

Preferences for Livestock Revenue Insurance Among Beef Producers

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Personal interviews were conducted with 52 Louisiana cow-calf producers to determine their preferences for a livestock revenue insurance (LRI) product. Conjoint analysis was utilized to determine the importance of selected attributes of insurance policies for these producers. Two-limit tobit models were estimated. Producers were segmented using cluster analysis based upon preferences for LRI product attributes. A multinomial logit model was used to determine differences between characteristics of producers in each cluster. Producers generally preferred higher-premium, zero-deductible products; 180-day policy length; the state price series; and an in-person method of marketing. Cluster analysis yielded three groups of preferences.

Key Words: cluster analysis, conjoint analysis, livestock revenue insurance

Livestock revenue protection (LRP) was established via the Agricultural Risk Protection Act of 2000 as a means of strengthening the safety net for U.S. livestock producers. It was recognized that current insurance programs should be expanded to cover economically important enterprises which had not been previously included. Pilot programs for livestock revenue insurance were to cover cattle, sheep, swine, goats, and poultry. This paper reports on a study designed to evaluate cow-calf producers' preferences for LRP products.

The goal of LRP is to develop user-friendly products that reduce livestock producers' exposure to price risk. An LRP pilot program for Iowa swine producers was launched in 2002, and pilot programs for beef cattle were approved for 2003. These pilot programs evaluate the use of futures and options contracts in developing insurance to provide livestock producers with protection from the financial risks of price fluctuations inherent in livestock production and marketing. The Federal Crop Insurance Corporation is responsible for conducting the program. It has the authority to provide reinsurance for insurance policies and to subsidize the purchase of futures and options contracts for insurance policies offered under the pilot programs.

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One reason livestock producers have historically been excluded from federal insurance programs is the difference in the risk associated with livestock versus crop production. Crop producers commonly face catastrophic risks resulting from natural disasters such as drought, flooding, and hail. While adverse weather conditions can influence livestock production by creating poor range conditions or high grain costs, production risk is lower for livestock as animals are more adaptable to weather variations. Consequently, risk management strategies that focus on price risk rather than production risk have been deemed to be more important for livestock producers. It is noted, however, that recent work has been done on the development of insurance products designed to deal with catastrophic risks, such as disease (Koontz et al., 2006).

Cash forward pricing and futures and options contracts have been the primary tools available for managing livestock price risk. Although these tools are widely available, they are not used extensively by cattle producers. A study by the USDA's Animal and Plant Health Inspection Service (1998) found that forward pricing strategies were used by only about 1.5% of U.S. beef cattle operations. Video auction, a cash forward pricing strategy through which animals are videotaped and offered for sale at remote locations, is used by a limited number of producers, but it requires uniformity among calves and substantial coordination to be done successfully. Gillespie, Basarir, and Schupp (2004) reported that approximately 3% of Louisiana cattle producers used video auctions. Using futures and options requires extensive knowledge of commodity markets, and many producers are uncomfortable with the strategy.

Study Objectives and Product Description

Objectives

In order for LRP to be successful, insurance providers must know the policy attributes of importance to various types of livestock producers. This research identifies the relevant attributes of LRP and provides insights into the most effective product design for Southeastern U.S. cow-calf producers. The overall goal of the study is to identify segments of cow-calf producers who prefer livestock revenue insurance products with similar characteristics. The specific objectives are: (a) to determine beef cattle producers' preferences among insurance products, and (b) to segment producers and identify significant differences in the characteristics of beef cattle producers who prefer certain levels of a given product attribute.

Determining preferences for various attributes and segmenting producers accordingly provides insight to policy makers and private insurers for the development of new insurance products. Conjoint analysis, a survey-based approach that decomposes actual or hypothetical products into individual attributes and asks respondents for an overall evaluation of the products, is used in the analysis. Conjoint analysis has been used in a number of similar studies examining new or hypothetical products in recent years (e.g., Boyle et al., 2001; Gillespie et al., 1998; Harrison, Gillespie,

and Fields, 2005; Harrison, Özayan, and Meyers, 1998; Harrison, Springer, and Prinyawiwatkul, 2002; Holland and Wessells, 1998; Miquel, Ryan, and McIntosh, 2000; Reddy and Bush, 1998).

The Product

The insurance product evaluated in this study sets a price guarantee based upon beef cattle futures prices. Producers are able to guarantee a price at or below a quoted futures price at a given point in time. To purchase insurance, producers pay a premium which is calculated based upon the deductible or coverage level the producer prefers (the larger the deductible, the lower the premium). The deductible is subtracted from the quoted futures price to establish the guaranteed price for the producer. For example, if a futures price of \$90/cwt is quoted and a producer selects a \$5/cwt deductible, the producer will guarantee a price of \$85/cwt. The producer pays the premium associated with a \$5/cwt deductible.

The indemnity payment under the policy is based on the USDA Market News average price for that class of livestock at the end of the policy term. Producers retain the right to sell the livestock at any time during the coverage period, and indemnity payments will be made independent of the price at which the livestock were sold (Bossman, 1999).

The Conceptual Model

The Lancasterian framework is used as the basis for modeling producer preferences in this study. This framework suggests that goods are not the direct object of utility; rather, it is the characteristics of the goods from which utility is derived (Lancaster, 1971). Let \mathbf{X} represent a composite good (insurance product) with n attributes, where $\mathbf{X}' = (x_{1j}, \dots, x_{nj})$ and x_{kj} represents the k th attribute level of the j th product profile. The utility function for the j th multiattribute product can be written as follows:

$$(1) \quad U_j = U[\mathbf{X}(x_{1j}, \dots, x_{nj})],$$

where U_j represents the utility received from product j . The utility function is analyzed over the n attributes, where there are a total of j alternative products. The consumer assigns a measure of utility for each of the j alternative products (Greene, 2000).

A separate part-worth relationship is often assumed to analyze the contribution of attributes to utility. This model assumes preferential independence (Keeney and Raiffa, 1993); i.e., preference is an additive function of the utility values for a product's attribute levels. The econometric specification of the additive model is expressed as:

$$(2) \quad U_{ij} = \sum_k \beta_k x_{kj} e_{ij}$$

In this model, U_{ij} represents the utility the i th individual derives from the j th alternative, \mathbf{X}_j is a vector of variables representing values for each of the attributes of the j th product, $\boldsymbol{\beta}^*$ is a vector of unknown parameters (part-worth estimates), and e_{ij} is the random disturbance. The random disturbance may reflect unobserved attributes of the alternative, random choice behavior, or measurement error.

Data and Methods

Survey

A questionnaire was developed to gather information about producers' farm characteristics, risk attitude, risk management and record keeping practices, demographics, and preference for revenue insurance products. Fifty-two Louisiana cattle producers were selected and surveyed via personal interview, mostly on their farms, but with a few in their local parish extension offices. The selected group of producers had herd sizes of 50 or more cows (the likely target audience for livestock revenue insurance dealing with cow-calf production). Producers were identified with the help of extension agents in 15 Louisiana parishes. Agents were asked to identify representative producers in four herd size categories: 50–99, 100–199, 200–499, and 500+ animals. The surveys were conducted in the winter of 2002.

Conjoint Analysis

Conjoint analysis is used to examine the importance of product attributes for an individual or group. For the conjoint analysis used in this study, four attributes with three levels each were defined. Selection of the attributes and their levels was done by interviewing potential insurance providers and through discussion with a focus group of cattle producers. Selected attributes and their levels were the following:

- Premium|deductible (\$/cwt) levels were \$2.24|\$0.00, \$1.25|\$5.00, and \$0.50|\$10.00, represented as *PRE224*, *PRE125*, and *PRE50*, respectively.
- Policy length levels were 90 days, 180 days, and 360 days, represented as *PL90*, *PL180*, and *PL360*, respectively.
- Price series levels were state, regional, and national, represented as *PSST*, *PSRG*, and *PSNT*, respectively.
- Method of marketing levels were in-person, telephone, and internet, represented as *MMIP*, *MMTP*, and *MMIT*, respectively.

The premium|deductible levels were identified via discussion with USDA Risk Management Agency personnel. These levels were estimates of those that would likely be offered. A policy length of 90 days would guarantee price in the relative

short run, a length of 180 days would guarantee price from the point of the calf's birth until roughly the date at which it would be sold at approximately 500 pounds, and a policy length of 360 days would allow the producer to essentially lock in a calf price several months after the dam conceived.

Price series was the price to be averaged upon expiration of the contract to determine whether an indemnity payment would be made and, if so, its amount. For example, if the state price series were used, the insurance company would take the average price in that state over a specified number of days and compare it to the futures price. Since Louisiana prices are generally lower than Southeastern regional prices, which are in turn generally lower than national prices, it was expected that Louisiana producers would prefer a state price series first, regional second, and national third. Finally, the method of marketing stipulated how the insurance company would interact with the producer to set up insurance contracts. A different cost to the insurance company is associated with each method, so insurance companies would have an interest in this information.

A fractional factorial design yielded nine products to be evaluated by each respondent. Two additional products were included to increase degrees of freedom for individual models and to test for internal validity. Respondents were asked to rate (not rank) each product from 0 (least preferred) to 10 (most preferred).

Individual conjoint analyses using two-limit tobit models were performed for each producer so producers could be segmented based on their part-worth utility estimates for product attributes. The two-limit tobit model follows, as in Maddala (1983, p. 161):

$$(3) \quad y_i^* = \beta x_i + u_i,$$

where $y_i^* = 0$ if $y_i \neq 0$, $y_i^* = y_i^*$ if $0 < y_i^* < 10$, and $y_i^* = 10$ if $y_i^* > 10$. In this case, y is the latent variable for rating, x represents the attribute level, and β denotes the parameters to be estimated. The range is 0 to 10 because this was the range of the ratings.

Since individual-level models were required, two-limit tobit rather than ordered probit models were used. While an ordered probit model would have been more appealing theoretically, sufficient degrees of freedom were not available to run ordered probits as individual models. Harrison, Gillespie, and Fields (2005) showed that part-worth results of the two models did not differ significantly at the 5% level for any of three data sets tested; thus the two-limit tobit model was an acceptable alternative under such conditions.

Cluster analysis was used to group respondents into three mutually exclusive groups based on preference similarities (results of the individual two-limit tobit models). The general objective of cluster analysis is to maximize the homogeneity of the objects within a group (cluster) while also maximizing the heterogeneity between the clusters. Knowledge of the heterogeneity among producers would assist in understanding factors that influence a producer's insurance product purchase decision. Cluster analysis does not estimate the variate empirically, but instead uses

the variate specified by the researcher to define clusters. The similarity between each pair of observations is measured according to the Euclidean distance between the pairs.

Ward's method, an agglomerative procedure designed to optimize the minimum variance within clusters, was used to identify clusters (Aldenderfer and Blashfield, 1984). The most commonly used criterion for determining the number of clusters to use is examining a measure of similarity or distance between clusters at each successive step. Either a similarity value can be specified or the difference in values between successive steps can be used as a criterion. With the inclusion of a total of 52 observations, the number of clusters defined was expected to be relatively small.

An aggregate two-limit tobit model was run for each cluster to examine the preference structure for each. Models for each cluster were estimated in the same manner as the aggregate model for all respondents. Part-worth estimates and relative importance of attributes were evaluated to determine differences in preference exhibited by producers in each cluster.

Factors Influencing Producer Preferences

To determine the types of producers most likely to prefer various insurance products, multinomial logit analysis was conducted, with the cluster in which the producer is categorized serving as the dependent variable. The multinomial logit is modeled as in Greene (2000, p. 859):

$$(4) \quad \Pr(Y_i = j) = \frac{e^{\beta_j x_i}}{\sum_{k=0}^j e^{\beta_k x_i}}, \quad j = 0, 1, 2.$$

Thus, the probability that producer i is categorized into cluster j is a function of his or her personal or financial attributes x , and β represents the parameters to be estimated. Marginal effects for continuous variables are calculated as discussed in Greene (2000, pp. 815–816), and for discrete variables as in Greene (2000, p. 817).

Independent variables included in the model are as follows. *Herd Size* is measured as the total number of beef animals on the farm. *Age* is the producer's age in years. *Video Auction* is a dummy variable indicating that the producer sells cattle via video auction. *Select Sales* is a dummy variable indicating that the producer sells cattle via select sales, or via private treaty. *Risk Averse* is a dummy variable based upon the following question: "Relative to other investors, how would you characterize yourself?" Potential response choices were: (1) "I tend to take on substantial risks in my investment decisions," (2) "I neither seek nor avoid risk in my investment decisions," and (3) "I tend to avoid risk when possible in my investment decisions." *Risk Averse* producers indicated response [3]. This question was utilized in a recent survey conducted by Fausti and Gillespie (2006).

Bachelor's Degree indicates the producer holds a college bachelor's degree. *Check Futures Price Weekly* indicates the producer checks beef futures prices on at

least a weekly basis. *Debt-Asset Ratio # 20%* indicates the producer holds low debt relative to assets (# 20%). *Risk Strategies \$ 4* indicates that the producer uses at least four of the following risk management strategies in his or her operation: cash and forward contracts, marketing cooperative participation, crop yield insurance, crop revenue insurance, enterprise diversification, contract production, or futures and options.

Results

Producers were presented with the statement, "Overall, I feel that livestock revenue protection will be beneficial to beef cattle producers." They were asked to respond on a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree. Thirty-five percent and 54% strongly agreed and agreed, respectively, with the statement. None strongly disagreed. These results suggest that producers generally see benefits in LRP.

The aggregate tobit model for all 52 producers indicated that producers preferred an insurance product with a premium|deductible of \$2.24|\$0.00/cwt, a policy length of 180 days, use of the state price series, and in-person method of marketing (tables 1 and 2). As reported in table 2, the most important attribute was price series (50.1%), followed by premium|deductible (23.2%), method of marketing (13.7%), and finally policy length (13.1%).

The cluster analysis separated producers into three market segments. With 13 producers in cluster 1 and 10 products, there were 130 observations for the two-limit tobit model. Part-worth estimates for *PRE125*, *PRE50*, *PL90*, *PL180*, *PSST*, *PSNT*, and *MMIT* were significant at the 1% level, and the part-worth for *MMTP* was significant at the 10% level (table 1). Respondents indicated a strong preference for a premium|deductible combination of \$1.25|\$5.00/cwt. These results differ from findings in the overall model, where the \$2.24|\$0.00/cwt was the most preferred level, suggesting that producers in cluster 1 were less concerned about a full price guarantee. The premium|deductible attribute constituted only 21.8% of the relative importance among the four attributes, and the 180-day policy was the most preferred (table 2).

Price series was the most important attribute for cluster 1 producers, constituting 34.0% of the relative importance of attributes (table 2). As with all clusters, the state price series was strongly preferred by cluster 1 producers. The national price series had a strong negative effect on utility. Method of marketing was the least important of the four attributes for these producers. This was the only cluster that preferred to purchase via telephone.

Producers who used select sales, did not use video auction, did not check futures prices weekly, and who used at least four other risk management strategies were the most likely to fall into cluster 1 (tables 3 and 4). Furthermore, producers who were risk averse, had larger herd sizes, and were college educated were more likely to fall into this cluster than cluster 2. Overall, these results suggest that those who are

Table 1. Two-Limit Tobit Part-Worth Estimates

Variable	Cluster 1 (N = 13)	Cluster 2 (N = 17)	Cluster 3 (N = 22)	Overall Model (N = 52)
Constant	4.9973***	5.6478***	4.9091***	5.1681***
Premium Deductible Levels:				
<i>PRE224</i>	! 0.3436	1.4092***	0.7519***	0.6956***
<i>PRE125</i>	1.1090***	! 0.1429	0.1633	0.2863**
<i>PRE50</i>	! 0.7037***	! 1.2663***	! 0.9152***	! 0.9820***
Policy Length Levels:				
<i>PL90</i>	! 1.2265***	0.3391	! 0.0429	! 0.1816
<i>PL180</i>	1.3025***	0.3369	0.3025*	0.5671***
<i>PL360</i>	! 0.1140	! 0.6760***	! 0.2596	! 0.3855***
Price Series Levels:				
<i>PSST</i>	1.3559***	0.8026***	2.7884***	1.8020***
<i>PSRG</i>	0.2225	0.0978	! 0.1313	0.2638
<i>PSNT</i>	! 1.4729***	! 0.9004***	! 2.6570***	! 1.8283***
Method of Marketing Levels:				
<i>MMIP</i>	0.2148	0.3545	0.5659***	0.4136***
<i>MMTP</i>	0.4643*	0.2013	! 0.0578	0.1649
<i>MMIT</i>	! 0.6781***	! 0.5558**	! 0.5081***	! 0.5785***
σ	1.9995***	2.0393***	1.7104***	2.1577***
Log Likelihood	! 263.7424	! 344.9693	! 388.6409	! 1,079.852

Note: Single, double, and triple asterisks (*) denote statistical significance at the 10%, 5%, and 1% levels, respectively.

already managing risk via other means are more likely to choose a product with a lower premium and higher deductible than other producers. Moreover, their lesser desire to pay more for full protection which is based upon a futures price estimate may be due to their lower level of experience with futures markets.

Seventeen producers were grouped in cluster 2. Part-worth estimates for *PRE224*, *PRE50*, *PL360*, *PSST*, and *PSNT* were significant at the 1% level, while *MMIT* was significant at the 5% level (table 1). Cluster 2 respondents indicated a strong preference for the premium|deductible level of \$2.24|\$0.00 (table 2). The premium|deductible was the most important attribute for this cluster (with a relative importance of 42.4%), and it was of greater importance to this cluster than for the other two clusters. Producers in cluster 2 were practically indifferent between the 90-day and 180-day policy lengths, preferring these lengths to the 360-day length. Price series was relatively less important for this cluster than it was for the other clusters, though this cluster also preferred the state price series. The most-favored method of marketing was in-person.

Producers who had smaller herd sizes, did not use select sales, were not risk averse, who did not hold a bachelor's degree, or did not utilize four or more other risk management strategies were more likely to fall into cluster 2. Furthermore,

Table 2. Relative Importance of Attributes, Most and Least Favored Attributes, and Means of Independent Variables, Clusters 1–3

Description	Cluster 1 (N = 13)	Cluster 2 (N = 17)	Cluster 3 (N = 22)	Entire Sample (N = 52)
----- Relative Importance of Attributes (%) -----				
Premium Deductible	21.8	42.4	19.1	23.2
Policy Length	30.4	16.1	6.4	13.1
Price Series	34.0	27.0	62.2	50.1
Method of Marketing	13.7	14.4	12.3	13.7
----- Most (Least) Favored Attribute Levels -----				
Premium Deductible (\$/cwt)	1.25 5.00 (0.50 10.00)	2.24 0.00 (0.50 10.00)	2.24 0.00 (0.50 10.00)	2.24 0.00 (0.50 10.00)
Policy Length	180 days (90 days)	90 days (360 days)	180 days (360 days)	180 days
Price Series	state (national)	state (national)	state (national)	state (national)
Method of Marketing	telephone (internet)	in-person (internet)	in-person (internet)	in-person (internet)
----- Means of Independent Variables -----				
<i>Herd Size</i> (no. of animals)	263.46	251.35	546.91	379.42
<i>Age</i> (years)	57.69	53.94	51.55	53.87
<i>Video Auction</i>	0.08	0.47	0.50	0.39
<i>Select Sales</i>	0.46	0.06	0.23	0.23
<i>Risk Averse</i>	0.77	0.35	0.59	0.57
<i>Bachelor's Degree</i>	0.46	0.29	0.55	0.44
<i>Check Futures Price Weekly</i>	0.23	0.77	0.68	0.60
<i>Debt-Asset Ratio # 20%</i>	0.77	0.59	0.77	0.71
<i>Risk Strategies \$ 4</i>	0.15	0.06	0.18	0.13

producers who utilized video auctions or checked futures prices weekly were more likely to fall into this cluster than cluster 1 (table 3). Overall, these results suggest that smaller, less educated producers who did not utilize other risk management strategies were most concerned about the premium|deductible and the least concerned about the price series, relative to the other clusters.

There were 22 producers in cluster 3. Part-worth estimates for *PRE224*, *PRE50*, *PSST*, *PSNT*, *MMIP*, and *MMIT* were significant at the 1% level, and *PL180* was significant at the 10% level (table 1). These producers had strong preferences for the premium|deductible level of \$2.24|\$0.00 (table 2). They preferred the 180-day policy length, but considered this attribute to be much less important than the other attributes, and relatively less important than it was for the other clusters. These producers were most concerned with the price series, understanding that Louisiana prices are substantially lower than national prices. Method of marketing was of roughly equal importance to these producers as compared to the other clusters; cluster 3 preferred in-person marketing.

Table 3. Multinomial Logit Results

Variable	Cluster 2 vs. 1	Cluster 3 vs. 1	Cluster 3 vs. 2
Constant	11.66836** (5.35236)	4.76051 (4.46185)	! 6.90784* (4.18577)
<i>Herd Size</i>	! 0.00464* (0.00262)	! 0.00014 (0.00114)	0.00450* (0.00247)
<i>Age</i>	! 0.10776 (0.07607)	! 0.08316 (0.06276)	0.02459 (0.05534)
<i>Video Auction</i>	3.26286* (1.91000)	3.62215** (1.64674)	0.35929 (1.09444)
<i>Select Sales</i>	! 6.89938*** (2.61817)	! 3.25086 (2.03281)	3.64852* (1.94544)
<i>Risk Averse</i>	! 5.68952** (2.31468)	! 1.78992 (1.84827)	3.89959** (1.59338)
<i>Bachelor's Degree</i>	! 4.61699** (1.92042)	! 1.25711 (1.46889)	3.35988** (1.50755)
<i>Check Futures Price Weekly</i>	3.44965** (1.53200)	2.87775** (1.31233)	! 0.57190 (1.09930)
<i>Debt-Asset Ratio # 20%</i>	1.08279 (1.76489)	2.20662 (1.56334)	1.12383 (1.14051)
<i>Risk Strategies \$ 4</i>	! 5.14607** (2.32601)	! 3.16282* (1.79232)	1.19832 (1.62992)
Pseudo $R^2 = 0.46$			
Correctly Predicted: 69.23%			

Notes: Single, double, and triple asterisks (*) denote statistical significance at the 10%, 5%, and 1% levels, respectively. Values in parentheses are standard errors.

Producers who ran larger herds and were risk averse were more likely to fall into cluster 3. Those who used video auction or checked futures prices weekly were more likely to fall into this cluster than cluster 1. Those who used select sales or held bachelor's degrees were more likely to fall into this cluster than cluster 2 (table 3). Overall, these results indicate that the larger, more educated producers who use alternative marketing methods were most concerned with the price series used to calculate payments.

Conclusions and Discussion

Cow-calf producers had generally positive reactions to livestock revenue protection products, and could not be classified as being in great disagreement as to the important attributes of an LRP product. Producers were generally most concerned about the price series, a reasonable concern given the lower prices typically received by Louisiana producers. If the indemnity were calculated based on the average Louisiana price, the producer would generally receive a higher indemnity payment than with a regional or national price. This preference would be unique to Louisiana

Table 4. Marginal Effects of Multinomial Logit Results

Variable	Cluster 1	Cluster 2	Cluster 3
<i>Herd Size</i>	0.00008 (0.00009)	! 0.00063* (0.00033)	0.00056* (0.00031)
<i>Age</i>	0.00681 (0.00537)	! 0.00463 (0.00774)	! 0.00218 (0.00903)
<i>Video Auction</i>	! 0.25635** (0.12433)	0.00069 (0.13884)	0.25566 (0.17157)
<i>Select Sales</i>	0.54343* (0.30022)	! 0.32622*** (0.12594)	! 0.21721 (0.32470)
<i>Risk Averse</i>	0.18043 (0.14334)	! 0.62463*** (0.18387)	0.44419* (0.23479)
<i>Bachelor's Degree</i>	0.14967 (0.14088)	! 0.45602*** (0.17655)	0.30635 (0.23226)
<i>Check Futures Price Weekly</i>	! 0.32559* (0.17506)	0.12581 (0.11530)	0.19979 (0.20095)
<i>Debt-Asset Ratio # 20%</i>	! 0.21757 (0.21905)	! 0.11167 (0.17969)	0.32924 (0.22039)
<i>Risk Strategies \$ 4</i>	0.57351* (0.30183)	! 0.20069* (0.10770)	! 0.37282 (0.30796)

Notes: Single, double, and triple asterisks (*) denote statistical significance at the 10%, 5%, and 1% levels, respectively. Values in parentheses are standard errors.

and surrounding state producers, however, as those in regions with relatively high cattle prices would likely prefer the national price series.

Most producers preferred the highest premium with no deductible, a rational choice given the subsidization of livestock insurance by the federal government. The policy length and method of marketing attributes were of roughly equal importance, with most preferring a 180-day policy length and an in-person method of marketing. The 180-day policy length allows producers to insure upon birth of the calf. It is likely that the preference for in-person method of marketing could change over time, as internet use is rapidly becoming more widespread among producers. Another factor that could impact preference is familiarity; as producers become more familiar with livestock insurance products, they may become more comfortable with internet purchasing.

Though there was not great disagreement as to the important attributes and their levels, several clusters, or groups within the cow-calf segment, were identified. Preferences generally differed according to demographics and information availability. The larger and more highly educated producers were generally less concerned about premium/deductible levels, concentrating more heavily on policy length and/or the price series. Those who were already using numerous risk management strategies were less interested in a higher premium with no deductible, even though these were the producers who were characterized as the most risk averse. Use of alternative markets such as select sales or video auction produced mixed results.

Since the completion of this research, livestock revenue protection insurance has been offered to feeder cattle producers in 19 states, not including Louisiana. Provisions of the insurance and purchase information may be found at the USDA-Risk Management Agency website. The product is offered for 10 different period options, ranging from 13 to 52 weeks (approximately 90 to 360 days), and the price series is reported by the Chicago Mercantile Exchange as a feeder cattle index, adjusted by animal type. Although the set of products analyzed here is generally similar to the currently offered policies, some of the specifics of the two sets differ.

While this paper provides insights into cow-calf producer preferences, the authors acknowledge that a similar study of greater scope—more regions and a broader cross-section of producers—should be conducted. The products would be expected to evolve somewhat during their early introduction, so there is likely to be much room for further research. The preferences found in this study would generally represent those of the better managed Southeastern producers (with the exception that price series would perhaps be of less importance to the higher-priced areas of the region); however, preferences in other regions may differ significantly.

References

- Aldenderfer, M., and R. Blashfield. (1984). *Cluster Analysis*. Sage University paper series on quantitative applications in social sciences. Newbury Park, CA: Sage Publications.
- Bosman, D. (1999). "The Federal Crop Insurance Program: The need for livestock revenue protection." American Feed Industry Association, statement to the House Subcommittee on Risk Management and Specialty Crops, House Committee on Agriculture, Washington, DC.
- Boyle, K., T. Holmes, M. Teisl, and B. Roe. (2001). "A comparison of conjoint analysis response formats." *American Journal of Agricultural Economics* 83, 441–454.
- Fausti, S., and J. Gillespie. (2006). "Measuring risk attitude of agricultural producers using a mail survey: How consistent are the methods?" *Australian Journal of Agricultural and Resource Economics* 50, 171–188.
- Gillespie, J., A. Basarir, and A. Schupp. (2004, Fall). "Beef producer choice in cattle marketing." *Journal of Agribusiness* 22(2), 149–161.
- Gillespie, J., G. Taylor, A. Schupp, and F. Wirth. (1998). "Opinions of professional buyers toward a new, alternative red meat: Ostrich." *Agribusiness: An International Journal* 14, 247–256.
- Greene, W. (2000). *Econometric Analysis*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Harrison, R., J. Gillespie, and D. Fields. (2005, October). "Analysis of cardinal and ordinal assumptions in conjoint analysis." *Agricultural and Resource Economics Review* 34(2), 238–252.
- Harrison, R. W., A. Özayan, and S. P. Meyers. (1998, December). "A conjoint analysis of new food products processed from underutilized small crawfish." *Journal of Agricultural and Applied Economics* 30(2), 257–265.

- Harrison, R. W., T. Springer, and W. Prinyawiwatkul. (2002, October). "An analysis of consumer preferences for value-added seafood products derived from crawfish." *Agricultural and Resource Economics Review* 31(2), 157–170.
- Holland, D., and C. Wessells. (1998, April). "Predicting consumer preferences for fresh salmon: The influence of safety inspection and production method attributes." *Agricultural and Resource Economics Review* 27(1), 1–14.
- Keeney, R. L., and H. Raiffa. (1993). *Decisions with Multiple Objectives: Preferences and Value Tradeoffs*. New York: Cambridge University Press.
- Koontz, S. R., D. L. Hoag, D. D. Thilmany, J. W. Green, and J. L. Grannis, eds. (2006). *The Economics of Livestock Disease Insurance*. Cambridge: CABI Publishing.
- Lancaster, K. (1971). *Consumer Demand: A New Approach*. New York: Columbia University Press.
- Maddala, G. S. (1983). *Limited-Dependent and Qualitative Variables in Econometrics*. New York: Cambridge University Press.
- Miquel, F., M. Ryan, and E. McIntosh. (2000). "Applying conjoint analysis in economic evaluation: An application to menorrhagia." *Applied Economics* 32, 823–833.
- Reddy, V., and R. Bush. (1998). "Measuring softwood lumber value: A conjoint analysis approach." *Forest Science* 44, 145–157.
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service. (1998). "Marketing practices in beef cow-calf operations." Online. Available at <http://www.aphis.usda.gov/vs/ceah/cahm>. [Posted 2002.]