

The relationship between glucose and lipid metabolism parameters and carcass characteristics in finishing cattle

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Blood parameters in finishing cattle, such as glucose, insulin, non-esterified fatty acids (NEFA), and beta-hydroxybutyrate (BHBA) can be used for several applications in ruminants. It has been widely speculated that differences in insulin sensitivity and free fatty acid circulation of finishing cattle may impact important carcass traits in beef, such as marbling and fat thickness. The objective of this research was to measure glucose and metabolism parameters in late-stage finishing cattle and establish the relationship of those parameters with carcass characteristics. Late-stage finishing steers (N=23; average initial BW=618±25 kg) and heifers (N=12; average initial BW=573±26 kg) were fed high-concentrate diets for a 56-d period. During this study period, non-fasted blood samples were collected at d-0, d-28, and d-56 and glucose-tolerance tests were conducted at d-21 and d-49 of the study period. Glucose-tolerance tests consisted of infusing cattle with 0.5 mL of 50% glucose solution/kg of BW after a period of 16-24 hours without feed and collecting blood for multiple time increments after the infusion. Cattle

were slaughtered in a commercial facility on d-57 of the study period and carcass characteristics were measured 48-h after slaughter. Pearson correlation coefficients were calculated for all parameters using the CORR procedure of SAS. Marbling was not correlated ($r \leq |0.25|$; $P \geq 0.16$) with glucose tolerance test parameters, including not being correlated ($r \leq |0.20|$; $P \geq 0.27$) with d-56 glucose, insulin, NEFA, and BHBA. Fat thickness measured at the 12th rib location was not correlated ($r \leq |0.30|$; $P \geq 0.09$) with glucose tolerance test parameters, including not being correlated ($r \leq |0.19|$; $P \geq 0.27$) with d-56 glucose, insulin, NEFA and BHBA. Overall, glucose and lipid metabolism parameters and carcass characteristics were mostly uncorrelated in this group of late-stage finishing cattle.

Biography

Benjamin M Bohrer is a Meat Scientist with training and expertise in Animal and Food Sciences. He completed his graduate education in Animal Sciences at the University of Illinois with a focus on meat science and muscle biology and began his career as an Assistant Professor in Food Sciences at the University of Guelph. Much of his previous research has been completed on the impacts of on-farm production practices on muscle development, carcass characteristics, fresh meat quality and processed products of pork, beef, and poultry. In the future, his research program at the University of Guelph will expand on livestock production factors affecting meat and muscle biology. In addition, a great focus will be placed on whole muscle and processed meats, with specific focus on the health of these products and innovative ways to improve quality and value of meat products.

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