

## Finishing Cattle That Have Been Limit Fed or Fed Ad Libitum at the Stocker Phase- *Marketing Live Fed Cattle*

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### **Background**

A research study was conducted at the Kansas State University Stocker Unit and Pratt Feeders to evaluate the impacts of limit feeding during the backgrounding phase and develop an economic framework to measure and quantify the sustainable attributes of limit feeding. At the stocker phase, four hundred eighteen calves were allotted to two treatments, one a 60NEg diet that was limit fed and a 45NEg diet that was fed ad libitum for 90 days. Limit fed calves had feed restricted to 85% of ad libitum calves feed intake. Cattle were then sent to Pratt Feeders where all cattle were finished on the same diet which was fed ad libitum. Throughout the trial, performance data and cost of gain was collected to build a producer budget sheet. All variables from the study were utilized to construct a budget sheet that compares the cost at the feedlot sector when finishing cattle that were limit fed or fed ad libitum at the stocker phase. The budget sheet is built utilizing data received through the study, but also allows owners/operators to input costs and information relevant to their operation.

### **Budget Sheet Explanation**

This spreadsheet is designed for feedlot operators to input values relevant to their operation in combination with values found during the trial to evaluate the per head income over total costs for calves fed ad libitum or limit fed at the stocker phase. This budget sheet is designed to be utilized by operators that sell their fed cattle on a live basis. Values in **blue** are designed to be changed by the producer to represent their operation. If these values are unknown for your operation, use the values in place as a default.

It is important to note that this budget sheet is designed as a comparison, assuming the same feeder animal is placed into each scenario. There are numerous factors that impact stocker cattle production with key factors being the diet fed, the rate at which it is fed, and the weight of cattle entering the feedlot. With that, data from previous studies comparing feeder cattle to fed cattle shows that as bodyweight at feedlot entry increased, finishing average daily gain, dry matter intake, and hot carcass weight increased, whereas gain to feed ratio and days on feed decreased (Rueter and Beck, 2013).

### **Production Efficiency Measures:**

To begin, fill out death loss, average daily gain, and days on feed for your operation. The anticipated increase in average daily gain for the ad libitum fed calves is the value that was found through the research conducted at Pratt Feeders. If you choose to not account for the anticipated increase, this value can be set to zero. These values go into calculating the weight of calves when they are ready to be sold. The prices for fed animal sale price is a default value based upon a 3-year average steer price and purchase price is a default value based upon a 3-year average 700- 900-pound feeder steer price. The user should update both values to obtain a more accurate estimate. If purchasing heifers

these values should be adjusted accordingly. If purchasing cattle at a specific time of year, utilize the seasonality tab to obtain a more accurate fed steer price. The average weight of calves purchased should be inserted into the purchase price quantity.

### ***Total Gross Return:***

Total gross return, is then calculated by taking the feeder animal sale price and subtracting purchase price and death loss from that value. Differences between the two feeding types are captured here through the anticipated increase in average daily gain of stocker calves fed ad libitum, resulting in a greater hundred weight produced.

### ***Variable Costs:***

The next section looks at the variable costs. Prior to beginning this section, the feed tab should be updated to reflect the ration fed. Doing so will accurately account for the harvested forage, grain/ protein supplement, and mineral cost per head per day. Research at Pratt Feeders found an anticipated increase in cost of gain for limit fed calves. This value may be zeroed out if preferred. If the operation has other feed costs those can be accounted for in the space provided. Labor represents the labor requirement for each animal during the feedlot phase. The wage for employees should be adjusted to fit the operation. Variable costs for vet medicine/ drugs, marketing costs, utilities, gas, fuel, oil, and machinery, facility/ equip repairs are all Kansas Farm Management Association (KFMA) values for the feedlot sector. These values may be used, or values for a specific operation may be inserted if available. Cash interest paid and other variable costs are also KFMA data for feedlot operations. Other variable costs is a rough sum of all other KFMA variable costs, including fees/ publications/ travel, conservation, building rent, and auto expenses. The sum of these values gives the total variable costs. The difference in variable costs is due to the anticipated increase in feed costs for limit fed stocker calves.

### ***Fixed Costs:***

Depreciation, taxes, and farm/ livestock insurance are all KFMA values. The opportunity cost of investment is a KFMA value that represents interest charge, it does not represent cash interest paid, rather a measure to reflect the interest that could have been earned had the investment been made elsewhere. It is important to note that the fixed costs are the same for both feeding methods.

### ***Income Over Costs:***

Finally, the income over variable costs and income over total costs is found at the bottom of the spreadsheet. The profitability of each feeding type can be compared and a producer may make adjustments and decisions as they see fit for their operation.

### ***Producer Example:***

Producer A finishes cattle for 150 days and has experienced a death loss of 1.5%. Cattle at this operation have an average daily gain of 3.2 pounds. Producer A is anticipating an increase in average daily gain of .2 when finishing calves that were fed ad libitum in the background phase. For limit fed stocker calves he observes the cwt produced is 4.8, and the cwt produced for ad libitum fed stocker calves is 5.1.

Producer A typically buys 800 pound steers in April then markets them live in September, so he uses 162.97 and 106.43, respectively from the seasonality tab. After feeding cattle for 150 days, the limit fed stocker calves are expected to be 1280 pounds and the ad libitum fed stocker calves are expected to be 1310 pounds. Once death loss is accounted for, the total gross return for producer A when finishing limit fed stocker calves is \$38.99 and \$70.92 when finishing ad libitum fed stocker calves.

When formulating rations, producer A feeds cattle a ration of 1.5 lbs/ day of prairie hay, 1.5 lbs/day of alfalfa, 17 lbs/ day of corn, 5 lbs/ day of DDGs, and .5 lbs/ day of salt and mineral. After feeding for 150 days the feed costs per head are \$23.63 for harvested forage, \$242.11 for grain/ protein, and \$11.25 for salt and mineral. Producer A is anticipating the increased feed cost when finishing limit fed stocker calves, so he includes the additional \$6 per cwt produced for a total of \$28.80 per head. Producer A will not be using any other feed, so that line remains untouched. Producer A accounts for a labor wage of \$17 per hour. After 150 days and a .3 hour a month labor requirement per head, labor costs are \$25.5. Producer A opts to use the KFMA values for vet medicine/ drugs, marketing costs, utilities, gas, fuel, oil, and machinery, facility/ equip repairs. Additionally, producer A also decides to use the provided KFMA values for cash interest paid and other variable costs. After completing the variable cost section, when finishing ad libitum fed stocker cattle, \$376.48 in variable costs is observed and when finishing limit fed stocker cattle, \$405.28 in variable costs is observed.

Producer A decides to use the KFMA values for the fixed cost section, and does not have any other fixed costs. This brings the fixed costs for finishing limit fed or ad libitum fed stocker calves to \$56.50. Income over total costs for finishing limit fed stocker cattle comes out to be -\$422.79 and income over total costs for finishing ad libitum fed stocker cattle comes out to be -\$362.07. Producer A realizes an economic benefit of finishing cattle that have been fed ad libitum during the stocker phase

#### Reference:

Reuter, R.R., & Beck, P.A. (2013). Carryover effects of stocker cattle systems on feedlot performance and carcass characteristics. *Journal of Animal Science*, 91(1), 508.