Livestock Revenue Insurance: How Did It Perform?

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Two livestock revenue insurance products, Livestock Risk Protection (LRP) and Livestock Gross Margin (LGM), were introduced in Iowa in July 2002. To help producers weigh the merits of these programs, an evaluation was made of how LRP and LGM policies purchased in July to cover hogs marketed from August 2002 to January 2003 would have performed. These outcomes were then compared to similar risk management strategies using options on futures contracts. The comparison assumed 204 head were marketed each month, enough to comprise a lean hog futures contract of 400 hundredweight.

LRP versus Lean Hog Put Options

LRP protects livestock producers from declining hog prices by guaranteeing a specified live hog price level. Available coverage levels range from 70 to 90 percent of prevailing market prices. Coverage can be purchased any time, and is available for sales 90, 120, 150, and 180 days into the future. Indemnity payments are triggered if the cash price index at the end of the endorsement period falls below the guaranteed price.

Table 1 presents the net payback for an LRP policy purchased on July 15. The maximum coverage levels available were $40.00, $38.21, $38.00, and $37.90 per cwt. for the marketing months October through January, respectively. The premium totaled $4,727, or $5.79 per head. The realized price index at the end of each month ranged from $1 to $4 per cwt higher than the guaranteed price. Consequently, no indemnity payments were triggered.

Table 1 also shows the outcome of buying put options to give price protection comparable to the LRP example. Four put options on lean hog futures were purchased on July 15, at the lowest strike prices available for delivery months corresponding to the LRP endorsement periods. The individual contract premiums were higher than LRP premiums for the October, November, and December delivery months, but lower for January. Without the federal subsidy the cost of the LRP policy would have been nearly identical to the premiums for the options strategy. The options contract exercised in November recouped $180 of the $1,580 premium, while the contracts covering October, December, and January marketings expired at virtually no value. Overall, the net cost of price protection was $5,487, or $6.72 per head, $.93 per head more than for the LRP insurance.

Table 1. Net cost of Livestock Risk Protection and put options, $ per head.

	Oct.	Nov.	Dec.	Jan.	Average
LRP policy	4.15	5.96	6.13	6.94	5.79
Lean hog put options	5.59	6.86	7.70	6.70	6.72

LGM versus Puts and Calls

LGM was designed to protect producers from both declining hog prices and rising feed prices, so it is not directly comparable to LRP protection. The program divides the year into two insurance periods, February through July and August through January. An LGM policy guarantees the gross margin per head (revenue minus feed cost) for each marketing month within the insurance period. The gross margin guarantee levels are determined by lean hog, corn, and soybean meal futures prices prevailing when the policy is purchased, and are available at 85, 90, 95, and 100 percent coverage. The first signup period was July 16 to 31. The producer designates the type of operation, farrow-to-finish or finish only, and the number of head to be marketed during each month of the insurance period.

Table 2 shows the outcome of the LGM policy. Unlike LRP, LGM coverage was available for the August and September marketing months. Premiums were $5.94 and $5.89 per head at 100 percent coverage for the farrow-to-finish and finish only alternatives, respectively. As the marketing period

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unfolded, insurance losses accrued during August and September, when hog prices crashed and feed prices were rising. The December lean hog contract, however, rallied after the September Quarterly Hogs and Pigs Report eased fears of a fourth quarter price meltdown. Consequently, the cumulative losses were eliminated by the end of the insurance period, and there were no indemnity payments made to offset the premiums. Note that producers could have purchased coverage for individual months, only, though the premiums may have been higher.

Table 2. Monthly indemnities from Livestock Gross Margin insurance, $ per head.*

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Premium
Farrow-finish	6.08	1.07	-3.81	-1.21	.64	- 6.50	5.94
Finish only	5.77	.91	-.56	.65	-3.37	-10.95	5.89

*Indemnity payments for the six-month period were zero.

Table 3 shows the outcome of a strategy of buying put options on lean hog contracts, and buying call options on corn and soybean meal contracts (to protect against rising prices). The premiums paid on the six lean hog put options totaled $9,908, but the combined exercise value was $5,321. Consequently, the net cost of the put options was $4,587, or $3.75 per head. The call options on the feed costs offered a small positive net return, as corn prices surged in August and September amid drought concerns in the Corn Belt and downward revisions in USDA corn harvest estimates. This reduced the total cost per head of the put and call strategy to $2.67 for farrow-to-finish and $2.93 for finish only.

Conclusions

- Insurance premiums were substantially lower than the initial premiums for the corresponding options strategies. However, the options did offer the chance to recoup some of their initial cost by the time they expired.
- None of the products and strategies offered a positive net return, but all of them protected producers against even larger losses that could have been incurred if hog prices had trended even lower.
- These results apply only to the marketing Livestock Revenue Insurance: How Did It Perform? strategies and time periods covered in the analysis, and will not necessarily occur in the future.

The insurance products considered in this study offer some advantages that were not quantified in the analysis. For example, LRP and LGM are better suited to smaller producers whose marketings are insufficient to fill a futures contract. Insurance coverage is available for any number of hogs marketed. Conversely, a lean hog contract is standardized at 40,000 pounds. Using futures to protect marketing groups smaller than this adds a speculative element and may increase rather than reduce price risk exposure.

One feature distinguishing LRP from the other alternatives considered in this analysis is that indemnity payments are based on a cash price index rather than futures prices, thereby covering basis risk. LGM indemnity payments are based on futures prices, leaving LGM policyholders fully exposed to basis risk.

A more complete summary of this research is available at: http://www.econ.iastate.edu/outreach/agriculture/livestock/LivestockInsurance.pdf

Table 3. Net cost of put and call options, $ per head.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Average
Farrow-finish	-3.69	-9.26	5.17	4.07	7.98	11.73	2.67
Finish only	-3.69	-9.26	5.62	4.83	8.26	11.82	2.93