



## Performance Programs at a Crossroads

Genetic improvement - Who benefits? At what cost? Who pays?

## Performance programs at a crossroads...*in transition*

- Performance program **services**
  - Kent Andersen, North American Limousin
- Beef cattle production **research**
  - Ronnie Green, USDA-ARS
- Producers...**user** of selection information
  - Brian McCulloh, Woodhill Farms

## Genetic Improvement – Who benefits?

• Cow/Calf	↔	763,000 producers average herd size 43 head
• Feedlot	↔	261 feed yards 61% market share
• Packer	↔	5 major packers 85% market share
• Retail	↔	Big 10 retail chain 55% market share
• Consumer	↔	300 million domestic 5% export

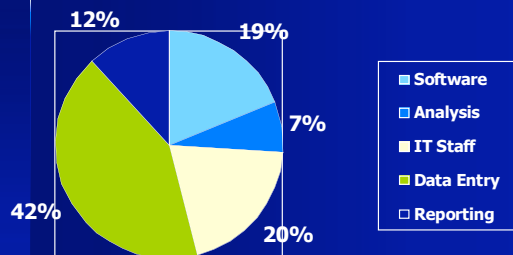


## Massive scope of the U.S. beef industry\* ...

- Economic impact of U.S. beef industry
  - Consumer spending – over \$70 billion (2005)
  - Direct and indirect employment
    - 1.4 million full-time-equivalent jobs
  - Annual gross receipts from sales of cattle and calves exceeds \$40 billion
  - Direct and indirect economic activity throughout the U.S. economy
    - \$188 billion (beef sector is largest single ag enterprise)

\*Economic Impact of the U.S. Beef Industry. 2000. Dan Otto and John Lawrence, Iowa State University,

## Genetic improvement - At what cost? ...\$3 million annually from breed associations...



Is too much riding on too little?

What "price" might the industry pay for under-funded, under-staffed, fragile and antiquated performance programs, research and genetic evaluation infrastructure?

## Returns from past investment in beef cattle genetic improvement

- Australia – G.R. Griffith, et. al., 2003
  - Costs and benefits of all beef cattle genetic improvement activity since 1970
  - Benefit/cost ratio was 28:1 over 30 years
- Canada (Ontario) – C. Devitt, 2003
  - For every \$1 million invested, \$3.3 million in gross margin is directly returned

## Performance programs at a crossroads...

- Genetic Evaluation
- Genomics
- Decision Support
- The Breed Association
- Leadership



## Performance program survey - selection

Do you have the selection tools needed to reliably make desired genetic improvement?

1. No, not for most traits
2. No, not for many traits
3. Neutral - Yes for some, but no for other traits
4. Yes, for most traits, no for a few
5. Yes, for nearly all traits

## Performance program survey

Do you know your within herd genetic (seedstock) / phenotypic (commercial) trends for key traits?

1. No, I don't monitor genetic/phenotypic trends within my herd
2. Somewhat – I've got a "gut-feel" for the trends, but don't routinely calculate
3. Yes, I routinely quantify and monitor specific genetic/phenotypic trends in my herd

## Performance program survey – birth data (seedstock)

How do you most commonly collect birth weight data?

- I do not collect birth weight data
- Visually, with my eyeball
- With a hoof tape
- With a scale

## Performance program survey – scan data

Which of the following best describes your use of ultrasound scan data in selection?

- I do not use scan information when making selection decisions
- I primarily use actual scan measures
- I primarily use yearling adjusted scan measures/ratios
- I primarily use interim carcass/scan EPDs that incorporate animal/group scan data

## Performance program survey – carcass data

Which of the following best describes your efforts to have actual carcass data collected on your cattle?

- Have never collected much
- Collected some in the past but not much in recent years
- I've begun collecting more lately
- Have routinely collected significant amounts

- Breakout results by seedstock and commercial

## Performance program survey – multi-breed

Do you currently produce (seedstock) / use (commercial) hybrid seedstock?

1. No
2. Yes

- Breakout results by seedstock and commercial

## Performance program survey – multi-breed

What do you anticipate regarding future production/use of hybrid seedstock?

- Declining production/use
- Stable but stagnant production/use
- Increased production/use
- Dramatically increased production/use

- Breakout results by seedstock and commercial

## Crossroads: Genetic Evaluation

- Computation – public to private entity (s)
- Within breed to multi-breed (hybrid)
- Within population to multi-population
- Existing methodology to “quantum leap”
- Traditional to “new” trait development
- Domestic to international evaluations
- Periodic to continuous computation
- Quantitative to molecular information

## Performance program survey – DNA diagnostics

Have you tested (seedstock) / used (commercial) any of the DNA diagnostics for quantitative traits (marbling, tenderness, etc.)?

- No
- Yes

- Breakout seedstock and commercial results

## Performance program survey – DNA diagnostics

How comfortable are you with your understanding of DNA diagnostics for marbling and tenderness?

- Uncomfortable – I don't understand these selection tools
- Somewhat uncomfortable and confused
- Somewhat comfortable, working knowledge
- Comfortable - strong understanding

## Performance program survey – EPDs, DNA

Do multiple sources of genetic information for the same trait (marbling) help to simplify or confuse your selection decisions?

- ☞ Simplifies selection once tools are understood
- ☞ Slightly confuses selection
- ☞ Somewhat confuses selection
- ☞ Creates significant confusion and may impede response to selection

## Crossroads: Genomics

- Research/development – investment/risk
- Validation – consortium, other
- Commercialization...relationships
- Operations...services before/after testing
- Education...what do the results mean?
- **Context**...seek to minimize confusion
  - Incorporation into genetic evaluation

## Joshua Bell, Violin Virtuoso



## Performance program survey – DNA diagnostics

- **Context** - For a moderately heritable trait such as marbling, how much would a DNA diagnostic enhanced EPD, with accuracy increased from .20 to .70, be worth?

## Performance program survey – decision support

How much do you emphasize current selection index information (\$BEEF, \$API, \$MTI, etc.) when making breeding decisions?

- ☞ Do not use
- ☞ Low emphasis
- ☞ Moderate emphasis
- ☞ High emphasis

## Crossroads: Decision Support

- Genetic predications to economic impact of selection decisions
- Static indexes to dynamic/customized decision support
- Tools for seedstock and commercial
- Coping more objectively with increased complexity and volatility...modelers needed
  - Interactions: genetics, nutrition (corn) management and markets...

## Performance program survey

How much on average have you paid for bulls over the past two years?

- ☞ Less than \$2,000
- ☞ \$2,000 to \$3,000
- ☞ \$3,000 to \$4,000
- ☞ Greater than \$4,000
- ☞ I produce my own bulls

- Breakout seedstock and commercial results

## Performance program survey (seedstock)

Which of the following best describes your willingness to pay for more advanced performance recording and evaluation services?

- ☞ Not willing to pay more...prices already too high
- ☞ Willing to pay a little more (up to 10%)
- ☞ Willing to pay somewhat more (10% to 25%)
- ☞ Willing to pay a lot more (over 25% more)

## Performance program survey

Which of the following best describes your willingness to pay for more thoroughly and reliably evaluated seedstock?

- ☞ Not willing to pay more...already too high
- ☞ Willing to pay a little more (up to 10%)
- ☞ Willing to pay somewhat more (10% to 25%)
- ☞ Willing to pay a lot more (25% to 50%)

## Crossroads: Breed Association

- Income from data processing/evaluation
- Reinvest in marketing/programs/research
- Performance program transitions:
  - Animal to inventory business model
  - Paper to paperless...electronic input/output
  - Batch to real-time processing
  - Breed and hybrid recording
  - Quantitative to “molecular” data services
  - Passive to assertive producer education

## Crossroads: Leadership

- People/Intellectual
  - Empowering breeders – knowledge gap
- Capital
  - How can we fuel discovery and performance program enhancements?
- Public Policy
  - Societal changes...threats

## The big question?

What do we need to do to be the undisputed global leader in beef cattle performance evaluation and improvement for the next 40 years?

## A Progressive Vision for Beef Improvement

- Competition
- Cooperation
- Coordinated
  - Infrastructure
- Comprehensive
- Cost
  - Who pays?

