AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Eliciting Expert Opinion on Components of USDA Market Livestock Information

J. Ross Pruitt
Assistant Professor
Department of Agricultural Economics and Agribusiness
Louisiana State University Agricultural Center
rpruitt@agcenter.lsu.edu

Glynn T. Tonsor
Associate Professor
Department of Agricultural Economics
Kansas State University
gtt@agecon.ksu.edu

and

Kathleen R. Brooks
Assistant Professor
Department of Agricultural Economics
University of Nebraska
kbrooks4@unl.edu

Selected Paper prepared for presentation at the Agricultural & Applied Economics Association's 2014 Annual Meeting, Minneapolis, MN, July 27-29, 2014.

Copyright 2014 by J. Ross Pruitt, Glynn T. Tonsor, and Kathleen R. Brooks. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided this copyright notice appears in such copies.

Eliciting Expert Opinion on Components of USDA Market Livestock Information

J. Ross Pruitt, Glynn T. Tonsor, and Kathleen R. Brooks

Abstract: This paper explores the tradeoffs that agricultural economists accept for current levels of information contained in two U.S. Department of Agriculture livestock reports. Our analysis compares the components of a report to its value in improving understanding of market dynamics, expense, substitutability, and priority to be maintained. Results indicate the importance of maintaining information regarding the placement weights of cattle in feedlots as well as the inventory and weight information for market hogs.

Key Words: Public Information, Value of Information, Livestock, Forced-Rank Choices

The decision-making process of agricultural commodity market participants has been aided by the provision of agricultural production and marketing data collected by the U.S. Department of Agriculture (USDA) for well over a century. Recent reductions in federal funding for data collection and publication have impacted the availability of agricultural reports that results in additional uncertainty on the status of U.S. livestock production. While availability of funding was likely a major criterion in deciding what reports to continue publishing, this type of approach can overlook the public good nature of the data collected. An approach that looks solely at the financial impacts of a public good ignores the non-monetary value in which the data released by USDA helps to promote efficient agricultural markets.

While agricultural economists generally agree public provision of agricultural production and marketing data benefits society, the size of those benefits relative to the cost of generating the data is less clear (C-FARE, 2013). Few studies have attempted to estimate the returns to

society from the public provision of agricultural data, but Hayami and Peterson (1972) show substantial benefits from improved accuracy of agricultural reporting. Other researchers have looked at specific U.S. agricultural commodities including wheat by Bradford and Kelejian (1978) and fed cattle by Antonovitz and Roe (1986) who find significant returns to improved supply information and price forecasts, respectively. Previous research may show that additional government expenditures can result in increased benefits to U.S. society, but the recent past highlights the fact the dollars to fund improved agricultural data collection and publication are not always there.

Salin et al. (1998) find that market analysts value USDA reports for the statistics that are contained in the reports as well as their continuity. Although Salin et al. (1998) don't focus on a specific USDA report, it stands to reason that not all statistics in a given report are equally valued. Their results seemingly support this point depending on whether one is viewing a USDA report to stay informed or for market analysis purposes. Even then, while some statistics may not be viewed as important as others in a given report, a statistic may be needed to result in the report summing properly (i.e. other disappearance needed to calculate total cattle on feed in the monthly *Cattle on Feed* report).

Isengildina-Massa (2013) conducted a meta-analysis to determine which commodity futures markets are impacted by which USDA report. As with Salin et al. (1998), questions remain about what components of a given USDA report are valuable to the market. Pruitt et al. (forthcoming) find that there is heterogeneity among USDA information users. They find that for agribusiness professionals and market analysts, the monthly USDA *Cattle on Feed* and quarterly *Hogs and Pigs* reports were the most preferred among twelve included USDA reports.

We seek to expand the knowledge base on USDA market livestock reports by exploring the tradeoffs agricultural economists are willing to accept for different levels of information contained in USDA reports. Building on the findings of Pruitt et al. (forthcoming), our efforts focus specifically on the monthly *Cattle on Feed* and quarterly *Hogs and Pigs* reports released by USDA. We focus our efforts on understanding the importance of each component of a report in terms of expected expense, substitute sources of similar information, value in regards to improving understanding of the markets, and priority for USDA to maintain as a component of the report.

Methods

A forced-rank instrument was designed to better understand the tradeoffs that agricultural economists implicitly have when viewing the USDA National Agricultural Statistics Service's (NASS) monthly *Cattle on Feed* and quarterly *Hogs and Pigs* report. The instrument was created by analyzing each of these two reports and listing each identifiable component contained in the report. The various components are listed in Table 1 and may be viewed as the key pieces of information contained in the report. Each respondent was then asked four questions on each of the individual components: importance in improving understanding of current and future market dynamics, expense incurred by USDA in collecting the component, existence of substitute sources of similar (non-USDA information), and priority that USDA should place on maintaining each component in the report. Respondents rated each of the six components in the *Hogs and Pigs* report and three components in the *Cattle on Feed* report on each of the four aspects of interest: importance in understanding the marketplace, expense, substitute sources of similar information, and priority to maintain. Each ordinal ranking for a given question could only be selected once.

A follow-up question was then posed to respondents that asked them if they believed reducing the frequency of the USDA NASS report would result in additional market volatility for the sector the questionnaire focused on. Respondents who answered “yes” to this question were then asked to rank the components according to their individual contribution to the resulting market volatility. Those respondents who did not agree that a reduction in the *Cattle on Feed* or *Hogs and Pigs* report would result in additional market volatility did not see this follow-up question and moved to the next section of the questionnaire.

The components listed in Table 1 may be contrasted with the details of a specific report also listed in the table: weights, frequency of inclusion in reports, operational size in the *Hogs and Pigs* report, class information on the number of cows and bulls, steers, and heifers in the *Cattle on Feed* report, and state of operation. This distinction between the components and the details of the report is highlighted due to the details of a given report providing depth and breadth to the components of the report. Respondents were then asked to rank each of the report details according to the value placed on them by the respondent by each component. For instance, respondents who completed the *Hogs and Pigs* report were asked to rank the importance of each detail in its contribution to value seen in the breeding hog inventory information. It should be noted that not all details are included for each component contained in either USDA NASS report. We did not alter questions where a detail was not included as respondents would be allowed to rank that detail as least valuable.

Data

The website link to the *Hogs and Pigs* questionnaire was distributed electronically to the sample population. On the introductory page of this questionnaire, respondents were given the option to

switch to the *Cattle on Feed* questionnaire, if desired. After completing the questionnaire, respondents were given the option of completing the other questionnaire. The respondent pool was comprised of the Technical Advisory Committee of the Livestock Marketing Information Center and members of the Extension Section of the Agricultural and Applied Economics Association. Respondents received the initial request to complete the questionnaires in early October 2013 with the questionnaire available for completion for approximately a month. Two email reminders were sent to help increase the response rate. The questionnaire was sent to 252 email addresses resulting in a 7.9% response rate for the *Hogs and Pigs* questionnaire and 8.3% response rate for the *Cattle on Feed* questionnaire.

Summary statistics are provided in Table 2. Respondents to either survey were overwhelmingly male and possessing at least 25 years in agricultural-related positions. Over half of respondents held a university position with most of their time being devoted to Extension pursuits. Half of respondents in the *Hogs and Pigs* questionnaire focused on general agriculture or multiple commodities compared to approximately one-quarter of respondents in the *Cattle on Feed* questionnaire. Nearly sixty percent of respondents to the *Cattle on Feed* questionnaire focused on beef cattle.

Results

Hogs and Pigs Questionnaire Results

In the initial forced ranking questions on understanding the market, expense, substitutable sources of information, and priority to maintain the report, respondents consistently ranked the market hog inventory as their top choice. For those respondents who felt that market volatility would increase if the frequency of this report decreased, the majority felt the reduction in the

information on the market hog inventory would contribute the most to the resulting volatility. Inventory information on breeding hogs was seen most often rated the second highest, but the number of sows farrowed was seen as the second highest priority to maintain behind market hog information. Pigs per litter was most often ranked last among the initial four questions on understanding the market, substitutability, expense, and priority to maintain as well as contributing the least to additional volatility.

With the exception of the market hog inventory, frequency of inclusion in reports was the most valuable to respondents among the four details (weight, frequency of inclusion, operational size, and state of operation). For the market hog inventory, details regarding the weight categories had the most value to respondents. Operational size was frequently second in the questions on the value of details of the different components included in this USDA NASS report.

A limited sample size combined with a lack of variation in many of the collected variables prevents meaningful econometric insights from being gained. However, cross tabulations were generated to compare how respondents ranked the components of the report relative to the details of the report. These cross tabulations provide useful insights on respondents' intuition that econometric models might not detect given the small sample size.

Generally, a strong relationship was not found in the cross tabulations when comparing the details of breeding hog inventory relative to the aspects of understanding market dynamics, expense, substitutability, and priority to maintain this report. This could possibly be a reflection of the *Hogs and Pigs* report containing six components. The one exception is the comparison of how the breeding hog inventory improves market understanding relative to the value of

frequently including the breeding hog inventory in the report as shown in Table 3. In this case, forty percent of respondents that rated the value of the breeding hog inventory was in its frequency as highly important (i.e. a 3 or 4 rating) and the breeding hog inventory's ability to improve understanding of the hog market as highly important (i.e. a 5 or 6 rating).

Forty-five percent of respondents felt the value of the market hog weight information was highly important (i.e. a 3 or 4 rating) and the market hog inventory's high importance to improving understanding of current and future hog market dynamics (Table 4). Over half of respondents thought the market hog inventory was the most expensive part of the *Hogs and Pigs* report to collect combined with the highly important value of the market hog inventory. This was also true for the substitutability of market hog inventory information and the value of market hog inventory weight information. Not surprisingly, nearly half of respondents rated the market hog inventory as a high priority for USDA to maintain and felt the accompanying weight information was highly valuable (Table 5). This was also reflected in the fact that over half of respondents felt that the value of market hog weight information was highly valuable and the market hog inventory would be the source of the most volatility from an alteration in the publication frequency of the *Hogs and Pigs* report as shown in Table 6.

Cattle on Feed Questionnaire Results

For the initial forced ranking questions on understanding the market, expense, substitutable sources of information, and priority to maintain the report, total placements were ranked as the most important part of the USDA NASS *Cattle on Feed* report in three out of the four questions. The one exception was the existence of substitutable information where total marketings was the highest rated option. Although the questionnaire specifically asked for non-USDA sources, the

fact that marketings were believed to have the highest amount of substitutable sources of information is not surprising given private (i.e. non-USDA) estimates of the number of cattle marketed. Other disappearance was consistently rated the least important of the major components of the USDA NASS *Cattle on Feed* report.

Of the respondents who felt a reduction in publication of the *Cattle on Feed* report would contribute to additional market volatility, the majority of respondents felt the total number of placements would contribute the most to the resulting volatility. This should not be surprising given the respondents' prior perceptions regarding available substitute placement information that would fill the knowledge gap if USDA was forced to reduce the frequency of the *Cattle on Feed* report.

Frequency of inclusion in reports was the most important detail of the *Cattle on Feed* report for the total number of marketings and other disappearance. This is not surprising as this information, and particularly the total marketings estimate, serves as an important way to validate other publicly funded and available data from USDA. It also supports the findings Salin et al. (1998) on the importance of continuity of USDA reports. The fact that weight categories were the most important detail according to respondents for total number of placements is intuitive as this information provides an important insight into when placements will reach slaughter estimate that is needed to form price expectations for live cattle futures.

Cross tabulations were generated for the *Cattle on Feed* questionnaire. Over half of respondents who thought placements were highly important to understanding the market (i.e. rated a 3) felt that the value of placement weights was important (i.e. rated a 3 or 4) and is shown in Table 7. Similar response patterns were seen when respondents were asked about the expense

and priority associated with generating placement information compared to the value of placement weights. Furthermore, 18 of 22 respondents believed volatility would increase as a result of a reduction in the number of *Cattle on Feed* reports; as shown in Table 8, 15 of those respondents felt placement information would contribute the most to volatility and rated weight information as important (i.e. a 3 or 4 rating). Somewhat surprisingly, approximately half of respondents rated placements as important to understanding the market (Table 9), also rated the frequency of placement information as unimportant (i.e. a 1 or 2). Similar cases would happen with the expense and priority for placement information cross tabulation data.

Cross tabulations for aspects of placement and state of operation and class information (steers, heifers, and cows/bulls) were mixed with their findings compared to results discussed above. This partially reflects the fact these pieces of information may not be available (i.e. placement information is never provided for cattle classes, only total number on feed by category on a quarterly basis). It is possible the real value is in the weight placement information and not the state of operation where those placements occur. In the latter case, two-thirds of respondents felt placement information was the most important priority for USDA to maintain, but not important on a state level (i.e. a 1 or 2 rating). In fact, for many of the cross tabulations that include state of operation information, the majority of respondents did not see this information as important compared to the importance of weight placement information to understanding the market, its associated expense, substitutability or priority to maintain the report.

Cross tabulations for comparison of the marketing questions were more neutral than found with the placement questions. In one exception to this, two-thirds of respondents felt the marketing information was the most substitutable but not important on a state by state level. This could be a reflection that the number of marketings in a state does not always reflect the flow of

cattle as many feedlot cattle cross state boundaries to be slaughtered. In fact, information on where those animals are slaughtered might be more informative to Extension economists than simply where the cattle completed the feedlot phase of beef production.

In the cross tabulations for other disappearance, the majority of respondents felt this component contributed the least to the *Cattle on Feed* report in understanding the market, expense, substitutability, and priority to maintain. Respondents were largely split between the importance of differences in details contained in the report (weight information, frequency, state information, and class information).

Conclusions

The purpose of this study is to improve understanding of the tradeoffs that agricultural economists have for publicly financed livestock information. More information is preferred to less, but federal budget constraints exist that continue to cloud the future of publicly financed agricultural data. Our study furthers the understanding of tradeoffs that agricultural economists implicitly have about the USDA NASS *Hogs and Pigs* and *Cattle on Feed* reports. Although the study's conclusions are limited by a small sample size, there are still general conclusions that can be made as researchers continue to improve their understanding of the value of publicly financed agricultural data and information.

It is not surprising that in both the *Cattle on Feed* and *Hogs and Pigs* results, respondents favored information on feedlot placement and market hog inventory, respectively. As both reports provide information on the flow of animals to slaughter weight, additional details on the weight of animals at the time USDA NASS sends out the survey used to generate each report are highly valued by respondents to our survey. Information about the breeding hog inventory or

feedlot marketings were relatively less important than feedlot placement and market hog inventory information; however respondents still value this information for its frequency of inclusion in either USDA NASS report. This finding validates Salin et al. (1998) on the continuity of statistics being valued by market analysts.

State information was relatively more important in the *Hogs and Pigs* than the *Cattle on Feed* report. This may be a reflection of the Porcine Epidemic Diarrhea virus (PEDv) that was spreading through the country in fall 2013 when our survey was distributed. State information can be of great importance to market analysts trying to assess the spread of a disease that did not have reporting requirements when the survey was distributed. USDA is now requiring reporting of PEDv, but continuity of publicly provided agricultural data can be used to help understand diseases that do not have reporting requirements.

The small sample size that responded to our questionnaires is reflective of an increasingly smaller community that relies on agricultural data produced by USDA and other federal governmental agencies. Although the importance of the data at the heart of this research is understood, conveying that to policymakers is difficult when a small community is involved in daily or weekly analysis of the data. The call to improve the understanding of the value of this agricultural information is well-founded as it goes beyond a small set of individuals trumpeting its importance. Although a small number of individuals that routinely work with the data that was the focus of this research, it is these individuals that transform the data into information that the general U.S. populace understands and uses to make production or consumer purchasing decisions. Improved understanding of their needs will help lessen the impact should further reductions in agricultural data collection and dissemination occur.

References

Antonovitz, F., and T. Roe. 1986. "A Theoretical and Empirical Approach to the Value of Information in Risky Markets." *Review of Economics and Statistics* 68:105-114.

Bradford, D.F., and H.H. Kelejian. 1978. "The Value of Information for Crop Forecasting with Bayesian Speculators: Theory and Empirical Results." *Bell Journal of Economics* 9:123-144.

Council on Food, Agricultural and Resource Economics (C-FARE). 2013. Value of USDA Data Products, Washington DC.

Hayami, Y., and W. Peterson. 1972. "Social Returns to Public Information Services: Statistical Reporting of U.S. Farm Commodities." *American Economic Review* 62(1/2):119-30.

Isengildina-Massa, O. 2013. *Value of Information through the Effects of USDA Reports on Markets*. Invited presentation at the Seminar on Value of USDA Data Products held by the Council for Food, Agricultural, and Resource Economics, Washington, D.C., May 16, 2013.

Pruitt, J.R., G.T. Tonsor, K.R. Brooks, and R.J. Johnson. "End User Preferences for USDA Market Information." *Food Policy*. Forthcoming.

Salin, V., A.P. Thurow, K.R. Smith, and N. Elmer. 1998. "Exploring the Market for Agricultural Economics Information: Views of Private Sector Analysts." *Review of Agricultural Economics* 20(1):114-24.

Table 1. Components and Details Contained in the USDA NASS *Cattle on Feed* and *Hogs and Pigs Report*

	Cattle on Feed	*Hogs and Pigs*
Components of the Report	Total Number of Placements Total Number of Marketings Other Disappearance	Breeding Hog Inventory Market Hog Inventory Sows Farrowed Farrowing Intentions Pig Crop Pigs per Litter
Details of the Report	Weight Categories Frequency of Inclusion in Report Information by class (Steers, Heifers, Bulls/Cows) State of Operation	Weight Categories Frequency of Inclusion in Report Operational Size State of Operation

Table 2. Summary Statistics for *Hogs and Pigs* and *Cattle on Feed* Questionnaires

Variable	Mean	Standard Deviation	Minimum	Maximum
Hogs and Pigs Questionnaire				
Female	0.15	0.37	0.00	1.00
Age	52.47	10.66	30.00	66.00
Years in Current Position	18.10	12.81	1.00	40.00
Years in Agricultural-Related Positions	27.40	11.33	5.00	44.00
Frequency of USDA Data Use				
Daily	0.35	0.49	0.00	1.00
Weekly	0.30	0.47	0.00	1.00
Monthly	0.20	0.41	0.00	1.00
Semi-Annually	0.10	0.31	0.00	1.00
Annually	0.05	0.22	0.00	1.00
None of the Above	0.00	0.00	0.00	1.00
Nature of Job				
University	0.65	0.49	0.00	1.00
Industry	0.05	0.22	0.00	1.00
Trade/Commodity Association	0.05	0.22	0.00	1.00
Other	0.25	0.44	0.00	1.00
Commodity Focus				
Beef Cattle	0.15	0.37	0.00	1.00
Crop	0.15	0.37	0.00	1.00
Dairy Cattle	0.10	0.31	0.00	1.00
Hogs	0.10	0.31	0.00	1.00
Poultry	0.00	0.00	0.00	1.00
General Agriculture/Multiple Commodities	0.50	0.51	0.00	1.00
Food	0.00	0.00	0.00	1.00
Farm Inputs	0.00	0.00	0.00	1.00
Other	0.00	0.00	0.00	1.00
For University Faculty, Percent Time Allocated to:				
Teaching	20.77	22.44	0.00	75.00
Research	12.31	14.95	0.00	40.00
Extension	47.69	34.56	0.00	100.00
Administration	11.54	27.94	0.00	100.00
Additional Market Volatility if Reduced Report Frequency? (Yes = 1)	0.82	0.39	0.00	1.00

Table 2. Continued

Variable	Mean	Standard Deviation	Minimum	Maximum
Cattle on Feed Questionnaire				
Female	0.05	0.22	0.00	1.00
Age	47.06	12.82	27.00	67.00
Years in Current Position	12.19	11.51	2.00	42.00
Years in Agricultural-Related Positions	25.86	12.06	2.00	50.00
Frequency of USDA Data Use				
Daily	0.43	0.51	0.00	1.00
Weekly	0.43	0.51	0.00	1.00
Monthly	0.14	0.36	0.00	1.00
Semi-Annually	0.00	0.00	0.00	1.00
Annually	0.00	0.00	0.00	1.00
None of the Above	0.00	0.00	0.00	1.00
Nature of Job				
University	0.57	0.51	0.00	1.00
Industry	0.00	0.00	0.00	1.00
Trade/Commodity Association	0.10	0.30	0.00	1.00
Other	0.33	0.48	0.00	1.00
Commodity Focus				
Beef Cattle	0.57	0.51	0.00	1.00
Crop	0.05	0.22	0.00	1.00
Dairy Cattle	0.10	0.30	0.00	1.00
Hogs	0.05	0.22	0.00	1.00
Poultry	0.00	0.00	0.00	1.00
General Agriculture/Multiple Commodities	0.24	0.44	0.00	1.00
Food	0.00	0.00	0.00	1.00
Farm Inputs	0.00	0.00	0.00	1.00
Other	0.00	0.00	0.00	1.00
For University Faculty, Percent Time Allocated to:				
Teaching	1.67	3.26	0.00	10.00
Research	7.17	8.31	0.00	25.00
Extension	75.75	33.97	0.00	100.00
Administration	15.42	29.65	0.00	80.00
Additional Market Volatility if Reduced Report Frequency? (Yes = 1)	0.82	0.39	0.00	1.00

Table 3. Cross Tabulation for Breeding Hog Inventory of Understanding Market Dynamics and Frequency of Inclusion

		Breeding Hog Inventory Frequency of Inclusion Value			
		1 (Least Value)	2	3	4 (Most Value)
Breeding Hog Inventory Understanding Market Dynamics	1 (Least important)	1	0	0	0
	2	0	0	1	1
	3	0	0	0	1
	4	0	2	0	3
	5	0	1	1	4
	6 (Most important)	1	1	2	1

Table 4. Cross Tabulation for Market Hog Inventory for Understanding Market Dynamics and Market Hog Weights

		Market Hog Inventory Weight Information			
		1 (Least Value)	2	3	4 (Most Value)
Market Hog Inventory Understanding Market Dynamics	1 (Least important)	0	0	1	1
	2	0	0	0	2
	3	0	0	2	1
	4	0	0	0	2
	5	0	1	1	2
	6 (Most important)	0	1	2	4

Table 5. Cross Tabulation for Market Hog Inventory of Priority of Maintaining the Inventory and Market Hog Weights

		Market Hog Inventory Weight Information			
		1 (Least Value)	2	3	4 (Most Value)
Market Hog Inventory Priority	1 (Least Priority)	0	0	1	1
	2	0	0	0	1
	3	0	0	1	3
	4	0	1	1	1
	5	0	0	1	1
	6 (Highest Priority)	0	1	2	5

Table 6. Cross Tabulation of Volatility in the Market Hog Inventory and Hog Weights

		Market Hog Inventory Weight Information			
		1 (Least Value)	2	3	4 (Most Value)
Market Hog Inventory Volatility	1 (Least Priority)	0	0	1	0
	2	0	0	0	1
	3	0	0	0	1
	4	0	1	0	1
	5	0	0	0	2
	6 (Highest Priority)	0	1	4	5

Table 7. Cross Tabulation of Cattle Placement Understanding and Value of Cattle Placement Weight

		Value of Placement Weights			
		1 (Least value)	2	3	4 (Most value)
Placement Understanding	1 (Least Important)	0	0	0	0
	2	1	0	2	3
	3 (Most important)	0	2	6	7

Table 8. Cross Tabulation of Volatility from Reduced Placement Information and Cattle Placement Weight

		Value of Placement Weights			
		1 (Least value)	2	3	4 (Most value)
Placement Volatility	1 (Least Volatility)	0	0	0	0
	2	0	0	2	1
	3 (Most Volatility)	1	2	4	11

Table 9. Cross Tabulation of Cattle Placement Understanding and Frequency of Information

		Value of Placement Weights			
		1 (Least value)	2	3	4 (Most value)
Placement Understanding	1 (Least Important)	0	0	0	0
	2	1	2	1	2
	3 (Most important)	5	5	1	4