THE IMPACT OF SELECTED HOG CARCASS TRAITS ON PRICES RECEIVED

J. Mintert[1], S. Dritz[2], T. Schroeder[1], and S. Hedges[1]

Summary

Hog producers can control the quality of the hogs they market. Through genetic selection and management, producers can have a large impact on hog carcass characteristics such as weight, backfat depth, and loin depth. Determining how much emphasis to place on changing or managing various carcass traits requires knowledge of the trait's value to the individual producer. Results from this study provide information on expected changes in price at one major midwestern packer associated with changes in carcass weight, backfat depth, and loin depth. Number of hogs marketed in each group did not affect net carcass value. However, these results might not apply to other packing companies that employ different pricing matrices.

(Key Words: Carcass Traits, Merit, Pricing.)

Introduction

A dramatic shift away from selling hogs on a liveweight basis towards marketing hogs on a carcass merit basis has taken place in the U.S. hog industry. For example, in 1984, marketing of approximately 14% of hogs in the U.S. used some type of merit pricing system. But by 1994, two-thirds of the nation's hogs were priced under some form of a grid or carcass-merit pricing system. Despite the dramatic shift in pricing techniques, little research has been conducted to identify the value of individual hog carcass traits from a producer's perspective. The purpose of this study was to identify and quantify the impact of various factors on prices received by farmers under a hog carcass-merit pricing system.

Procedures

Slaughter summaries covering the period from Dec. 28, 1994 through Dec. 27, 1995 were obtained from a midwestern hog marketing network. All of the hogs were procured by a single packer under a contractual carcass merit-based marketing agreement and were slaughtered at the same packing plant. The data set consisted of 121,961 market hogs marketed in 1,237 groups.

Carcass weight was reported as total weight for each group, and carcass characteristics were reported as averages for the group. To obtain an average hot carcass weight for the hogs within each group, the total carcass weight in pounds was divided by the number of hogs in the group. Other data included in the analysis were the average backfat depth in inches measured at the 3/4 positions on the last rib, the average loin depth in inches measured at the 3/4 position on the last rib, the number of animals marketed in a group, and the average percentage of lean within a carcass. Measurements for backfat depth and loin depth were taken simultaneously using an optical probe. Lean percentage was determined by a proprietary plant formula based on carcass weight, backfat depth, and loin depth.

[1]Department of Agricultural Economics.
[2]Food Animal Health and Management Center, College of Veterinary Medicine.

Other data included in the analysis were the weekly Iowa-Minnesota live hog prices reported by the USDA, converted to a carcass weight basis. This was included because hogs from this marketing network were marketed to a single packer under a long-term marketing agreement, which was based on the previous week's live hog price. The contract also prescribed how price would be determined if the live hog price fell below or moved above a predetermined price level. Three additional variables were included to account for price variability attributable to this marketing arrangement. The origin of each load of hogs was included to account for hog carcass variability not measured directly by the carcass quality characteristics identified at the packing plant.

A regression model that estimated net carcass price per cwt. as a function of the weekly average Iowa-Minnesota hog price lagged 1 week, carcass weight, carcass weight squared, backfat, loin depth, number of head and number of head squared in each group, the hogs' origin, and three variables designed to capture price variability attributable solely to the hog price contract was employed to identify the value of various hog carcass characteristics.

Results and Discussion

Hogs marketed by the network had an average carcass weight of 190.5 lb and ranged from a minimum of 157.8 to a maximum of 219.3 lb. The average backfat depth was 0.74 in. and varied between 0.47 and 1.07 in. Loin depth averaged 2.12 in. and ranged from a minimum of 1.7 to a maximum of 2.8 in. The lean percentage of the hogs averaged 53.9% and varied between 48.3% and 59.7%. The number of head marketed in each group averaged 66, with a low of 4 head and a maximum of 229 head marketed per group. Finally, carcass prices received for the hogs ranged from $54.55 to $74.30 per cwt. and averaged $63.95 per cwt.

Regression model results indicated that increases in backfat led to lower carcass prices. A backfat increase of 0.1 in. was associated with an average carcass price decline of $0.88 per cwt. At the average carcass weight of 190.5 lb, this means a 0.1 in. backfat increase would be expected to reduce the net carcass price received by $1.67 per head. If we examine the impact of changes in backfat alone on net carcass value, at the mean carcass weight of 190.5 lb, the group of hogs with the lowest average backfat depth of 0.47 in. likely earned a premium of $2.90 per head compared to a group of hogs that had a backfat measurement equal to the overall mean of 0.74 in.

Increases in loin depth were associated with higher carcass prices. Regression model results indicated that a 0.1 in. increase in loin depth was associated with a $0.19 per cwt. price increase. At the average carcass weight of 190.5 lb, and holding all other factors constant, this means the group of hogs in the study with the highest loin depth of 2.8 in. likely received a premium of $2.46 per head compared to a group of hogs with a loin depth measurement equal to the overall mean of 2.12 in.

Carcass weight had a significant, nonlinear impact on price received. Adding weight to hog carcasses had a positive impact on net price received until dressed weight reached approximately 188 lb. Carcasses that weighed 188 lb, on average, received a net price that was $1.40 per cwt. greater than the price paid for carcasses that weighed only 158 lb. Conversely, carcasses that weighed more than 188 lb were discounted by the firm that purchased the hogs. Figure 1 depicts the impact of changes in carcass weight on prices received for hogs sold. Note that all price changes reflect those expected compared to a 158 lb carcass.

In summary, the three carcass traits that had a significant impact on net carcass value were backfat, loin depth, and carcass weight. The number of hogs marketed in each group did not have a significant impact on net carcass value. This could reflect the nature of the contractual marketing agreement between the packing company and the hog marketing network.

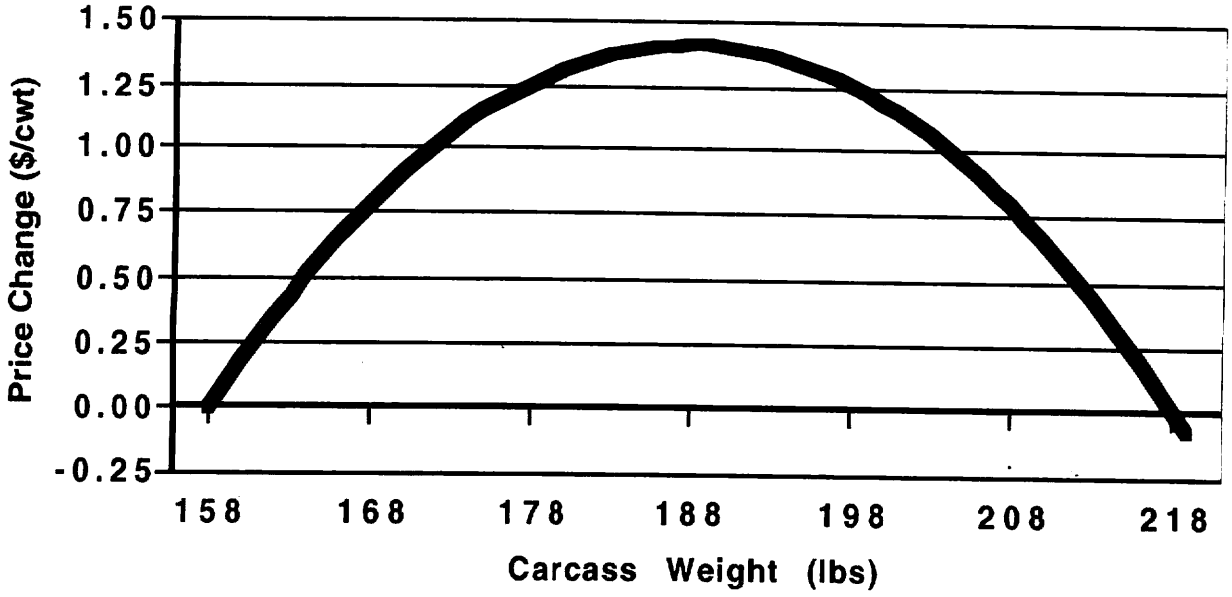

Figure 1. Impact of Weight on Net Carcass Price

Terry Gugle, ASI Feedmill Manager.