Herd Health Issues 2018
-Food for Thought

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Definition

Stewardship:
Careful and responsible management of something entrusted to one's care (noun, Webster)

Animal Agriculture

Feeding the world by caring for animals through responsible resource management and the prudent use of technology

Global demand for food, feed & fiber will nearly double over the next 40 years

http://www.census.gov/ipc/www/idb/worldpopgraph.php

Deloitte Food Value Equation Survey 2015
Capitalizing on the shifting consumer food value equation.

- Deloitte Consulting, Food Marketing Institute (FMI), Grocery Manufacturers Association (GMA)
- Survey of 5,000 consumers nationwide
- Interviews of executives from 40 companies—retailers, food & beverage manufacturers, ingredient suppliers, ag producers
- FMI, GMA and Deloitte secondary research
Deloitte Food Value Equation Survey 2015
Capitalizing on the shifting consumer food value equation.

• Consumer food purchase decisions—then
  – Traditional drivers—taste, price, convenience
  – other factors/drivers had small impact

• Consumer food purchase decisions—now
  – Traditional drivers—taste, price, convenience
  – Evolving drivers—health & wellness, safety, social impact, experience, transparency (overarching driver)

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Deloitte Food Value Equation Survey 2015
Capitalizing on the shifting consumer food value equation.

About half of consumers surveyed indicated they weigh Evolving value drivers more heavily than Traditional ones

- 51% Traditional consumers say they prefer traditional value drivers
- 49% Evolving consumers say they prefer evolving value drivers

Summary Points

• Primary purpose of animal agriculture is food production
• Attitudes and perspectives of US and world populations are changing
• Increasing world human population & development requires increased food and fiber supplies
• Global resources are limited
• Production level animal care and use of science and technology offers current and future solutions

Topics Outline-Brief Comments

• Antimicrobial stewardship
• Nursing Calf/Summer Pneumonia
• Commingling
• Feedlot Mortality and Morbidity
  – Bovine Congestive Heart Failure study update

Everything should be as simple as possible, but no simpler.
Einstein
Antimicrobials/Antibiotics

What drugs cure disease? Do antimicrobials cure disease?

• Kill
• Cleanup
• Replace/Repair
• Return to Function

Other Mechanisms

Respiratory tract healing takes time (~3-6 weeks)

Antimicrobial Stewardship

• Primary concern is development of antimicrobial resistance impacting effectiveness in treating human diseases
• Stewardship of antimicrobials
  – Assumed or actual: Need for an antimicrobial represents production/economic loss
  – Systems approaches to reducing need/use
  – Re-examining need for antimicrobial use
    • A breach in the system?
    – Use appropriately

DEFINITION OF ANTIMICROBIAL STEWARDSHIP

Antimicrobial stewardship is the commitment to reducing the need for antimicrobial drugs by preventing infectious disease in cattle, and when antimicrobial drugs are needed, a commitment that antimicrobials are used appropriately to optimize health and minimize selection for antimicrobial resistance.
Reduced risk for disease, control or elimination of disease

Biosecurity – the outcome of all actions used to prevent disease agent entry into a unit of interest.

Biocontainment – the outcome of all actions resulting in control of a disease agent in a unit of interest.

Nursing Calf Respiratory Disease


For consideration

Unintended consequences?

- Herds with 150-499 cows (OR 7.9 times) and 500 or more cows (OR 12 times) over herds with less than 150 cows
- Herds that used intensive grazing (OR 3.3 times greater)
- Herds that used estrus synchronization programs (OR 4.5 times greater)

Simulation Model Estimate $165 million annually

Case-control study to determine herd-level risk factors for bovine respiratory disease in nursing beef calves on cow-calf operations

Commingling
Commingling-The Forces At Play

Published December 3, 2014

Effects of commingling beef calves from different sources and weaning protocols during a forty-two day receiving period on performance and bovine respiratory disease.1,2


1Department of Veterinary Clinical Sciences, Center for Veterinary Health Sciences, Department of Animal Sciences, Division of Agricultural Sciences and Natural Resources, 2Department of Veterinary Pathobiology, College of Veterinary Medicine, Oklahoma State University, Stillwater, OK

Study Design

509 Steers
- MS Market-N=260
- MO Ranch-N=249

2x3+1 Factorial
- Weaning Management (Abrupt, Wean45, WeanVac45)
- Commingled or not
- Auction market calves served as control

Impact of Commingling

Impact of Weaning/Vaccination

Summary

Getting to Implementation

- Understanding of the system
  - Address current outbreak, prevent new cases in current outbreak, prevention in future years

- Owner/Decision maker engagement in plan
  - Priorities and decision making
Feedlot mortality and morbidity rates have not improved in spite of technological and other advances.

Right-Sided Heart Failure in North American Feedlot Cattle

- Study objectives
  - To evaluate risk of RHF over time and among feedlots
  - To investigate some of the risk factors for RHF
  - To determine how these risk factors affect the time to RHF occurrence

Bovine Congestive Heart Failure
“Brisket Disease”

- The bovine cardiopulmonary system (heart and lungs) is small relative to body mass
- Increased body mass may be surpassing the ability of the cardiopulmonary system to sustain normal function
- Oversimplified?

Right ventricular hypertrophy with heart failure in Holstein heifers at elevation of 1,600 meters

- CO front range heifer raising facility (1,600 m = 5,249 ft)
- Second leading cause of death (first was pneumonia) in heifers <1.5 years of age.
  - Premature sale or death of 55 heifers over a 5 year period (yard population varied from 1,000-4,000 hd)
- Clinical, necropsy and histological findings consistent with brisket disease due to pulmonary hypertension

Right-Sided Heart Failure in North American Feedlot Cattle

- Results
  - Adjusted risk of RHF doubled from 2000 to 2012 (p=0.003)
    - CA feedlots had ~2/10,000 hd in 2000 & 2004 to ~4/10,000 hd in 2008 & 2012
  - For every 10,000 hd entering US feedlots in 2012, 11 cattle died from RHF.
    - CA feedlots had about half the risk
  - The median time to RHF was 19 weeks
  - Cattle treated for BRD were 3X more likely to die from RHF, and they died earlier in the feeding period
Some outbreaks clustered by source (Western Plains Feedlots)
Up to 7% loss observed in single-source groups (lot)
- 40 of 600 (May, 2017)
- 39 of 500 (January, 2018)

Congestive heart failure in feedlot cattle

Desired outcomes
- Better understanding of the disease mechanism
  - Essential for prevention and treatment
- Blood test for diagnosing disease
  - Identify and manage cattle at risk
- DNA test for causative mutation
  - Eradicate from breeding stock

Study design
- 100 matched case-control pairs
  - Four feed yards ~4000 ft
  - Pen riders identify clinical cases
- Differential diagnosis
  - Clinical presentation, necropsy, histopathology
- Preserve tissues
  - DNA, RNA, protein

What did we see?
Clinical cases at every stage of the feeding cycle
- Day 1 arrival at feed yard
- Day 28 ready for processing

Other clinical signs
- Jugular distension
- Submandibular edema
Conclusions

• Gene (EPAS1) variants associated with high mountain disease were not associated with feedlot heart failure disease
• A major candidate gene region has been identified
• Candidates for a diagnostic blood test have been identified

Do we need to change how we think about some of this?
Do you have a plan to manage risk for ______?
Does your health program fit your operation?

Dr. Dale Grotelueschen’s interests include beef health systems management, preventive health planning, diagnostic investigations, also including factors influencing morbidity and mortality, control of bovine viral diarrhea virus, neonatal calf diarrhea, and bovine respiratory disease. He has served as Director of GPVEC since 2013 following service as a managing veterinarian, Beef Cattle Veterinary Operations, Pfizer Animal Health for 12 years, with the University of Nebraska 16 years as professor, Veterinary Extension and Diagnostics and as Director of the Panhandle Veterinary Diagnostic Laboratory, Scottsbluff, Nebraska, and in private veterinary practice for 11 years, mostly in southwest Nebraska. He is active in organized veterinary medicine and the beef industry. He received his DVM from the University of Missouri and MS, Clinical Sciences from Colorado State University. He and his wife, Elizabeth, are parents of 2 grown daughters and reside in Harvard, Nebraska.

Brisket Project Collaborators

Thank You!