Value of Pre-Harvest Food Safety and Animal Welfare Certification for Cattle Producers
FY 2011

The general long term goal of this project was for a multidisciplinary team of researchers, educators, and extension specialists to generate and disseminate essential information beef producers could use to increase profitability by certifying production protocols providing safer beef produced with animal welfare assurances to consumers. Specific objectives were to:

1. Identify and document efficacy of specific production protocols to improve food safety and ensure animal welfare

2. Develop guidelines for beef cattle production management protocols that profitably enhance food safety and ensure animal welfare.

3. Estimate impacts on producer (cow-calf, feedlots, packers, and retailers) and consumer economic surplus over time of adoption of pre-harvest production management certification that enhances food safety and assures animal welfare.

4. Disseminate knowledge generated to producers, industry stakeholders, industry associations, regulatory agencies, and scientists.

FINAL REPORT

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Project Title
Value of Pre-Harvest Food Safety and Animal Welfare Certification for Cattle Producers

Final Project Report Prepared for
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Background Problem Statement
The US beef industry is facing substantial challenges from several directions. Beef customers are demanding progressively greater accountability of upstream producers to improve food safety, assure animal welfare, produce using environmentally friendly stewardship, and demonstrate sustainable production and marketing practices.[1] Many factors consumers demand are credence attributes that cannot be determined even after a product is consumed. Providing food products containing credence attributes regarding production practices is facilitated by a process that certifies production claims are true. Furthermore, food product credence attributes being demanded have multiple and broad dimensions that require careful delineation and measurement. For example, animal welfare has numerous components that can be measured in a host of different ways that span from scientific to ethical considerations.[2] As such, defining specific production practices that attain particular credence attribute claims can be a daunting task.

The overriding goal of this project was to determine the value of well-defined beef cattle production practices that would enhance food safety and provide animal welfare assurances. This project was designed to compile established beef cattle production practices that can be verified and bundled to provide a food safety and animal welfare certification system for beef cattle producers. Economic feasibility of producers adopting and certifying specific production practices hinges critically upon the costs of adoption and potential demand for cattle produced under certification parameters. As such, this project entailed a multi-faceted approach to indentify essential production practices to enhance food safety and assure animal welfare concerns that, if adopted by producers, could increase profitability. The production protocols defined in the certification system were those that can feasibly be adopted and have sufficient demand by customers to encourage adoption. The protocols were identified based upon published research demonstrating the efficacy of the protocols in enhancing food safety and addressing animal welfare concerns. Furthermore, the production practices designed with capability for third-party audit so that USDA Process Verified Program (PVP) or private third party standards could be developed. This is important because US consumers place

[1] Schroeder, T.C. and G.T. Tonsor. 2011. "Demand for Meat Quality Attributes." Chapter 34 in *Oxford Handbook on the Economics of Food Consumption and Policy*, Eds. J. Lusk, J. Roosen, and J. Shogren.
[2] Rushen, J., A. Buttersworth, and J.C. Swanson. 2011. "Farm Animal Welfare Assurance: Science and Application." *Journal of Animal Science* Published Online January 7.

substantially greater value on attributes verified by third parties including USDA, than unverified claims.[3]

Economic feasibility of adoption by producers of a production and marketing certification system for enhancing food safety and animal welfare must be carefully assessed. Producers will not adopt new, or certify existing, production practices unless adoption increases net returns. Thus, we identified and compiled production practices that are feasible to adopt and at the same time could provide sufficient value to customers to justify added adoption costs.

An important question is, w*hy focus on both food safety and animal welfare in this project?* Potential extrinsic beef product attributes that could be addressed in this project were numerous. However, we focused our project on food safety and animal welfare for several reasons. Food safety breaches, which result in some 48 million illnesses annually, include among the most prevalent pathogens *Salmonella* and *E. coli 0157* - those most often found in meat.[4] Food safety breaches result in substantial public relations crises and often even bankruptcies for beef industry firms as evidenced by the Hudson Foods, Topps, and Westland/Hallmark cases. Food safety is a dominant concern that has prompted a host of substantial policy initiatives including the recently passed food safety bill. Food safety concerns have had substantial market impacts in the beef industry.[5] Furthermore, beef realized about 40% more food safety recalls (combined FSIS class I and II) than either pork or poultry products over the 1982-2007 period which had a detrimental impact on beef demand.[6]

Animal welfare has become one of the most hotly contested public policy arenas. US residents in multiple states have signaled that particular production practices will be banned due to perceived undesirable animal welfare impacts. Food service establishments are also increasingly sourcing food from "humanely raised" sources.[7] While most existing discussions have focused on pork, egg, or poultry production, public interest in animal welfare aspects of beef production is growing.

Our project combined food safety and animal welfare into a single certification development because they are complementary. Consider for example the Westland / Hallmark plant beef recall of 143 million pounds in 2008, the largest in US history.[8] Arguably, the Westland /

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[3] Olynk, N.J., G.T. Tonsor, and C.A. Wolf. 2010. "Consumer Willingness to Pay for Livestock Credence Attribute Claim Verification." *Journal of Agricultural and Resource Economics* 35:261-280.

[4] Centers for Disease Control and Prevention. 2010. "CDC Reports 1 in 6 Get Sick from Foodborne Illnesses Each Year." CDC Online Newsroom, December 15. CNN. 2011. "Obama Signs Food Safety Bill." January 4.

[5] Schroeder, T.C., G.T. Tonsor, J.M.E. Pennings, and J. Mintert. 2007. "Consumer Food Safety Risk Perceptions and Attitudes: Impacts on Beef Consumption across Countries." *B.E. Journal of Economic Analysis & Policy* 7,1 *(Contributions)*, article 65.

[6] Tonsor, G.T., J. Mintert, and T.C. Schroeder. 2010. "U.S. Meat Demand: Household Dynamics and Media Information Impacts." *Journal of Agricultural and Resource Economics* 35(1):1-17.

[7] Hudson, D. and J. Lusk. 2004. "Activists and Corporate Behavior in Food Processing and Retailing: A Sequential Bargaining Game." *Journal of Agricultural and Resource Economics* 29:79-93.

[8] Seltzer, J., J. Rush, and J. Kinsey. 2010. "Westland/Hallmark: 2008 Beef Recall A Case Study by the Food Industry Center." The Food Industry Center, University of Minnesota, January.

Hallmark issue had more to do with animal welfare concerns than with food safety. In fact, several industry stakeholders argued that a recall was unnecessary as no food safety issue was present. However, the incident contributed to significant changes to US food safety regulations especially related to non-ambulatory cattle which had to be condemned and disposed. More broadly, the issue of public trust or growing lack thereof in the food supply is at the heart of both food safety and animal welfare concerns.

Project Approach

To accomplish the project we established four specific goals. The general long term goal of this project was for our multidisciplinary team of researchers, educators, and extension specialists to generate and disseminate essential information producers could use to increase profitability by certifying production protocols providing safer beef produced with animal welfare assurances to consumers. The objectives and associated plan of work was:

1. **Identifying and documenting efficacy of specific production protocols to improve food safety and ensure animal welfare.** The research team has considerable expertise and knowledge in this area having been involved heavily in cattle production sciences, veterinary medicine, and animal welfare research and outreach. As such, drawing on current expertise of the research team to document this segment of the study was natural. However, there is also a wide body of published research that the team reviewed to document specific protocols to meet targeted food safety and animal welfare assurances. This portion of the project was less concerned with economic feasibility of particular practices, but focused more on populating and ranking the list of protocols that have the most substantial potential to enhance food safety and ensure particular animal welfare conditions.

2. **Developing guidelines for beef cattle production management protocols that profitably enhances food safety and ensures animal welfare.**
   a. **Determining demand for enhanced food safety and animal welfare assurance certification in downstream retail markets.** Determination of the food safety and animal welfare attributes retail establishments demand was completed immediately after completion of objective 1. To accomplish this objective we used personal interviews with selected retailers to identify, rank, and solicit valuation of specific food safety enhanced and animal welfare assurances and certification programs for beef they purchase. We targeted our interviews to major national and regional supermarket chains to collect information.

   b. **Determining costs of adoption of production management protocols to provide food safety enhancement and animal welfare assurances by individual cattle producers**. To accomplish this objective the costs of specific protocols that were identified for the certification program from objectives 1 and 2a were used to develop cost estimates by cattle producers of adopting specific protocols for representative operations.

3. **Estimating impacts on producer (cow-calf, feedlots, packers, and retailers) and consumer economic surplus over time of adoption of pre-harvest production management certification that enhances food safety and assures animal welfare.** Ultimately, if producers adopt a food safety and animal welfare enhanced production system, markets adjust through the added costs impacting market supply of cattle and the enhancements impacting market demand for beef. To estimate how adoption of such a certification system could impact overall market prices and quantities at each major vertical sector of the beef industry, as well as economic surplus (well-being) at each level, we employed an Equilibrium Displacement Model.

4. **Disseminating knowledge generated to producers, industry stakeholders, industry associations, regulatory agencies, and scientists.** The entire team of multidisciplinary scientists disseminated information through publication of refereed journal articles and extension fact sheets, and industry presentations (in-person and via webinars).

Contributions of Public or Private Agency Cooperators

Several entities provided direct support to accomplishing this project. Work identifying and disseminating animal welfare protocols was led by investigators Thompson and Reinhardt in cooperation with the Kansas Beef Council. Several anonymous Kansas cattle producers provided information for the welfare protocol research. A Kansas State University College of Veterinary Medicine professor, Dr. David Renter, and Pfizer Animal Health (now Zoetis) collaborated with investigator Schroeder on estimating costs of vaccinating cattle for *E. coli.* A large number of anonymous retail grocers participated in surveys used to estimate the value of food safety and animal welfare assurances certifications.

Results, Conclusions, and Lessons Learned

Results: Several key results were revealed from our work including:

1. An animal welfare assessment conducted in Kansas beef cattle production facilities revealed that current production practices generally exceed acceptable levels for facilities and cattle comfort. Likewise, cattle handling procedures were well within acceptable protocols. The welfare assessment was the first to document how actual production practices compared with objective standards developed for animal welfare assurances. This suggests there are no added costs for the typical cattle production operation to comply with welfare assurances beyond what might be required for certification or periodic audits.

2. Retail grocers indicated that beef product safety is of utmost concern to them and having safe food to provide their customers is their single highest priority. One retailer indicated, “Safety is a non-negotiable factor. If the safety factor is not there, then the product in not considered.” Seven of ten retailers we interviewed indicated they would prefer beef products that had both food safety and animal welfare certifications. Overall, animal welfare assurances were important to retailers, something they simply expected of suppliers and producers, or something they simply did not want to talk about with us in phone interviews.

3. Costs to administer *E. coli* vaccinations in feedlots were estimated to range from about $6.50 per head to $13 per head. The costs depend upon whether the animals were going to be processed through a chute anyway relative to whether the vaccination required an additional chute run. The vaccination protocols currently in use recommend two or three doses and the multiple doses may result in economically important animal feeding performance reductions if these require running the animals through the chute additional times beyond what the producer would have done without the vaccination. This contributes to the range in cost estimates.

4. Economic analyses of administering *E. coli* vaccinations and assuring animal welfare at the beef cattle production stage revealed that in the absence of any additional benefits, feedlot operators would realize net economic losses. In such a situation, beef quantities at the retail, wholesale, slaughter cattle, and feeder cattle level would all decline over the 10 years examined. Prices at the retail and wholesale beef levels would increase in all 10 years as the increased feedlot level costs were passed vertically towards consumers. Prices at the feeder cattle level would decline in all 10 years as the feedlot level costs result in reduced derived demand for feeder cattle. Slaughter cattle prices decline in years 1 and 2 and increase over years 3-10 reflecting long-run supply being more elastic than short-run supply and a multitude of derived demand and supply feedbacks captured by the model. In the situation of no additional demand benefits or cost savings, the Equilibrium Displacement Model (EDM) results suggest cumulative net present value declines over ten years in producer surplus at the feedlot level are $1 billion if no animal performance loss associated with vaccinating is assumed and $1.79 billion if reduced animal performance occurred. Recognize these substantial losses occur if no offsetting benefits materialize which would suggest very limited voluntary adoption by producers would be expected.

   However, if incentives for *E. coli* vaccination occur in the form of derived demand increasing for slaughter cattle by beef packers or if either domestic retail or wholesale export beef demand increased following program implementation benefits quickly would accrue to producers. Similarly, a derived demand benefit would materialize if production costs at either the retail or wholesale level declined following *E. coli* vaccination program implementation. Given these probable situations, we extended our analysis and utilized the EDM to identify the additional demand benefits or cost savings needed to make the feedlot level indifferent to adoption. Specifically, we estimated the retail demand increase, wholesale export demand increase, retail cost savings, and wholesale costs savings that result in producer surplus changes at the slaughter cattle (feedlot) level being $0. When animal performance impacts are considered either a 3.0% increase in retail beef demand or a 32.6% increase in wholesale export beef demand would provide the derived demand benefits for feedlot operators making them indifferent to implementing *E. coli* vaccination programs. Similarly, a 3.9% cost savings for retailers or 2.2% cost savings for packers results in $0 changes in economic welfare for the feedlot segment.

5. Economic costs associated with downstream (packers, processors, and retailers) food safety breaches can be significant. In examination of specific case studies, we found statistically and economically important reductions in stock prices of publicly reported firms following meat food safety recall events. Costs of food safety breaches can be substantial to post-farm gate suppliers.

Conclusions: Important conclusions from our work include:

1. Beef cattle producers appear to be for the most part adhering to or exceeding acceptable animal welfare standards. As such, little general additional cost is probable for most beef cattle producers to offer welfare assurances to customers.

2. Use of *E. coli* vaccination by cattle producers will only occur if beef packers realize sufficient cost savings (1.2% to 2.2%) associated with reduced food safety handling costs or risks. If consumer or export demand increased because of fewer food safety hazards, this would reduce the amount by which packer costs would need to decline to make *E. coli* vaccination programs profitable for the industry to adopt.

3. Retailers consider food safety a top priority in their fresh meat case. They also expect industry to adhere to animal welfare production and processing practices that meet identified standards. Retailers may be willing to pay more for enhanced food safety and animal welfare assurances, but only if they see it benefiting or being demanded by their customers.

Lessons Learned:

1. Many retailers tend not to want to talk at all about their meat procurement activities in phone interviews. Even fewer are willing to discuss animal welfare, especially with interviewers in telephone conversations. Those that are willing to discuss it, tend to have visible programs in place ensuring animal welfare practices are being adhered to. In contrast, nearly every retailer contacted was willing to talk with us about the immense importance of meat food safety.

2. To get wide-scale adoption of *E. coli* vaccinations by cattle producers, beef packers are going to have to realize reduced costs associated with lower food safety handling costs, have sufficiently lower food safety risk, and/or realize increased demand for their products by retailers. Without some combination of these, even though in combination the necessary magnitudes are small, significant adoption by producers is not likely to occur.

Current and Future Benefits Derived from this Project
This project provided a number of both direct and indirect noteworthy benefits including:

1. This study is the first to provide estimates of the costs of *E.* coli vaccination protocols by cattle producers. Knowing these costs is critical to understanding the added revenues producers must secure to provide adoption incentives.

2. We have illustrated what will be necessary for successful launch of a program that would provide food safety and animal welfare assurances by cattle producers. Essential to successful development of such an effort is having an understanding of the benefits that must accrue downstream in order to provide market incentives for adoption by producers. Armed with this information producers can work more closely with downstream packers, processors, and retailers to develop programs and protocols to continue to advance food safety enhancements and animal welfare assurances. The information generated from this study has already been used in industry discussions surrounding adoption of *E. coli* vaccination programs and associated incentives that would be necessary.

3. Investigating how to realize downstream benefits to provide incentives for increased food safety assurances through cattle vaccination programs is an important on-going effort of industry leaders. This project is certainly a catalyst to some of those discussions.

4. Ancillary benefits associated with this project included employment of three undergraduate students, six graduate students, and a research associate who gained knowledge associated with production management and economics of food safety enhancements and animal welfare assurances in the beef industry through work on segments of this project. Several publications and presentations resulting from this project directly included students and other associates who were engaged in various aspects of the project beyond the principle investigators.

Future Research
The most apparent next steps for on-going research emanating from this project include:

1. Continuing to identify and quantify the economic impacts of beef food safety and/or animal welfare concerns for downstream firms. We are currently working on projects designed to carefully assess these economic impacts so downstream packers and retailers can better quantify the expected value of such investments.

2. Continuing to understand the role of pre-harvest food safety interventions including *E. coli* vaccination protocols in enhancing food safety post-harvest. This is an immensely important area of on-going work that several principal investigators on this project as well as several others are currently working on.

3. Continuing to explore industry incentives for advancing food safety and animal welfare assurances remains a fruitful arena for future research in general.

Project Beneficiaries

Targeted beneficiaries of this project included beef producers, beef industry processing and marketing firms, food service and retail establishments, and consumers. The US has about 758,000 beef cow-calf operations, 90% of which have less than 100 head. Because of notoriously low returns in this sector, cow-calf producers are routinely exploring ways to add value to their calves without adding excessive costs. By estimating the costs and potential returns for feedlots to adopt *E. coli* vaccination programs, individual cow-calf producers are directly affected because any associated changes in packer, retailer, or export demands for cattle indirectly translate into higher prices for calves at the farm gate. Similarly, any costs incurred at the feedlot sector, such as added vaccinations, can result directly in reduced prices for calves.

The feedlot sector is comprised of more than 2,000 operations that finish cattle. We have illustrated the added returns these operations will need in order to adopt enhanced food safety vaccination programs. Having this information, feedlots are in a much better position as they contemplate adoption of such practices. Also, the findings that feedlots are largely complying or even exceeding animal welfare standards is promising news for the industry that provides general assurance of desired animal care in the industry.

Beef industry firms directly benefit from the information generated from this study because they can evaluate how much it will be worth for them to purchase beef products produced with enhanced food safety and animal welfare assurances. The costs of breaches to food safety and animal welfare to all firms involved in the industry are substantial. As such, industry stakeholders have incentives to assure customers that their products meet or exceed consumer expectations regarding safety and animal welfare. Finally, beef consumers ultimately benefit from this project by having safer beef produced using humane production standards they expect.

Additional Information Generated by the Project
Below is a list of publications and presentations generated to date under this project.

Refereed Journal Articles
Lister, G.C., G.T. Tonsor, M.A. Brix, T.C. Schroeder, and C. Yang. "Meat and Milk Consumer Values." First submission at *Food Quality and Preference,* October 2013.

Schroeder, T.C. and G.T. Tonsor. "Market Impacts of E. Coli Vaccination in Feedlot Cattle". Final preparation for first submission to refereed journal, anticipate submission in December 2013.

M.S. Thesis
Teague, Laura. "Effects of Food Safety Recalls on a Firm's Shareholder Value." M.S. Thesis, June 2013. Available at: https://krex.k-state.edu/dspace/bitstream/handle/2097/16232/LauraTeague2013.pdf?sequence=3

Extension Factsheets
Contreras, S., F.K. Nti, K. Teague, K. Waldie, and T.C. Schroeder. "Potential Retail Value of Pre-Harvest Food Safety and Animal Welfare Certification." Kansas State University Department of Agricultural Economics Fact Sheet, January 2013. Available at: http://www.agmanager.info/livestock/marketing/AnimalWelfare/TCS_FactSheet_Safety-AnimalWelfare.pdf

Lueger, A., T.C. Schroeder, and D.A. Renter. "Feedlot Costs of Vaccinating Cattle for E. coli." Kansas State University Department of Agricultural Economics Fact Sheet, December 2012. Available at: http://www.agmanager.info/livestock/budgets/production/beef/TCS_FactSheet_EcoliVaccination_12-07-12.pdf

Rooney, T.J., D.U. Thomson, D.A. Freese, S.B. Terrell, D.J. Rezac, A.C. Jones, and C.D. Reinhardt. "Implementation of a Beef Cattle Welfare and Quality Assurance Tool in Commercial Cattle Feeding Operations in Kansas." Beef Cattle Institute Publication November 2012. Available at: http://www.agmanager.info/livestock/marketing/AnimalWelfare/BeefWelfareAssessment.pdf

Extension Newsletters
Reinhardt, C.D. "FeedlotFacts" various issues March, May, September 2012; March, June, August 2013.

Reinhardt, C.D. "Management Minute." Summer 2012.

Industry Presentations
Tonsor, G. "Producers, Animals, & Consumers: Animal Welfare in U.S. Food Animal Production." Ohio Livestock Coalition – Annual Meeting and Industry Symposium. Lewis Center, OH. September 6, 2013. (+/- 95 in attendance).

Tonsor, G. “Economics of Animal Welfare: Summary of Literature/Evidence and Current Situation from and Economist’s Perspective.” National Pork Board, Literature Review Workshop Panel. Des Moines, IA. February 13, 2013. (+/- 20 in attendance via webinar).

Tonsor, G. “Profitability Drivers and Global Position Impacts on the U.S. Beef Industry’s Future.” Ag Profitability Conference. Salina, KS. February 12, 2013. (+/- 50 in attendance; additional +/- 30 offsite in Iola and El Dorado via webinar).

Tonsor, G. and L. Schulz. “A Look into the Future of the Cattle Industry.” Cornbelt Cow-Calf Conference. Ottumwa, IA. January 19, 2013. (+/- 225 in attendance).

Tonsor, G. "Animal Welfare Oriented Expectations of the U.S. Public: Situation and Implications." New Mexico State University Collegiate Cattlemen’s Association Webconference. October 29, 2012. (+/- 40 in attendance via webinar).

Tonsor, G. “Animal Welfare Oriented Expectations of the U.S. Public: Situation and Implications.” K-State Olathe Seminar: Producers, Animals, and Consumers: Animal Welfare in U.S. Food Animal Production. October 22, 2012. (+/- 45 in attendance).

Tonsor, G. “Ten Thousand Labels: Credence Attributes, Product Differentiation, and Information Flows in the Food Systems: Animal Welfare.” Organized Symposium Presentation. Agricultural & Applied Economics Association Annual Meeting, Seattle, WA. August 14, 2012. (+/- 40 in attendance).

Tonsor, G. "Consumer Expectation and their Economics Impact." 2012 Livestock Care Conference - Alberta Farm Animal Care. Red Deer, Alberta. March 22, 2012. (+/- 180 in attendance).

Tonsor, G. “Economics of Animal Welfare Concerns.” Animal Welfare and Current Industry Issues for Livestock Producers. West Point, NE; Lincoln, NE; Kearney, NE; Gering, NE. February 6-9, 2012. (+/- 100 in attendance over four locations; delivered via webinar).

Tonsor, G. “Animal Welfare Oriented Expectations of the U.S. Public: Situation and Implications.” K-State Olathe Seminar: Producers, Animals, and Consumers: Animal Welfare in U.S. Food Animal Production. October 22, 2012. (+/- 45 in attendance).

Tonsor, G. and L. Schulz. “A Look into the Future of the Cattle Industry.” Cornbelt Cow-Calf Conference. Ottumwa, IA. January 19, 2013. (+/- 225 in attendance).

Implementation of a beef cattle welfare and quality assurance assessment tool in commercial cattle feeding operations in Kansas.

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Introduction

Consumer interest in production agriculture has prompted the beef industry to develop tools to increase the accountability and transparency of management practices within the industry. Recently, the development of an on farm assessment tool was developed by the Beef Quality Assurance program. The purpose of this project was to demonstrate the implementation of an industry-oriented animal welfare assessment, while recording data to observe and baseline current practices and documentation within the commercial cattle feeding industry as well as potentially identify necessary areas of improvement.

Materials and Methods

An assessment tool developed by veterinarians, animal scientists, and beef production specialists was used to objectively evaluate key areas of beef cattle production such as animal handling, antibiotic residue avoidance, cattle comfort, and food safety in 56 commercial feedyards located across Kansas. The average one-time animal feeding capacity was 35,455 animals, with a range of 3,000 to 135,000 animals. The participating feedyards have the capacity to provide feed and care for a total of 1,985,500 animals at one time, which represents roughly 85% of the entire one-time cattle feeding capacity of all feedyards in the state of Kansas.

Trained Kansas State University personnel in collaboration with practicing beef industry veterinarians worked with participant feedyard personnel to complete the assessments. During the assessment, the following areas of animal management were evaluated and assessed: documentation of 18 different best management practices (Table 1.), animal housing, care, and processing facilities, and cattle handling practices. Ten randomly selected pens within each feedyard were inspected for cattle comfort, water tank cleanliness, and feed quality; a minimum of 7 acceptable pens out of 10 was required to pass.

To evaluate animal handling, processing procedures were observed on a minimum of 100 cattle within each feedyard operation. Evaluation of animal handling included usage of driving aides on cattle, prevalence of cattle falling, tripping, vocalization prior to the application of a procedure, jumping, and accuracy of cattle restraint. The prevalence rates were compared to the maximum acceptable percentages set forth in the assessment tool, which are listed below in the results section of this report.

Results

All feedyards that participated in the assessment process were found to exceed acceptable levels for facilities and cattle comfort. On average 98% of inspected pens had acceptable animal stocking density, mud scores, and feed bunk evaluation. Cleanliness of water tanks was acceptable in 83% of all pens inspected. The most common water tank issue was the presence of excessive algae or debris accumulation (Figure 1). All feedyards assessed were found to possess a documented valid veterinary-client-patient-relationship.

Cattle handling procedure assessment finding are illustrated in Figure 2. Across all cattle observed during processing, a driving aide was used on 3.98% of the cattle (maximum acceptable = 10% usage rate), 0.2% of cattle fell while exiting the chute (maximum acceptable = 5%); 1.8% of cattle tripped while exiting the chute (maximum acceptable = 10%); 0.9% of cattle vocalized while in the chute before a procedure was performed (maximum acceptable = 5%); 5.9% of cattle jumped and ran when exiting the chute (maximum acceptable = 25%); and 0.2% of cattle were improperly restrained before processing (maximum acceptable = 0%).

Nineteen of the 56 participating feedyards (34%) maintained complete and current documentation of the 18 best management practices (BMP) required by the assessment (Figure 3). The percentage of large feedyards (≥ 20,000 head capacity) with complete BMP documentation exceeded the percentage for small feedyards (42% vs. 18%, respectively).

Conclusions

This is the first study of its kind, looking into production practices across the commercial cattle feeding industry and comparing actual practices to an objective standard. Commercial feedyards in Kansas do an excellent job in maintaining cattle comfort and cattle handling. However, this benchmark exercise indicates that most commercial cattle feeding operations need to develop and document best management practices for their operation through consultation of their veterinarian, nutritionist and industry specialist.

Implementation of this assessment tool is valuable for internal assessment of cattle care quality associated with wholesome, safe beef production within the individual cattle feeding operations. This assessment tool will also serve as an excellent external assessment to maintain consumer confidence in how the beef industry strives for consistent improvement in food safety and cattle health and well-being.

Acknowledgements

This project was funded by the Kansas Beef Council though funding from the Beef Check off program. The authors would like to thank the participating Kansas cattle feeding facilities and the veterinarians that participated in this project. We acknowledge funding assistance from the USDA Federal- State Marketing Improvement Program.

Table 1. The 18 Best Management Practices assessed for existence of documentation in 56 commercial Kansas feedyards.

1. Drug residue avoidance protocols
2. Medication and biological records
3. Veterinary-client-patient relationship validation
4. Emergency action plans for inclement weather
5. Needle management and disposal plan
6. Cattle shipment records
7. Pen management/maintenance plan
8. Euthanasia protocol and training documentation
9. Feed supplement records
10. Feed medication records
11. Feed quality assurance records
12. Personnel training documentation
13. Non-ambulatory cattle management
14. Cattle processing records and injection site maps
15. Feed delivery records
16. Mortality disposal documentation
17. Biosecurity and security plan and documentation
18. Individual animal health records

Figure 1. Percentage of the 56 participating Kansas feedyards (large feedyards ≥ 20,000 animals; small feedyards < 20,000 animals) which had acceptable scores for facilities assessment.

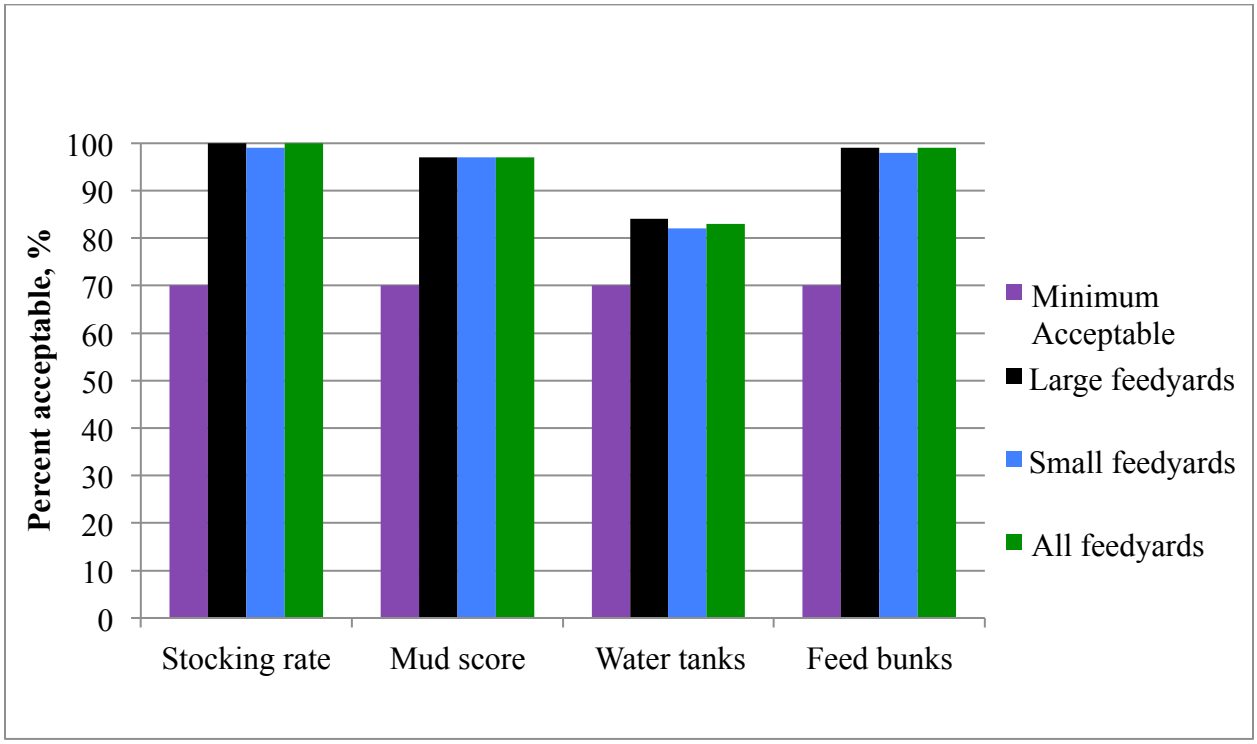


Figure 2. Percentage of cattle observed during processing (minimum of 100 animals within each feedyard) requiring use of driving aides, falling, tripping, vocalizing, jumping, or which were improperly restrained for 56 commercial feedyards in Kansas (large feedyards ≥ 20,000 animals; small feedyards < 20,000 animals)

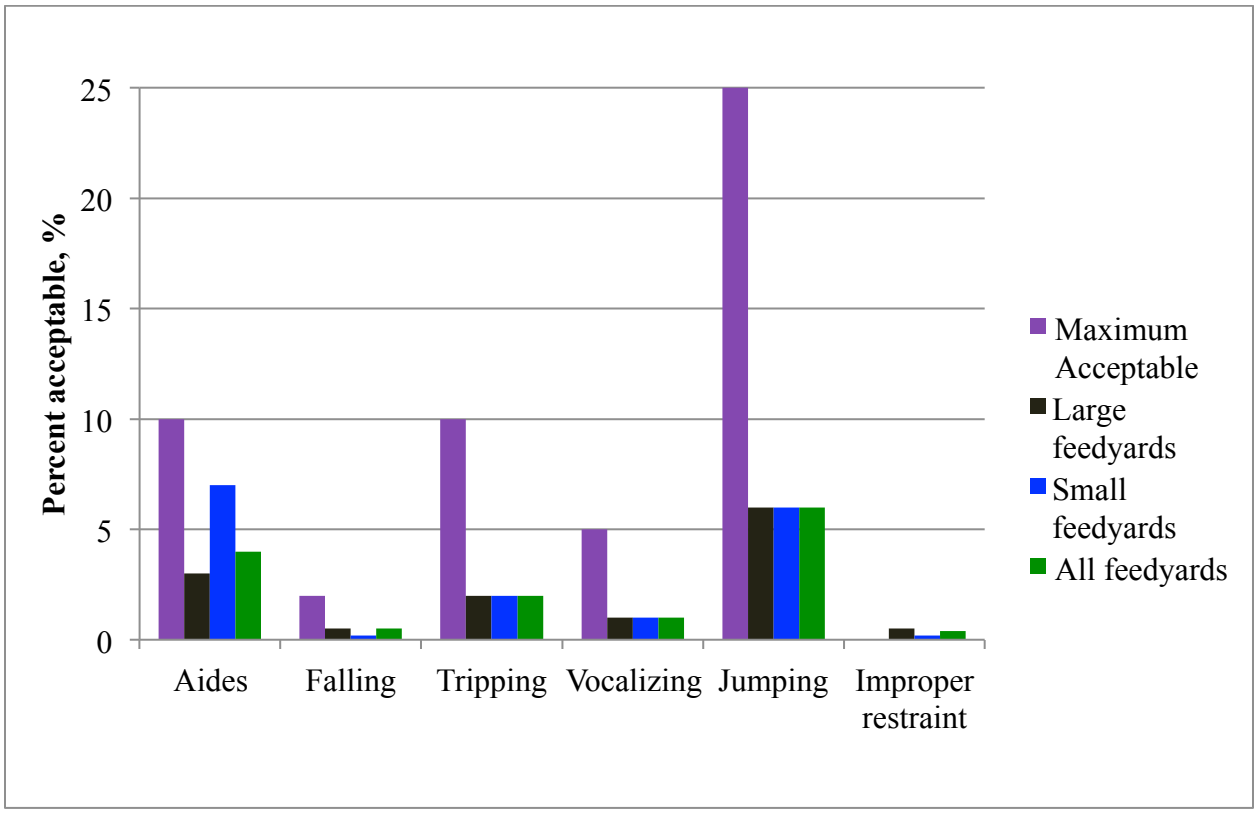
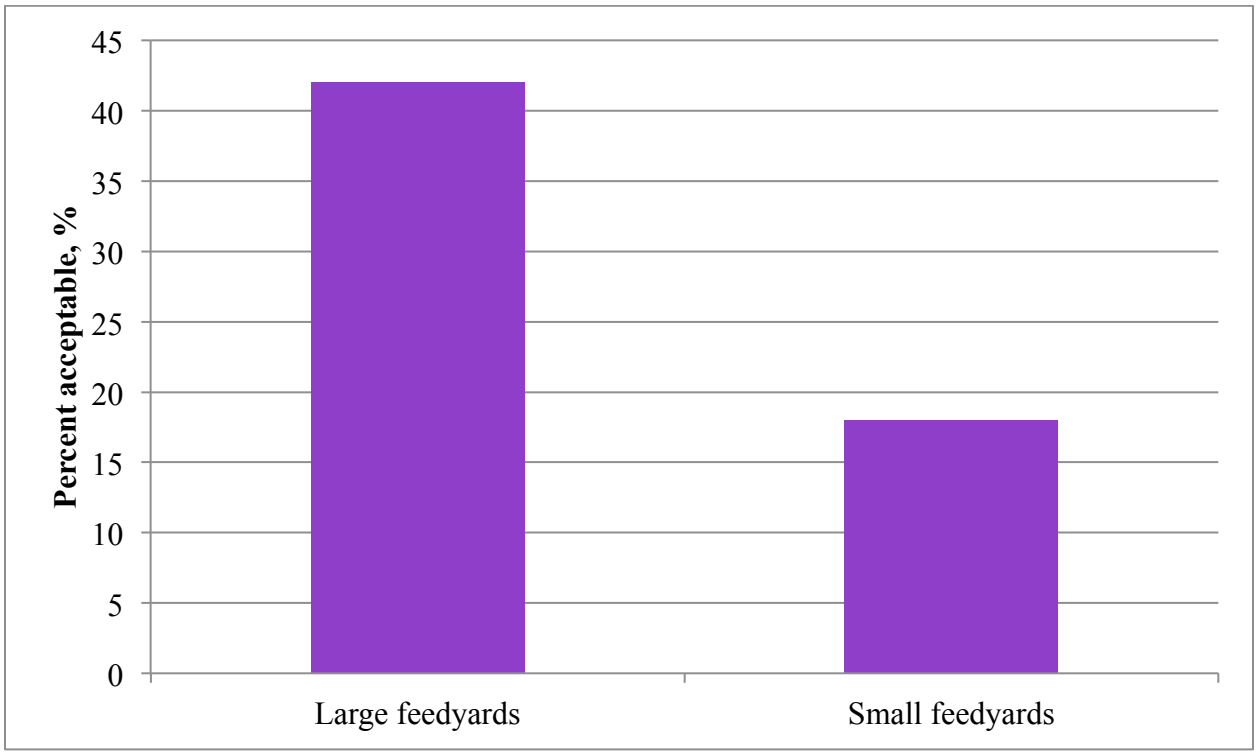


Figure 3. Percentage of Large (≥ 20,000 animal capacity) and Small (< 20,000 animal capacity) feedyards in Kansas which had complete documentation of the 18 Best Management Practices required by the assessment tool.



Feedlot Costs of Vaccinating Cattle for *E. coli*

December 2012

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Feedlot Costs of Vaccinating Cattle for *E. coli*

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Background

Escherichia coli O157:H7 (*E. coli*) is one of the most important food safety concerns facing the beef industry. *E. coli* presence contributes to food product recalls, human health risks, and ultimately reduced consumer demand for beef. As such, reducing prevalence of meat contamination is of utmost importance to the beef industry. Beef food safety is influenced at numerous phases of the production and processing value chain, as such intervention strategies to reduce *E. coli* prevalence need to be considered and evaluated at each production phase. The purpose of this fact sheet is to provide estimates of the costs associated with vaccination programs to reduce *E. coli* presence in the cattle feeding sector. Reducing pre-harvest prevalence of *E. coli* may translate into reducing risk of meat contamination post-harvest.

Costs associated with administering an *E. coli* vaccination program could be as simple as costs of the vaccine plus any labor needed to administer the vaccine if vaccinating does not impact animal feeding performance. However, if feeding performance is impacted, then estimating costs of vaccinating becomes more complex. This fact sheet provides estimates of vaccinating under alternative feedlot cattle handling assumptions and animal performance impacts of vaccinating. Results reveal that these issues make substantial differences in the anticipated cost of administering an *E. coli* vaccination program to feedlot cattle.

Approach

This fact sheet compares net returns to a cattle feeder of administering an *E. coli* vaccination program under various assumptions regarding current feedlot animal management practices and vaccination activity impacts. Costs of vaccination include direct costs associated with the vaccine and the vaccination protocol as well as potential costs associated with animal performance impacts due to the vaccination activity. Stylized cattle feeding budgets are developed with cost assumptions associated with *E. coli* vaccination parameterized based on available published data on impacts of such vaccination programs.

Three net return scenarios are compared. *Scenario 1* is a baseline of cattle feeding net return for a pen of 150 steers that are not vaccinated for *E. coli*. This pen serves as a benchmark for which to compare net returns across alternative vaccination programs. *Scenario 2* assumes the feedlot administers an *E. coli* vaccination program that entails two vaccinations – one administered upon arrival on feed at the same time other normal animal processing activities occur and a second at least 60 days prior to harvest. This scenario assumes the cattle would not have been otherwise run through a chute and handled the second time were it not for the *E. coli* vaccination. *Scenario 2* also assumes no impact of the vaccine or the second chute handling on animal feeding performance. *Scenario 3* is the same as the second scenario only the second vaccination activity is assumed to impact animal feeding performance based on recent research findings discussed below. Together these three scenarios enable comparison across these and other related vaccination cost and impact assumptions.

Budget Assumptions

Table 1 provides assumed inputs into the feedlot budgets for each scenario. The base budget assumes a pen of steers placed on feed at 832 pounds. Non-vaccinated cattle (*Scenario 1*) and vaccinated cattle with no animal feeding performance impact from vaccinating (*Scenario 2*) are assumed to be on feed for 112 days with an average daily gain of 3.29 pounds per head per day and have a finished weight of 1200 pounds. Vaccinated cattle with a cattle feeding performance impact associated with the second vaccination (*Scenario 3*) are assumed to be on feed for 115 days with an average daily gain of 3.20 pounds per head per day and a finish weight of 1200 pounds. Feed conversion (dry matter basis pounds fed per pound of gain) for non-vaccinated and vaccinated cattle with no performance difference is 6.01. Feed conversion for *E. coli* vaccinated cattle with a performance difference is 6.14. Assumed feed conversion and daily gain differences between *Scenario 3* and the other two scenarios are based upon recent research which ranges from finding no difference in animal performance [1] to finding statistically reduced animal feeding performance when a second vaccination was employed [2]. As such, *Scenarios 2* and *3* illustrate differences in net returns associated with no feeding performance change and a reduction in feeding performance associated with the vaccination activity.

A purchase price of $146.26/cwt was used for all groups of feeder steers when placed in the feed lot. A sale price of $128/cwt was used for all groups of steers. Death loss is assumed to

be 1% of gross revenue [3]. The following costs are held the same for all scenarios: marketing costs; utilities, fuel, and oil; facility and equipment repairs; interest on facilities and equipment; insurance and taxes; total depreciation; and interest rate on operating costs and purchased cattle. Costs of veterinary, drugs, and supplies (other than the *E. coli* vaccination) are also the same for both scenarios. A first chute charge for processing all cattle upon arrival to the feedlot is incorporated into veterinary, drugs, and supplies cost.

E. coli vaccinated cattle (*Scenarios 2* and *3*) have the following additional expenses that non-vaccinated cattle do not. Vaccinated cattle incur a second chute charge of $1.50 per head, chute labor of $0.43 per head, and a first and second *E. coli* vaccine cost of $2.25 per head. The second chute labor is calculated using the labor rate per hour ($17) multiplied by an assumed 90 seconds per animal to work cattle divided by 3600 seconds in an hour (17×90/3600) = $0.43.

With cattle that are vaccinated for *E. coli* but do not show a feeding performance difference, added charges incurred relative to cattle that are not vaccinated are two *E. coli* vaccines of $2.25 each and a second chute charge and second chute labor charge. That is, we assume non-vaccinated cattle (*Scenario 1*) are processed through a chute only once. If cattle are normally processed through a chute twice anyway during normal finishing management schemes at a feed lot, then the additional chute charge of $1.50 per head charged in *Scenario 2* for vaccination could be zero for such a feedlot.

Table 1. Assumed Inputs for Budgets Comparing Alternive *E. coli* Vaccination Scenarios

Assumptions	*Scenario 1* Non-Vaccinated	*Scenario 2* Vacccinate No Performance Difference	*Scenario 3* Vacccinate Performance Difference
Head per pen	150	150	150
Days on Feed	112	112	115
Average Daily Gain (lbs/head/day)	3.29	3.29	3.20
Feed Conversion (Dry Basis) (lbs fed/lb gain)	6.01	6.01	6.14
Feed Conversion (Wet Basis/As Fed) (lbs fed/lb gain)	13.01	13.01	13.29
Purchase Weight (lbs)	832	832	832
Purchase Price ($/cwt)	146.26	146.26	146.26
Sale Weight (lbs)	1200	1200	1200
Sale Price ($/cwt)	128.00	128.00	128.00
Labor Rate ($/hour)	17.00	17.00	17.00
Death Loss (%)	1.00%	1.00%	1.00%
Veterinary, Drugs, & Supplies ($/head)	12.00	12.00	12.00
2nd Chute Charge ($/head)	-	1.50	1.50
2nd Chute Labor Charge ($/head)	-	0.43	0.43
1st *E. coli* Vaccine ($/head)	-	2.25	2.25
2nd *E. coli* Vaccine ($/head)	-	2.25	2.25
Marketing Costs ($/head)	6.00	6.00	6.00
Utilities, Fuel, & Oil ($/head)	6.00	6.00	6.00
Facility & Equipment Repairs ($/head)	6.50	6.50	6.50
Interest on Facilities & Equipment ($/head)	3.25	3.25	3.25
Insurance and Taxes ($/head)	2.00	2.00	2.00
Total Depreciation ($/head)	4.50	4.50	4.50
Interest Rate on Operating Costs & Purchased Cattle (%)	5.0%	5.0%	5.0%

Feed Ration Assumptions

The ration used in these budgets is the same ration as used in a recent field research study [2]. Non-vaccinated cattle (*Scenario 1*) and the cattle vaccinated with no performance loss (*Scenario 2*) are fed a total of 4,787 dry matter pounds of feed and vaccinated cattle with a performance loss (*Scenario 3*) are fed 4,891 pounds over the feeding periods (Table 2). Pounds of feed fed are calculated as feed conversion (as-fed basis) multiplied by total gain (ending weight minus beginning weight). The ration on an as-fed wet basis consists of high moisture corn, wet distiller's grain, corn gluten, silage, steep, and micro/minerals mix.

Table 2. Assumed Rations Used in Alternative Budgets

					Scenarios 1 & 2		*Scenario 3*	
Ingredient	Percentage		Price		4,787	lbs.	4,891	lbs.
High Moisture Corn	30.12%	$	6.00	/bu	1,441.90	lbs.	1,473.09	lbs.
Wet Distiller's Grain	39.71%	$	72.15	/ton	1,900.99	lbs.	1,942.11	lbs.
Corn Gluten	19.05%	$	63.34	/ton	911.96	lbs.	931.69	lbs.
Silage	7.76%	$	48.00	/ton	371.49	lbs.	379.52	lbs.
Steep	2.44%	$	177.90	/ton	116.81	lbs.	119.33	lbs.
Micro/Minerals Mix	0.92%	$	322.80	/ton	44.04	lbs.	44.99	lbs.

Net Return

Returns for all groups of cattle are calculated using a purchase price of $146.26/cwt for feeder cattle and a sale price of $128.00/cwt for harvested fed cattle. All scenarios have an assumed finished animal weight of 1200 pounds. Total revenue is $1,536 per head for each. The purchase cost for the steers was $1,216.88 per head, and the death loss cost was $15.36 per head (1% of sales). Gross margin after subtracting purchase price and death loss for the pen is $45,563.52 or $303.76 per head – the same across all three scenarios (Table 3).

Cattle that were vaccinated and experience a performance loss (*Scenario 3*) have a higher per head feed cost for all feed ingredients than *Scenario 1* or *2* that were not vaccinated or were vaccinated but did not incur a performance loss. The reason for this difference is that the vaccinated cattle with a performance loss have a higher (worse) feed conversion than cattle not vaccinated or vaccinated but with no performance loss. Since cattle that experienced a performance loss have a higher feed conversion, they have to be fed more to have similar gains relative to those without performance losses.

Additional cost differences across the three scenarios are those related to the *E. coli* vaccination. Cattle that were not vaccinated (*Scenario 1*) do not have any second chute costs. Vaccinated cattle (*Scenarios 2* and *3*) have a second chute charge of $1.50 per head and a second chute labor charge of $0.43 per head. The *E. coli* vaccine costs $2.25 per head and the cattle are administered two doses consistent with recent field study research [2]. The only other cost difference is a marginal difference in interest cost between the three groups, with the vaccinated cattle's interest cost being higher.

The reduction in net return for vaccinated steers with a performance loss (*Scenario 3*) is about $13 per head relative to non-vaccinated cattle. Net return for vaccinated cattle that do not realize a performance loss is about $6.50 per head lower than non-vaccinated cattle. The reduced

return for vaccinated cattle relative the base is mostly attributable to the cost of the vaccinations ($4.50) and the cost associated with running cattle through the chute a second time ($1.93).

Table 3. Net Returns of Alternative *E. coli* Vaccination Scenarios

	Scenario 1		*Scenario 2*		*Scenario 3*	
REVENUE	Total	Per Head	Total	Per Head	Total	Per Head
Pounds	180,000	1200	180,000	1200	180,000	1200
Total Revenue	$230,400.00	$ 1,536.00	$ 230,400.00	$ 1,536.00	$230,400.00	$ 1,536.00
Less Purchase Price	$182,532.48	$ 1,216.88	$ 182,532.48	$ 1,216.88	$182,532.48	$ 1,216.88
Less Death Loss	$ 2,304.00	$ 15.36	$ 2,304.00	$ 15.36	$ 2,304.00	$ 15.36
Number of Animals Lost (head)	2.00		2.00		2.00	
Gross Margin	$ 45,563.52	$ 303.76	$ 45,563.52	$ 303.76	$ 45,563.52	$ 303.76
COSTS	Total	Per Head	Total	Per Head	Total	Per Head
High Moisture Corn	$ 23,173.40	$ 154.49	$ 23,173.40	$ 154.49	$ 23,674.66	$ 157.83
Wet Distiller's Grain	$ 10,287.12	$ 68.58	$ 10,287.12	$ 68.58	$ 10,509.63	$ 70.06
Corn Gluten	$ 4,331.99	$ 28.88	$ 4,331.99	$ 28.88	$ 4,425.69	$ 29.50
Silage	$ 1,337.35	$ 8.92	$ 1,337.35	$ 8.92	$ 1,366.28	$ 9.11
Steep	$ 1,558.50	$ 10.39	$ 1,558.50	$ 10.39	$ 1,592.21	$ 10.61
Micro/Minerals Mix	$ 1,066.26	$ 7.11	$ 1,066.26	$ 7.11	$ 1,089.32	$ 7.26
Labor	$ 2,550.00	$ 17.00	$ 2,550.00	$ 17.00	$ 2,550.00	$ 17.00
Veterinary, Drugs, & Supplies	$ 1,800.00	$ 12.00	$ 1,800.00	$ 12.00	$ 1,800.00	$ 12.00
2nd Chute Charge	$ -	$ -	$ 225.00	$ 1.50	$ 225.00	$ 1.50
2nd Chute Labor Charge	$ -	$ -	$ 63.75	$ 0.43	$ 63.75	$ 0.43
1st *E. coli* Vaccination	$ -	$ -	$ 337.50	$ 2.25	$ 337.50	$ 2.25
2nd *E. coli* Vaccination	$ -	$ -	$ 337.50	$ 2.25	$ 337.50	$ 2.25
Marketing Costs	$ 900.00	$ 6.00	$ 900.00	$ 6.00	$ 900.00	$ 6.00
Utilities, Fuel, & Oil	$ 900.00	$ 6.00	$ 900.00	$ 6.00	$ 900.00	$ 6.00
Facility and Equipment Repairs	$ 975.00	$ 6.50	$ 975.00	$ 6.50	$ 975.00	$ 6.50
Depreciation on Facilities & Equipment	$ 675.00	$ 4.50	$ 675.00	$ 4.50	$ 675.00	$ 4.50
Interest on Facilities & Equipment	$ 487.50	$ 3.25	$ 487.50	$ 3.25	$ 487.50	$ 3.25
Insurance & Taxes on Facilities & Equipment	$ 300.00	$ 2.00	$ 300.00	$ 2.00	$ 300.00	$ 2.00
Interest	$ 3,170.86	$ 21.14	$ 3,178.26	$ 21.19	$ 3,270.50	$ 21.80
Total Costs	$ 53,512.98	$ 356.75	$ 54,484.12	$ 363.23	$ 55,479.54	$ 369.86
NET RETURN	$ (7,949.46)	**$ (53.00)**	$ (8,920.60)	**$ (59.47)**	$ (9,916.02)	**$ (66.11)**

Net Return Sensitivity to Sell Price at Different Corn Prices

Net return impacts were also calculated for each scenario under alternative corn price assumptions of $4.00/bushel, $6.00/bushel (base assumed in budgets presented above – see Table 2), and $8/bushel to illustrate how feed cost differences impact costs associated with *E. coli* vaccination. To complete this sensitivity analysis we held the fed cattle sale price constant and adjusted feeder cattle purchase price as corn price varied to keep net return for vaccinated cattle approximately constant across the three different corn prices. We also let other feed ingredient prices vary as in accordance with the corn price. In this way, we could isolate how the net return to vaccinated cattle changed relative to non-vaccinated with changing feed prices.

As corn price increases, the net return differences between *Scenarios 1* and *2* and *Scenario 3* widen. That is, given the reduction in feeding performance associated with cattle in

Scenario 3 compared to *Scenario1* and *2*, higher feed prices result in greater feed cost for *Scenario 3* compared to the others. At $4.00/bushel corn, *Scenario 3* has a net return that is about an $11 per head lower than *Scenario 1*, at $6.00/bushel the different increases to $13 per head, and at $8.00/bushel corn the difference is $15 per head. Because *Scenario 2* has the same feed efficiency as *Scenario 1*, changes in feed cost affects the two scenarios by the same amount keeping *Scenario 2* at about a $6.50 per head lower net return.

Concluding Observations

If a feedlot is already sending cattle through a chute two times during their normal cattle management plans that coincide with the *E. coli* vaccination program label requirements including a 60-day withdrawal, then added costs associated with vaccinating would be the vaccine plus labor needed to administer the shot. Combined, these costs would likely be less than $5 per head. However, if a feedlot is sending cattle through a chute only one time, then an additional chute charge and labor would be necessary with the vaccination plan assumed here and the overall *E. coli* vaccination cost without an animal performance loss would be around $6.50 per head and with a performance loss around $13 per head plus or minus, depending on feed price. Whether an *E. coli* vaccination program causes performance losses is obviously an important consideration that needs additional research to resolve.

Works Cited

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Potential Retail Value of Pre-Harvest Food Safety and Animal Welfare Certification

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Background

Among the most important concerns facing the beef industry is consumer demand. Prosperity of all sectors of the industry relies critically upon producing products consumers want and maintaining consumer trust in beef products. Prominent among the long list of demand drivers are attributes consumers simply expect of beef products including industry measures taken to ensure food safety and that producers follow animal friendly production practices. A recent survey conducted by Drover's CattleNetwork, indicates producers share similar sentiments as more than 1,100 cattle producer respondents to an on-line survey ranked "animal well-being" as their most important concern and "assuring beef quality and safety" ranked sixth on the list.[1]

However, in recent years several highly publicized food safety breaches and/or animal welfare concerns have surfaced in the beef industry. Such events reduce customer and consumer trust in the product and the industry. Food safety events have lead to rapid substantial economic losses to the industry as market access can be restricted, product recalls occur, and liability costs arise. Animal welfare breaches reduce consumer trust in livestock production and often result in increased regulation and regulatory compliance costs. One way to regain and enhance consumer trust is through proactive interventions and practices to address concerns, increase transparency and information sharing regarding food safety and animal welfare practices, and develop independent third-party audits. The purpose of this study was to determine retailer reaction to beef that certified to possess a bundling of enhanced food safety and assured animal welfare production practices. Essentially, we set out to determine the value retailers would place on such

[1] http://www.cattlenetwork.com/drovers/columns/Survey-suggests-producers-are-optimistic-182417721.html

a third-party certification system that cattle producers could design and adopt to increase customer and consumer trust in the production process and thus beef products they purchase.

This is the third in a series of fact sheets exploring the value of pre-harvest enhanced food safety and animal welfare certification. The first fact sheet assessed animal welfare practices of cattle feeders in Kansas.[2] The animal welfare practices fact sheet provides guidelines for animal friendly production practices that could constitute assured animal welfare certification. A second fact sheet assessed the costs cattle feeders would incur in adopting cattle vaccination protocols to reduce post-harvest prevalence of *Escherichia coli* O157:H7 (*E. coli*).[3] Such a vaccination plan could be part of an enhanced beef food safety certification by cattle producers. The purpose of this fact sheet is to summarize results of interviews conducted with retailers regarding their preferences for, and willingness-to-pay for beef specifically produced under a third-party certified pre-harvest food safety enhancement and animal welfare assured production system. That is, we set out to determine if cattle producers certified the procedures outlined in the two fact sheets regarding animal welfare and food safety enhancements, would retailers value this and be willing to pay more for beef produced with such a certification.

Approach

The approach taken was to interview retail meat buyers and/or managerial staff to determine their perceptions of beef food safety and animal welfare associated with the beef they procure and present to consumers in their retail grocery stores. A total of 41 retail beef buyers from different retail grocery firms were contacted to invite them to participate in our study which involved about a 30-minute telephone interview. The 41 retailers represented a broad spectrum of grocers including large national firms with stores located across the United States (as well as stores in other countries) to small grocers with only regional or local presence. We assured the retailers that their participation was entirely voluntary and that the information we collected would only be reported in summarized fashion and no individual retailer would be indentified in our study. Ten retailers agreed to participate in our survey and completed the interview during March and April 2012. The low participation rate in itself is interesting as it illustrates some combination of lack of time willing to devote to the survey process, company policy prohibiting

[2] http://www.agmanager.info/livestock/marketing/AnimalWelfare/BeefWelfareAssessment.pdf
[3] http://www.agmanager.info/livestock/budgets/production/beef/TCS_FactSheet_EcoliVaccination_12-07-12.pdf

sharing such information, lack of trust in confidentiality of our survey, or lack of interest. Those who did agree to participate as such are likely not a representative sample and may represent those with most interest in such issues as food safety and animal welfare assurances.

Participants included a wide array of retail grocery firm sizes from a few large national grocers owning more than 1,000 stores, some owning 100-1,000 stores, and several small grocers with fewer than 20 stores. Six of the retailers interviewed had stores located across the nation, and others were mostly serving Midwest or East Coast locations. All participants were asked the same five questions as well as follow-up discussion for each question. The five questions presented in order were:

1. What factors do you consider in your beef purchasing decisions?
2. To what extent do food safety and animal welfare issues influence your beef purchasing behavior?
3. Would you be interested in a product that has enhanced food safety certification?
4. Would you be interested in a product that has animal welfare assurance certification?
5. What do you think the premium for an enhanced food safety and welfare assurance certification on beef products would be worth?

Results

Seven of the 10 retailers interviewed indicated that they had been part of a food safety recall and all of these had occurred most recently within the past five years. The factors most often listed as influencing purchasing decisions for beef relative to question 1 included product quality (8 respondents), safety (5), and price (4). Other factors mentioned included product freshness, cuts or products available, and grade or trim specifications. Question 1 was asked before any information about the purpose of the survey was revealed to the participants. Therefore, we attempted to elicit unbiased responses to question 1 to avoid framing their responses around food safety and animal welfare. If the respondent did not list food safety as highest priority, a follow up question was asked about how food safety would rank. When probed further all 10 respondents indicated food safety was in fact their highest priority. A couple of quotes from the respondents help to illustrate the importance of food safety:

> *"Safety is a non-negotiable factor. If the safety factor is not there, then the product in not considered."* - Anonymous retailer

"On one side you should have food safety by itself, with quality, price, service and other factors on the other." - Anonymous retailer

Seven of the 10 retailers indicated they would prefer beef products that had both food safety and welfare assurance certifications. Three of the 10 indicated that such a certification already existed and that they purchase certified safe products. The retailers tended to be more interested in purchasing beef products having such certification if the certification provided value to their customers and was labeled as such in the retail counter.

When asked about how much of a premium they would be willing to pay for beef that was certified as food safety enhanced and animal welfare assured, most retail meat buyers were unable or unwilling to provide an answer. They were inclined to want to pass any costs associated with certification directly on to consumers or make sure the costs were split among industry sectors. One retail buyer summarized his sentiment as: "The prices of meat are already too high and an additional increase in price would be ridiculous." Four retailers were willing to provide estimates of the potential premium a food safety and animal welfare assured certification would be worth. Two quoted price premiums of $0.01 to $0.02 per retail pound of beef and two indicated $0.02 to $0.05 per pound premiums might be reasonable. During the time of the interviews, the average U.S. retail beef price was about $5.00 per pound, so the price premiums quoted represent at most a retail price premium of 1% for a bundled food safety enhanced and animal welfare assured product.

Concluding Observations

We found many retailers unwilling to discuss beef product preferences with us over the phone. This is not surprising given the competitive nature of the retail grocery industry, the sensitivity of the topic, and the fact we did not have an established relationship with most of these folks. Only about 25% of the retailers contacted were willing to grant us an interview when we approached them indicating that we wanted to visit with them about their beef product purchase preferences. In the future, in-person interviews may be one way to attempt to increase participation by retailers, but such interviews are very costly to administer, and may not increase participation rates.

Retailers that participated clearly indicated beef food safety is one of their highest priorities in beef product retailing. A few retailers also indicated that animal welfare assurances were increasingly gaining importance to them, but this sentiment was revealed only after probing this topic and it was not mentioned as a high priority in open-ended questions. This does not mean animal welfare is not important to retailer grocers, but it was not at the top of most of their concerns at the time our survey was conducted. Retailers generally supported having enhanced food safety and welfare assured certification in the beef industry but they were concerned about potential costs associated with such certification, who would incur the costs, and whether such certification could be presented to consumers through retail packaged labeling. Retailer grocers revealed strong desires to supply beef products that provide value to consumers, and to the extent consumers reveal specific product assurance preferences, they will strive to offer products possessing such characteristics.

FeedlotFacts

Chris Reinhardt, Ph.D.
Extension Feedlot Specialist

"Get Better Every Day"

Prior to initiation of the Beef Quality Assurance program back in the early 1990's, The National Beef Quality Audit had shown that 22% of top butts were damaged with injection site lesions. Injections of high value cuts don't simply damage the tissue from the actual scar caused by the needle and the compound injected, but the tissue trauma and the subsequent healing process actually makes the meat around the injection tougher as much as 4 inches away from the injection site.

Once the data became well-known, U.S. beef producers at every level collectively and individually asked, "Why are we ruining our own product?" Family, friends, neighbors, veterinarians, university scientists, and extension personnel all were asking the same question and telling each other the same answer: "Just STOP!"

The results of that level of universal, coordinated, and uni-directional mutual self-improvement effort were resounding, if not even astounding. The subsequent beef quality audit said that injection site lesions damaged less than 3% of top butts.

When everyone is saying the same thing, and then reinforcing words with actions and changes in formerly commonplace practices, nearly miraculous changes can take place. Once was normal or common to see someone vaccinate an entire snake full of cows or calves, poking each one in the top butt because it was easy. And today, if we saw someone do the exact same thing, we'd be shocked. Huge changes can be made if an entire industry decides that the changes will make us all better.

Animal welfare is the modern equivalent of the injection sites of twenty years ago. An astounding change has occurred throughout the beef industry in attitudes, practices, and facilities---for the better. We have always cared for our livestock, but we accepted situations which were less than ideal as "normal". Today, we have an eye toward improvement of every facet of our operations, from sub-optimal facilities to improving our approach to low stress handling and general stockmanship.

We can change anything if we decide, individually and collectively, that the change will make us better.

For more information, contact Chris at 785-532-1672 or cdr3@ksu.edu.

Feedlot Facts– Chris Reinhardt, Ph.D., Extension Feedlot Specialist

"S.O.R.T. – A Four Letter Word"

Patton is quoted as saying, "No good decision was made from a swivel chair." So it's easy for me to sit here and tell you how you "should" be marketing your fed cattle---but "easy" and "right" are seldom the same things.

The questions I would have to ask are myriad, but mostly surround the target (quality grade, carcass weight, grid-type, live vs. carcass value, etc.) you're trying to achieve. But there is another level that the "consultant" often overlooks, or even avoids: sorting logistics. (See the swivel-chair comment, again).

After sorting, a half-full pen doesn't maximize yardage (from customer cattle) or maximize facilities utilization (for company-owned cattle). If you feed 80-head pens for logistics of feeder cattle freight, you can't split those pens into 3 full loads of finished cattle; you could sort into 2 outcome groups but this fails to capture the full value of sorting. If you feed mostly small groups of customer cattle, you can't easily re-blend non-market-ready cattle from separate original pens into new outcome groups.

It has been estimated that sorting into 3 uniform outcome groups shortly before harvest may increase profitability of the entire pen by $16 per animal. Sorting allows you to remove potentially over-weight and over-fat cattle, which allows you to feed the lighter and leaner animals longer, increasing the total weight sold out of the pen without increasing the percentage of out cattle which, for grid cattle, may bring hefty discounts, and for non-grid cattle, may bring the ire of your packer-partner. Also, an added positive by-product of this opportunity to increase the days on feed for the lighter and leaner cattle is that they also have a greater opportunity to move into higher value quality grades.

The relationship between carcass price and feed costs will dictate the actual endpoint to which cattle can be fed. At high grain-to-cattle prices, cattle may need to be marketed at a low yield grade 3, whereas if carcass value rises relative to grain costs, cattle may be fed well toward mid to upper yield grade 3. However, after cattle reach yield grade 4, efficiencies and cost of gain normally exceed the value of the carcass weight added through additional days on feed.

Finally, if the decision is made to utilize a beta agonist, the logistics of sorting become even more complicated. Ideally, cattle would be sorted into outcome groups prior to feeding the beta agonist, and the marketing date could be determined at time of sorting. If this is not feasible due to lack of sorting pens, another option may be to market the fattest and heaviest cattle from the pen, then initiate feeding the beta agonist and market after that feeding phase is complete.

Sorting does indeed complicate fed cattle marketing. If sorting can be accomplished with minimal stress on the cattle, it can be a source of additional revenue for the astute cattle feeder.

For more information contact Chris at cdr3@ksu.edu.

Feedlot Facts– Chris Reinhardt, Ph.D., Extension Feedlot Specialist ·

"Heat Stress Interventions"

Prevention is better than a cure---for virtually any disorder we can think of. But this is especially pertinent if you're a cattle feeder going into summer heat. We know that we can intervene in the event of extreme heat events to prevent cattle death. But by that point cattle have likely been off feed for a protracted period and performance has been lost; we're just happy to save the cattle.

The most effective and surest preventative of extreme heat stress for black-hided cattle is some sort of shade structure. We often see this in pasture cattle: even though extremely hot, humid conditions may exist on pasture, if cattle can find shade during the hottest part of the afternoon, they will be back out grazing after the sun begins to set. Shades can be sturdy, permanent structures, mobile, portable structures, or temporary structures using a frame with cloth overhead. Costs will tend to follow the permanence of the design. Also, the shade portion of the structure does not need to be solid; partial shade is better than no shade.

Another preventative measure is light-colored bedding. Recent K-State research (Rezak et al., 2012) suggests that during high heat days, the surface temperature of chopped hay or straw is 25°F cooler than that of the bare dirt floor and provides a cooler place for cattle to lay down and rest. And resting improves performance.

Other research suggests that wetting the surface of pen mounds in the morning prior to extreme heat can reduce surface temperatures and reduce heat load of cattle. The water essentially is "cooked off" by the radiant heat of the sun, and the evaporating water is taking heat with it from the pen surface. Without the water, the surface would simply absorb this heat and transfer it back to the cattle. However, the downside of this approach is that by adding water we may also be contributing to humidity conditions.

The key in all of these examples is to get interventions in place prior to the extreme heat event, give cattle a chance to utilize and benefit from the relief measures, and be prepared---summer is coming.

For more information contact Chris at cdr3@ksu.edu.

Feedlot Facts– Chris Reinhardt, Ph.D., Extension Feedlot Specialist ·

"The Elephant in the Room"

Calf health is probably the most scrutinized yet poorly understood areas of cattle feeding. The beef industry has voluminous data on sickness and death loss in various classes of feedlot cattle. We tirelessly investigate the science behind modern vaccines and antimicrobials. And yet the U.S. beef industry has not substantially improved the health outcome of feedlot cattle in 30 years.

Vaccine technology has continued to progress, and producers certainly have better knowledge of the use and administration of vaccines than only a generation ago. The veterinary community has, necessarily, increased pharmacovigilance in order to preserve the efficacy of available antimicrobials. Most diagnostic labs currently keep a running database of antimicrobial resistance in populations of respiratory organisms.

And yet, in spite of all our advanced technology and knowledge, the most effective program for reducing respiratory disease in calves, is reducing stress.

Stress is the enemy of immunity. We see this in cattle, and we see this in our own human bodies. In otherwise healthy people, the greatest risk of cold and flu comes during or after periods of stress. Stress changes the way the body responds to invading pathogens---either viral or bacterial.

Most respiratory bacteria can be isolated from the respiratory tract of healthy cattle. But it usually requires the damage caused by a viral invasion for these bacteria to take over. The simple presence of viral pathogens is not sufficient to elicit disease, either. The critical factor causing a "tipping point" is stress.

Stress can come in the form of inclement weather, abrupt weaning, isolation, commingling with unfamiliar cattle, extended transport, rough handling, mud, dusty conditions, etc. Unfortunately, many of these conditions are unavoidable when receiving calves into the feedyard. We simply must deal with the outcomes of these stressful conditions.

Fortunately, in home-weaned and home-raised calves, we CAN prevent many, if not all, of these disease-causing stressors. By raising the calves locally, you can dramatically reduce or eliminate transport, commingling, and isolation. Through low-stress, quiet handling techniques we can (and should) eliminate rough handling. Using fence-line weaning or other techniques we can reduce weaning stress. We can affect pen conditions by scraping and bedding, and we can provide shelter to alleviate poor weather conditions.

The rancher who weans and raises calves at home has a tremendous advantage over commercial feedyards with respect to health outcome of weaned calves. While a commercial feedyard must simply manage health to the best of their ability in spite of the numerous stressors, ranchers can prevent a huge proportion of disease simply by reducing stress.

And with estimates of lost profitability of $150-200 for sick calves, reducing stress sounds like money in the bank.

For more information contact Chris at cdr3@ksu.edu.

Heat Stress Abatement: Prevention IS the cure – Chris Reinhardt, Ph.D., Extension Feedlot Specialist

Summer is upon us and is promising some record temperatures and heat conditions across the Midwest, and we're just coming into the time of greatest concern for heat stress. As beef producers and those of us who support the beef industry, it's our duty to prepare for all the possible contingencies that summer weather can bring. So, that being said, what are the tools we have in our toolbox to be better prepared to deal with the heat?

1. Pasture cattle fare better than confined cattle during heat events, provided that they can find adequate shade, elevated areas to catch more breeze, and abundant water quality and quantity to alleviate heat stress during the hottest times of the day.
2. Black-hided cattle sustain the greatest challenge due to absorption of more solar radiation compared to light-hided cattle, and the problem is exacerbated in heavy, long-fed cattle. Heat stress is caused by the combination of actual temperature, high humidity, lack of wind, and lack of cloud cover.
3. Shade works. Keeping solar radiation to a minimum during extreme heat events may eliminate the need for emergency intervention. Even some kind of temporary or portable shade structures which can be placed in pens prior to extreme heat events will give cattle relief and get you through the worst heat episodes.
4. Wind breaks contribute to heat stress. Even if no extreme heat stress may be evident, reducing potentially cooling breezes can make cattle less likely to consume and perform up to their full potential. If wind breaks are needed for the winter, consider some form of temporary wind break which can be removed for the summer months.
5. Building mounds isn't just for during wet, muddy, conditions. Cattle will climb mounds for improved access to breezes. Cattle don't like: if they're using shades and using mounds, they are probably more comfortable.
6. Extra drinking water space may provide comfort and alleviate the demand on the water system during peak heat hours. Remember: cattle cool themselves through evaporative cooling from their lungs and this can move a tremendous volume of water which needs to be replaced. Extra water space can be in the form of steel tanks or even feed bunks with tarps and sand bags on the ends to convert part of the bunk to an extended water tank. Space is critical as dominant cattle may simply stand at the water trough to breathe the cooler air over the water, and prevent others from getting needed water.
7. Bedding the pen with straw or light-colored hay provides a lighter-colored, reflective surface to provide cattle a (relatively) cooler place to lie down and rest, thus reducing their activity and comfort during already stressful conditions.
8. Sprinkling cattle may be essential. Spraying cattle is costly, time-consuming, and can contribute to increased humidity within the pen, but it also may be the difference between life and death for extremely heat-stressed cattle. Be hyper-vigilant for signs of extreme heat distress: open mouthed, labored, unabated, panting. Both cattle surface temperature and soil surface temperature are reduced as a result of spraying water which then evaporates, taking heat out of

the surface. Have a full water truck on hand when the forecast calls for elevated temps, high humidity, minimal wind, and lack of cloud cover.

As summer heat comes at us, we all need to be prepared. Shade, extra water space, mounds to elevate cattle to catch extra breeze, and removal of wind breaks can help cattle effectively alleviate heat stress. Preparation is much more effective at reducing the costs of heat stress than interventions after extreme heat stress is obvious.

For more information contact cdr3@ksu.edu.

Feedlot Facts

Chris Reinhardt, Ph.D.
Extension Feedlot Specialist

"Mud Mitigation"

As cattle people we grudgingly accept the various natural elements as part of the cost of doing business. Rain, snow, ice, and extreme temperatures are part of life for ranchers and cattle feeders. And each of these factors that forces cattle outside of their comfort zone, called the "thermo neutral zone", steals performance. With respect to mud, however, we know that the cost of fighting mud is high in terms of lost performance, and we can prepare for the inevitability of it.

Researchers have estimated that although pastern-level mud has little effect on performance, hock-deep mud is costly. A 500 lb steer gaining 2.8 lb/day, without any environmental stress, uses exactly half of it's daily energy intake just for maintenance. So if the calf is eating 20 lbs of feed, 10 lbs are spent just to "keep the lights on and the furnace running", and only 10 lbs are available for gain. But if calves are on a diet designed to gain 1.5 lb/day, only about 1/3 of the total energy is available for gain.

If calves are gaining 2.8 lb/day and environmental stress (cold, rain, mud, heat) increases the energy requirement by 10%, it also decreases the amount of energy available for gain by 10%. But if calves are only gaining 1.5 lb/day, a similar increase in energy requirement will reduce gain by nearly 20%.

But mud also decreases feed intake, so in addition to the extra energy required to maintain body functions, intake may steal away energy from the other side of the equation. So it's conceivable that gain will be reduced by 1/3 to ½ when cattle are fighting deep mud.

Preparing for mud won't totally eliminate these performance costs, but we can reduce the losses:

1. Mounds within the pen. Cattle should have about 25 ft^2 of mound space per animal on top of the mounds (not including the slopes). Mounds should have a slope of about 1:5 on the sides to facilitate moisture to flow away from the cattle and the 'valleys' between mounds should slope about 3-4% away from the bunk. The end of the mound nearest the bunk should connect to the concrete pad so cattle don't have to slog through deep mud to get from the mound to the bunk.
2. Increase pen space per animal. Whereas 125 ft^2 of pen space might be adequate during dry conditions in the summer, 350 ft^2 may be barely sufficient during wet conditions. Adapt as conditions dictate.
3. Smooth pen surfaces whenever the weather allows. The longer muddy conditions persist, the worse the pen conditions become and cattle will have an even greater difficulty moving throughout the pen.

Raising cattle has many rewards. By preparing pens for the wet times of the year cattle can continue to perform up to expectations, even during difficult environmental conditions. Sometimes, if we burn some diesel, we can help the cattle to actually SAVE energy!

For more information contact Chris at cdr3@ksu.edu or 785-532-1672.

Animal Welfare Oriented Expectations of the U.S. Public: Situation and Implications

October 29, 2012

Glynn Tonsor
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www.agmanager.info

Background & Motivation

- Consumer & resident interest in food production methods is growing
  - Think about discussions on food safety, farm size, GM-feed, hormone use, etc….
  - Includes animal welfare
    - well-being, care, and handling of livestock being raised for meat, milk, and egg production (Tonsor)

Source: March 12, 2012 TIME magazine

By affirming these principles, America's pork producers acknowledge their responsibility to:
Produce safe food
Protect and promote animal well-being
Ensure practices to protect public health
Safeguard natural resources in all of our practices
Provide a work environment that is safe and consistent with our other ethical principles
Contribute to a better quality of life in our communities
SOURCE: http://www.pork.org/Programs/32/wecare1.aspx

Events Summary

- U.S. State-by-State: Ballot initiatives, legislature, agreements
- Live Trade Events
  - May 11': Australia banned live cattle exports to Indonesia because of inhumane treatment
- National Legislation & Labeling?
  - July 11': UEP & HSUS agreement
- 2012:
  - McDonald's – wants plans for gestation stall phase out
  - OK pork video – pressure on Wal-Mart sourcing
  - Tyson Foods – FarmCheck Audit Program

Voting vs. Buying Divergence & Information Provision

- Relatively few "animal welfare" labels on U.S. retail products
  - AW ranks low in broad food interest public surveys
  - No USDA PVPs with direct claims
  - <5% of eggs are "cage-free" ; mean WTP >50% ...
- "Debate" being carried out more in the media, ballots, and legislative arenas than retail shelf
  - "labels aren't sufficient" view leads to bans…
    - Most recently, note CA vote on GM ingredients…

Current Regulations

- Growing number of states with passed ballots or legislation restricting production practices
  - Interstate commerce law quickly comes to play…
    - Some groups think non-ballot states are safe production havens…
- Discussion for national standards (UEP-HSUS)
  - Leads to growing tension across species…
- Europe is "ahead" by most timetables
- Uncertainty reduces investment …

Highlights of AW Research

- Public concerns are not unique to any species
- Trust in the source of AW information is driver of ballot voting
- Residents are insensitive to timetables
- Public doesn't know about retail price impacts
- Media attention to AW influences meat demand
- Online videos influence perceptions; not WTP
- Mandatory AW labeling has public support

Consumer/resident desires regularly initiate change

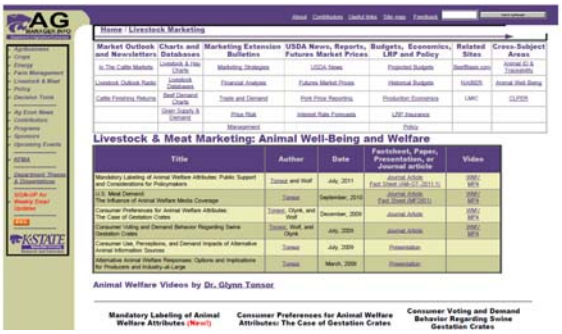
- "Perception is reality"
  - perception drives decisions
- "Accurate knowledge" and familiarity is NOT necessary to be influential
- No one individual can be "educated" on everything…

Tonsor's Overall Take

- AW is one of several "social challenges" here to stay – also related to perceived others…
- Trend of pressure coming from sources "outside the retail shelf" also here to stay
- AW is not univariate yet many debates, bans, labeling schemes, etc. treat it as such
- Does AW fit into a "cost of doing business" category in US that areas of global meat demand growth simply don't care about???

More information @ AgManager (http://www.agmanager.info/)

http://www.agmanager.info/livestock/marketing/AnimalWelfare/default.asp



More information available at:

State funds for this project were matched with Federal funds under the Federal-State Marketing Improvement Program of the AMS, USDA

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Supporting Material Slides

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Animal Welfare Research Overview

- 4 Surveys (w/ Christopher Wolf, MSU) Since 07'
  - Mainly gestation crate/stall and laying hen cage focused
- Aggregate meat demand, AW media impact study
- Online dairy video impact study
- Mandatory labeling of AW information study
- Just started 3-Yr USDA Beef and Dairy Cattle project

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How much do you agree that the following practices seriously reduce the welfare of farm animals?

- Castration, Tail Docking, Cages/Crates, Indoor Confinement
- Swine, Dairy Cattle, Beef Cattle, Laying Hens
  - Responses are grouped by production practice rather than species.
  - Suggests 'no industry is immune' and that concerns are global across species

Source: Survey of 2,001 U.S. residents

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CA's Proposition 2 Question:
Law would require farmers nationally to confine calves raised for veal, egg-laying hens, and pregnant pigs only in ways that allow these animals to lie down, stand up, fully extend their limbs, and turn around freely.

- CA actual vote (Nov 2008):63% FOR
- Survey national question:
  - National support: 70% FOR (Oct/Nov 2008)
  - National support: 66% FOR (May 2010)

Source: Survey of 2,001 & 800 U.S. residents

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Determinants of voting response in national Proposition 2 questions:

- State of residence not a factor
- Some observable socio-economic traits are influential
- Info. accuracy perceptions are most influential
  - Those perceiving livestock industry (consumer groups) to provide accurate AW information are much less (more) likely to vote FOR.

Source: Survey of 2,001 U.S. residents

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Ballot Voting Implications

- Targeting residents is difficult (latent perceptions drive voting)
- Residents were insensitive to # years for producers to comply (6-8 is common).
  - 1st or most heard voice may set adjustment timetable
  - Substantial costs of not being active or sending mixed signals
  - Industry may have opportunity to pursue longer implementation timetable

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Perceived price impacts of g.c. ban:

	Entire Pop. Raw %	Entire Pop. "Know" %s
Fall by 11% or more	4%	7%
Fall by 6-10%	3%	5%
Fall by 1-5%	2%	3%
Change by less than 1%	5%	8%
Increase by 1-5%	7%	12%
Increase by 6-10%	12%	20%
Increase by 11% or more	26%	44%
Don't Know	42%	

Source: Survey of 1,001 U.S. residents

	FOR a G.C. Ban Raw %	FOR a G.C. Ban "Know" %s	AGAINST a Ban Raw %	AGAINST a Ban "Know" %s
Fall by 11% or more	3%	5%	5%	8%
Fall by 6-10%	3%	5%	2%	3%
Fall by 1-5%	3%	5%	0%	0%
Change by less than 1%	6%	11%	2%	3%
Increase by 1-5%	9%	16%	2%	3%
Increase by 6-10%	14%	25%	7%	12%
Increase by 11% or more	19%	33%	42%	70%
Don't Know	44%		40%	

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Mean vs. Median Issues…

- Egg Purchasing Analysis (Chang, Lusk, & Norwood, 2010)
  - Cage-free premium is 57%
    - driven by minority: <4% of sales nationally are cage-free
- *Majority show voting support but not matching retail purchasing behavior…*

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National Consumer Perceptions

- Consumers infer food safety and pork quality from gestation crate/stall use.
  - Common perception is that g.c use reduces food safety and pork quality.
- Supporting evidence:
  - Valuations of gestation crate/stall-free pork are lower when food safety & quality claims are present on pork chop labels.

Source: Survey of 1,001 U.S. residents

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Impacts of Animal Welfare Media Coverage on Meat Demand

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Methods: Media Indices

(collaborated w/ Nicole Olynk, Purdue Univ.)

- Lexis-Nexis searches (1980-2008) of major U.S. newspaper and magazine articles with key words:

"(animal welfare) or (animal friendly) or (animal care) or (animal handling) or (animal transportation) AND (food or diet or meat)."

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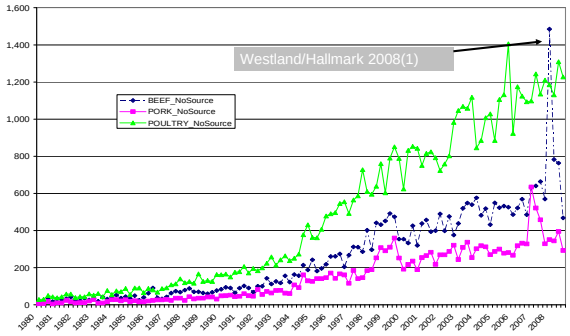
Species-Specific Indices



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Methods: Model

- Estimated aggregate demand model
  - Beef, pork, poultry, non-meat food
  - Allow for "cross-meat" and "out of meat" substitution impacts
- Control for time trends, quarterly seasonality, prices, total meat expenditures, and AW media impacts

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Results Summary

- *Reject* null hypotheses of:
  - No AW media effects
  - AW media effects being contemporaneous only
  - AW media effects extending beyond 6 months
    - SO: AW media effects are significant in the quarter of article release & one subsequent quarter…
- *Fail to reject* null hypotheses of:
  - Cross-species spillover effects = 0
    - SO: AW impacts lead to expenditure reallocation to non-meat food rather than to increases in competing meats…

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Results Summary

- AW media elasticities are notably smaller than price & expenditure effects
- Increases in AW media have:
  - Not directly impacted beef demand
  - Reduced pork demand (both in short- and long-run)
  - Reduced poultry demand (in long-run)
- AW impacts lead to expenditure reallocation to non-meat food rather than to increases in competing meats…
- 1999(1)-2008(4) pork & poultry AW media indices increased by 181% & 253%
  = 2.65% pork & 5.01% poultry demand reductions…

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Implications

- Aggregate meat demand impacts exist. Do they cover avg. adjustment costs?
  - Highlights the resident voting vs. consumption decision dilemma …
  - Also consistent with limited "free market" disadoption observed to-date by livestock industry…
- Budget reallocation effects:
  - Supports notion of a broader meat industry response rather than species-specific responses
  - All species lose as expenditures leave meat complex…

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Future Work Opportunities

- Reassessment & replication needed
- Net Information vs. Separating out "positive," "negative," and "neutral" articles…
- No delineation by source considered…
- Broader global "comparative advantage" consideration needed (pork exports: 20-25%)

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Nature of "Media" is Changing… How Influential are Today's Videos?

- Information flows constantly and instantly
  - Mobile devices complement computers, TVs, print material
  - Videos related to food production are posted regularly
    - Yet impacts and effectiveness are largely unknown
  - Previous work suggests media (non-video) influences meat demand…

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Methods: Video Treatments

- National online sample of 800; May 2010
- Three videos – randomly allocated
  1. "Happy Cow" video (CA dairy producers)
     - Check-off funded; very positive tone
  2. "Unhappy Cow" video (PETA)
     - Very negative tone – presumably seeks consumption reduction
  3. Farmers Feed Us video (Center for Food Integrity)
     - Farm family focused - $5k grocery lottery rollout

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Video Study: Take Home Points

- Perceptions may be altered by videos
  - We assessed short-term, reaction impacts – what about persistence???
- Stated milk WTP is unaltered by videos
  - Altering perceptions (and hence votes) but not purchasing behavior = industry dilemma…

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Mandatory Labeling of Animal Welfare Attributes: Public Support and Considerations for Policy Makers

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Comparative Ad(dis)vantages = National Legislation???

- Adjustments of production practices varies across states
- Timelines of implementation vary across states
  - Possible support for national legislation to "level the field"
  - Increasingly pockets of producers may lead the call..
- July 7, 2011 UEP & HSUS agreement
  - call for national standards regarding laying hen housing
  - call for mandatory labeling of eggs

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Objectives of this Study

(collaboration w/ Dr. Chris Wolf – Michigan State Univ.)

1. Examine U.S. resident support for mandatory labeling of AW information on pork and eggs
2. Outline considerations for assessment ***prior*** to implementing any mandatory labeling policies

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Methods

- Oct/Nov 2008 national survey of 2,001
  - Purposely around CA's Proposition 2 vote…
  - Assess awareness and perceptions w/r/t AW
  - Estimate demand for mandatory labeling of AW on pork and egg products

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Results

- 62% in favor of mandatory labeling of pork (gestation crate/stall use) and eggs (laying hen cage use)
  - 44% reversed support with price considered
- Perceived accuracy of AW info. from livestock industries *relative* to consumer groups is critical demand driver

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Pre-Mandatory Labeling Implementation Considerations

- Through benefit-cost assessment is needed
- Delineations needed:
  - Frequent consumer vs. advocates for change/bans
  - Producer impacts likely vary within industries
  - Mean vs. median economic welfare distinctions
- Alternative voluntary labeling consideration
- Consumer choice may not be enhanced
- Information overload possibility
- Composite AW index needed – AW isn't univariate

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Summary Points & Thoughts

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Summary Points: Consumers & Residents

- Voting and purchasing behavior mismatch = dilemma for industry…
- Meat demand impacts do exist and warrant industry consideration in strategy development
- National housing standards & mandatory labeling discussions picking up..

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Summary Points: Consumers & Residents

- Consumers associate "good AW practices" with smaller farms, higher food safety, improved product quality…
- Ballot voting behavior & regulation impacts all:
  - Product choice set for all is impacted
    - Even if only a minority WTP>MC (mean vs. median distinction)

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Big Unknowns: Consumers & Residents

- Little is known about true desires
  - E.g. Is group indoor housing sufficient or is outdoor pasture 'necessary' to concerned segments?
- Would 'site unseen' meat from other countries be accepted if U.S. production costs accelerate?
- If adjustments (i.e. remove stalls) increase farm size, will that trigger additional pressure?
- What impact do AW changes have on export demand?
- Will individual/group ID have a growing role in AW discussion?

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Current Unknowns: Producers

- Limited research on adjustment costs
- Diverse producer impacts are largely driven by unknowns including:
  - farm size, facility age, region of production …
  - recognize public data sources on these issues is decreasing …
- Adjustments will likely involve environmental, food safety, and other impacts as well that require consideration
  - "nothing happens in a silo" …

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An Additional Critical Point

- A state passing a ballot initiative isn't likely necessary to cause change:
  - Packers or retailers may drive a switch:
    - Cost of segregation; switch at some critical volume
    - External pressures will likely continue to mount (e.g. Jan. 2012 HSUS video w/r/t OK pork; Wal-Mart PR pressure)
  - **Implication**: "Fighting ballot initiatives at all costs" may not be optimal

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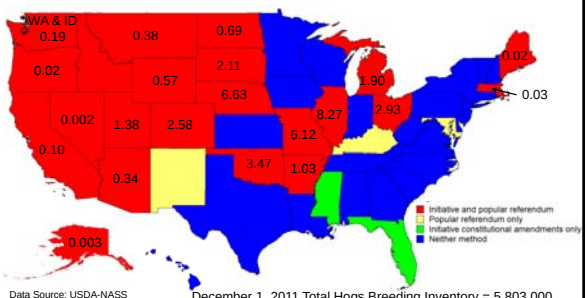
December 1, 2011 TOTAL Hogs Breeding AS PERCENT OF TOTAL U.S.



Data Source: USDA-NASS

December 1, 2011 Total Hogs Breeding Inventory = 5,803,000
Initiative and Popular Referendum = 43.22%

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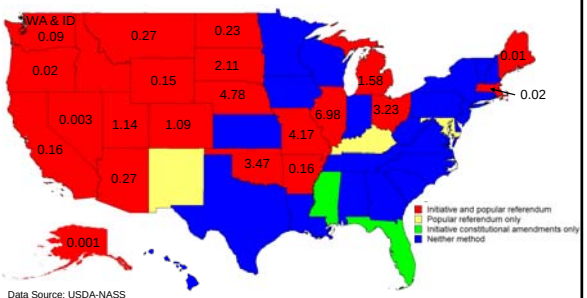
December 1, 2011 TOTAL Hogs & Pigs AS PERCENT OF TOTAL U.S.



Data Source: USDA-NASS

December 1, 2011 Total Hogs & Pigs Inventory = 65,931,000
Initiative and Popular Referendum = 29.93%

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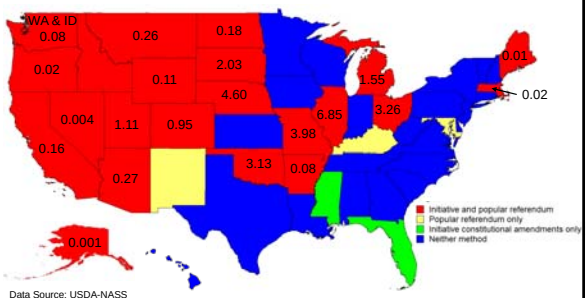
December 1, 2011 TOTAL Hogs Market AS PERCENT OF TOTAL U.S.



Data Source: USDA-NASS

December 1, 2011 Total Hogs Market Inventory = 60,128,000
Initiative and Popular Referendum = 28.65%

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Alternative Industry Paths

- "Do Nothing"

PROS:
- Minimize current investment
- Wait for more information & avoid "building the wrong barn"

CONS:
- Limits nearly all ability to have influence if "not at the table"
- Misses opportunity as public views farmer/rancher to have most influence…
  - Risk sending signal of indifference to AW…

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Alternative Industry Paths

- "Proactive" Options {not necessarily mutually exclusive}:
  - Negotiate with concerned groups
    - Adjustment time and requirements may (or may not) be improved
  - Seek additional legislation
    - Ag. may have more influence than reacting to ballot initiatives
  - Support additional labeling of practices
    - Different from demand enhancing motives; (think in terms of "minimize maximum loss" rather than "maximize expected profit")
    - However multiple trade impacts with severe consequences (E.g. WTO-MCOOL) so voluntary labeling warrants alternative consideration…
  - Support 'phase-out' as old buildings come out of production
    - May align w/ timetables in prior ballot initiatives & reduce adjustment costs
  - Invest in public image (e.g. Center for Food Integrity approach)
    - Reconnect (not necessarily defend) with public; may not be sufficient for short-run response but may be necessary for long-run survival

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Certified Humane Website's Comparison Chart

http://www.certifiedhumane.org/uploads/pdf/Comparison%20Charts/Comp.Standards.Comparison.Chart.wappendix.8.13.12.pdf

- 5 Programs
  - HFAC/Certified Humane, Animal Welfare Approved, Global Animal Partnership (GAP), USDA Organic program, and American Humane Certified
- 37 "animal-welfare standards"
- Initial 4 of 19 pages cover all species standards: traceability, growth hormones, antibiotics, transport, euthanasia

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50

A Look into the Future of the Cattle Industry

Current Status, Farm-Level Profitability Drivers, and Industry Position

Lee Schulz
Department of Economics
Iowa State University

Glynn Tonsor
Department of Agricultural Economics
Kansas State University

FORTY-SECOND ANNUAL

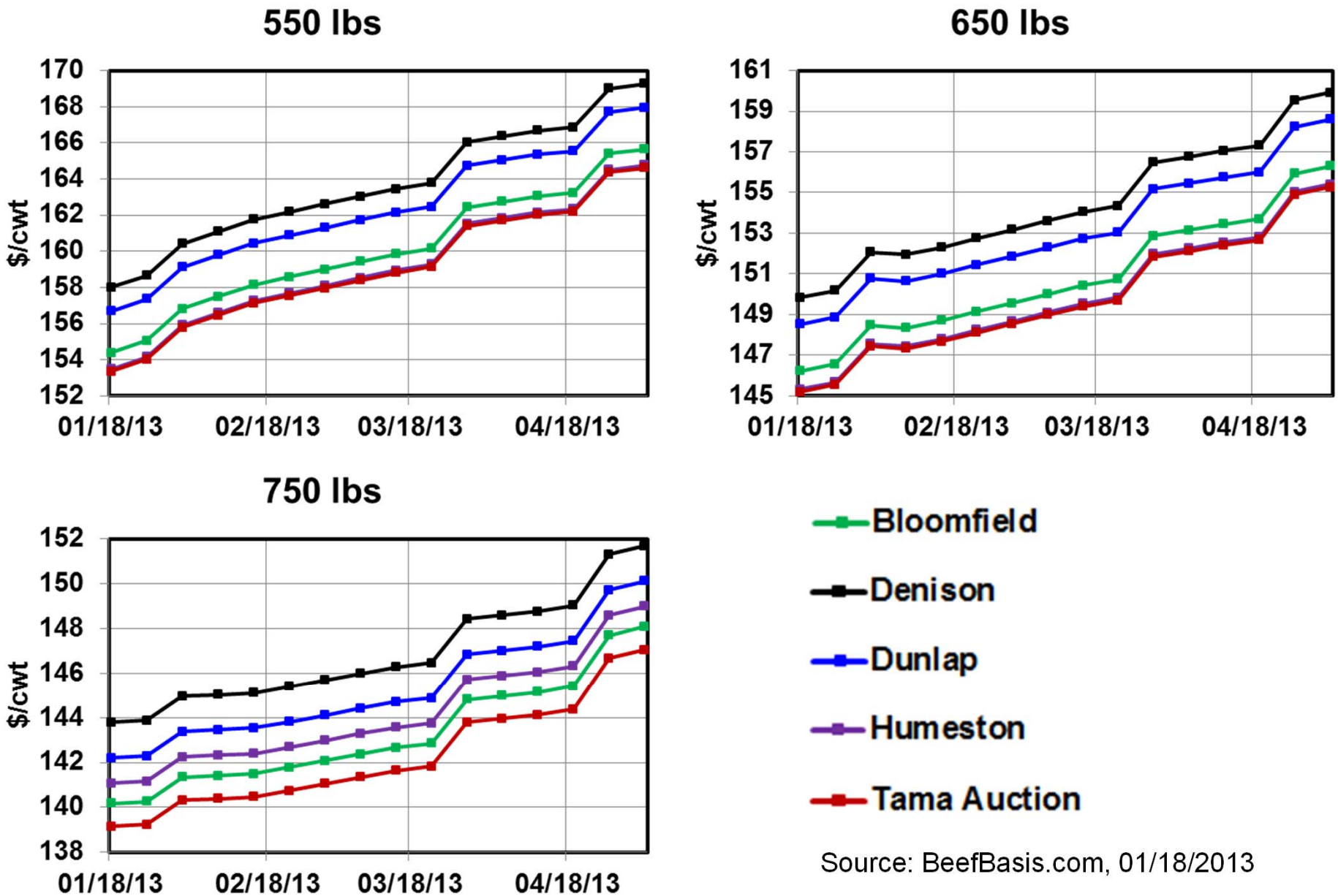
Cornbelt Cow-Calf Conference

Saturday, January 19, 2013

Economic Outlook Overview: Cow-Calf

- Historical year for calf and feeder price levels and variability
  - National vs. regional drought magnified market impact compared to 2011
  - “White hot” market in the Spring
- Return over cash costs
  - Good profit potential; cost management key
  - 2012 (2013) estimates have fell over $170/cow ($75) from Mar to Dec
  - Will 2015 now be “the peak return year”?
- Further widening between top 1/3 and bottom 1/3 of producers?
  - Cost management drives majority of differences in returns and is likely even more critical in period of drought response

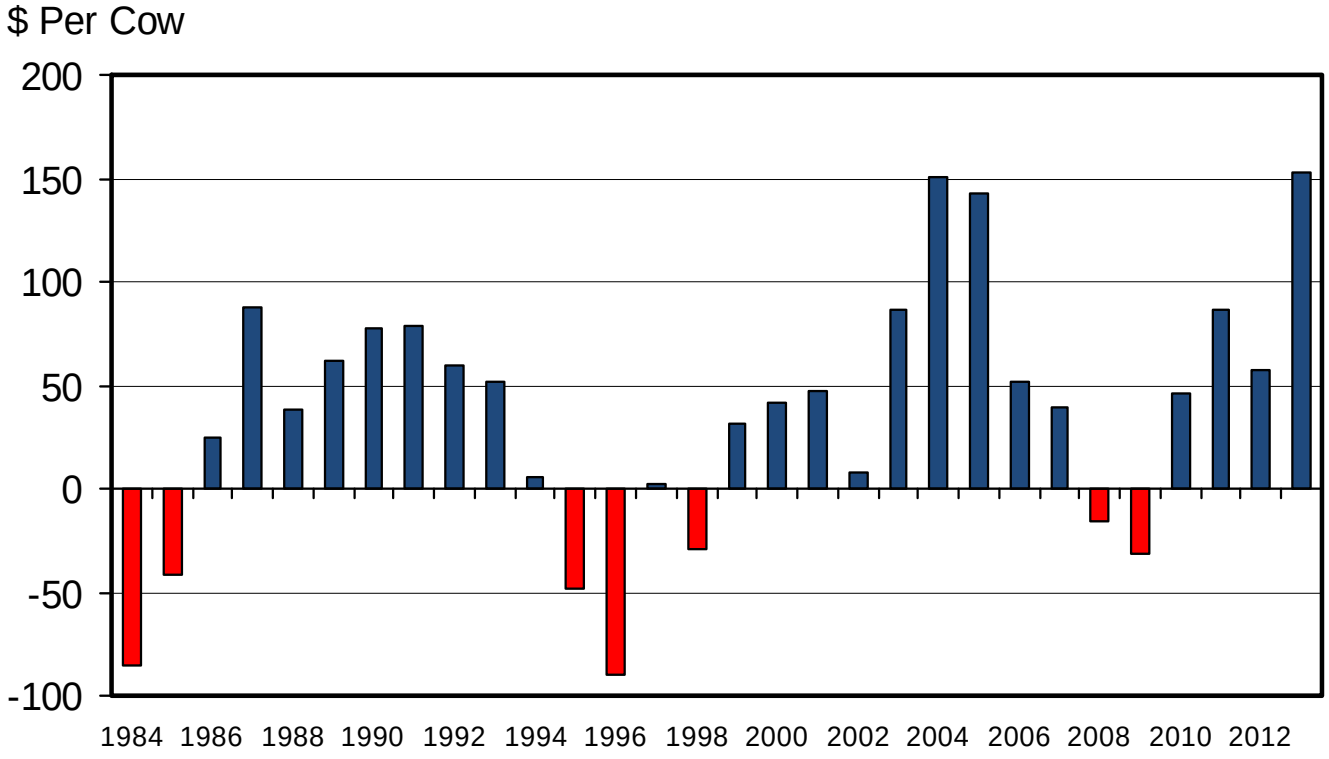
Projected Steer Prices at Selected Iowa Auctions



Source: BeefBasis.com, 01/18/2013

ESTIMATED AVERAGE COW CALF RETURNS

Returns Over Cash Cost (Includes Pasture Rent), Annual



C-P-66
09/20/12

Livestock Marketing Information Center

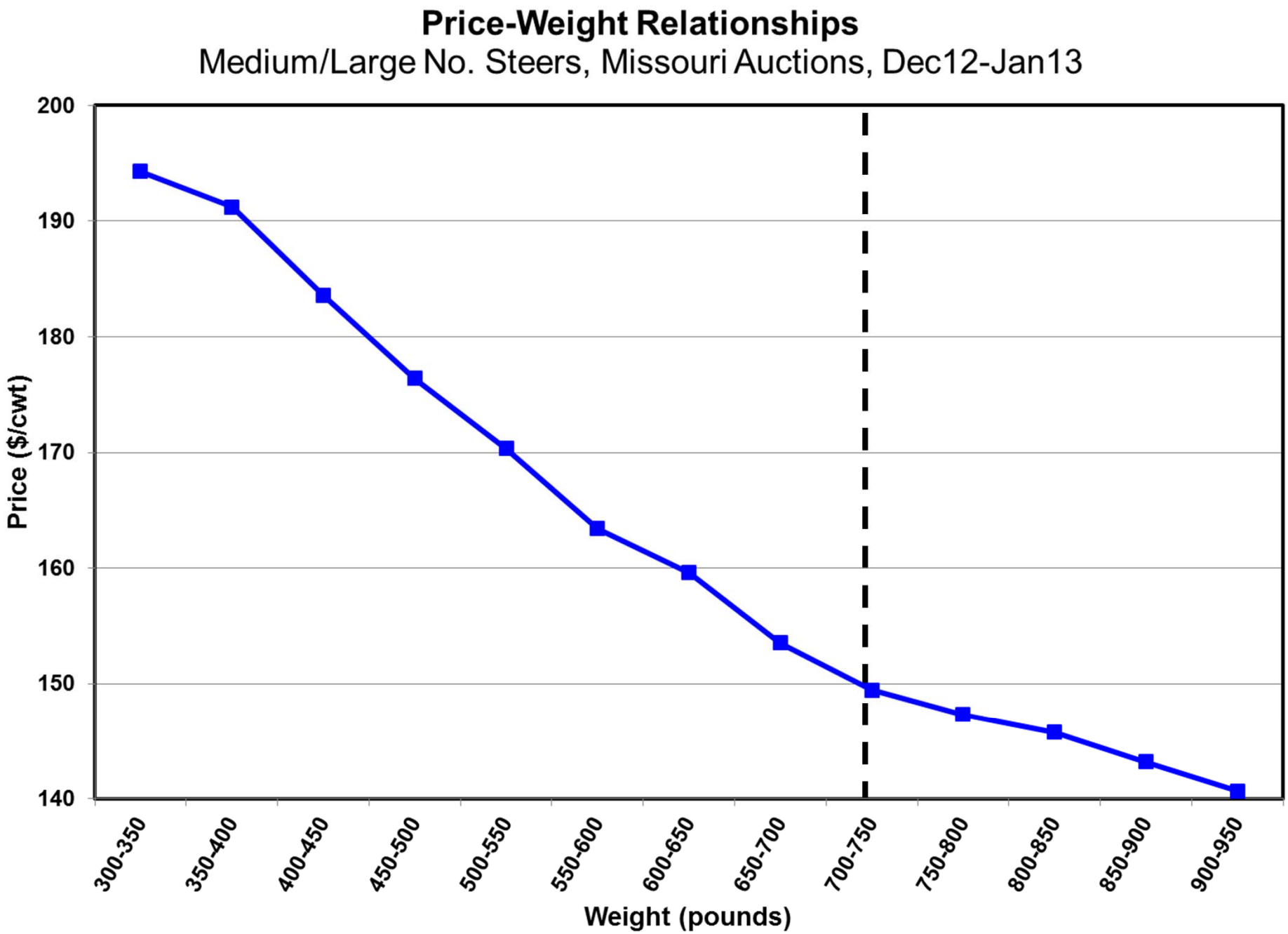
Data Source: USDA-AMS & USDA-NASS, Compiled & Analysis by LMIC

Economic Outlook Overview: Stocker

- Historically high values of gain (VOG)
  - But also historically high costs of gain (COG)

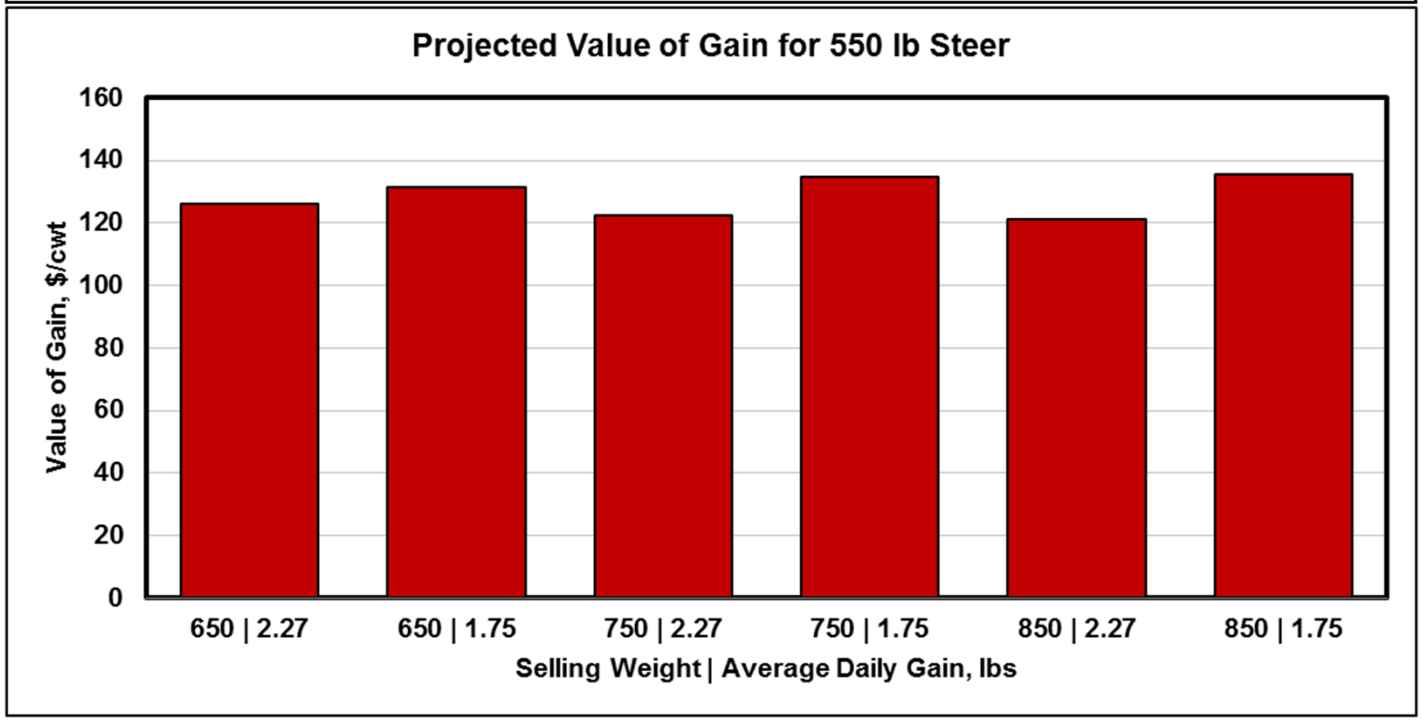
- Of course, not everyone has their typical feedstuffs/resources to engage this winter
  - ⇧ VOG = ⇧ rewards for sound management
  - ⇧ COG = ⇧ pain of hiccups or poor management

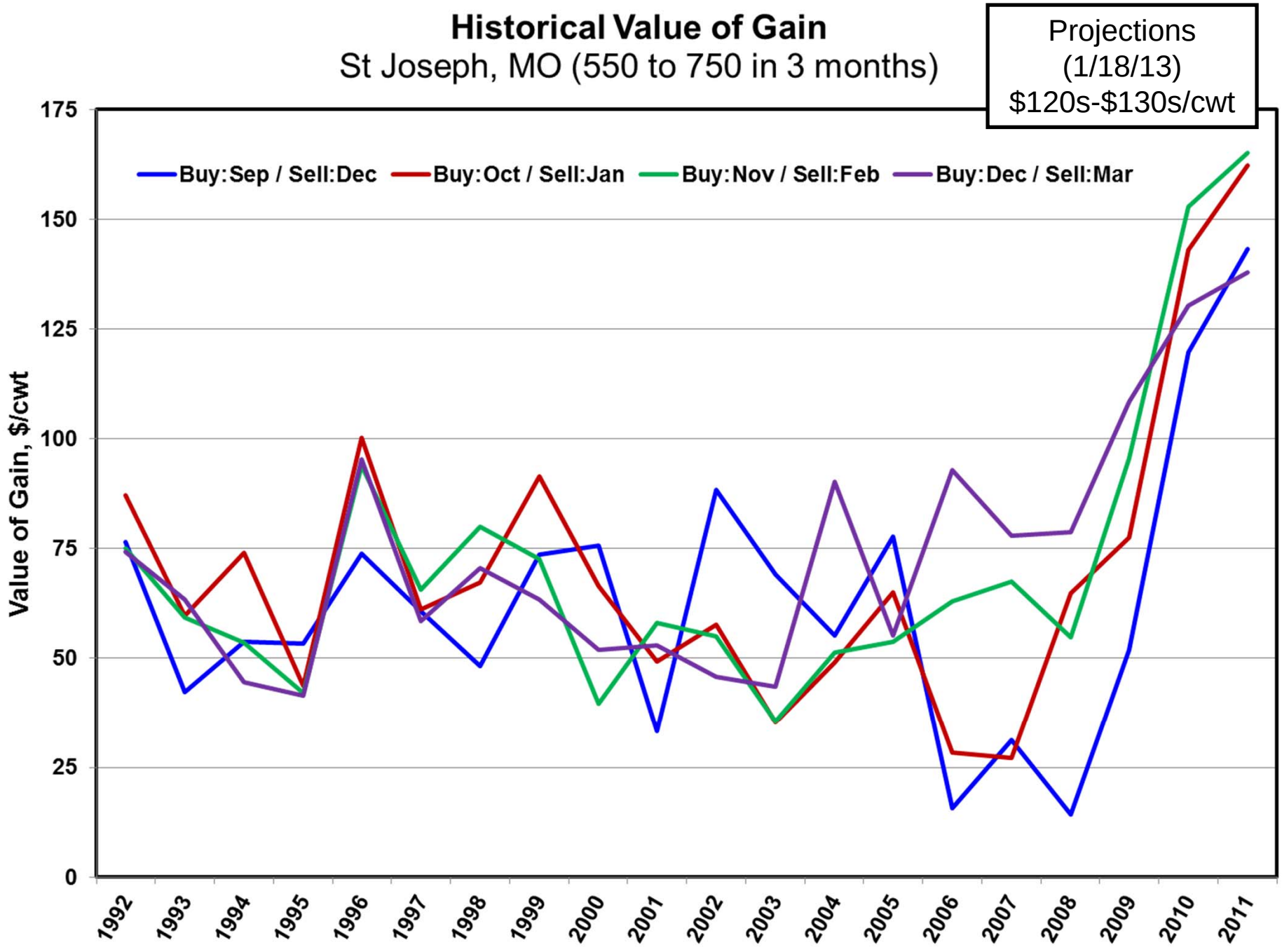
- Many producers feeding something “new”
  - Is there a widening gap between returns of stocker operations?


Price-Weight Relationships
Medium/Large No. Steers, Missouri Auctions, Dec12-Jan13
Price ($/cwt)
200
190
180
170
160
150
140
300-350
350-400
400-450
450-500
500-550
550-600
600-650
650-700
700-750
750-800
800-850
850-900
900-950
Weight (pounds)

Beginning Weight, lbs	Ending Weight, lbs	Date	Weight Gain, lbs/head	ADG, lbs	Value of Gain, $/cwt
550	650	03/03/13	100	2.27	$126.15
550	650	03/16/13	100	1.75	$131.28
550	750	04/16/13	200	2.27	$122.48
550	750	05/12/13	200	1.75	$134.59
550	850	05/18/13	300	2.50	$121.15
550	850	06/17/13	300	2.00	$135.74

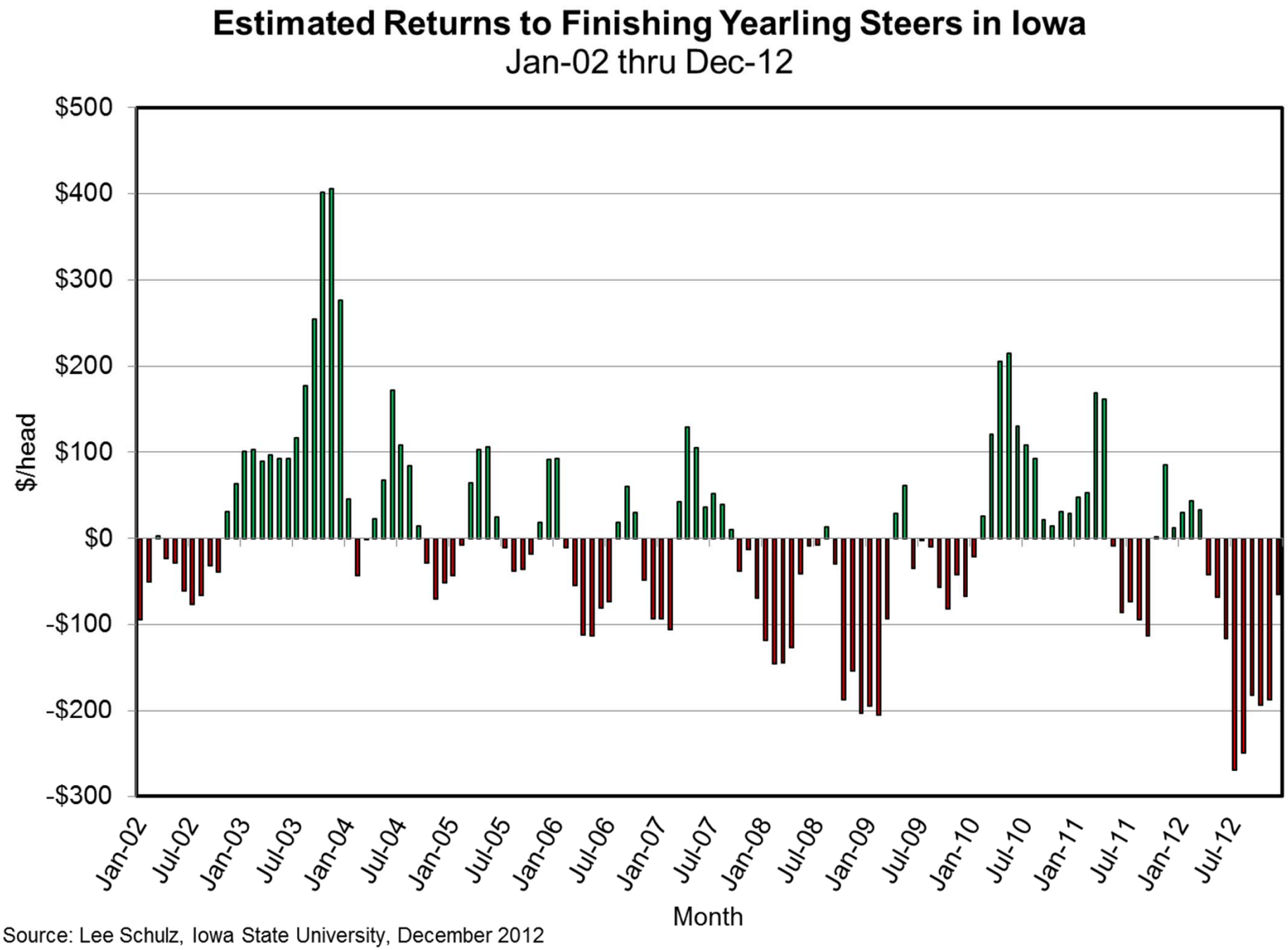
Note: Projections derived for the Dunlap, IA market using BeefBasis.com
Related information available at BeefBasis.com
01/18/13




Historical Value of Gain
St Joseph, MO (550 to 750 in 3 months)
Projections
(1/18/13)
$120s-$130s/cwt
Buy:Sep / Sell:Dec
Buy:Oct / Sell:Jan
Buy:Nov / Sell:Feb
Buy:Dec / Sell:Mar
Value of Gain, $/cwt
175
150
125
100
75
50
25
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011

Economic Outlook Overview: Feedlot

- Excess capacity concerns remain and are growing
  - Drought and Mexican feeder supplies mitigated this initially / magnifying it now and going forward
- Closeouts have been at historically high losses
  - 12-month rolling average thru Dec-12 = -$105.52/head
- Recent and future placements +/- breakeven margins
  - Watch response to shrinking available supplies
- Cattle prices pushed higher by limited supplies
  - Commercial slaughter down 4-7%



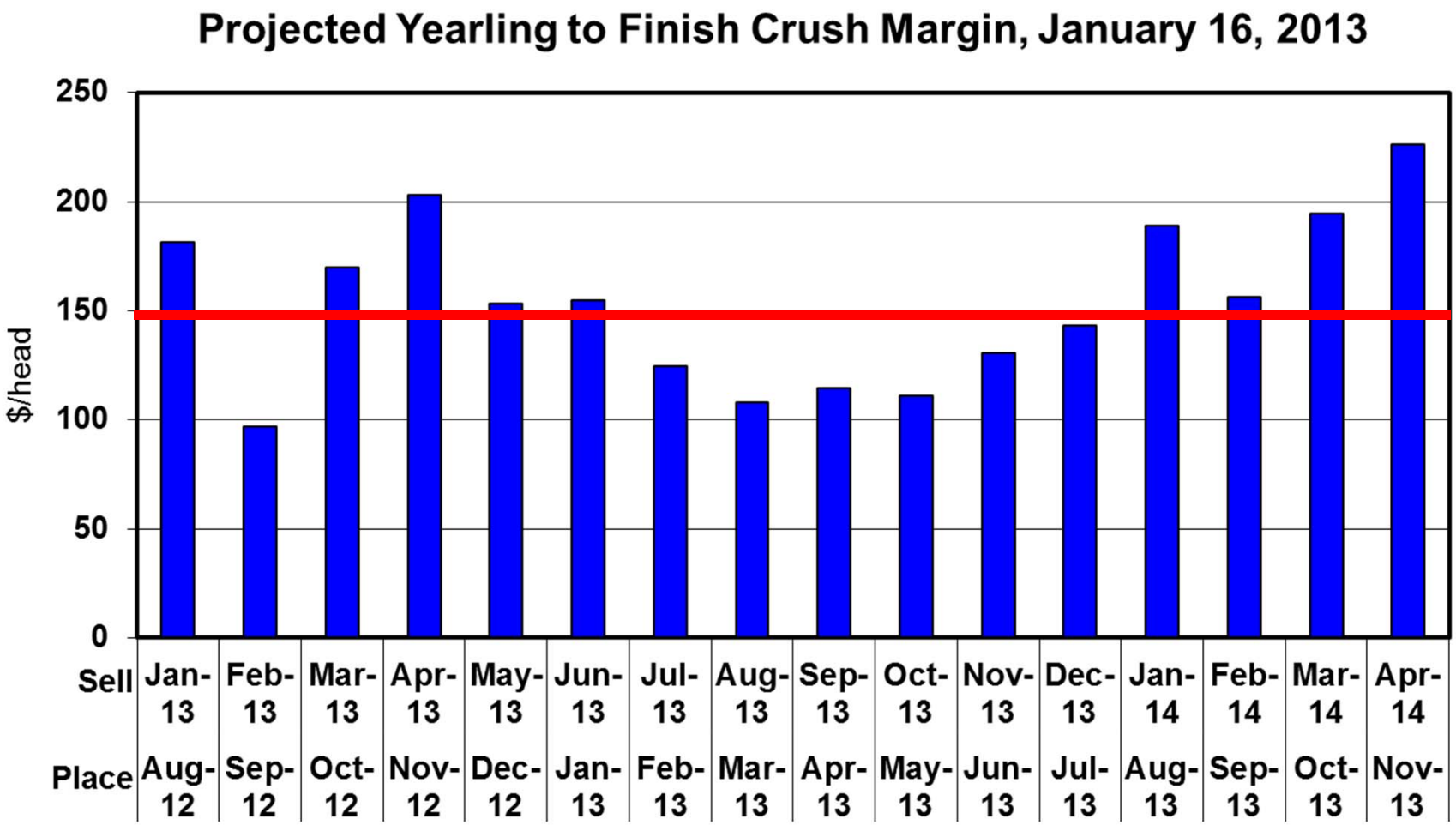
Source: Lee Schulz, Iowa State University, December 2012

Cattle Crush Margin

The Crush Margin is the return after the feeder steer and corn costs.

Live weight: 1250 pounds Feeder weight: 750 pounds

Corn: 50 bushels/head Source: http://www.econ.iastate.edu/margins/



Quarterly Forecasts (LMIC:01/18/13)

Year Quarter	Commercial Slaughter (1,000 hd)	Change from Year Ago (%)	Average Dressed Weight (lbs)	Change from Year Ago (%)	Commercial Beef Production (mil lbs)	Change from Year Ago (%)
2011						
I	8,314	1.8	771	0.7	6,410	2.6
II	8,640	-0.5	759	0.7	6,559	0.2
III	8,738	-0.2	771	-0.3	6,736	-0.5
IV	8,395	-3.0	773	-0.8	6,490	-3.7
Year	34,087	-0.5	768	0.1	26,195	-0.4
2012						
I	8,027	-3.5	783	1.5	6,283	-2.0
II	8,311	-3.8	779	2.6	6,475	-1.3
III	8,332	-4.6	790	2.5	6,584	-2.3
IV	8,281	-1.4	793	2.6	6,570	1.2
Year	32,951	-3.3	786	2.3	25,912	-1.1
2013						
I	7,662	-4.5	783	0.1	6,001	-4.5
II	7,916	-4.8	779	0.03	6,169	-4.7
III	7,967	-4.4	796	0.7	6,342	-3.7
IV	7,700	-7.0	799	0.8	6,155	-6.3
Year	31,245	-5.2	789	0.4	24,667	-4.8
2014						
I	7,200	-6.0	792	1.2	5,705	-4.9
II	7,457	-5.8	786	0.9	5,861	-5.0
III	7,532	-5.5	805	1.1	6,061	-4.4
IV	7,287	-5.4	807	1.0	5,882	-4.4
Year	29,476	-5.7	798	1.0	23,509	-4.7

Quarterly Forecasts (LMIC:01/18/13)

Year Quarter	Live Slaughter Steer Price 5-Market Average ($/cwt)	Change from Year Ago (%)	Feeder Steer Price Southern Plains 7-800# ($/cwt)	Feeder Steer Price Southern Plains 5-600# ($/cwt)
2011				
I	110.12	23.1	129.06	150.07
II	112.79	17.1	132.03	148.61
III	114.05	19.5	135.93	141.69
IV	121.99	21.7	143.15	153.11
Year	114.74	20.3	135.04	148.37
2012				
I	125.29	13.8	154.25	182.41
II	120.91	7.2	152.65	178.65
III	119.69	4.9	141.82	150.57
IV	125.54	2.9	146.50	161.42
Year	122.86	7.1	148.81	168.26
2013				
I	128-131	3.4	143-146	161-165
II	128-132	7.5	146-151	163-169
III	126-131	7.4	148-154	164-173
IV	128-134	4.3	149-156	163-170
Year	128-132	5.8	147-151	163-169
2014				
I	132-139	4.6	154-162	175-184
II	134-142	6.2	157-167	178-190
III	132-140	5.8	158-169	174-187
IV	133-143	5.3	156-168	171-185
Year	134-140	5.4	158-165	177-184

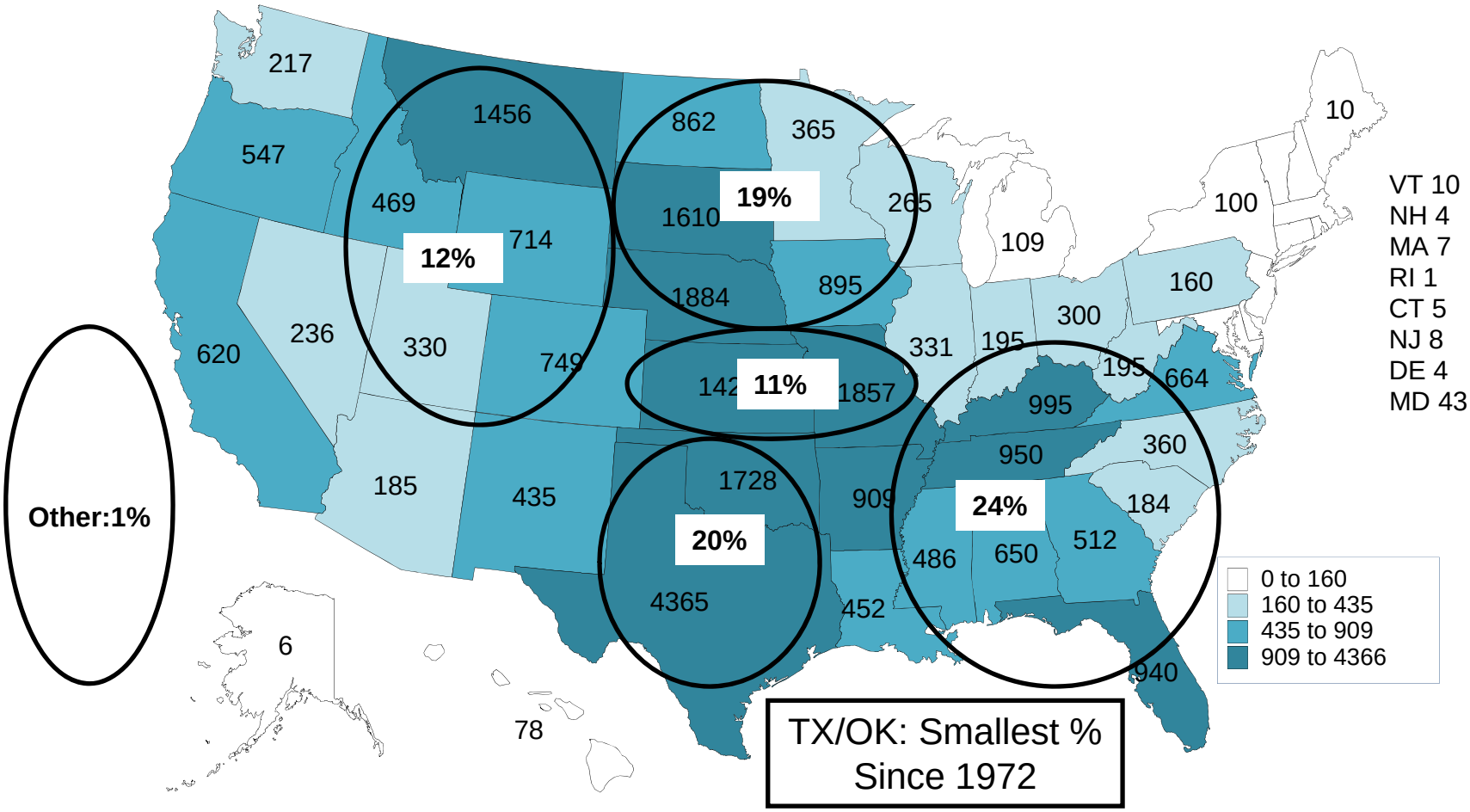
Cattle Herd Status

- Economic incentive to stabilize/rebuild herd overcome by drought
  - 2013 market will reflect tight supplies, moisture prospects, expansion possibilities…
- Tighter supplies…into 2015?
- Continued drought?
  - More liquidation
- …Or “normal” weather?
  - More heifer retention
  - Breeding cow and heifer demand; higher prices

BEEF COWS THAT CALVED JANUARY 1, 2012

(1000 Head), US Total 29,883

National Herd:
-3.1% (vs. 2011)
Smallest since 1962



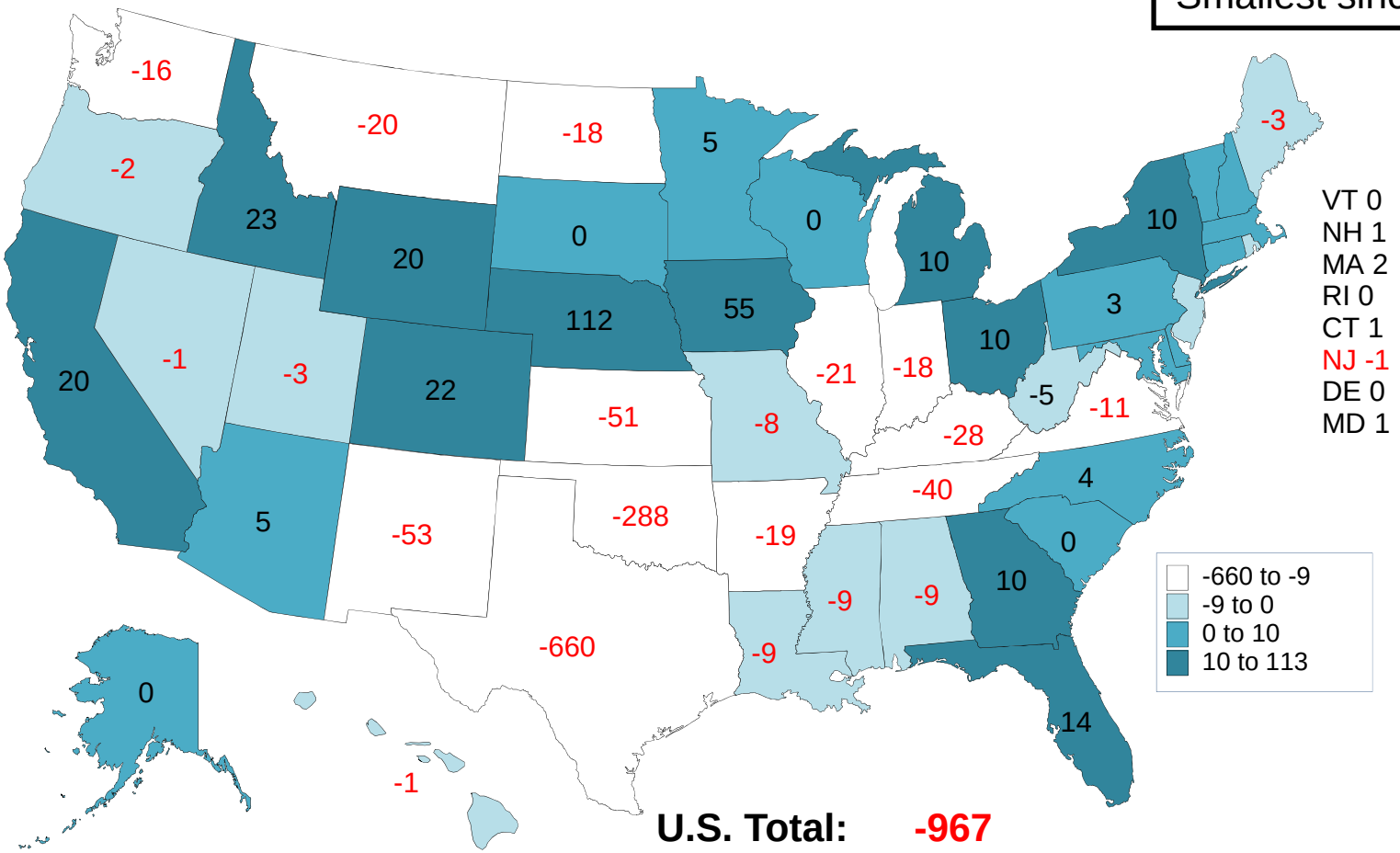
TX/OK: Smallest %
Since 1972

01/27/12

Livestock Marketing Information Center
Data Source: USDA-NASS

CHANGE IN BEEF COWS NUMBERS
JANUARY 1, 2011 TO JANUARY 2012
(1000 Head)

National Herd:
-3.1% (vs. 2011)
Smallest since 1962



U.S. Total: -967

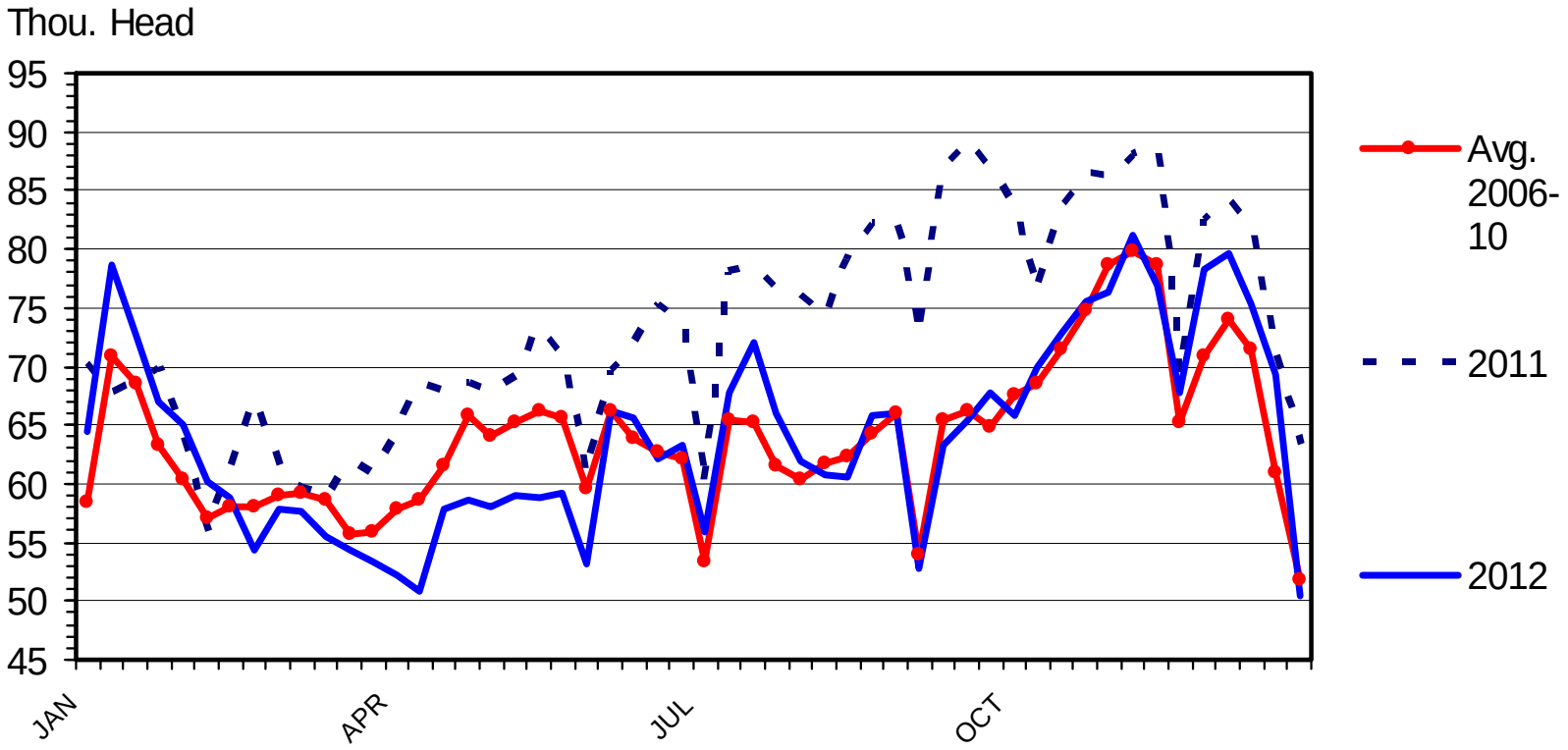
TX + OK = 98.1% of
National Decline

Livestock Marketing Information Center
Data Source: USDA-NASS

01/27/12

BEEF COW SLAUGHTER

Federally Inspected, Weekly



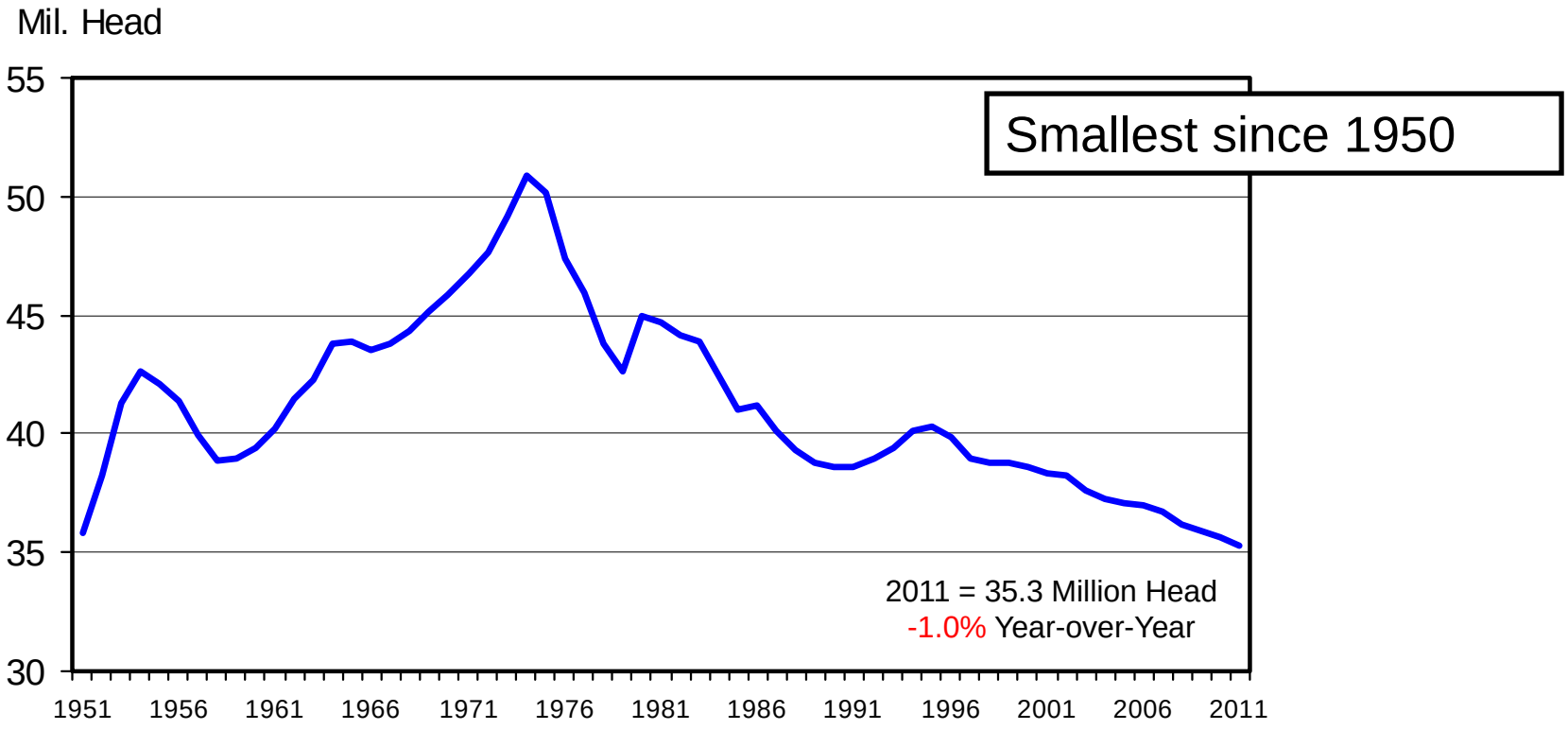
C-S-34
01/11/13

Livestock Marketing Information Center

Data Source: USDA-AMS & USDA-NASS

CALF CROP

U.S., Annual



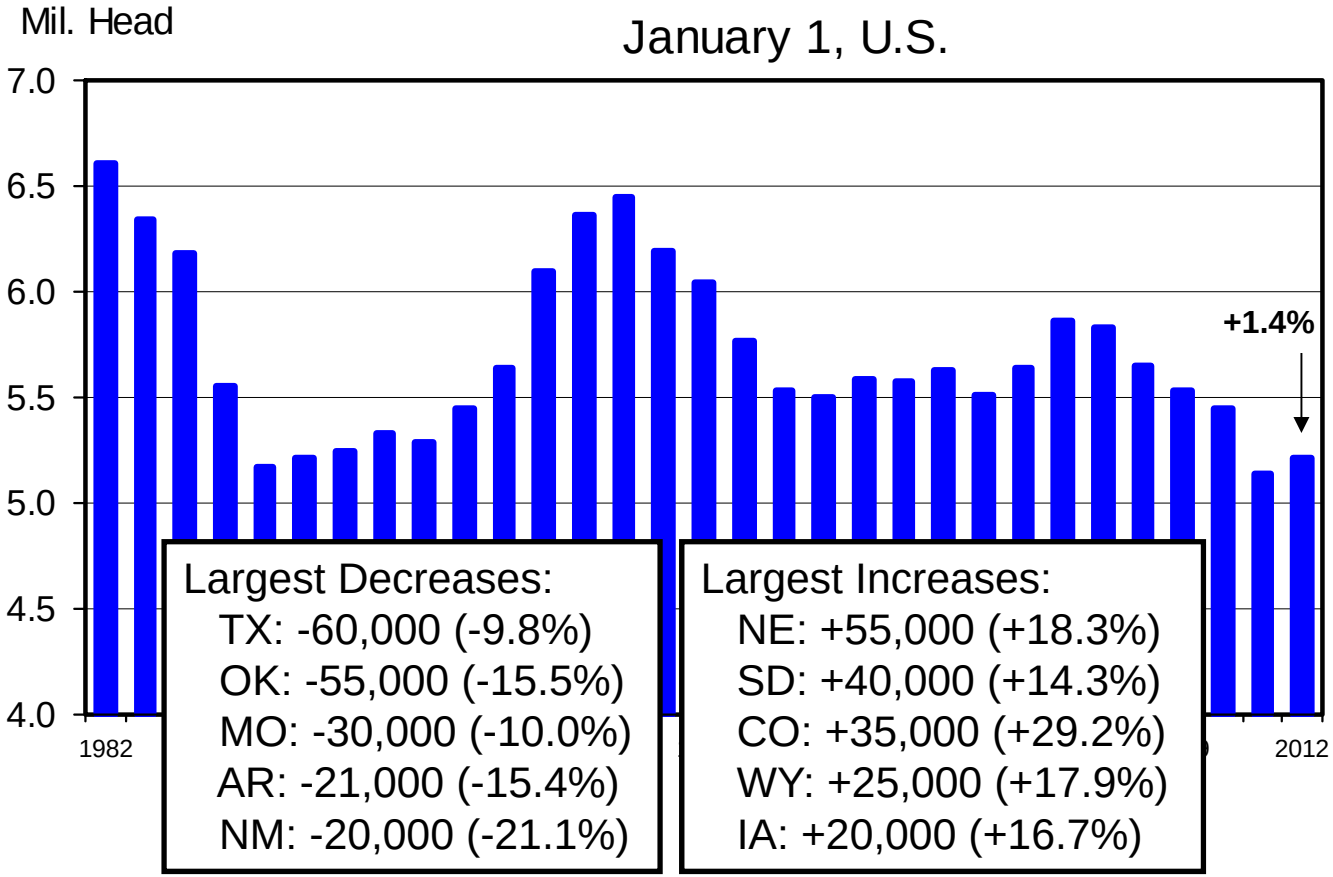
C-N-18A
07/20/12

Livestock Marketing Information Center

Data Source: USDA-NASS

HEIFERS HELD AS BEEF COW REPLACEMENTS

January 1, U.S.



C-N-38
07/20/12

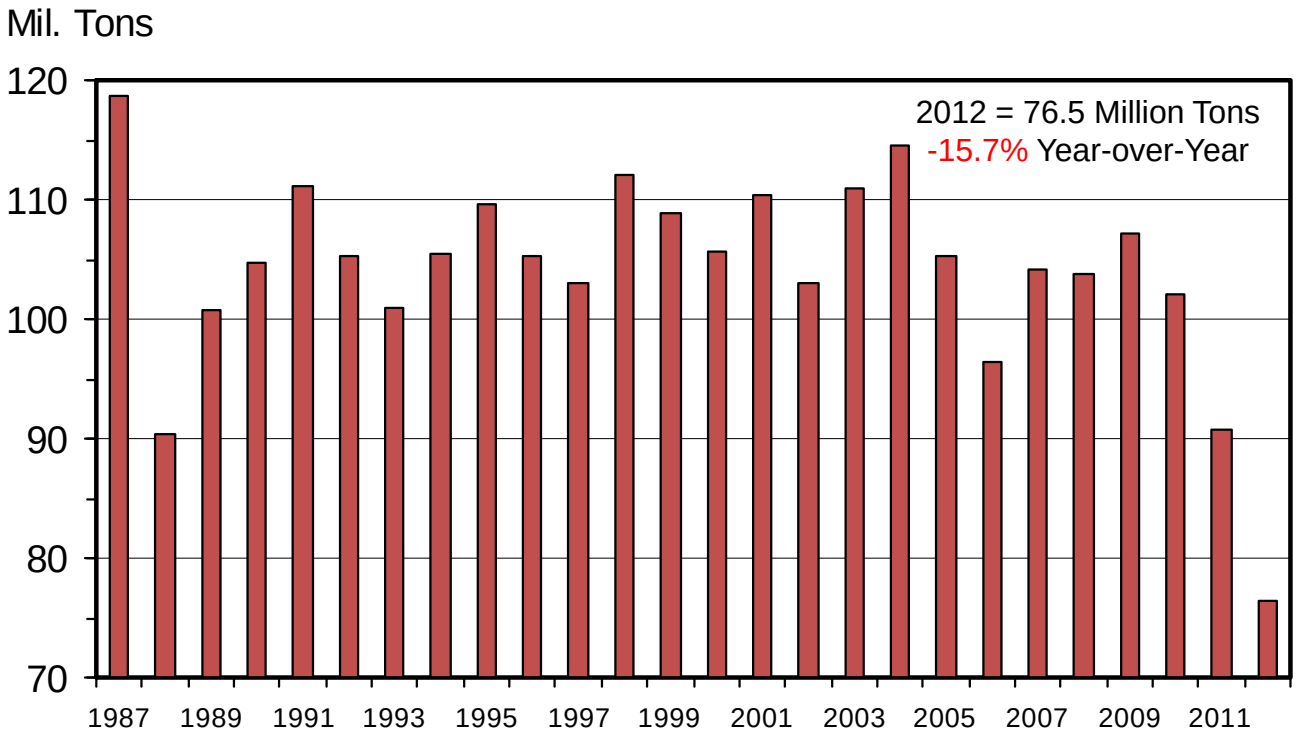
Livestock Marketing Information Center
Data Source: USDA-NASS

When will the U.S. national herd expand?

-- who/where will expansion occur???

U S ALL HAY STOCKS

December 1



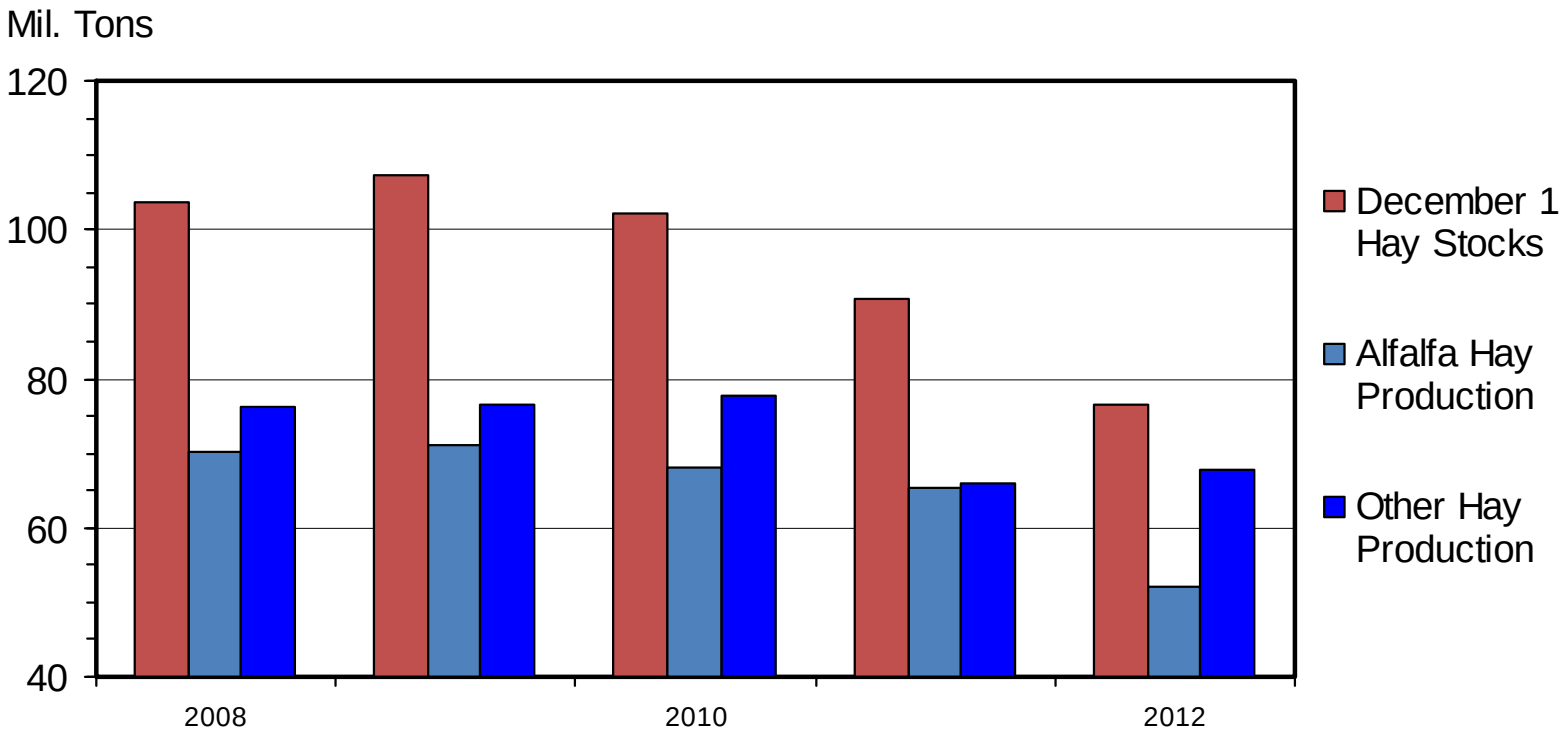
G-NP-22
01/11/13

Livestock Marketing Information Center

Data Source: USDA-NASS, Compiled & Forecasts by LMIC

U S HAY STOCKS AND PRODUCTION

Crop Year



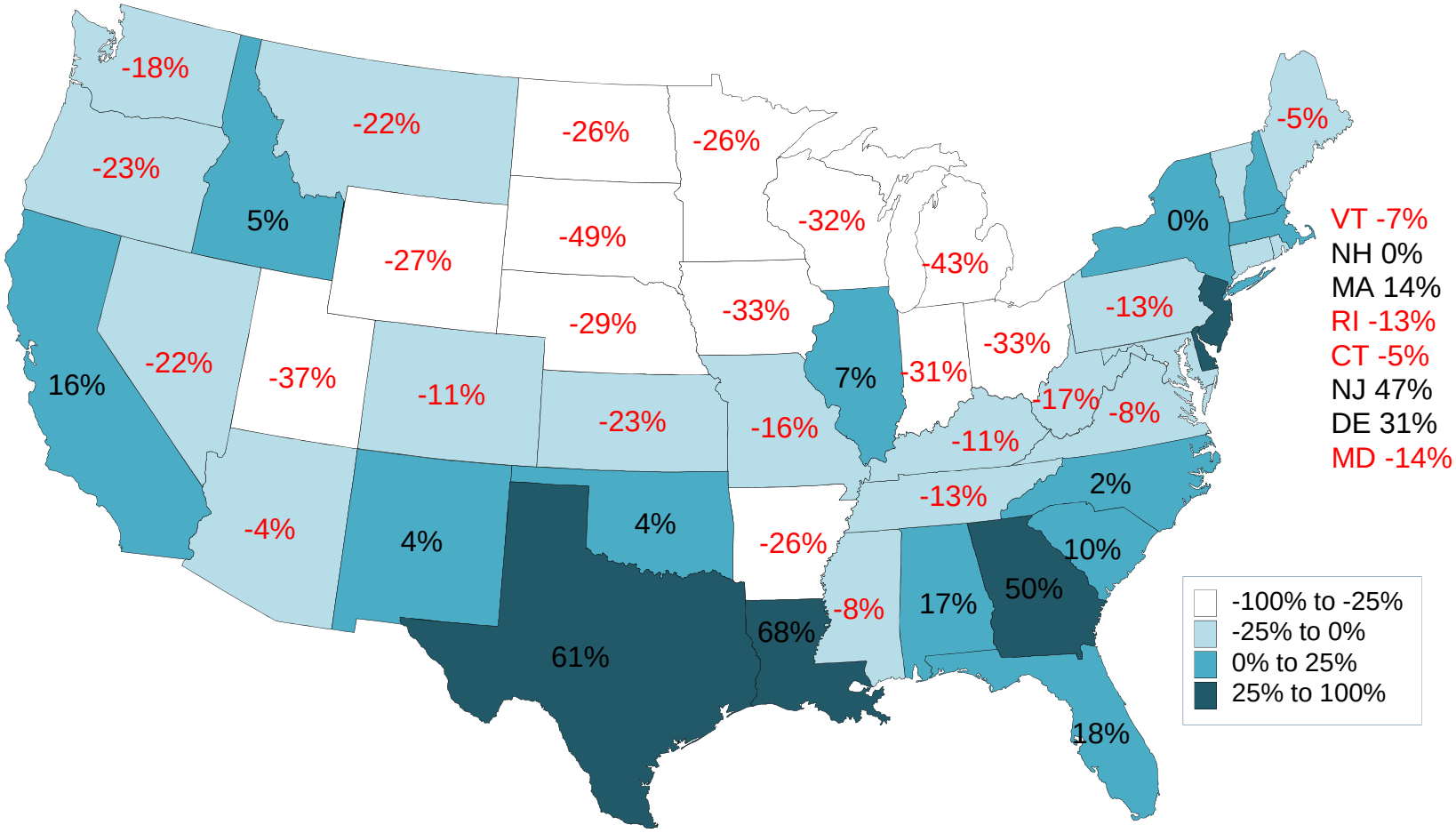
Livestock Marketing Information Center

01/11/13

Data Source: USDA-NASS, Compiled & Forecasts by LMIC

PERCENT CHANGE DECEMBER 1 HAY STOCKS

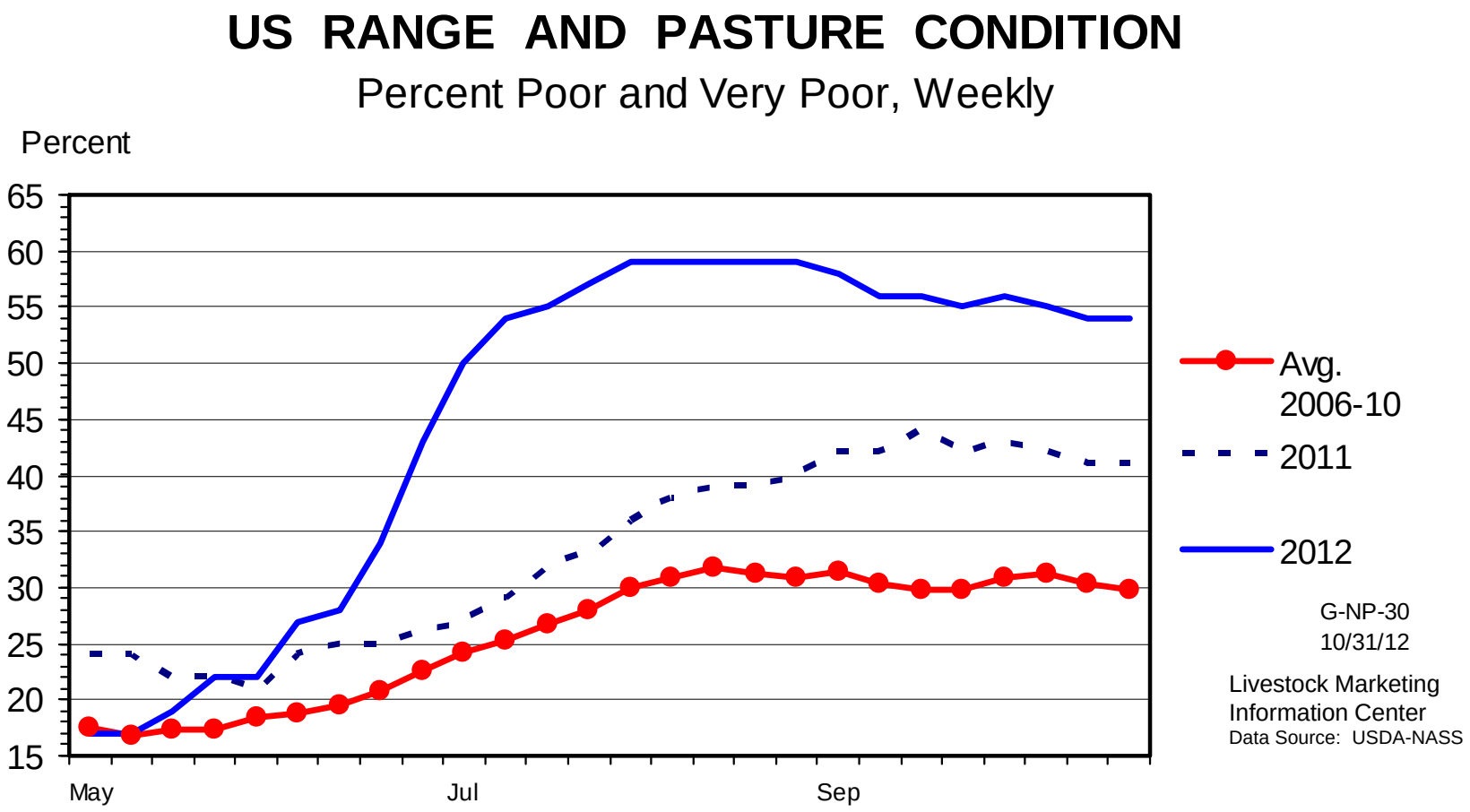
(2012-2011)



VT -7%
NH 0%
MA 14%
RI -13%
CT -5%
NJ 47%
DE 31%
MD -14%

Livestock Marketing Information Center
Data Source: USDA-NASS

1/15/2013



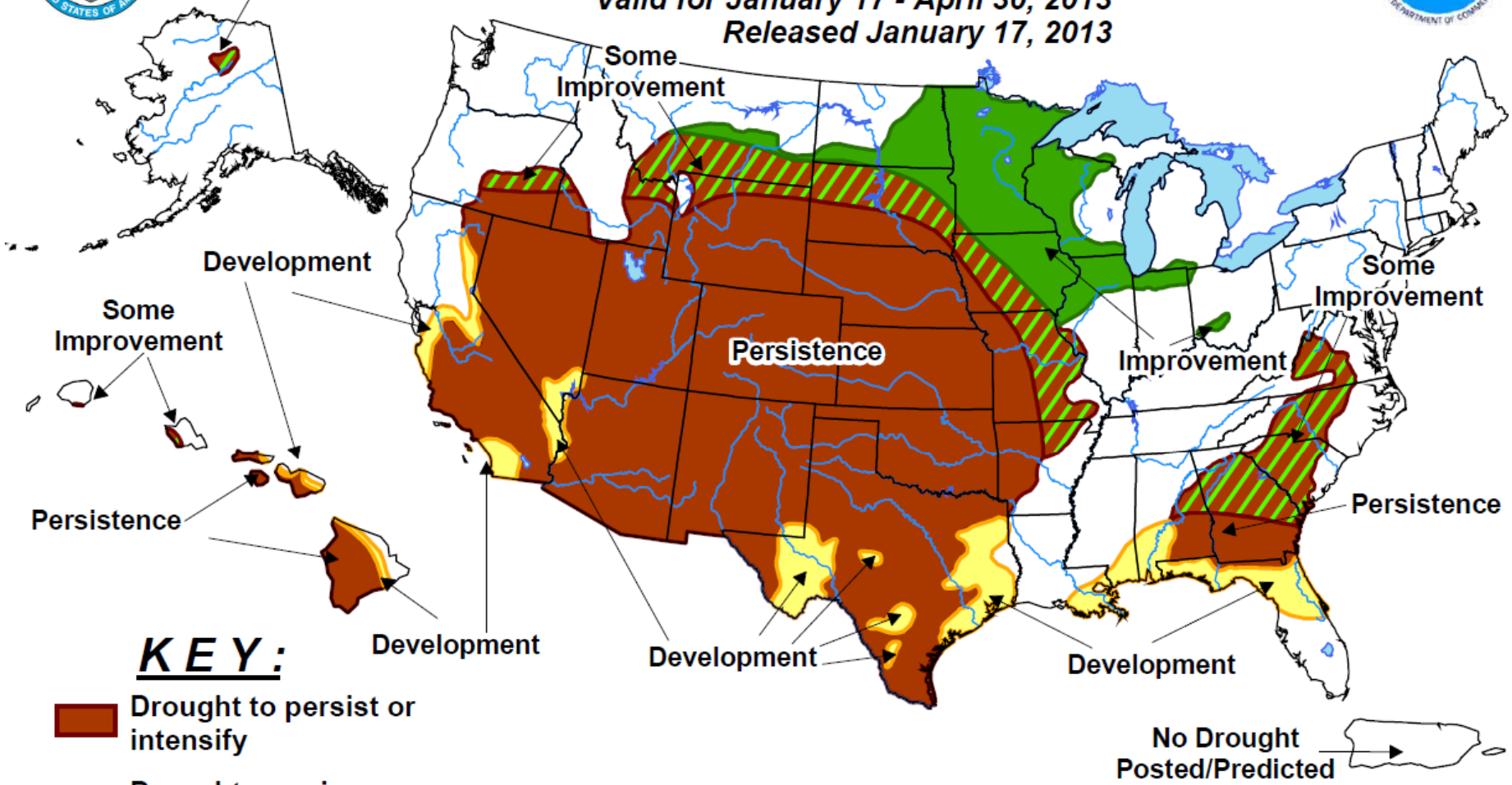
October 2012: 71% of Beef Cows in States with > 40% Poor to Very Poor Pasture Conditions (46% in 2011 & 20% in 2010)

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for January 17 - April 30, 2013

Released January 17, 2013



KEY:

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Build herd -- How much can I pay for a heifer/cow?

KSU-BeefReplacements_(01-16-12) with FAPRI prices.xls [Compatibility Mode] - Microsoft Excel

KSU-Beef Replacements.xls --- A spreadsheet program to evaluate the economic value of purchasing beef replacements females.

Version 1-16-12

INPUTS vs CALCULATED VALUES
In the *Price and weights* and *Net Present Value* tabs all blue numbers are inputs and all black numbers are calculated from these inputs.

DESCRIPTION OF INPUTS:
Several input cells (i.e., blue number) have a red diamond in the upper right hand corner of the cell. By moving your mouse cursor over this diamond, a brief description of the input will be displayed on the screen.

MACROS
This spreadsheet uses macros to print the three different pages, however printing can also be done manually by highlighting the desired range and using the menu print commands.

Developed by:
Kevin C. Dhuyvetter, Ph.D.
Extension Agricultural Economist
Kansas State University
Voice: (785) 532-3527
Email: kcd@ksu.edu
www.AgManager.info

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Introduction | Prices and weights | Net present value | Prices and weights (2)

KSU-Beef Replacements.xls **developed to help producers consider how much they can pay for replacement females given various assumptions.**

(Excel spreadsheet available: *http://www.agmanager.info/livestock/budgets/production/default.asp#Beef Cattle*)

Build herd -- How much can I pay for a heifer/cow?
Average cow costs of middle 1/3 = $803

Print information

Input Assumptions

Number of replacements purchased	100	Percent marketable calves (1 - death loss)	97.0%
Year of purchase	2013	Annual cow death loss	0.5%
First year for calf sales	2014	Annual cull rate	15.0%
Cull cow weight, lbs/hd	1,250		
Annual cow costs, $/year	$803	Annual inflation rate on costs	1.0%
Price scenario to use (1-3) (GTT Adj LMIC)	1	Annual increase in average weaning weight	0.0%
Weaning weight scenario to use (1-3)	1	Discount rate (interest rate)	6.5%

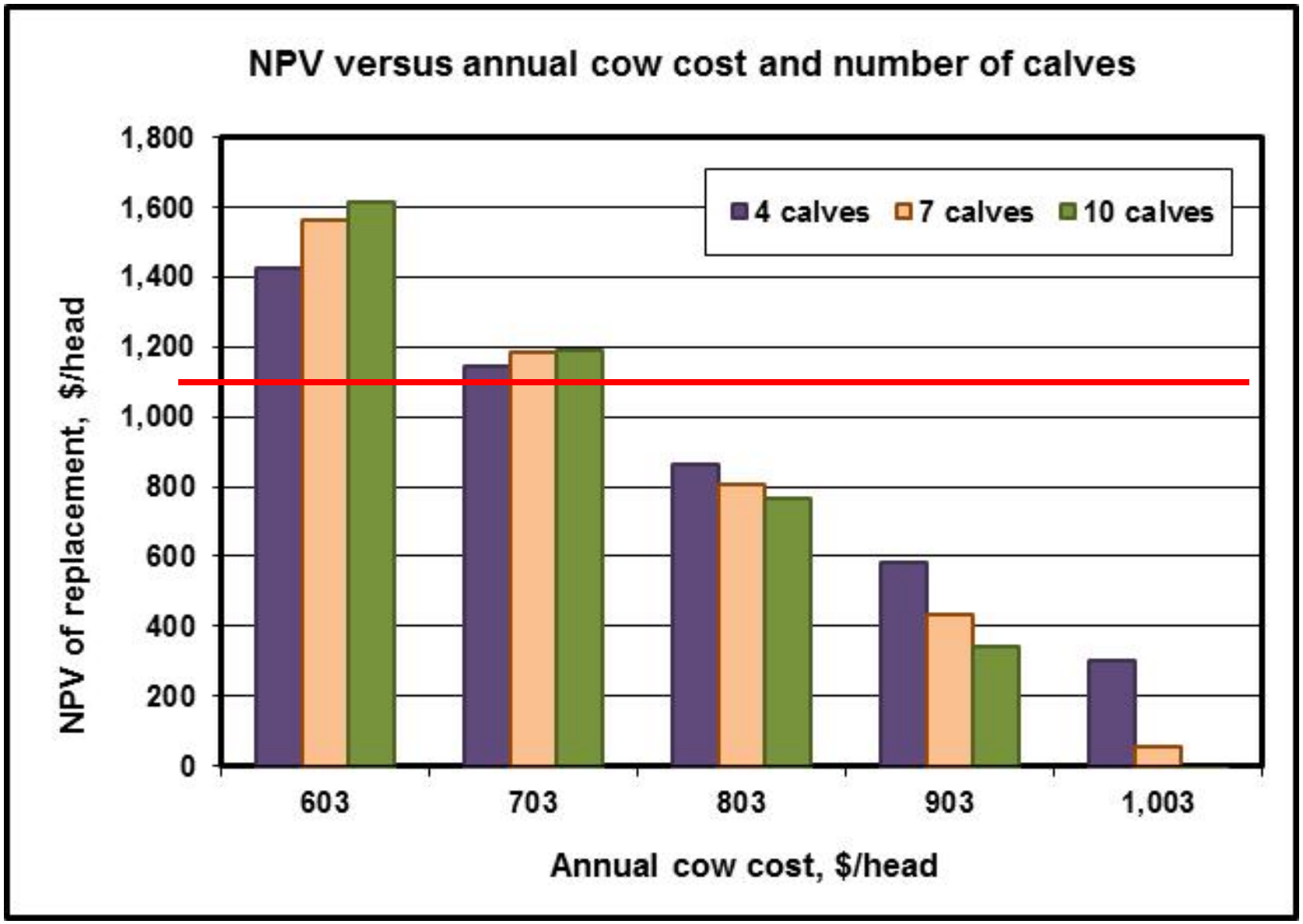
Net Present Value Analysis

Year	Cows at BOY*	Calf	Calf wt	Prices, $/cwt Calf	Prices, $/cwt Cull	Calf Income	Cull Income Annual	Cull Income Age	Cost	Cost Adj.	Net Income	Discount factor	NPV**
2014	100.0	1	542	$170.48	$70.00	$896	$131.25	$739	$811	$0	$217	0.9390	$898
2015	84.5	2	552	$164.88	$70.00	$746	$110.91	$625	$692	$0	$165	0.8817	$899
2016	71.4	3	562	$159.28	$70.00	$620	$93.72	$528	$591	$0	$123	0.8278	$887
2017	60.3	4	567	$153.98	$70.00	$511	$79.19	$446	$504	$0	$86	0.7773	$864
2018	51.0	5	572	$153.68	$70.00	$435	$66.92	$377	$430	$0	$71	0.7299	$844
2019	43.1	6	572	$153.68	$70.00	$367	$56.54	$319	$367	$0	$57	0.6853	$826
2020	36.4	7	567	$153.98	$70.00	$308	$47.78	$269	$313	$0	$43	0.6435	$809
2021	30.8	8	565	$154.10	$70.00	$260	$40.37	$227	$267	$0	$33	0.6042	$793
2022	26.0	9	562	$154.28	$70.00	$219	$34.12	$192	$228	$0	$24	0.5674	$778
2023	22.0	10	559	$154.46	$70.00	$184	$28.83	$162	$195	$0	$18	0.5327	$765
			562	$157.28	$70.00								

* BOY = Beginning of year

** Net present value if replacement is sold in this year

Build herd -- How much can I pay for a heifer/cow?



Total costs of bottom, middle, and top 1/3 operations (07'-11' KFMA): $961/cow, $803/cow, and $697/cow

Cow-calf profitability drivers…

- Analysis of KFMA cow-calf enterprise analysis returns
  - 1979-2011 all operations (examine time effect)
  - 2007-2011 operations with at least three years of data (examine producer effect)
- Paper available on web (www.agmanager.info)

Differences Between High, Medium, and Low Profit Producers:

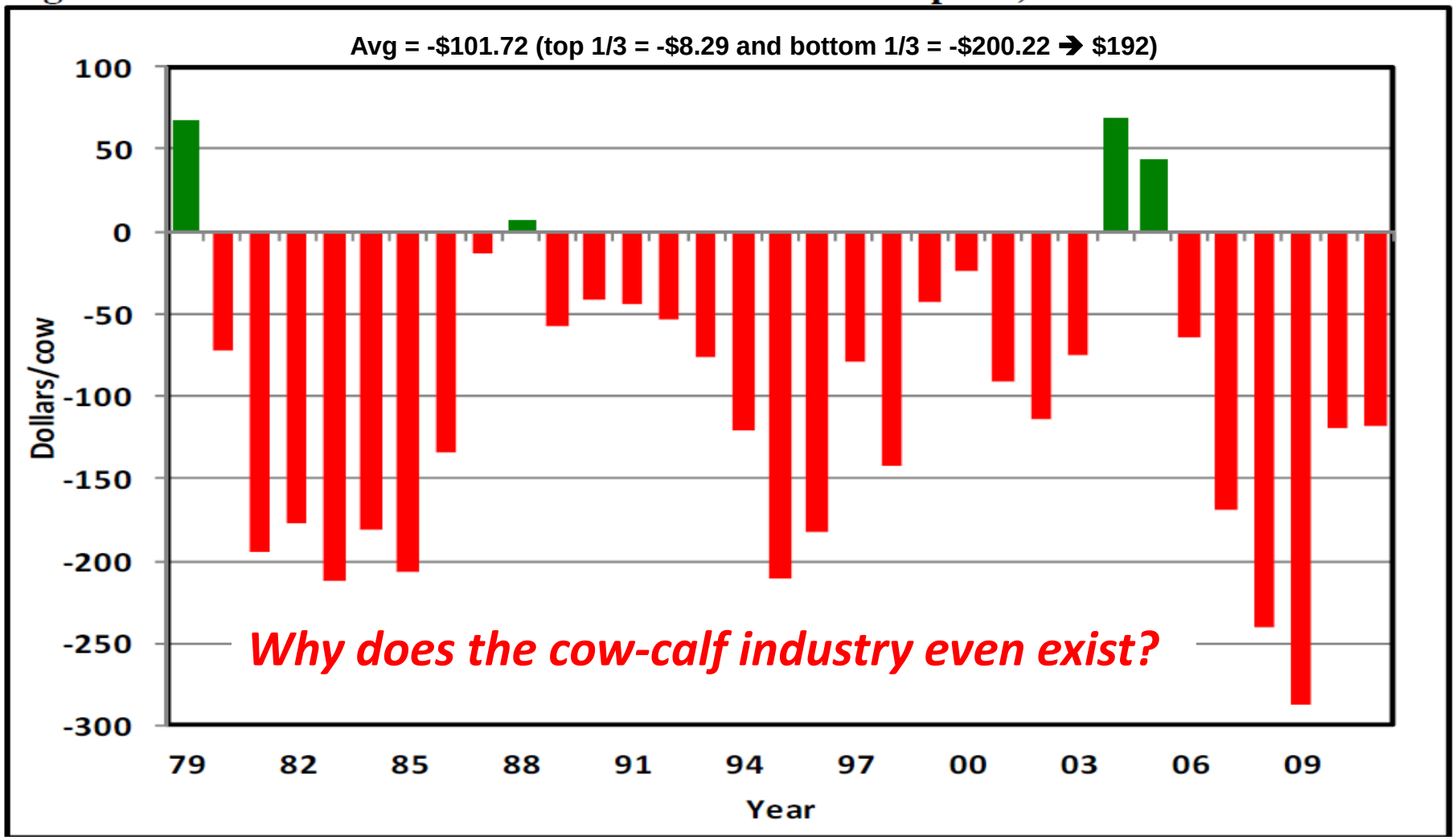
An Analysis of 2007-2011 Kansas Farm Management Association Cow-Calf Enterprise

Kevin C. Dhuyvetter
Department of Agricultural Economics, Kansas State University
November 2012

AG MANAGER.INFO
KANSAS STATE UNIVERSITY

KS average returns are highly variable over time…

Figure 2. Returns over Total Cost for Cow-calf Enterprise, 1979-2011



Source: Kansas Farm Management Association (KFMA) Annual Enterprise Analysis Reports

Financial importance of U.S. cow-calf operation…

Contributions to Income and Labor Input

	Percent of Operations				
	Herd Size (Number of Beef Cows)				
Reason	1-49	50-99	100-199	200+	All
Primary source of income	5.3	24.1	42.8	65.0	14.3
Supplemental source of income	78.0	68.3	50.9	31.7	71.9
Other	16.7	7.6	6.3	3.3	13.8

Source: USDA NASS APHIS, Beef 2007-08, NAHMS report.

An important characteristic of the U.S. beef cow-calf industry is that many participants are not motivated exclusively by profit from this enterprise …

… and it shows in their management practices.

Castration					
	Herd Size (Number of Beef Cows)				
	1-49	50-99	100-199	200+	All
Operations that castrated any bull calves before sale					
Percent of operations	50.3	75.0	85.1	95.3	59.2

Implanting Calves with a Growth Promotant Prior to or at Weaning					
	Percent of Operations				
	Herd Size (Number of Beef Cows)				
Implant Practice	1-49	50-99	100-199	200+	All
Any calves	7.0	19.9	27.3	31.1	11.9
Heifers intended for replacement	2.1	6.7	9.7	9.8	3.8
Other calves (nonreplacement)	6.7	19.7	25.2	30.8	11.4

Source: USDA APHIS, Beef 2007-08, Part I: Reference of the Beef Cow-calf Management Practices in the United States, 2007-08

Returns are more variable across producers than across time and largely driven by costs differences…

Table 1. Beef Cow-calf Enterprise Returns over Total Costs, 2007-2011 (minimum of three years)*

	All Farms	Profit Category: High 1/3 Head / $	Mid 1/3 Head / $	Low 1/3 Head / $	Difference between High 1/3 and Low 1/3: Absolute	%	
Number of Farms	91	30	31	30			
Labor allocated to livestock, %	37.6	49.9	31.0	32.0			
Number of Cows in Herd	145	191	151	92	98	107%	
Number of Calves Sold	131	173	137	83	90	109%	
Weight of Calves Sold	582	592	580	573	19	3%	
Calf Sales Price / Cwt	$110.82	$112.11	$109.25	$111.17	$0.94	1%	
Gross Income	**$585.86**	**$628.17**	**$594.00**	**$535.15**	**$93.02**	**17%**	
Feed	$383.62	$344.13	$382.81	$423.96	-$79.82	-19%	30.2%
Interest	$125.94	$106.16	$127.77	$143.85	-$37.69	-26%	14.2%
Vet Medicine / Drugs	$20.55	$17.11	$23.99	$20.45	-$3.34	-16%	1.3%
Livestock Marketing / Breeding	$14.84	$12.71	$14.05	$17.76	-$5.05	-28%	1.9%
Depreciation	$36.75	$26.73	$35.39	$48.18	-$21.45	-45%	8.1%
Machinery	$79.70	$58.47	$82.30	$98.25	-$39.77	-40%	15.0%
Labor	$120.90	$102.83	$99.82	$160.74	-$57.91	-36%	21.9%
Other	$37.66	$28.37	$36.62	$48.02	-$19.64	-41%	7.4%
Total Cost	**$819.96**	**$696.52**	**$802.74**	**$961.20**	**-$264.68**	**-28%**	
Net Return to Management	**-$234.10**	**-$68.35**	**-$208.73**	**-$426.05**	**$357.70**		

26%

74%

* Sorted by Net Return to Management (Returns over Total Costs) per Cow

Compared to $192 between top and bottom third years.

KS cow-calf profitability drivers…

- **Returns are more variable across producers at a point in time than they are on average over time**
  - ***even in "hard times" some producers are profitable;***
    - ***similarly, in "good times" some producers lose money…***

Figure A4. Profit versus Total Cost (correlation = -0.81)

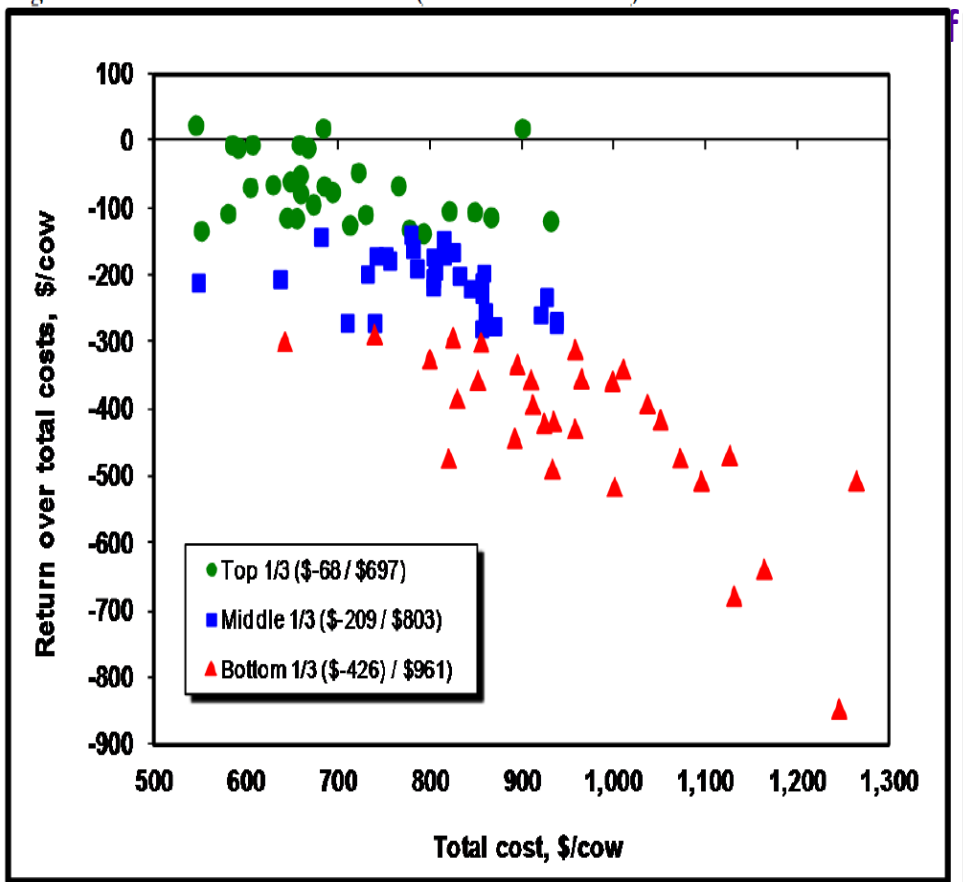
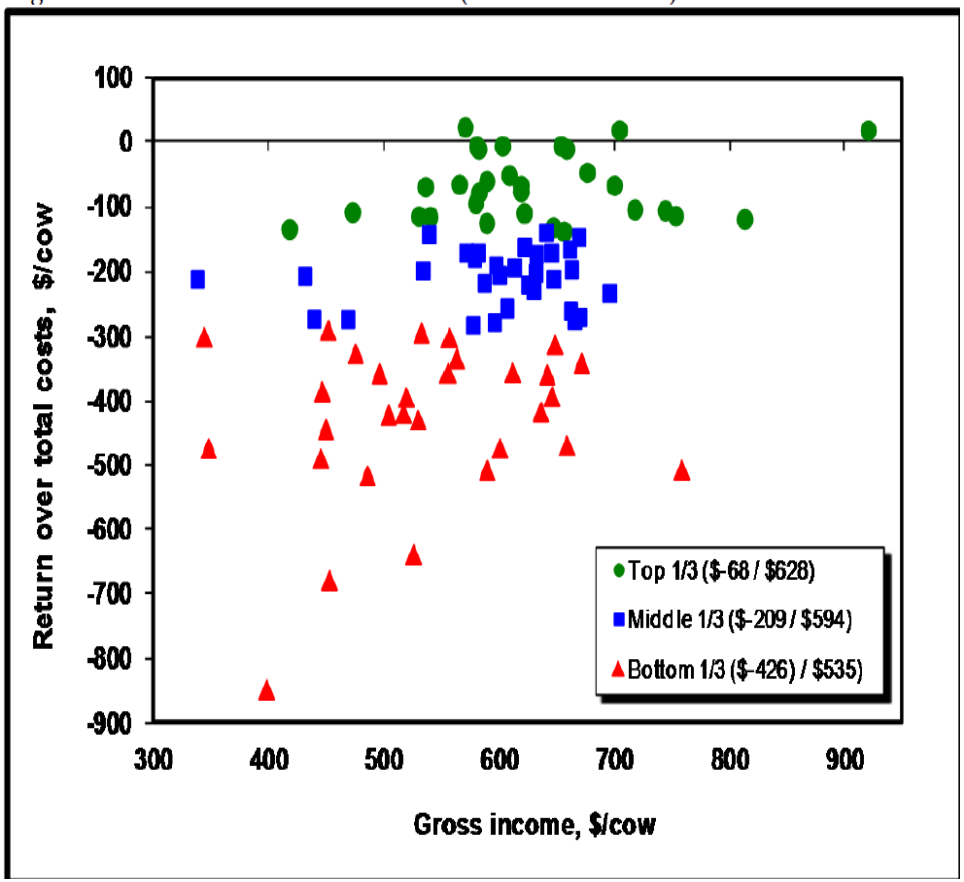


Figure A1. Profit versus Gross Income (correlation = 0.41)



USDA's longer-term projections (*as of Feb. 2012*) …

http://www.ers.usda.gov/media/273343/oce121_2_.pdf

- **U.S. beef cow inventory:**
  - **29.8 million in 2012**
  - **34.5 million in 2021 (+/- 1997 levels) / was 39.3 million in 1982**
    - **Beef Production (billion lbs) : 25.4 (1997), 26.2 (2011)**
      - ***More beef per cow will continue = less throughput in # head…***

- **Domestic per capita red meat & poultry consumption:**
  - **221 lbs in 04-07 (Beef=65.7 lbs; Pork=50.4 lbs; Poultry=103.8 lbs)**
  - **198 lbs in 2013 (Beef=51.3 lbs; Pork=46.3 lbs; Poultry=98.5 lbs)**
  - **213 lbs in 2021 (Beef=58.7 lbs; Pork=47.2 lbs; Poultry=105.8 lbs)**
    - ***These lower per capita volumes will be purchased with more consumer requests and hence requirements for industry-wide investment (& collaboration) in beef quality …***

USDA's longer-term projections (*as of Feb. 2012*) …

http://www.ers.usda.gov/media/273343/oce121_2_.pdf

- "Developing World" Changes
  - Increasing global $, pop., & per capita meat cons.
  - Africa & Middle East (4.4% GDP/yr)
    - Arguably the least understood growth market…
  - Latin America (4.2% GDP/yr)
    - Growing producer & consumer…
  - China (8.0% GDP/yr)
    - Canada has access but US does not …
  - South Korea (3.7% GDP/yr – but 10x per capita inc. of China)
    - US has access but Canada does not…

USDA's longer-term projections (*as of Feb. 2012*) …

http://www.ers.usda.gov/media/273343/oce121_2_.pdf

- **"Developed World" Changes**
  - **Declining global economic prevalence, populations, & per capita meat consumption**
  - **US/Canada (2.5% GDP/yr)**
    - **Different dependence on domestic consumption…**
  - **Japan (1.0% GDP/yr):**
    - **Major meat importer currently but will exporters care less going forward?**
  - **Europe (1.9% GDP/yr):**
    - **Will influential role as "food thought leader" persist?**

Who will produce beef in the future?
Identify COP Differences …

- An industry of +/- 750,000 operations is going to remain being very diverse…
- Differences within regions are significant
- Differences across regions are significant

Who will produce beef in the future?

Identify Fit with Broader Structural Changes…

- Increasing Variation Across Producers
- Role of "cattle cycle" is less pronounced today
- Excess Capacity: +(s.run) for cow-calf producers
- Moving, perhaps too slowly, away from "all beef is equal" systems…
  - Dropping % fed cattle sold via negotiated cash
  - Increasing role of premiums w/ eventual ties back to cow-calf producers…
    - *Make sure you aren't producing widgets nobody wants…*

U.S. Industry changes underway

- BEEF Magazine Poll (N=99 as of 8/17/11')
  - "If you had to liquidate cattle this year because of flooding or drought, what do you plan to do with the proceeds?
    - 47% Restock with cows when conditions improve
    - 9% Restock but change production models (e.g., buy stockers rather than cows)
    - 27% Keep the cash; leave the business
    - 6% Reinvest the cash in another non-livestock ag enterprise
    - 10% Don't know
- Cow-Calf Expansion points:
  - Sales value of cull cows is about = for all; costs are NOT = for all…
  - Firms with higher costs, opportunities to row crop, etc. increasingly exit
  - Expansion will not come from those with higher costs and notable alternative opportunities…
    - ***Will proportion of U.S. herd North & West of KS grow ???***

Bigger Picture
Other Discussion Points

- MCOOL
  - Aggregate economic loss is apparent…
- Animal ID & Traceability
  - U.S. is falling behind key competing meat producing countries…
- Animal Welfare
  - Active USDA project & "social concern" topic here to stay…
- Complex relationship & views on technology:
  - Feed 9 billion, "control" prices, and do so in an "acceptable" manner is story…
    - Think about LFTB, antibiotics, GM-feedstuffs labeling, etc. …
- *Issues vary in many facets BUT each raise uncertainty for industry stakeholders…*
  - *<u>Raises expected return/cow needed to trigger expansion…</u>*

Bottom-line Summary for Cow-Calf Producers

- "New normal" includes heightened uncertainty and volatility
  - Signals opportunity to many = expansion
  - Triggers discomfort to many = exit/status quo
    - within industry variations in views and comparative advantages will determine the ability to profit and shape future of industry…

- Industry is dynamic = "keep up or get out"
  - Export growth = reduced domestic per capita consumption, changing customer base …
  - Increasing demand for "higher quality" for consumers worldwide to justify higher costs of consumed protein…

What To Do?

- What is your comparative advantage?
  - Having a favorable cost structure is imperative…
  - Increase herd?, Change focus?; Exit?
  - *How does regionally varying expansion (cow herd) &/or excess capacity resolution (feedlot and/or packer) influence your business?*
- I encourage you to:
  - Recognize this "isn't your father's world" anymore and manage accordingly…
  - "Think globally, manage locally, and stay informed"

More information available at:

http://www.econ.iastate.edu/ifo/

http://www.extension.iastate.edu/agdm/

http://www.agmanager.info/

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