Evaluation of Individual Feed Intake, Body Composition, and Performance of Performance-Tested Angus Bulls during a 14-year Period

Claudio C. Ribeiro-Filho  
*Iowa State University*

Daniel D. Loy  
*Iowa State University*, dloy@iastate.edu

Allen H. Trenkle  
*Iowa State University*

W. Darrell Busby  
*Iowa State University*

Follow this and additional works at: [http://lib.dr.iastate.edu/beefreports_2003](http://lib.dr.iastate.edu/beefreports_2003)  
Part of the [Agriculture Commons](http://lib.dr.iastate.edu/beefreports_2003) and the [Animal Sciences Commons](http://lib.dr.iastate.edu/beefreports_2003)

Extension Number: ASL R1829

**Recommended Citation**

[http://lib.dr.iastate.edu/beefreports_2003/18](http://lib.dr.iastate.edu/beefreports_2003/18)

This report is brought to you for free and open access by the Animal Science Research Reports at Iowa State University Digital Repository. It has been accepted for inclusion in Beef Research Report, 2003 by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Evaluation of Individual Feed Intake, Body Composition, and Performance of Performance-Tested Angus Bulls during a 14-year Period

Abstract
Two hundred fifty-five purebred Angus bulls had their performance tested by the Wardens Farm in Council Bluffs, Iowa over a 14-year period. The bulls feed intake was recorded individually, and performance and ultrasound measurements were determined. Performance and body composition data were used to estimate required feed intake by Perry and Fox (1997) model, and estimated and observed DMI were compared. Average estimated DMI was 25.84 lbs/day and average observed Dry Matter Intake (DMI) was 24.93 lbs/day. The results indicated that the model is promising in estimating feed intake of purebred Angus bulls, but a few adjustments may be needed in certain situations to increase accuracy in estimating intake of bulls.

Keywords
ASLR 1829, Animal Science

Disciplines
Agriculture | Animal Sciences

This article is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/beefreports_2003/18
Evaluation of Individual Feed Intake, Body Composition, and Performance of Performance-Tested Angus Bulls during a 14-year Period

A.S. Leaflet R1829

Claudio C. Ribeiro-Filho, graduate research assistant, Dan Loy, professor of animal science, Allen Trenkle, professor of animal science, and Darrell Busby, field livestock specialist

Summary

Two hundred fifty-five purebred Angus bulls had their performance tested by the Wardens Farm in Council Bluffs, Iowa over a 14-year period. The bulls feed intake was recorded individually, and performance and ultrasound measurements were determined. Performance and body composition data were used to estimate required feed intake by Perry and Fox (1997) model, and estimated and observed DMI were compared. Average estimated DMI was 25.84 lbs/day and average observed Dry Matter Intake (DMI) was 24.93 lbs/day. The results indicated that the model is promising in estimating feed intake of purebred Angus bulls, but a few adjustments may be needed in certain situations to increase accuracy in estimating intake of bulls.

Introduction

Wardens Farm has been performance testing and evaluating their genetics for over 35 years. In addition to birth and growth records, they have collected feed efficiency data from their bull test program for 19 years and have been carcass testing and ultrasound testing for over 10 years. The Wardens Farm uses their own top bulls as well as proven sires in its A.I. program. The strategy is using artificial insemination in one heat cycle and then using their own bulls for clean up. Wardens Farm is concerned with beef quality and in 2000 it had over 100 steers in the Iowa Beef Tenderness and Carcass Evaluation Project.

Perry and Fox (1997) developed a model to predict feed intake of feedlot cattle. The model was designed to predict individual feed required for the observed body weight and average daily gain of growing cattle. The system also allows comparing predicted DMI and actual DMI for a pen of animals or an individual animal. The objective of the model of Perry and Fox (1997) was to provide a method for allocating feed to individuals fed in a group and to compute cost of gain in marketing programs based on individual animal management. The system allows sorting cattle into optimal feeding and marketing groups, which usually is made possible by feeding cattle from different owners in a pen. Ribeiro-Filho (2002) used the model developed by Perry and Fox (1997) to compare estimated and observed feed intake of individually fed feedlot steers. He observed that the model was adequate in predicting individual DMI of steers in a pen, and there was no significant difference between observed and predicted average DMI.

Data from the Wardens Farm bull test over 14 years were used to evaluate the accuracy of the Perry and Fox (1997) model in estimating feed intake requirements of purebred Angus bulls and comparing estimated and observed feed intake.

Materials and Methods

Two hundred fifty-five Angus bulls were tested over a 14-year period. The bulls were fed by Pinpointer System (PLM Corporation, Cookeville, TN). The Pinpointer provides feed to a group of animals, but records feed intake information on each individually. Data from each bull’s visit to the Pinpointer is retrieved and stored in a small computer, and the access to the feed is restricted to one animal at a time. The bulls were fed a commercial bull ration containing 0.763 Mcal of NEm/lb and 0.485 Mcal of NEg/lb. In addition, 4 lbs/d of alfalfa hay were fed for each bull.

DMI, average daily gain (ADG), and feed efficiency (FE) were measured. Ultrasound images of longissimus muscle (rieye) and subcutaneous fat thickness (backfat) were taken between the 12th and 13th ribs at the end of the test. Carcass weight and yield grade were estimated. Performance and body composition data were used to estimate feed requirement by Perry and Fox (1997) model as reported in Ribeiro-Filho (2002). The relationship between estimated and observed individual DMI for all 255 bulls on test was determined by least squares procedure.

Results and Discussion

Average estimated DMI was 25.84 lbs/d and average observed DMI was 24.93 lbs/d for all tested bulls. The average ADG was 3.47 lbs and FE was 6.72 (feed/gain). The relationship (R^2 = 0.44) between observed and predicted individual DMI is shown in Figure 1. The model seemed to underpredict feed intake for the lower intake bulls and overpredict feed intake for the higher intake bulls. However, considering that feed intake is influenced by several factors and its variability is usually high, the difference between the averages for estimated and observed DMI was acceptable. The performance and body composition data per year are shown in Table 1.
Table 1. Performance and body composition of the bulls on test.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. animals</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>15</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>31</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Initial Wt. lbs.</td>
<td>665</td>
<td>672</td>
<td>694</td>
<td>697</td>
<td>701</td>
<td>816</td>
<td>710</td>
<td>711</td>
<td>767</td>
<td>1144</td>
<td>1143</td>
<td>1227</td>
<td>1118</td>
<td>1165</td>
</tr>
<tr>
<td>Final Wt. lbs.</td>
<td>1074</td>
<td>1058</td>
<td>1126</td>
<td>1074</td>
<td>1123</td>
<td>1171</td>
<td>1144</td>
<td>1155</td>
<td>1139</td>
<td>1143</td>
<td>1139</td>
<td>1143</td>
<td>1127</td>
<td>1118</td>
</tr>
<tr>
<td>DOFa</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>ADG, lbs.</td>
<td>2.92</td>
<td>2.76</td>
<td>3.09</td>
<td>2.69</td>
<td>3.96</td>
<td>3.32</td>
<td>3.17</td>
<td>3.88</td>
<td>3.96</td>
<td>3.32</td>
<td>3.79</td>
<td>3.68</td>
<td>3.41</td>
<td>3.99</td>
</tr>
<tr>
<td>DMI, lbs.</td>
<td>23.17</td>
<td>18.48</td>
<td>19.09</td>
<td>21.86</td>
<td>22.68</td>
<td>22.22</td>
<td>24.16</td>
<td>22.1</td>
<td>22.04</td>
<td>21.69</td>
<td>23.15</td>
<td>23.9</td>
<td>25.34</td>
<td>25.46</td>
</tr>
<tr>
<td>FE,feed/gain</td>
<td>7.93</td>
<td>6.70</td>
<td>6.19</td>
<td>8.12</td>
<td>5.73</td>
<td>6.69</td>
<td>7.62</td>
<td>5.70</td>
<td>5.56</td>
<td>6.53</td>
<td>6.12</td>
<td>6.50</td>
<td>7.43</td>
<td>6.38</td>
</tr>
<tr>
<td>Backfat, inch</td>
<td>0.20</td>
<td>0.27</td>
<td>0.18</td>
<td>0.36</td>
<td>0.26</td>
<td>0.33</td>
<td>0.42</td>
<td>0.38</td>
<td>0.46</td>
<td>0.24</td>
<td>0.33</td>
<td>0.43</td>
<td>0.34</td>
<td>0.46</td>
</tr>
</tbody>
</table>

aDays on feed or duration of the test.

Implications

The results indicated that the model developed by Perry and Fox (1997) is promising in estimating DMI of purebred Angus bulls. Based on the results of this study, actual measurement of feed intake may result in more rapid genetic improvement than estimates based on the current model. The model was developed for commercial feedlot cattle, and it may need a few refinements to be used for bulls.

References


Figure 1. Relationship between observed and predicted individual DMI for all bulls on test.