

Designing Research for the Montana Beef Industry

2017 Montana Nutrition Conference & Livestock Forum

Range Beef Cattle
Nutrition & Management
Department of Animal &
Range Sciences

Cameron Endowed Professorship



- Funding & Support:
 - Bair Foundation
 - Montana Stockgrowers Association
 - Others ..
- Position Description:
 - 60% Research
 - 30% Teaching
 - 10% Service
- My Thoughts ..

Designing Research for the Montana Beef Industry!



Social Acceptability

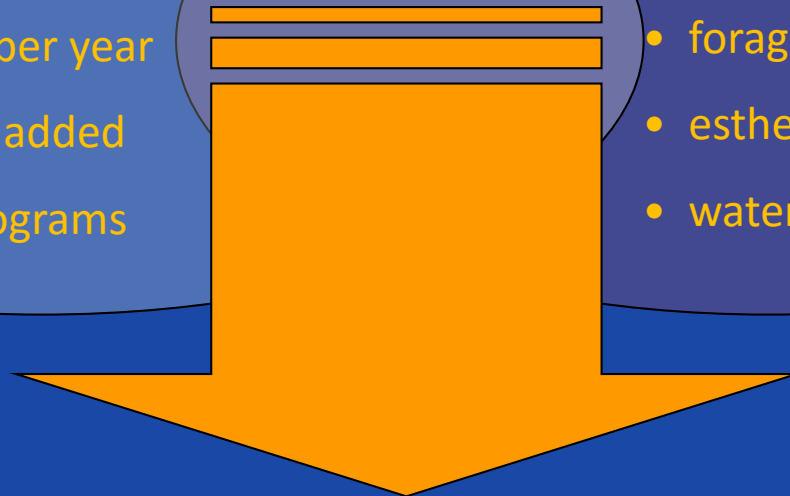
- quality of life
- values, tradition, and history
- honor and dignity

Economic Sustainability

- production per cow
- cost per cow per year
- genetic value added
- marketing programs

Ecologic Sustainability

- plant & animal biodiversity
- forage production
- esthetic values
- water and riparian values



Sustainable Range Beef Production Systems

DelCurto & Olson, 2010

Beef Production Systems

- Understanding Grazing Behavior
 - Landscape use patterns
 - Distribution relative to water
- Sustainable Management Systems for Montana Producers
 - Beef Cattle/wildlife interactions
 - Beef Cattle/vegetation interactions

Strategic Supplementation Optimizes the Use of Low-Quality Forages

- Past Research



Beef Production Systems

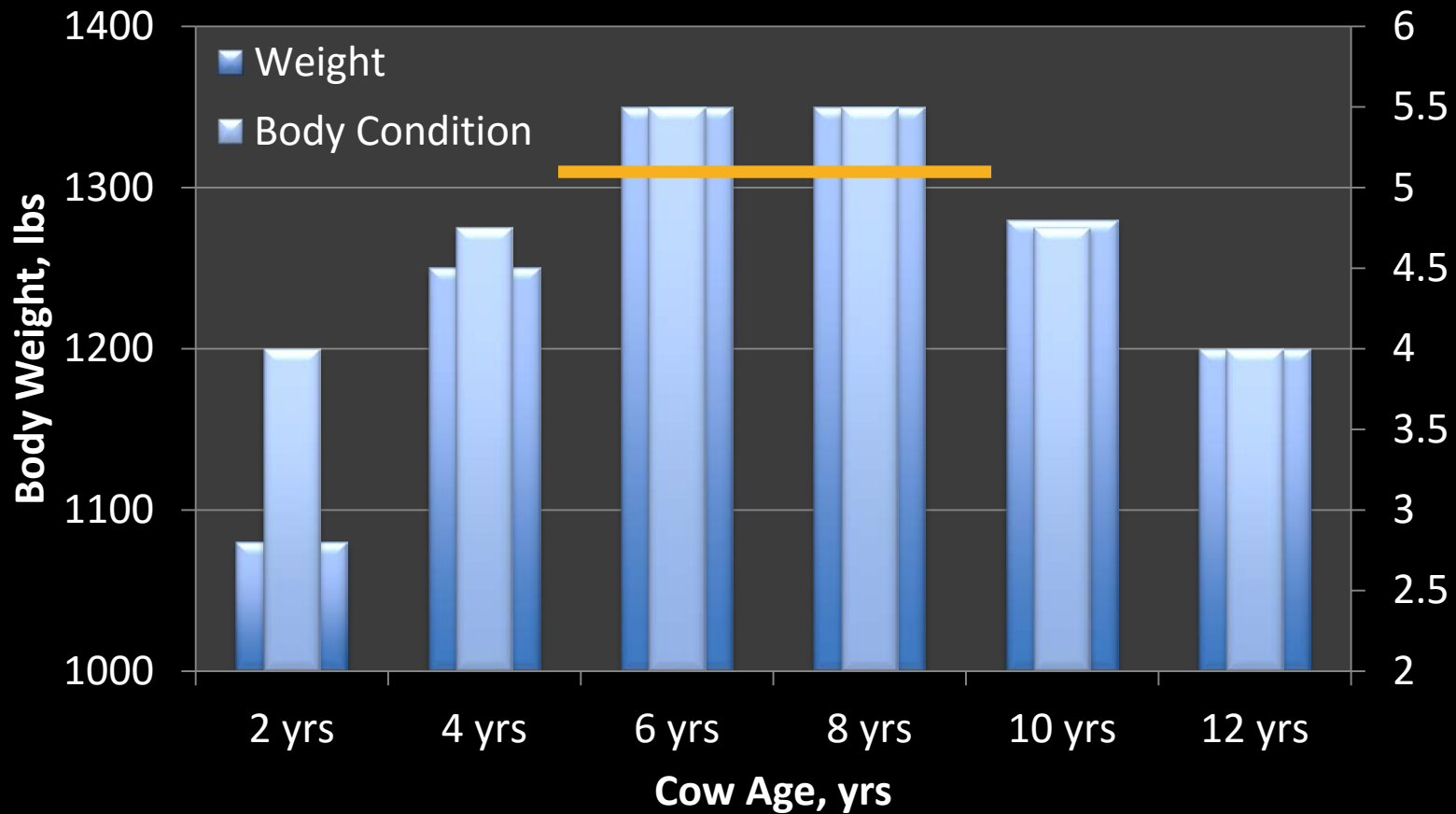
- Optimal Supplementation Strategies
 - Individual cow intake, feed intake ratios
 - Forage dynamics in winter grazing scenarios
 - Composition of diets and diet quality with increased levels of use
- Matching Production Expectation with the Environment
- Evaluating Beef Cow Efficiency
 - Should cows be able to wean 50% of the BW
 - Production per unit of cows exposed
 - Cow size & production efficiency

Beef Cattle Nutritional Requirements:

Cow Size	Milking Level	Lb of milk/ cow/day	Lb TDN Needed	Lb CP Needed
1000	Below Avg	10	12.4	1.9
1000	Average	20	14.8	2.6
1000	Above Avg	30	17.2	3.5
1200	Below Avg	10	13.8	2.1
1200	Average	20	16.2	2.8
1200	Above Avg	30	18.7	3.5
1400	Below Avg	10	15.2	2.3
1400	Average	20	17.6	3.0
1400	Above Avg	30	20.1	3.7

Source: Nutrient Requirements of Beef Cattle; 1984, 1996 & 2016.

Typical Herd Weight & Condition



Feed & manage to age group & condition

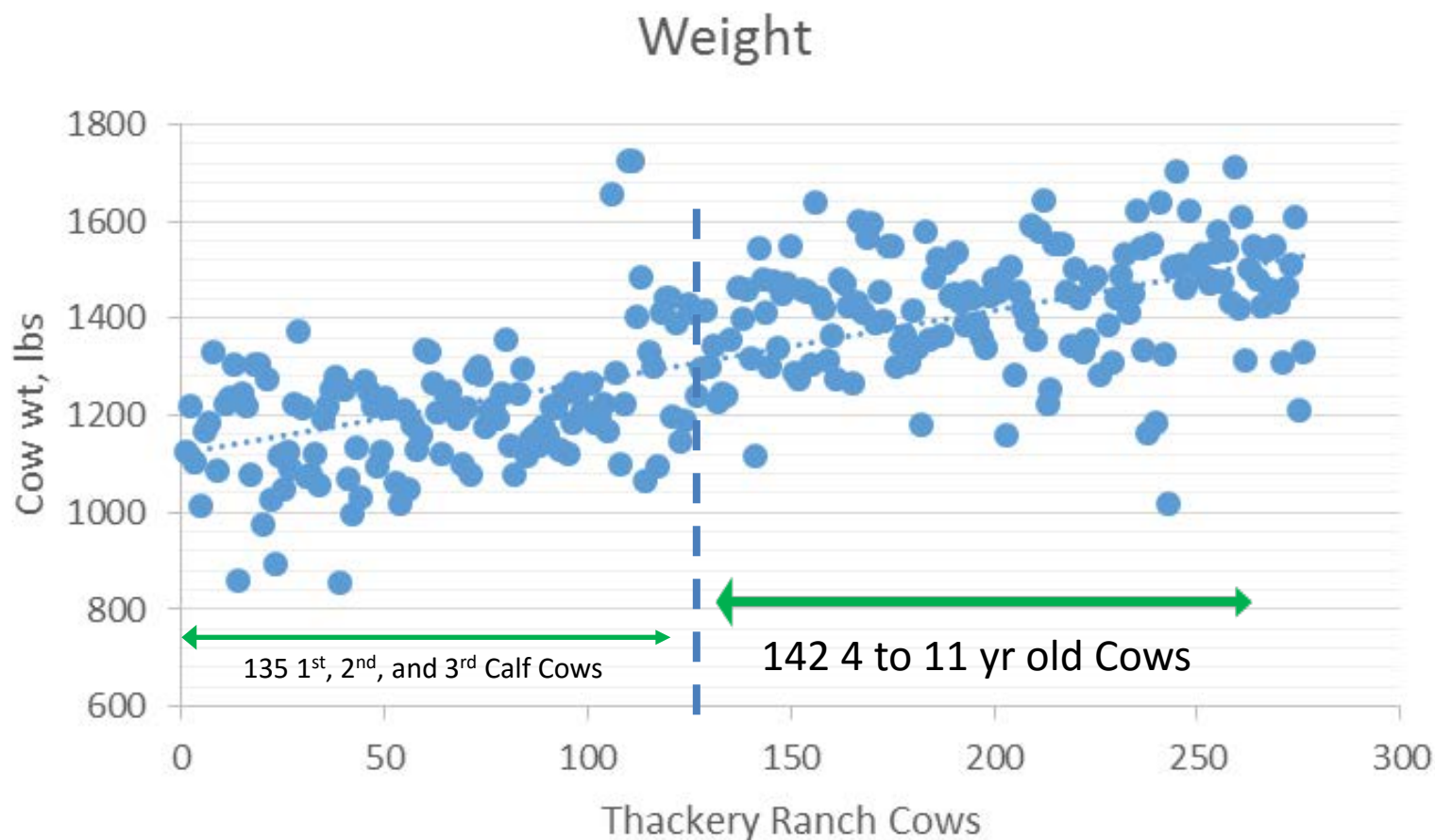
Winter Grazing Research 2016 & 2017 at Havre

- 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
 - Vegetation: production and cover by species, forage quality, robel structure estimates
 - Soil organic matter, temperature maps (GIS Layers)

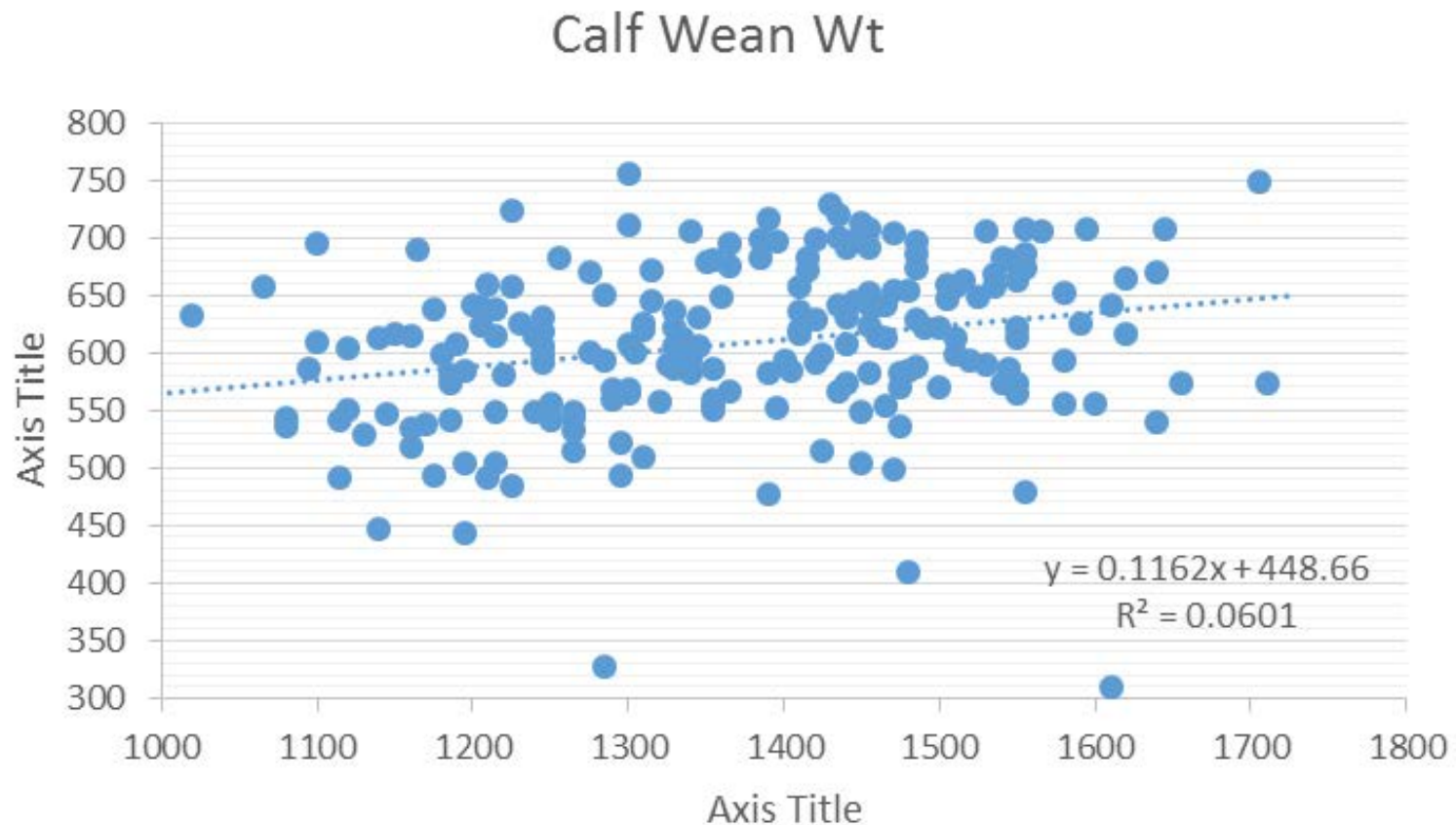
Winter Grazing Research 2016 & 2017 at Havre

- Influence of Cow % BW Weaned and Size on Supplement Intake and Grazing Behavior
 - Alyson Hicks-Lynch, Tim DelCurto, Jan Bowman, Darrin Boss, Cory Parsons, Julia Dafoe, and Sam Wyffels
 - Objective: Design a 2X2 Factorial design contrast Cow Size (weight) and % BW weaned

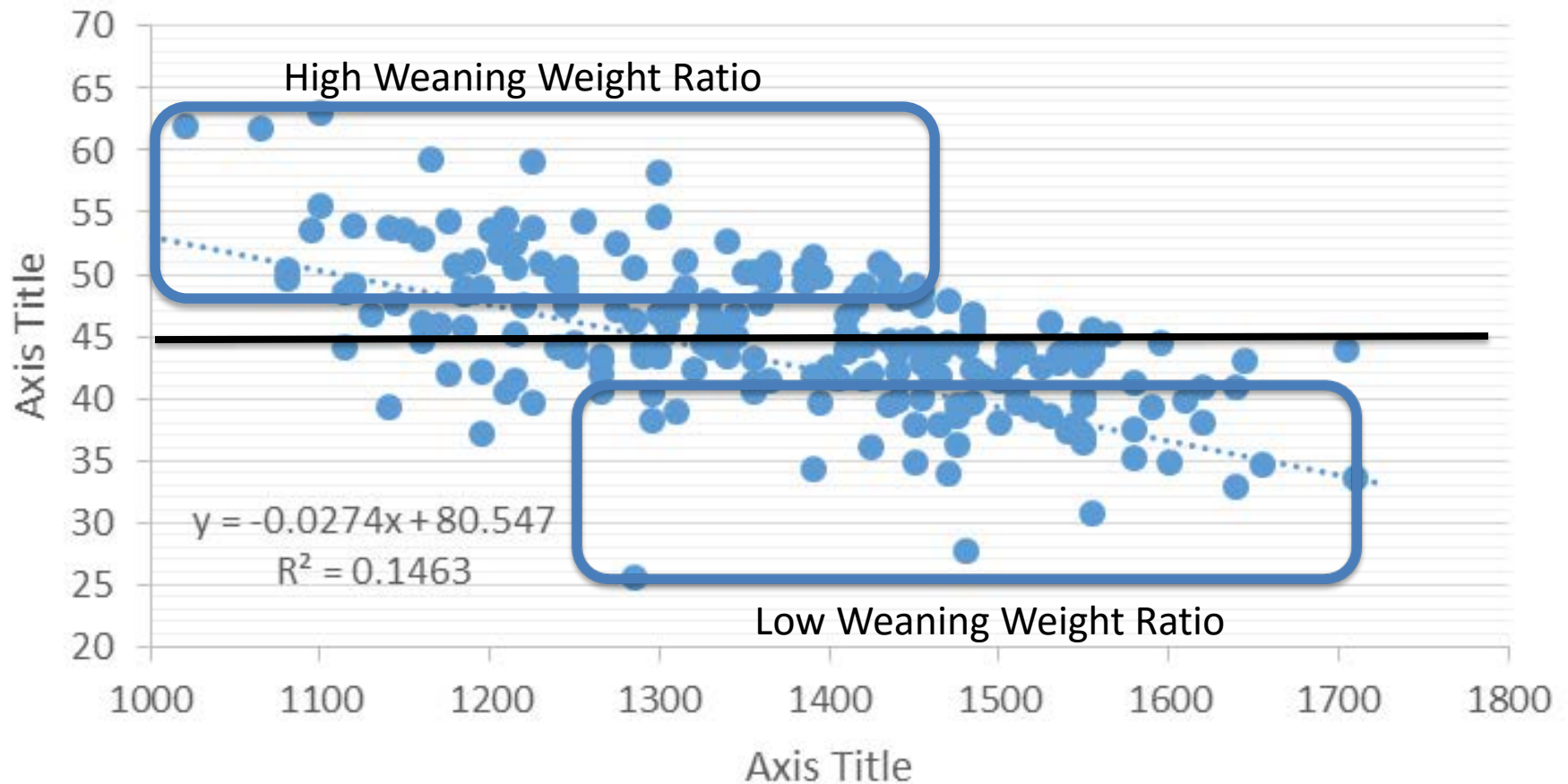
Cows at the Thackery Ranch 2016



Cow Weight vs Calf Weaning Wt



%BW Weaned vs Cow Weight



The Supplement

- We are working with Kim Hager CHS
- Salt-limited 30% CP supplement fortified with vitamins and minerals
 - 25% Salt
 - Bentonite used as binder for pelleting
- ✓ Potential Research Project at BART Farm

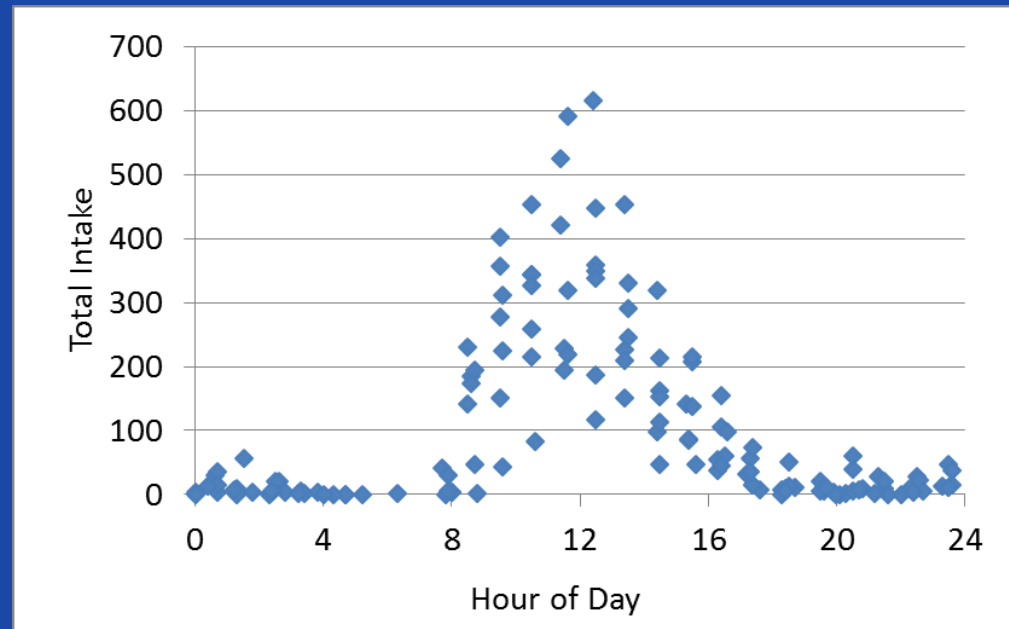
Research Techniques

- Lotek 3300 GPS Collars and Activity monitors
- Smart Feed Pro Feeders by C-Lock

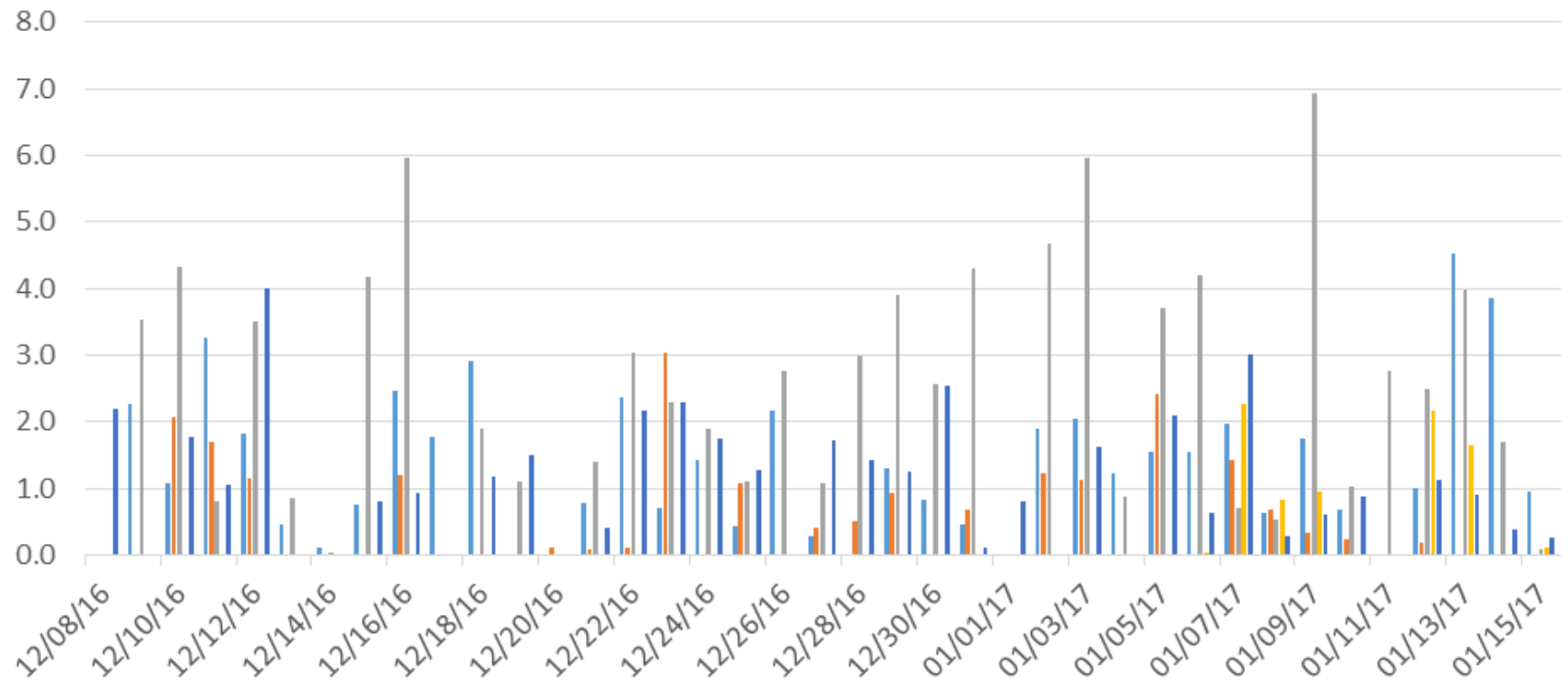


Preliminary Data

- 45 day grazing period:
 - 42,472 visits to the feeders
 - 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 cows were recorded



Supplement Intake Variation



Supple. Intake vs Avg. Temperature



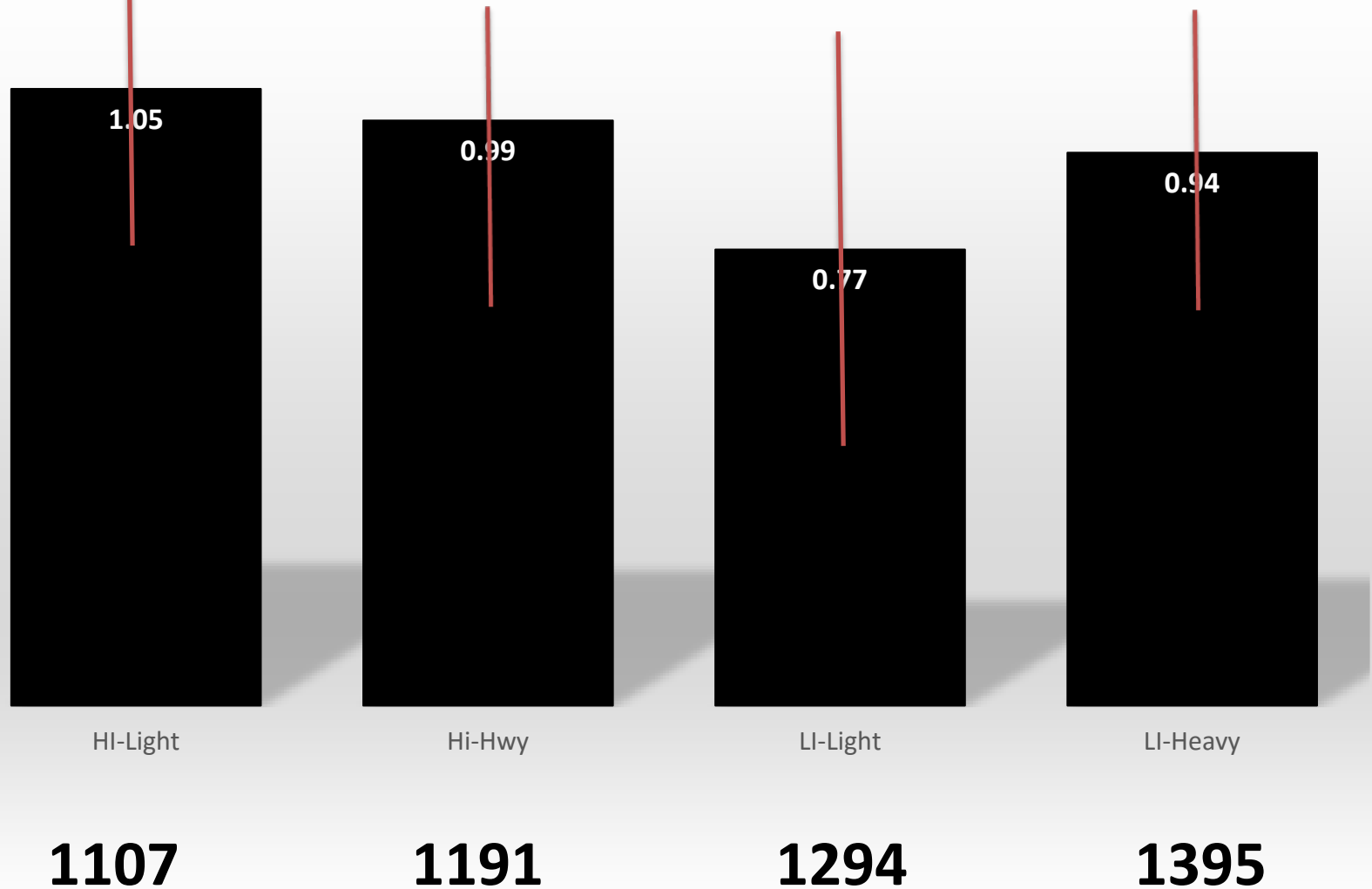
Wind/Gust speed mph



Cow Efficiency Study

- Using the NARC cattle records:
 - We have identified the high indexing ($> 53\%$ BW Weaned) and the low indexing ($< 45\%$ BW Weaned Cows)
 - Within index groups we further sorted by cow size
- Treatment Groups:
 1. High Index Light Wt Cows (1107 BW & 57% WR)
 2. High Index Heavy Wt Cows (1191 BW & 55% WR)
 3. Low Index Light Wt Cows (1294 BW & 43% WR)
 4. Low Index Heavy Wt Cows (1395 BW & 43% WR)

Supplement Intake vs Biological Type



Cow Efficiency Study (cont'):

- Two year study
- Three Phases
 - Winter Grazing Segment
 - Spring “dry-lot” intake study (total DMI & Milk)
 - Late Spring/Early Summer Grazing
- Potential Findings
 - How does performance translate to grazing behavior & distribution
 - What is consumption per unit of production

Future Research

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



Future Research (cont')

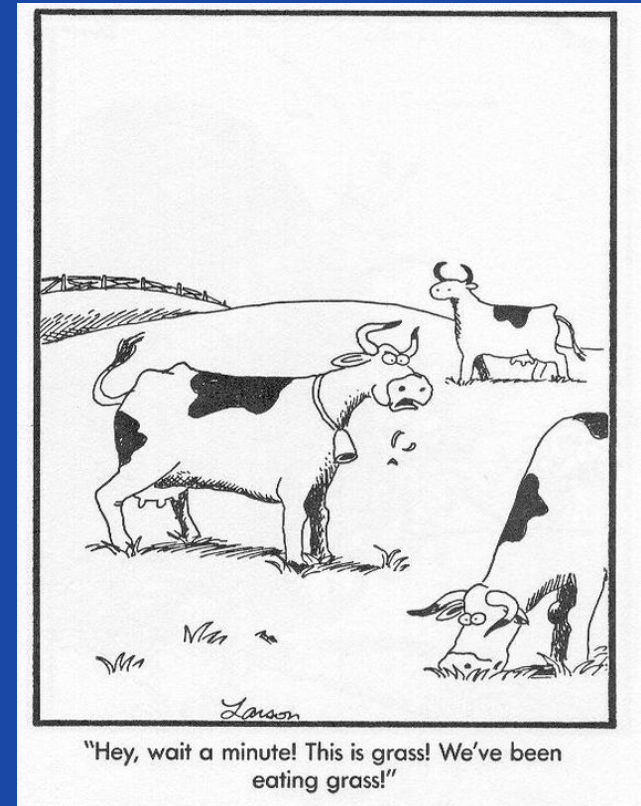
- **Matching Cow Type and Optimal Use of Montana Rangelands**

- Influence of Cow Size
- Influence of Productivity (ie. % BW weaned)
- Milk production
- Stage of Production

Future Research (cont')

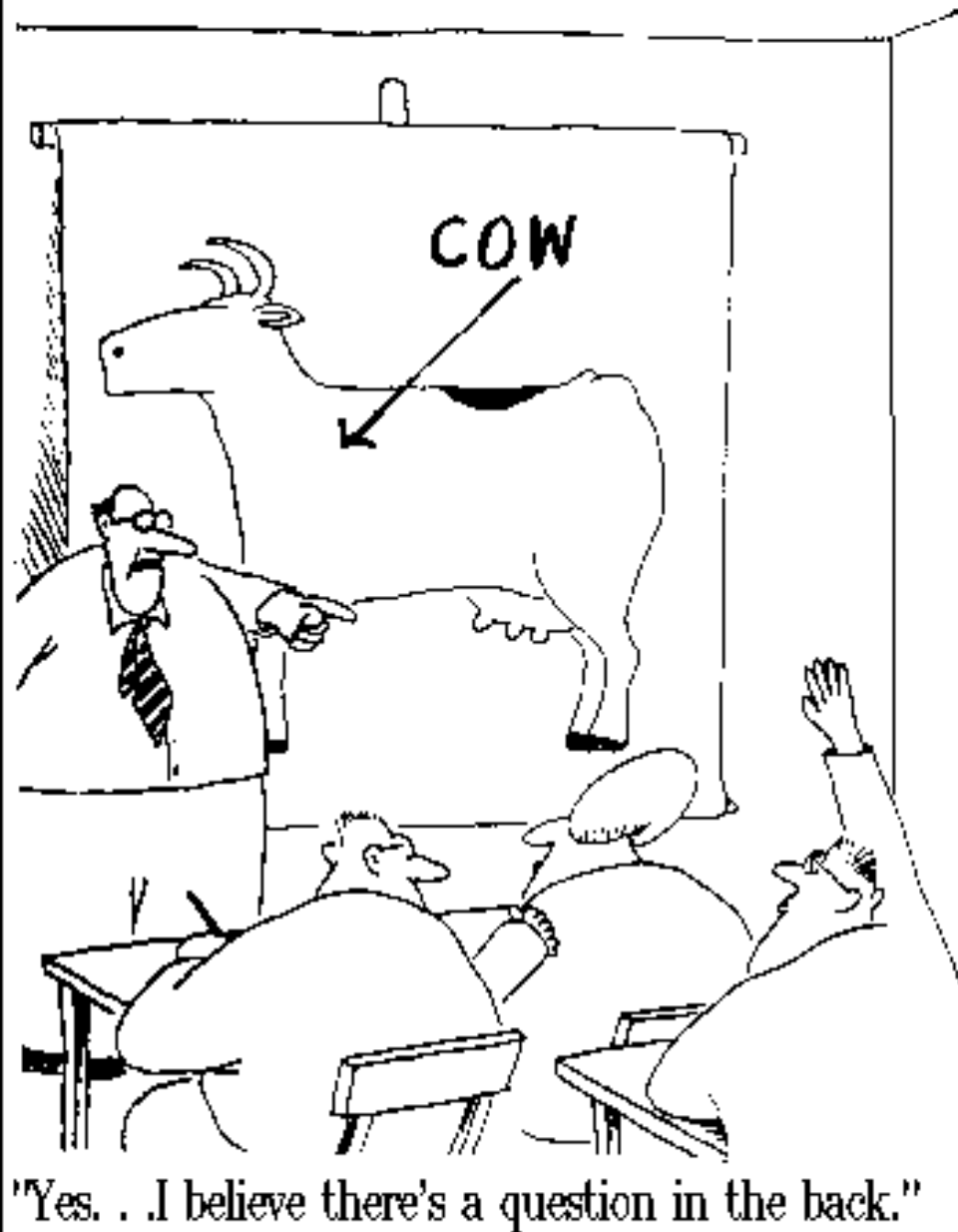
- Sustainable Management Systems for Montana Producers

- Beef Cattle/wildlife interactions
- Beef Cattle/vegetation interactions
 - Targeted grazing
- Distribution relative to riparian areas
 - Water development and optimal use





Larson



Thank You!

Questions?