Effects of Feed Delivery Methods for Stocker Calves Grazing Bermudagrass on Growth Performance, Behavior, and Labor Inputs

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Introduction

- Different delivery systems can impact cattle behavior, performance, and the operation's input costs. (Aubel, 2011)
- Solar Feeders could be a legitimate alternative to efficiently supplement cattle rather than more traditional delivery systems.
  - http://www.solarfeeders.com/

Objective

- To determine the effects of supplement delivery methods on
  - Pasture utilization
  - Corn gluten feed supplement disappearance
  - Body weight
  - Behavior
  - Labor inputs

Materials and Methods

- 78 crossbred heifers
  - Initial body weight – 246 kg
  - Preconditioned
    - Weaned > 30d
    - Vaccinated for clostridial diseases and respiratory viruses
    - De-wormed
  - Individually identified and fly tagged

- University of Arkansas Stocker Unit, Savoy, AR
- 6-2.4 ha bermudagrass pastures

Materials and Methods

- Delivery system treatments:

  - Hand-fed (Hand)
    - Fed 1 time/d at 0730
  - Solar Feeder© Automated Feeder 2500 (Auto)
    - Dispensed 3 times/d (0600, 1400, 2200)
  - Salt-limited (Salt)
    - Fed ad-libitum with salt content adjusted to obtain appropriate intake

Materials and Methods

- Corn gluten feed was the base feed for all delivery systems
- Trace mineral was offered ad-libitum if not included in the feed mixture (Salt)
- Calves were individually weighed on d -7 and d -6 (June 5 & 6) for initial weight

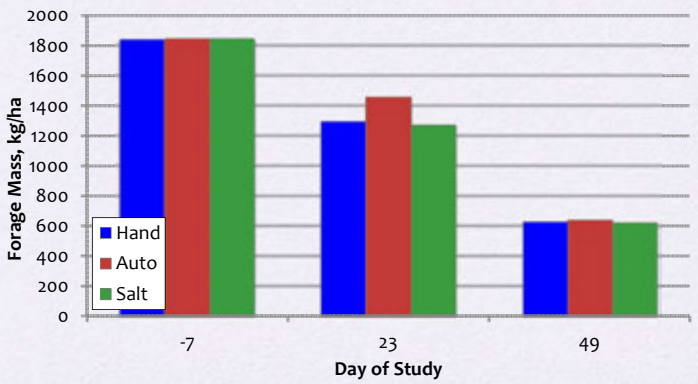
Materials and Methods

- The statistical model was a randomized complete block, so average initial BW of cattle in each pasture were similar
- PROC MIXED of SAS
  - Experimental unit: Pen
  - Fixed effects: Treatment and where appropriate day or period and the 2-way interaction
  - Random effect: Block
  - Kenward Rogers degrees of freedom were specified
  - Repeated statement was used with a spatial power structure
  - Means separation using the PDIFF option when $P < 0.10$

Measurements Taken

- Pasture forage mass – every 21-28 d
- Supplement disappearance – every 7 d
- Calf BW – every 28 d
- Visual Calf behavior – every 14 d
- Accelerometer – every 14 d for 7 d
- Labor hours – every 7 d

Forage Pasture Mass



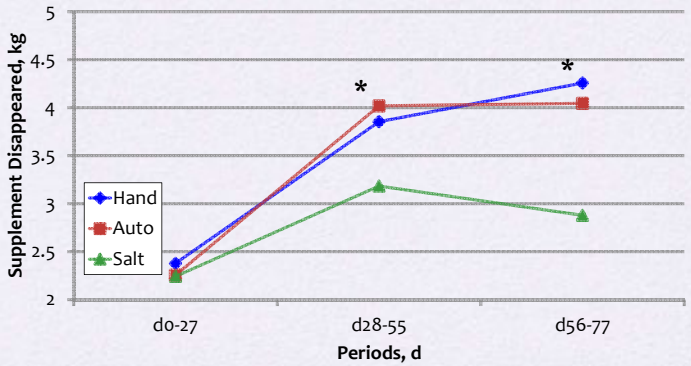
Treatment, *P* = 0.976
Treatment X Day, *P* = 0.903

Supplement Disappearance

- Feed dispensed – Amount weighed back
  = Estimated Feed Disappeared

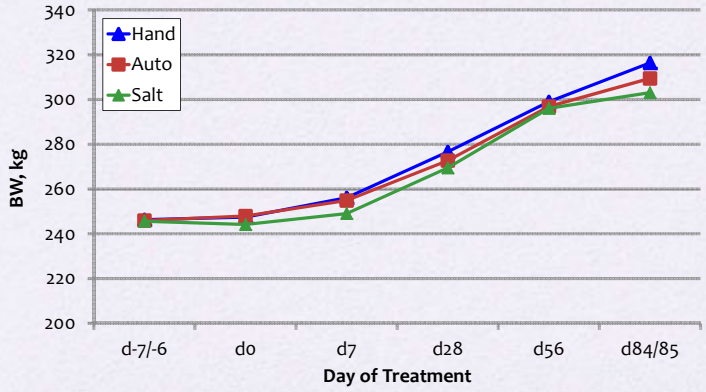
Disappearance
- Measured weekly
- Grab samples taken of each to determine DM variation

Supplement Disappearance



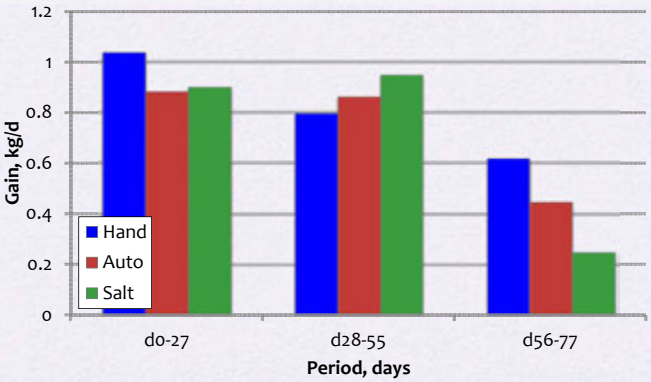
Treatment, *P* = 0.195
Treatment X Period, *P* = 0.0003

Performance, Calf Body Weight



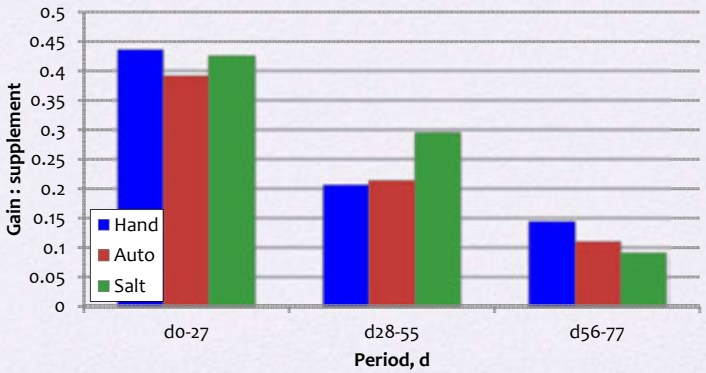
Treatment, *P* = 0.17

Performance, ADG



Treatment, $P \geq 0.141$
Treatment X Period, $P \geq .396$

Supplement Efficiency

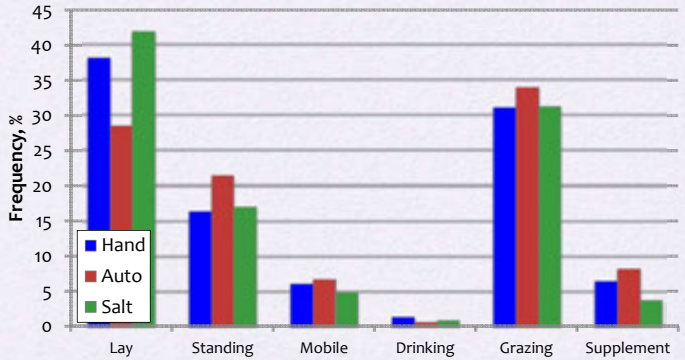


Treatment, $P = 0.571$
Treatment X Period, $P = 0.766$

Calf Behavior

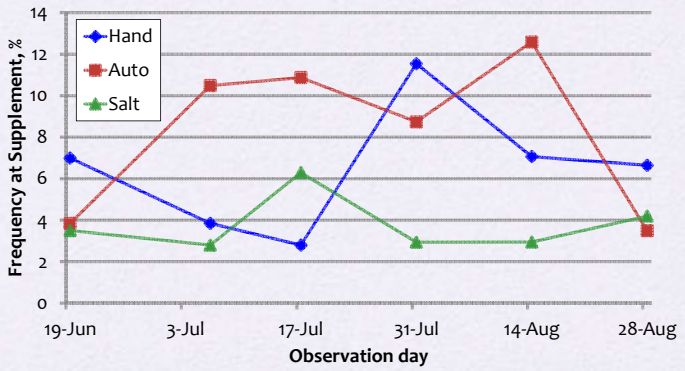
- Every 14-d, 11 h/d
  - **Lying**
    - Abdominal cavity of the calf having contact with the ground
  - **Standing**
    - Not moving, with all legs touching the ground
  - **Mobile**
    - All legs in motion
  - **Drinking**
    - Head in or over the waterer
  - **Grazing**
    - Head in or immediately over the grass
  - **Supplement**
    - Head in or immediately over the feeder

Calf Behavior



Treatment, $P \geq 0.04$

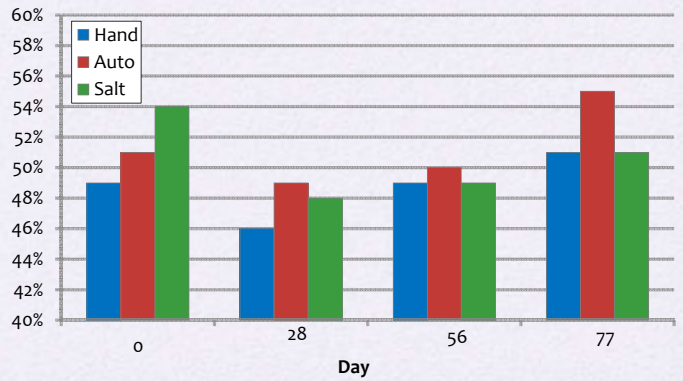
Supplement Behavior



Treatment X Day, $P = 0.043$

AF showed more variation

Accelerometer (standing)

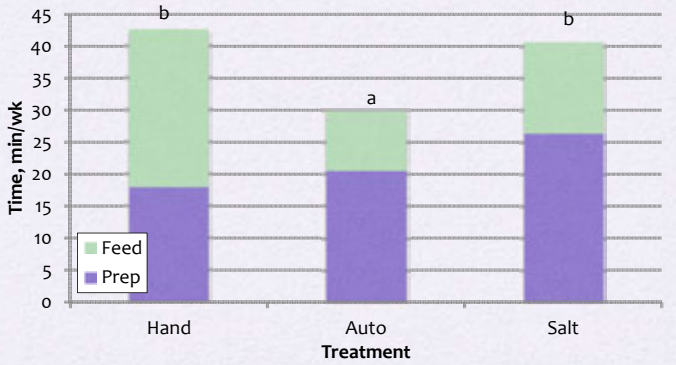


Treatment X Period, $P < 0.05$

Labor hours

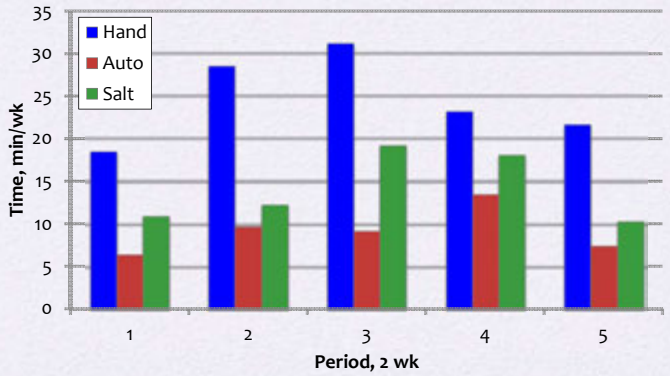
- Feed time
  - Fill feeder
- Prep time
  - Fill 18.93L bucket
  - Weighed bucket
  - Load on truck

Labor hours (overall)



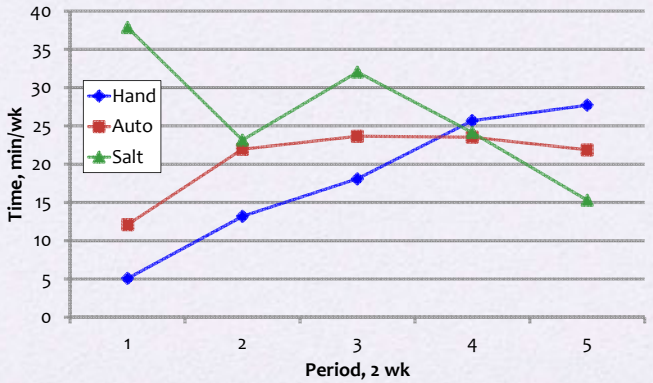
Treatment, $P = 0.042$ (Auto < Hand & Salt)
Treatment, Feed, $P = 0.002$ (Auto < Salt < Hand)
Treatment, Prep, $P = 0.002$ (Hand & Auto < Salt)

Feed labor hours



Treatment X Period, *P* = 0.343

Prep labor hours



Treatment X Period, *P* = 0.002

Summary

- Overall, there was no change in animal performance or behavior between the automated feeders and hand-fed methods.
  - Some labor variations
- Automated Solar Feeder may be an alternative for supplementing calves
  - Short-staffed
  - Broad geographic locations

Acknowledgements

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