

# Comparing LRP to a Put Option

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## Livestock Risk Protection (LRP) Outline

**LRP Feeder Cattle Coverage**

**LRP Premium**

**LRP Indemnity Payment**

**Compare LRP with CME Put Option**

**Market for LRP**

**LRP Issues**

**LRP Education**



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## What is LRP?

**A CME put option is an option on the underlining futures contract.**

**LRP is an option on the CME feeder cattle cash index price.**



LRP Coverage Prices, Rates, and Actual Ending Values - Report for 03/16/2005

**USDA subsidizes 13 percent of total LRP premium.**

State	County	Endorsement Length	Commodity	Type	Practice	Crop Year	Expected End Value	Coverage Price	Coverage Level	Rate	Cost Per CWT	End Date	Actual End Value
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$97.420	0.934300	0.013940	1.358	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$95.420	0.915100	0.010113	0.965	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$93.420	0.895900	0.007429	0.694	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$91.420	0.876800	0.005393	0.493	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$89.420	0.857600	0.003903	0.349	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$87.420	0.838400	0.003466	0.303	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$85.420	0.819200	0.002798	0.239	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$83.420	0.800000	0.002182	0.182	06/15/2005	
20 KANSAS	998 ALL COUNTIES	13	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.271	\$81.420	0.780800	0.001891	0.154	06/15/2005	
20 KANSAS	998 ALL COUNTIES	17	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.638	\$97.790	0.934600	0.018192	1.779	07/13/2005	
20 KANSAS	998 ALL COUNTIES	17	0801 FEEDER CATTLE	810 STEERS WEIGHT 2	997 NO PRACTICE SPECIFIED	2005	104.638	\$95.790	0.915400	0.013978	1.339	07/13/2005	
20 KANSAS	998 ALL COUNTIES	17	0801 FEEDER CATTLE	810 STEERS	997 NO PRACTICE	2005	104.638	\$93.790	0.896300	0.010918	1.024	07/13/2005	



## Price Adjustment Factors (PAF)

<i>Weight Range</i>	<i>Steers</i>	<i>Heifers</i>	<i>Predominately Brahman</i>	<i>Predominately Dairy</i>
	<i>&lt;6.0 cwt</i>	<i>110%</i>	<i>100%</i>	<i>100%</i>
<i>6.0-9.0 cwt</i>	<i>100%</i>	<i>90%</i>	<i>90%</i>	<i>80%</i>



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## 26 Week LRP Guarantee Example on 5.0 cwt Steer Calves

Commodity: 50 head Feeder Cattle @5.0 cwt  
 Type: Steers under 6.0 cwt  
 Expected ending value: \$104.034 per cwt X 110% = \$114.437  
 Coverage level: 94.37 %  
 Coverage price: 94.37 % X \$114.437 = 108 per cwt  
 Insured  
 Value: 50 hd X 100% Share X 5.0 cwt x \$108= \$27,000  
 End date: 09/14/2005  
 Rate: \$0.030108 per insured dollar  
 Total Premium \$0.030108 X \$27,000 = \$813  
 Farmer Paid Premium: \$813 X (1 - 0.13) = \$707  
 Farmer cost per cwt: \$707/5.0 cwt/50 hd = \$2.828 cwt



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## Example LRP Indemnity Payment

If the CME Feeder Cattle Cash Index Price on the last day of LRP coverage is below the guarantee, indemnity is paid.

**Coverage price:** \$108 per cwt

**CME Index**

**Price:** \$90.91 on final LRP day X **110%** = \$100

**Payment Rate:** \$108 - \$100 Adj. CME Index = \$ 8.00 cwt

**Indemnity Payment:**

50 hd X 100% Share X 5.0 cwt x \$8 = \$2,000



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## Total Revenue for Example 50 Steers

**Insured Value:** \$27,000

**LRP Indemnity Payment:** \$2,000

**Cash Sales:** ??

**Total Revenue:** ??

**Basis Risk:**

The price basis risk or difference between local cash and CME price index.

The calves may not perform, both weight and quality.

Time basis risk, LRP does not settle on the day of the cash sale.

**Death Loss**



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## Compare Livestock Risk Protection (LRP) Contract with Chicago Mercantile Exchange (CME) Put Option Premiums for Similar Coverage

1 Coverage Date	03/17/05	03/16/05	03/15/05	03/14/05	03/11/05
<b>Section I LRP Offer</b>					
2 LRP Weeks Covered <sup>1</sup>	26.0	26.0	26.0	26.0	26.0
3 LRP Expiration Date	09/15/05	09/14/05	09/13/05	09/12/05	09/09/05
4 % Coverage of Expected Market Price	94.79%	94.37%	94.45%	94.74%	94.79%
5 LRP Guarantee or "Put Strike" <sup>2</sup>	\$98.19	\$98.18	\$98.22	\$98.21	\$98.29
6 750 lbs calf Farmer Paid Premium <sup>3</sup>	\$19.39	\$19.29	\$19.30	\$19.66	\$19.17
7 Farmer Paid LRP Premium per CWT	\$2.58	\$2.57	\$2.57	\$2.62	\$2.56



## Compare Livestock Risk Protection (LRP) Contract with Chicago Mercantile Exchange (CME) Put Option Premiums for Similar Coverage

1 Coverage Date	03/17/05	03/16/05	03/15/05	03/14/05	03/11/05
<b>Section II Put Contract Alternative</b>					
8 Option Expiration Date	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05
9 September Feeder Cattle Futures Close	\$103.400	\$103.850	\$103.775	\$103.450	\$103.675
10 September Feeder Cattle Put Strike	\$98.00	\$98.00	\$98.00	\$98.00	\$98.00
11 September Put Premium	\$2.600	\$2.600	\$2.600	\$2.650	\$2.600
12 Commission <sup>4</sup>	\$50	\$50	\$50	\$50	\$50
13 Total Producer Costs for a Put	\$1,350.00	\$1,350.00	\$1,350.00	\$1,375.00	\$1,350.00
14 Total Put Cost per 100 CWT	\$2.70	\$2.70	\$2.70	\$2.75	\$2.70
<b>Section III. Cash Comparison Put Vs. LRP</b>					
15 LRP Vs. Put Cash Prem. Difference	(\$0.12)	(\$0.13)	(\$0.13)	(\$0.13)	(\$0.14)
16 % Diff. between LRP & Put premiums	(4.26%)	(4.75%)	(4.69%)	(4.68%)	(5.33%)



**Compare Livestock Risk Protection (LRP)  
Contract with Chicago Mercantile Exchange  
(CME) Put Option Premiums for Similar Coverage**

**LRP & Put do NOT expire on the same date, most  
of the time**

**LRP & Put do not have the same expected price  
or strike value**

**LRP is an European Option, no right to exercise**

**So one can NOT compare cash cost because they  
do not have the same coverage & expiration  
dates**



**Compare Livestock Risk Protection (LRP)  
Contract with Chicago Mercantile Exchange  
(CME) Put Option Premiums for Similar Coverage**

**LRP priced using option pricing model (John C.  
Hull, published by Prentice Hall)**

**Calculate implied volatility from current CME  
option premiums**



**Calculate current "fair market" option premium  
for LRP based on LRP expiration date, European  
option, LRP expected market price, and LRP  
strike**



## Compare Livestock Risk Protection (LRP) Contract with Chicago Mercantile Exchange (CME) Put Option Premiums for Similar Coverage

1 Coverage Date	03/17/05	03/16/05	03/15/05	03/14/05	03/11/05
<b>Section IV. Value of LRP based on Today's Market and LRP Expiration Date</b>					
17 LRP Estimated Market Price <sup>5</sup>	\$103.588	\$104.034	\$103.994	\$103.662	\$103.690
18 KSU Est. September Volatility <sup>6</sup>	16.61	17.08	16.96	16.74	16.68
19 KSU Estimated "Put" Premium to Provide Similar LRP Coverage based on Today's Market <sup>7</sup>	\$2.456	\$2.440	\$2.435	\$2.474	\$2.477
20 KSU Est. "Put" Premium +Commission	\$2.56	\$2.54	\$2.54	\$2.57	\$2.58
<b>Section V. Comparison of Put Vs. Current Market Value of LRP</b>					
21 LRP - Est. Market Value of LRP Put	\$0.03	\$0.03	\$0.04	\$0.05	(\$0.02)
22 % Current Market Value LRP Discount	1.13%	1.25%	1.52%	1.84%	(0.81%)



LRP Premium = \$2.58

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## Compare Livestock Risk Protection (LRP) Contract with Chicago Mercantile Exchange (CME) Put Option Premiums for Similar Coverage

1 Coverage Date	03/17/05	03/16/05	03/15/05	03/14/05	03/11/05
<b>Section VI. Underwriting Gains/Losses</b>					
23 Company Expected Payout	\$2.46	\$2.44	\$2.44	\$2.47	\$2.48
24 Farmer Paid Premium	\$2.58	\$2.57	\$2.57	\$2.62	\$2.56
25 Farmer Paid per Dollar Loss Ratio	\$0.95	\$0.95	\$0.95	\$0.94	\$0.97
26 Insurance Company Premium Received	\$2.97	\$2.96	\$2.96	\$3.01	\$2.94
25 Expected Underwriting gain	\$0.52	\$0.52	\$0.52	\$0.54	\$0.46
27 Expected % Underwriting gain	17.34%	17.46%	17.68%	17.89%	15.69%

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25 Expected Underwriting gain	\$0.52	\$0.52	\$0.52	\$0.54	\$0.46
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**Compare Livestock Risk Protection (LRP)  
Contract with Chicago Mercantile Exchange  
(CME) Put Option Premiums for Similar Coverage**

**Add in 12 point CAT load and Calculated  
premiums are "about the same" as the LRP  
premium set by RMA**

**Little effective net subsidy from 13% subsidy**

**Any "effective subsidy" will be similar to no  
commissions being charged to producers**



**Cost of Risk Reduction with Insurance:  
1995-1997 Loss Ratios (cost = 100-LR)**

<b>accident and health (1997 only)</b>	<b>82.6</b>
<b>commercial auto</b>	<b>67.0</b>
<b>passenger auto</b>	<b>66.2</b>
<b>homeowners</b>	<b>66.5</b>
<b>product liability</b>	<b>71.4</b>
<b>medical malpractice</b>	<b>56.7</b>
<b>workers' compensation</b>	<b>63.3</b>
<b>private crop hail</b>	<b>60-70 ?</b>
<b>federal crop insurance</b>	<b>150 to 200 ??</b>



## Participation and Loss Ratios for Livestock Insurance

July 2004-June 2005

Ins Plans	Pol Sold	Pol Earn Prem	Pol Indem	Units Earn Prem	Units Indem	Number of Head	Liabilities	Total Premium	Subsidy	Indemnity	Loss Ratio
LGM	244	237	0	365	0	428,684	41,733,799	2,235,723	0	0	0.00
LRP	2,234	1,020	0	1,460	0	175,365	73,529,839	1,693,227	220,123	0	0.00
<b>Grand Total:</b>	<b>2,478</b>	<b>1,257</b>	<b>0</b>	<b>1,825</b>	<b>0</b>	<b>604,049</b>	<b>115,263,638</b>	<b>3,928,950</b>	<b>220,123</b>	<b>0</b>	<b>0.00</b>

July 2003-June 2004

Ins Plans	Pol Sold	Pol Earn Prem	Pol Indem	Units Earn Prem	Units Indem	Number of Head	Liabilities	Total Premium	Subsidy	Indemnity	Loss Ratio
LGM	0	327	91	350	259	760,731	57,454,614	3,248,633	0	6,869,499	2.11
LRP	0	691	49	1,125	74	267,091	137,869,888	3,804,754	494,632	259,130	0.07
<b>Grand Total:</b>	<b>0</b>	<b>1,018</b>	<b>140</b>	<b>1,475</b>	<b>333</b>	<b>1,027,822</b>	<b>195,324,502</b>	<b>7,053,387</b>	<b>494,632</b>	<b>7,128,629</b>	<b>1.01</b>



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## Producer's LRP Advantages

LRP premiums are "fair" but they are priced similar to "market value" and little (no) "effective" producer subsidy.

**Flexible contract size**

**Flexibility to incremental minimum price a few head at a time**



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## OPERATIONS WITH BEEF COWS, BY SIZE CATEGORY, SELECTED STATES, 2002

State	1-49 Head	50-99 Head	100-499 Head	Less Than 500 Head	500+ Head	Total
<b>CO</b>	<b>6,300</b>	<b>1,700</b>	<b>2,250</b>	<b>10,250</b>	<b>250</b>	<b>10,500</b>
<b>KS</b>	<b>18,600</b>	<b>5,200</b>	<b>4,020</b>	<b>27,820</b>	<b>180</b>	<b>28,000</b>
<b>NE</b>	<b>12,200</b>	<b>4,200</b>	<b>5,070</b>	<b>21,470</b>	<b>530</b>	<b>22,000</b>
<b>TOTAL</b>	<b>37,100</b>	<b>11,100</b>	<b>11,340</b>	<b>59,540</b>	<b>960</b>	<b>60,500</b>

Source: USDA



### Producer's LRP Advantages

**Premiums are tax deductible, not true when producers mix speculative with hedging in their futures account**

**Commission on LRP are paid by RMA**

**May receive better loan terms on LRP insured cattle**

**Producers may purchase LRP on calves: later retain ownership through back grounding & insure; later retain ownership through fattening & insure**

**Under the above scenario producers would have 3 LRP contracts on the same calves, or they could purchase fewer LRP contracts but with later expiration dates**

**Orders are filed at the stated premium**



**CME Feeder Cattle, Oct 04 Option, Future  
price: 103475  
(3/15/05)**

Contract	P/C	Open	High	Low	Last	Change	Bid	Ask	Vol	Op Int	Time
OCT 05	88000P	0	0	0	1000*	0	0	0	5	8	04:42
OCT 05	90000P	0	0	0	1300*	0	0	0	0	9	05:41
OCT 05	94000P	0	0	0	1900*	-100			8	11	12:28
OCT 05	96000P	0	0	0	2300*	-100			0	3	13:44
OCT 05	98000P	0	0	0	2900*	-100	0	0	0	2	21:27
OCT 05	100000P	0	0	0	3500*	0			0	1	14:09
OCT 05	104000C	0	0	0			4000	5000	0	0	10:45
OCT 05	106000C	0	0	0	3000*	0			0	1	04:42
OCT 05	108000C	0	0	0	2200*	0			0	2	14:09
OCT 05	110000C	0	0	0	1400*	0			0	8	13:44



**Producer's LRP Disadvantages**

**Cannot exercise or cancel LRP contract. An issue if cattle are sold early because of drought damaged pastures.**

**Contracts offered in 4 week increments and may not match cash sale. Sell cattle 30 days early and offset the put on the same day, but LRP remains in force until it expires 30 days later leaving the producer in a short spec position.**



## Producer's LRP Disadvantages

**Replace sold cattle with a long futures and maintain LRP hedge but one **Cannot take an offsetting position****

**Limited to 2,000 feeders, and 4,000 fat cattle**

**Can not roll up the put coverage in a rising market**



## Producer's LRP Disadvantages

**Coverage is always greater than 5% out of the money and in some cases almost 10%**

**The expected net subsidy from crop insurance is about 50% but none is expected for LRP**

**If company exceeds its premium limit, producers with that company's policy can not buy additional SCEs even though other companies still have capacity to sell**



## Lender's LRP Advantages

**Lenders may prefer LRP over a put to cover loan collateral**

**Producers can not cancel the coverage**

**No "Texas Hedge"**

**Legally LRP is insurance, so Lenders can take a security interest in the contract**

**Purchased from a crop insurance agent**



## Insurance company issues

**There is only one private reinsurance company for LRP**

**The SRA for livestock shifts more of the risk to the insurance company**

**The losses will be highly correlated and in a falling market there will be large indemnity payments**

**The annual LRP experience will generate either very large underwriting gains or very large underwriting losses**



## Extension Education

**All day workshop using a cow-calf case problem.  
Allows producers to compare puts and LRP.**

**Analysis and discussion posted on  
AgManager.info**

**Radio programs**

**"30 minute" awareness meetings**

**Extension bulletins**



## Summary-LRP

**LRP does not guarantee a cash price**

**LRP protects against a negative change in CME  
Cash Index Price**

**LRP does NOT guarantee the basis**

**Policy does not cover any other peril**

