Feed additives for wintering beef cows

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What is an additive?

Additive – ingredient or combination of ingredients added to the basic feed mix or parts thereof to fulfill a specific need (AAFCO).

Food Additive – defined by federal law (CFR 21).

- Code of federal regulations lists food additives and additives that are **G**enerally **R**ecognized **A**s **S**afe

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- Example types of non-feedstuff additives
  - Drug (requires FDA approval)
    - VFD – medically important antimicrobials
    - Non-VFD – antimicrobial properties but not used in human medicine, anthelmintics, hormones
  - Pesticide (requires EPA approval)
  - Anticaking agent
  - Preservatives
  - Biotics (relating to or resulting from living things – yeast, bacteria origin)
    - Prebiotic (non-living) – simulates existing microbiome
      - ruminal
    - Probiotic (living) – direct fed microbial (colony-forming units aka CFU)
    - Postbiotic (non-living) – bioactive component of a probiotic organism
      - intestinal
  - Phytochemicals (phyto=plant; functional foods)
    - benefit beyond nutritional contribution
      - Oils (essential oils [bad terminology]), tannins, nitrates

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Economics of production

Cost for System Input

$$\frac{Total\ Cost}{Total\ Lbs\ Weaned} \times 100$$

System Response to Input
- Calf crop percentage
- Weaning weight

"A lot can happen in 16 months"

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Resolving losses

- One patch doesn't fix all the leaks
- Some leaks may be more critical than others
- Some leaks are easier to patch than others

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Thoughts on feed additives for beef cows

- Chlortetracycline (VFD)
  - Control of active infection of anaplasmosis caused by Anaplasma marginale susceptible to chlortetracycline

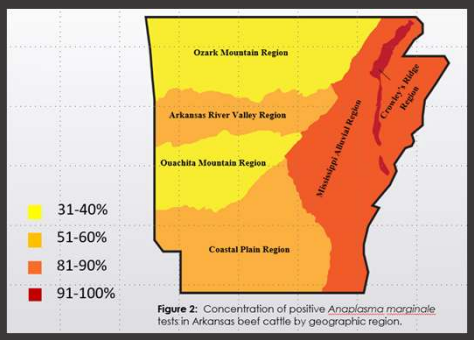

Figure 2: Concentration of positive *Anaplasma marginale* tests in Arkansas beef cattle by geographic region.

Image source: Ward et al., 2020

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Thoughts on feed additives for beef cows

Methoprene – insect growth regulator. Few published studies. Response highly dependent on uniform supplement intake and horn fly control in nearby herds.

Essential oils – Cinnagar (cinnamon and garlic), originally presented to improve rumen efficiency, reports of reduced fly populations. Moriel et al. 2018 reported mixed observations of reduced, similar and even greater numerical counts compared to control.

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Thoughts on feed additives for beef cows

Monensin – only approved ionophore for beef cows. Approved for improved feed efficiency when receiving supplemental feed and for the prevention and control of coccidiosis. Approved for beef replacement heifers for improved rate of gain.

Heifers	Cows
ADG and G:F = ↑	Calf birth weight = ↑
Age a puberty = ↓	Milk production = ↑
Cycling by first breeding = ↑	Days to first estrus = ↓
AI and Overall Pregnancy = unchanged	AI and Overall Pregnancy = unchanged

Meta-analysis results: data compiled by D. Lalman, Mikayla Moore

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Thoughts on feed additives for beef cows

- Biotics
  - Research with growing/finishing beef cattle and dairy cows.
  - Various proposed mechanism for digestive support
    - Immuno-modulation
    - Nutrient utilization & oxygen scavaging
    - Non-specific binding (mycotoxins)
    - Competition (more of the good = less of the bad)
  - Results are generally inconsistent for growth and health.
    - Inconsistent ≠ Ineffective
    - Stress type and level
  - Need more work in this area to characterize the conditions through **meta-analysis** that clarify conditions when these inputs are likely to be beneficial
    - Management (Ex. Low, moderate, high for BRD)
    - Nutrition (diet composition, diet transition)
    - Environment (heat stress, mycotoxin load)
  - *The future: gut microbiome research – marker-based decision aide for feed additive selection tool*

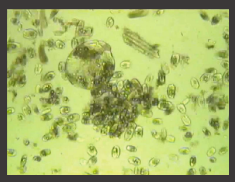

Image source: https://www.dairyherd.com/news-news/rumen-microbes-new-hot-topic-cattle-nutrition-research

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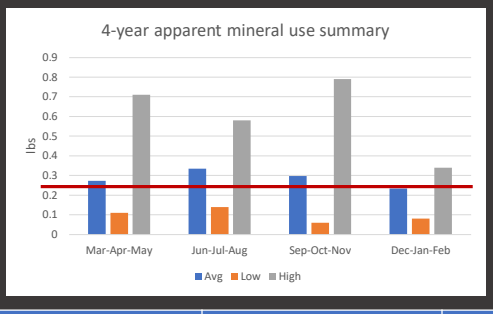
Thoughts on feed additives for beef cows



Group size	Monitoring Period	Visits/Animal	Mineral disappearance
4 heifers	1.5 months	17/week	1.3 to 4.6 oz/head
17 cows	2 months	2.5/week	0.5 to 1.9 oz/head
12 heifers	2 months	1.7/day	0 to 3 oz/head
Ranches et al., 2021			

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Put some thought into your feed additive management

- What is the added cost?
- What are the proposed production benefits?
- How will utilization be managed and monitored?

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