WILLINGNESS TO PARTICIPATE IN A BEEF CATTLE
MARKETING COOPERATIVE

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Introduction

Changes in the U.S. cattle industry in recent years have many producers looking for marketing alternatives to the traditional sale barn. One alternative that is often touted for producers with small to medium size herds is pooling or cooperative marketing of feeder cattle. This alternative holds particular promise for three main reasons. First, access to public auction markets has shrunk in recent years. For instance, in Mississippi since 1997, the number of auction markets for beef cattle has declined from about 34 to 17 (USDA, GIPSA). Secondly, producers perceive that larger groups of high-quality calves bring higher prices (Little, et al.). Finally, with an average cow-herd of about 24 cows (NASS a, b), most Southeastern producers cannot participate in the purported increased profits retained ownership offers (Cattle-Fax, Sleigh et al., Watt et al.)[2] through either the stocker or finishing phase.

The objective of this paper then is to examine beef cattle producer willingness to participate in a marketing cooperative and to determine how much capital producers are willing to invest on a per head marketed basis. After these determinations have been reached, a cursory feasibility analysis is conducted to assess the likelihood of success of the proposed cooperative.

Cooperative Marketing of Beef Cattle in the Southeast

The idea of cooperative marketing is not a new concept in the cattle industry. Producers in various regions of the country have been pooling their cattle for a number of years. Some examples of cooperative marketing ventures by stocker/feeder cattle producers in the South include five video board sales in Alabama, three video auction markets in Georgia, the Tri-

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[2] While retained ownership has been shown to increase profits it has also been shown to increase the variability of profits.

County Cattlemen's Association in South Carolina, at least three in Tennessee, and the Buckingham Cattlemen's Association Beef Marketing Alliance in Virginia.

Many of the group marketing efforts are group video board sales that are organized along geographical lines. In Alabama and Georgia the organized efforts are feeder cattle association video board sales (Prevatt). In most of these associations the Vac45 preconditioning program or one very similar is required or strongly recommended. Typically a minimum lot size of about 25 is specified but producers are able to pool their calves in order to meet the requirement. Producers are required to describe the cattle in terms of genetics, frame size and muscle score, and health program. Each association has only one sale per year, typically in late summer (late August-early September)

One notable exception to the regional feeder calf sales is the Red Carpet Cattlemen's Association (RCCA) in north Georgia. In the RCCA, producers consign any number of cattle and market them via video board sale. Producers are not required to perform any specific management practices although many do to receive higher prices.

In South Carolina, the Tri-County Cattlemen's Association has been cooperatively marketing stocker and feeder cattle since the mid-1970s. The alliance requires producers to follow a controlled winter calving season, follow herd health recommendations, and breed females to genetically superior bulls. This allows the alliance to sell calves in large; uniform lots (Thomson). Producers are required to follow the Southeast Pride health management program. After the calves are certified for this program, producers can consign them for a video auction. The calves are graded before being sold. Any calves that do not "fit" with other calves are ineligible to sell in the video sale.

In Tennessee there are numerous organized efforts that market groups of feeder cattle using video board sales including the Lower Middle Tennessee Cattlemen's Association (LMTCA), The Giles County Beef Alliance, the Smoky Mountain Feeder Calf Sale and Tennessee Farmer's Cooperative (TFC) Beef Advantage. Perhaps the most prominent is of these organizations is the LMTCA which has a video auction every month except for February and July. Although there is no prescribed program, consignors for LMTCA sales must offer a minimum of 20 head. In the Giles County Beef Alliance (GCBA) producers agree to a strict management protocol very similar to the Vac45 program. Additionally, producers agree to use bulls that meet set EPD criteria for birth weight, growth, and carcass traits.

The Smoky Mountain Feeder Calf Association in Tennessee also markets load lots of feeder calves via video-auction. Again, in this organization there is no set protocol, however the September sale is reserved for calves the meet the criteria for the Southeastern Pride Plus program. Finally, the Beef Advantage program sponsored by TFC requires that producers precondition their calves using TFC feeds. In addition to this requirement, it is stipulated that the second vaccination for respiratory disease be with a modified live vaccine (MLV).

In Virginia, cattlemen in the Buckingham Cattlemen's Association Beef Marketing Alliance, offer cattle for sale that are certified through the Virginia Quality Assured Feeder Cattle program. Vaccinations include IBR, BVD, PI_3, 7-way clostridial, pasturella, and H. Somnus. After health certification, state graders estimate weights and grades on the calves (Myers). After the calves are sold via tele-auction they are delivered to a central location where they are sorted, weighed, and loaded on trucks.

The Effect of Quality and Lot Size on Stocker Cattle Prices

The reason that producers are interested in pooling cattle is because of the perceived benefits from marketing large groups of high quality calves. This perception is well-founded as numerous studies have found that lot size and calf quality can have a positive effect on prices (KSU, McLemore et al., OSU, and Turner et al.). In the KSU study, sales information from 1993 indicated price premiums for steers increased steadily for number of head in a pen up to about 42 head where the premium was almost $12/cwt. more than lots of individual calves. McLemore et al. found that in weekly Tennessee auctions in 1993-1994, premiums for lot size increased through all lot sizes evaluated. Lots with 10, 20, 50, and 70 head generated premiums if 2.69, 3.50, 4.57, and 4.96 percent respectively when compared to lots with only one calf. In Oklahoma, lots with more than 10 head generated premiums of more than $7/cwt. when compared to lots with single calves.

In addition to lot size, producers can usually receive a higher price from performing certain value-added practices such as preconditioning. In the studies mentioned above studies have found that lot size and calf quality can have a positive effect on prices (KSU, McLemore et al., OSU, and Turner et al.), there were significant premiums for calves that were healthy when compared to sick or stale calves. Also, all of the group marketing organizations previously discussed, particularly the ones requiring a preconditioning program, report consistently receiving $2-$7/cwt. premiums over local auction markets from the same time period.

Even though there are numerous group marketing efforts, the overall number and percentage of cattle marketed through these organizations is relatively small. Also, as was previously mentioned, most of these organizations are more multi-county efforts as opposed to state or regional. Thus the purpose of this paper is to determine if producers are willing to

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cooperatively market feeder cattle as part of a state or regional organization, and if so, how much would they be willing to pay to form such a cooperative?

Procedures

The data used in the analysis of this problem came from the Mississippi Beef Cattle Production and Marketing Survey. This survey was mailed to 1,355 Mississippi cattle producers in June 1999. The purpose of this instrument was to gain information regarding a producer's current production, health management, and marketing practices. It was also designed to gauge producers' attitudes regarding possible changes in their operation. Specifically, the Mississippi Beef Cattle Production and Marketing Survey sought information concerning producers' attitudes about alternative production and marketing practices. Producers were asked if and how much they would be willing to invest in new market development through a livestock marketing cooperative. The survey was also designed to gather demographic information about producers. A total of 529 of the 1,355 producers returned usable questionnaires.

Model Estimation

The payment card method was used to elicit responses regarding producer WTP. The estimated WTP was based on producer response to the two-part question, "Would you be willing to invest in new market development through a livestock marketing cooperative? Yes or No"; with the follow-up, "If yes please indicate how much: up to $5 per head sold, up to $10 per head sold, or up to $25 per head sold." The responses to this question were viewed as the one-time amount producers would pay for new market development. This cost did not include consignment fees or other marketing fees associated with selling beef cattle. Producers who responded that they were not willing to invest in new market development were assumed to have a zero dollars per head willingness to invest.

Willingness to invest in a cooperative can be analyzed within a contingent valuation (CV) framework. In CV analysis a project such as a dam, wetlands, or some other public good is proposed. Taxpayers are then surveyed to determine if they desire such a project and if so, how much additional tax (τ_j) they would be willing to pay for the project to be completed. Certain protocols are followed to minimize response bias and strategic behavior. In this study, the cooperative is considered the proposed "project", cattle producers the "taxpayers", and the amount producers are willing to invest the "tax" (τ_j) they are willing to pay.

The underlying economic premise to CV analysis is the marginal utility principle. That is, consumers will not pay more for a good than the marginal utility derived from its consumption. By extending this concept to the cooperative problem, it can be reasoned that beef producers will not pay any more to participate in a cooperative than the expected marginal benefit.

In theory, consumers are willing to pay some amount between (-∞, ∞). However, since positive prices are assumed, the practical interval is [0, ∞).

Empirical Estimation

Because all producers in this study were given the same discrete choices, the values over the interval [τ_j, ∞) are censored. That is, a producer might be willing to invest $7 per head but not $10, therefore the response is censored at $5. Additionally, the highest value the respondents could select was $25, which was thought to be the highest value that anyone would pay. Thus, there are no observations greater than $25 per head.

The empirical model used is a modification of the technique developed by Cameron for estimating WTP from discrete choice models. Following Cameron's work, it can be shown that for each individual $i(i=1,...n)$ confronted with tariff τ_j and by their yes/no response, it can be

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concluded that the true value of the respondents true unobserved latent variable, y_i, is either greater than or less than τ_j. For the censored normal regression model, it is assumed that:

$$y_i = \mathbf{x_i'}\boldsymbol{\beta} + u_i$$
$$\text{with } u_i \sim N(o, \sigma^2)$$

(1)

where $\mathbf{x_i}$ and $\boldsymbol{\beta}$ are, respectively, vectors of explanatory variables and model parameters, and u_i is the error term.

The bid value τ_j can be modeled with the observed response I_i as:

$$I_i = 1, \text{if } y_i > \tau_j$$
$$\quad = 0, \text{otherwise}$$

(2)

so that

$$\begin{aligned} \Pr(I_i = 1) &= \Pr(y_i > \tau_j) \\ &= \Pr(u_i > \tau_j - \mathbf{x_i'}\boldsymbol{\beta}) \\ &= \Pr(u_i / \sigma > (\tau_j - \mathbf{x_i'}\boldsymbol{\beta})/\sigma) \\ &= 1 - \Phi((\tau_j - \mathbf{x_i'}\boldsymbol{\beta})/\sigma) \end{aligned}$$

(3)

where Φ is the cumulative normal distribution and σ is the standard deviation.

WTP estimation was performed using a censored probit model with values censored at threshold levels. Because the data were censored, the interval specified depended on the producer's response to the two-part question regarding investment. It was assumed that if a producer indicated a WTP of up to \$10.00 per head, he would also be willing to pay between \$6.00 and \$10.00 per head. Empirically, this model is similar to that used by Hite, Hudson, and Intarapapong.

Because the responses are censored, the only probabilities that can be modeled are: the probability of a Yes vote in terms of willingness to invest in the proposed cooperative as Pr (WTP$\geq\tau_j$) or 1- Pr (WTP$<\tau_j$).

The model, as estimated was specified as:

$$CL, CH = \beta_0 + \boldsymbol{\beta}'\mathbf{x_i} + u_i \qquad\qquad (4)$$

Where:

CL is the lower bound of the censoring interval

CH is upper bound of the censoring interval

β_0 is the intercept term

$\mathbf{x_i}$ is a vector of explanatory variables

$\boldsymbol{\beta}$ is a vector of model parameters

u_i is the error term.

Variables used to explain producer's willingness pay included variables that addressed producer's current production and health management practices, current marketing practices, demographics, and attitudes regarding alternative production and marketing practices. An explanation of these variables is included in Table 1.

Results and Discussion

Descriptive Statistics

About 32 percent (159) of the respondents indicated that they were willing to invest in new market development through a livestock marketing cooperative. The remaining 345 producers (68.5 percent) responded no to the question. The numbers of responses for no and for the discrete amounts that producers were willing to pay are shown in Figure 1. The means and standard deviations of the variables estimated in the model are presented in Table 2

Producers indicated that a large majority (77 percent) raise at least some their own replacement heifers (HFR_RSD). Twenty-two percent of producers indicated that they purchase heifers through regular auction markets (HFR_SLB). Only a very small percentage of producers (five percent) purchase heifers from purebred producers (HFR_PB).

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Producers indicated that on average, about 46 percent of their calf crop was born in the spring (SPRCLV). Some producers revealed that none of their calves were born in the spring while others reported that all of their calves were born in the spring. Producers stated that a very small percentage of their calves were born in the summer (SUMRCLV). Respondents further indicated that almost the same percentage of calves, about 18 and 19 percent, respectively, were born in fall and winter (FALLCLV and WNTRCLV). Often the difference in spring and fall calving is associated with geographical location and the resulting available forage. Typically producers in South Mississippi with a bermuda or bahia grass base will calf in the fall while producers in North Mississippi who rely on fescue and bermuda grass will calve in the spring.

Having a live, healthy calf to market is essential to the viability of any cattle operation. However, only a very small percentage of producers (18 and 21 percent) indicated that they perform the two key management practices to insure this occurs, pregnancy checking (PREG) and having breeding soundness exams (BSE) performed on herd bulls.

Bailey et al. found that calves sold through auctions do not bring as much as calves marketed using video board sales. In this survey, 67 percent of the producers indicated that they sell their cattle through a regular auction (AUCT_REG). This suggests that most Mississippi beef cattle producers do not receive the highest possible price for their calves.

Forty-two percent of producers indicated that they were employed full-time off the farm (OFF_FULL). Additionally, respondents reported that 47.9 percent of their household income comes from off-farm sources (PCNT_OFF). These two variables seem to verify the contention that most beef cattle producers are part-time farmers. Thirty-one percent of the respondents had attended beef cattle short courses or seminars (SEMINAR).

When asked about their willingness to perform specific production or marketing practices, producers in general, seem to be somewhat receptive to certain practices. Producers seem much more inclined to adopt alternative production practices than marketing practices. Overwhelmingly, producers would be willing to either restrict the length of their calving season (CH_RST) (76 percent) or change the timing of their calving season (CH_CLV) (73 percent), if they thought it would be more profitable. Also, a majority of producers, 53, 57, and 53 percent, respectively, indicated they would be willing to permanently identify all cows and calves (CH_ID), implement a specific pre-weaning health management program (CH_HLTH), and vaccinate and pre-condition calves for 30-60 days past weaning (CH_VACC). Close to a majority (48 percent) specified that they would be willing to change the breed of bull they use (CH_BULL).

When considering alternative marketing practices, producers were more willing to either pool cattle (CH_POOL) or accept prices negotiated by the cooperative (CH_PRICE), 37 and 41 percent. Only about one-third of the respondents indicated they would be willing to either cash forward contract (CH_CASH) or retain ownership through the stocker or finisher phase. Part of this dichotomy could be explained by the fact that most producers feel more knowledgeable about production than marketing and thus are less willing to try a venture they think more risky. A graphical representation of the responses regarding attitudes about alternative production and marketing practice is given in Figure 2.

Model Estimation

Parameter estimates for the estimated model are given in Table 3. The natural log of the likelihood function was −848.190. A model that included only the intercept term was also estimated. Its log of the likelihood function was −1,051.960. A likelihood ratio test was

performed and found to be significant at alpha-level .01, suggesting that the model as estimated does have explanatory power in estimating producers' willingness to pay.

Almost half of the variables are significant at .10 or less. Three more are marginally significant at .15 or less. The lack of statistical significance of the intercept term indicates that the explanatory variables included in the model do an adequate job of predicting the WTP of producers. As expected, the number of heifers bought through an auction market (HFR_SLB) has a negative impact on producer WTP. This is because breeding animals bought through sale barns on regular auction day have very little information available regarding their genetic composition or potential productivity. Typically, less progressive producers purchase replacement heifers through sale barns. Analysis of this coefficient indicates that for each percentage increase in replacement heifers purchased through a regular auction market, WTP decreases by 65 cents per head.

The percentage of calves born in the spring (SPRCLV) had a positive, albeit smaller, effect on producer WTP. Spring is the recommended time of year to calve unless one lives in South Mississippi; therefore, it could be argued that producers who do a better job of managing their cow herd might be more interested in production and marketing alternatives. When current production and marketing practices are examined, the data suggest that producers who regularly perform BSEs would be willing to pay almost 83 cents per head more than those producers who do not perform BSEs.

The only two significant demographic explanatory variables were whether producers had attended beef cattle short courses and seminars (SEMINAR), and the number of years producers had in the beef cattle business (YEARS). The signs on these variables were as expected in that

producers who attended the educational events would be willing to pay more and more experienced producers would be willing to pay less.

Producers who indicated they had attended educational events were willing to pay 55 cents per head more than producers who had not attended these events. This response suggests that educational efforts on herd quality and marketing have some impact on producers marketing perceptions. Conversely, the number of years a person had been raising beef cattle had a negative impact on the amount of money one was willing to invest in new market development (2 cents per head). This finding is consistent with the perception that older producers or producers with more beef cattle experience are less likely to be willing to participate than younger or less-experienced producers.

Regarding alternative production and marketing practices, willingness to change calving season (CH_CLV), permanently identify all cows and calves (CH_ID), implement a post-weaning vaccination program (CH_VACC), pool calves with other producers (CH_POOL), and accept prices negotiated by the cooperative (CH_PRICE) had positive effects on the willingness to pay. Producers' willingness to implement a pre-weaning health program (CH_HLTH) had a negative impact on producer's WTP. The largest overall effect was the positive impact (95 cents) from producers who would be willing to accept prices negotiated by the cooperative (CH_PRICE). It was hypothesized that responses to all of the alternative production and marketing practices would be positively related to willingness to pay. Therefore, the reason for the negative sign for CH_HLTH is surprising and not intuitively obvious. The issue of multicollinearity was considered but analysis of the eignevalues of the correlation matrix did not indicate the presence of collinear variables.

Producers who were willing to permanently identify their animals (CH_ID) were willing to pay 89 cents per head more than those respondents who were not willing to do so. Additionally, producers who indicated they were willing to change their calving season (CH_CLV) were amenable to investing 69 cents per head more than producers who were opposed to changing their calving season.

One of the advantages of using a model such as the one estimated is that the parameter estimates can be used as the marginal contributions to overall willingness to pay. Thus, by multiplying the parameter estimates from the econometric model by the appropriate variable for each case and then calculating the mean yields an average WTP of 1.66 dollars per head marketed (6).

$$\text{Mean WTP} = \frac{\sum_{j=1}^{n}\left(\beta_0 + \sum_{i=1}^{m}\chi_i\beta_i\right)}{n} \tag{6}$$

where m is the number of variables and n is the number of observations. A chart depicting various calculated WTPs is shown in Figure 3.

Demand Implications for a New Beef Cattle Marketing Cooperative

Gehrke and Matson reviewed several studies that analyzed factors that contribute to the success or failure of cooperatives. They reported that new cooperatives generally fail for four reasons: insufficient capitalization by producers, lack of producer commitment, inadequate marketing operations, and inadequate management. Therefore, it is critical to determine if the estimated willingness to pay will generate sufficient capital to make the cooperative sustainable.

Any business requires two types of capital to function: equity or investment capital and operating capital. For analysis purposes, it was assumed that the WTP was a one time expense in

addition to the sales commission. The number of cows owned by producers who indicated a

willingness to pay at least $1.66 amounted to about 56 percent (27,281) of the cows in the

survey. According to the January 1, 2000 Mississippi beef cow inventory, there were 579,000

(NASS, b) cows in Mississippi. Applying the percentage of producers willing to invest in the

cooperative and the mean WTP to the Mississippi beef cow inventory and adjusting for calving

percentage and replacement heifers yields about $356,500 of initial equity with which to start the

cooperative.

Average operating revenues were calculated by charging a commission for each head of

cattle estimated to be sold through the cooperative. Most cattle marketing groups sell cattle using

video board sales. The consignment fees for most of these video board sales range from $7.50-

$9.50 (Rawls, 2001). Assuming calves in the proposed cooperative are marketed using a video

board sale, and assuming the consignment fees of $8 go to the cooperative, approximately $1.7

million[3] per year could be generated.

Initially, it appears that the $356,500 equity capital plus the $1.7 million operating capital

could be sufficient for the cooperative to be financially feasible if the stated assumptions hold.

However, several critical issues must be addressed. First, this analysis assumes that the

percentage of cattle represented by the calculated WTP of $1.66 is indicative of the percentage of

the Mississippi beef cattle that would be marketed through the cooperative. This implies that

approximately 215,000 calves would be marketed annually through the cooperative. It is highly

doubtful that many producers would participate during the first few years until "they see how

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[3] Calculated as 56 percent of 579,000 head with a 92 percent calf crop; and accounting for replacements, marketing

72 percent of the calf crop; with an eight dollar per head consignment fee. Assumptions based on MSU cow-calf

budgets.

things go". Also, organizing and marketing 215,000 calves from across the state poses several logistic difficulties.

Secondly, this analysis makes no assumption regarding shipping costs to get the calves to delivery points. Virtually all of the feeder cattle marketing organizations previously mentioned are organized into geographic areas so as to minimize shipping costs. However, this problem could be solved rather easily with establishment of delivery or shipping points throughout the state.

Thirdly, it is likely that much of the $8 per head commission will go to pay the auction company. However, it is quite possible that state or federal funds could be available for additional operating funds in the beginning years.

In reality, the actual number of cattle is likely to be considerably less than the calculated 215,000 head. This will result in reduced equity and operating revenues. Furthermore, much of the impetus behind proposing this cooperative has been to provide producers a vehicle to market groups of high quality homogeneous calves. However as Lacy demonstrated, many producers are resistant to making many of the necessary changes. Therefore, it must be concluded that based on this cursory financial analysis, there is little hope for the proposed cooperative to succeed.

Summary and Conclusions

The objective of this chapter was to estimate demand for a beef cattle marketing cooperative in Mississippi and determine the amount producers were willing to pay to form such a cooperative. Analysis was conducted by using a censored probit model to estimate willingness to pay. On average, producers were willing to invest $1.66 per head marketed.

Factors that had the largest positive impact on WTP were producers who were willing to permanently identify all of their cows and calves and producers who were willing to accept prices negotiated by the cooperative. Negative factors included producer willingness to implement a pre-weaning health management program and the percentage of replacement heifers purchased through regular auctions.

Producer willingness to permanently identify all cows and calves may be indicative of a higher level of management and/or desire to improve their cow herd. Conversely, the percentage of replacement heifers purchased through regular auctions could reflect a lack of management expertise or a lack of interest in improving their cow herd. It can be reasoned then that producers who have a strong interest in improving the genetics and quality of their herd are willing to invest capital to ensure they have a marketing outlet that will reward them for producing a superior product.

Applying the estimated WTP to the January 1, 2000 beef cow inventory provides about $357,000 initial equity capital and approximately $1.7 annual operating capital. However, once factors outside the model are considered, it appears that the cooperative would have limited success.

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Table 1

Description of Variables Used in Analysis and Other Variables of Interest

Variable	Definition
Current Production and Marketing Practices	
TOTBRD	Total breeding animals (cows, replacement heifers, and bulls)
HFR_RSD	Percentage of raised replacement heifers
HFR_SLB	Percentage of replacement heifers purchased through an auction market on a regular sale day
HFR_PB	Percentage of replacement heifers purchased from a purebred breeder
SPRCLV	Percentage of calves born in the spring
SUMRCLV	Percentage of calves born in the summer
FALLCLV	Percentage of calves born in the fall
WNTRCLV	Percentage of calves born in the winter
VET	Producer consults with a veterinarian according to recommendations (=1 if yes, 0 otherwise)
PREG	Producer pregnancy checks cows according to recommendations (=1 if yes, 0 otherwise)
BSE	Producer has BSE performed according to recommendations (=1 if yes, 0 otherwise)
AUCT_REG	Producer regularly sells through an auction on a regular sale day (=1 if yes, 0 otherwise)
Demographic Variables	
U_FULL	Producer is employed off-farm full-time (=1 if yes, 0 otherwise)
GRSFRM	Percentage of gross farm income generated by the cattle enterprise
SEMINAR	Producer has participated in a beef cattle short course or seminar (=1 if yes, 0 otherwise)
OFF_FRM	Percentage of household income from off-farm sources
YEARS	Years producer has been raising beef cattle

Table 1 continued

Variable	Definition
Attitudes about alternative production and marketing practices	
CH_RST	Producer willing to restrict length of calving season if he thought it would increase profits (=1 if yes, 0 otherwise)
CH_CLV	Producer willing to change calving season if he thought it would increase profits (=1 if yes, 0 otherwise)
Would you be willing to adopt (if necessary) these practices to participate in a livestock marketing cooperative to possibly get price premiums for producing high quality, uniform cattle?	
CH_ID	Individually identify all cows and calves (=1 if yes, 0 otherwise)
CH_BULL	Change breed of bulls (=1 if yes, 0 otherwise)
CH_HLTH	Follow a specific pre-weaning health program (=1 if yes, 0 otherwise)
CH_VACC	Vaccinate and pre-condition for 30 to 60 days past weaning (=1 if yes, 0 otherwise)
CH_POOL	Co-mingle or pool calves with those of other producers (=1 if yes, 0 otherwise)
CH_CASH	Use cash forward contracts (=1 if yes, 0 otherwise)
CH_RETN	Retain ownership through stocker/feedlot (=1 if yes, 0 otherwise)
CH_PRICE	Accept prices negotiated by the cooperative (=1 if yes, 0 otherwise)
RETAIN2	Producer willing to adopt all alternative production and marketing practices with the exception of PRE_YOU and PRE_OTH (=1 if yes, 0 otherwise)
CH_PROD	Producer willing to adopt all alternative **production** practices with the exception of PRE_YOU and PRE_OTH (=1 if yes, 0 otherwise)
CH_MKT	Producer willing to adopt all alternative marketing practices with the exception of PRE_YOU and PRE_OTH (=1 if yes, 0 otherwise)

Table 2

Descriptive Statistics for Variables Associated With Producers' Willingness to Pay to Participate in a Marketing Cooperative

Variable	Mean	Std Dev	Minimum	Maximum
TOTBRD	115.87	163.81	0	2385.00
HFR_RSD	0.774	0.419	0.000	1.000
HFR_SLB	0.222	0.416	0.000	1.000
HFR_PB	0.056	0.229	0.000	1.000
SPR_CLV	46.341	33.373	0.000	100.000
SUMR_CLV	6.744	11.924	0.000	90.000
FALL_CLV	17.685	24.499	0.000	100.000
WNTR_CLV	18.694	28.968	0.000	100.000
VET	0.361	0.481	0.000	1.000
PREG	0.179	0.383	0.000	1.000
BSE	0.212	0.409	0.000	1.000
AUCT_REG	0.671	0.470	0.000	1.000
U_FULL	0.417	0.493	0.000	1.000
GRSFRM	70.716	35.663	1.000	100.000
SEMINAR	0.312	0.464	0.000	1.000
OFF_FRM	47.855	40.464	0.000	100.000
YEARS	29.694	15.060	1.000	80.000
CH_RST	0.758	0.429	0.000	1.000
CH_CLV	0.732	0.443	0.000	1.000
CH_ID	0.532	0.499	0.000	1.000
CH_BULL	0.484	0.500	0.000	1.000
CH_HLTH	0.571	0.495	0.000	1.000
CH_VACC	0.530	0.500	0.000	1.000
CH_POOL	0.365	0.482	0.000	1.000
CH_CASH	0.300	0.459	0.000	1.000
CH_RET	0.312	0.464	0.000	1.000
CH_PRICE	0.411	0.492	0.000	1.000

Table 3

Parameter Estimates For The Willingness To Pay Model

Variable	Parameter Estimate	Standard Error	P-value
Intercept	-0.054	0.593	0.928
TOTBRD	-0.001	0.001	.2393
HFR_RSD	0.042	0.316	0.894
HFR_SLB	-0.663**	0.301	0.028
HFR_PB	0.334	0.539	0.534
SPR_CLV	0.006*	0.004	0.091
SUMR_CLV	-0.002	0.010	0.804
FALL_CLV	0.001	0.005	0.803
CASTRATE	-0.259	0.272	0.342
VET	-0.418§	0.270	0.121
PREG	0.477	0.372	0.199
BSE	0.834*	0.347	0.016
AUCT_REG	0.315	0.261	0.226
U_FULL	-0.127	0.287	0.659
GRSFRM	-0.000	0.003	0.888
SEMINAR	0.545**	0.275	0.048
OFF_FRM	0.005§	0.004	0.123
YEARS	-0.024***	0.008	0.003
CH_RST	-0.098	0.376	0.794
CH_CLV	0.692**	0.349	0.047
CH_ID	0.892***	0.342	0.009
CH_BULL	0.087	0.289	0.778
CH_HLTH	-0.889**	0.418	0.034
CH_VACC	0.638*	0.354	0.072
CH_POOL	0.669*	0.349	0.054
CH_CASH	0.387	0.355	0.276
CH_RET	0.519§	0.336	0.122
CH_PRICE	0.951***	0.343	0.006

§denotes marginal significance at .15, *denotes significance at the .10 level, **denotes significance at the .05 level, and ***denotes significance at the .01 level.

Figure 1. Producer Response To The Two-Part Question, "Would you be willing to invest in new market development through a livestock marketing cooperative? Yes or No"; with the follow-up, "If yes please indicate how much: up to $5 per head sold, up to $10 per head sold, or up to $25 per head sold."
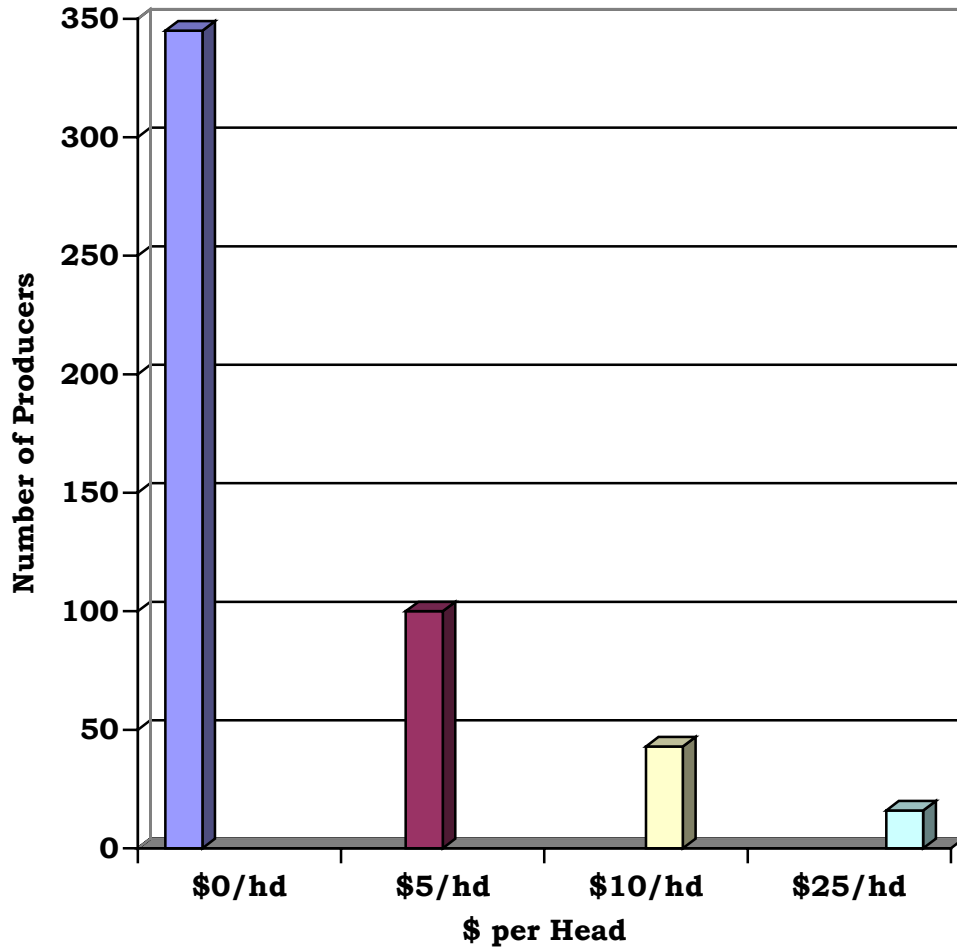
Figure 2. Percentages of Producers Willing to Adopt Alternative Production and Marketing Practices.
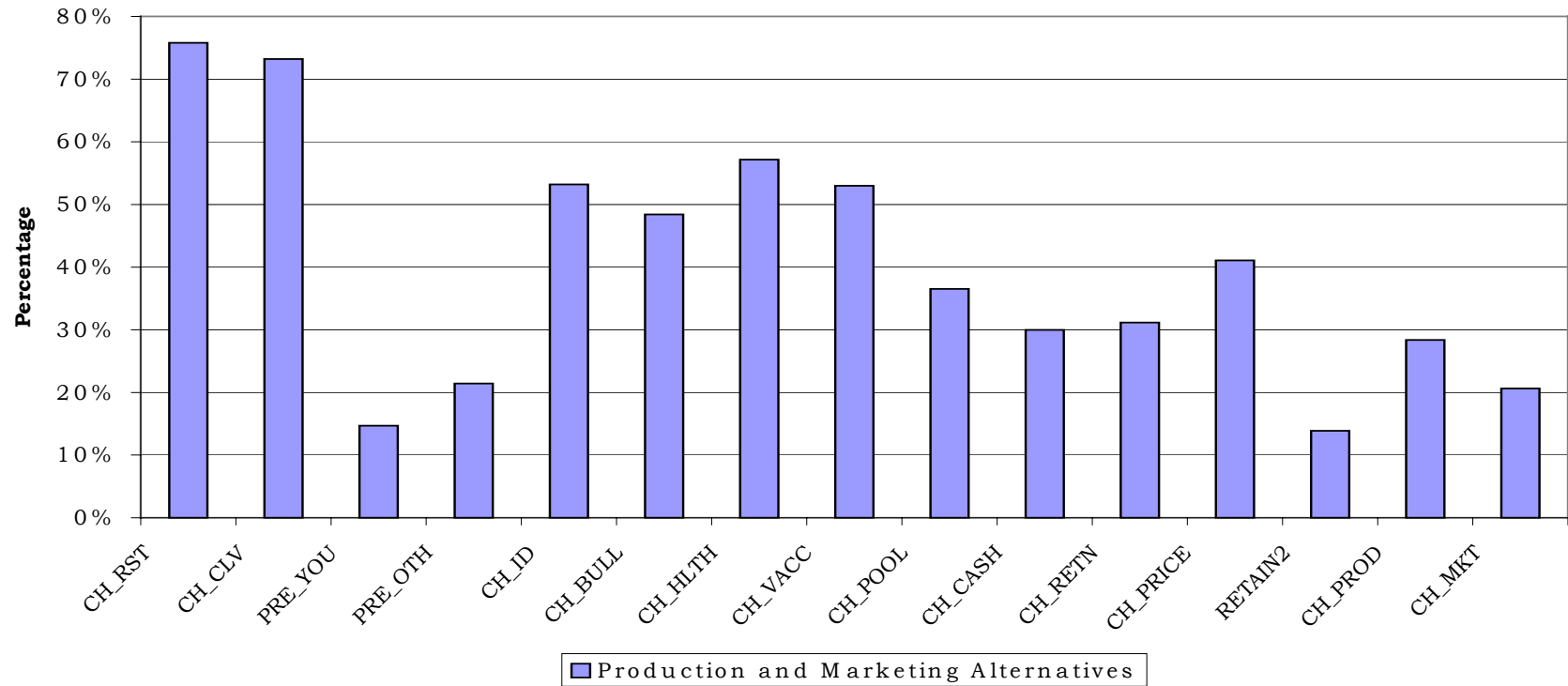
Figure 3. Estimated Producer WTP To Participate In A Marketing Cooperative.