

Guidelines for collection of bovine respiratory disease data

Economics of BRD

- ▶ Leading cause of mortalities in the beef industry
- ▶ In 1997, Dr. Griffin estimated losses to the industry as \$750 million per year
- ▶ In a 1996 report, loss of production and carcass value resulting from BRD averaged over \$92/head (McNeill et al.)

Using an EPD for susceptibility in a genetic improvement program

- ▶ Incidence of BRD ~7 times more important in a terminal sire index than WW, PWG or feed intake
- ▶ 2–3 times more important than marbling score and yield grade.
- ▶ Van Eenennaam and MacNeil (2011)

BRD Guidelines Committee

- ▶ Dr. Dee Griffin, University of Nebraska
- ▶ Larry Kuehn, USDA MARC
- ▶ Dr. Jim Lowe, University of Illinois
- ▶ Holly Neibergs, Washington State University
- ▶ Chris Seabury, TAMU
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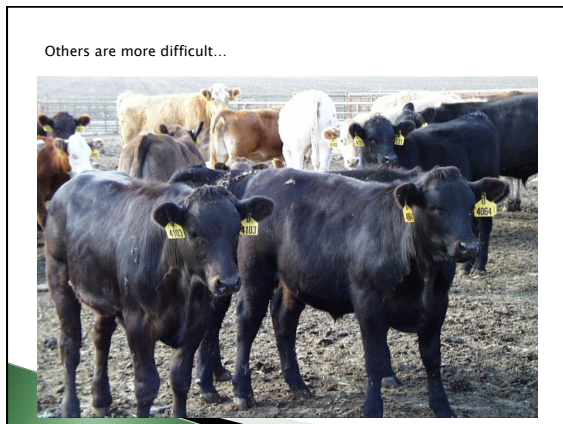
What are feedlots recording now?

- ▶ Drs. Lowe and Griffin
- ▶ Two widely-used feedlot software programs
 - Animal Health International
 - Micro Technologies (Micro Beef Technologies)
- ▶ Production Animal Consultation provided summaries of reporting rates

Diagnosing BRD



Cattle Treatment Guide, 2004
Cattle Disease Guide, 2001



Data reporting rates for two feedlot recording systems:

- ▶ Lot info
 - In date (100%)
 - Out date (100% if closed)
 - Sex (100%)
 - Owner (74%)
 - Buyer (41%)
 - Origin (71%)
 - Starting average weight (100%)
 - Ending average weight (100% if closed)
 - Starting head (100%)
 - Ending head (100% if closed)
 - Risk (1%)
 - Breed (0%)

Treatment information recording rates

- ▶ Date (100%)
- ▶ Weight (99%)
- ▶ Temperature (74%)
- ▶ Severity score (41%)
- ▶ Products applied (100%)
- ▶ Cost of products applied (69%)
- ▶ Pen rider (6%)
- ▶ Doctor (4%)
- ▶ Diagnosis (100% – doesn't mean it isn't unknown or other occasionally)

Phenotypic data

- ▶ The data is being recorded at the feedlot level
- ▶ How can we use/leverage this for genetic improvement?

Guidelines

- ▶ Recommendations for “performance” recording
- ▶ Recommendations for use of data in genetic evaluation
- ▶ First attempt at BIF Guidelines for a disease trait

Guidelines for BRD recording

- ▶ Suggesting a tiered approach to recording
 - Different levels of data “comfort”
- ▶ Enables flexibility in use of data for genetic evaluation
 - Will enable more detailed genomic research should DNA samples be available
- ▶ Envision use of both phenotypic and genomic data in the genetic evaluation

Low-detail observations (trait one)

- ▶ Animal ID (need IDs of all animals in lot)
- ▶ Lot information: In and out dates, sex, owner/origin
- ▶ Treatment information (tied to animal)
 - Date pulled, temperature (if available, 74% recording rate), diagnosis
 - Animal info: date died/railed
- ▶ Used to create a “binary” observation
 - Treated → yes/no

High-detail observations

- ▶ Presumed BRD (pBRD; same as trait 1):
 - Increased respiratory rate and/or effort, depression, lack of gut fill (reduced feed intake)
- ▶ Active BRD (trait 2):
 - pBRD plus temperature over 104—active inflammatory response
- ▶ Chronic BRD (trait 2):
 - pBRD plus temperature below 104—lack of active inflammatory response
- ▶ Confirmed BRD (trait 3):
 - aBRD or cBRD plus evidence of lung pathology consistent with pneumonia
 - Thoracic ultrasound
 - >1 score on Whisper automated auscultation system
- ▶ Not levels of severity, but levels of specificity—likely a different trait analysis
- ▶ Other contemporary group information

Contemporary group dilemma

- ▶ Pen will likely be important environmental factor
 - Most likely vectors for shedding and transmission will be pen mates
 - Historically, add pen to contemporary group definition
 - Birth weight CG + weaning CG + arrival date + origin + pen
- ▶ Concern: overspecifying/subdividing CG so that little variability exists.

Contemporary group approaches

- ▶ Fit pen(lot) as separate main effect outside of contemporary group structure
- ▶ Fit pen(lot) as a random rather than fixed effect
 - Pen effects will be regressed relative to the information content
 - Epidemiology is not completely understood
 - This approach would allow correlations to be fit based on pen proximity (if that data were available)
 - Larry Kuehn

Summary

- ▶ There is opportunity for genetic improvement in susceptibility to bovine respiratory disease.
- ▶ Considerable data is currently being recorded in the feedlot
- ▶ Board has approved guidelines
 - Given the relatively new nature of the trait complex, we fully expect changes with evolution of collection.
- ▶ We expect that data for EPDs and genomic tests will start rolling in as breeds develop commercial cattle programs