

# Feed Efficiency Calculator

## A.S. Leaflet R2945

Garland Dahlke, ISU Extension and Outreach Program  
Specialist, Iowa Beef Center

### Summary and Implications

The Feed Efficiency Calculator, a product from the National Program for Genetic Improvement of Feed Efficiency in Beef Cattle provides a tool to researchers and producers interested in calculating residual feed intake (RFI), residual gain (RG) and adjusted feed to gain values on tested animals.

### Introduction

Calculation of residual feed intake (RFI) and residual gain (RG) from phenotypic data collected on the farm is not intuitive yet the results of this calculation have become fairly widespread in conversation and selection criteria among those involved in the genetic selection beef cattle seedstock. The RFI value results from determining the difference between actual dry matter intake and expected dry matter intake for a given animal at a measured level of weight gain or performance. RG results from determining the difference between actual gain and expected weight gain for a given level of feed dry matter intake. In both situations, the expected values are based on a regression calculation of group contemporaries and their performance.

### Equation 1. TonIndex

$$[(rDM / AdjF:G) \times MV] - \$160 - [(rDM / AdjF:G)/ADG] \times YC$$

rDM=1 ton of Ration Dry Matter = \$160

AdjF:G=Adjusted Feed to Gain conversion outlined by Beef Improvement Federation Guidelines

YC=Daily yardage charge = \$0.40 per head per day

MV=Market Value of beef produced = \$1.30 per pound

### Results

The program is available as a free download from the official website of the Beef Cattle Feed Efficiency grant.

This calculation is unique for each group and is the complicating aspect in determining the final result.

### Material and Methods

Input on creating this application came from members involved in extension and outreach aspect of this USDA grant. These include; Daniel Loy (Iowa State University), Daniel Shike (University of Illinois), Mathew Spangler (University of Nebraska), Jeremy Taylor (University of Missouri) and Robert Weaber (Kansas State University).

The Beef Improvement Federation guidelines were used for the calculations of the RFI and adjusted feed to gain. The RG calculation mirrored the guidelines used in calculating RFI but also included an ultrasound backfat in the regression. Along with this standard for calculation, RFI could include an ultrasound backfat measure if desired and allowed for flexibility in the number of weights that could be included over the test time. Along with these calculated values a selection index value was included based on Rolfe et.al. (2011, J. Anim. Sci. 89:3452-9). Finally a simplified phenotypic index was also included that was derived from a number of producer requests which included elements of growth and feed conversion. This index, explained in Equation 1, allows producer input in terms of ration cost and animal value to arrive at a dollar value ranking of animals in terms of what the animal can produce per ton of feed dry matter.

The address is <http://www.beefefficiency.org>. Go to the "For Producers" section and select RFI Calculator.