

# Market Beef Evaluator

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## INTRODUCTION

The Market Beef Evaluator is an Excel spreadsheet program designed to assist youth beef project members and their parents and/or county educators in the evaluation of animal progress and feeding programs for growing and finishing beef cattle. This spreadsheet is designed merely as an evaluation tool; it is not intended to be used in balancing rations. The program consists of six worksheets which include:

- GENERAL INFO
- FEED LIST
- EVALUATOR
- REQUIREMENTS
- PRINT SUMMARY
- PROJECT PLAN

Many factors can affect animal performance, in addition to the nutritional program. As a result it is encouraged that youth visit with their project leader or educator to ensure that the feeding program is safe and satisfactory prior to implementing the program.

## Getting Started

System requirements:

- IBM compatible computer with a 486 processor or higher
- Windows 95 or higher operating system
- Microsoft Excel software (if you do not have Excel – contact Dr. Celina Johnson at [jcelina@lamar.colostate.edu](mailto:jcelina@lamar.colostate.edu))
- At least 8 MB of memory (RAM), 16 MB is recommended

To install the software from a disk:

- Start Windows
- Insert disk into appropriate drive
- Open “My Computer”
- Open the appropriate disk drive
- Open “Market Beef Evaluator.xls” by double clicking on the icon

The program can be saved to your system’s hard drive to enhance operation. As changes are made and the spreadsheet is customized to your needs, files can be saved as Excel (\*.xls) files under an appropriate name. This can be done by selecting the SAVE AS function from the FILE menu located on the Windows toolbar.

**NOTE:** It is recommended to save the original file as a backup to ensure that you always have one working copy!

## Using the Market Beef Evaluator

To simplify the use of this spreadsheet, the program is divided into six worksheets, which can be opened by selecting the appropriate tab located at the bottom of the screen. These tabs include *GENERAL INFO*, *FEED LIST*, *EVALUATOR*, *REQUIREMENTS*, *PRINT SUMMARY*, and *PROJECT PLAN*. Data can only be entered into yellow cells, green cells are protected. If a red arrow is shown in the upper-right corner of a cell, there is a comment that can be viewed. To view the comment, simply move the mouse cursor over the cell (NOTE: the cell does not have to be selected to view the comment). Comments are designed to explain calculations or nutritional concepts that are included in the spreadsheet.

### GENERAL INFO

The GENERAL INFO worksheet allows the user to input the gender of their project animal, beginning and ending weights, and the length of the feeding period.

#### INPUTS:

“Is your market beef a steer or heifer?” – Steers and heifers grow differently; therefore an adjustment needs to be made to make sure estimations are as accurate as possible. If the animal is a steer enter “1”, if you have a heifer than enter “0”.

“What is your market beef’s beginning weight?” and “What is your market beef’s ending weight?” – To accurately estimate daily gain and intake, it is important to have accurate beginning weights and a realistic estimate of the desired ending weight. Typically growing beef project animals will gain approximately 2 to 3 lbs per day. An animal’s growth slows as they approach their market weight; therefore it is important to evaluate your animal’s performance periodically throughout the feeding period. Table 1 shows the expected gain for a steer for a 240 day feeding period, divided into 4 quarters. Your project animal may perform differently, due to differing environmental factors, so this table should be used as a guide only!

**TABLE 1. Expected gains of a project steer during the feeding period.**

Quarter	Days	Beg. Wt.	ADG	Total lbs.	
				Gained	End Wt.
1	60	600	3.00	180	780
2	60	780	2.75	165	945
3	60	945	2.50	150	1095
4	60	1095	2.00	120	1215

Adapted from “Management of the Junior Market Steer Project” by Steven M. Jones and Gerald Crossland, University of Arkansas

“What is the beginning date of your feeding period?” and “What is the ending date of your feeding period?” – These are the dates that will be used in calculations of average daily gain.

**CAUTION:** As your animal grows and reaches maturity, its nutritional requirements will change. Therefore it is important to reevaluate your animal’s performance periodically throughout the entire feeding period. MARKET BEEF EVALUATOR is best utilized in evaluating performance during short periods of time, ideally about every 45 to 60 days.

## **OUTPUTS:**

“Desired Gain” – This number is simply the difference between the desired ending weight and the beginning weight. The desired gain is used to calculate average daily gain.

“Days on Feed” – Days on feed represents the number of days in the feeding period and is calculated as the difference between the beginning and ending dates entered above. Remember that this program is best used when evaluating your project animal’s performance over 45 to 60 day periods.

“Needed Average Daily Gain” – Average daily gain is expressed in pounds per day and calculated by the following formula:


$$ADG = \frac{\text{Desired Gain}}{\text{Days on Feed}}$$

**CAUTION:** It is important to note that the “Needed Average Daily Gain” is representing an unstressed animal. Many factors can influence animal performance including illness, level of exercise, daily fitting and grooming, and implants. As a result, if your animal is undergoing a large amount of stress, the ability for your animal to meet the desired average daily gain may be reduced. Additionally, if you have administered implants, the desired gain may be lower than what your animal actually gains.

## **FEED LIST**

The FEED LIST worksheet contains a partial list of feeds commonly used in youth market beef projects. Additionally, there are lines in which you can enter your feeds, if the required information is available. Feed analysis data that is provided in this spreadsheet comes from the National Research Council and is based upon scientific research. For each feed, the following variables are listed:

“% Dry Matter (DM)” – Dry matter refers to the percentage of the feed that is NOT water. For example, if corn is 90% DM, then the remaining 10% is water.

“% Crude Protein (CP)” – Protein is essential for proper muscle growth and development of animals.

“% Total Digestible Nutrients (TDN)” – Total digestible nutrients is a measure of the amount of energy in a feed. Many nutrients can contribute to the energy value, including carbohydrates, fats, and proteins. Animals need the energy from these nutrients to properly grow and develop.

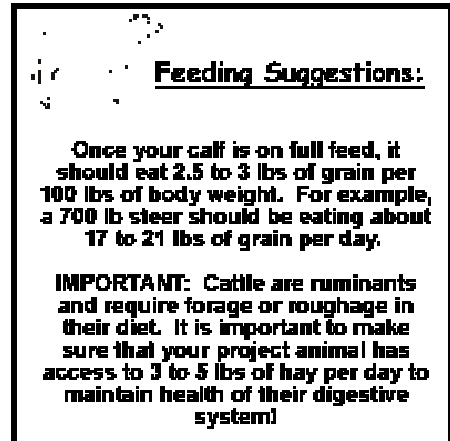
The feeds listed in the FEED LIST worksheet are divided into three categories including FORAGES AND ROUGHAGES, GRAINS AND ENERGY FEEDS, and COMMERCIAL FEEDS. Forages and roughages include hays, pasture, and feed byproducts like cottonseed hulls and straw. Grains and energy feeds include corn, oats, barley, wheat, and other grains as well as byproducts like molasses. Many youth feed commercially mixed show rations and an example of a growing ration and a finishing ration are listed in the COMMERCIAL FEEDS category.

To view examples of the feeds discussed above, visit the following website:

<http://www.ca.uky.edu/agripedia/agmania/feedid>

## EVALUATOR

The EVALUATOR worksheet is designed to determine if the diet you are feeding is sufficient to meet the nutritional needs of your project animal. In the YELLOW cells under FEED NO., enter the feed numbers from the FEED LIST that correspond to the feeds you are feeding your animal. For example, in the FEED LIST, corn has a feed number of 18, which is entered into the FEED NO. column. In the DESCRIPTION column, the name of the feed that was selected can be viewed. For each feed in the ration, the amount fed expressed as pounds per day is placed in the column titled AS FED LBS/DAY. It is extremely important to know how much feed you are feeding your animal, as feed costs are one of the largest costs in livestock production. Once the ration is entered, there are several outputs that are explained below:



“Desired ADG” – This is the target gain that your animal needs to achieve based upon the inputs in the GENERAL INFO worksheet.

“Estimated ADG” – Based upon the diet that you enter in the EVALUATOR worksheet and the amount that you are currently feeding, this is the gain that your animal is capable of achieving. Many factors can influence actual animal performance, include factors like illness, exercise load, and daily fitting and grooming.

“Total Feed Intake per Day” – This number is calculated as the sum of the amount fed per day for each ingredient that you listed.

“Estimated Feed Intake per Day” – Based upon the diet that you entered, this is an estimate of how much of the given diet your animal needs to eat PER DAY to maintain proper growth and development for your animal!

“Feed Intake Ratio” - The Feed Intake Ratio represents the ratio of total feed intake per day to estimated feed intake per day. You want this number to be as close to 1.0 as possible. If it is not, you may be over or underfeeding your animal.

“Total Diet Protein” – This is the CP concentration of the total diet, on an as-fed basis.

“Total Diet TDN” – This is the TDN concentration of the total diet, on an as-fed basis.

“Total Diet Protein and TDN, DM basis” – The CP and TDN concentrations of the diet expressed on a DM basis. These are the numbers that can be matched to the animal requirements in the REQUIREMENTS worksheet.

## REQUIREMENTS

As your project animal grows and matures, their nutritional requirements will change. The REQUIREMENTS worksheet is a table with a variety of target gains within each weight class and the required amount of dry matter (DM) intake and the corresponding required concentrations for protein (CP) and energy (TDN). To use this table, find your animal's current weight and the desired gain you want your animal to achieve. Follow that line across to view the required intake and concentrations of CP and TDN. You can then match these numbers to the output in the EVALUATOR worksheet. Just make sure you match the numbers that are labeled "Dry Matter Basis".

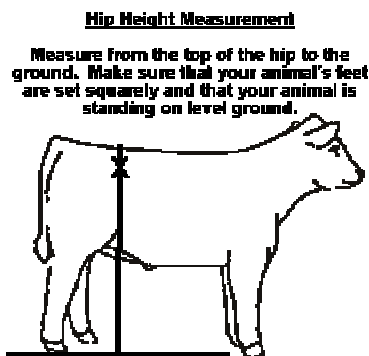
## PRINT SUMMARY

This worksheet summarizes the total diet and results from the EVALUATOR into a printer friendly form. This page shows what your animal's desired gain is as compared to what your animal can gain based upon the ration information that was entered. Additionally, the ration is displayed including ingredients and amounts fed.

## PROJECT PLAN

The PROJECT PLAN worksheet is designed to assist in monitoring animal performance during the feeding period. Necessary inputs are animal gender, initial age and hip height of the animal, and monthly weights. The worksheet calculates the frame score of the animal from its age and hip height. Frame score is used to estimate an optimal slaughter weight which is reported as an output. The graph compares your animal's actual gain (yellow line) with an estimated gain (green line) based upon the optimal end weight.

It is possible to make a homemade hip height stick that will be fairly reliable. To record an accurate hip height, make sure the animal's hind legs are set squarely and on level ground and measure from the ground to the top of the hip as shown in the accompanying figure.



## REFERENCES

- Jones, Steven M., and Gerald Crossland. "Management of the Junior Market Steer Project". Available online at [http://www.uaex.edu/Other\\_Areas/publications/HTML/FSA-3041.asp](http://www.uaex.edu/Other_Areas/publications/HTML/FSA-3041.asp).
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- National Research Council. 1984. "Nutrient Requirements of Beef Cattle". 6<sup>th</sup> Revised Edition. National Academy Press, Washington DC.
- National Research Council. 1996. "Nutrient Requirements of Beef Cattle". 7<sup>th</sup> Revised Edition. National Academy Press, Washington DC.

## **GLOSSARY**

ADG:	Average daily gain; the amount of weight gain made each day
Carbohydrates:	These are the elements (i.e. starch) that provide energy for the animal
Concentrates:	Feeds that are high in energy, such as grains like corn, wheat, and barley
Dry Matter Intake:	Quantity of dry matter (feed weight without the moisture) that an animal consumes daily
Nutrient:	Any group of food components (chemical parts of feeds) that have similar general characteristics and aid in the support of life. These include protein, fats, carbohydrates, vitamins, minerals, and water
Protein:	Component of feeds used to build muscles and hair and are essential for necessary body processes
Roughage:	Feeds that are low in energy, such as hay, silage, and straw
TDN:	Total Digestible Nutrients; Component of feed that is digested (or used) by the animal for growth and development