Present:

Mark Enns – Colorado State University *
Brent Buckley – University of Missouri *
Denny Crews – Colorado State University ***
Lauren Hyde – North American Limousin Foundation *
Charles Gaskins – Washington State University ***
Holly Neibergs – Washington State University *
Cody Moreshead – Leachman *
Kristi Cammack – University of Wyoming *
Bret Hess – University of Wyoming **
Milt Thomas – New Mexico State University *
Peter Burfening – CSREES / USDA **
David Schafer – University of Arizona *
Larry Keenan – Red Angus Association of America *
Matt Cronin – University of Alaska *
R. Mark Enns – Colorado State University *
Harvey Blackburn – ARS Germplasm Preservation ***

*Member
**Advisor
***Invited
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.
Meeting Summary

June 18

Introductions

Advisor Reports
Peter Burfening
   Farm Bill – NIFA
   AFRI Programs and Deadlines
   Personnel Updates
   Budget Updates

Bret Hess
   Update on David Thawley
   Hatch Project
   Formula Funds

WERA-1
   In 1st Year
   Reports With Outcomes and Impacts Required Years 3 and 5
   All Reports Require Minutes and Publications
   Reports Due 60 d After Meeting

Update on Cooperative Distance Education Program (Enns):
   Graduate Education Grant / Higher Education Challenge Grant
   Virginia Tech, Colorado State University, Michigan State University, and Cornell
   2 – year Program (4 modules / year)
   No Tuition Charge
   15 -20 Institutions with Students in Courses

Courses:
   Introduction to Matrix Algebra (Year 1)
   Genetic Simulation Game (Year 1)
   Primer to Quantitative Genetics (Year 1)
   Design of Animal Breeding Programs (Year 1)
   Heterosis and Crossbreeding Systems (Year 2)
   Linear Models (Year 2)
   Genetic Prediction (Year 2)
   Marker Assisted and Gene Assisted Selection (Year 2)

Use of On-line Testing and Assignments
**June 19**

**Introductions**

**Discussion of Group Objectives (Thomas):**

**M. Thomas will take the lead.**

1. DNA Repositories - Update from Universities (Repository Collections): *First Priority*
   - NMSU, CSU, WSU, UN-Reno, Univ. Arizona, U. Alaska, UW

**Storage Options:**
   - Blood Cards
   - Buffy Coats
   - Tissues (-80C)
   - Ear Notches

**Resources:**
   - Universities
   - Breed Associations

2. Integration of Quantitative and Molecular Research Tools:
   - 50K Data
   - Phenotype Selection / Traits / Data Sharing:
     - Growth Traits
     - GrowSafe Data (CSU, UW)
     - Reproduction Traits
     - Disease Traits

**2010 Location**

**Host Possibilities:**
1. Palmer, AK
2. Reno, NV

**Dates:** June (mid to late June)
Station Report Summaries

1. New Mexico State University

Agency(s) and Principal Leaders: M.G. Thomas, D.W. Bailey, G.A. Silver, P. Luna-Nevarez, S.O. Peters, and K.L. DeAtley; Department of Animal and Range Sciences, New Mexico State University, Las Cruces.

Progress of work and results:
Research supported by NM-AES and other supplements:

Usefulness of findings:
A. Frequencies of DNA polymorphisms differ among Angus, Brangus, and Brahman cattle. Heterozygous genotypes appear advantageous in Bos indicus-influenced composites.
B. DNA polymorphisms in genes of the GH axis or its transcriptional regulators appear to predict growth and or reproductive traits in Brangus bulls and heifers (CAUTION: original studies used single locus associations).
C. SNP discovery efforts in candidate genes (fine mapping) are very productive, dbSNP limited.
D. Identification of haplotype blocks and tag SNP appears to be a much more effective strategy within a pathway/candidate gene approach to MAS.
E. Desert adaptation is measurable. Question is whether it is an effect of genetics and (or) environment (i.e., management, learned behavior, etc…)?

Work planned for next year:
A. Continue collaboration with team at UCD with Juan Medrano and Gonzalo Rincon. Specifically, transcriptome sequencing, SNP discovery, and genotype to phenotype association studies.
B. USDA-NRI fertility project, QTL association with heifer pregnancy and transcriptome identification of genes.
C. Efforts continue to evaluate genetic and (or) environmental effects on desert adaptation of Brangus cattle (i.e., grazing distribution, etc.). Compare grazing distribution and diet selection of Angus, Brangus and Brahman.

D. International collaboration for Genome Resource sharing (USDA-ARS-Thallman, Bennett and Snelling, CSIRO-U of NE, AU – Rachel Hawken, UA and UG of CA).


A. Refereed journal articles.


B. Book chapter.


C. 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. 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.
2. Washington State University

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 – HLN
- Wagyu diversity – HLN
- Residual feed efficiency and mitochondrial function – HLN

Publications:
 Peer-reviewed journal articles


**Book chapters:**

**Abstracts:**


3. Colorado State University

Personnel
R. Mark Enns, Associate Professor
Denny H. Crews, Professor
Scott E. Speidel, Research Associate
Brian W. Brigham, Research Associate
Chase McAllister, Graduate Student
Cory Pendley, Graduate Student
Amanda Pepper, Graduate Student
Mike Moon, CSU Beef Improvement Center Manager
Duane Wood, CSU Beef Improvement Center Cow Manager

Impacts and Accomplishments
We have developed and released to the beef industry a new methodology for calculating stayability EPDs that utilizes early-life indicators to improve the accuracy of those EPD. Traditional stayability EPD represent the probability that an animal’s daughters will remain in the productive herd until 6 years of age. Given this definition sires are at least 8 years old before their daughters ever have an observation for stayability. Using a new methodology we incorporate information on stayability from earlier ages in a female’s productive life.

Publications


4. University of Nevada – Reno

Personnel
L. Gomez-Raya, Associate Professor
D. Thain Assistant Professor
W. M. Rauw, Assistant Professor
M. Teglas, Assistant Professor
B. Bruce, Associate Professor
T. Wuliji, Associate Professor

Ranch Managers
Kevin Piper

Impacts and Accomplishments
We have developed methods for inferring sire’s genotypes when DNA from the sires is not available. It will help to carry out Quantitative Trait Loci mapping in range populations. We have also arrived to the conclusion that DNA paternity programs can be economically efficient. Dr. Rauw has edited a book just published on feed efficiency.

Publications for 2008 and 2009

**ASAS Presentations 2009 and 2008**

Gomez-Raya. L. Construction of LD maps for SNPs linked to susceptibility loci (oral presentation). Joint ADSA-CSAS-ASAS Meeting. 2009, Montreal, Quebec, Canada. (oral presentation).


5. University of Wyoming

Personnel:

Lead Scientist:
Kristi Cammack

Collaborators:
Steve Paisley (University of Wyoming)
Bill Lamberson (University of Missouri)
Jerry Taylor (University of Missouri)
David Ledoux (University of Missouri)
Ken Olson (South Dakota State University)
Kathy Austin (University of Wyoming)
Cody Wright (South Dakota State University)
Patricia Johnson (South Dakota State University)
Bret Hess (University of Wyoming)
Brenda Alexander (University of Wyoming)
Rebecca Cockrum (University of Wyoming)
Sheila Rustemeyer (University of Wyoming)
Katie Kessler (University of Wyoming)

Ongoing Relevant Research:

Differential Gene Expression as an Indicator of Tolerance to High-Sulfate Water in Steers
University of Wyoming (Kessler, Austin, Cammack)
South Dakota State University (Olson, Wright, Johnson)

Differential Gene Expression in Ewes Divergent for Response to Nitrate Toxicity
University of Wyoming (Cockrum, Austin, Cammack)
University of Missouri (Taylor)

Recent Publications:


Recent Abstracts:


CURRENT BEEF CATTLE 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.


PUBLICATIONS
7. North American Limousin Foundation

2008 Publications
Manuals


Magazine Articles


2009 Publications
Manuals


Magazine Articles


8. University of Hawaii
   - Decline in Livestock Numbers
     - Angus Breed

9. University of Alaska – Fairbanks
   - 20 Cows – Herd Size
   - DNA Resources – Limited
     - Galloway, University Herd, Chirikof Island
   - Wildlife Research – Conservation Issues

10. Red Angus Association of America Research – Idaho (400 head)
    - Extension Component of NRI-funded Project
      - RFI – Cow Efficiency, Carcass Merit, Etc.

11. Leachman Cattle
    - 500 Head – Feed Efficiency Data
    - Blood Samples
      - 25% Angus
      - 25% Red Angus
      - 50% Stabilizer