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Enhancing meat production and quality of culled Sarda ewes

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Meat from culled ewes is an underexploited resource in Mediterranean sheep systems due to poor body condition, low carcass conformation, and limited commercial value. Nutritional strategies, including antioxidant supplementation such as vitamin E, may help restore body reserves and improve carcass and meat quality. A feeding trial was conducted on 77 culled Sarda ewes, assigned to three groups: fat ewes fed a maintenance diet (as fed: 400 g/d wheat straw, 400 g/d barley grains, 300 g/d protein and mineral mix), supplemented with 0.6 g/head/day vitamin E (F+E; n=27); lean ewes supplemented with 0.6 g/head/day vitamin E (L+E; n=25), and lean ewes without vitamin E (L; n=25), both receiving the same fattening diet (as fed: 400 g/d grass hay, 900 g/d barley grains, 300 g/d protein and mineral mix). Over 4 weeks, fat ewes slightly lost body weight (-1.91kg), whereas lean ewes maintained or gained weight (+0.16kg L+E; +0.33kg L; P<0.01). The final BCS was higher in F+E (3.58), while among lean ewes L+E had numerically higher BCS than L (3.02 vs. 2.91). BCS variation during the trial was greatest (P<0.01) in L+E (+0.65) compared with F+E (+0.26) and L (+0.34). Ultrasound measurements of subcutaneous fat and Longissimus dorsi depth at thoracic (T12-T13) and lumbar (L3-L4) sites showed greater tissue accretion in L+E, especially for lumbar fat (+1.28mm). At slaughter, carcass yield range was 39.74-41.24% (highest in L+E). Hot carcass weight was higher (P<0.05) in F+E (21.72kg) than lean groups, while L+E (17.33kg) and L (18.31 kg) were similar. Carcass conformation and fat scores were higher in the vit. E supplemented groups: F+E (70%O, 30%P; fat 3.9), L+E (27%O, 73%P; fat 3.2), L (9%O, 91%P; fat 3.0). Short-term fattening improved body reserves and carcass traits of lean ewes. Vitamin E enhanced fat deposition and carcass traits. Ultrasonography effectively monitored in vivo tissue development. Average feed cost per day per ewe was 0.40 €/d (F+E), 0.47 €/d (L+E), and 0.37 €/d (L). The higher cost of vitamin E supplemented diets was compensated by better gain and carcass quality.

Secondary compounds in beef due to the inclusion of preserved sainfoin during fattening

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Sainfoin (*Onobrychis viciifolia*; SF) was incorporated into the diets of intensively fed cattle during the fattening period in the form of hay or pellets. Sainfoin is a valuable source of secondary compounds; however, preservation may reduce their concentrations. The deposition of carotenoids, tocopherols, and polyphenols in meat may improve meat quality parameters, depending on their dietary intake. Forty Montbeliard young bulls (age: 117 d, body weight (BW): 188 kg) were fed ad libitum for 28 weeks with four diets combining two forages (SF hay and barley straw) and two iso-energetic concentrates (C: commercial concentrate; CSF: concentrate containing 15% SF pellet). The resulting diets were C+straw, CSF+straw, C+SFhay, and CSF+SFhay. In feedstuffs and meat, carotenoids and tocopherols were analysed by UPLC, polyphenols by spectrophotometry, and phenolic compounds by HPLC-QTOF-MS. Sainfoin hay showed the highest contents of xanthophylls, total β -carotene, and α -tocopherol. It also exhibited the greatest concentrations of extractable polyphenols, as well as extractable and non-extractable proanthocyanidins, followed by straw, SF concentrate, and C concentrate. The main phenolic compounds were kaempferol 3-O-rutinoside in SF hay and SF concentrate, p-coumaric acid in straw, and 3,4-dihydroxybenzoic acid in C concentrate. In the meat, retinol was higher in CSF+SFhay bulls than in CSF+straw bulls. The β -carotene levels were higher in SF hay-fed bulls than in straw-fed bulls, regardless of the concentrate. Lutein was detected only in CSF+SFhay meat. Meat from C+SFhay bulls had higher α -tocopherol concentrations than meat of both groups of straw-fed bulls (CSF+straw and C+straw). The concentrations of total polyphenol and the detected polyphenol metabolites (gallic acid and 3,4-dihydroxybenzoic acid) did not differ among diets. Dietary inclusion of SF hay enhanced the deposition of key antioxidants, such as carotenoids and α -tocopherol, in meat, without reflecting differences in polyphenol metabolite concentrations.