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## Progress Report: Projecting Weights within Lot Scales

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## Progress Report: Projecting Weights within Lot Scales

### A. S. Leaflet R2283

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#### Summary

A total of 660 head of calves, yearlings and finished cattle at two locations were involved in evaluating the relationship between front end weight and whole body weights. A stepwise linear regression model utilizing front end weight, animal sex and cattle type (calf, yearling, finished) predicted whole body weight with an  $r^2$  of .959. If an electronic identification system can be developed to work in concert with a digital scale system for recording front end weights at a water fountain, it may be possible to monitor weight and gain, therefore, allowing for sorting market ready cattle.

#### Introduction

Beef marketing systems today incorporate premiums and discounts associated with quality grade, yield grade and carcass weight. Knowing where cattle are at in their growth curve is imperative to optimizing marketing decisions. Weighing feedlot cattle on a routine basis is not practical due to labor cost, shrink issues, and potential injury and bruising. However, if low cost electronic methodology could be incorporated into the existing lot facilities tracking growth may be possible.

#### Material and Methods

This project has three phases. First, development of total body weight estimates based off of cattle front end weights; second, development of low cost methods of detecting cattle identification and weights within the existing feedlot structure; third, testing the validity and accuracy of the system. For this system to be effective and applicable it has to be simple, dependable and economical.

Starting in the summer and fall of 2006 existing research and extension feedout cattle at three locations were routinely weighed. While doing this a small digital platform scale was placed in the existing working facility to capture front end weights just prior to regular whole body weights. At two locations on five different dates a total of 660 cattle were processed through the system.

Stepwise linear regression within PC SAS version 9.1 was utilized to analyze the data. Sources of variation in predicting whole body weight were front end weights, sex, location, type of cattle (calf, yearling, finished) and date. Significance value used for entry into the prediction model is 0.05.

#### Results

Front end weight has proven thus far to be a good predictor of total body weight. As table 1 indicates front end weight, sex (1=steer, 2=heifer) and cattle type (1=calf, 2=yearling, 3=finished) were significant indicators of total body weight in feedlot cattle. The full model had an  $R^2$  of .959, however, front end weight accounted for 99 percent of that value. Figure 1 shows a plot of the data collected thus far.

**Table 1. Linear regression model for predicting total body weight in feedlot cattle.**

| Variable         | Parameter Estimate | Standard Error | Significance Level | Model R Square |
|------------------|--------------------|----------------|--------------------|----------------|
| Intercept        | 152.4581           | 15.4681        | <.0001             |                |
| Front end weight | 1.1018             | .0467          | <.0001             | .9461          |
| Sex              | -59.3011           | 8.2077         | <.0001             | .9557          |
| Cattle Type      | 142.0625           | 10.1189        | <.0001             | .9590          |

#### Implications

This project and data analysis will assist feedlot operators in determining when cattle have reached their optimum end point harvest weight in an economical manner.

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Figure 1. Plot of Front End vs. Total Feedlot Body Weight

