

## **Managing Stocker Risk in Uncertain Times**

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## Managing Stocker Risk in Uncertain Times

Managing risk in a stocker/backgrounding operation is a broad topic and can have different meanings to different people. Stocker operators, and agricultural producers in general, face many types of risks in their businesses (e.g., environmental, legal, personnel, financial, production, market). The primary focus of this paper is on production and market risk. This is not to say the many other types of risks producers face are less important, rather they are beyond the scope of this paper and thus are not discussed here. The objective of this paper is to examine factors impacting profitability in stocker operations to help producers identify areas where to focus their management efforts, which results in managing the risk associated with profitability. Much of this information is from a historical perspective and is not necessarily tied directly to issues producers are facing today (e.g., drought, current market collapse), however, this information should be helpful as producers are forced to make decisions in the current environment.

Numerous studies analyzing cattle feeding profitability have found that price and production risk significantly impact the variability of profits (e.g., Lawrence, Wang, and Loy; Mark, Jones, and Schroeder; Williams et al.). Additionally, price risk is typically found to be more important than production risk. Thus, it is often concluded that producers should focus their management efforts on managing price risk. However, this fails to account for whether or not this price risk is *manageable*. That is, do marketing strategies exist that can help producers reduce price risk without significantly reducing selling prices? If marketing strategies for managing price risk exist, then it would seem logical that producers focus their management efforts on marketing. On the other hand, if strategies for adequately dealing with price risk do not exist, then it may be that focusing on production risk, even if it is less than price risk, may be more beneficial.

In an analysis of Kansas Farm Management Association enterprise data from 1999-2001, Albright found that most of the difference in return to management between high profit (top 1/3) and low profit (bottom 1/3) cow-calf and backgrounding operations was due to costs and not prices. On average, high profit cow-calf operations had returns to management that were \$234 per cow higher than low profit operations (table 1). Slightly over a fourth (26.6%) of this difference was due to higher income but the rest was due to lower costs. High profit farms had slightly heavier calves than the low profit farms, but their feed costs were lower as were the costs in every other category. High profit farms were larger on average, thus they likely were realizing some economies of size advantages. Results were similar for the backgrounding operations analyzed. Almost a third (30.1%) of the differences in returns to management was due to income (i.e., prices) with the remaining 69.1% due to lower costs. As with the cow-calf enterprise, the high profit farms had lower costs in every category but one (marketing costs were higher for high profit farms) compared to the low profit farms and had considerably larger operations (table 2).

The results in tables 1 and 2 suggest that managing costs may be as important, if not more important, than managing for prices. A potential weakness of this analysis is that it is based on only three years and a relatively small sample of farms (71 cow-calf operations and 40 backgrounding operations). Kastens, Dhuyvetter, and Nivens analyzed the costs and returns of 1,000 predominately crop producers over 10 years (1992-2001) and found that producers were least able to differentiate themselves from other producers with regards to prices. That is, other management factors (e.g., costs, technology adoption, planting intensity, and yields) were more *manageable* than prices and impacted relative profits more. Their large data set allowed them to make much stronger statistical inferences about the importance of costs relative to prices. However, an important distinction between crop producers and stocker operators is that crop producers tend to market a more homogenous product. Thus, being “better than average” at price for crop producers means selling at higher prices, whereas, with stocker operators it can mean both selling at higher prices and selling the “right” product. This distinction is important and will be discussed in more detail in the price risk section later in the paper.

**Table 1. Comparison of High-, Mid-, and Low-Profit Cow-calf Operations, 1999-2001.<sup>a</sup>**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Level	%
Number of farms	24	24	23		
Number of cows in herd	168	127	67	100	149%
Number of calves sold	147	102	57	90	159%
Weight of calves sold	558	542	542	16	3%
Calf sales price, \$/cwt	\$89.50	\$89.28	\$87.18	\$2.32	3%
INCOME (\$/cow):					
Gross Income	\$482.09	\$443.49	\$419.77	\$62.31	15%
COSTS (\$/cow):					
Feed	\$232.55	\$258.41	\$283.19	-\$50.65	-18%
Interest	81.01	91.19	106.39	-25.38	-24%
Vet, medicine, drugs	13.88	14.75	15.43	-1.55	-10%
Marketing / breeding	5.28	7.66	11.88	-6.60	-56%
Depreciation	12.46	23.54	29.49	-17.02	-58%
Machinery	32.45	33.92	53.20	-20.75	-39%
Labor	50.26	71.57	83.15	-32.88	-40%
Other	17.95	23.53	35.29	-17.34	-49%
Total Cost	\$445.84	\$524.56	\$618.02	-\$172.18	-28%
Net Return to Management	\$36.24	-\$81.08	-\$198.25	\$234.49	

<sup>a</sup> Includes only operations with average selling weights of 450-600 pounds.

**Table 2. Comparison of High-, Mid-, and Low-Profit Backgrounding Operations, 1999-2001.**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Level	%
Number of farms	14	13	13		
Number of calves sold	540	480	275	265	96%
Purchase weight	461	466	497	-36	-7%
Purchase price, \$/cwt	\$93.60	\$91.69	\$89.06	\$4.54	5%
Sale weight	809	797	800	9	1%
Sale price, \$/cwt	\$80.30	\$79.58	\$77.05	\$3.25	4%
Pounds of gain, lbs/head <sup>a</sup>	367	323	313	54	17%
INCOME (\$/cwt):					
Gross Income	\$61.97	\$62.01	\$53.95	\$8.02	15%
COSTS (\$/cwt):					
Feed	\$32.28	\$33.63	\$39.98	-\$7.69	-19%
Interest	12.17	13.07	15.56	-3.39	-22%
Vet, medicine, drugs	4.49	5.54	5.86	-1.37	-23%
Marketing	2.63	2.34	2.08	0.55	27%
Depreciation	1.46	2.62	2.35	-0.89	-38%
Machinery	3.64	5.12	5.02	-1.38	-27%
Labor	4.33	7.94	6.79	-2.46	-36%
Other	1.90	2.60	3.20	-1.30	-41%
Total Cost	\$62.90	\$72.85	\$80.83	-\$17.93	-22%
Net Return to Management	-\$0.93	-\$10.84	-\$26.89	\$25.96	

<sup>a</sup> Adjusted for inventory changes – this value can be used to convert \$/cwt costs to \$/head costs.

### ***Production Risk***

As previously mentioned, cattle feeding studies have often found that cattle performance (e.g., ADG, feed conversion, death loss) are significant variables in explaining profit variability over time. However, the relative importance of these variables is generally less than purchase and selling price variability. The impact production risk has on profitability and breakeven prices can be examined by developing cost-return budgets and then varying factors of interest. Table 3 includes a projected budget for backgrounding a 525 pound steer this winter and various sensitivity analysis scenarios. The “base” scenario (first column) represents an ADG of 2.00 for a 100 day backgrounding period with a death loss of 1.25% and all other inputs at expected, or average, values. The following sensitivity scenarios are considered (from left to right in the table):

- 1) poor production – ADG decreases 20% to 1.80 and death loss increases to 2.0%
- 2) good production – ADG increases 20% to 2.20 and death loss decreases to 0.75%
- 3) high cost – all costs except feeder are increased 20%
- 4) low cost – all costs except feeder are decreased 20%
- 5) high price – cost of feeder increases \$3/cwt.
- 6) low price – cost of feeder decreases \$3/cwt.

In the case of varying production and death loss, all feed and veterinary costs were held constant to the levels in the base budget. Thus, the different ADG levels reflect varying feed conversion levels. While the +/- 20% levels considered is somewhat ad hoc, it is thought to reflect reasonable variability that could occur. The varying levels of death loss easily fall within the range reported in the results of the *Beef Stocker 2000 Survey* (Blasi et al.). The high (+20%) and low (-20%) cost scenarios are consistent with cost differences between high and low profit backgrounding operations as reported in table 2. Furthermore, the difference in processing and vet between the high cost and low cost is also very consistent with the average values reported in the *Beef Stocker 2000 Survey*. Finally, the high (+\$3/cwt) and low (-\$3/cwt) purchase price scenarios are included so that a “marketing” scenario could be compared with the “production” scenarios.

The first point that needs to be made is that the base scenario, which represents our best expectation (as of August 8<sup>th</sup>), with a projected loss of over \$30/head does not paint a very good picture for backgrounding calves this winter. This should not be entirely unexpected given the current relatively high price of feedstuffs. Somewhat disheartening is that even the most optimistic scenario of low costs still shows a loss of almost \$10/head. Of the sensitivity scenarios considered, the high and low cost scenarios had the biggest impact on profits (\$48/head difference in profits). The poor and good production scenarios (i.e., +/- 20% on ADG and 0.75% on death loss) and the +/- \$3/cwt change in the purchase price of the feeder had similar impacts on profits. A scenario reflecting a purchase price of \$85/cwt (i.e., -\$2/cwt) and a selling price of \$79.36/cwt (i.e., +\$2/cwt) resulted in a profit of -\$8.23/head (results not shown) which was comparable to the low cost scenario. The information in table 2 does show that the high profit operations had a higher selling price, but they also had a higher purchase price so this may be indicative of quality of cattle differences and not necessarily “marketing superiority.”

No strong conclusions can be reached regarding the importance of managing for production risk versus price risk from the results in table 3 because we still don’t know how manageable all of these risks are. However, a case can be made that the +/- 20% cost scenarios, which result in about a \$50/head difference in costs, are likely quite realistic and thus this information does make it clear that managing for cost is important.

**Table 3. Projected Budgets for Backgrounding 525 lb Steer.**

<b>Budget Assumptions</b>	Base	Poor prod	Good prod	High cost	Low cost	High price	Low price
Purchase date	10/15/2002	10/15/2002	10/15/2002	10/15/2002	10/15/2002	10/15/2002	10/15/2002
Purchase weight (lbs)	525	525	525	525	525	525	525
Purchase price/cwt	\$87.00	\$87.00	\$87.00	\$87.00	\$87.00	\$90.00	\$84.00
Estimated ADG	2.00	1.80	2.20	2.00	2.00	2.00	2.00
Days	100	100	100	100	100	100	100
Death loss	1.25%	2.00%	0.50%	1.25%	1.25%	1.25%	1.25%
Selling weight (lbs)	725	705	745	725	725	725	725
Expected sale price/cwt <sup>a</sup>	\$77.36	\$78.14	\$76.63	\$77.36	\$77.36	\$77.36	\$77.36
Yardage/day	\$0.20	\$0.20	\$0.20	\$0.22	\$0.18	\$0.20	\$0.20
Processing and vet	\$10.00	\$10.00	\$10.00	\$11.00	\$9.00	\$10.00	\$10.00
Miscellaneous (trucking, etc.)	\$10.00	\$10.00	\$10.00	\$11.00	\$9.00	\$10.00	\$10.00
Interest rate	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%

<sup>a</sup> Based on futures prices for a sale date of 01/23/2003 and historical weight and seasonal (month) relationships.

Projected Budget	Base	Poor prod	Good prod	High cost	Low cost	High price	Low price
Feeder cost	\$466.76	\$466.76	\$466.76	\$466.76	\$466.76	\$482.86	\$450.67
Forages	54.95	54.95	54.95	65.94	43.96	54.95	54.95
Grain-Prot.-Suppl.	23.08	23.08	23.08	27.70	18.46	23.08	23.08
Yardage	20.00	20.00	20.00	24.00	16.00	20.00	20.00
Processing and vet	10.00	10.00	10.00	12.00	8.00	10.00	10.00
Miscellaneous/interest	12.37	12.37	12.37	14.84	9.89	12.37	12.37
Total cost	\$120.40	\$120.40	\$120.40	\$144.48	\$96.32	\$120.40	\$120.40
Breakeven selling price	\$82.01	\$84.98	\$79.21	\$85.38	\$78.65	\$84.26	\$79.76
Feed cost of gain/cwt	\$40.87	\$47.03	\$36.08	\$49.04	\$32.69	\$40.87	\$40.87
Total cost of gain/cwt <sup>b</sup>	\$63.06	\$72.57	\$55.67	\$75.67	\$50.44	\$63.06	\$63.06
Estimated returns, \$/head	(\$33.28)	(\$47.30)	(\$19.13)	(\$57.36)	(\$9.20)	(\$49.37)	(\$17.18)
Comparison to Base, \$/head	n/a	(\$14.02)	\$14.15	(\$24.08)	\$24.08	(\$16.10)	\$16.10

<sup>b</sup> Excludes interest on feeder

## Price Risk

As stocker operators think about managing price risk, there are several different risks to consider. First, the obvious risk is that prices change over time – here this risk is referred to as *price level risk*. A second risk that stocker operators face is *basis risk*, where basis refers to the difference between cash and futures prices. The third risk is that I produce something that buyers don't want – at least not without a discount. For the sake of this paper, this third risk is referred to as *product risk*.<sup>1</sup> Each of these three risks are important for stocker and backgrounding operations but the impact of each of them and how they are managed can vary considerably. Following is a discussion on some historical data pertaining to these three types of risk.

### Price Level Risk

Price level risk refers to the fact that the absolute level of prices varies considerably over time. This is the price risk that gets most of the attention in the media because it is so easy to see, i.e., futures and cash prices are reported every day. Figure 1 shows the weekly average price for 700-800 pound feeder steers at Dodge City, KS from January 1980 through July 2002. Over this time period, weekly average prices have ranged from approximately \$50/cwt to almost \$95/cwt.<sup>2</sup> Furthermore, this range has occurred within the last seven years. Figure 2 shows the weekly nearby CME feeder cattle futures price since 1980. Even though the feeder cattle futures contract specifications have changed several times over the last 20 years, it can be seen that the two prices tend to follow a similar pattern – at least in terms of major ups and downs. The bottom line of these two figures is that considerable price level risk exists for feeder cattle. The next important question though is, How important of an issue is this price risk for stockers?

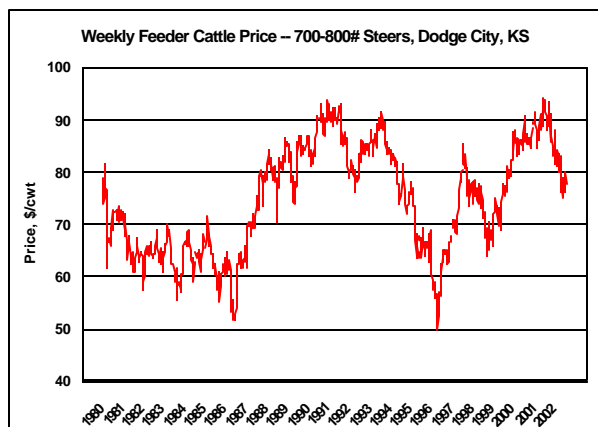


Figure 1

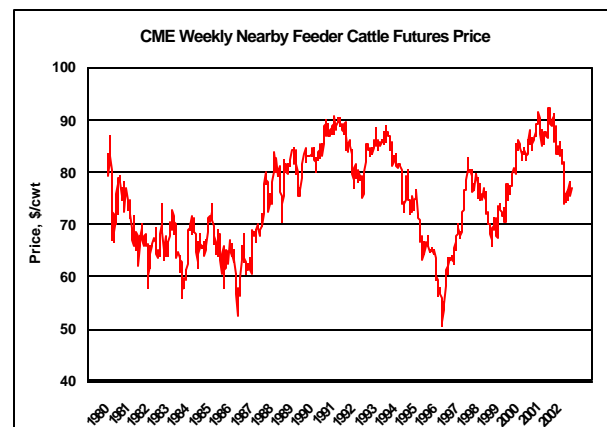


Figure 2

McKissick and Ikerd simulated net returns for cow-calf and both winter and summer stockering programs for the years 1950 to 1996 and showed that the returns from a stockering program are not very closely related to cow-calf returns during the gradual up- and down-trend years of the cattle cycle. This is because cow-calf returns tend to be cyclical, whereas, stocker returns are much more random in between major breaks in the markets. While their analysis was conducted to consider retained

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<sup>1</sup> It could be argued that product risk is as much of a *production risk* as a *price risk*, but because the data presented is in the context of prices it is discussed in the price risk section.

<sup>2</sup> Average weekly prices mask the variability associated with individual lots of cattle at a given sale in a particular week. Thus, the variability in figure 1 is actually considerably less than what might be expected for individual lots of cattle.

ownership opportunities, it reinforced a well known point – price levels are less important in stocker operations than cow-calf operations because stockers are margin operators. Figures 3 and 4 show the historical returns over variable costs to cow-calf and backgrounding enterprises in Kansas from 1980 to 2001, respectively. Several points can be made about this data. First, the returns to cow-calf appear to be somewhat more cyclical than the backgrounding returns (as suggested by McKissick and Ikerd). Secondly, the correlation between the returns is +0.70 when they are compared contemporaneously (i.e., both in the same calendar year). However, if the backgrounding returns are lagged one year to account for the fact that backgrounding returns would be realized a year later than the initial calf crop, the correlation is -0.01. This suggests that there is basically no relationship between the cow-calf returns in one year and backgrounding returns the following year. Furthermore, there is a strong positive correlation between 500-600 pound feeder calf prices and cow-calf returns (+0.84) and a much weaker relationship between backgrounding returns and price levels (+0.37) (data not shown). What does all of this mean? Simply what we all already know – that is, unlike cow-calf producers, stockers and cattle feeders are margin operators and thus the major price level risk over time that everybody likes to talk about isn't that important to manage.<sup>3</sup>

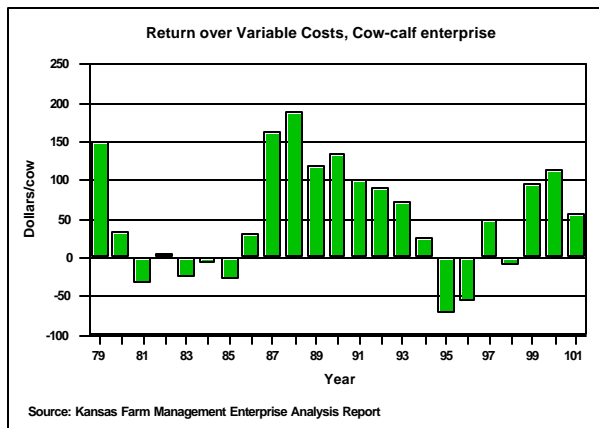


Figure 3

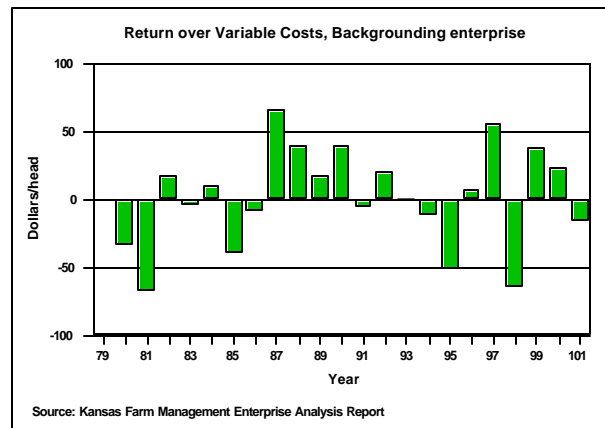


Figure 4

Just because the major price level risk (i.e., swings in excess of \$40/cwt) may not be particularly relevant for stocker operators, that does not mean that price level risk is not important. From figures 1 and 2 it can be seen that prices levels can change significantly over short time periods (e.g., the 90-180 days cattle are in a stocker/background program). To examine how much price risk stocker/backgrounder producers face over a “typical” feeding/grazing program, historical feeder cattle futures prices from the last 22 years were analyzed for each contract (Jan, Mar, Apr, May, Aug, Sep, Oct, and Nov). It is important when interpreting the results from an analysis of historical data to be cognizant of the time period analyzed (i.e., past results are not necessarily indicative of future results). The last 22 years covers approximately two cattle cycles and thus there were several periods of up markets and several of down markets. The key is that this time period is long enough that it should be useful for making inferences for the future.

As a measure of price level risk, the range of Wednesday futures prices for the 26 weeks prior to contract expiration was calculated for each feeder cattle futures contract for the last 22 years. This range simply compares the highest and lowest prices over the 26-week period. That is, it says nothing about whether prices were increasing or decreasing or how many weeks apart these minimum and

<sup>3</sup> To the extent that many stocker and backgrounding operations are also cow-calf producers, this long term price level risk is obviously a concern to them.

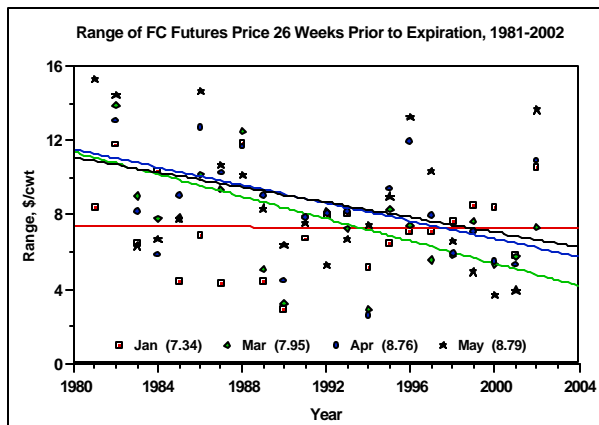
maximum prices occurred. Table 4 shows the average, minimum, and maximum of the price range for each futures contract over the last 22 years. On average, the price ranges have been \$7-\$10/cwt depending on the contract. The August contract has had the most price variability and the November and January contracts have had the least price variability. Using the October contract as an example, the information is interpreted as follows – we would expect there to be a \$7.96/cwt range in prices for the October contract in the 26 weeks prior to it expiring (i.e., the difference between the contract high and the contract low from mid April to October). While this \$7.96 represents our expectation for price level risk over this 26-week period it has been as low as \$3.50 and as high as \$13.65.

Given that the information in table 4 represents averages over a 22-year time period, a question one might ask is, Has the price level variability been changing over time? That is, is there more price level risk today than there was 10 or 20 years ago? Figures 5 and 6 show the annual ranges plotted by year and their linear trend over time. Even though it is not possible to discern the different trend lines from each other on a black and white printed figure, the important point is that the price range has been trending down over time for all contracts except the Jan contract. This would suggest that price level variability has been decreasing, however, it can also be seen that in 2002 the levels are quite high compared to other recent years (figure 5). The bottom line of the information in table 4 is that price level variability of feeder cattle for any 26-week time period is about \$8/cwt not the \$40+ swings we see over longer time periods. To put this in perspective, \$8/cwt on a 750 pound feeder calf is \$60 per head which is reasonably close to the amount of cost differences we might see between high and low cost producers.

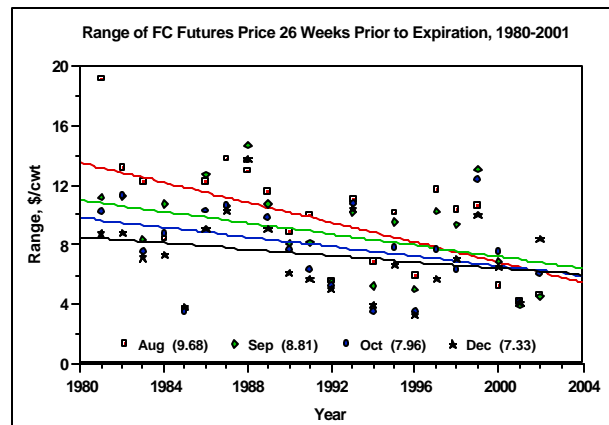
**Table 4. Feeder Cattle Futures Price Range, 26-Week Period Prior to Contract Expiration.<sup>a</sup>**

	Futures Contract							
	Jan	Mar	Apr	May	Aug	Sep	Oct	Nov
Average, \$/cwt	7.34	7.95	8.76	8.79	9.68	8.81	7.96	7.33
Minimum, \$/cwt	2.90	2.90	2.60	3.75	3.75	3.70	3.50	3.33
Maximum, \$/cwt	11.85	16.30	17.53	15.25	19.15	14.65	13.65	13.80

<sup>a</sup> Based on the last 22 years – 1981-2002 for Jan, Mar, Apr, May and 1980-2001 for Aug, Sep, Oct, Nov.



**Figure 5**



**Figure 6**

Now that we have identified the *price level risk* stocker producers need to be concerned with, the next step is to think about how it might be managed. Thus, the question to answer is, Can this shorter term

(90 to 180 day) price level risk be managed effectively?<sup>4</sup> Typically, there are three different types of tools (or combinations of them) that we think of for managing price level risk: futures contracts, options (puts and calls), and forward contracts. Hedging with futures and using forward contracts are similar in that they both “lock in” the price level, but they are different in that hedging does not lock in basis, whereas, basis is established with a forward contract (this will be discussed in more detail in the *basis risk* section). Marketing strategies using options typically provide some downside price risk coverage while allowing upside potential, however, this will depend on the specific strategy used. As a general rule, basis risk will still exist with options marketing strategies unless the options are used in conjunction with a forward contract that locks in basis. Most of the discussion here will focus on futures market price changes (as opposed to forward contracts or options premiums) due to data availability.

When producers think of hedging to protect price level risk there are two types of hedging strategies that are often referred to. A *routine* hedging strategy would be to consistently take the same position (i.e., sell futures all the time) and a *selective* hedging strategy would be to take a position only in years when “it makes sense” – however that might be defined. Thus, a selective hedging strategy essentially tries to “outguess” the market because you supposedly know when to hedge and when not to. Economists have analyzed hedging strategies for many years and have found a variety of results as to the successfulness of hedging strategies, which in itself should raise some concern.

Based on a study of optimal marketing decisions for feeder cattle, Wang et al. concluded that a winter stockering program was profitable when it was done in conjunction with hedging strategies utilizing futures and options contracts. Specifically, their marketing strategies were to do nothing (cash sales), hedge with futures, buy put options (various strike prices), or buy put options and sell call options (various strike prices). While their optimal marketing strategy varied slightly depending on their assumptions, the straight hedge was the best in most cases. However, their analysis was based on only four years and a time period (1993/94 - 1996/97) that coincided with a sharply falling market (see figure 1). Clearly, any “short hedging” strategies in a downward trending market will be superior to doing nothing and thus the strength of their results are somewhat questionable and should be viewed with caution.

Lawrence estimated the returns to finishing yearling steers in Iowa under various futures hedging strategies from 1991-1999 and found that a 100% routine hedging strategy reduced returns by \$7.05/head compared to no hedging but also reduced the worst case year from a loss of -\$139.38 with no hedge to -\$92.99 with a hedge. Thus, it would appear that routinely hedging can help manage risk although it does come at a cost (i.e., lower risk but also lower returns). Lawrence and Smith conducted a similar analysis only they used data from 1987-2000 and also included options strategies (routine and selective). Similar to Lawrence, they found that returns with routine hedging were \$16.25/head lower than no hedging, however, in this case the difference between the worst case year was only \$13/head compared to not hedging. In this analysis a routine hedger would give up an average of \$16.25/head every year to avoid a \$13/head larger loss in the worst-case year – hardly an effective risk management strategy.<sup>5</sup> These two studies make an important point of any analysis of hedging strategies – that is, the results will always be heavily dependent on the particular time period analyzed.

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<sup>4</sup> Effectively refers to managing price risk in a reasonable risk-return tradeoff. That is, can risk be reduced without significantly reducing price? Obviously, reducing or even eliminating price risk would serve no purpose if it comes at too high of a cost.

<sup>5</sup> The other routine and selective futures- and options-based strategies analyzed yielded similar results with regard to the risk-return tradeoff.

Rather than analyzing specific hedging strategies for stocker or backgrounding operations, seasonality of historical feeder cattle futures prices were analyzed. The price of each feeder cattle futures contract for the 26 weeks prior to expiration was divided by the expiration week price and multiplied by 100 creating a seasonal index. By definition, this means that the index the week of expiration will always equal 100. This seasonal index by year was then averaged across years (for each of the 26 weeks) to give an indication of how prices have changed on average from week to week. For example, if the seasonal index 12 weeks prior to expiration is 102 that means that the price for that particular contract was two percent higher, on average, in week 12 than it was at expiration. Thus, these results could be roughly viewed as what you would have made (or lost) with a *routine* hedging strategy (i.e., if you would have taken the same position in a particular week each year for the last 22 years). From a short hedging standpoint (i.e., a producer selling feeder cattle), a seasonal index that is above 100 prior to contract expiration would suggest that routinely hedging (i.e., selling futures) would have reduced downside price risk for the cattle to be sold in the cash market. An index below 100 would indicate that, on average, prices have increased and thus routinely hedging would have eliminated the ability to take advantage of upside risk.

If the feeder cattle futures are efficient, meaning that profitable routine trading strategies do not exist, then we would not expect any strong seasonal pattern to exist. However, a seasonal pattern can still exist for two reasons. First, for any particular time period there may be strategies that would work, however, that does not mean they will in the future (i.e., results are dependent on the particular time period). Second, while routine strategies may lead to positive profits on average, the variability may be so high that traders are not willing to use these strategies (i.e., the return is not higher enough given the risk).

Because averages can be misleading, the minimums and maximums were examined for each week as well as the distribution of the seasonal index values for a particular week prior to expiration for each of the contracts. Figures 7-30 show the results of this seasonal index analysis. There are three figures for each contract – the first is simply the average seasonal index by week over the last 22 years, the second shows the average along with the minimum and maximum values, and the third shows the distribution for a particular week.

Looking at the average seasonal index for the different contracts there are several interesting results. The index values tend to be fairly small (low of 95.9 for Aug contract 13 weeks prior to expiration and a high of 102.8 for Apr contract 11 weeks prior to expiration). These relatively low values provide some support that the feeder cattle futures market is efficient. The patterns for the different contracts varied considerably. For example the seasonal index for the Mar and Apr contracts was above 100 every week prior to expiration, whereas, for the Jan and Aug contracts it was consistently below 100.

The figures showing the minimum and maximum values make it clear that, even though the average for a particular contract might be above (below) 100 suggesting a short (long) hedging strategy would be profitable, considerable risk exists. For example, 11 weeks prior to expiration the Apr contract has an average seasonal index of 102.8, however, it has ranged from 90 to 117. The figures showing the distributions further exemplify the risk involved. For example, the distribution of the seasonal index for the Apr contract 11 weeks prior to expiration (figure 15) indicates that 40% of the time the index was below 100 (64% of the time it was less than 102.5). This means that routinely selling Apr futures 11 weeks prior to expiration would have resulted in a loss 40% of the time. The figures showing the distributions make it obvious why so many people want to *selectively* hedge (i.e., only hedge in those years when it is needed). The problem is that there is little evidence out there that suggests this can be done in real-time with much success.

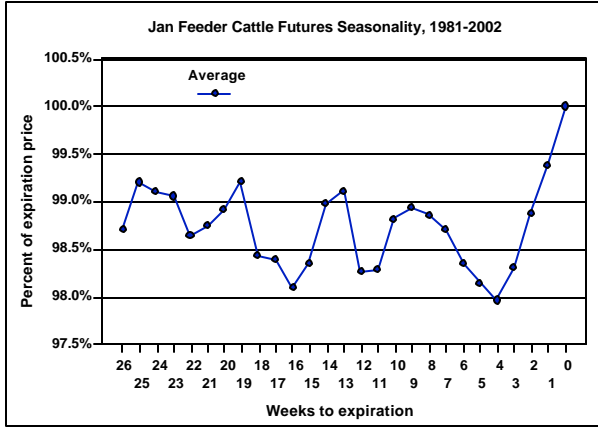


Figure 7

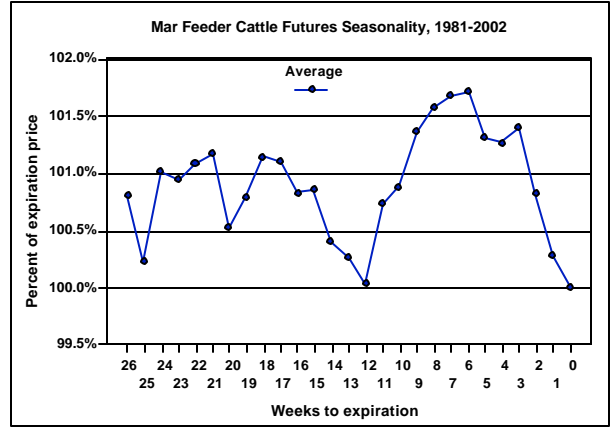


Figure 10

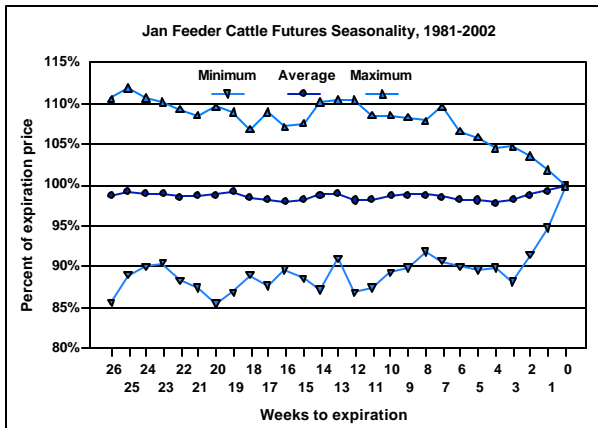


Figure 8

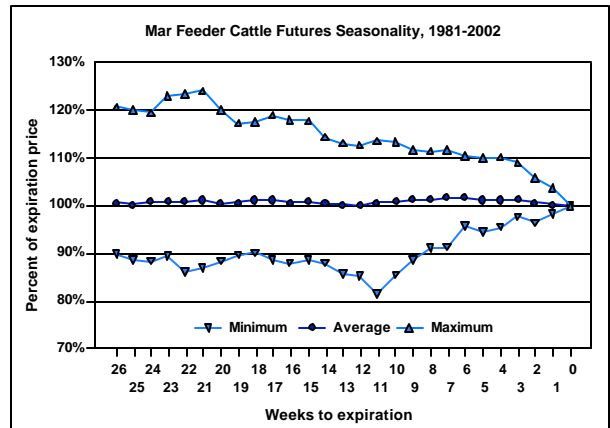


Figure 11

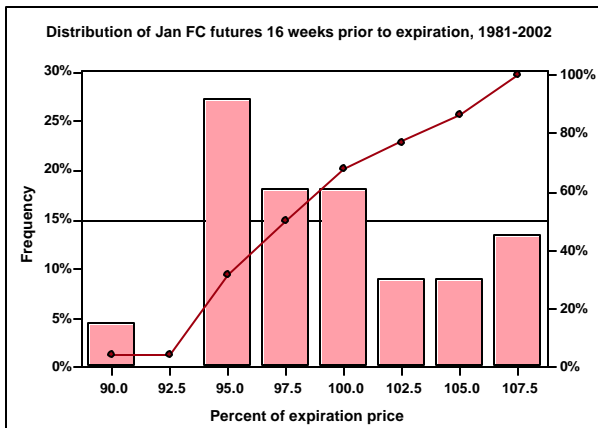


Figure 9

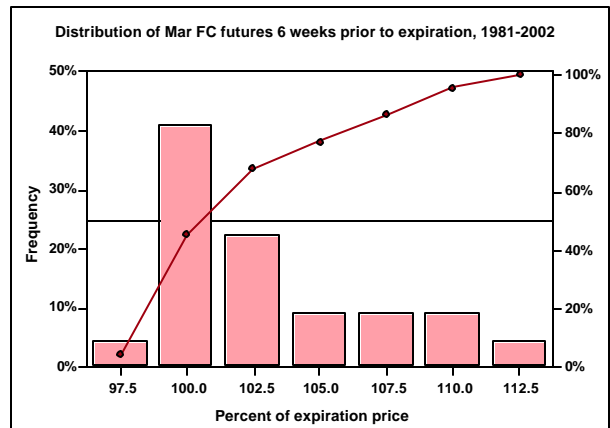


Figure 12

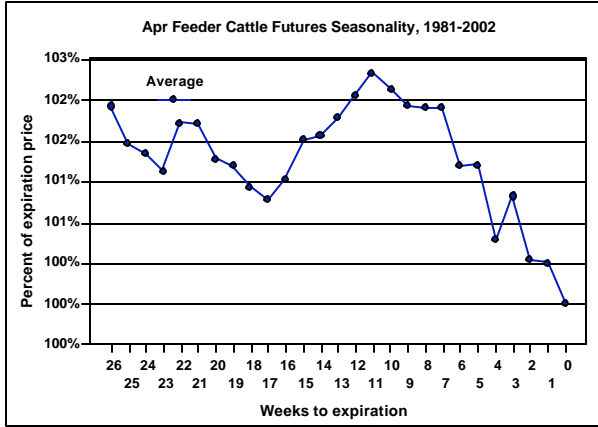


Figure 13

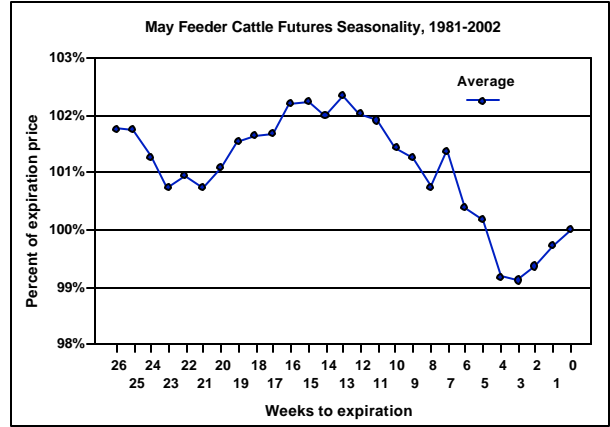


Figure 16

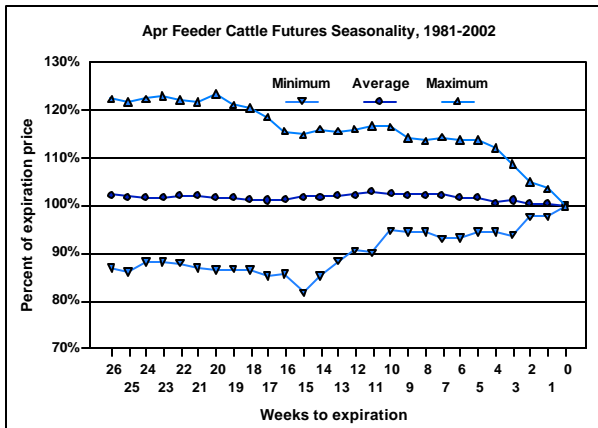


Figure 14

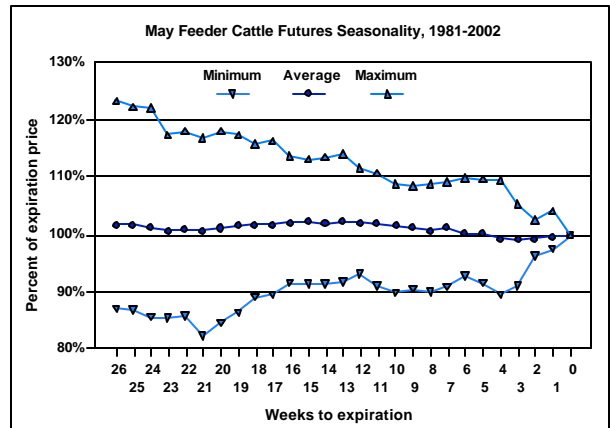


Figure 17

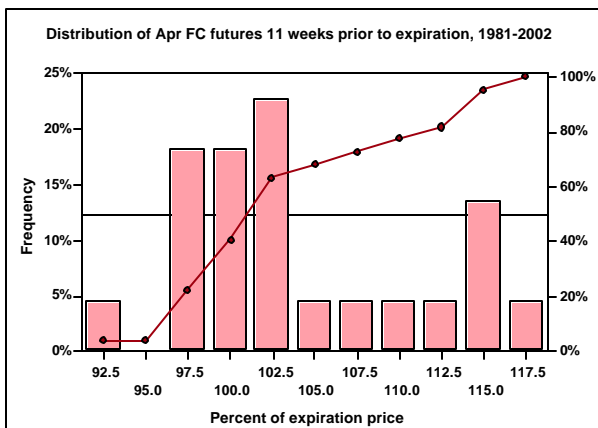


Figure 15

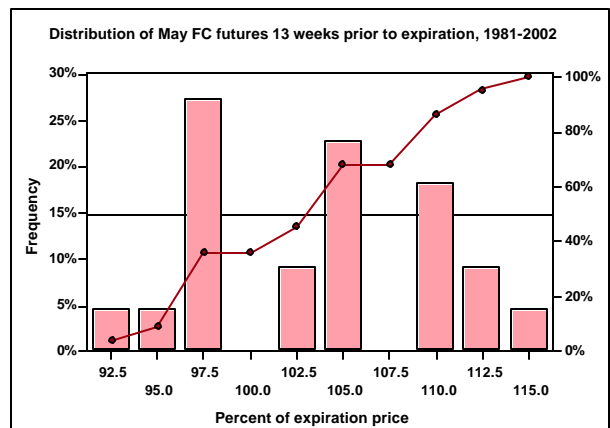


Figure 18

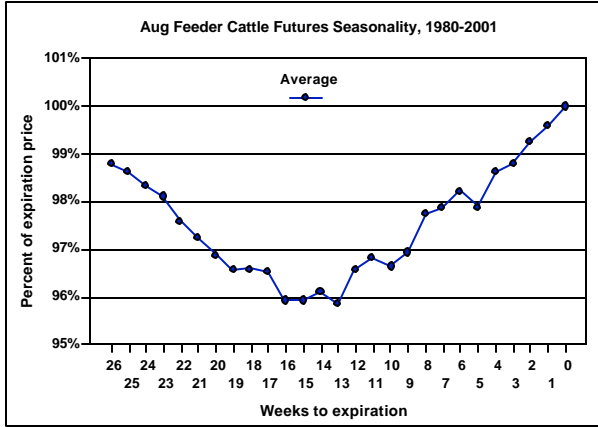


Figure 19

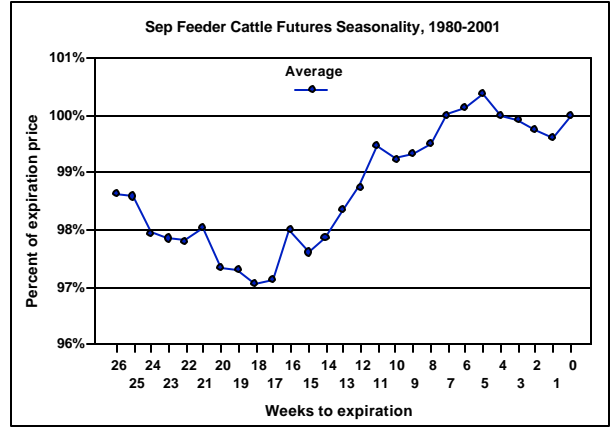


Figure 22

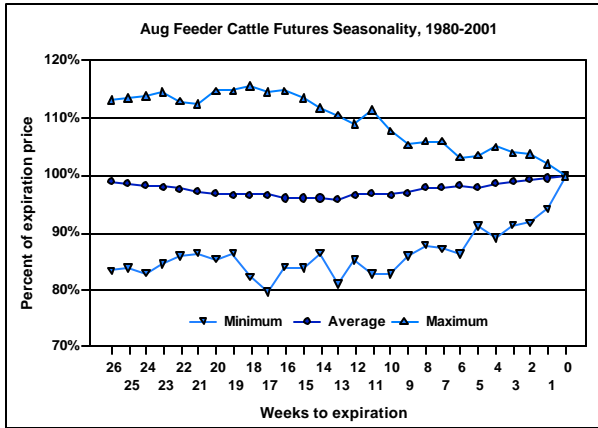


Figure 20

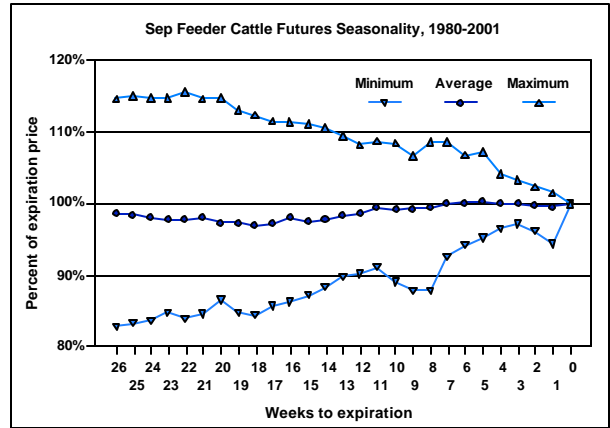


Figure 23

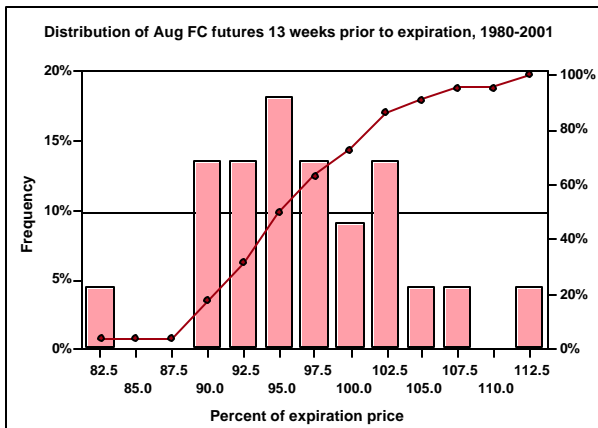


Figure 21

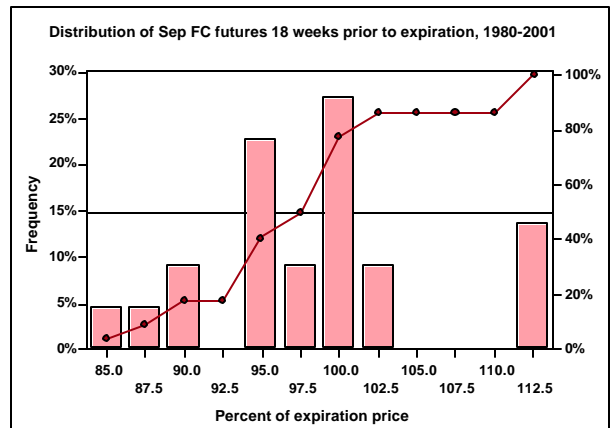


Figure 24

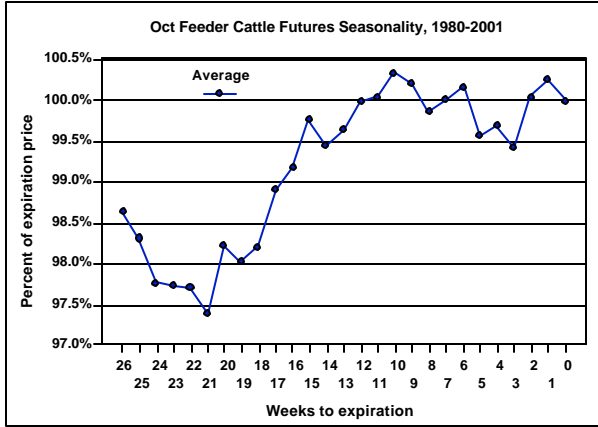


Figure 25

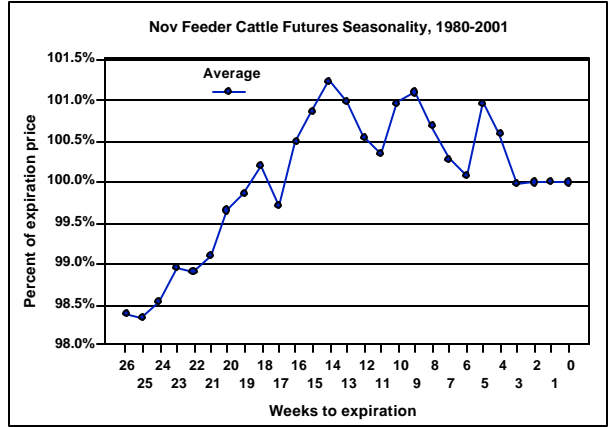


Figure 28

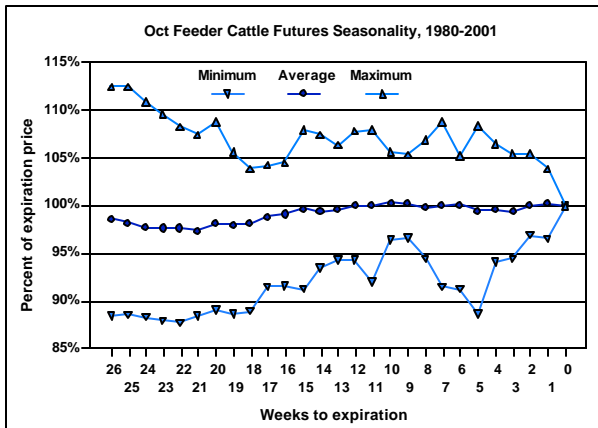


Figure 26

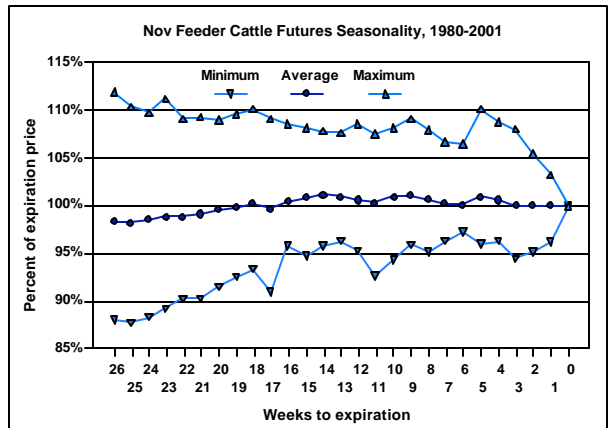


Figure 29

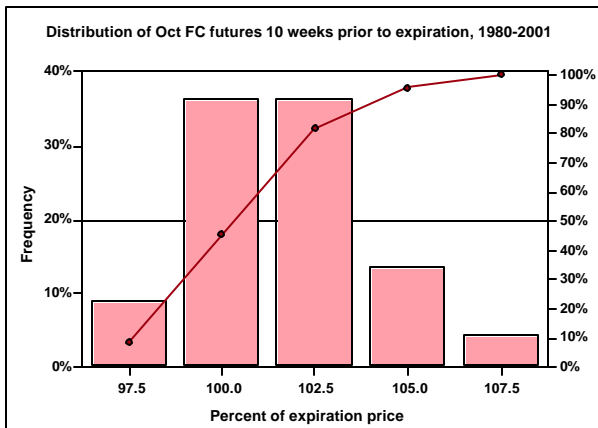


Figure 27

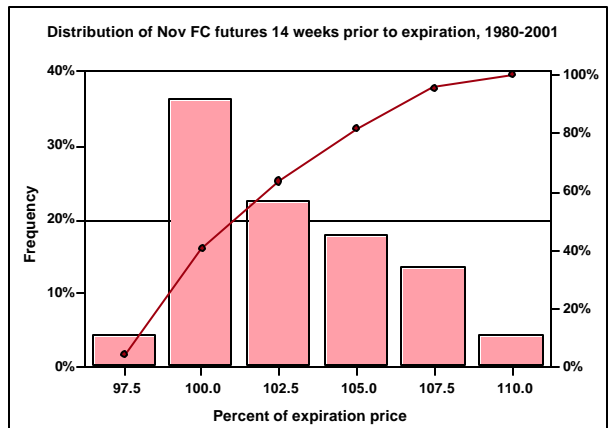


Figure 30

In addition to examining historical patterns of futures prices, knowing and understanding seasonality of cash prices can be helpful. Calf and feeder cattle prices are seasonal in nature and are affected by many supply and demand factors. Calving season influences the supply of calves at the local, regional, and national level, which impacts the seasonal price patterns of calves. Pasture conditions (weather), seasonal fed cattle prices, expected feeding performance at different times of the year, and seasonal price patterns of feed and competing meats affect the demand for calves and feeder cattle; thus, they also contribute to seasonal price patterns. It is important to keep in mind that calves, feeders, and fed cattle are not the end product demanded by consumers, rather they are inputs used to produce beef. The demand for these inputs is referred to as derived demand and this derived demand is related to the primary demand for beef by consumers. Seasonal demand for beef by consumers will have an effect on seasonality of fed cattle prices; thus, affecting the prices of feeder cattle and calves. Farmers, ranchers, and cattle feeders should be aware of seasonal price patterns for calves and feeders they buy and/or sell so they can incorporate this information into their marketing and production decisions.

Seasonality of cash prices are calculated using the average price in a particular month divided by the annual average and then multiplied by 100 to give a percent. Thus, values greater than 100 imply above average prices and values below 100 reflect below average prices. Figures 31 and 32 show the seasonal patterns of various weights of steers in western Kansas for the 1992-2001 and 1982-2001 time periods, respectively. A couple of points to make are that the seasonal prices vary considerably for the different weight cattle which is obviously tied to production (e.g., calf prices are lowest in the fall, feeder cattle are lowest in the spring – after calves have been backgrounded, and fed cattle are lowest in the summer). It also can be seen that the general seasonal pattern is quite similar whether it is based on the last 10 or the last 20 years.

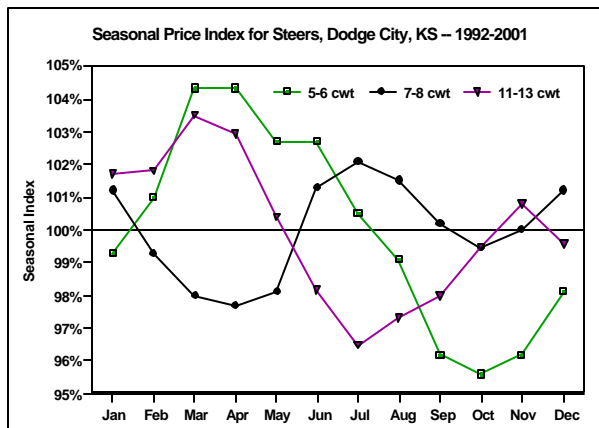


Figure 31

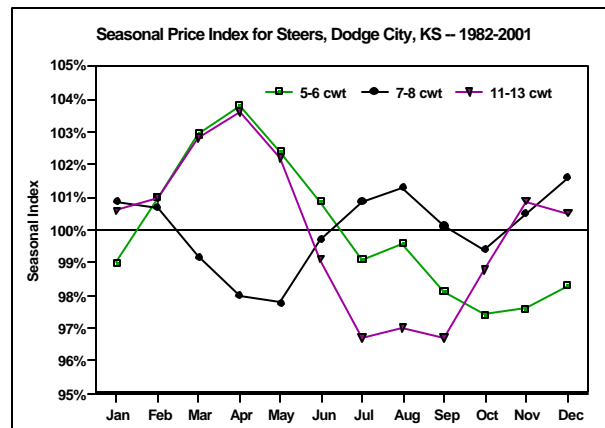


Figure 32

Figures 33 and 34 show seasonal cash price indices for 400-500 and 700-800 pound steers, respectively, for northern states (MT, ND, SD) compared to states from the southeast (AL, FL, GA, LA, MS). It can be seen that the seasonal patterns are similar for the different regions of the country but there are also some noteworthy differences. For example, calf prices are lowest in the fall and highest in the spring in both regions, however, the range from low to high is much larger in the north compared to the southeast. Additionally, feeder cattle (700-800 cwt) prices in the southeast states are below the annual average in the fall, whereas, the price in the northern states is actually above the annual average slightly. These differences reflect different types of cattle and expectations as to how they will perform in a stocker, backgrounding, and or feeding program. Because stocker operators often ship cattle from one area of the country to another, it is important for them to know how prices compare between different regions. Knowing and understanding how seasonal price patterns vary for different regions of the country can help livestock producers make informed marketing and production

decisions. However, knowing how production factors such as; expected gain, death loss, feed conversion, and expected selling price vary by cattle type and origin are also important.

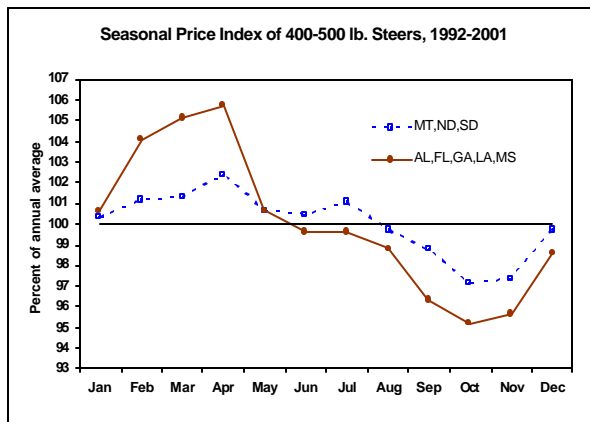


Figure 33

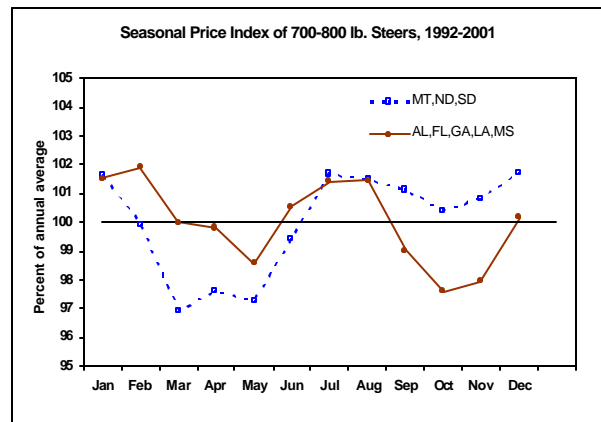


Figure 34

### ***Basis Level Risk***

Basis is defined as the difference between the local cash market and a futures contract price (Basis = Cash price - Futures price). Calculated this way, a positive basis implies that cash price is greater than the futures price and a negative basis implies that futures price is greater than the cash price.

Knowledge of historical basis patterns is important when estimating expected sale or purchase prices at the conclusion of a futures or options hedge, when evaluating a current cash market quote, and when evaluating forecasted cash prices. In order for hedging, whether it be with futures or options, to be successful as a means of managing price risk, basis needs to be relatively predictable. That is because hedging (i.e., selling futures) locks in the futures price but the relationship between the cash price and futures price (basis) is unknown and must be predicted.

By definition, anything that affects cash prices will impact basis. For example, because basis for feeder steers and heifers is calculated using the same futures price, feeder steers and heifers will often have a much different basis because heifers typically trade at a discount to steers. Similarly, different feeder cattle weight classes will also have substantially different basis levels and patterns because light weight cattle generally trade at a premium to heavy weight cattle and follow a different seasonal pattern (see figures 31-34). Thus, it is important to have data best representing the sex and weight of the cattle being produced because it can have a big impact on basis. Similarly, there are a wide variety of physical characteristics that influence cash sale prices for feeder cattle, all of which will impact the basis for a particular pen of steers or heifers.

Basis is generally easier to predict than either the cash or futures price because most of the factors that influence a commodity's price affect both cash and futures prices simultaneously. This means that cash and futures prices tend to move together (i.e., if feeder cattle futures prices go up by \$1/cwt, cash prices of 700-800 pound feeder cattle also tend to go up by \$1/cwt). However, given that the feeder cattle futures market might also be used to hedge feeder calves that do not meet the contract specifications because of different weights or sex (e.g., 550 pound steers or 750 pound heifers), these cash prices may not move together dollar for dollar with the futures price. If futures and cash prices do not move together dollar for dollar, then it may be that basis should be calculated differently (e.g., cash price proportional to futures). Research by Kastens, Jones, and Schroeder suggests that this is likely not a serious issue except for lightweight calves (400-500 pounds). However, they only included 400-500 and 700-800 pound weight categories in their analysis and thus it is unknown if this is an issue for other weight categories (e.g., 500-600 and 600-700 pounds). When cash and futures prices do not

move together very well, producers may want to consider using a hedge ratio other than one.<sup>6</sup>

The most common way of forecasting basis is to simply use an historical average. Research has shown that this simple approach often works as well as more complex forecasting models (Dhuyvetter and Parcell, Dhuyvetter and Kastens). Dhuyvetter and Parcell concluded that a three- or four-year average was preferred to a longer term average for forecasting feeder cattle basis. Tables 5 through 8 give historical basis levels and the most recent 3-year average by feeder cattle futures contract for 4-5, 5-6, 6-7, and 7-8 cwt feeders steers, respectively, for Dodge City, Kansas.<sup>7</sup> Figures 35 and 36 show the 3-year average basis data for 5-6, 6-7, and 7-8 cwt steers and heifers, respectively. It can be seen that basis levels vary throughout the year (i.e., there is a seasonal pattern) and that basis is considerably more positive for lightweight feeders and for steers (remember this is essentially by definition as the different cash prices are being compared to the same futures price). In addition to the most recent three-year average, tables 5-8 also include the minimum and maximum values from the last 10 years. The minimum and maximum values allow you to quickly see how much variability there has been in the basis. The wider the range between the minimum and maximum, the more variability there has been and hence higher levels of basis risk. The range in basis over the last 10 years is an indicator of the basis risk producers face and it can be seen that it can be higher than the price risk discussed previously, especially as the weight of the cattle decreases.

*Basis risk* is generally thought to be less of a concern than *price level risk* and that generally holds true for feeder cattle weight categories that match those of the feeder cattle futures contract. However, basis risk for light weight feeder cattle can be quite high and thus the effectiveness of hedging with futures or options to manage price risk for these weight categories is questionable.

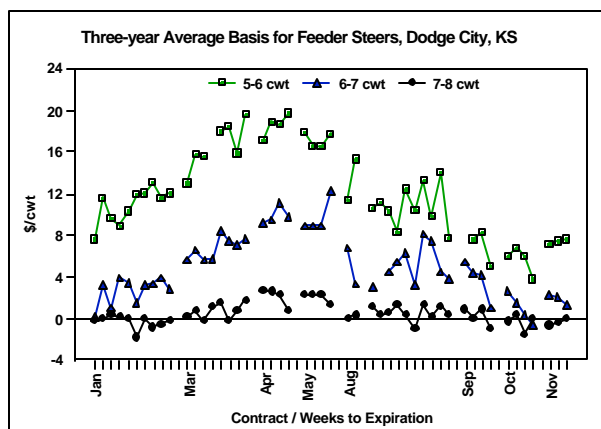


Figure 35

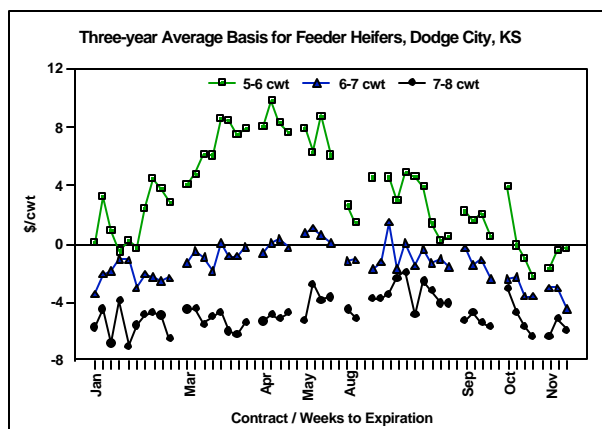


Figure 36

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<sup>6</sup> For a discussion of cross-hedging and hedge ratios see Graff et al. Also, for a more thorough discussion of forecasting and using basis see Mintert et al. and Dhuyvetter and Parcell.

<sup>7</sup> Basis tables comparable to tables 5-8 are available for heifers but have been left out of this paper to save space. They are available from the author upon request.

**Table 5. Feeder Cattle Basis -- 400-500 lb steers, Dodge City, KS.**

Weeks prior to expiration	<u>January Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
9	n/a	18.75	18.95	4.42	1.69	n/a	13.84	16.94	15.28	20.43	17.55	1.69	20.43
8	n/a	20.48	n/a	2.67	n/a	11.28	16.25	18.90	13.57	24.55	19.01	2.67	24.55
7	6.83	19.48	15.78	-1.06	-0.70	n/a	19.13	19.71	17.76	27.77	21.75	-1.06	27.77
6	n/a	19.57	11.71	-0.05	2.38	13.20	15.04	28.62	14.00	28.05	23.56	-0.05	28.62
5	n/a	19.56	16.05	n/a	n/a	n/a	n/a	22.88	16.46	n/a	19.67	16.05	22.88
4	12.78	19.28	21.60	n/a	n/a	10.38	15.50	21.25	n/a	n/a	21.25	10.38	21.60
3	13.33	18.56	n/a	-2.67	5.50	n/a	16.51	22.02	20.77	22.73	21.84	-2.67	22.73
2	8.28	20.18	18.72	0.36	4.40	11.18	17.17	26.81	24.42	29.93	27.05	0.36	29.93
1	13.21	20.80	n/a	3.45	8.28	14.61	14.75	n/a	20.89	24.27	22.58	3.45	24.27
0	12.25	19.13	15.42	4.32	10.35	17.25	16.97	21.63	29.98	29.70	27.10	4.32	29.98

Weeks prior to expiration	<u>March Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
7	15.93	21.20	23.31	3.46	16.08	19.78	15.58	28.84	22.90	n/a	25.87	3.46	28.84
6	16.51	23.73	22.27	7.48	18.03	21.38	21.11	26.06	n/a	29.57	27.82	7.48	29.57
5	n/a	21.60	24.73	9.00	18.72	19.57	24.02	20.56	27.67	32.45	26.89	9.00	32.45
4	26.36	26.40	20.83	7.24	17.24	22.79	22.83	25.10	n/a	25.68	25.39	7.24	26.40
3	n/a	29.43	18.35	2.45	19.26	24.64	24.02	24.33	32.91	31.21	29.48	2.45	32.91
2	19.36	27.29	21.59	4.95	21.51	22.96	25.07	29.08	33.00	29.84	30.64	4.95	33.00
1	27.88	25.48	21.36	5.50	22.27	n/a	21.00	n/a	26.40	32.66	29.53	5.50	32.66
0	29.53	26.33	19.82	6.99	20.89	26.81	20.95	26.23	31.85	29.95	29.34	6.99	31.85

Weeks prior to expiration	<u>April Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	19.98	n/a	22.36	7.35	19.53	26.43	19.55	n/a	29.69	21.00	25.35	7.35	29.69
2	21.60	22.80	20.70	6.29	n/a	24.89	23.47	38.05	n/a	22.58	30.32	6.29	38.05
1	21.45	23.48	22.25	5.18	20.64	25.93	24.02	35.22	26.38	23.79	28.46	5.18	35.22
0	24.42	19.78	18.40	1.77	19.83	23.45	24.91	22.88	27.53	24.50	24.97	1.77	27.53

Weeks prior to expiration	<u>May Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	21.83	23.33	14.59	6.50	22.80	23.63	24.68	n/a	27.21	31.30	29.26	6.50	31.30
2	23.43	24.00	19.95	5.87	15.90	21.51	17.69	29.94	25.08	n/a	27.51	5.87	29.94
1	24.53	23.90	18.12	n/a	14.03	26.36	15.45	28.86	26.93	25.72	27.17	14.03	28.86
0	20.40	18.22	17.10	-0.47	16.40	n/a	28.58	n/a	30.00	19.70	24.85	-0.47	30.00

**Table 5. Feeder Cattle Basis -- 400-500 lb steers, Dodge City, KS. (con't)**

Weeks prior to expiration	<u>August Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
12	21.61	20.55	15.66	3.65	15.60	n/a	11.08	20.28	n/a		15.68	3.65	21.61
11	20.50	21.33	16.81	-0.10	15.98	n/a	n/a	25.23	28.58		26.91	-0.10	28.58
10	23.55	n/a	16.43	3.07	15.30	17.30	n/a	n/a	n/a		n/a	3.07	23.55
9	8.73	n/a	n/a	1.74	n/a	n/a	13.97	25.20	n/a		19.59	1.74	25.20
8	4.90	11.85	4.87	n/a	n/a	n/a	15.83	28.17	n/a		22.00	4.87	28.17
7	n/a	n/a	13.11	n/a	n/a	n/a	n/a	23.43	26.88		25.16	13.11	26.88
6	15.80	n/a	n/a	n/a	n/a	n/a	14.47	24.61	n/a		19.54	14.47	24.61
5	16.65	n/a	n/a	3.37	n/a	n/a	17.60	n/a	16.03		16.82	3.37	17.60
4	14.90	n/a	17.65	1.89	n/a	n/a	22.44	25.18	14.43		20.68	1.89	25.18
3	7.78	16.01	7.08	0.36	n/a	9.61	24.28	21.57	18.67		21.51	0.36	24.28
2	11.13	17.78	8.25	2.86	18.11	14.13	16.46	19.25	22.59		19.43	2.86	22.59
1	12.88	n/a	n/a	0.94	18.84	11.68	16.79	n/a	20.10		18.45	0.94	20.10
0	11.35	n/a	n/a	2.18	n/a	13.97	n/a	12.46	20.77		16.62	2.18	20.77

Weeks prior to expiration	<u>September Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	10.50	n/a	7.00	n/a	n/a	n/a	n/a	13.85	18.95		16.40	7.00	18.95
2	13.83	n/a	n/a	12.74	n/a	8.55	13.94	15.56	18.24		15.91	8.55	18.24
1	10.95	14.30	1.34	9.25	17.05	7.19	9.21	15.15	22.48		15.61	1.34	22.48
0	18.08	10.47	7.38	-1.09	12.89	9.36	11.58	15.40	12.27		13.08	-1.09	18.08

Weeks prior to expiration	<u>October Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	13.90	14.88	n/a	-2.45	n/a	n/a	12.73	n/a	13.86		13.30	-2.45	14.88
2	13.50	12.78	6.27	2.92	17.32	11.99	15.02	12.98	14.06		14.02	2.92	17.32
1	14.70	12.48	2.88	0.63	16.89	n/a	18.51	13.69	15.28		15.83	0.63	18.51
0	17.37	14.91	3.52	4.03	15.71	14.33	13.90	13.88	13.33		13.70	3.52	17.37

Weeks prior to expiration	<u>November Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
2	19.03	14.68	0.69	0.98	12.17	10.90	15.36	23.81	12.72		17.30	0.69	23.81
1	15.40	15.38	4.74	0.75	12.75	14.37	16.63	20.22	11.76		16.20	0.75	20.22
0	15.03	15.24	4.30	1.78	16.08	19.11	19.24	19.25	13.13		17.21	1.78	19.25

**Table 6. Feeder Cattle Basis -- 500-600 lb steers, Dodge City, KS.**

Weeks prior to expiration	<u>January Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
9	n/a	5.45	9.70	1.47	0.28	4.07	8.76	7.31	6.09	9.61	7.67	0.28	9.70
8	n/a	11.54	10.18	0.81	-0.65	3.38	6.85	11.52	10.18	13.18	11.63	-0.65	13.18
7	7.83	7.17	8.53	-2.81	-1.50	4.43	11.12	10.79	9.88	8.16	9.61	-2.81	11.12
6	1.05	6.88	8.21	-1.21	1.51	7.37	6.53	10.53	6.45	9.79	8.92	-1.21	10.53
5	2.23	n/a	6.93	-1.93	n/a	n/a	n/a	13.19	7.56	n/a	10.38	-1.93	13.19
4	3.53	9.03	15.48	-2.21	n/a	n/a	6.84	11.92	n/a	n/a	11.92	-2.21	15.48
3	2.27	6.00	7.89	-10.43	1.38	3.39	8.75	11.57	11.28	13.31	12.05	-10.43	13.31
2	3.78	7.18	5.70	-1.76	n/a	4.18	10.16	12.06	12.58	14.72	13.12	-1.76	14.72
1	4.83	7.24	5.31	0.94	4.99	9.90	7.72	12.10	9.29	13.42	11.60	0.94	13.42
0	5.00	5.50	5.41	n/a	7.37	10.54	7.83	10.89	10.80	14.70	12.13	5.00	14.70

Weeks prior to expiration	<u>March Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
7	10.06	6.83	9.89	1.64	10.98	9.02	7.07	16.38	13.48	9.35	13.07	1.64	16.38
6	8.82	11.86	7.60	1.65	8.52	11.45	9.97	14.72	14.70	18.02	15.81	1.65	18.02
5	n/a	6.73	9.39	5.29	10.22	15.74	12.82	13.66	14.91	18.05	15.54	5.29	18.05
4	9.23	13.28	5.93	3.44	9.97	19.36	12.98	n/a	n/a	n/a	n/a	3.44	19.36
3	n/a	13.16	10.15	2.87	14.46	17.77	15.09	18.62	19.40	16.10	18.04	2.87	19.40
2	10.23	12.35	13.28	0.57	19.89	19.73	15.65	19.17	19.59	16.82	18.53	0.57	19.89
1	15.38	12.51	9.78	1.56	17.05	13.51	12.73	16.50	17.38	14.03	15.97	1.56	17.38
0	19.03	10.83	9.85	5.77	18.02	16.03	11.66	19.52	20.32	18.95	19.60	5.77	20.32

Weeks prior to expiration	<u>April Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	11.11	13.95	11.65	4.97	15.99	15.67	13.83	n/a	16.48	17.63	17.06	4.97	17.63
2	14.60	13.93	12.40	1.19	16.48	15.70	15.80	16.37	19.08	21.43	18.96	1.19	21.43
1	17.20	13.98	14.37	2.66	16.38	13.84	11.62	17.13	20.54	18.30	18.66	2.66	20.54
0	12.85	14.15	13.19	3.90	16.76	n/a	14.05	18.78	20.74	n/a	19.76	3.90	20.74

Weeks prior to expiration	<u>May Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	12.70	18.83	9.46	4.96	17.98	15.30	16.82	n/a	19.23	16.67	17.95	4.96	19.23
2	13.56	17.75	11.46	7.10	9.10	15.51	13.62	19.31	13.83	n/a	16.57	7.10	19.31
1	17.03	19.40	9.63	4.37	10.29	21.42	14.09	17.87	14.68	17.10	16.55	4.37	21.42
0	10.40	10.03	13.08	2.59	7.64	n/a	15.86	n/a	17.79	n/a	17.79	2.59	17.79

**Table 6. Feeder Cattle Basis -- 500-600 lb steers, Dodge City, KS. (con't)**

Weeks prior to expiration	<u>August Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
12	17.11	15.55	9.75	1.22	14.00	10.95	10.25	8.13	15.70		11.36	1.22	17.11
11	15.75	n/a	n/a	-0.13	n/a	8.44	8.91	n/a	21.83		15.37	-0.13	21.83
10	11.05	n/a	n/a	2.41	6.09	n/a	n/a	11.97	n/a		n/a	2.41	11.97
9	8.23	n/a	5.22	n/a	n/a	n/a	10.19	n/a	11.10		10.65	5.22	11.10
8	11.65	n/a	n/a	n/a	6.63	4.65	11.42	10.98	n/a		11.20	4.65	11.65
7	n/a	4.55	n/a	n/a	n/a	n/a	n/a	10.40	n/a		10.40	4.55	10.40
6	6.93	n/a	2.65	-1.92	n/a	n/a	8.42	n/a	n/a		8.42	-1.92	8.42
5	12.15	n/a	n/a	n/a	n/a	n/a	9.09	17.35	10.80		12.41	9.09	17.35
4	9.40	n/a	n/a	-1.15	8.15	n/a	7.47	14.71	9.12		10.43	-1.15	14.71
3	4.85	n/a	n/a	0.13	7.86	5.76	10.68	15.59	13.54		13.27	0.13	15.59
2	5.57	n/a	n/a	n/a	5.34	5.36	7.62	12.75	9.41		9.93	5.34	12.75
1	8.88	11.90	3.13	-1.33	6.99	4.59	n/a	12.25	15.86		14.06	-1.33	15.86
0	n/a	n/a	-2.48	0.34	7.03	6.60	n/a	6.36	9.11		7.74	-2.48	9.11

Weeks prior to expiration	<u>September Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	9.00	n/a	n/a	n/a	7.68	n/a	n/a	n/a	n/a		n/a	7.68	9.00
2	5.45	7.45	-0.72	2.49	6.91	n/a	9.34	5.98	7.73		7.68	-0.72	9.34
1	3.45	n/a	-0.03	1.25	7.90	0.05	5.70	8.02	10.97		8.23	-0.03	10.97
0	3.08	6.78	-2.34	n/a	7.75	5.67	n/a	4.97	n/a		4.97	-2.34	7.75

Weeks prior to expiration	<u>October Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	5.53	5.88	-1.63	-7.00	7.15	1.06	7.02	n/a	5.03		6.03	-7.00	7.15
2	5.25	6.28	2.91	0.97	9.44	3.94	9.54	6.24	4.65		6.81	0.97	9.54
1	7.20	5.23	-0.25	-0.11	8.37	3.13	8.26	5.54	4.33		6.04	-0.25	8.37
0	5.43	8.28	-0.04	0.17	9.91	5.90	4.80	5.37	1.51		3.89	-0.04	9.91

Weeks prior to expiration	<u>November Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
2	6.16	6.05	-2.19	-2.60	1.64	-0.82	5.28	10.82	5.37		7.16	-2.60	10.82
1	7.90	7.75	-1.20	-2.35	5.27	5.51	9.24	8.45	4.80		7.50	-2.35	9.24
0	8.78	7.80	0.62	0.71	8.34	9.53	10.34	8.50	4.32		7.72	0.62	10.34

**Table 7. Feeder Cattle Basis -- 600-700 lb steers, Dodge City, KS.**

Weeks prior to expiration	<u>January Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
9	n/a	2.88	1.70	-1.40	-1.92	-3.38	-1.98	1.66	-1.50	0.47	0.21	-3.38	2.88
8	-1.70	3.87	1.50	-1.98	-2.13	-1.13	3.40	3.78	2.46	3.21	-2.13	4.73	6.86
7	0.58	1.17	n/a	-0.48	-0.71	0.83	2.26	2.79	0.03	0.32	1.05	-0.71	2.79
6	0.80	1.63	3.52	-1.17	0.12	1.08	-0.77	5.49	1.67	4.65	3.94	-1.17	5.49
5	0.98	3.00	3.43	-1.49	n/a	n/a	-3.35	3.55	n/a	n/a	3.55	-3.35	3.55
4	2.41	2.66	3.85	-0.69	n/a	n/a	0.69	-0.19	n/a	3.25	1.53	-0.69	3.85
3	3.08	3.12	3.26	-2.32	2.30	3.35	3.46	5.26	2.39	2.25	3.30	-2.32	5.26
2	1.81	3.18	2.04	0.26	1.18	4.90	3.09	6.33	2.75	1.19	3.42	0.26	6.33
1	2.08	1.62	2.03	-1.28	1.38	4.23	2.99	4.89	4.17	2.77	3.94	-1.28	4.89
0	0.38	0.32	1.23	-2.64	1.76	2.16	2.20	3.75	3.96	1.18	2.96	-2.64	3.96

Weeks prior to expiration	<u>March Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
7	4.06	3.33	4.11	0.22	3.37	3.46	-0.05	7.25	4.63	5.06	5.65	-0.05	7.25
6	0.32	5.36	3.72	0.61	5.21	4.95	2.75	7.61	n/a	5.64	6.63	0.32	7.61
5	0.93	2.04	2.49	0.56	3.75	4.42	5.30	8.68	3.16	5.09	5.64	0.56	8.68
4	1.86	5.53	2.27	-0.63	4.45	6.48	2.82	9.41	5.40	2.53	5.78	-0.63	9.41
3	0.35	4.66	2.32	-0.91	4.20	5.71	4.51	8.40	9.09	8.09	8.53	-0.91	9.09
2	1.61	4.29	1.85	-1.12	6.37	5.45	5.21	7.41	9.24	5.60	7.42	-1.12	9.24
1	4.32	4.67	4.76	-0.53	4.48	3.82	2.64	6.84	7.52	7.08	7.15	-0.53	7.52
0	5.90	4.71	4.06	-1.04	3.27	3.95	4.84	6.60	9.09	7.43	7.71	-1.04	9.09

Weeks prior to expiration	<u>April Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	5.30	7.77	3.75	0.34	4.11	6.08	2.76	n/a	10.60	7.77	9.19	0.34	10.60
2	7.48	5.18	4.11	-1.41	7.59	7.87	4.10	7.30	12.06	9.32	9.56	-1.41	12.06
1	8.20	6.98	3.07	-0.30	7.93	5.84	4.92	8.78	13.46	n/a	11.12	-0.30	13.46
0	8.23	6.15	3.76	0.28	6.84	3.54	4.97	8.21	11.39	n/a	9.80	0.28	11.39

Weeks prior to expiration	<u>May Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	7.83	8.08	1.31	2.15	n/a	3.98	5.23	10.11	7.89	n/a	9.00	1.31	10.11
2	7.69	8.07	1.74	4.12	5.33	7.07	6.83	8.97	5.83	12.07	8.96	1.74	12.07
1	11.16	8.34	2.78	2.96	4.97	9.73	7.32	9.27	5.75	11.98	9.00	2.78	11.98
0	6.05	4.16	3.23	2.76	3.04	n/a	8.96	n/a	12.29	n/a	12.29	2.76	12.29

**Table 7. Feeder Cattle Basis -- 600-700 lb steers, Dodge City, KS. (con't)**

Weeks prior to expiration	<u>August Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
12	7.05	7.99	n/a	0.43	6.14	4.24	n/a	n/a	6.83		6.83	0.43	7.99
11	6.07	n/a	n/a	-1.67	5.81	2.91	2.64	n/a	4.08		3.36	-1.67	6.07
10	7.49	2.63	7.02	-1.42	6.26	2.47	3.45	5.56	2.60		n/a	-1.42	7.49
9	5.05	4.24	2.87	0.59	4.08	2.15	0.67	n/a	5.55		3.11	0.59	5.55
8	7.15	2.29	n/a	-0.31	6.26	1.57	n/a	n/a	n/a		n/a	-0.31	7.15
7	5.09	3.18	n/a	-2.03	n/a	-0.86	n/a	n/a	4.50		4.50	-2.03	5.09
6	5.68	2.35	1.03	-1.36	5.74	n/a	5.55	6.32	4.47		5.45	-1.36	6.32
5	3.53	4.08	n/a	0.51	2.52	1.73	6.40	8.35	4.43		6.39	0.51	8.35
4	3.28	n/a	1.12	n/a	4.59	-1.03	2.32	n/a	4.30		3.31	-1.03	4.59
3	2.91	3.20	1.03	1.50	3.97	-0.38	n/a	10.00	6.27		8.14	-0.38	10.00
2	3.70	n/a	-0.84	1.26	2.89	1.13	n/a	n/a	7.51		7.51	-0.84	7.51
1	5.07	2.72	-0.41	n/a	3.87	1.43	1.20	n/a	7.85		4.53	-0.41	7.85
0	0.73	2.30	-0.44	0.05	2.83	0.90	4.27	3.51	3.58		3.79	-0.44	4.27

Weeks prior to expiration	<u>September Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	5.13	0.51	1.43	0.16	4.02	0.88	4.03	5.22	7.07		5.44	0.16	7.07
2	2.89	5.01	0.94	1.88	3.94	n/a	5.44	n/a	3.48		4.46	0.94	5.44
1	3.33	2.93	1.20	1.03	n/a	2.31	0.49	6.52	5.47		4.16	0.49	6.52
0	1.08	2.65	0.30	-1.81	n/a	3.38	2.55	1.85	-1.40		1.00	-1.81	3.38

Weeks prior to expiration	<u>October Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	2.78	4.01	-1.60	-2.07	4.37	-1.99	0.94	1.58	5.38		2.63	-2.07	5.38
2	1.25	1.40	-0.09	-1.70	3.26	2.25	2.87	2.89	-1.07		1.56	-1.70	3.26
1	1.08	2.11	-2.90	-1.54	2.50	0.04	1.36	2.73	-3.05		0.35	-3.05	2.73
0	1.18	2.47	-0.85	-2.26	0.74	0.56	-0.97	0.43	-1.32		-0.62	-2.26	2.47

Weeks prior to expiration	<u>November Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
2	2.78	0.87	-0.43	-0.08	0.07	-2.01	0.94	4.56	1.40		2.30	-2.01	4.56
1	1.83	2.84	0.63	-0.71	n/a	0.53	3.10	0.94	2.39		2.14	-0.71	3.10
0	1.16	1.87	-1.41	1.05	0.31	0.52	3.78	1.22	-0.80		1.40	-1.41	3.78

**Table 8. Feeder Cattle Basis -- 700-800 lb steers, Dodge City, KS.**

Weeks prior to expiration	<u>January Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
9	n/a	1.25	1.39	-1.69	n/a	-2.82	-4.25	-3.02	n/a	2.87	-0.07	-4.25	2.87
8	-0.76	3.42	3.50	3.00	0.29	-1.32	-3.42	-0.45	0.40	0.14	0.03	-3.42	3.50
7	-0.48	2.17	2.28	3.31	0.79	-1.38	-1.23	2.31	n/a	-1.36	0.47	-1.38	3.31
6	-0.32	1.07	2.77	3.36	2.20	0.12	-1.70	3.12	-2.10	-0.17	0.28	-2.10	3.36
5	-0.24	0.50	2.87	2.71	n/a	n/a	-1.94	1.65	-1.53	n/a	0.06	-1.94	2.87
4	1.03	-0.96	1.83	0.88	n/a	-1.62	0.25	-1.07	n/a	-2.49	-1.78	-2.49	1.83
3	0.02	-0.06	1.01	0.03	1.75	2.98	0.49	2.50	-0.02	-2.32	0.05	-2.32	2.98
2	-1.90	-0.22	1.34	1.15	2.51	-0.24	-0.02	0.87	-1.07	-2.06	-0.75	-2.06	2.51
1	-0.23	0.56	0.27	-0.70	0.48	-0.40	0.49	0.42	-0.71	-1.11	-0.47	-1.11	0.56
0	-1.49	-1.24	0.42	-0.40	1.76	-2.32	-0.24	0.09	-0.27	-0.06	-0.08	-2.32	1.76

Weeks prior to expiration	<u>March Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
7	1.12	1.52	1.85	1.32	2.13	0.15	-0.05	1.94	-1.08	-0.25	0.20	-1.08	2.13
6	0.13	1.61	2.06	1.38	2.57	-0.71	0.30	0.07	1.06	1.37	0.83	-0.71	2.57
5	0.69	0.79	0.51	0.29	2.56	-0.30	1.37	0.27	-1.83	1.07	-0.16	-1.83	2.56
4	-0.70	1.90	-0.88	-1.23	2.05	0.93	-0.38	2.86	0.40	0.31	1.19	-1.23	2.86
3	-0.09	0.49	0.20	-0.95	0.69	1.49	0.34	2.29	0.94	1.72	1.65	-0.95	2.29
2	-1.02	-0.39	-0.61	-0.38	0.31	0.06	-0.39	-0.05	1.07	-1.25	-0.08	-1.25	1.07
1	1.43	1.17	-0.40	0.10	0.86	-0.85	-2.31	0.62	0.51	1.28	0.80	-2.31	1.43
0	1.57	0.21	-2.25	0.86	0.31	-1.37	0.19	0.83	2.61	2.28	1.91	-2.25	2.61

Weeks prior to expiration	<u>April Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	-0.39	0.77	0.54	0.38	0.80	-0.83	-0.06	n/a	1.61	3.98	2.80	-0.83	3.98
2	1.61	-0.01	0.14	-1.00	0.65	0.95	1.10	2.38	3.51	2.27	2.72	-1.00	3.51
1	1.64	0.29	-1.62	0.11	1.09	-0.03	-0.03	1.02	3.46	2.66	2.38	-1.62	3.46
0	2.92	-0.66	-0.41	-0.91	0.68	0.58	-0.21	1.64	0.23	0.70	0.86	-0.91	2.92

Weeks prior to expiration	<u>May Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	3.52	1.46	0.27	1.34	1.51	1.18	-1.02	1.93	4.29	0.73	2.32	-1.02	4.29
2	2.62	1.44	0.62	2.74	2.29	1.36	-1.43	2.63	1.89	2.46	2.33	-1.43	2.74
1	2.88	0.15	0.12	1.83	2.60	0.85	1.11	1.60	3.23	2.02	2.28	0.12	3.23
0	2.55	-0.41	0.55	1.39	1.49	n/a	1.83	1.40	2.05	0.60	1.35	-0.41	2.55

**Table 8. Feeder Cattle Basis -- 700-800 lb steers, Dodge City, KS. (con't)**

Weeks prior to expiration	<u>August Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
12	2.74	3.49	0.62	-0.32	0.75	-0.04	-1.17	-1.08	2.62		0.12	-1.17	3.49
11	2.76	1.84	2.25	1.45	1.65	0.00	-1.18	0.99	1.31		0.37	-1.18	2.76
10	2.56	1.95	2.12	2.26	1.99	1.14	-0.02	3.74	1.05		n/a	-0.02	3.74
9	2.87	2.30	1.39	0.78	1.74	-0.72	-1.47	3.27	1.75		1.18	-1.47	3.27
8	2.69	2.11	-2.25	2.30	n/a	-0.20	n/a	0.49	n/a		0.49	-2.25	2.69
7	4.90	0.80	0.09	1.08	2.50	0.02	-1.59	1.25	1.96		0.54	-1.59	4.90
6	3.99	-0.42	1.09	0.83	3.32	-0.91	0.05	3.02	1.24		1.44	-0.91	3.99
5	2.72	1.16	0.51	2.11	1.14	-1.64	0.76	-0.43	1.10		0.48	-1.64	2.72
4	2.09	0.50	1.42	1.66	0.48	-0.84	-0.74	n/a	-1.11		-0.92	-1.11	2.09
3	3.36	1.20	0.42	1.29	0.53	-0.14	1.38	0.71	2.20		1.43	-0.14	3.36
2	1.01	0.16	-0.29	2.82	0.38	-1.12	-0.79	1.19	0.38		0.26	-1.12	2.82
1	0.17	1.12	-0.65	0.83	3.31	1.27	1.64	0.98	1.36		1.33	-0.65	3.31
0	0.36	-0.89	-0.51	1.61	-1.18	-1.79	0.65	-0.39	1.17		0.48	-1.79	1.61

Weeks prior to expiration	<u>September Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	2.69	-0.18	1.34	1.53	-0.32	-2.74	-0.33	1.06	2.13		0.95	-2.74	2.69
2	1.21	1.88	1.01	0.88	0.45	-1.11	2.01	0.74	-2.40		0.12	-2.40	2.01
1	0.45	0.87	1.41	0.53	0.00	-1.32	-0.63	1.07	2.41		0.95	-1.32	2.41
0	-1.04	1.22	1.27	-0.84	-0.52	-2.00	0.83	-0.08	-3.51		-0.92	-3.51	1.27

Weeks prior to expiration	<u>October Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
3	0.40	-0.05	1.23	-0.82	2.27	-2.51	-1.70	-1.54	2.57		-0.22	-2.51	2.57
2	-0.06	-0.10	1.29	-0.33	-0.47	-1.67	-0.83	0.00	2.31		0.49	-1.67	2.31
1	-1.36	1.05	-0.01	-0.13	-1.10	-2.04	-1.22	-2.80	-0.23		-1.42	-2.80	1.05
0	-0.13	1.60	1.29	1.98	-3.24	0.71	-0.43	-0.62	1.03		-0.01	-3.24	1.98

Weeks prior to expiration	<u>November Contract</u>										00-02	93-02	93-02
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Avg	Min	Max
2	0.10	-1.07	1.62	-0.44	-2.01	-2.87	0.46	-2.54	0.25		-0.61	-2.87	1.62
1	-0.04	1.88	2.34	-0.42	-2.46	-0.82	0.80	-1.29	-0.47		-0.32	-2.46	2.34
0	0.41	1.05	2.65	2.00	-0.28	-2.17	0.38	0.25	-0.58		0.02	-2.17	2.65

### Product risk

For this paper, *product risk* simply refers to producing something that nobody wants without a discount. There have been numerous studies over time examining the factors affecting feeder cattle prices (e.g., Lambert et al., Mintert et al., Sartwelle et al.). Many of these studies have come to a conclusion that producers can enhance the price they receive by following some basic production and marketing strategies. For example, these studies have consistently found that premiums are paid for larger lot sizes of cattle and uniform lots. However, Sartwelle et al. found that the price effects of some feeder cattle characteristics change with time and thus they stated that “producers should be wary of relying upon dated information when making management and marketing decisions.” For example, Lambert et al. analyzing Kansas data from the fall of 1981 found that Angus feeder cattle were discounted relative to Hereford cattle. In an analysis of Kansas data from the fall of 1986 and spring of 1987, Mintert et al. also found that Angus- influenced feeder cattle were discounted relative to Hereford feeder cattle. Sartwelle et al. analyzing Kansas data from the spring and fall of 1993 found that Angus-influenced cattle brought a premium relative to Hereford cattle.

Certified Angus Beef LLC (CAB) started collecting feeder cattle prices of Angus versus other cattle from cooperating auction markets in 10 states from Kentucky to California (“Here’s the Premium” project). Figure 37 shows the premiums that have been received for Angus feeder cattle over their non-Angus counterparts. This study shows there has been a consistent premium that is possibly growing over time – at least for calves in the fall. While this is not to say that all producers need to be producing Angus cattle, it does reinforce the findings of Sartwelle et al. That is, what the market is willing to pay premiums for (or what they are going to discount) changes over time and producers need to be aware of this to the best of their ability and make management decisions accordingly.

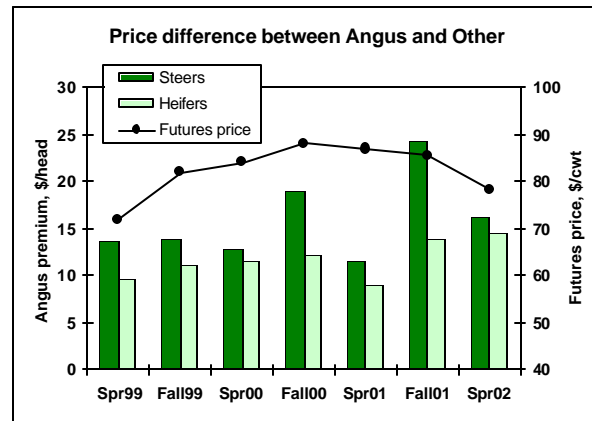


Figure 37

In addition to physical characteristics that affect feeder cattle prices, how cattle are managed and marketed can impact prices. There are numerous pre-vaccination or preconditioning types of programs that producers can participate in with the intent of increasing the value of their cattle. However, producers need to compare the added cost of these programs with the expected benefit (i.e., premium on calves). Figure 38 shows the estimated premium that has been received for the cattle participating in the Holton Special Calf Sale from the fall of 1999 through the spring of 2002 (Dhuyvetter, Holthaus, and Hallauer). After accounting for cattle and other marketing characteristics (e.g., weight, sex, breed, lot size, uniformity) prices for calves sold through the Special Calf Sale were compared with prices received for calves sold in the regular auction sale of that same week. These results suggest that calves sold through this special preconditioned sale have been receiving a premium of about \$20-\$25 per head (\$4.40/cwt for fall calves and \$3.01/cwt in the spring). These results are consistent with values found by others – King (\$3.33/cwt) and Avent, Ward, and Lalman (\$1.96-\$3.36). Avent, Ward, and Lalman, indicate that preconditioning can cost up to \$60 more per head than selling calves at weaning. However, because costs can vary significantly between producers, it is important for individual producers to compare this expected value with what their added costs are to determine if programs such as this are profitable for their operations.

In a Colorado State University study analyzing the benefit of preconditioned calves in the feedlot phase, Roeber and Umberger found that preconditioned calves had \$45-\$50 per head higher returns than cattle of an unknown origin due to lower costs. They concluded that premiums from preconditioned sales could be as high as \$8-\$9/cwt for 550 pound calves. However, they also suggested that cattle feeders may not be paying the higher premiums due to risk issues. Others have estimated the value of preconditioning to be in this same range and even higher (e.g., Cravey; Nyamusika et al.). Whether it is a risk issue or because producers selling preconditioned calves are not aware of the true value of these programs, there appear to be fairly large differences between the value and cost of these programs. Thus, there should be opportunities to profit from these discrepancies. If you are a cattle feeder, then it clearly looks like it is advantageous to purchase preconditioned calves because the premium you have to pay has historically been less than the value. On the other hand, if you are preconditioning calves you may want to consider retaining ownership in them because the market currently is not paying you for the value of your calves. Either way, these are management decisions that can be *manageable* if you have the right information.

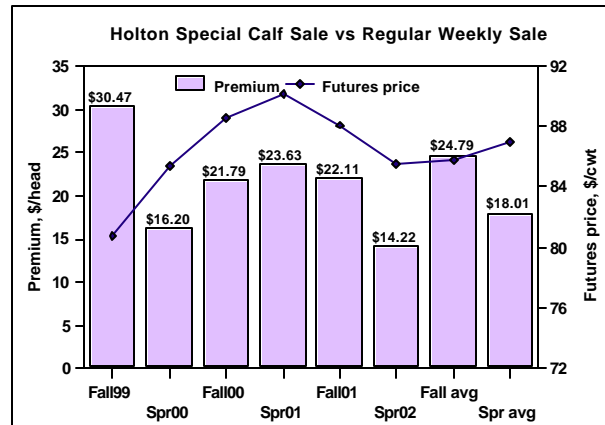


Figure 38

### Summary

There are numerous risks that stocker and backgrounding operations face and managing these risks is a topic that generates much interest. In addition to identifying the risks involved in their operations, producers need to think about where their management efforts are best spent. That is, producers should focus on those risks that are *manageable*. This paper has examined and briefly discussed several different types of risk: production, price level, basis, and product risk.

Differences between high- and low-profit farms is often tied to differences in costs and not prices which suggests that producers can, and do, manage costs much better than prices. Thus, one recommendation to producers for managing risks has to be the following – ***focus on being a low cost operator first and foremost because that is what keeps businesses in business.*** After you have done the best job in that area, then you can turn your attention to price level risk. There is huge variability in the price of calves and feeder cattle over time (i.e., price swings in excess of \$40/cwt). However, because stocker/background operators are margin operators that is not the price level risk they need to be concerned with. Rather, the price level risk they face is from prices changing over the time period in which they own cattle (e.g., 90-180 days). Over the last 22 years, this shorter term price risk has averaged about \$8/cwt based on feeder cattle futures price changes. While this risk is large enough to be concerned with, it is questionable as to whether or not our traditional risk management tools (i.e., futures and options) can be used very effectively to manage this risk, especially given the basis risk that also exists. Thus, a second recommendation to producers for managing risks is the following – ***if price level risk is a concern for your business, then you may want to look into establishing partnerships/alliances for forward contracting or retaining ownership of cattle.*** Finally, producers need to know what production and marketing characteristics impact the price of the cattle they are selling. Remember, the goal is not to get the highest price for your cattle, it should be to make the most money from your cattle. In other words, don't go for premiums if the cost of achieving them is higher than the premium, however, if the opposite is true make sure you are aware of it. Thus, a final recommendation to producers is the following – ***know what the market is and isn't paying for and be flexible with your production and marketing strategies to take advantage of these.***

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