Beef Industry Risk Management: Alternatives and Resources for Producers

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One must know their business to manage it …

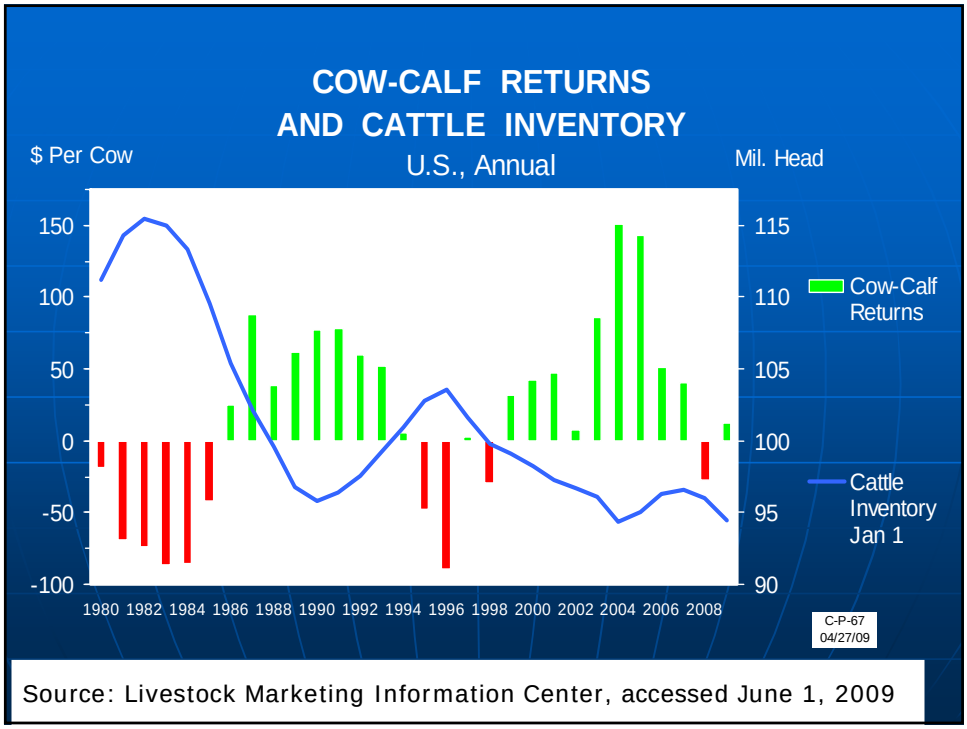
- Items to understand:
  - Factors you may be able to influence
    - *relative* prices, production efficiency, own-herd health, etc.
  - Factors you generally can't influence
    - weather, government policy, trade status, neighbor's herd-health, etc.
- You must know:
  - a) how much you can afford to, and
  - b) how much you prefer to risk in making risk management decisions.

One must know their business to manage it …

- BUILD & KEEP A CURRENT BUDGET
  - Templates are available:
  - http://www.extension.iastate.edu/Publications/FM1815.pdf
    - 10 beef cattle budgets, differentiated by season of placement & hay vs. silage systems
  - http://www.agmanager.info/farmmgt/fmg/livestock/default.asp
    - 9 beef cattle budgets including those specific to cow-calf and feedlot operations

One must know their business to manage it …

- BUILD & KEEP CURRENT:
  - CASH FLOW,
  - BALANCE SHEET, and
  - INCOME STATEMENT
- Examples are available:
  - http://www.extension.iastate.edu/Publications/FM1824.pdf
  - http://osuextra.okstate.edu/pdfs/F-751web.pdf
  - http://www.extension.iastate.edu/publications/FM1792.pdf
  - http://www.oznet.ksu.edu/library/agec2/mf294.pdf



Source: Livestock Marketing Information Center, accessed June 1, 2009

Profit Variability Example: Finishing Calves (1999-2008)

(Dr. John Lawrence – Iowa State)

Profit	Over		$ 150	3.30%
Profit	$ 120	to	$ 150	0.80%
Profit	$ 90	to	$ 120	4.20%
Profit	$ 60	to	$ 90	13.30%
Profit	$ 30	to	$ 60	11.70%
Profit	$ -	to	$ 30	11.70%
Loss	$ (30)	to	$ -	12.50%
Loss	$ (30)	to	$ (60)	11.70%
Loss	$ (60)	to	$ (90)	15.80%
Loss	$ (90)	to	$(120)	6.70%
Loss	$(120)	to	$(150)	5.00%
Loss	Over		$(150)	3.30%

45.0% of Months are Profitable

Range: (-$222, $345)

55.0% of Months are Unprofitable

Price Risk Management Strategies/Options for Cattle Producers

- 100% Cash Marketing
- Forward Contracting
- Hedging: Futures Contract
- Hedging: Put & Call Options
- Livestock Risk Protection Insurance (LRP)
- Livestock Gross Margin Insurance (LGM)

Basis = Cash Price – Futures Price

- Varies seasonally, geographically, and by time horizon until futures contract expiration
  - Suggestions:
    - Record your operation's realized basis to learn & improve management
    - Success depends more on basis than typically appreciated
- Tonsor, Dhuyvetter, & Mintert (04')
  - Historical average of 3 & 4 years to forecast feeder & live cattle basis, respectively (Dodge City, KS data)
- BeefBasis.com (http://www.beefbasis.com/Home/tabid/53/Default.aspx)
  - Decision support for hedging feeder cattle (output for cow-calf; input for feedlots)
    - Based on 12 states; KY/TN is most similar to MI

Hedging with Futures Contracts

- Basis risk remains, price risk negated, and margin calls exist
- LC & FC Contracts: 40,000 & 50,000 lbs
  - Equates to about 30 (1,300 lbs) fed and 67 (750 lbs) or 100 (500 lbs) feeder cattle
- Fixed proportions introduces speculation and under/over hedging for most farms:
  - Cow-calf operation selling 75 head (500 lbs) speculates on 25 head by going short 1 FC contract
  - Feedlot operation selling 100 head (1,300) could have 3 (under hedged by 10 head) or 4 short LC contracts (over hedged by 20)

Expected & Realized Prices of a Potential Futures Market Hedge

- Determine expected sales price:

  Futures price when hedge placed ($/cwt)

  + Expected basis ($/cwt)

  - Brokerage commission/fees ($/cwt)

  = *Expected sales price* ($/cwt)
- Identify realized sales price:

  Expected sales price ($/cwt)

  + Basis change from expect. ($/cwt)

  = *Actual sales price* ($/cwt)

Minimum Expected & Realized Sales Prices of a Put Option Hedge

- Determine minimum expected sales price:
  - Put option strike price ($/cwt)
  - Option premium ($/cwt)
  + Expected basis ($/cwt)
  - Brokerage commission/fees ($/cwt)
  = *Minimum expected sales price* ($/cwt)
- Identify realized sales price:
  - Cash market price received ($/cwt)
  + Net on option trade ($/cwt)
  = *Actual sales price* ($/cwt)

USDA RMA Products

- Livestock Risk Protection (LRP)
  - Insure 70-100% of expected *output* prices
  - Feeder Cattle
    - Annual limit of 2,000 head/year
  - Live Cattle
    - Annual limit of 4,000 head/year
- More details at: http://www.rma.usda.gov/livestock
  - Fact sheets, premium calculators, etc.

USDA RMA Products

- Livestock Gross Margin (LGM)
  - Insures the following *margins*:
  - Yearling operation (5 months):
    - $12.5*LC_t - 7.5*FC_{t-5} - 50*Corn_{t-2}$
  - Calf finishing operation (8 months):
    - $11.5*LC_t - 5.5*FC_{t-8} - 52*Corn_{t-4}$
- Covers feeding margin, not one leg
- Limit of 10,000 head per year
- Assumes only 1 corn price period
- State-specific prices, changes but doesn't remove basis considerations

GIPSA Livestock & Meat Marketing Study (Jan. 2007)

- Fed Cattle Transactions (10/02-3/05):
  - Sales through sale barns resulted in highest price, but most price risk
  - $0.16/lb (carcass wt) higher price for auction sales than forward contracts;
  - 46% higher price variance in auction sales than forward contract sales

Source: Muth et al. (2008): http://ageconsearch.umn.edu/bitstream/36711/2/33010118.pdf

Relative Performance

(Lawrence & Smith, Iowa State)

1/1987-12/2000 IA Feeding Operation

Returns ($/cwt) to Feeding Risk Management Strategies

	Average	Std Dev	Maximum	Minimum
Cash	1.63	5.54	18.22	-12.33
Futures	0.33	3.76	11.77	-11.29
50% Futures / 50% Cash	0.98	4.17	12.97	-9.82
1 OTM Put	0.82	4.86	16.15	-11.96
1 ATM Put	0.66	4.68	15.37	-11.29
1 ITM Put	0.52	4.51	14.5	-10.56

	Positive Returns %	Beats Cash %
Cash	65%	NA
Futures	54%	40%
50% Futures / 50% Cash	64%	40%
1 OTM Put	58%	14%
1 ATM Put	57%	21%
1 ITM Put	58%	25%

Feeder Cattle Sales Risk Management EXCEL Tool, K-State AgManager

(http://www.agmanager.info/livestock/marketing/LRP/default.asp)

- Comparison of:
  - Cash
  - Futures Hedge
  - LRP
  - Put Option
  - Hedge & Call
  - Put & Call
- Input information:
  - Hedging & sales date
  - Number of head
  - Expected basis
  - Current futures and options market
  - LRP coverage & costs
  - Commission costs

June 11th Example:

Sell 95 head (525 lbs) on 9/11/09

Current Sep Futures $96.70 ($2 basis)

Futures price	Cash	Hedge	LRP	Put
$80.00	$82.00	$98.62	$83.81	$95.56
$85.00	$87.00	$98.61	$84.86	$95.55
$90.00	$92.00	$98.60	$89.86	$95.54
$95.00	$97.00	$98.58	$94.86	$95.53
$100.00	$102.00	$98.57	$99.86	$97.58
$105.00	$107.00	$98.56	$104.86	$102.58
$110.00	$112.00	$98.55	$109.86	$107.58
$115.00	$117.00	$98.53	$114.86	$112.58
$120.00	$122.00	$98.52	$119.86	$117.58

NAIBER's Feeding Risk Analyzer (Feedlot Profitability Tool)

(http://www.naiber.org/cattleriskanalyzer/)

- Inputs:
  - placement & sales dates,
  - placement weight
  - current feeder cattle prices,
  - interest rates,
- Outputs:
  - Distribution of profit, vet costs, feeding efficiency, corn price, revenue
    - E.g., expected proft & likelihood of different profit/loss ranges

June 17th Example (KS): Buy 750 lb steers on 6/24 for $97/cwt; sell 11/24; interest rate of 7.5%

- Expected Values:
  - Vet costs: $12.03/head
  - Feed conversion: 6.13 lbs
  - Daily Gain: 3.39 lbs
  - Days on Fed: 153 days
  - Sales Weight: 1,268 lbs
  - Corn Price: $4.18/bu
  - Fed Cattle Price: $85.99/cwt
  - Revenue: $1,038/head
    - Full report link shows distributions

Forecasting Feeding Margin Volatility

(Tonsor & Schroeder, forthcoming)
(Jan 95' – July 04' Dodge City KS data)

- Incorporating BOTH implied volatility & historical volatility provides best forecasts of feeding margin variability.
- Historical average approach underestimates downside risk (Value-at-Risk Evaluations)
  - HA: -$99 VaR Estimate; 15% violations
  - IVHN: -$157 VaR Estimate; 6% viol
    - Average implied vol. & 1-year lagged historical vol.
- Can be difficult for individual producers to implement. However, recognition is important.

Cow-Calf Operations: Feeding & Marketing Cull Cows (Feuz).

- Cull-cow receipts are 15-30% of enterprise income
- Three main factors to consider:
  - Price Seasonality
    - Lowest in Nov-Jan; Highest Mar-May
  - Slaughter Grades
    - Canner, Cutter, Utility, Commercial
  - Cost of Feeding
- Cull-cow markets are difficult to forecast

Other Resources

- Cattle Risk Management Info. Library (USDA RMA/Kansas State Univ.)
  http://www.agmanager.info/crmil/Home.aspx
- USDA Agricultural Marketing Resource Center
  (http://www.agmrc.org/business_development/operating_a_business/risk_management/livestock_price_risk_management.cfm)
- Dr. Dillon Feuz' website:
  http://cattlemarketanalysis.org/downloads.html

QUESTIONS

- Tonsor's website (includes presentation):
  - http://www.msu.edu/user/gtonsor/