

USING HEART GIRTH TO DETERMINE WEIGHT IN FINISHING PIGS¹

*C. N. Groesbeck, R. D. Goodband, J. M. DeRouchey, M. D. Tokach,
S. S. Dritz², J. L. Nelssen, K. R. Lawrence, and M. G. Young*

Summary

Heart girth and body weight were measured on 100 growing-finishing pigs (50 to 273 lb) at the KSU Swine Teaching and Research Center. Heart girth, in inches, was measured using a cloth measuring tape. The tape was placed directly behind the front legs and then wrapped around the heart girth and read directly behind the shoulders. Heart girth was strongly correlated ($R^2=0.98$) with body weight, with the following regression equation: pig weight = $10.1709 \times$ Heart girth - 205.7492. The 95% confidence interval shows the projected weight to be ± 10 lb of the actual weight of the pig. To validate our equation we weighed and measured heart girth on 40 pigs from a commercial breeding farm and a group of 165 pigs at the 2002 Swine Classic Youth Exposition. At the commercial breeding farm, the actual measured body weights fit within the 95% confidence interval from their projected weights, based on the regression equation. The average residual (difference between predicted and actual weight) of the 40 pigs was -0.70 lb with a range of ± 4 lb. The actual weights of pigs at the Swine Classic averaged 16 lb greater than their predicted body weights with a range of ± 8.5 lb. The actual weights failed to fall within the 95% confidence interval for the developed regression equation. This was probably due to shrink during transportation to the show and limited feed and water. Heart girth as a means of deter-

mining body weight is a viable device for 4-H-ers and producers, but it is important to use only on pigs with continuous access to feed and water.

Introduction

Many people in 4-H as well as producers may not have access to an accurate scale to weigh their pigs. Heart girth can be a tool used by 4-Hers and producers to estimate body weight and track progress of growth for their pigs. Using heart girth to measure weight may also help if a producer or individual only has a few pigs that need to be weighed by reducing the amount of time it takes to put up and tear down a scale and reduce transportation of the pigs. The objective of our study was to develop a regression equation to determine pig weight based on heart girth and validate its accuracy.

Procedure

Heart girth and weight were measured on 100 randomly selected pigs at the KSU swine teaching and research facilities. All pigs had ad libitum access to feed and water. Weights of pigs measured for heart girth ranged from 50 to 273 lb. The heart girth was measured with a cloth measuring tape in inches. The tape was placed snugly around the heart girth of the pigs, directly behind the front legs, and carefully read directly behind the pigs shoul-

¹Appreciation is expressed to Craig Good for his cooperation with part of the study.

²Food Animal Health and Management Center.

ders. However, it is important that the pig is measured when its head is down or even with its body. When a pig raises its head, this increases its heart girth. The pig needs to be standing still when the measurement is taken. A confined pig is the easiest to tape as its movement is restricted. In addition, an extremely muddy pig may also affect the result of the taping procedure.

Results and Discussion

A correlation between heart girth and weight ($R^2=0.98$) was obtained (Figure 1) and a regression equation (pig weight = $10.1709 \times$ heart girth - 205.7492) was developed. The 95% confidence interval for the equation is ± 10 lb. The regression equation was tested on two populations of pigs, which consisted of 40 pigs from a commercial breeding farm and 165 pigs from the Swine Classic. All weights of the pigs from the commercial breeding farm fit well within the 95% confidence interval from their projected weights (Figure 2). The average residual (difference between predicted and actual weight) of the 40 pigs was -0.70 lb with a range of ± 4 lb. The projected

weights of pigs at the Swine Classic showed much greater variation and were less accurate than the pigs from the commercial farm. The actual weights of pigs at the Swine Classic averaged 16 lb greater than their predicted body weights with a range of ± 8.5 lb. The regression equation greatly underestimated the weights of the Swine Classic pigs. This was probably due to shrink during transportation to the show from limited feed and water, travel, or stress.

There are a few problems that may occur when measuring pigs. Pigs move around and have a tendency to lift their head which leads to more variation in the weight measurement accuracy. A confined pig is simplest to measure with the cloth tape. We suggest taking three separate heart girth measurements and using the average. A 1-inch inaccuracy will result in an inaccuracy of 10 lb. Averaging three measurements should more accurately represent true girth measurement. The pigs also should be on continuous feed and water to insure accuracy of results. Heart girth measuring can be very useful to 4-Hers and producers for approximating pig weight.

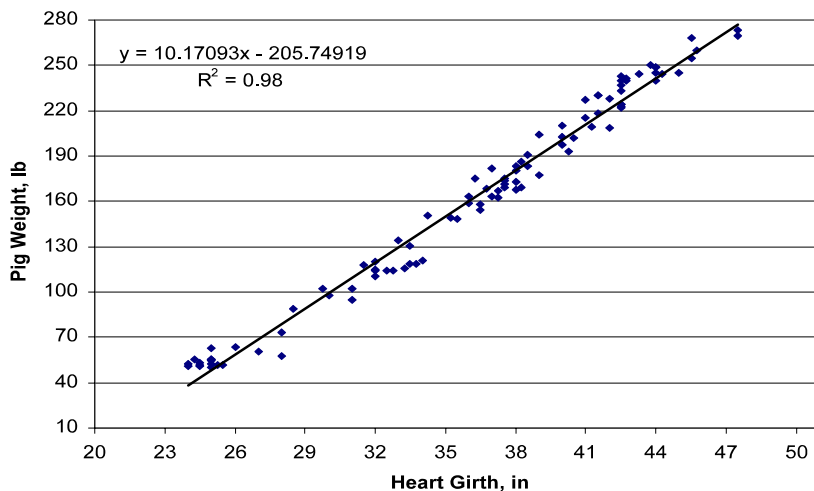


Figure 1. Heart Girth and Weight Measurements of 100 Pigs from KSU Swine Teaching and Research Center.

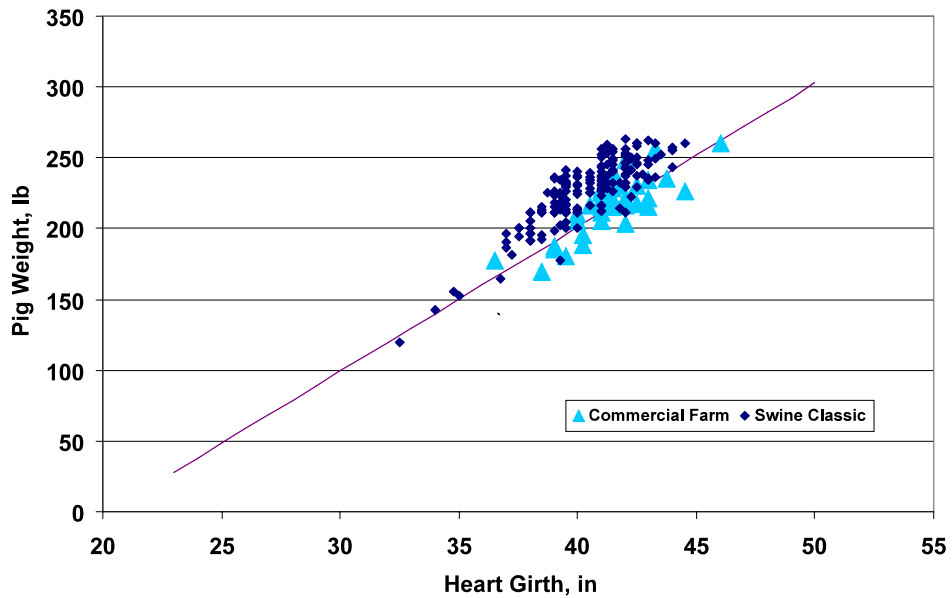


Figure 2. Heart Girth and Weight Measurements of 165 Swine Classic Pigs and 40 Commercial Farm Pigs. The average residual (difference between predicted and actual weight) of the 40 pigs was -0.70 lb with a range of ± 4 lb. The actual weights of pigs at the Swine Classic averaged 16 lb greater than their predicted body weights with a range of ± 8.5 lb.

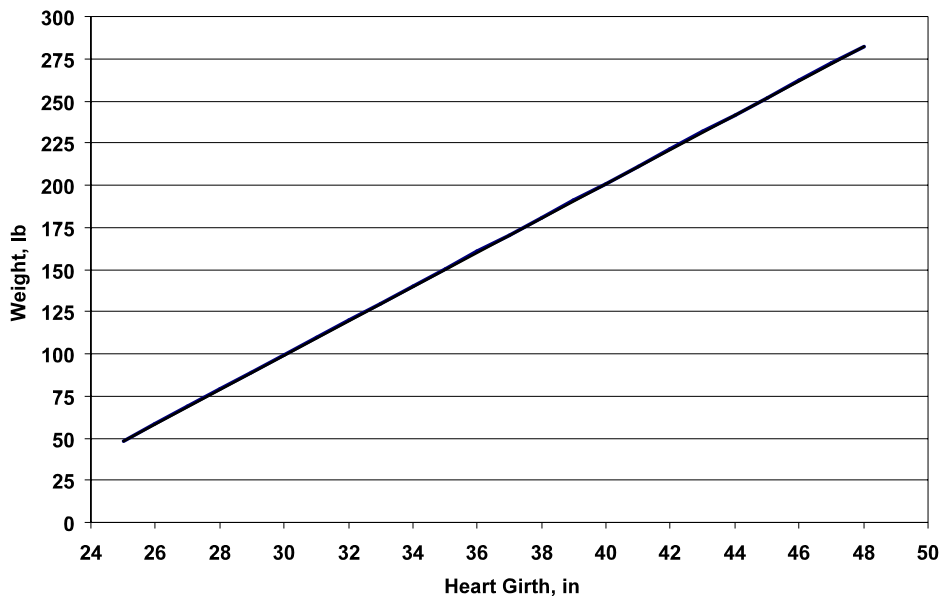


Figure 3. The Relationship Between Heart Girth and Weight Generated to Predict Body Weight of Pigs. This chart can be used to estimate weight based on heart girth.