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Did Producer Hedging Opportunities in the Live Hog Contract Decline?

by

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"Did Producer Hedging Opportunities in the Live Hog Contract Decline?"

Fabio C. Zanini and Philip Garcia*

The paper assesses the usefulness of selective hedging strategies when combined with forecast techniques in the live hog contract. The use of routine futures and options hedging is not attractive relative to a cash-only strategy. However, forecasting and hedging can contribute to price risk management improvement for risk-averse producers. Consistent with previous research, the results indicate that the live hog contract continues to offer producers attractive pricing opportunities. The findings suggests that the success of the new lean value carcass contract may depend on its ability to attract trading volume from outside the traditional production sector.

Introduction

Ginn and Purcell (1987) indicate that an improvement in price risk management may contribute to the competitive nature of the pork industry. In this context, researchers have investigated the usefulness of the live hog contract for reducing price risk, and have found encouraging results when combining hedging strategies with forecasting techniques (e.g., Brandt, 1985; Holt and Brandt, 1985; Park, Garcia and Leuthold, 1989). The studies indicate that risk-averse producers could reduce their output price variability by selling selective futures contracts based on signals provided by the forecasting procedures. Despite these findings, there is some recent concern that the hog futures and options markets no longer provide the producers with viable hedging opportunities. In particular, some anxiety has developed over the declining volume of futures trading in the live hog contract, the possible increase in basis risk and the usefulness of the contract (Unnevehr, 1988; Einhorn, 1994). In a effort to restore trading activities, contract specifications have been changed from live hog basis to lean value carcass basis.

Nevertheless, it is difficult to anticipate whether the lean hog contract will be more successful than the live hog contract in encouraging producers to hedge. A difficulty may be the changing nature of the production process which has become more vertically integrated and concentrated, and the declining volume marketed through traditional terminal markets (Rhodes, 1995). Producers may have opted to ignore the futures and options markets in favor of alternative methods of managing risk. In this context, it is important to assess whether the live hog contract continued to offer producers attractive hedging opportunities in order to understand the potential of the lean hog contract. If hedging opportunities are available and producers do not take advantage of them, then changes in the contract specifications may not be sufficient to restore trading volume.

The objective of the paper is to investigate the value of the live hog futures and options markets when combined with relatively straightforward forecasting approaches as marketing tools

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for a farrow-to-finish hog operation. Monthly forecasting models (i.e., econometric, ARIMA, seasonal indices, and composite) are identified during the period August 1981 to July 1986. Out-of-sample forecasts are generated for 84 months, from January 1987 to December 1993 by updating the models. These forecasts are used to identify the usefulness of the forecasting in conjunction with the various strategies. The effects on producer final prices are compared to cash prices using stochastic dominance and mean-variance analysis.

Simulation Framework

Careful attention is given to keep the analysis relevant to actual marketing scenarios faced by Midwestern U.S. hog producers. The futures and options trading activities follow from different strategies built for a farrow-to-finish hog operation with monthly output equivalent to the size of one live hog futures contract (30,000 pounds of weight or approximately 125 head). In order to focus the results on the differences among the pricing strategies, the production process is assumed to be continuous, with no supply response to higher or lower prices, a common approach in this type of analysis (e.g., Brandt, 1985). Hence, at any time the operation's inventory contains 125 barrows and gilts in six weight categories, totaling 750 head. The USDA indicates that almost 70% of the U.S. hog production between 1987 and 1993 came from farms with inventories over 500 head (45% from farms with more than 1,000 head).

Farrowings are assumed to take place in the first week of every month and the hedges are placed on the first working day of the second week of the month, if the decision to hedge is taken. To establish the hedge positions, one futures contract is sold (or one put option bought) with delivery six months later at slaughter. When a futures contract is not available for the slaughter month, the nearby delivery month is used. Since the production process is continuous, there are always animals being farrowed at the same time that there are six-month-old animals going to slaughter. At any one time, there may be as many as six futures positions corresponding to the growth of hogs in the production process.

Strategies

In the six strategies described below, the six-month old hogs are sold in Omaha, in the first week of the month, at the average price for that week. Delivery in the futures market is never considered and the hedges opened at slaughter are lifted on the first working day of the second week of the month. The short futures positions are liquidated by buying one futures contract. The put options may be allowed to expire if the strike price is below the futures market price or otherwise are exercised and the resulting short futures contract position is offset by the purchase of a futures contract. The final prices received for the hogs slaughtered are the cash prices plus the net gains and losses from the trading activity in futures and options. Commission costs and put premiums are built into the trading signals, but margin calls are not taken into account in the simulation since margin calls can be fulfilled by T-Bills.[1]

Strategy 1 - cash-only strategy. The cash-only strategy is included as a benchmark, so that the usefulness of forecasting and hedging can be assessed under current market conditions. The final

[1]The T-Bills do not bear interest rate if they are used to fulfill margin calls.

price is the average cash price in Omaha during the first week of the slaughter month. Results from previous works indicate that the cash-only strategy has not always been the best pricing strategy available in terms of risk reduction (Brandt, 1985; Holt and Brandt, 1985; Adam, Garcia and Hauser, 1993).

Strategy 2 - routine futures contract hedge. In the routine hedge strategy, hedges are placed for every group of pigs farrowed by selling a live hog futures contract with delivery six months later in the slaughter month. The final price received by the producer is the Omaha cash price adjusted by the gains or losses from the futures trade and by $0.15/cwt. commission costs. The evidence in the literature of the value of this routine strategy has been mixed. While Adam, Garcia and Hauser (1993) indicate that selling a futures contract is a robust hedging strategy for risk-averse producers that are uncertain about forthcoming price variation, Holt and Brandt (1985) argue that the routine hedge can be outperformed by the cash-only strategy and by selective hedging strategies.

Strategy 3 - routine put option hedge. Put options are attractive since they allow the producers to set a floor price without eliminating price increase opportunities. One at-the-money put option is bought at farrowing, where the delivery month of the underlying futures contract is the same as that of the futures contracts sold under the routine futures contract hedge (Strategy 2). If there is no open interest on the at-the-money put option on the first working day of the second week of the month, the next lower strike price is used. The producer exercises the put option if the futures price on the put expiration day is below the strike price. The put option is allowed to expire otherwise. If the put is exercised but the expiration day is earlier than the slaughter month, a short position in the futures market is kept open until the first working day of the second week of the slaughter month. Following this procedure may be more costly than simply selling back the put option, but allows the producer to remain hedged until slaughter. The final price received by the producer equals the average cash price of the first week of the month in Omaha, discounted by the put option premium and by any net gain from the futures market trade. The initial commission costs are $0.08/cwt. for each put option bought. If the option is allowed to expire, there are no additional costs or gains for the producer. On the other hand, when put options are exercised, an additional $0.15/cwt. in commission costs are charged and the producer gains the difference between the futures price on the first working day of the second week of the month and the put option strike price.

Strategy 4 - selective futures contract hedge. The selective futures contract hedge differs from the routine futures contract hedge (Strategy 2) since the hedges can be placed at any time from farrowing to the end of the growing period. Hedges are placed when the basis-adjusted forecast price is below the futures price by more than the commission costs. The producer does not enter the futures market otherwise. Whenever a hedge is placed, the short positions in the futures contract is held until slaughter, when the futures contract is bought back. The final price received by producer equals the first week of the month average cash price in Omaha plus any net gain and losses from futures trades. The commission costs are $0.15/cwt. charged only when the hedges are placed. It is possible that the signal to sell a futures contract occurs when the same futures contract is being bought to lift a hedge at slaughter. In this case, there is no net change of position in the futures contract and the producer pays no extra commission costs.

Strategy 5 - dynamic futures contract hedge. This strategy is similar to the selective futures contract hedge, but the producer is allowed to lift the hedges before maturity. Similarly, the hedging positions offset prior to slaughter may be reestablished within the six months growing period. A hedge is placed when the basis-adjusted forecast price is below the futures prices by more than the commission costs and lifted when it is above the futures prices by more than the commission costs. Therefore, trading

signals within the commission costs range do not change the producer's futures market positions, avoiding an excessive number of trades that could be caused by the random fluctuations present in the futures prices and forecasted prices. The final price received by the producer equals the average cash price during the first week of the month in Omaha plus the sum of net gain and losses in futures trading.

Strategy 6 - selective put option hedge. The put-option selective-hedging strategy is constructed in the same manner as the selective futures contract hedge (Strategy 4), but put options are bought instead of futures contracts when hedges opportunities are signaled.[2] The put option signals differ from the futures contract signals since premiums are built into the put option signals in addition to the commission costs built into futures contract signals. The final price received by the producer is calculated similar to Strategy 3.

Data

The data are provided by the Office for Futures and Options Research at the University of Illinois. The **cash prices** are a simple average of daily prices for the Omaha market during the first week of the month, which is the week that contains the first working day of the month. If the first working day is on Friday, however, the next week is used.[3] The **current futures prices** are defined as the average of the closing prices during the first week of the month defined above. Current futures market prices are estimated for each month, for every live hog futures contract, and are used to produce the trading signals and to define the at-the-money put option strike prices. The **futures contract price** used in the trades is defined as the closing price on the first day of the second week of the month. The **put option premiums** are the closing price on the first working day of the second week of the month for the at-the-money strike price, which has the first strike price available below the current price of the underlying futures contract. For example, the at-the-money strike price is $40.00 if the current futures price is equal to or higher than $40.00, but lower than $42.00. When there was no open interest for the at-the-monthly strike price, the next lowest was used.

All the data used to generate the forecasts are available at the time the forecasts are generated. Since the hog prices are obtained in the first week of each month, they are available on the Monday of the second week of the month when the models are estimated. The in-sample period used to identify all the forecasting models is from August 1981 to July 1986. The sample has 60 observations, which is above the minimum of 40 to 50 observations required to estimate ARIMA models (Granger and Newbold, 1986). During the out-of-sample period, the number of observations is kept constant at 60, permitting the estimates to more quickly capture fundamental structural changes (Leuthold, Garcia, Adam and Park, 1989). The data used in the econometric estimation are: monthly U.S. population (millions) and personal income (billions of dollars); U.S. sow farrowings (million heads); U.S. hog slaughter (million pounds), cattle slaughter (million pounds) and broiler slaughter (million heads); average Central

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[2] A dynamic put option strategy which would offset the option when the price signal is above the commission and premium adjusted futures prices was not included in the work. The incentives to follow such a strategy are not as strong as the incentive to follow a dynamic futures strategy because Strategy 6 permits the producer to capture the large gains associated with increasing prices.

[3] This definition of the first week of the month is consistent with Garcia and Sanders (1996).

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Basis Forecasting

dt (1985) suggest that three-year simple moving averages may lead to reasonable
tterns are seasonally repetitive. Garcia and Sanders (1996) have indicated that the
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r to keep the forecast process parsimonious, a three-year average basis forecasting
he forecasted basis is generated by taking the simple average of the actual basis
three years in the month for which the predicted values are generated.

Price Forecasting Models and Forecast Results

re forecasted using three individual procedures (seasonal index, ARIMA,
omposite model (simple average of ARIMA and econometric forecasts). Since
ast period starts in January 1987 and lasts until December 1993, the models are
ated in July 1986, six months before the first slaughter. During the out-of-sample
f both the econometric and the ARIMA models are estimated monthly before the
The seasonal index is re-calculated every January. The ARIMA model is re-
during the out-of-sample period, allowing for the possibility that it might be
used. The econometric model is re-identified every January during the out-of-
nges in fundamental supply and demand conditions are difficult to capture when
rvation.

ting procedure is the seasonal-index which was found by Holt and Brandt (1985)
selective hedging strategy. The construction of the seasonal index is described
(1994, pp. 160-177). Cash prices are forecasted one to six months ahead by
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price is defined as the average of the current and the past two two-month cash
rresponding seasonal indexes. The average of the past two month cash prices
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vidual forecasting procedure is an ARIMA model, identified and estimated by
n's method. The Hannan-Rissanen method yields consistent estimates as long
g average is close to the invertibility region (Granger and Newbold, 1986). The
model is selected to generate the forecast hog prices for the initial period of the
des the lowest BIC value within the models that generated white noise residuals.
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the models selected out-of-sample generate the lowest BIC value for several
he criteria used to select the models are not sensitive to small changes in the
irst out-of-sample month, the ARMA(1,1)XSAR(1)$_{12}$ is the model with the
ite noise residuals. The ARMA(1,1)xSMA(1)$_{12}$ is the predominant model from

signals within the commission costs range do not change the producer's futures market positions, avoiding an excessive number of trades that could be caused by the random fluctuations present in the futures prices and forecasted prices. The final price received by the producer equals the average cash price during the first week of the month in Omaha plus the sum of net gain and losses in futures trading.

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[3] This definition of the first week of the month is consistent with Garcia and Sanders (1996).

Illinois price of corn (No. 2, yellow) and U.S. Treasury Bill rate. Except for sow farrowings, all observations are published monthly. Sow farrowings are published quarterly. The **basis** is defined as the average cash prices during the first week of the month in Omaha minus the current futures prices.

Basis Forecasting

Holt and Brandt (1985) suggest that three-year simple moving averages may lead to reasonable forecasts since basis patterns are seasonally repetitive. Garcia and Sanders (1996) have indicated that the predictability of the basis has not changed considerably and should not affect the attractiveness of hedging. Thus, in order to keep the forecast process parsimonious, a three-year average basis forecasting model is used here. The forecasted basis is generated by taking the simple average of the actual basis observed over the last three years in the month for which the predicted values are generated.

Price Forecasting Models and Forecast Results

Cash prices are forecasted using three individual procedures (seasonal index, ARIMA, econometric) and one composite model (simple average of ARIMA and econometric forecasts). Since the out-of-sample forecast period starts in January 1987 and lasts until December 1993, the models are first identified and estimated in July 1986, six months before the first slaughter. During the out-of-sample period, the parameters of both the econometric and the ARIMA models are estimated monthly before the forecasts are generated. The seasonal index is re-calculated every January. The ARIMA model is re-identified every month during the out-of-sample period, allowing for the possibility that it might be sensitive to the sample used. The econometric model is re-identified every January during the out-of-sample period since changes in fundamental supply and demand conditions are difficult to capture when changing only one observation.

The first forecasting procedure is the seasonal-index which was found by Holt and Brandt (1985) to be useful in guiding a selective hedging strategy. The construction of the seasonal index is described in Newbold and Boss (1994, pp. 160-177). Cash prices are forecasted one to six months ahead by multiplying the current seasonal-adjusted cash price by the seasonal indexes for the forecast months. The current seasonal-adjusted price is defined as the average of the current and the past two two-month cash prices divided by their corresponding seasonal indexes. The average of the past two month cash prices is used to attenuate the influence of extreme values, as suggested by Newbold and Boss (1994).

The second individual forecasting procedure is an ARIMA model, identified and estimated by the Hannan and Rissanen's method. The Hannan-Rissanen method yields consistent estimates as long as the order of the moving average is close to the invertibility region (Granger and Newbold, 1986). The ARMA(2,0)xSAR(1)$_{12}$ model is selected to generate the forecast hog prices for the initial period of the simulation, since it provides the lowest BIC value within the models that generated white noise residuals. The identification of a seasonal component in the ARMA model is consistent with models identified in related works (Park, Garcia and Leuthold, 1989; Holt and Brandt, 1985).

The majority of the models selected out-of-sample generate the lowest BIC value for several months, indicating that the criteria used to select the models are not sensitive to small changes in the sample period. In the first out-of-sample month, the ARMA(1,1)XSAR(1)$_{12}$ is the model with the lowest BIC value and white noise residuals. The ARMA(1,1)xSMA(1)$_{12}$ is the predominant model from

July 1986 to August 1988. After September 1988 and to the end of the simulation, the best mod
the ARMA(1,0)xSAR(1)$_{12}$ and the ARMA(1,0)xSMA(1)$_{12}$, with June 1990 as the only except

The third forecasting procedure is an econometric model, adapted from the farm-level rec
demand-supply model of the hog market in Leuthold, Garcia, Adam and Park (1989). The s
equation specifies hog production as a function of the expected output and input prices, interes
lagged sows farrowings, and monthly dummy variables. The expected input and output price
represented by corn prices and hog prices lagged seven months in order to simplify the estim
Interest rate is used as a proxy for the opportunity cost of the capital allocated for hog production.
farrowings are an average lag of two and three quarters (Leuthold, Garcia, Adam and Park, 1989).
demand equation specifies the hog prices in Omaha as the dependent variable. The independent vari
are hog slaughter, cattle slaughter, broiler slaughter, income per capita and monthly dummy variat

Supply

$$\text{Hog Slaughter}_{(t)} = \alpha_1 + \beta_1 \text{Hog Price}_{(t-7)} + \beta_2 \text{Corn Price}_{(t-7)} + \beta_3 \text{Interest Rate}_{(t-7)} + \beta_4 \text{Sow Farrowings}_{(t-7)} + \beta_{5\text{-}15} \text{Monthly Dummy Variables} + \epsilon_1.$$

Demand

$$\text{Hog Price}_{(t)} = \alpha_2 + \delta_1 \text{Hog Slaughter}_{(t)} + \delta_2 \text{Cattle Slaughter}_{(t)} + \delta_3 \text{Broiler Slaughter}_{(t)} + \delta_4 \text{Income}_{(t)} + \delta_{5\text{-}15} \text{Monthly Dummy Variables} + \epsilon_2$$

The equations are estimated individually since typically prices in the hog sector are form
recursively. Each equation is initially estimated by least squares, but since the OLS residuals a
autocorrelated (based on the Ljung-Box Q-statistic), a generalized least squares procedure (GLS) is us
to obtain efficient estimates both in the supply and the demand estimations. The supply residuals a
third-order autocorrelated and the demand residuals are first-order autocorrelated.

Surprisingly, the estimated coefficients of the expected input and output prices (hog price an
corn price lagged seven months) and interest rates are not significant in explaining hog supply. An F-te
at a 1% level of significance indicates that the coefficients of the economic variables are not jointl
statistically different than zero. However, the coefficient of the sow farrowings variable in the restricte
model is significant with a positive sign as expected. The Q-statistic indicates that the residuals of th
restricted model are white noise and the adjusted R^2 (.88) shows reasonable explanatory power. I
Leuthold, Garcia, Adam and Park (1989) the expected output hog price was significant, but corn price
and interest rates were not significant variables in explaining hog supply. They explained the
insignificance of the variables due to collinearity in the data, which may also explain why no economic
variable was significant in explaining hog supply in the sample period used here. At the same time,
Skold, Grundmeier and Johnson (1989) indicate that hog supply is essentially a function of investment
decisions taken at breeding almost four months before farrowing. After farrowing, producers may change
output either by slaughtering sows or by changing the weights of barrows and gilts sold, but the overall
response to economic variables may be small. This is more consistent with our findings.

Problems were encountered with the demand specification. The in-sample estimates of coefficients are inconsistent with economic relationships normally anticipated. While the hog slaughter variable had the expected negative sign, the coefficients of the cattle and broiler slaughter were incorrect (indicating complementary) and insignificant, respectively. Likewise, the income variable has a significant but negative coefficient. Thus, a restricted model with only hog supply and dummy variables is tested against the unrestricted model based on F-statistic.

The F-statistic fails to reject the hypothesis that the restricted coefficients on broiler slaughter, cattle slaughter and income per capita are equal to zero at a 5% level of significance, supporting the restricted equation. However, in the case, the t-statistic on hog slaughter is not significant. Since hog slaughter is highly seasonal (see the supply estimations), there is strong reason to believe that a high degree of collinearity between the hog slaughter and the dummy variables is influencing the restricted model estimation. Consequently, the model is further restricted by dropping the seasonal dummy variables from the demand estimation. The F-statistic on the restricted model with only hog slaughter explaining hog prices against the original model is not significant, suggesting that all coefficients are equal to zero, except for hog slaughter. Both the Q-statistic and the R^2 (.683) indicate that the model is reasonably well specified.

During the out-of-sample period, the coefficients of the demand equation are not stable. Respecification of the demand model each year again identified problems with signs and significance of the broiler and cattle slaughter and income variables. Hence, in general, the model with only hog slaughter in the explanatory set is used in the forecasting model. Clearly, structural changes are occurring in the demand equation which warrant further investigation.

Last, a composite forecast based on a simple average of the ARIMA model and the econometric model is considered. In general, Granger and Newbold (1986) argue that most economic forecasts are not optimal and might be improved by expanding the information set used to generate the forecasts by combining competing models.

An analysis of the models' out-of-sample forecast performance is provided using the forecast root mean squared error for the 84 months from January 1987 through December 1993 (Table 1). The more reliable forecasts are at the shorter horizons (one and two months). Similar to previous findings, the econometric model performed better than the ARIMA specifications at distant forecast horizons, while the ARIMA model performed better at shorter forecast horizons. The simple average composite model has the lowest root mean squared error, except for the one-month forecast horizon, when the errors from the econometric model inflate the composite. The poor performance of the seasonal index model clearly indicates that supply and demand relationship and/or price patterns should be considered when building a model to forecast hog prices as suggested by Brandt (1985).

Table 1. Root Mean Squared Forecast Errors, January 1987 - December 1993.

	6-Month	5-Month	4-Month	3-Month	2-Month	1-Month
Seasonal Index	7.055	6.793	6.510	5.934	5.964	4.219
ARIMA	6.833	6.500	6.031	5.370	4.573	3.658
Econometric	6.036	5.941	5.856	5.723	5.546	5.400
Composite (ARIMA and Econometric)	5.851	5.604	5.355	4.886	4.388	3.823

Table 3. Western Kansas Producers' Preferences for Sources of Market Outlook Information

	Preference for Source of Information			
	Do Not Use	Low	Medium	High
A. Public Media				
Newspapers	24*	30	30	16
Radio	13	16	26	44
Television	18	23	30	30
Farm Publications	13	12	48	28
B. Electronic Market Information				
Satellite Information Services	48	8	18	26
Internet Farm Market Information	82	8	7	3
C. Marketing Newsletters				
University Extension	33	23	34	10
Private Analysts	38	18	28	16
D. Workshops/Marketing Meetings				
KSU Extension Meetings	21	26	38	15
Private Commodity Firm Meetings	38	30	25	6
E. Area Agribusiness Industry Contacts				
Grain Elevator Managers/Staff	10	25	44	21
Livestock Feed Buyers	53	21	20	7
Sale Barn Managers	57	23	13	7
Livestock Order Buyers/ Packer Buyers	57	16	18	8
Commodity Brokers	39	36	18	7
F. Other Sources of Market Information				
Farm Marketing Clubs	89	8	2	2
Other Informed Farmers	44	33	20	3

* Preferences are expressed as a percent of 61 survey responses.

Table 1. Western Kansas Producers' Preferences for Types of Market Outlook Information

	Preference for Type of Information			
	Do Not Use	Low	Medium	High
Futures Prices	13*	13	28	46
Supply/Demand Fundamentals	11	20	39	30
Charts of Futures Prices	23	25	31	21
Cash and Forward Contract Prices	16	5	28	51
Price Forecasts by Marketing Experts	8	23	57	12
Buy/Sell Strategy Recommendations	28	29	36	7
Opinions of Other Farmers	18	51	26	5

* Preferences are expressed as a percent of 61 survey responses.

Table 2. Western Kansas Producers' Preferences for Frequencies of Receiving Market Outlook Information

	Don't Use	Seasonally	Monthly	Current	Daily	Weekly
Futures Prices	16*	12	5	8	48	12
Supply/Demand Fundamentals	15	16	30	30	5	5
Charts of Futures Prices	25	18	21	23	13	0
Cash and Forward Contract Prices	15	8	7	34	34	2
Price Forecasts by Marketing Experts	5	7	15	30	36	8
Buy/Sell Strategy Recommendations	30	15	16	36	3	0
Opinions of Other Farmers	28	28	16	20	7	2

* Preferences are expressed as a percent of 61 survey responses.

Convenience appears to drive many farmers' preferences for sources of market information. The high preference expressed for radio and farm publications suggest producers want regular access to market information that can be accessed readily. The low level of Internet use among the respondents indicates using this media for a primary avenue of information distribution might be premature. A little more than half of those surveyed placed zero or low preference on marketing newsletters, whether public or private. Agricultural economists may want to invest more time in mass media information delivery.

University Extension grain and livestock marketing specialists have long offered market outlook workshops and meetings as part of their educational programs. More than half of the survey respondents expressed medium or high preferences for these educational programs, while more than two-thirds of the same group showed zero or no preference for educational programs conducted by private commodity firms. This suggests agricultural producers in western Kansas prefer to turn to University Extension for market outlook information and marketing education. This preference could be due to Extension's reputation for providing unbiased, research-based information to producers. This could show that allocating Extension specialists' time to public market outlook and education meetings would be met favorably by agricultural producers in western Kansas.

In accordance with its land grant charge, University Extension serves as an information conduit, communicating research-based information from University faculty to Extension cooperators and relating research and information needs from cooperators to University faculty. The authors strongly encourage similar marketing information needs assessment surveys be conducted in other states and regions to assure land-grant research and University Extension marketing information efforts are indeed client-driven.

References

Batte, Marvin T., Gary D. Schnitkey, and Eugene Jones. "Sources, Uses, and Adequacy of Marketing Information for Commercial Midwestern Cash Grain Farmers." *North Central Journal of Agricultural Economics*. 12(1990): 187-196.

Goodwin, Barry K., and Terry L. Kastens. "An Analysis of Marketing Frequency by Kansas Crop Producers." *Review of Agricultural Economics*. 8(1996): 575-584.

high preference by more than half the respondents.

Public educational meetings on the topics of market outlook and marketing strategies have long been a focus of private commodity marketing firms and University Extension economists. This survey revealed mixed preferences among grain and livestock producers as to the provider of marketing workshops/meetings. More than one-half of the western Kansas farmers who returned this survey instrument expressed medium or high preferences for KSU Extension marketing meetings, but more than two-thirds of the same group showed zero or low preference for private commodity firm marketing meetings or workshops.

When asked about which human resources farmers in western Kansas prefer to visit with about market information, survey respondents overwhelmingly placed medium or high preference on grain elevator managers and staff. This preference held true for respondents overall and those included in the more narrow interest groups in particular. Livestock feed buyers, sale barn managers, livestock order buyers/packer buyers, and commodity brokers garnered zero or no preference as face-to-face sources of marketing information. The same held true of farm marketing clubs and other informed farmers.

Implications for Agricultural Economists

These survey results provide insight into the information needs of University Extension's producer clientele in western Kansas and perhaps beyond. The oft-discussed information revolution appears to have struck the farmers and ranchers of this largely rural area. The adjustments these producers have made to their marketing/risk management plans in response have serious implications for educators. Survey results reveal eclectic grain and livestock marketers in western Kansas. Their reluctance to depend on one type of information in developing individual market outlooks could provide direction to private- and public-sector economists in providing educational programming to a pragmatic farming populace.

With respect to the types of information preferred by farmers in western Kansas, most producers prefer to incorporate several types of information into their individual market outlook. More than two-thirds placed medium or high preference on futures prices, supply/demand fundamentals, cash/forward contract prices, and price forecasts by marketing experts. This would suggest western Kansas grain and livestock producers do not rely on one type of market information to form their individual market outlooks and marketing plans. Farmers' preferences for different types of market information hold implications for agricultural economists. Futures prices and cash/forward contract prices typically are available from private sources for little or no cost. There appears to be a demand for University Extension personnel and private-sector economists to disseminate information on supply/demand fundamentals and develop and distribute market outlooks and forecasts based on the analysis of that information.

medium or high preference on futures prices preferred weekly, daily, or up-to-the-minute information on supply/demand fundamentals, cash/forward contract prices, experts' forecasts, and buy/sell recommendations. This pattern followed among the other individually-analyzed information-preference categories.

Producers' Preferences for Sources of Market Information

Many sources exist for market information. Mass media outlets, subscription-based private outlook services, Extension newsletters, and coffee shop ruminations are just a few of the ways farmers access price information and market outlook/opinion. This survey revealed some interesting information about how much preference farmers in western Kansas place on 17 different sources identified in the survey instrument. Results are reported in table 3.

Considerable amounts of market information and opinion are available to producers through the public media. Given the on-the-go lifestyle of today's farmers, the high preference for receiving market information from radio, television and farm publications is not surprising. Radio reports enable producers to access market information from their pickup truck, tractor, or combine. Television commodity market reports and in-depth market analysis (e.g., PBS' *Market to Market*) hold appeal to more than half the producers surveyed. These results agreed with a 1990 survey of Ohio commercial farmers (Batte, Schnitkey, and Jones). More than one-quarter of Ohio producers surveyed ranked radio and television as the most valuable source of information for marketing decisions. The high preference for farm publications as a source of information confirmed prior expectations given the large circulations of many leading magazines and the fact that many well-known publications are available to farmers at no cost. Again, this agreed with the Ohio farmers' valuations of general and specialized farm magazines as market information sources.

Satellite-based information networks are popular among many farmers in western Kansas. DTN, FarmDayta, and other private companies provide market, weather, and news information to subscribers for a fee. It is logically consistent that the vast majority of farmers who bore the cost of these services placed a medium or high preference on this source of information. When asked about obtaining market information from the Internet, however, more than 80 percent of those surveyed said they did not use it at all. Several respondents wrote they would like to use the Internet for market outlook development, but the telephone line costs were prohibitive.

Marketing newsletters, whether authored by private concerns (Doane's, ProFarmer, Brock, or others) or University Extension, were not highly-preferred sources of information as fewer than one-half of the farmers surveyed placed a medium or high preference on them. However, when only considering the respondents who expressed medium or high preferences for supply and demand fundamentals, cash and forward contract prices, futures price charts, and price forecasts of marketing experts, these sources of information were rated medium or

Producers' Preferences for Types of Market Outlook Information

Grain and livestock producers in western Kansas expressed definite preferences for the types of information they incorporate into their individual farm-level market outlooks and marketing plans. Table 1 summarizes the respondents' preferences for types of information. More than two-thirds of the respondents placed medium or high preference on cash and forward contract prices, futures prices, forecasts by market experts, and supply and demand fundamentals. A few more than half the farmers surveyed indicated medium or high preferences for futures price charts. More than half of the respondents placed zero or low preferences on buy/sell recommendations and the opinions of other farmers.

Analysis of survey responses when sorted by producers who placed medium or high preferences on particular information categories yielded some interesting results. Western Kansas producers indicated they did not rely solely on one type of information or another. Rather, results suggest cross-over demand for types of information. That is, most individual respondents placed medium or high preferences on multiple market information types. The eclectic individual market outlooks suggested by these results agree with field observation.

Farmers' Preferences for Frequencies of Receiving Market Information

Agricultural producers have access to a vast amount of information and limited time to process that material. As time is the ultimate scarce resource, it made sense not only to ask producers about which types and sources of marketing information they preferred to use, but also to gauge the frequencies with which they preferred to receive different types of information. Survey results are summarized in table 2.

Although the majority of Kansas farmers market their crop production three times a year or fewer (Goodwin and Kastens), survey respondents overall preferred to receive several types of market outlook information from various sources with varying preferences for receiving information. On the surface, the responses to this section of the survey are straightforward. Producers preferred updates the most often (on a daily or up-to-the-minute basis) on the types of information that change the most frequently (futures prices and cash/forward contract prices). Conversely, producers preferred to receive less frequent updates on other types of information that typically change less frequently (expert forecasts, supply/demand fundamentals, and buy/sell recommendations). When survey responses are separated among types of information to which respondents attach a medium or high preference, however, frequency preferences can vary.

More than three-fourths of producers who placed a medium or high preference on futures prices in developing their on-farm marketing plans indicate a high preference for receiving daily or current updates on futures prices. However, these producers also prefer access to a great deal of other information. More than fifty percent of respondents who placed

assessment should yield meaningful educational efforts that could assist producers in making effective buy/sell decisions in what is expected to be an increasingly risky market environment.

Private marketing services, futures markets, and University Extension have historically provided market outlook information to producers at little or no cost. Recent self-examination within our discipline has yielded discussion on what Extension's focus should be with respect to commodity marketing. The information needs of the end client of land grant research and extension, the agricultural producer, should be of primary importance in the debate.

Assessing Producers' Market Information Preferences

A survey instrument was designed to gauge grain and livestock producers' preferences for market outlook information. Stated briefly, producers were asked to respond to four questions: 1) which types of information do they prefer to use in making marketing decisions, 2) which sources of farm market information do they prefer to use in formulating marketing strategy, 3) how frequently do they prefer to use different types of farm market information, and 4) were they primarily interested in the marketing of grain, livestock, or both? The market information survey instrument was developed by Kansas State University (KSU) Extension agricultural economists with the guidance of evaluation experts from KSU, the University of Minnesota, and the University of Wisconsin. The survey was approved by the KSU Committee on Research Involving Human Subjects.

Western Kansas crop and livestock producers were surveyed about their market information preferences in three different manners in early 1997. First, producers attending Extension grain and livestock market outlook meetings in western Kansas received the survey instrument to take home, fill out, and return at their volition. Second, KSU agricultural economists mailed surveys directly to 50 producers from a pool of names provided by county agricultural agents in western Kansas. Third, 125 surveys were mailed to western Kansas producers selected at random from county atlases. All producers were provided a postage-paid envelope to return their surveys.

Sixty-one producers returned completed surveys. Fifty-three percent of respondents said they were primarily interested in grain market information, two percent were primarily interested in livestock market information, and 46 percent were interested in grain and livestock market information. Analysis of data emphasized frequencies of preferences for marketing information by content, information source, and information frequency categories. Several aspects of the summarized responses hold interesting implications for public- and private-sector providers of commodity market information.