

**Comparing Basis Risk in Futures Hedging and Livestock Risk Protection Insurance:
Implications for Use of Livestock Insurance**

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Comparing Basis Risk in Futures Hedging and Livestock Risk Protection Insurance: Implications for Use of Livestock Insurance

Livestock Risk Protection (LRP) insurance is a new hedging tool available to fed cattle, feeder cattle, and swine producers. Similar to minimum price hedges with a put option, LRP establishes a floor price for future livestock sales without limiting upside price potential. However, LRP indemnities are determined based on national or regional cash prices rather than futures market prices. Therefore, basis risk for hedgers is the difference between their local cash market sales price and the national/regional cash price. The basis relevant for LRP hedges is generally smaller and less variable for fed cattle and swine producers in Nebraska, but little reduction in basis risk is observed for feeder cattle hedges. This results from the degree to which the national/regional cash prices are comprised of local Nebraska sales prices. LRP, which functions similar to a European option, also can leave hedgers unprotected from price changes during a 30-day window at the end of the contract. Although some users have viewed this as an opportunity for adverse selection, it is unlikely to occur given current underwriting rules.

Keywords: Livestock Risk Protection Insurance, basis

Introduction

Livestock Risk Protection (LRP) is an insurance program offered by the USDA Risk Management Agency (RMA) that provides livestock producers with single-peril price risk insurance coverage. LRP was initially offered as a pilot program for swine in Iowa in 2001 and was expanded to include swine, feeder cattle, and fed cattle in nineteen states late in 2004. The insurance coverage provides minimum price protection for future livestock sales while allowing the user to benefit from price increases. Livestock producers obtain LRP coverage by paying a premium, which is subsidized by the Federal Crop Insurance Corporation (FCIC) and varies according to the level of price insurance selected. In many respects, LRP insurance provides the same type of price protection as a traditional hedge involving the purchase of a put option. Two key differences, however, are that LRP users are exposed to a different basis risk and the date to lift the hedge is not flexible and cannot be changed in the event the marketing date of the livestock changes.

LRP's protection is established through cash market prices rather than futures prices. Users of LRP select a coverage price to insure (similar to an option strike price) that is 70-95% of the policy's expected ending value (EEV). This EEV represents USDA-RMA's current estimate of the livestock cash price corresponding to the end date of the insurance policy. Although USDA-RMA has not released the details associated with the calculation of EEV, it is likely that the insurable prices are a function of deferred futures prices and possibly a basis adjustment. On the ending date of the policy, which can be 13 to 52 weeks from the purchase date for feeder and fed cattle and 13 to 26 weeks for swine, the LRP insurance policy pays producers an indemnity if the policy's actual ending value (AEV) falls below the insured coverage price. The AEV is based on a national or

regional cash price (rather than the futures market). For fed cattle, the AEV is the 5-area weekly weighted average direct slaughter steer price reported by USDA Agricultural Marketing Service. The feeder cattle and swine AEV are equivalent to the Chicago Mercantile Exchange's (CME) feeder cattle cash price index and lean hog cash price index, respectively. The LRP indemnity is equal to the difference between the coverage price insured and the AEV. If the AEV is higher than the insured coverage price on the policy's end date, no indemnity is paid. Because LRP indemnities are based on cash prices rather than futures prices, there is the possibility that basis risk is lower with LRP hedges than futures hedges.

Although LRP insurance offers producers more flexibility than futures and options in terms of minimum number of head that can be insured (as little as one head per coverage endorsement) and available policy lengths ranging from 3 to 12 months in one month intervals, some LRP underwriting rules can limit its flexibility. One such policy provision requires producers to sell their insured livestock no more than 30 days before the end date of the LRP insurance contract to maintain the price insurance (they can sell any time after the end date). Further, LRP end dates, once fixed in the policy endorsement, cannot be adjusted, nor can the value of the LRP insurance be captured at any time other than the end date. So, unlike the American traded livestock options contracts at the CME, LRP works similar to a European option and cannot be offset earlier or later than the end date (expiration date). As a result, producers are exposed to price and basis risk if they sell their livestock up to 30 days before the LRP policy end date or any time after the end date. Further, there could be potential for adverse selection by users seeking to time the LRP end date to a date with an expected indemnity payout and market the livestock at a time within the 30-day window when cash prices are high.

Initial offerings of LRP insurance in 2003 resulted in some insurance agents and others promoting LRP as a tool that would guarantee producers a cash price for livestock (implying no basis risk). Further, some producers considered strategically timing the end date of the LRP insurance policy to correspond to seasonal decreases in market prices while intending to sell their livestock during higher seasonal prices in an effort to gain from high cash selling prices and an insurance indemnity. These issues are considered in this paper, which is designed to present future research opportunities associated with the LRP insurance program. Given that use of LRP is relatively low, even in states with a concentrated educational and marketing effort, and that the 2004 loss ratio was only 7%, it appears unlikely that LRP is vulnerable to this type of adverse selection and that producers understand that some basis risk is still present.

LRP Basis

When using CME put options or futures contracts to protect against price level changes, hedgers remain exposed to basis risk, a change in the difference between their local cash price and futures price. Livestock producers using LRP insurance to hedge sales prices are also exposed to a type of basis risk. However, the difference between producers' selling price and futures price, or futures basis, is not relevant when using LRP. Instead,

the difference between the producers' selling price and the cash price used to determine AEV, or *LRP basis*, is relevant when hedging with LRP. Changes in the relationship between a producers' cash sale price and the AEV (i.e., changes in the LRP basis) will determine whether the actual net selling price (at the conclusion of the hedge) is equal to the expected hedged price. Consequently, understanding the magnitude and seasonal trends in LRP basis is important when hedging with LRP.

Because LRP insurance is indemnified on cash prices (AEV), there is the potential for the LRP basis risk to be smaller for livestock producers. Instead of being exposed to the basis difference between local cash selling prices and futures prices, LRP users have basis risk associated with the difference between the local cash selling price and AEV (e.g., 5-area slaughter cattle price, feeder cattle cash index, or lean hog cash index). Basis risk is reduced by the difference between the futures market and AEV, which is likely to be small, especially for feeder cattle and swine due to the convergence of the futures price with the cash indexes. Given that LRP basis is the difference of two cash prices and the AEV price/index may incorporate the local cash selling price to a small or large degree depending upon the geographic location and market volume, there exists the possibility for LRP basis to be smaller and less variable than traditional futures basis.

Fed Cattle LRP Basis

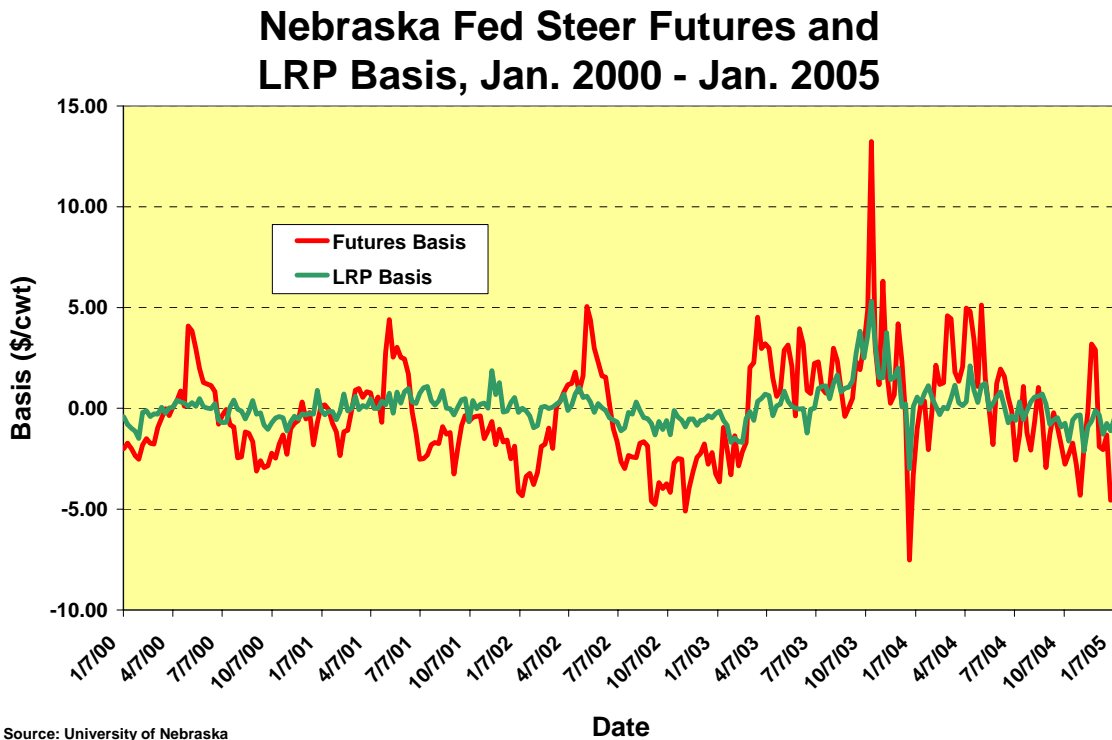
Fed cattle AEV is equivalent to the 5-area weekly weighted average direct slaughter steer price for steers grading 35% to 65% choice sold FOB on a live weight basis. This 5-area price includes slaughter cattle sales in Texas/Oklahoma, Kansas, Colorado, Iowa/Minnesota, and Nebraska. Therefore, the AEV closely follows these cash markets, implying that LRP basis should be relatively small in these areas. Figure 1 illustrates both LRP and futures basis for Nebraska fed steers from January 2000 to January 2005. Over that time period, LRP basis was closer to zero and appeared less variable than futures basis. This suggests that hedgers may be able to more accurately anticipate LRP basis for hedging purposes using a naïve forecast such as an historical average. Therefore, the impact on actual net selling price resulting from the hedge will be lessened by smaller differences between the expected (forecasted) and actual LRP basis. Seasonally, fed cattle LRP basis in Nebraska tends to be strongest from April through June and weakest from December through March (see Figure 1 and Mark, 2004a).

Table 1 summarizes statistics for LRP basis and traditional futures basis for Nebraska direct steers and heifers from January 2000 to January 2005. Note that fed heifers can be insured with LRP, but that the indemnity is still determined relative to the 5-area steer price (the same AEV as for fed steers). The mean LRP basis for Nebraska fed steers and heifers indicates that, on average, the Nebraska direct steer and heifer price was \$0.07/cwt and \$0.16/cwt higher than the AEV, respectively. The mean steer and heifer LRP basis was \$0.36/cwt and \$0.37/cwt higher than the traditional nearby futures basis. The range in LRP basis from 2000 to January 2005 was about one-third to one-half of the range in futures basis. The standard deviation for Nebraska steer and heifer LRP basis is

about a third of that for futures basis, confirming that LRP basis is less variable than futures basis.

Because hedgers are accustomed to using averages of historical basis to forecast basis for the particular week or month of the year when they intend to lift a hedge, it is useful to consider both the length of the historical average for the particular week or month that provides the best forecast and the variability of basis within each week or month across those years. Analysis of the historical average fed cattle LRP basis from 1997 to 2004 showed that the root mean squared error of the historical forecasts were minimized when using a four-year average. Standard deviations of both LRP and futures were calculated within each week of the year across the four-year period from 2001-2004 for both steers and heifers. The average of these weekly standard deviations for fed steer and heifer LRP basis was \$0.85/cwt and \$0.76/cwt. The corresponding average standard deviations for futures basis were \$1.99/cwt and \$1.85/cwt. The substantial reduction in weekly basis variation for LRP suggests that forecasting LRP basis using the historical average is less risky than for futures basis. Therefore, the actual net selling price from the hedge will not differ as much from the expected hedged price for LRP hedges.

Figure 1



Source: University of Nebraska

Table 1. Nebraska Direct Steer and Heifer LRP Basis and Futures Basis Summary Statistics, 2000-January 2005.

	Steer LRP Basis (\$/cwt)	Steer Futures Basis (\$/cwt)	Heifer LRP Basis (\$/cwt)	Heifer Futures Basis (\$/cwt)
Mean	0.07	-0.29	0.16	-0.21
Minimum	-2.99	-7.52	-2.34	-4.85
Maximum	5.32	13.24	4.17	12.09
Standard Deviation	0.94	2.46	0.82	2.29

Swine LRP Basis

Swine AEV is determined from the 2-day volume weighted average of negotiated and swine or pork market formula average net carcass prices reported by USDA Agricultural Marketing Service. It is equivalent to the CME lean hog cash price index against which the lean hog futures contract is settled. This price index represents national prices for hog sales, but would tend to represent geographic areas where market hog inventory numbers are more concentrated. Swine LRP basis is the difference between a producer's selling price and the AEV. Because a producer's cash selling price may be contractually linked to either the Iowa/Southern Minnesota, Western Corn Belt, Eastern Corn Belt, or National base or average hog prices, LRP basis variability is considered for each of these price series. Western Corn Belt average swine LRP basis and futures basis is shown in Figure 2 from August 2001 to January 2005. As with fed cattle LRP basis, swine LRP basis appears somewhat less variable and closer to zero than futures basis (Figure 2), although not to the same extent as fed cattle (Figure 1). Thus, it may be likely that swine producers can benefit from a less variable basis when hedging with LRP rather than futures. Seasonal trends in LRP basis are illustrated in Mark, 2004b. Generally, swine LRP basis tends to be strongest in May and September and weakest in late August and December.

Table 2 reports summary statistics for LRP basis and traditional futures basis for hogs using the price series listed above from August 2001 to January 2005. The mean LRP basis for the Western Corn Belt average hog price of \$0.57/cwt indicates that, on average, the Western Corn Belt average hog price is \$0.57/cwt higher than the AEV. Relative to the AEV, the base price series are lower than the average price series due to the premiums included in the average and net prices. The mean LRP basis for all the swine price series was about \$0.34/cwt lower than the futures basis. The range in LRP basis from August 2001 to March 2004 was substantially smaller than for futures basis. Further, the standard deviation of LRP basis was about half of the futures basis standard deviation. Like fed cattle, this suggests that LRP basis is less variable over time and may be predicted by producers more accurately when using an historical average.

The swine AEV is based on a price series initiated on August 1, 2001 following the Mandatory Price Reporting Act. Therefore, insufficient data exists to determine the length of average that best forecasts the current year basis. However, standard deviations of both LRP and futures basis were calculated within each week of the year across the four-year period from 2001-2004 for each swine price series. The average of these weekly standard deviations for Western Corn Belt LRP basis was \$1.45/cwt compared to \$2.84/cwt for Western Corn Belt futures basis. The other price series also showed about a fifty percent decrease in weekly basis variability for LRP relative to futures. As with fed cattle, this substantial reduction in weekly basis variation for LRP suggests that forecasting LRP basis using the historical average is less risky than for futures basis and that the actual net selling price from the hedge will not differ as much from the expected hedged price for LRP hedges.

Figure 2

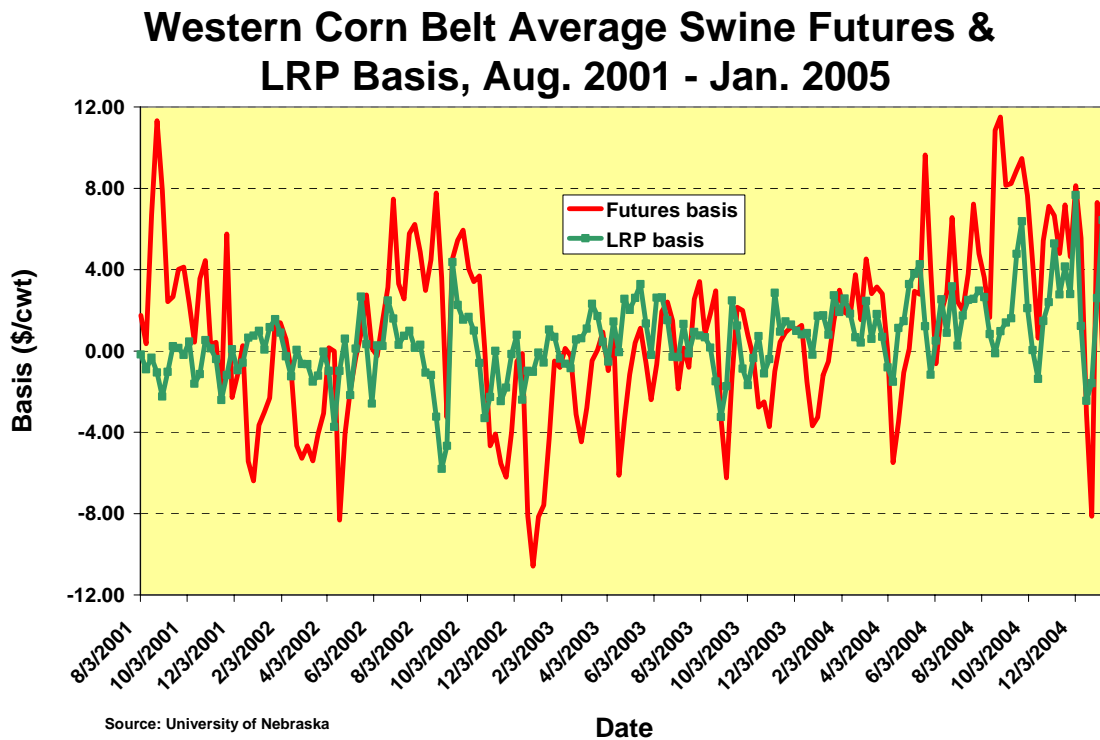


Table 2. Swine LRP Basis and Futures Basis Summary Statistics, Aug. 2001 to Jan. 2005.

Hog Price Series	Mean	Minimum	Maximum	Standard Deviation
	(\$/cwt)	(\$/cwt)	(\$/cwt)	(\$/cwt)
Western Corn Belt Base				
LRP Basis	-2.68	-17.07	2.58	2.36
Futures Basis	-2.33	-23.60	8.42	4.36
Western Corn Belt Average				
LRP Basis	0.57	-5.80	7.67	1.93
Futures Basis	0.91	-10.58	11.50	4.20
Iowa/S. Minnesota Base				
LRP Basis	-2.81	-17.02	2.63	2.53
Futures Basis	-2.46	-23.56	8.29	4.58
Iowa/S. Minnesota Average				
LRP Basis	0.51	-5.62	6.68	1.88
Futures Basis	0.85	-10.57	11.86	4.20
Eastern Corn Belt Base				
LRP Basis	-3.24	-19.93	-0.19	2.26
Futures Basis	-2.90	-23.32	9.22	4.25
Eastern Corn Belt Average				
LRP Basis	-0.41	-6.21	2.59	1.44
Futures Basis	-0.07	-10.27	11.97	4.00
National Base				
LRP Basis	-2.22	-6.36	2.52	1.73
Futures Basis	-1.88	-10.33	10.37	3.67
National Net				
LRP Basis	0.27	-3.97	5.79	1.82
Futures Basis	0.62	-8.16	12.94	3.67

Feeder Cattle LRP Basis

Feeder cattle AEV, equivalent to the CME feeder cattle cash index, is a volume weighted average of prices for medium and medium/large frame #1 feeder steers weighing between 700 and 849 lbs. Feeder cattle that are insurable under LRP include: 1) steers and heifers weighing 600-900 lbs., 2) steers, bulls, and heifers weighing less than 600 lbs., 3) feeder cattle of predominately dairy breed, and 4) feeder cattle of predominately Brahman breed. Regardless of the type, weight, or sex, all feeder cattle insured under LRP are

indemnified against the same AEV based on 700-849 lb. steer prices. In the 2005 insurance crop year, the underwriting rules were modified to include constant price adjustment factors (PAF) for heifers, lighter weights (<600 lbs), and dairy and Brahman breeds. The PAFs increase or decrease the LRP's EEV, AEV, coverage prices, and premiums by the constant percentage amounts shown in Table 3.

The PAFs are intended to reduce the price spread between the insured feeder cattle and the AEV, or to shift LRP basis closer to zero when insuring heifers, dairy or Brahman cattle, or light weight feeders. Because the PAFs are a constant percentage adjustment, the variability of LRP basis with the PAFs is unchanged relative to LRP basis before the PAFs were implemented. However, by using a constant percentage to adjust for the premiums and discounts that vary according to market conditions, the PAFs are likely to over or under compensate for the differences at different geographic locations, price levels, or within the year. For example, 700-800 lb. steer prices in Nebraska averaged \$95.65/cwt from 2002-04 while heifer prices (700-800 lb.) averaged \$6.25/cwt lower at \$89.40/cwt, or 93.5% of the steer price. During this time period, the average AEV (CME cash price index) was \$91.30/cwt, so the 10% PAF reduction for heifers implies that the AEV for heifers was \$82.17/cwt. Without the PAF, the 700-800 lb. heifer LRP basis would have been -\$1.81/cwt (\$1.81/cwt under the \$91.30/cwt steer AEV). However, the PAF caused the AEV for the heifers to decrease by \$9.13/cwt to \$82.17/cwt. Thus, the 700-800 lb. heifer price was more than \$7/cwt higher than the heifer AEV. So, rather than the 700-800 lb. heifer LRP basis being approximately \$2/cwt under than the AEV the policy is indemnified on, it is over \$7/cwt over than the AEV (after the PAF). In other cases, the goal of the PAF lowering the basis spread was accomplished. Nebraska 500-600 lb. steers, for example, had an LRP basis of \$9.56/cwt with the PAF compared to \$18.70/cwt without the PAF.

Because the PAFs are a constant percentage of price, the actual dollar adjustment increases during times with high prices and decreases at low-priced times. However, price spreads between steer and heifer prices are likely to be lower during times of high prices, especially during inventory lows when heifer demand is high both for feeding and replacement breeding stock. Further, the PAFs, while not changing the ability of producers to successfully use LRP as long as they anticipate their basis when initiating the hedge, do not necessarily reduce LRP basis to zero which would allow users the ease of assuming their EEV or coverage price is equivalent to the actual net price they will receive.

Table 3. Feeder Cattle LRP Price Adjustment Factors

Weight Category	Steers	Heifers	Dairy	Brahman
	%	%	%	%
Less Than 600 lbs.	110	100	100	100
600-900 lbs.	100	90	90	80

Figure 3 suggests that for Nebraska feeder cattle, LRP basis is similar to futures basis for 700-799 lb. steers. Unlike fed cattle and swine, it does not appear that LRP basis is smaller or less variable than futures basis (similar relationships are observed for other weights and heifers). This is confirmed in Table 4 where summary statistics are reported for LRP basis and traditional futures basis for Nebraska feeder steers and heifers weighing from 500-900 lbs. in 100-lb. increments. The mean LRP basis for Nebraska 700-800 lb. feeder steers of \$4.44/cwt indicates that, on average, the Nebraska 700-800 lb. feeder steer price is \$4.44/cwt higher than the LRP AEV. The stronger LRP and futures basis for lighter weight feeder cattle is a reflection of higher cash prices paid for lighter animals. The substantially lower LRP basis for 500-600 lb. steers relative to futures basis is a result of the 110% price adjustment factor applied to AEV. Similarly, the heavier weight feeder heifer LRP basis averages are higher than the futures basis due to the 90% price adjustment factor (LRP basis is substantially higher because the 90% PAF overstates the difference between 800-900 lb. feeder heifer prices in Nebraska and the AEV by approximately 7%).

The range (difference between maximum and minimum) observed in LRP basis was somewhat smaller than the range for futures basis for each category except 700-800 lb. heifers (Table 4). However, the reduction was not as great as for LRP basis in fed cattle and swine. Further, the variability did not decline similarly for feeder cattle LRP basis. In most cases, the standard deviation was only slightly smaller for LRP basis. The benefit of the less variable LRP basis as observed for fed cattle and swine does not appear to hold for feeder cattle.

The Nebraska combined weighted average feeder cattle price began in 1999, so insufficient data exists to determine the length of average basis that best forecasts the current year LRP basis over a long time period. However, standard deviations of both LRP and futures basis were calculated within each week of the year across 2002-2004 for each steer and heifer weight category. The average of these weekly standard deviations for 700-800 lb. steer LRP basis was \$1.72/cwt compared to \$2.20/cwt for futures basis. Similar reductions of less than 30% in the average weekly standard deviations for LRP basis compared to futures basis were observed for other types and weights of feeder cattle. This is smaller than the 40-50% reductions seen for fed cattle and swine. So, while feeder cattle LRP basis is somewhat less variable than futures basis, the improvement in feeder cattle basis risk is not as great for Nebraska LRP users as for fed cattle and swine.

Figure 3

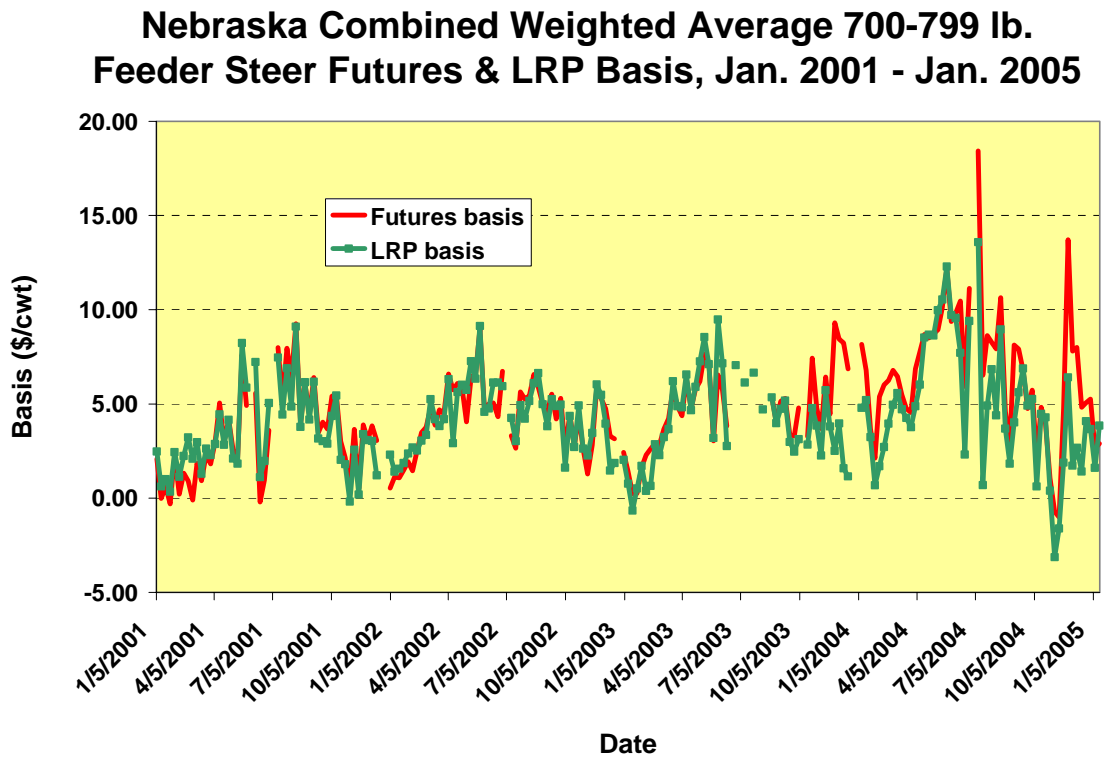


Table 4. Nebraska Feeder Steer and Heifer LRP Basis and Futures Basis Summary Statistics, 2002-2004.

	Mean	Minimum	Maximum	Standard Deviation
	<i>(\$/cwt)</i>	<i>(\$/cwt)</i>	<i>(\$/cwt)</i>	<i>(\$/cwt)</i>
500-600 lb. Steer				
LRP Basis	9.56	-5.65	23.08	7.02
Futures Basis	19.60	5.74	36.23	6.97
600-700 lb. Steer				
LRP Basis	10.19	1.30	21.75	4.13
Futures Basis	11.07	1.74	26.60	4.34
700-800 lb. Steer				
LRP Basis	4.44	-3.13	13.58	2.62
Futures Basis	5.32	-1.02	18.43	2.77
800-900 lb. Steer				
LRP Basis	0.03	-7.88	7.18	2.38
Futures Basis	0.92	-7.43	12.03	2.84
500-600 lb. Heifer				
LRP Basis	9.02	-1.37	18.96	5.08
Futures Basis	9.93	-1.54	20.43	5.35
600-700 lb. Heifer				
LRP Basis	11.63	3.10	18.55	3.21
Futures Basis	3.39	-5.14	11.73	3.36
700-800 lb. Heifer				
LRP Basis	7.31	-0.53	18.34	2.48
Futures Basis	-0.93	-9.15	8.10	2.59
800-900 lb. Heifer				
LRP Basis	4.03	-7.67	11.32	2.52
Futures Basis	-4.19	-18.15	3.41	2.71

Temporal Price/Basis Risk

Producers using LRP select an end date for the insurance policy that corresponds to the intended marketing date for their livestock. Once that end date is chosen and the LRP endorsement is created, the end date cannot be moved, even in the event the livestock growth rate increased or decreased from expected and the revised actual marketing date is earlier or later. Further, the LRP insurance indemnity is determined only on the end date, and any potential value (intrinsic or extrinsic) cannot be captured earlier or later than the end date. Thus, LRP insurance is similar to a European option contract. As indicated earlier, the LRP policy restricts producers from marketing the livestock more than 30 days before the end date (if they sell more than 30 days early, they forfeit the premium paid and the right to collect an indemnity on the end date if one were due). Producers can market their livestock at any time after the end date without voiding the policy, but the indemnity is still payable on the end date.

If producers market their livestock other than on the LRP end date, they are exposed to price level risk between the actual sales date and the marketing date. Assume, for example, a producer sells 25 days before the end date at a price that would trigger an indemnity but price rises on the end date such that no indemnity is actually due. As a result, the net selling price is lower than expected when the hedge was initiated and the coverage price and expected basis were determined. Conversely, the producer could sell 25 days before the end date at a high price and still collect an indemnity if the AEV on the end date fell below the insured coverage price. The opposite is true if the livestock were marketed after the LRP end date.

Although LRP prevents producers from lifting the hedge early, it leaves them unhedged between the time they sell the livestock and the end date (up to 30 days). A long position in the futures market could be used to offset the price risk in this situation; however, LRP policy provisions restrict producers from taking offsetting positions in the futures market (to prevent capturing the 13% government subsidy on the premium). Some potential users have viewed this potential 30-day market window without price protection as an opportunity to market livestock at a high price and still collect an indemnity on the end date. This requires the AEV to be lower than the coverage price on the end date but higher either 30 days before or any time after the end date. Table 5 shows the average, largest decrease, and largest increase in the swine, fed cattle, and feeder cattle AEV from 2001-2004. On average, the 30-day change in AEV is very small, suggesting that over time capitalizing on the short term changes in price would be difficult because there is not a consistent bias in the 30-day change in AEV. Further, the sizeable increases and decreases in AEV observed over time imply this would be fairly risky.

Strategically timing the end date of the LRP insurance policy for a time with expected low prices but within 30 days of a higher price might not only be difficult to consistently do, but it also would likely not be possible given the LRP coverage prices and premiums offered for a particular time in the future. A regression of the 30-day AEV changes on monthly binary variables indicates there is a seasonal pattern corresponding to the seasonal price pattern of the AEV and several months have price changes that are

statistically different than zero. However, because the EEV and coverage prices available in LRP insurance are determined every day on market conditions and are presumably based on deferred futures prices, this seasonal trend is already incorporated into EEVs and coverage prices available for future dates. Thus, with the seasonal price trend already established in LRP EEVs and coverage prices, it would be difficult to select an end date that would allow (with foresight) the opportunity to capture a high price 30 days before or after the end date and a price low enough to collect an indemnity on the end date. Essentially, a counter-seasonal price trend would have to occur. Further, insured coverage prices are 70-95% of the EEV for the future end date. This deductible reduces the insured coverage price below the EEV, requiring that price would have decline 5-30% lower than the current EEV for an indemnity to be paid.

Table 5. Thirty Day Change in Actual Ending Value (AEV), 2001-2004

	Average	Largest Decrease	Largest Increase
	(\$/cwt)	(\$/cwt)	(\$/cwt)
Swine AEV (CME Index)	-0.19	19.10	12.64
Fed Cattle AEV (5-Area Price)	0.22	25.56	18.57
Feeder Cattle AEV (CME Index)	-0.05	15.26	6.72

Summary

LRP insurance provides a substantial basis risk reduction to Nebraska fed cattle and swine producers, but not for feeder cattle. The decrease in basis variability when using LRP instead of futures or options is likely because the local, Nebraska prices represent a greater proportion of the AEV on which the LRP insurance contract is indemnified for fed cattle and swine relative to feeder cattle. The fed cattle AEV, or 5-area cash price, is weighted heavily with Nebraska prices. Therefore, the difference between Nebraska prices and the AEV (LRP basis) is relatively small and less variable. Similarly, for hog producers with contracts based on the regional or national price series discussed earlier, the LRP basis, or difference between their contract selling price and AEV tends to be reduced. Basis variability did not decrease for Nebraska feeder cattle prices because the LRP AEV for feeder cattle (CME feeder cattle cash index) does not weight Nebraska prices as heavily as do the AEVs for fed cattle and swine. Further, the quality premiums and discounts observed geographically in the feeder cattle market increase the range of prices incorporated into the feeder cattle AEV.

The basis risk reduction for fed cattle and swine can be an important advantage for producers to consider when selecting a hedging instrument. The implementation of the price adjustment factors (PAFs) for feeder cattle may also be beneficial in reducing basis to near zero for some types of feeder cattle or certain geographic locations.

If users of LRP could selectively establish policy end dates that would consistently allow them to capture an insurance indemnity and a high cash sales price for the livestock, there would be an opportunity for adverse selection. It does not, however, appear that this possibility exists due to the LRP EEVs, coverage prices, and premiums reflecting expected seasonal price patterns. Further, expected changes in AEVs are not consistently biased over time and have the potential to be large. Attempting to predict changes in AEVs and constructing LRP hedges to benefit from anticipated changes would not be any easier than predicting future cash prices or futures prices.

Several opportunities exist for research on LRP insurance. First, the EEV is determined through a calculation that is not publicly available, but is likely based on some futures price and/or cash price forecast for a future date (the policy end date). It is possible that this model's forecasts of EEVs result in errors, which would imply that the EEV could be too high or low relative to the AEV. An LRP user who could forecast the EEV better than the program's model would be able to predict better when an LRP indemnity might be paid. Another issue to examine is whether basis risk variability is reduced for feeder cattle in other geographic locations. Forecasting models that predict LRP basis more accurately than naïve forecasts using historical averages would benefit hedgers using LRP.

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