

Nancy Cameron Chair Update:

**2018 Montana Nutrition
Conference & Livestock
Forum**



Land & Forage Resources in the Western US



Western Beef Cattle Industry

- *20% of US cow/calf industry (6.4 mil beef cows)*
 - *Montana represents 23% of the Western US Beef Production*
- *larger ranches (> 100 hd) are often dependent on public lands*
- *limited nutritional environments*
- *substantial winter feed costs*
 - *1.5 to 3 tons of harvested forage per cow*
- *increased focus on extended, ecologically sustainable, grazing*

Problem & Justification

- Use of fall & winter forages will increase:
 - Economical alternative to harvested forages
 - Allows for increased use of rangelands outside of the growing season
 - Extended grazing seasons (decreased confinement feeding) may have physiological benefits
 - BUT, **optimal use of high-fiber, low-quality, forages**
- Cattle will be selected for environmental “fit”
- New technologies will assist in refining existing knowledge of strategic supplementation

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

Salt Limited Supplement Intake: Impacts of Salt Level, Frequency, and Form of Supplement on Intake, Nutrient Digestion, and Variability of Supplement Intake in Beef Cattle

Hayley White MS program

Intake Variation Study:

- Approximately 60 crossbred heifers
- Comparing intake and intake variation between two forms of salt-limited supplement, pelleted or loose, using SmartFeed Pro Trailer.
- 3 Treatment Groups:
 1. Control (no supplement)
 2. Pelleted form
 3. Loose form
- Heifers will be weighed and body condition scored on days 0, 42, and 84. Individual dry matter supplement intake, frequency of feed events, and total number of feed events will be measured for each heifer.



Digestion Study

- Eight Ruminally Cannulated Heifers in Two 4X5 Latin Squares
- Treatments
 1. Control
 2. 0.23 kg NaCl daily
 3. 0.45 kg NaCl alternate days
 4. 0.45 kg NaCl daily
 5. 0.90 kg NaCl alternate days
- Square 1 Low Quality Forage 7% CP, 50% TDN
- Square 2 Moderate Quality Forage 10% CP, 55% TDN
- Research Techniques:
 - 20 d digestion study period with 10 d adaptation, 7 d feed intake and fecal collection period, with ruminal profiles conducted on d 18 and 19 with completed ruminal evacuations on d 20.
 - Ruminal VFA, microbial populations, and digesta kinetics

Alfalfa Supplementation of Beef Cattle Winter Grazing Rangelands: Influence on Beef Cattle Performance, Grazing Behavior, and Interaction with Environment

- Noah Davis MS Program:
- Treatments
 1. non-supplemented control cows
 2. 1.5 kg of Alfalfa Pellets
 3. 3.0 kg of Alfalfa Pellets
- DESIGN:
 - 150 hd of dry pregnant mature cows (50 per trt)
 - Feed Supplements late November to mid-February
 - Two year study

Materials & Methods

- 84 day supplementation period (Red Bluff)
- Beef cattle performance:
 - Cow BW & Condition at d 0, 42, 84, breeding, and weaning
 - Calf birth wt, weaning weights, ADG
 - Calving interval, pregnancy to AI & overall
- Vegetation response to environmental extremes
 - Four key grass species sampled weekly for 12 week period (5 replicate sites)
- Influence of Protein Status on Grazing Distribution & Behavior
 - GPS collars, activity monitors, and GIS layers

Goals & Objectives

I. Strategic/Precision Supplementation of Beef Cattle Grazing dormant, low-quality, rangelands

❖ FUTURE PROJECTS:

3. Variation in Supplement Intake with Baked-Molasses Protein Blocks: Influence of Block Hardness and Trace Mineral Salt Availability
 - Tyrell McClain Masters Project
4. Variation of Supplement Intake of hand-fed Versus Self-Fed Protein Supplements and Subsequent Impacts on Beef Cattle Performance & Use of Winter Rangelands
 - Francis Arias Masters Project

Goals & Objectives

II. Matching Beef Cattle Production to Western Rangeland Environments

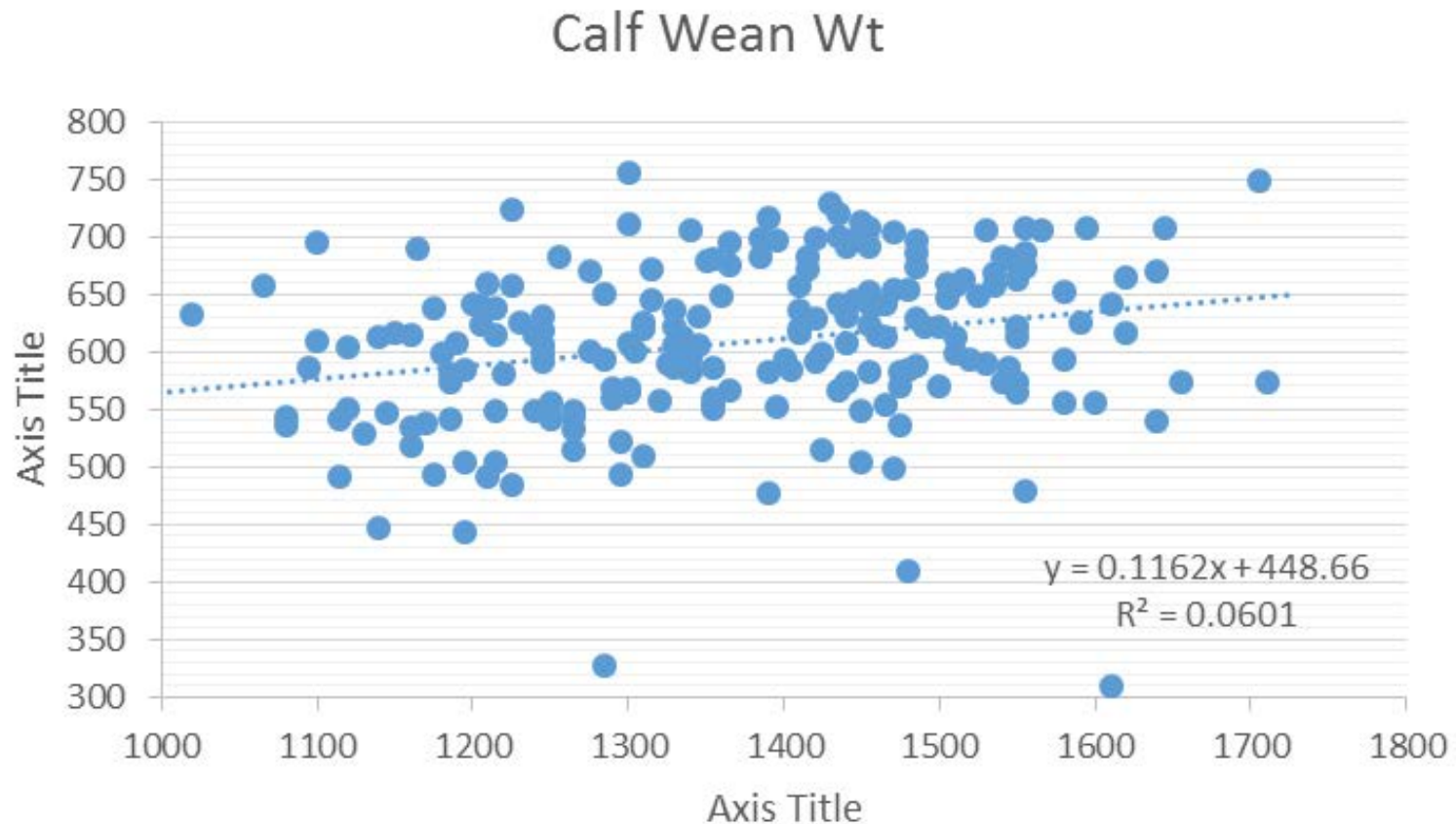
1. Influence of Mature Cow Weaning Weight Ratios and Cow Size on Intake and Grazing Behavior
 - Alyson Williams MS Program
2. Ability of Yearling Heifer Residual Feed Intake (RFI) Estimates to Predict Cow Productivity, Feed Intake and Grazing Behavior
 - Cory Parsons PhD Program

Influence of Mature Cow Weaning Weight Ratios and Cow Size on Intake and Grazing Behavior

- Alyson Williams MS Program

- **Using the NARC cattle records:**
 - We have identified the high indexing ($> 53\%$ BW Weaned) and the low indexing ($< 45\%$ BW Weaned Cows)
 - Only used cows that had weaned at least 3 calves and bred for the 4th.
 - Randomly selected cows at least .75 SD from the mean of % Body Weight Weaned
 - Within index groups we further sorted by cow size
- **Treatment Groups:**
 1. High Index, Light Wt Cows
 2. High Index, Heavy Wt Cows
 3. Low Index, Light Wt Cows
 4. Low Index, Heavy Wt Cows
- **Experimental Design:** CR Split Plot Design with Weaning Wt Ratio as the whole plot and Cow Size as the sub-plot.

Cow Weight vs Calf Weaning Wt



Biological Type Multi-parous Cows*

Biological Type:	adj. weight	weaning ratio	adj calf wt
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Fall 2016:

High Weaning Ratio, Light Cows	1107	57%	631
High Weaning Ratio, Heavy Cows	1191	55%	649
Low Weaning Ratio, Light Cows	1294	43%	552
Low Weaning Ratio, Heavy Cow	1395	43%	596

Fall 2017:

High Weaning Ratio, Light Cows	1118	55%	619
High Weaning Ratio, Heavy Cows	1213	53%	647
Low Weaning Ratio, Light Cows	1330	42%	560
Low Weaning Ratio, Heavy Cow	1424	42%	599

*selected cows had weaned at least three calves and were bred with the 4th calf

Goals & Objectives

III. Develop Research Techniques in Range Beef Cattle Nutrition

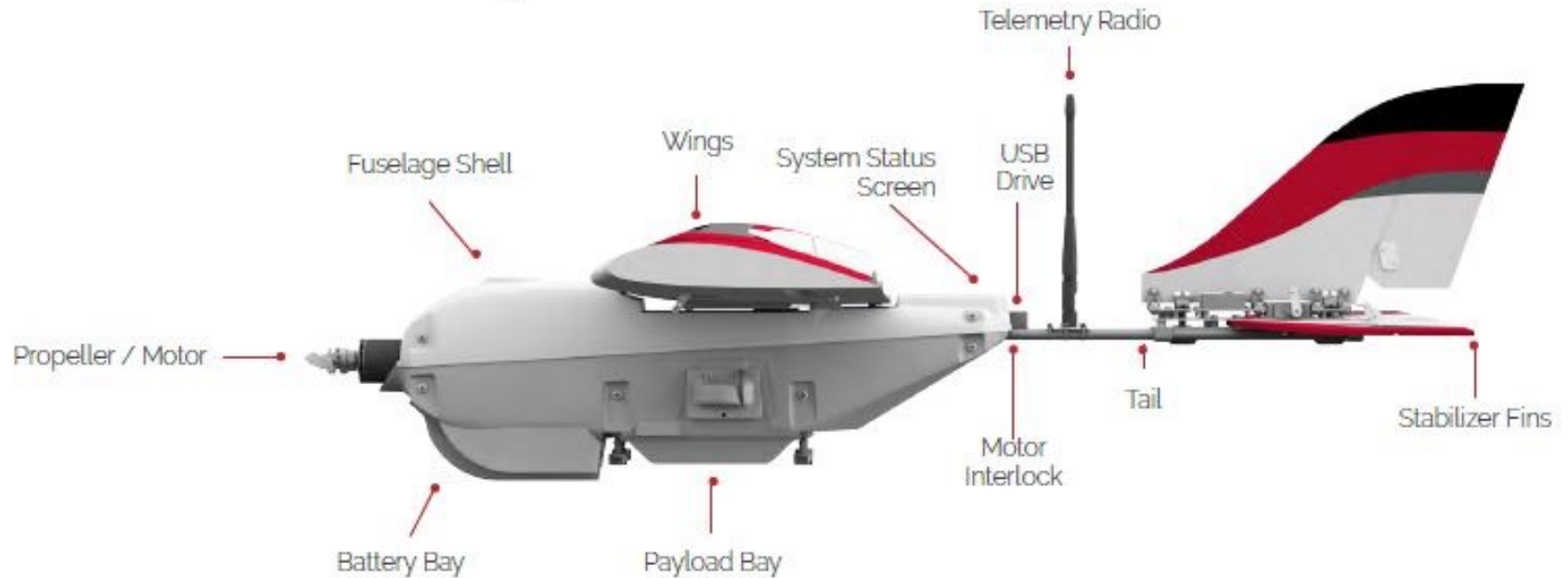


Validation Study Needs:

1. How does “stocking rate” influence supplement intake behavior?
2. How does supplement delivery method influence supplement intake behavior?
 - SmartFeed Pro and SuperSmartFeed systems are different
3. Effectiveness of feeders to limit and/or more precisely deliver supplements in extensive environments.

PLATFORM

LANCASTER MK-III REV 5

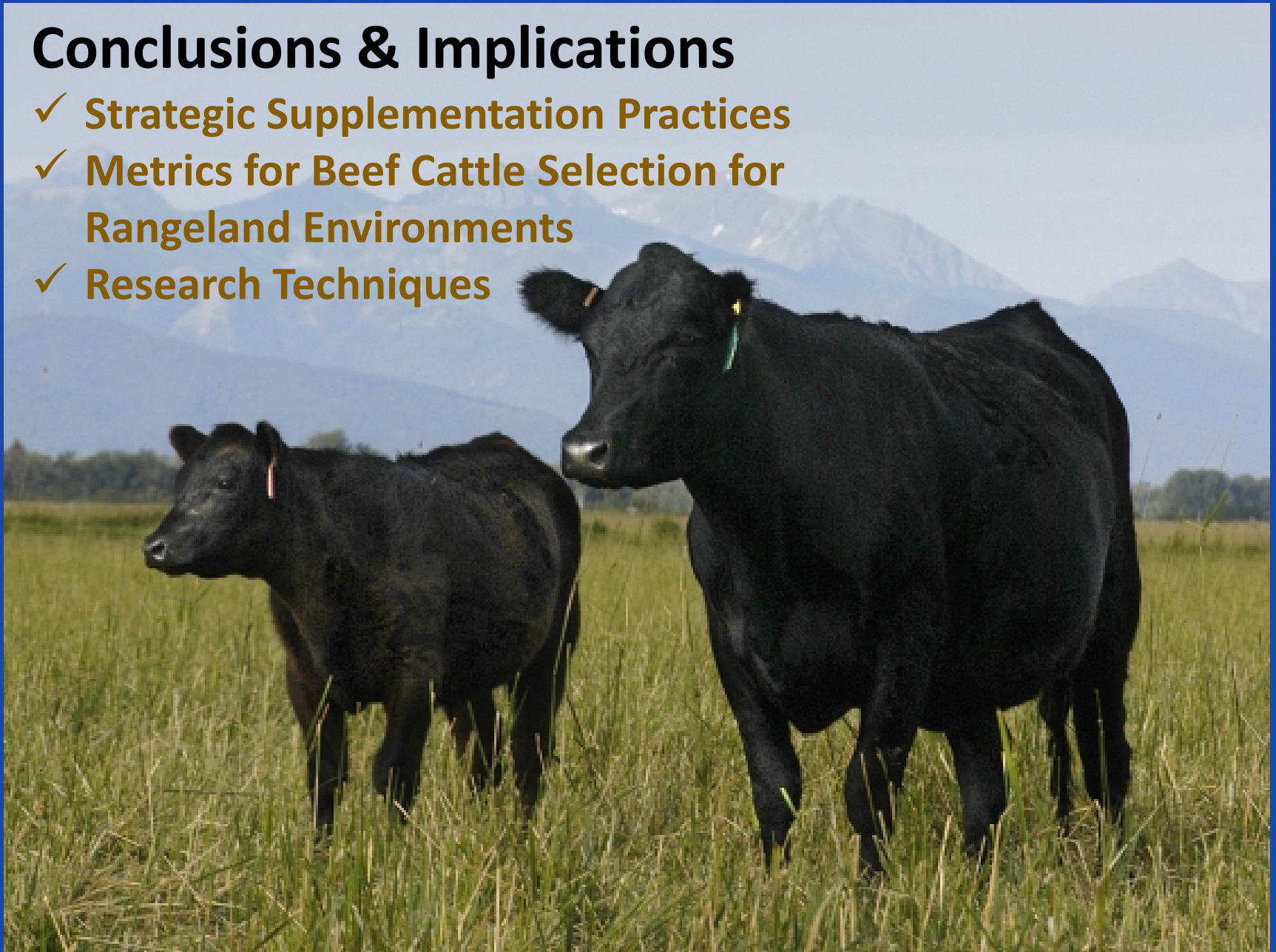


Using UAVs in Range Beef Cattle Research:

1. Using UAVs to monitor distribution patterns on extensive landscapes
2. Using UAVs and photo imagery to monitor use patterns

Conclusions & Implications

- ✓ Strategic Supplementation Practices
- ✓ Metrics for Beef Cattle Selection for Rangeland Environments
- ✓ Research Techniques



Research Support

Nancy
Cameron
Endowment

BAIR RANCH
FOUNDATION

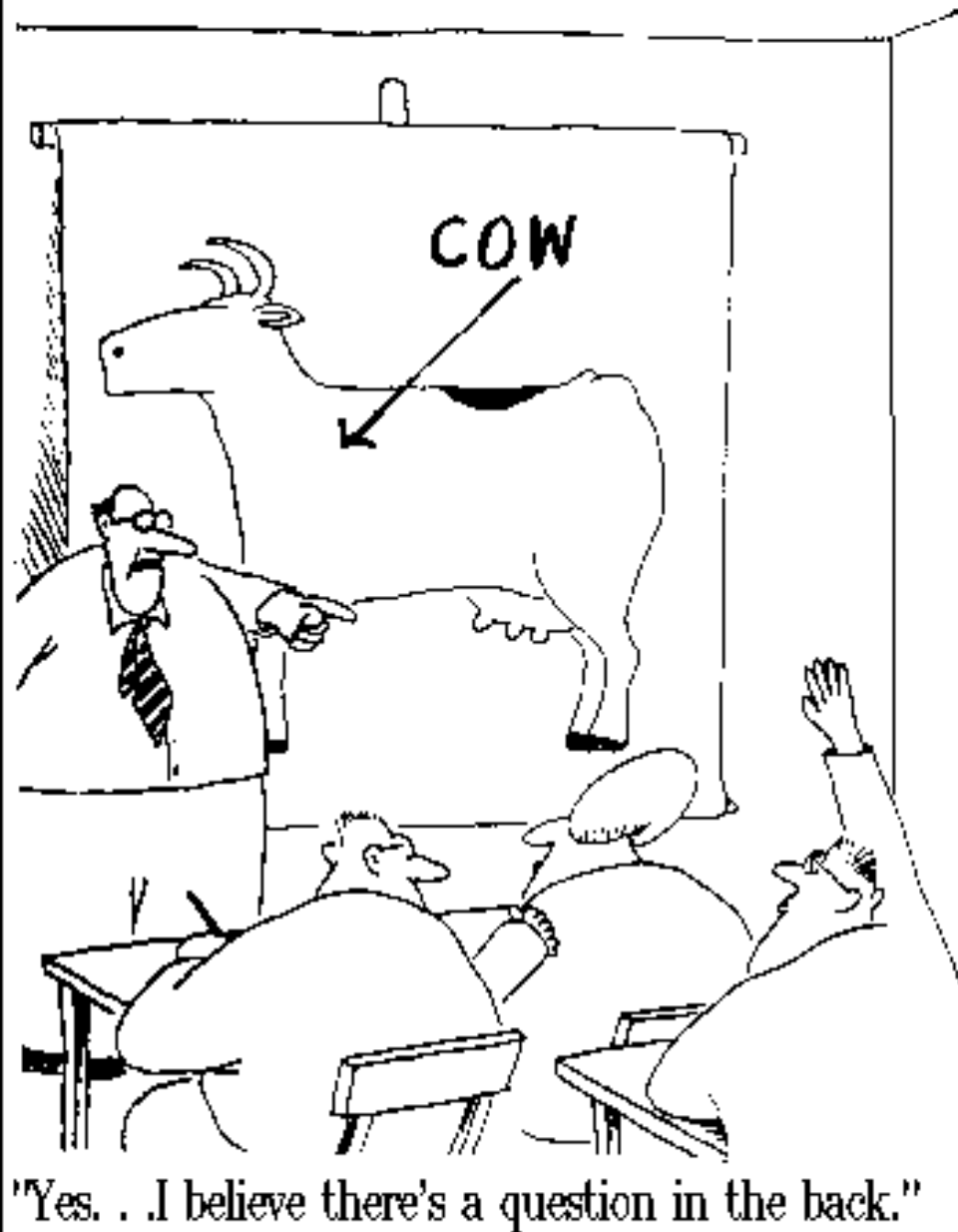


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AGRICULTURE
&

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EXPERIMENT STATION



Larson



Thank You!

Questions?