2019 Reciprocal Meat Conference – Animal Welfare

Meat and Muscle Biology™

Effect of Electrolyte Administration on Carcass Weight and pH Decline of Australian Feedlot Lambs

M. Eckhardt[1]*, A. Garmyn[1], and M. Miller[1]

[1]Meat Science, Texas Tech University, Lubbock, TX, USA
*Corresponding author. Email: megan.e.eckhardt@ttu.edu (M. Eckhardt)

Keywords: electrolyte, lamb, pH
Meat and Muscle Biology 3(2):188

Objectives

This study was conducted to determine how the administration of electrolytes to Australian feedlot lambs would affect the carcass weight and pH decline.

Materials and Methods

Australian feedlot lambs (*n* = 200) were weighed (LW = 59.0 ± 2.7 kg) prior to the first administration of electrolyte and assigned randomly to 1 of 4 treatment groups (*n* = 50/group). Treatment groups consisted of no electrolyte (CON), a commercially available electrolyte (E1; Generade, Mount Barker, SA, 5251), an electrolyte formulated by a consulting nutritionist (E2), and experimental electrolyte formulation (E3). Electrolyte formulation was proprietary but contained the following ingredients: sodium bicarbonate, sodium chloride, potassium compounds, magnesium compounds, glucose and lysine. Electrolytes were delivered through the feed at specified dosage rates per treatment of 100ml/d (E1), 50 g/d (E2), and 17 g/d (E3) for 4 d. The administration of E2 and E3 began after weighing and sorting on d 1; E3 was started on d 3 and was only fed for 2 d prior to slaughter. Half of each treatment group was assigned to 1 of 2 consecutive harvest days with equal representation among treatments. Individual live weights were recorded after 4 d and prior to transportation to the abattoir. Individual live weights were recorded on arrival at the abattoir and again immediately before slaughter to determine transportation shrink and shrink during holding at the abattoir. Hot carcass weights were recorded. *Longissimus* pH was recorded when carcasses first entered the chiller following slaughter and were recorded again at 60 min and 120 min to monitor pH decline over the course of 2 h. On the following day after chilling, cold carcass weights were recorded, and cooler shrink was calculated.

Results

Treatment influenced all live weights ($P < 0.01$). The use of electrolytes in comparison to the control had a significant impact on the 4-d gain, as E3 lambs had greater gain than E1 or CON prior to transportation. All lambs administered an electrolyte maintained the live weight advantage over CON through pre-slaughter live weight collection; however, E2 and E3 were similar for transport shrink percentage, but were both greater ($P < 0.05$) when compared to E1 and CON, which were also similar. HCW, CCW, and cooler shrink percentage were not influenced by electrolyte treatment ($P \geq 0.25$).

No interaction between treatment and time was detected for pH ($P = 0.07$), suggesting pH declined at similar rates; however, CON had greater ($P < 0.05$) pH values (6.00) than any of the electrolyte-treated lamb carcasses (5.79–5.89), regardless of time postmortem.

Conclusion

Results suggest the administration of the various electrolytes does create live weight differences between the treatments and especially apart from CON, as evidenced by the improved 4-d gain and transportation shrink. Electrolytes, however, did not affect carcass weights. The intended usage for electrolytes should reduce stress, therefore resulting in a positive influence on meat quality by reducing the incidence of high pH and dark cutting. Although the administration of electrolytes did not affect the decline of pH, it did influence the ultimate pH value. The CON had greater final pH, indicating that the use of electrolytes on Australian feedlot lambs can benefit meat quality.