Effect of the vitamin E supplementation prior to slaughter on plasma metabolites in light lambs

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Dietary vitamin E (VE) supplementation has been recommended to increase meat shelf life. Alpha-tocopherol, the most potent form of vitamin E, is a major free-radical-trapping antioxidant in plasma and tissues that attenuates the oxidative stress and decreases the formation of low-density lipoproteins (LDLs). However, it is expensive which requires accurate feeding to reduce the period of α-tocopherol supplementation. Grazing is a cheap option to increase α-tocopherol content in the muscle and reduce the oxidation processes. Single reared male lambs (n=54) of Rasa Aragonesa breed were weaned at 45 days of age and fed a basal concentrate (C; 30 mg α-tocopherol acetate/kg of concentrate) and a supplemented concentrate (500 mg α-tocopherol acetate/kg of basal concentrate) for 0 (C), 10 (VE10d), 20 (VE20d) and 30 (VE30d) days before slaughter (23±1.4 kg; 75±1 3 days) Additionally, 8 unweaned lambs were continuously stocked on alfalfa pasture supplemented with the basal concentrate (ALF). Jugular blood samples were collected at before slaughter into EDTA vacuum tubes to determine α-tocopherol, cholesterol, high density lipoproteins (HDL), L DL and triglycerides (TG) concentrations. Plasmatic α-tocopherol concentration increased with VE supplementation (P<0.05), regardless the length of the feeding period. ALF lambs had intermediate plasmatic α-tocopherol concentration between C and VE supplemented lambs. Cholesterol, HDL and LDL were lower in VE30d than in C lambs (P<0.01). ALF lambs had greater cholesterol, HDL, LDL and TG concentrations than the concentrate-fed lambs, because lambs suckled milk. In summary, VE supplementation increased α-tocopherol plasmatic concentration but 30 days were needed to decrease plasmatic LDL, HDL and cholesterol concentrations. In unweaned light lambs, grazing increased α-tocopherol concentration in plasma, but milk intake had a greater effect than forage intake or VE supplementation on plasmatic metabolites.

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