THE USE OF A COMMERCIAL ELECTROLYTE REPLACER TO IMPROVE THE HYDRATION STATUS OF SLAUGHTER LAMBS

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A previous study suggests that many lambs may be poorly hydrated at the time of slaughter in Australian abattoirs (Jacob *et al.* 2005). Studies with cattle have shown that supplementation with electrolyte can reduce losses of carcase weight and yield due to dehydration as well as losses of muscle glycogen associated with transport (Schaefer *et al.* 1990; Phillips 1997). Meat from dehydrated lambs may be darker in colour and visually less attractive to consumers (Gregory 1998). This experiment tested the effect of a commercially available electrolyte formulation on the hydration status, and carcase variables of lambs at the time of slaughter under Western Australian conditions.

The experiment was conducted in April 2004, using a commercial consignment of 236 prime lambs of mixed gender and breed that included Poll Dorset, Suffolk and Dorper genotypes. The 4 treatment combinations were: 1. access to water only on-farm and in lairage (control), 2. electrolytes on-farm and water only in lairage, 3. water only on-farm and electrolytes in lairage, and 4. electrolytes on-farm and in lairage. Lambs were stratified for liveweight and allocated to treatment with gender and breed balanced across treatments. Electrolytes were added to water at the rate recommended on the label for 2 days on-farm just prior to transport, and for the entire period in lairage for the appropriate treatments. Animals were excluded from feed and water on-farm for 16 hours before transport to the abattoir which took 5 hours, and the lairage period was 24 hours. Carcase weight, fatness (GR), *m. longissimus thoracis et lumborum* (LL) dimensions, glycogen concentration in the *m. semimembranosus* (SM) and *m. semitendinosus* (ST) and urine specific gravity (USG) were measured at the time of slaughter. USG was used as an indicator of hydration status. Data were analysed using the general analysis of variance procedure in Genstat version 7, with liveweight included as a covariate for comparisons of carcase weight and fatness.

Table 1. The effect of treatment on USG, carcase variables and concentration of muscle glycogen

Variable	Control	Electrolytes farm only	Electrolytes lairage only	Electrolytes farm and lairage	F value	LSD
USG	1.033	1.040	1.031	1.035	0.008	0.005
Hot carcase weight* (kg)	24.3	24.1	24.2	24.3	0.75	0.41
GR* (mm)	17.2	15.8	16.5	16.6	0.09	1.13
LL width (mm)	29.9	29.6	31.3	31.8	<0.01	0.94
SM [glycogen] (g/100g)	1.1	1.2	1.2	1.1	0.23	0.16
ST [glycogen] (g/100g)	0.7	0.7	0.7	0.8	0.30	0.13

*Adjusted for liveweight.

The mean water intake during lairage was 1.27 L/hd.day for the electrolyte treatments and 1.30 L/hd.day for the water-only treatment. Since the water intake was virtually the same in both cases it is not surprising that electrolyte treatment did not significantly affect carcase weight (Table 1) nor, consequentially, the economic values of the carcases. Concentration of muscle glycogen was low suggesting that the animals may have been stressed during the transport-to-lairage period. However, supplementation with electrolyte did not change muscle glycogen concentration at the time of slaughter. Supplying electrolytes on-farm and not in lairage significantly ($P<0.05$) increased USG and appeared to reduce ($P=0.09$) GR measurement. Unfortunately, we were unable to compare water intakes in-lairage for the 2 on-farm treatment groups. This, and the significant ($P<0.01$) increase in loin width after electrolyte supplementation in-lairage suggests that timing of electrolyte treatment may be important. Therefore, it is still possible that combining electrolyte supplementation with an increase in water intake during lairage may be beneficial.

The authors acknowledge Virbac Australia Pty Ltd and Sheep CRC for funding assistance.

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