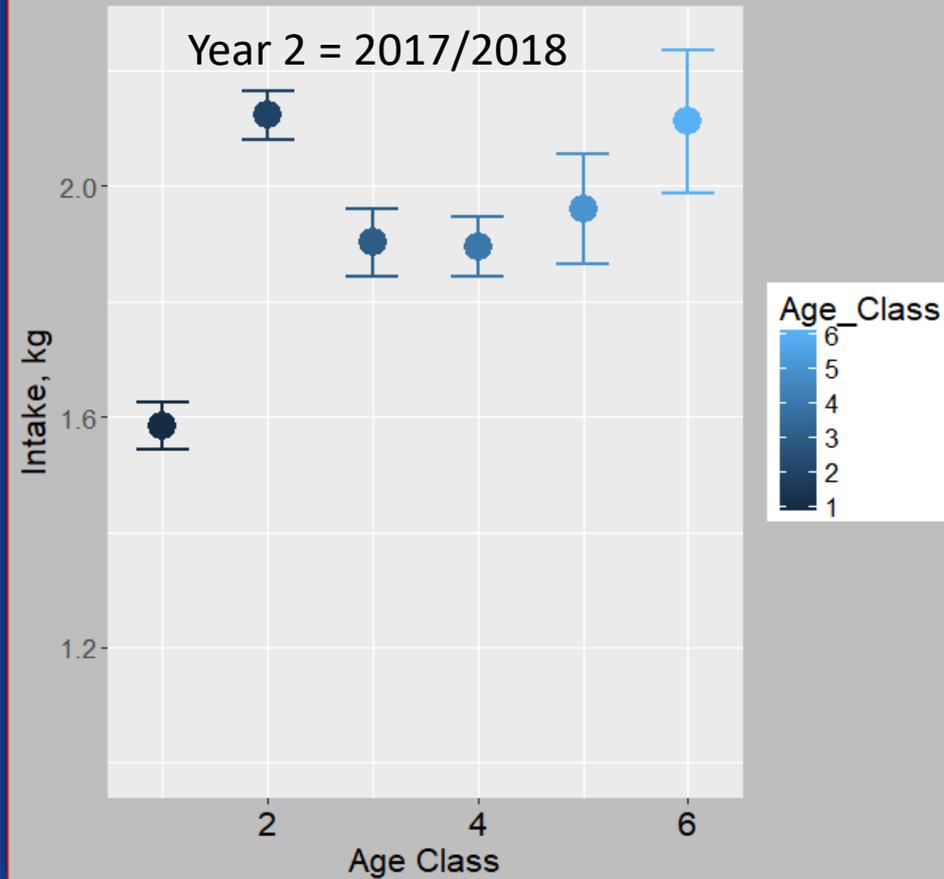


Figure 1. The influence of cow age on supplement intake and variation in intake. Age class 1 = yearling heifers, age class 2 = 2 & 3 yr cows, age class 3 = 4 & 5 yr cows, age class 4 = 6 & 7 yr cows, age class 5 = 8 & 9 yr cows, and age class 6 = 10 & older (Wyffels et al., 2020).

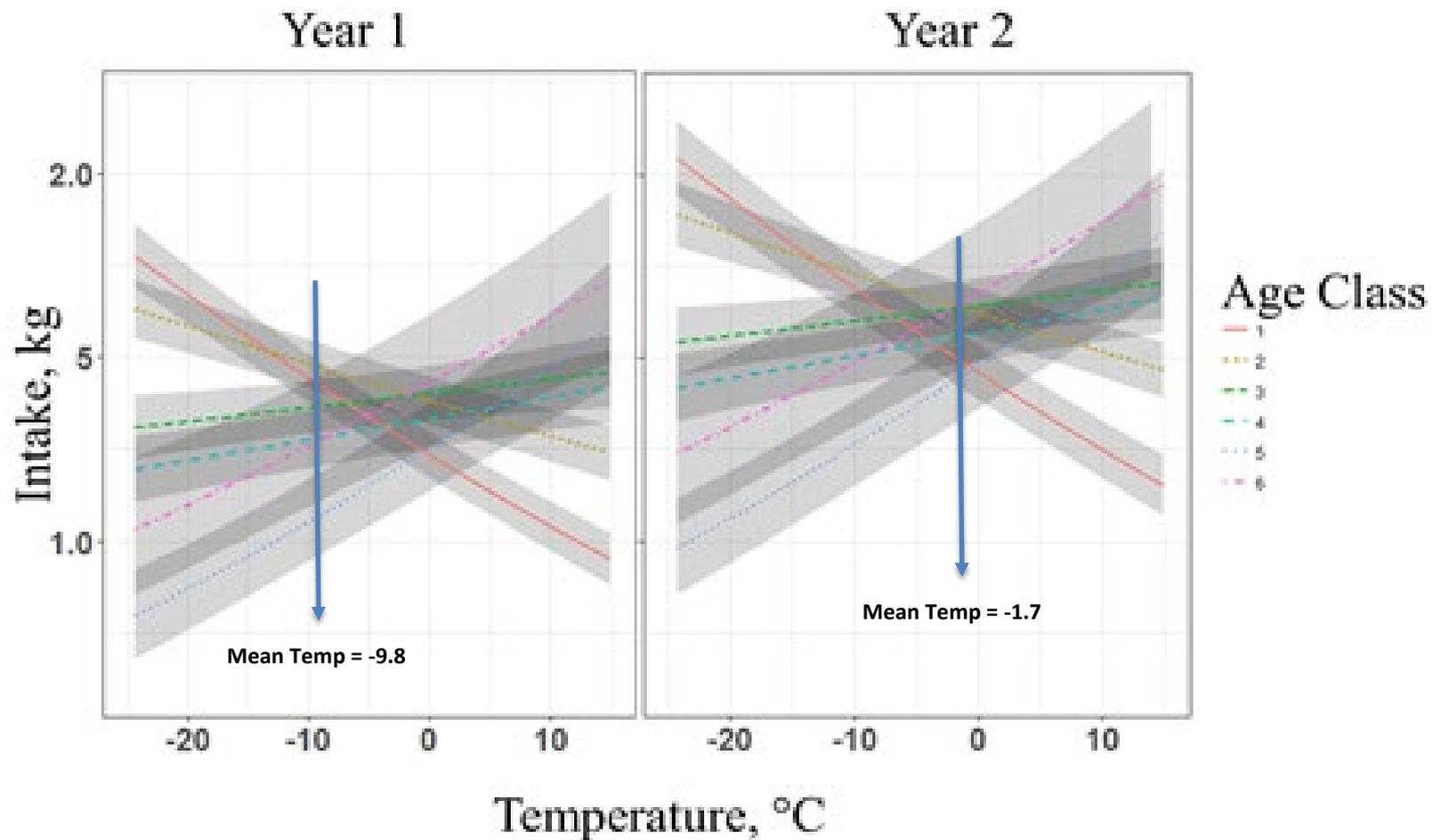


Figure 2. The influence of environment and cow age on supplement intake behavior. Best-Fit model involved mean daily temperature and cow age (Wyffels et al., 2020).

Winter Grazing Research at MSU

- Winter of 2018 to Present

- Influence of Supplementation Strategy, Protein/Mineral Status and Cow Age/Type on Grazing Behavior and Rangeland Use Patterns
 - Parsons et al., 2021 *Animals*
 - Davis, Wyffels & Kirkpatrick (in progress)
 - Marques - minerals
- Studies are unique with environmental interaction with the above treatments and grazing behavior/distribution on extensive landscapes and environment

The influence of RFI classification and cow age on body weight and body condition change, supplementation intake and grazing behavior of beef cattle winter grazing mixed-grass rangelands

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Materials & Methods

* MSU AACUC #2018-AA12

* n=205 yr-1 and n=203 yr-2

- ❖ Pregnant Angus beef cows
- ❖ 1 – 9 years of age
- ❖ Performance trial 84 days
- ❖ Supplement intake trial last 45 days
 - ❖ mid-October – early January
 - ❖ Winters of 2018-2019 and 2019-2020

* Cattle were categorized by RFI based on GrowSafe RFI tests when they were yearling heifers (9-11 months of age.)

- ❖ low (< -0.50 SD from mean),
- ❖ average ($+/- 0.50$ SD from mean) or
- ❖ high ($> +0.50$ SD from the mean)



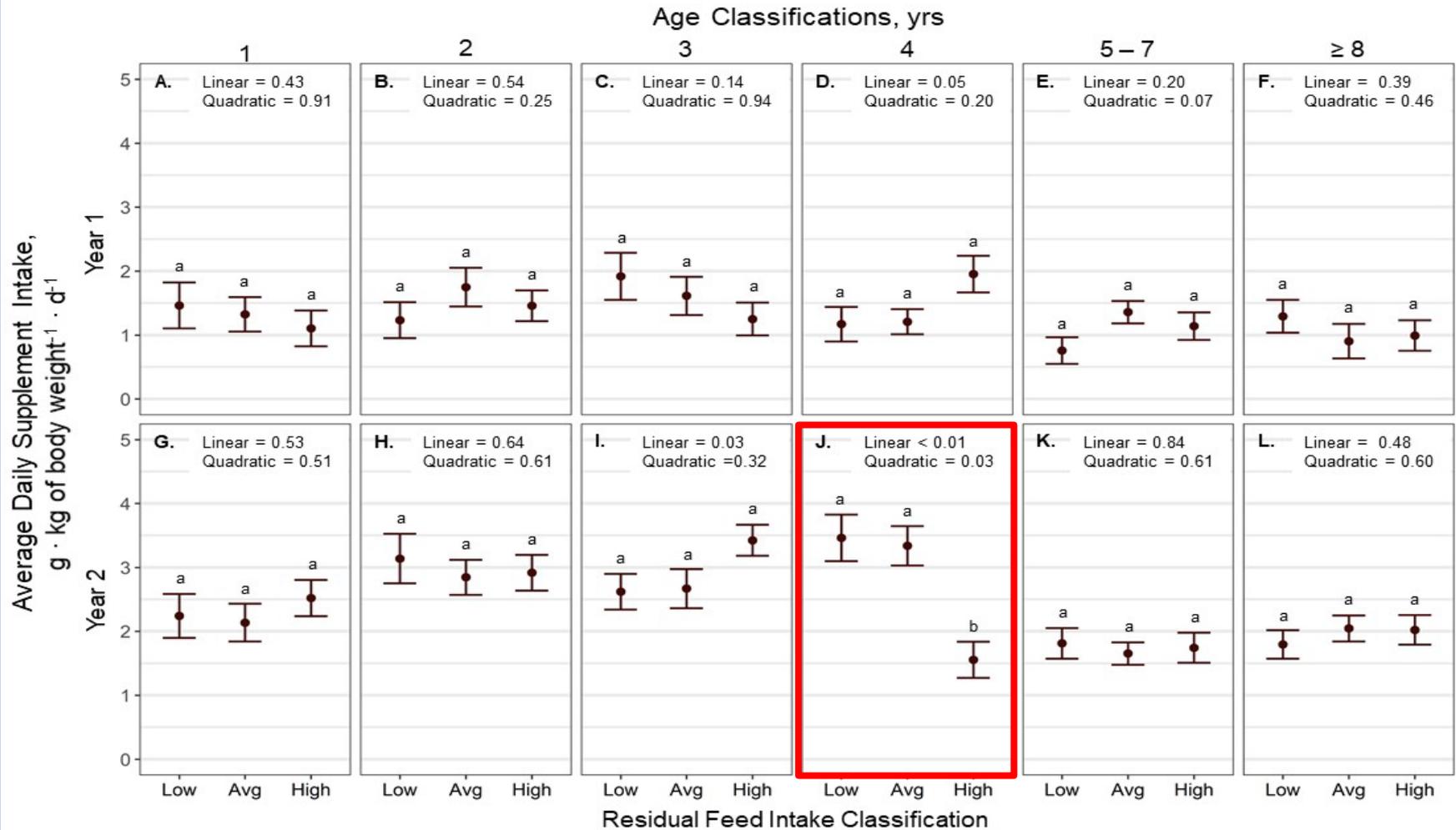
Forage Conditions

Annual average grass quality and quantity, Northern Agricultural Research Center Thackeray Ranch, Havre, MT

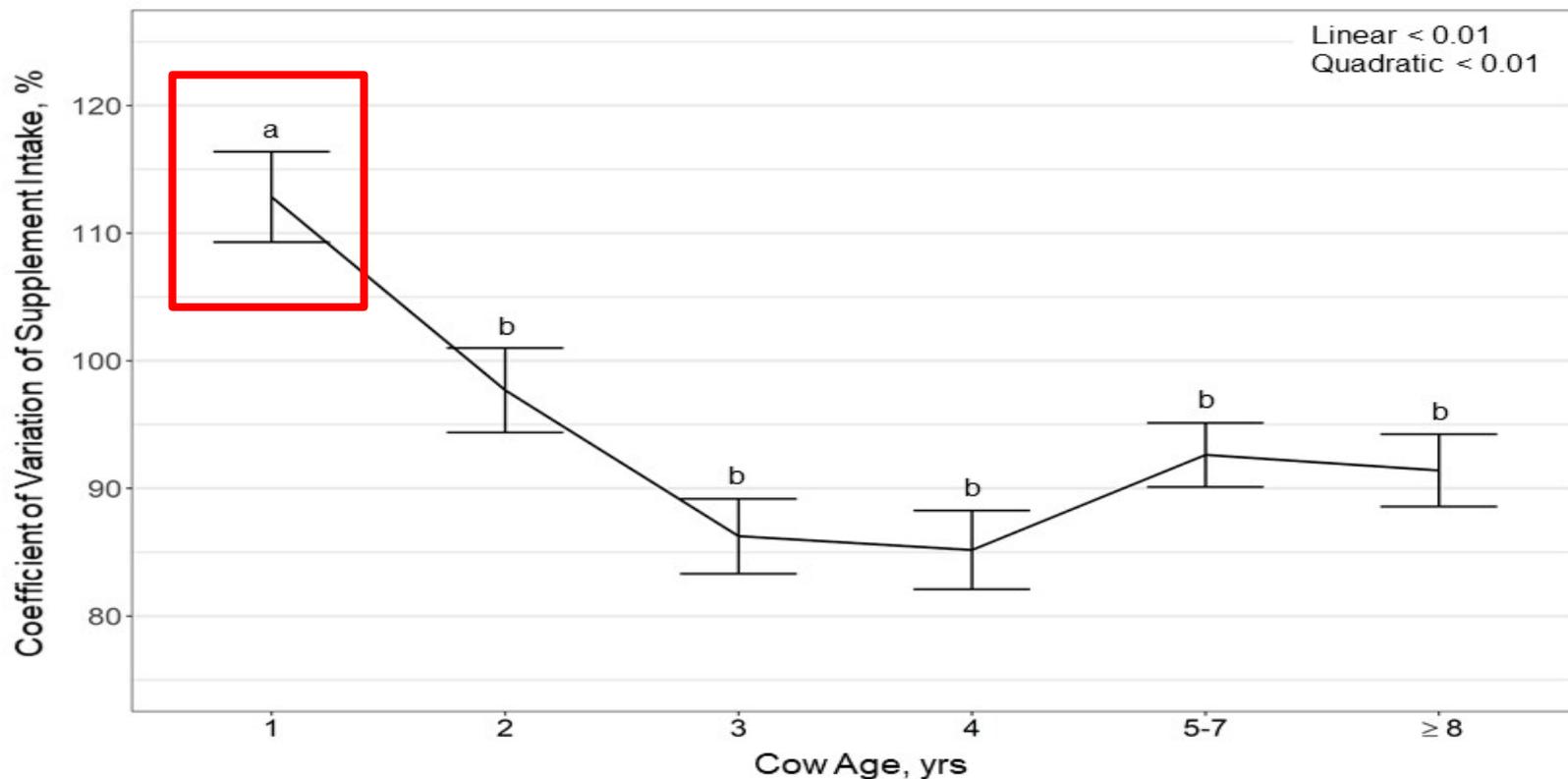
	Production (kg · ha ⁻¹)	CP (%)	NDF (%)	ADF (%)	TDN (%)
Yr 1	1790	5.4	63.2	41.9	56.0
Yr 2	1456	5.4	66.9	39.9	55.0



Results: Daily supplement intake



Influence of cow age on variation of supplement intake



Intake Behavior Study

Impacts of form of salt-limited supplement on supplement intake behavior and performance with yearling heifers grazing dryland pastures

- White et al., 2018

► Objectives:

1. Evaluate the effects of salt as an intake-limiter on supplement intake behavior and animal performance.
2. Evaluate the difference between loose form and pelleted form of a salt-limited supplement.



Materials and Methods

▶ 3 Treatment Groups:

1. Control (no supplement)
2. Pelleted form
3. Loose form



Ingredient	Loose	Pelleted
	Percent	Percent
Wheat Midds, STD	57.10	53.54
Salt, Bulk	25.00	25.00
Soybean - Hi Pro	8.50	9.50
Calcium Carbonate	5.50	5.45
Molasses, Cane	—	5.00
Lots-O-Lass	2.50	—
Bentonite Powder	1.00	1.00
Phos 21% Dical	0.15	0.25
CHS TM- Range ²	0.10	0.10
Bovatec 91-Dry ¹	0.07	0.07
Selenium 1600	0.06	0.06
CHS PN VT-Range ²	0.02	0.02
Chemical		
TDN	48.68	47.64
CP	14.14	14.09
ADF	6.56	6.23
NDF	21.09	19.92

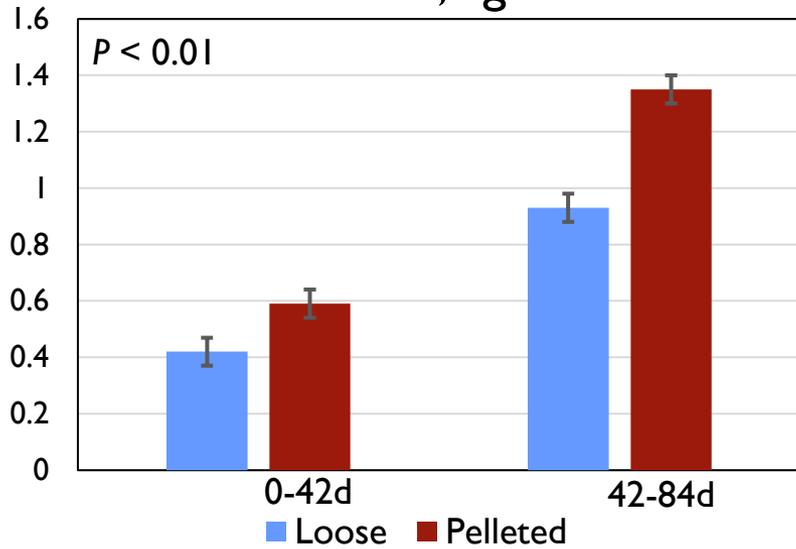
¹Bovatec® by Zoetis Services LLC, Parsippany, NJ

²CHS Inc., Sioux Falls, SD

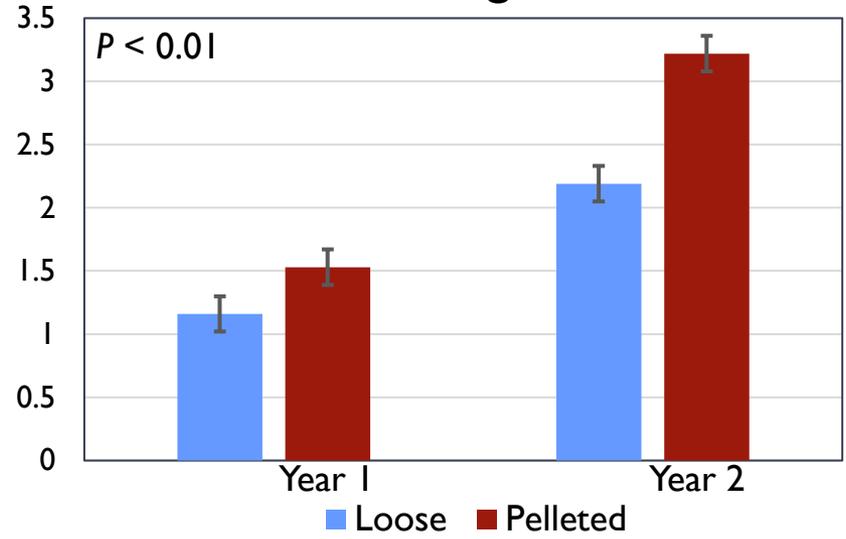
Heifers were weighed and body condition scored on days 0, 42, and 84. Individual dry matter supplement intake, and intake behavior were measured for each heifer.



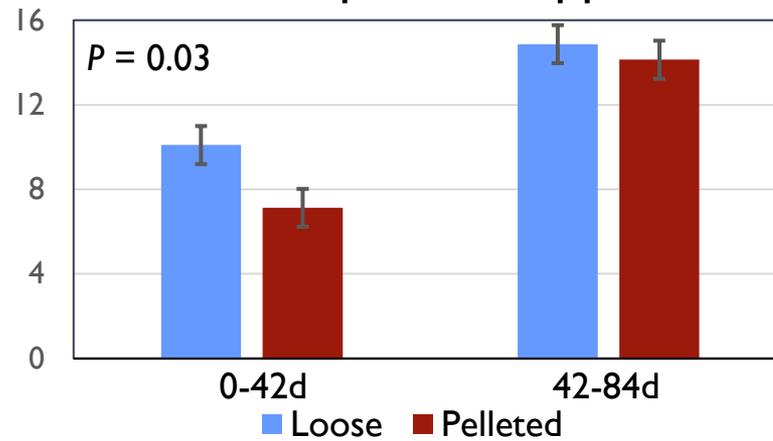
Intake, kg



Intake rate, g/min



Time spent at supp.

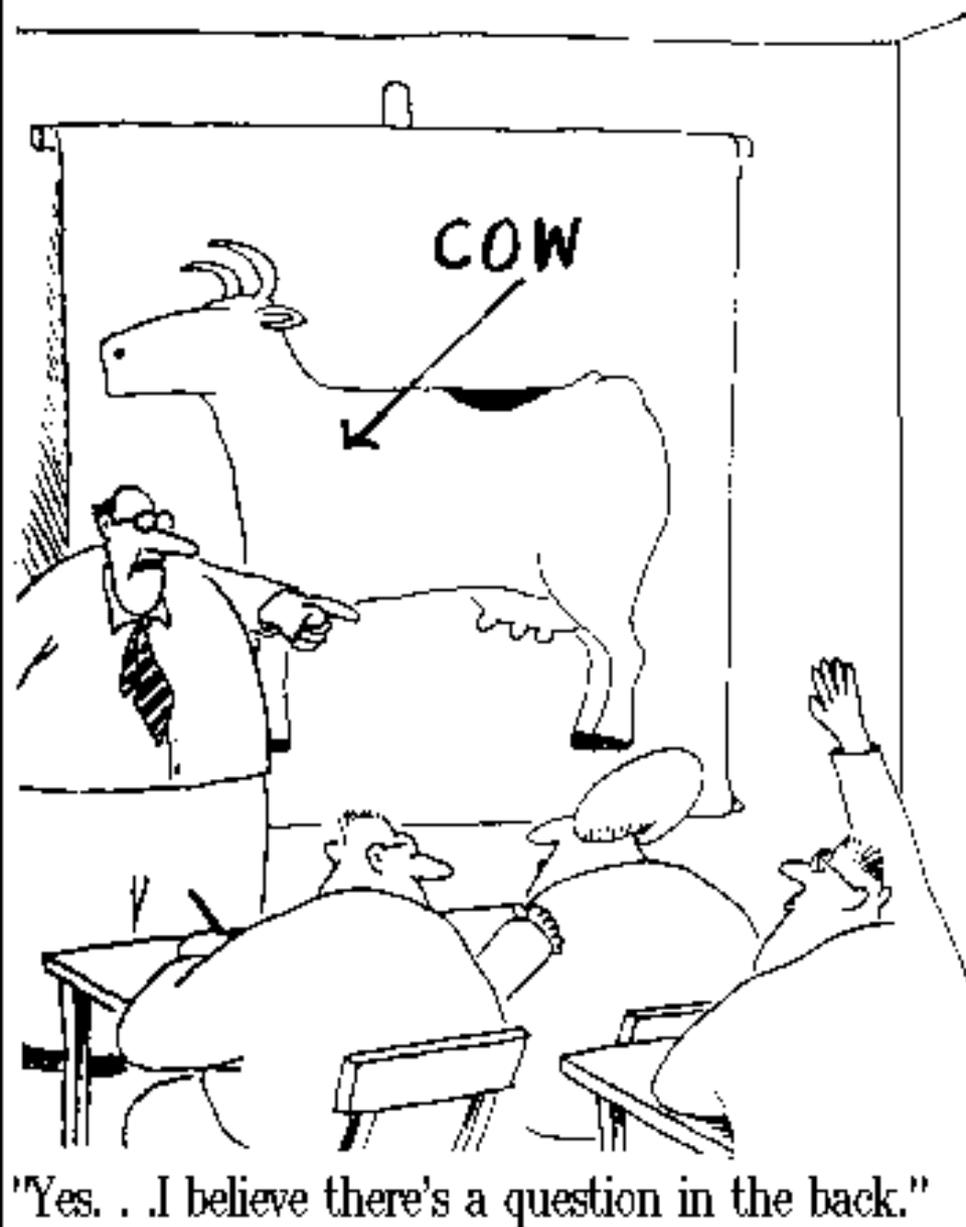


Final Thoughts: Self-Fed Supplement Use

- Significant Variation within days, over the season, and among animals
- Weekly averages are encouraging
- Further research is needed



Larson



Thank You!
Questions?

"Yes. . . I believe there's a question in the back."

Research Support

Nancy
Cameron
Endowment

BAIR RANCH
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