Meeting Notes – Weds., June 16.

Overview / review of objectives: Milt Thomas

Objective 1. Develop, disseminate, and maintain resources on the genetics of beef cattle to support outreach, extension, and education activities.
Objective 2. Maintain animal populations, DNA repositories, and performance databases to support beef cattle phenomics research.
Objective 3. Integrate quantitative and molecular research tools that contribute to the understanding of genetic associations among economically important traits and their indicators.
Objective 4. Exchange information, discuss research results, plan new research, examine new developments, discuss future problems, plan cooperative research and share ideas for interdisciplinary involvement in beef cattle breeding.

- Objective 1. Develop, disseminate, and maintain beef cattle genetics resources.
  - Website – Changed to a FaceBook account (relative to dissemination).
  - Update on Breed Association involvement (Milt, Mark, Denny).
  - Petition to be e-mailed.
  - Add on-line courses to list of classes taught.

- Objective 2. DNA Repositories, etc.
  - Milt will take charge of this. Create new spreadsheet and gather numbers.
  - Should be sent out by August/September.
  - Data sharing.
  - IP issues – overview by MacNeil.
  - Possibility of whole-genome rep. to improve sharing ability.

- Objective 3. Integrate quantitative and molecular research tools.
  - Update on projects integrated research (quantitative + molecular).
  - Short courses (CSU, ISU).
  - More with Station Reports.

- Objective 4. Overarching goals of group.
Update from Bret Hess.

- USDA / NIFA Update.
- Representative - Send report to.
- Major change to NIFA.
- Comments to NIFA and listening sessions.
- AFRI Program $400-500M 2010-2011 (no expected influx for next year – back to $80M-100M).

Project approval (Start date: Oct. 1, 2008 – Sept. 30, 2013)
Plan posted on NIMMS site (reports, too).

Report: Participants
Minutes
Accomplishments
- Activities (organized specific functions / duties /teams)
- Outputs (publications (also graduate students, presentations, courses/education, etc.)
- Short-term outcomes (quantitative and quantifiable measures)
- Impact statements (economic and behavioral changes)
  - e.g. trait improvement

$40 registration fee. (To Mark Enns).

Symposium for Charlie Gaskins (retired member).

**Meeting Notes – June 17.**

Station Reports:

- Milt Thomas (NMSU)
  - NMSU Gerald W. Thomas Chair – 1 year appointment.
  - McMaster’s Fellowship + CSIRO
  - Overview of Chair interview.
  - Research:
    - Relationship of beef cow size to fertility.
    - Relationship of dairy cow milk production level to fertility.
    - Bayesian QTL inference and gene identification for first service conception rate in Brangus heifers.
    - SNP50 chip; Bayes C analysis.
    - QTL detection = SNPlotZ=GBrowse
    - Hypothalamic expression of candidate genes
**Recent publications:**


**Invited academic and extension efforts:**

M. Thomas continues effort as Chair of the IBBA Breed Improvement Committee ad-hoc group known as DNA technology committee changed to a task force. Effort becoming much more strategic and educational. How do we incorporate genetic markers into a multi-breed EPD?

Branch Ranch, Lovington, NM. Developing DNA paternity testing program and within herd EPD system for an organization of 5 cow-calf operations and a feedlot. Assisting with NMSU-Ag Marketing project for Branch Ranch-Natural Beef of NM, LLC.

- Andy Herring (TAMU)
  - Evaluation of genetic variability in immune responses to BVDV.
  - Characterize multiple phenotypes associated with response to BVDV challenge.
  - Evaluation of cow productivity traits in McGregor Genomics Project.
  - Genes affecting cow productivity traits.
  - Genes with effects on carcass traits, efficiency, etc.
  - Cattle epigenetics project.
  - Joint international study (w/ Queensland and Adelaide).
  - *Bos indicus* x *Bos taurus* crosses.
  - MPRC (NRC-based residual feed intake) – Angus x Nellore crosses.
  - Epigenetic aspect of temperament.
  - 5 QTL for temperament.
  - Prenatal and postnatal gene identification and expression.
Recent publications:

Peer reviewed articles


Editor reviewed/proceedings papers


Abstracts


Extension Activities
Genetic and management tools for beef quality. BEEF 706. August 12, 2009. College Station; 40 participants.
Genetic and management tools for beef quality. BEEF 706. August 14, 2009. College Station; 40 participants.
Coordinator and moderator of Beef Cattle Research in Texas session of 54th TAMU Beef Cattle Short Course, August 3, 2009; 105 participants.

- Matt Cronin (Alaska)
  - Feral cattle on Chirikof Island
  - Taxonomy and Systematics
  - Visiting scientist – ARS Miles City (MacNeil).
  - Assessing relationships of species, subspecies, and populations, and identification of management units.
  - Polar bears (mtDNA of bear species).
  - Endangered species update.

Recent publications:

- Mike MacNeil (ARS-Miles City, MT)
  - Overview of ongoing projects / personnel (including graduate students).
  - Line 1 project (world populations).
  - Objectives:
    - Characterization of rumen microbial populations.
    - Using shotgun sequencing.
    - Determination of rumen microbial and host genetic effects – heifer efficiency.
Determination of phenotypic and genetic relationships early measures of feed intake, growth, and body composition with later reproduction and lifetime productivity.

- Determination of *in utero* nutrition on epigenetic effects.
- Development and validation of appropriate phenotypes for fertility measures.
- Identification and fine-mapping of QTL affecting feed intake, growth, and reproduction traits.

**Recent publications:**


- Mark Enns (CSU)
  - Update on budget.
  - Center for Genetic Evaluation of Livestock.
    - 20+ breeds (Background research; production EPD analysis).
    - Animal Breeder’s Tool Kit revisions (Version 3.0).
    - The DSS (complete re-write).
  - GrowSafe system
    - 6 pens with 4 nodes each (35 hd capacity per pen).
Each pen equipped with effluent run-off measurement channel.

- Genetics of Feedlot Health.
- Susceptibility/resistance to disease.
- Collection of phenotypic data.
- BRD / # treatments summary (performance + carcass traits).
- Treated vs. non-treated – Lung damage.
- Heritabilities estimated (~15%).

**Recent publications:**


- Kristi Cammack (UW)
  - Update on GrowSafe projects at SAREC.
    - 8 node system.
    - Bull test (Hereford test).
    - Upcoming heifer tests.
  - UW Herd – crossbreeding system initiated.

Recent publications:

Recent abstracts:


Motion by Milt – Chairperson follow alphabetical order (by organization). Secretary previous host/chair. 2nd Mark. Approved.

**Alaska – Proposed next location. June. Palmer campus.**
- Alaska – Chair and host
- Colorado State – Secretary

Motion: Milt, 2nd Andy, Approved.

States participating: AK, AL, CA, CO, HA, MI, MT, NMSU, TAMU, WSU, UW.

Other Submitted Station Reports:

**WERA-01**

**2010 Annual Progress Report: Washington State University**

**Period Covered:** 2009-2010

**Personnel:** C.T. Gaskins, Z. Jiang, H.L. Neibergs

**Current Collaborative Projects:**
- Wagyu EPDs – CTG
- Identification of candidate genes for fat deposition and fatty acid composition in beef cattle – ZJ, CTG
- Genomic standardized farming for high quality beef to benefit Washington agriculture and human health – ZJ
- Genome-wide DNA marker information transfer from cow to buffalo – ZJ
- Johne’s disease – HLN
- BVD/BRD – HLN
- Wagyu diversity – HLN
- Residual feed efficiency and mitochondrial function – HLN

**Recent publications:**


**Book and Book chapters:**


Abstracts:


Pan ZX, Michal JJ, Gaskins CT, Reeves JJ, Bauck S, Jiang Z. 2010. SNP-based parentage assignment with different software/programs in beef cattle. PAG XVIII. San Diego, USA.

Jiang Z, Michal JJ, Chen J, Daniels TF, Kunej T, Garcia MD, Gaskins CT, Busboom JR, Alexander LJ, Wright Jr. RW, MacNeil MD. 2010. Discovery of novel genetic networks associated with 19 economically important traits in beef cattle. PAG XVIII. San Diego, USA.
Ranch Personnel: David W. Schafer  
Keith G. Cannon  
Debra L. Pearson  
Wade W. Woodbury  
Margaret M. Woodbury  
Doug Tolleson  
John Kava  

Researchers: S. Peder Cuneo  
John A. Marchello  
Jim E. Sprinkle  

Feedlot Personnel: James English  
Keith O. Cannon  

Graduate Students: R. Dean Fish  

Current Projects:  
- Evaluation of composite and/or purebred cow productivity and profitability under stressful environmental conditions and subsequent progeny performance in the feedlot.  
  - D.W. Schafer and J.A. Marchello.  
- Effects of a long-acting, trace mineral, reticulorumen bolus on range beef cow productivity and performance.  

Recent publications:  

Impacts and outcomes:  
Provide producers with information on beef cattle performance from conception to consumption of selected purebreds and/or composites. Provide educational materials and conduct workshops for students, ranchers and the general public.
WERA-1 Expected outcomes and impacts:

1. Effective outreach and communication to beef producers through peer reviewed publications, bulletins, and direct interactions among beef producers, extension personnel, and scientists. This includes working closely with many breed associations and their members.

2. By developing the ability to conduct a phenomics focus, the group will share resources to efficiently maximize research efforts, training of students and extension personnel, as well as deliver improved tools to breeders. Most importantly, involvement in phenomics-based research fosters collaboration among scientists and increased productivity.

3. Focus on phenomics allows for information exchange and review of ongoing research to prevent duplication of efforts which maximizes use of limited research funds.

4. Involvement in phenomics research encourages cooperative research efforts that require scientists with varied expertise (i.e., quantitative and molecular genetics).

5. Collaborative/cooperative research efforts involving phenomics will lead to grant proposal development among committee members.

6. Information exchange will occur within the committee because of the knowledge of other members’ academic and research activities. This knowledge will also facilitate cooperative efforts in research as well as student training and extension activities.

7. Attendance to the annual meeting will also yield detailed planning efforts for workshop/producer training efforts. This direct interaction allows the committee members to effectively discuss how to create programs to aid producer decision making relative to use genetic evaluations and (or) molecular markers for economically relevant and indicator traits.

OTHERS:

1. The Texas A&M project has received $25,000 in internal funding and in $30,000 external funding and provides results for cattle producers in the U.S. and areas of the world to identify genomics regions associated with cow productivity, longevity, temperament, and health measures, and, their potential interactions; we are collaborating with scientists across multiple disciplines and institutions.

2. Improvements and additions to the decision support model are ongoing based on feedback and input from users of the system. If all breeders of participating associations adopted this technology it would impact the performance of 750,000 commercial progeny from just these two breeds. If the system yields only an average of $10 more profit per progeny produced, the economic result would be a $7 million increase in profit.

3. Continued graduate student participation in the Breeding and Genetics Online Education Grant by students of members of the WERA-1. This grant is funded through the USDA Higher Education Challenge Grant series and continues through August of 2011. The program provides courses to supplement education of respective institutions by presenting additional information and breadth to programs than would otherwise be possible.

4. Current funding:
• Collaborator, European Union Commission, “Development, integration and dissemination of animal-based welfare indicators, including pain, in commercially important husbandry species, with special emphasis on small ruminants, equidae and turkey”.

• Investigator, Johne’s Disease Integrated Program, “Identification of Mutations in Genes Associated with Pathogenesis of *Mycobacterium avium* subspecies *paratuberculosis* Tissue Infection”.

• Investigator, NIFA International Program, “Relationships with New Zealand to Improve Feed Efficiency of Ruminants”

• Investigator, Western SARE, “Residual Feed Intake”