Detail of Procedures for Estimating Historic and Projecting Future Fed Cattle Finishing Returns

July 2012

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This short document outlines the procedures used to create the monthly cattle finishing returns series, which was updated and expanded in July of 2012. The main purpose of this update was to modify the feeder and fed cattle prices used for calculating historical returns, incorporate available information into projected returns, present returns for both steers and heifers, and to calculate costs of gain required to breakeven given expected fed cattle selling prices. An explanation of how monthly historic returns are estimated and how projections for upcoming months are derived are provided here.

To estimate cattle finishing returns a host of details are needed on how cattle perform (e.g., average daily gain, feed conversion, death loss) while on feed as well as information on the cattle and feed markets. The main sources of information utilized are the *Focus on Feedlots* (*FOF*) survey conducted monthly by Kansas State University which provides animal performance estimates[1]; the Livestock Marketing Information Center[2] (LMIC) which compiles feeder and fed cattle market information originating from the USDA and futures market prices; and the Federal Reserve system which provides interest rates.

To be transparent in how the return series are created, the following is a brief summary of the sources and approaches used:

- Placement and final weights, days on feed, average daily gain, feed-to-gain, death loss, and cost of gain information are provided each month from closeout estimates contained in the *Focus on Feedlots* survey summaries. The specific values used are the means of individual feedyards; there typically are 6 to 8 Kansas feedyards participating in the survey each month.

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[1] http://www.asi.ksu.edu/p.aspx?tabid=302
[2] http://www.lmic.info/

- Projections of placement and final weights, average daily gain, feed-to-gain, death loss, dressing percentage, and relative marketings on live and dressed basis for upcoming months are each derived using values from one year earlier multiplied by an adjustment for how the most recent six months have deviated, on average, from the same six month period one year earlier. This approach captures both seasonality that exists as well as current trends (i.e., placement weights increasing or decreasing relative to previous year). Projections for days on feed are then recovered from projected in- and out-weights and average daily gain values.

- Projections for cost of gain over upcoming months are derived from a regression where historical cost of gain reported in the *Focus on Feedlots* survey is estimated as a function of death loss, feed conversion, corn price, alfalfa price, and a monthly trend. The inputs for estimating this regression are provided directly by the *Focus on Feedlots* survey. Projected corn prices for upcoming months are generated using a composite forecast derived by placing 50% weight on a basis-adjusted (three-year historical average) futures market forecast and 50% weight on a regression forecast where corn price is a function of the nearby futures market contract price and monthly dummy variables to capture seasonal variation. Projected alfalfa prices for upcoming months are also generated by a composite forecast. Narrowly, 80% weight is placed on the previous month's price and 20% weight is placed on a regression forecast where alfalfa price is a function of corn price.

- Historic feeder cattle prices are derived mainly using information from the *DC_LS750* report for the Winter Livestock Feeder Auction in Dodge City, Kansas which USDA Market News regularly releases.[3] These USDA prices are then adjusted for placement weight and date to align with the *FOF* information. Narrowly, the date of purchase is derived from the days on feed, average daily gain, and final weight reported in the *Focus on Feedlots* survey. The purchase date is then used to identify the relative weight placed on each of the two surrounding months' prices. For instance, the *FOF* closeouts in May 2012 were estimated to have been placed on January 3, 2012 so the purchase price is derived by placing 37.1% weight on a December 2011 price and 62.9% weight on a January 2012 price for the appropriate weights reported by USDA consistent with the *FOF* reported placement weights.

- Projected placement prices for feeder cattle are generated using a composite forecast derived by placing 50% weight on a basis-adjusted (four-year historical average) futures market forecast

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[3] http://www.ams.usda.gov/mnreports/dc_ls750.txt

and 50% weight on a regression forecast where feeder cattle price is a function of the nearby futures market contract price and monthly dummy variables to capture seasonal variation. Narrowly, prices are first projected for 650, 750, and 850 lb placements and given calculated start weights and dates for each month a projected price is derived.

- Historic fed cattle sales prices are derived mainly using information from the *LM_CT182* report for Kansas Direct Slaughter Cattle which USDA Market News regularly releases.[4] More specifically, a marketing volume weighted average price is derived using live and dressed values, live and dressed head counts, and dressing percentages are used to derive historic fed cattle sales prices.

- Projected fed cattle sales prices result from combining futures market prices for upcoming contracts, historical basis levels, a regression forecast, and expectations on dressing percentage and the proportion of sales made on a dressed basis. Narrowly, a composite forecast for live fed steer price is derived by placing 50% weight on a basis adjusted (three-year historical average) futures market forecast and 50% weight on a regression forecast where Kansas live fed steer price is a function of the nearby futures market contract price and monthly dummy variables. A dressed fed steer price forecast is then derived using the past six month's average dressed-to-live fed steer price relationship. The final fed cattle sales price is derived combining the projected live and dressed prices which are volume weighted to reflect the relative head counts expected for the projected month.

- The interest rate paid by a feedyard is assumed to be an equally split, five-month average of the Bank Prime Loan Rate and Agricultural Operating Loan Rate as tracked and reported by the Federal Reserve. This interest rate is used to estimate the interest paid in carrying a purchased feeder from placement to the time of sale. It is assumed the cost of gain estimates provided in the *FOF* survey incorporate interest paid on purchased feed and thus no additional interest is charged on feed cost of gain.

- Equivalent information is available for steers and heifers so comparable historical and projected returns are derived for both.

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[4] http://usda.mannlib.cornell.edu/usda/ams/LM_CT182.txt

Given the above information, standard measures including gross return, total cost, net return, and breakeven values (feeder cattle purchase price, fed cattle sales price, and cost of gain) are calculated. These are the main "bottom-line" measures of core interest to most analysts of the feedlot industry. Going forward we anticipate providing monthly updates of the following for both steers and heifers:

1. Historical & Projected Net Returns for Finishing
2. Historical & Projected Feeding Cost of Gain
3. Breakeven Fed Cattle Prices, Breakeven Cost of Gain Values, and Breakeven Feeder Cattle Prices