ABSTRACT:

The protein hormone product of the ob gene, leptin, has been implicated in the control of food intake and body composition. The principal site of leptin production is the adipocyte, and circulating concentrations of leptin have been positively correlated with body fat mass in humans and rodents, with limited data available in other species. Recently, few investigations have sought to ascertain the relationships between circulating concentrations of leptin and carcass composition and quality in beef cattle and swine. Our objective was to determine if circulating levels of leptin and postmortem quality and composition and to determine the composition and quality factors which significantly correlated with serum concentrations. In the first study, 252 pigs were harvested at 11 months of age at the Iowa State Hybrid Swine Farm, Hamptton, IA. All pigs were fed the same diet to achieve uniform body weight. Pigs were stratified into groups based on live weight and randomly assigned to matched pens. Blood samples were collected 3 days prior to harvest and at harvest. Average serum leptin concentrations were 0.94 ng/ml (Beef 1) and 2.16 ng/ml (Beef 2). Serum leptin concentrations were positively correlated with carcass yield grade (r = 0.19, 0.52, and 0.19, respectively; P < 0.10). In the second study, 40 steers and heifers were harvested at 21 months of age at the Colorado State University, Fort Collins, CO. All steers were fed the same diet to achieve uniform body weight. Blood samples were collected 24 hours prior to harvest. Average serum leptin concentrations were 1.49 ng/ml (Beef 3) and 0.25 ng/ml (Beef 4). Serum leptin concentrations were positively correlated with chill grade (r = 0.21, 0.34, and 0.21, respectively; P < 0.10). In conclusion, serum leptin concentrations were positively correlated with carcass yield grade and chill grade in both beef and swine. These findings have implications for the meat industry, as leptin may be used as a marker for postmortem quality and composition.

RESULTS:

Body Condition

In many species including cattle, sheep, swine, hogs and humans, leptin concentrations increase as subcutaneous fat increases.

CONCLUSION:

The results of this study suggest that circulating leptin concentrations are positively correlated with carcass yield grade and chill grade in both beef and swine. These findings have implications for the meat industry, as leptin may be used as a marker for postmortem quality and composition. Further research is needed to determine the relationship between leptin and postmortem quality and composition in other species.

APPLICATIONS:

The results of this study suggest that circulating leptin concentrations are positively correlated with carcass yield grade and chill grade in both beef and swine. These findings have implications for the meat industry, as leptin may be used as a marker for postmortem quality and composition. Further research is needed to determine the relationship between leptin and postmortem quality and composition in other species.