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Managing Cattle Market Risk with LRP Insurance

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Market Report	Year Ago	4 Wks Ago	12-15-17
Livestock and Products, Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	*	NA	*
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	145.49	NA	177.37
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	137.76	NA	162.67
Choice Boxed Beef, 600-750 lb. Carcass.	192.05	NA	203.00
Western Corn Belt Base Hog Price Carcass, Negotiated	53.21	NA	55.42
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	76.42	NA	76.81
Slaughter Lambs, wooled and shorn, 135-165 lb. National.	138.63	NA	132.24
National Carcass Lamb Cutout FOB.	350.69	NA	380.49
Crops, Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	2.72	NA	3.24.
Corn, No. 2, Yellow **Columbus**, bu.	3.06	NA	3.12
Soybeans, No. 1, Yellow **Columbus**, bu.	9.29	NA	8.76
Grain Sorghum, No.2, Yellow Dorchester, cwt.	4.70	NA	5.57
Oats, No. 2, Heavy Minneapolis, Mn, bu.	2.97	NA	2.79
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	*	NA	162.50
Alfalfa, Large Rounds, Good Platte Valley, ton.	67.50	NA	87.50
Grass Hay, Large Rounds, Good Nebraska, ton.	65.00	NA	82.50
Dried Distillers Grains, 10% Moisture Nebraska Average.	110.00	NA	150.50
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	43.50	NA	45.00
* No Market			

Price and market uncertainties pose a significant risk to cattle producers with a substantial amount of money invested in breeding livestock, land, and other infrastructure. Price protection through the Chicago Mercantile Exchange (CME) futures contracts and options can be used to help mitigate this risk but, in the case of futures contracts, they can also introduce financial burdens in the form of margin calls. Furthermore, many medium to small-scale producers prefer not to get involved with trading futures and options contracts.

Livestock Risk Protection (LRP) insurance became available in the early 2000's from the USDA's Risk Management Agency to provide cattle producers with a price risk management tool that helps protect against unexpected downswings in the national market price. LRP is a single-peril insurance product that provides an indemnity to insured producers if a national cattle price index falls below a selected coverage price on the end date of the policy. Even though it functions much like a put option in that it creates a floor on the national selling price for cattle at a future point in time while still allowing the producer to benefit from price increases, it is not an actual put option that can be exercised or sold at any time before expiration to turn a profit on its intrinsic value. LRP is a European put in principle. It is a commitment to an end point in terms of determining value. However, for cattle producers interested in protecting value at a particular date in the production year cycle, it may be a good choice to help them mitigate that market risk.

LRP insurance for cattle is available in five different forms: LRP-Feeder Cattle Steers Weight 1 (< 600 pounds); LRP-Feeder Cattle Heifers Weight 1 (< 600 pounds); LRP-Feeder Cattle Steers Weight 2 (600-900 pounds); LRP-Feeder Cattle Heifers Weight 2 (600-900 pounds); and, LRP-Fed Cattle Steers & Heifers (> 900 pounds). Table 1 and Table 2 contain sales and indemnity data for Nebraska over the ten year period from 2008-2017 for the four Feeder Cattle products combined and the Fed Cattle product, respectively. Policies are sold when a producer completes an application with a livestock insurance agent. Premiums are not paid until a producer completes a Specific Coverage Endorsement (SCE) to purchase price protection for a particular group of animals. Only about 3% of all policies sold in Nebraska actually have premiums paid and insurance coverage attached to them.

Over the last ten years, an annual average of 154 LRP-Feeder Cattle policies have had premiums paid on them attaching coverage for an average of 18,064 animals per year. Approximately, 43% of policies have been indemnified over this period with annual results ranging from a high of 89% indemnified in 2016 to a low of 1% in the price upswing year of 2013. With $4.2 million of indemnities paid out on $5.6 million in total premium collected, the loss ratio for LRP-Feeder Cattle has averaged about 0.75 over 10 years.

LRP-Fed Cattle is a much less popular product in terms of volume of sales (Table 2). This is due to the fact that LRP has a limit that no more than 2,000 head of cattle can be insured per producer per year. Many of our

Table 1: LRP-Feeder Cattle Nebraska Summary of Business 2008-2017.

Year	Policies Sold	Policies Earning Premium	Quantity (Head)	Liabilities ($)	Total Premium ($)	Policies Indemnified	Indemnity ($)	Loss Ratio
2008	1,062	106	12,985	9,944,835	268,290	69	413,746	1.5422
2009	1,203	57	7,594	5,377,763	173,634	42	457,249	2.6334
2010	1,029	145	15,551	10,989,386	361,387	103	265,774	0.7354
2011	1,279	313	34,443	29,203,924	986,235	88	149,965	0.1521
2012	1,376	230	27,202	27,122,685	773,296	136	980,198	1.2676
2013	1,386	85	10,386	10,806,100	282,484	34	247,183	0.8750
2014	1,310	197	25,398	32,211,424	701,899	2	252	0.0004
2015	1,457	141	15,456	23,890,729	616,680	69	872,264	1.4145
2016	1,402	75	9,885	10,773,447	460,552	67	625,482	1.3581
2017	1,552	191	21,735	20,816,435	995,861	50	195,421	0.1962
TOTAL	**13,056**	**1,540**	**180,635**	**181,136,728**	**5,620,318**	**660**	**4,207,534**	**0.7486**

Table 2: LRP-Fed Cattle Nebraska Summary of Business 2008-2017.

Year	Policies Sold	Policies Earning Premium	Quantity (Head)	Liabilities ($)	Total Premium ($)	Policies Indemnified	Indemnity ($)	Loss Ratio
2008	131	6	1,294	416,836	2,403	3	38,662	1.1932
2009	138	3	334	347,541	11,260	2	196	0.0174
2010	134	10	1,467	1,634,670	46,919	1	2,087	0.0445
2011	166	9	632	863,967	35,521	4	5,676	0.1598
2012	146	6	389	571,394	17,085	3	5,821	0.3407
2013	144	5	1,709	2,873,442	74,550	3	47,696	0.6398
2014	151	10	1,789	3,055,621	71,667	0		0.0000
2015	139	7	1,156	288,532	9,771	1	50,382	0.7221
2016	165	11	636	1,094,373	41,947	7	58,225	1.3881
2017	198	18	1,864	2,605,096	107,466	1	6,329	0.0589
TOTAL	**1,512**	**85**	**11,270**	**16,751,472**	**508,589**	**25**	**215,074**	**0.4229**

feedlots in Nebraska market a lot more than 2,000 head per year and, therefore, utilize other tools to help manage price risk. Only about 29% of LRP-Fed Cattle policies earning a premium in Nebraska have been indemnified over the last ten years and the loss ratio of 0.42 is much lower than LRP-Feeder Cattle over that same time span.

Like most insurance products, cattle producers should not purchase LRP hoping to collect on it. All else being equal, the preference should be for good, strong market prices to prevail along with solid returns on investment. Nevertheless, it should be of interest to producers considering LRP as a part of their market risk management plan to see how LRP has performed over the years. Two examples are provided below for LRP-Feeder Cattle.

Table 3 shows how 13-week LRP-Feeder Cattle insurance contracts taken out in early August for price coverage in early November performed for Steers Weight 2 from 2005-2017. In this example, only 6 of the 13 years resulted in an indemnity payment and they occurred over four consecutive years from 2006-2009 plus two consecutive years from 2015-2016. However, the indemnity to premium ratio was 1.78 (5.10/2.87) over the entire period of time. As a result, the average effective ending price with LRP insurance coverage ($140.23) was virtually identical to the average expected ending price ($140.10) despite an average $2.09 decline in actual ending price compared to expectations. Furthermore, 72% of the upward price movement in the good years is preserved in the effective price while removing 53% of the downward price movement in the bad years after adding in the LRP premiums and indemnities.

Table 4 shows how 21-week LRP-Feeder Cattle insurance contracts taken out in early June for price coverage at the end of October performed for Steers Weight 1 from 2012-2017. An extra two months time compared to the 13-week policy period analyzed in Table 3 shows a lot more volatility. On average, the LRP Actual Ending Value is only $0.93 below the Expected Ending Value but it ranges from being $43.37 above expectations in 2014 to being $28.31 below expectations in 2015. The net effect of LRP over these six years was to add $4.31 to average effective price. It did this by taking away 46% of the downward price movement in the bad years of 2012, 2015, and 2016 while retaining 85% of the upward price movement in the good years of 2014-15.

LRP insurance programs focus only on reducing downside price risk. At the core, the LRP program provides a price floor but allows producers to take advantage if higher prices are realized. Other risks still exist. The program does not cover sickness or death of the cattle and does not protect overall profit since it only locks in sales prices. Basis risk (the risk that local prices decline relative national prices) is another source of price risk LRP does not eliminate.

However, LRP may be a good option as part of a cattle producer's risk management strategy. The value of LRP will depend upon the premiums and coverage levels in the contracts relative to other price risk management tools available to the producer.

For more details on LRP insurance for cattle, readers are encouraged to consult the two NebGuides,

Livestock Risk Protection Insurance for Feeder Cattle
http://ianrpubs.unl.edu/live/g1723/build/g1723.pdf

Livestock Risk Protection Insurance for Fed Cattle
http://www.ianrpubs.unl.edu/epublic/live/g2257/build/g2257.pdf

The data for this article was obtained from http://rma.usda.gov

Table 3: LRP-Feeder Cattle (Steers Weight 2, 600-900 lbs.) Performance Aug 6-8 to Nov 5-7.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average
Expected Ending Value	105.335	115.273	117.336	118.101	101.586	113.395	135.654	141.348	160.211	219.081	206.948	142	144.965	140.095
Coverage Price	98.34	108.32	116.01	117.4	99.71	109.9	131.65	122.85	159.54	216.93	200.82	140.68	140.12	135.56
Actual Ending Value	**116.06**	**103.2**	**108.76**	**96.59**	**93.15**	**111.32**	**141.97**	**144.12**	**164.59**	**240.36**	**188.47**	**126.46**	**159.01**	**138.00**
Net Change in Ending Value	**$10.73**	**($12.07)**	**($8.58)**	**($21.51)**	**($8.44)**	**($2.08)**	**$6.32**	**$2.77**	**$4.38**	**$21.28**	**($18.48)**	**($15.54)**	**$14.05**	**($2.09)**
Indemnity	0	5.12	7.25	20.81	6.56	0	0	0	0	0	12.35	14.22	0	5.10
Producer Premium	0.70	0.91	2.77	4.06	2.45	1.91	3.03	0.38	3.21	5.01	3.29	5.04	4.59	2.87
Net LRP Effect	-0.70	4.21	4.48	16.75	4.11	-1.91	-3.03	-0.38	-3.21	-5.01	9.06	9.18	-4.59	2.23
Effective Price	**115.36**	**107.41**	**113.24**	**113.34**	**97.26**	**109.41**	**138.94**	**143.74**	**161.38**	**235.35**	**197.53**	**135.64**	**154.42**	**140.23**
Deviation from Expected Ending Value	**$10.03**	**($7.86)**	**($4.10)**	**($4.76)**	**($4.33)**	**($3.99)**	**$3.29**	**$2.39**	**$1.17**	**$16.27**	**($9.42)**	**($6.36)**	**$9.45**	**$0.14**
Indemnity Ratio (Indemnity/Premium)	0.00	5.63	2.62	5.13	2.68	0.00	0.00	0.00	0.00	0.00	3.75	2.82	0.00	1.78

Table 4: LRP-Feeder Cattle (Steers Weight 1, < 600 lbs.) Performance Jun 3-5 to Oct 28-30

	2012	2013	2014	2015	2016	2017	Average
LRP 21-week Coverage Price	166.33	160.59	220	238.95	157.32	155.89	172.03
LRP Expected Ending Value	177.414	164.142	220.578	240.871	157.785	172.253	188.84
LRP Actual Ending Value	159.43	181.76	263.95	212.56	137.14	172.61	187.91
Net Change	**($17.98)**	**$17.62**	**$43.37**	**($28.31)**	**($20.65)**	**$0.36**	**($0.93)**
LRP Indemnity	6.90	0.00	0.00	26.39	20.18	0.00	8.91
LRP Producer Premium	1.97	3.26	5.22	6.19	7.04	3.95	4.61
Net LRP Effect	4.93	(3.26)	(5.22)	20.20	13.14	(3.95)	4.31
Net Effective Price	**$164.36**	**$178.50**	**$258.73**	**$232.76**	**$150.28**	**$168.66**	**192.22**
Deviation from Expected Ending Value	**($13.05)**	**$14.36**	**$38.15**	**($8.11)**	**($7.51)**	**($3.59)**	**$3.37**

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