

Ionophores and Reproduction: What is the benefit for range cows and heifers?

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Overview

- Reproductive Challenges in Range Beef Systems
- Why Ionophores?
 - Impacts in Heifers
 - Impacts in the Cowherd
- On-going Research at UNL

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Management After Calving

- The Cow Herd
 - Profitable cow/calf operations should have a high percentage calf crop each year
 - Gestation 280 d
 - Recovery & rebreeding should occur within 80-85 d postpartum
 - Nutritional influence on reproduction
 - Cows gaining wt slightly before breeding will have higher conception rates & shorter time to 1st heat
 - Most critical time – 30d prepartum – 70d postpartum

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Production Challenges in Young Range Cows

- Pregnancy rates in young cows can be the lowest in the cow herd (Meek et al., 1999)
 - Inability to consume enough energy
 - Maintenance
 - Lactation
 - Growth



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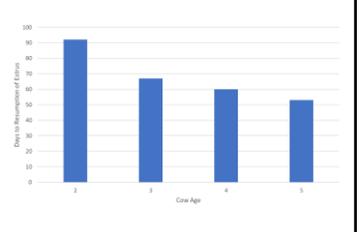
Postpartum Interval

- Postpartum interval
 - Major economic impact on cow/calf producers
- Young cows can have a prolonged postpartum interval
 - Additional energy demands
 - Combined with stress of lactation

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Reproduction Challenge in Young Cows

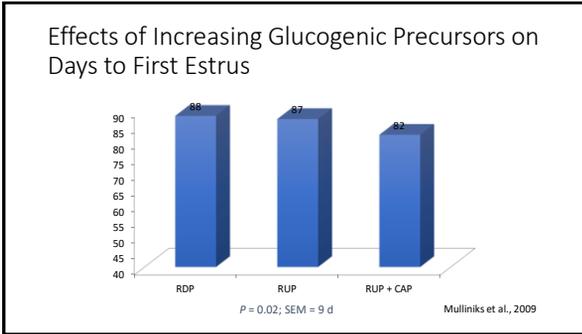
- Shorten the PPI to increase opportunities a cow has to conceive (Wilbank et al., 1961)
- How do we do this?
 - Nutritional management
 - Repartition nutrients away from lactation for growth and maintenance



Cow Age	Days to Re-conception of Cows
2	~90
3	~70
4	~65
5	~60

Wilbank, 1970

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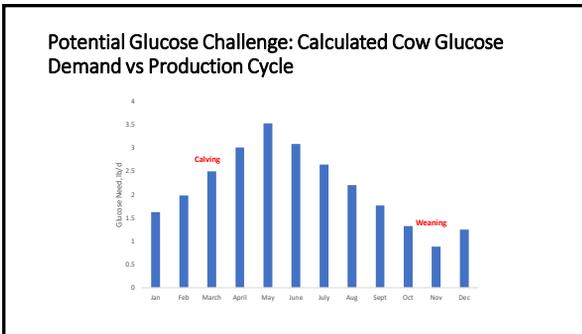


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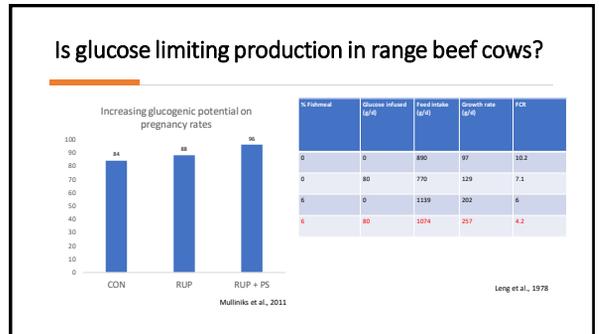
Nutrient Challenges Rebreeding Young Cows

- Declining forage quality
 - Cows going into a weight loss scenario prior to breeding
- Metabolizable protein deficiency
- Imbalance of Acetate to Propionate ratio
 - Limited in available glucose

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Why Ionophores?

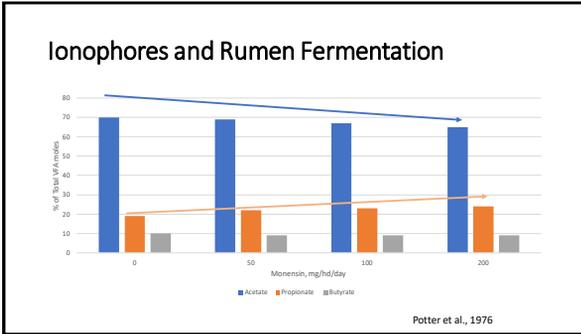
- Alters rumen microbial populations
 - Inhibits gram positive bacteria
- Alter VFA productions
 - Increased propionate and reduces methane
 - Improves energetic efficiency
- Improvement of feed efficiency 2.5 to 6%
 - Improvement in energy efficiency
- May improve beef production efficiency of grazing females

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Ionophores

- Monensin – Rumensin
- Lasalocid – Bovatec
- Laidlomycin Propionate – Cattlyst
- Narasin
- Salinomycin
- Virginiamycin
- Avoparcin

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Challenges with Ionophores

- Delivery
 - Daily or every other day feeding
- Supplemental type
 - Intakes
- Label for classification of animals
 - Heifers vs Cows

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Impacts of Ionophores in Growing Heifers: Meta-analysis

- Reduction in feed intake by 4.3%
- Increased gain:feed ratio by 14%
- Reduced age at puberty by 8.9 days
- No impact on BW at puberty
- Increased number of heifers cycling by the start of breeding by 15.9%
- No impact on pregnancy rate

Gadberry et al. (2022)

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Rumensin and forage intake

	Rumensin	Control
Initial BW, lb	1079	1093
Calving BW, lb	1129	1117
Gain, lb	50	24
DMI, lb/d	21.2	22.6
Cost Savings	\$13.20	--

Landblom and Nelson, NDSU

- Forage intake decreases
 - 6% to 20%
- Increased cost savings
- Potential increases in cow body weight
 - Increased nutrient use

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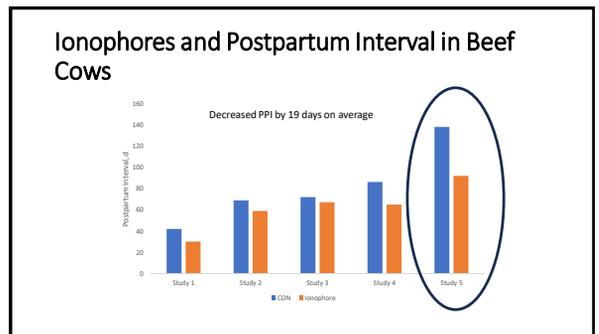
Impact of Rumensin in Mature Beef Cows

	0 mg/d	200 mg/d
Conception date	161 ^a	155 ^b
Call to conception, days	90 ^a	85 ^b
Calving percentage, %	80.7 ^a	91.9 ^b

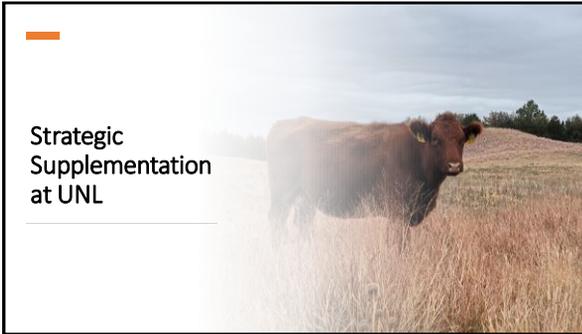
^{a,b}Means with different superscript differ (P < 0.01)

Baily et al., 2007; Can. J. Anim. Sci

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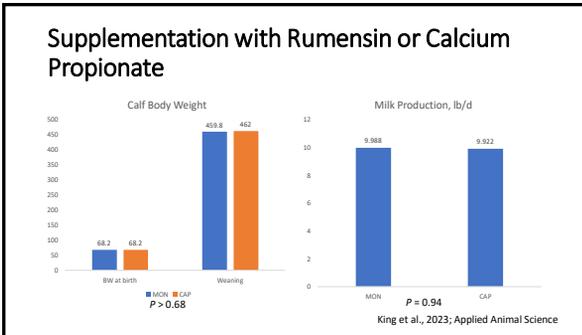
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Supplementation with Rumensin or Calcium Propionate

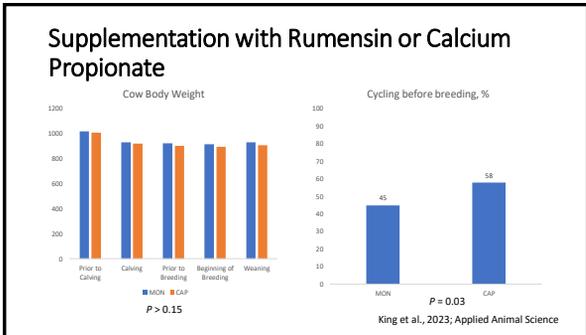
- 3-year postpartum supplementation study
 - Calving until breeding
- March-calving 2- and 3-yr-old cows
- Feed 2 lb per head per day from calving to breeding
 - 32% CP with 180 mg of monensin
 - 32% CP with 40 g of calcium propionate

King et al., 2023; Applied Animal Science

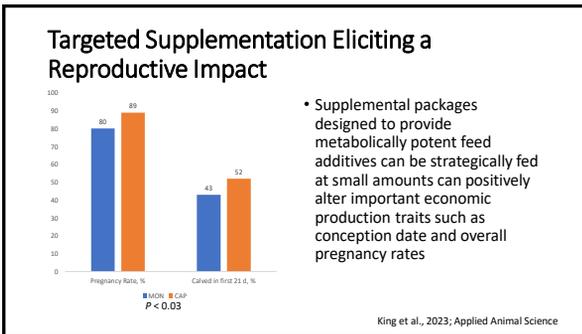
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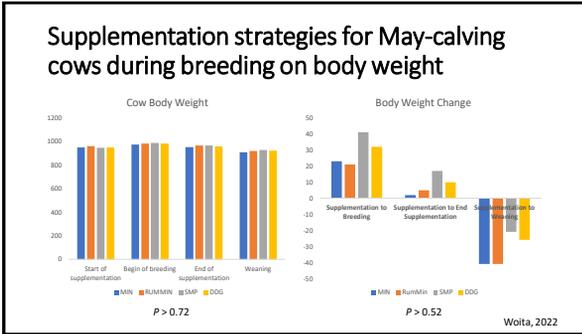
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Strategic Postpartum Supplementation for May-calving cows during breeding

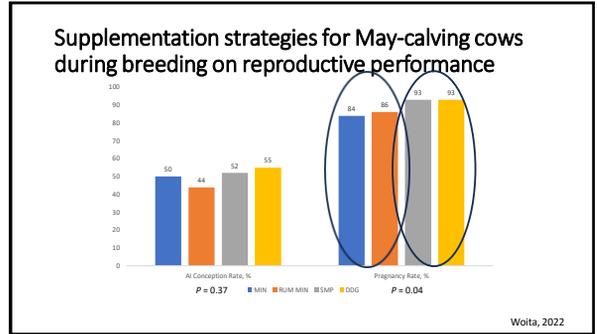
- 4 Supplemental Treatments
 - 4 oz Mineral
 - 4 oz Mineral plus rumensin at 200 mg/hd/d
 - 4 oz Mineral plus 8 oz of high RUP sources
 - 2 lb per day of DDG

Wolfa, 2022

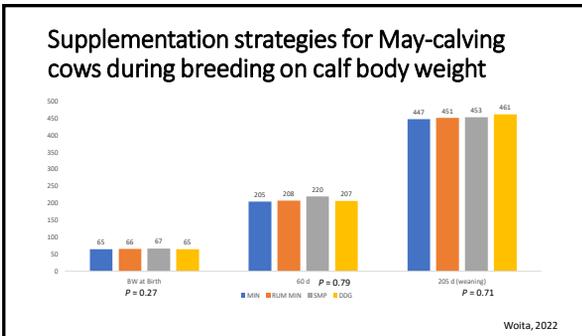
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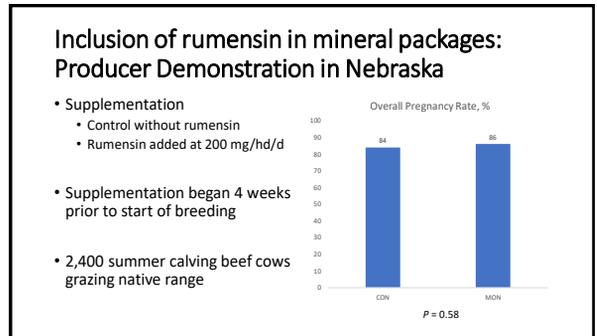
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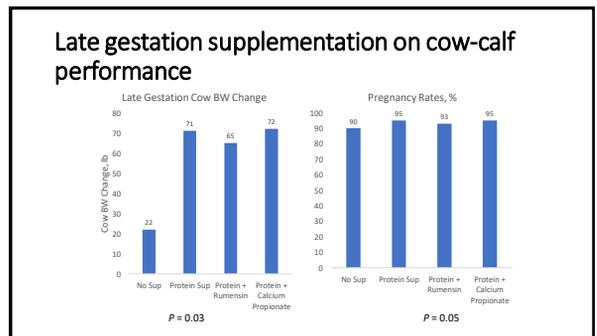


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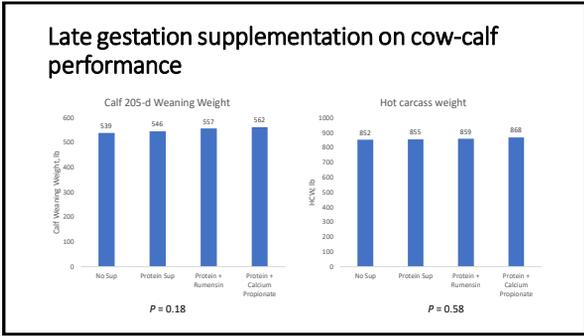
Late gestation supplementation on cow-calf performance

- No supplementation
- Protein Supplementation
 - 32% CP
 - 63% RDP
- Protein Supplement + Rumensin
- Protein Supplement + Calcium Propionate

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Parameters of Ionophore Use

- Quality of forage dictates response
 - Low-quality forage – decrease intake, improve efficiency
 - High-quality forage- increased ADG
- Thin cows
- Drylot cow rations
- Delivery mechanisms to ensure intake are important

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Conclusion

- Widely utilized for feed efficiency and growth performance in feedlot/backgrounding
 - Underutilized in the cow-calf sector
- Provide opportunity to mitigate challenges within range beef production systems
- Impact on reproduction is not extensively studied
 - Challenges in delivery mechanisms
 - Daily or every other day intakes
 - Varied responses
 - Forage availability and conditions
- Strategic supplementation
 - Enhance energy utilization
 - Days to resumption of estrus/decreased days to puberty
 - Pregnancy rates?

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Questions?

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