



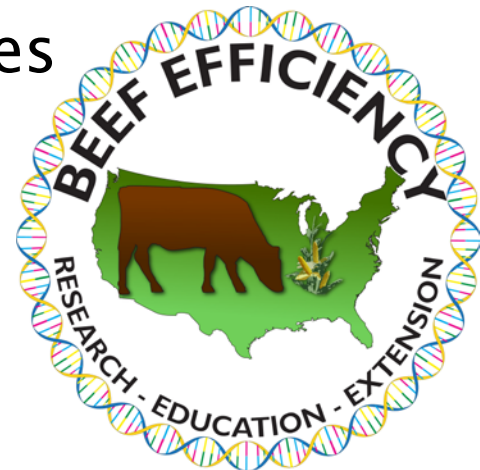
# Analysis of US Cow–Calf Producer Survey Data to Assess Knowledge, Awareness and Attitudes Related to Genetic Improvement of Feed Efficiency

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# Importance of Feed Efficiency

- ◆ Feed costs = 66% in calf feeding systems
- ◆ Feed costs = 77% in yearling finishing systems  
*Anderson et al. 2005*
- ◆ 10% improvement in gain = +18% profit
- ◆ 10% improvement in efficiency = +43% profit  
*Fox et al. 2001*
- ◆ Efficiency increases have 7–8 times the economic impact of comparable increases in gain  
*Okine et al. 2004*



# Value of Improved Efficiency in Feedlot Sector

**Table 1. Estimated cost savings to the US beef cattle industry from selection for a 2 lb reduction in residual feed intake.**

In Wt.	Out Wt.	Lb. Gain	ADG	Days on Feed	RFI	Reduced Feed Intake (lb)	Feed Cost Savings \$/hd	% of Fed Mix	Total Feed Cost Savings
<b>Calf Feds</b>									
600	1250	650	3.5	186	0.0	0			
600	1250	650	3.5	186	-2.0	-372	(54.72)	34	\$ 502,620,656
<b>Yearling Feds</b>									
775	1300	525	4.0	131	0.0	0			
775	1300	525	4.0	131	-2.0	-262	(38.67)	66	\$ 689,539,820
									<b>Total Savings: \$ 1,192,160,476</b>
Annual fed slaughter cattle: 27 million head; Delivered feed cost: \$ 294.62 as fed									

Weaber, 2011

# National Program for the Genetic Improvement of Feed Efficiency in Beef Cattle



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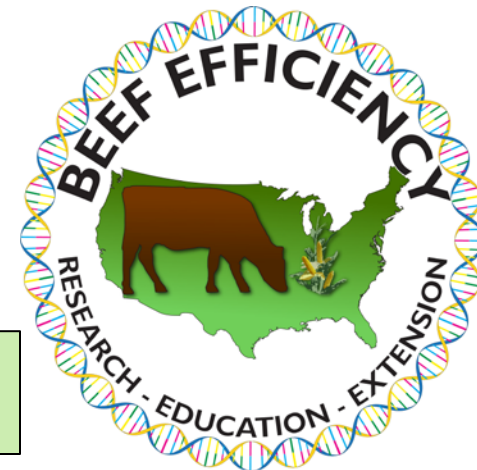
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United States Department of Agriculture  
National Institute of Food and Agriculture



*20 investigators  
10 institutions*



# Stakeholder Survey

## ◆ Objectives

- Develop understanding of stakeholder attitudes/behaviors related to:
  - Importance of feed efficiency
  - Feed efficiency metrics
  - Methods of genetic improvement
- Base line for determination of project impact
- Guide extension program development deployment



# Stakeholder Survey

## ◆ Stakeholder sampling

- USDA–NASS Producer sample (~7,500)
  - Cow–calf (National)
  - Feedyard (13 state region used for Cattle on Feed)
  - Mailed September 18, 2013; non–respondents received second copy October 23, 2013

## ◆ Paper survey–55 questions

- Survey instrument reviewed and granted exemption (45 CFR §46.101, paragraph b, category: 2, subsection: ii) by K–State IRB

## ◆ Dataset returned December 2, 2013

- Return rate: 11.6%



# Stakeholder Survey

- ◆ Regions

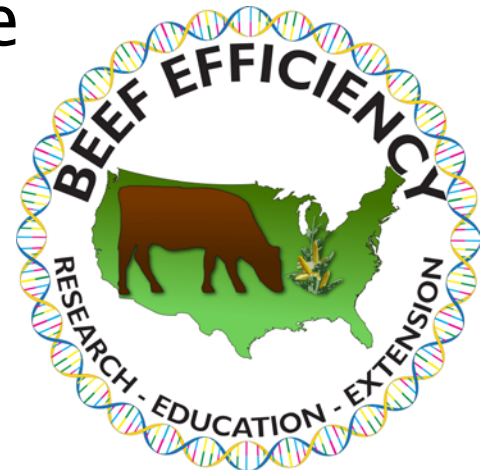
- ◆ Strata--Herd Size

7	5,001 +	Beef Cows
6	2,501 - 5,000	Beef Cows
5	1,001 - 2,500	Beef Cows
4	501 - 1,000	Beef Cows
3	251 - 500	Beef Cows
2	101 - 250	Beef Cows
1	100 and below	Beef Cows



# Stakeholder Survey Statistical Analysis

- ◆ Weighted frequencies and standard errors estimated using PROC SURVEYFREQ in SAS
- ◆ Means and standard errors estimated using PROC SURVEYMEANS in SAS
- ◆ Stratified sample design
- ◆ Frequencies weighted to account for unequal probability of inclusion in the sample





# Stakeholder Survey Results

- ◆ Analysis focused on commercial cow-calf producers (n=269)
  - 93% Owners
  - 5.1% Managers
  - 1.8% Other
- ◆ Mean age  $57.4 \pm 1.9$  y
- ◆ Mean experience  $33.2 \pm 1.6$  y
- ◆ Farm/ranch cattle inventories of respondents
  - $83.1 \pm 6.7$  hd
- ◆ 3.7% use of Artificial Insemination
- ◆ Mean bull price US\$  $1,887 \pm 102$



# Stakeholder Survey Results

- ◆ Respondent level of education
  - 38.3% 4 y college graduates
  - 23.3% some college
  - 27.3% high school graduates
  - 5.0% less than high school grad
  - 6.3% no response
- ◆ Farm/ranch work as % of time
  - 47.3% indicated greater than half-time
- ◆ Farm/ranch income as % of family income
  - 29.9 ± 2.2%



# Stakeholder Survey Results

- ◆ Sources of breeding/genetics information
  - 38.9% unpaid consultant
  - 29.7% veterinarians
  - 29.5% extension professionals
  - 27.7% seedstock producers
  - 18.9% internet search
  - 18.1% farm supply/feed store
  - 14.7% breed association personnel
  - 11.7% AI stud personnel
  - 9.3% popular press
  - 2.1% paid consultants

*Important to educate traditional trainers; but also direct communication to commercial and seedstock*



# Stakeholder Survey Results

- ◆ Decision making process in their business
  - 73.8% profitability greatest concern
  - 24.2% early adopters of new technologies
  - 77.0% let ideas prove themselves before adoption
  - 87.0% current management/selection sustainable
  - 55.4% access new knowledge from media/program
  - 40.1% rely on extension educators to teach new techniques
  - 39.8% rely on seedstock/breed associations for new info on breeding/selection practices



# Stakeholder Survey Results

## ◆ Feed Efficiency Concepts

- 32.5% correctly identified definition of F:G
- 36.2% correctly identified definition of feed efficiency
- 16.4% had heard of RFI
- 14.3% familiar of RADG
- 54.8% identified rate of gain as method used by industry historically to improve FE
- 40.6% improved diet formulation
- 28.4% feed additives

(ionophore/beta-agonist)

- 35.2% implants
- 24.2% didn't know if any of the options were used
- ~50% of respondents didn't know of any negative consequence to cowherd due to selection for ADG; 13.4% no harmful effects; 10.3% correctly answered





# Stakeholder Survey Results

## ◆ Feed Efficiency Concepts

- 41.2% not knowledgeable of methods to select for improved efficiency
- 28.8% slightly knowledgeable
- 20.2% somewhat knowledgeable
- 7.0% very knowledgeable
- 1.5% extremely knowledgeable



# Stakeholder Survey Results

- ◆ Largest obstacle to genetic improvement of FE in beef industry
  - 11.9% lack of available facilities/equip
  - 9.7% lack of uniform guidelines
  - 8.3% no obstacles
  - 8.0% lack of demand for tested bulls
  - 7.1% too expensive to collect ind. FI records
- ◆ ~10% were aware of this project



# Stakeholder Survey Results

Frequency of use (SE) for various types of genetic prediction information used by beef producers during past five years and their anticipated future use.<sup>1</sup>

Data type	Use past 5 years <sup>2</sup>	Anticipated future use <sup>2</sup>
Actual measurements	18.4 (3.0)	6.7 (1.8)
Ratios	21.6 (4.0)	13.8 (3.3)
Expected Progeny Differences	<b>29.9 (4.4)</b>	<b>12.4 (3.4)</b>
Genomically Enhanced EPD	<b>5.6 (2.2)</b>	<b>12.6 (3.0)</b>
Productivity of relatives	16.4 (3.5)	14.3 (3.7)
Comments by seller	17.6 (3.8)	11.4 (3.0)
DNA marker results	<b>2.8 (1.5)</b>	<b>15.4 (3.1)</b>
None of above	31.0 (4.9)	42.5 (5.1)

<sup>1</sup>Respondents could select more than one type of information used; column totals will not sum to 100%.

<sup>2</sup>Percentage of respondents indicating use or anticipated use followed by standard error of measurement.



# Stakeholder Survey Results

- ◆ Genetic Improvement Concepts
  - Gauge knowledge of and understanding of basic genetics/selection concepts and attitudes
  - Asked to identify current and anticipated selection behaviors



# Stakeholder Survey Results

- ◆ Producers lack basic understanding of new genomic based selection tools and anticipated benefits
  - 62% didn't know what class of traits would benefit from marker assisted selection
  - 13.1% correct (difficult/expensive; sig. costs/returns)
  - >2/3 didn't know value of including genomics in NCE
  - 20.8% correctly ID'd increase in acc.
  - 70% didn't know how much genetic variation accounted for by current DNA markers





# Stakeholder Survey Results

- ◆ Genetic Improvement Concepts
  - 41.7% ADG as selection criteria to improve FE
  - 27% cow mature weight and body condition score
  - <4% ME EPD
  - <4% Residual Average Daily Gain (rADG)
  - <4% selection index that use FI predictions



# Stakeholder Survey Results

- ◆ Willingness to pay for bulls with reliable FE genetic predictions
  - 23% would not pay more
  - 10.5% increase price US\$ 101–200
  - 11.8% increase price US\$ 201–300
  - 13.6% pay > US\$ 500



# Stakeholder Survey Conclusions

- ◆ Cow-calf producers not well versed in either feed efficiency or genetic/selection concepts.
- ◆ More work to be done to educate trainers and producers on both topics
- ◆ No direct price signal in value chain, although significant cost saving/value improvement through improvement
- ◆ Value of demonstration project; surveyed participants to quantify knowledge gain/attitudes



# Acknowledgements

- ◆ US Consortium for Genetic Improvement of Feed Efficiency in Beef Cattle
  - [www.beefefficiency.org](http://www.beefefficiency.org)



United States  
Department of  
Agriculture

National Institute  
of Food and  
Agriculture

This project is supported by Agriculture and Food Research Initiative Competitive Grant no. 2011-68004-30214 from the USDA National Institute of Food and Agriculture



[www.beefefficiency.org](http://www.beefefficiency.org)

**Thank you!**

**Questions?**

