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...in-vitro oxidation of bovine oxymyoglobin as ...affected by 4-hydroxy-nonenal

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...Discoloration from the desirable cherry red to brown color ...resh meat is a result of oxidation of ferrous oxymyoglobin ...(OxyMb) to ferric metmyoglobin (MetMb). Lipid oxidation, ...among other factors, influences the rate of fresh meat discol... ...nature. 4-Hydroxy-nonenal (HNE), a known product of ù-6 ...fatty acid oxidation, is very reactive toward protein and has ...been shown to accelerate equine cardiac OxyMb oxidation. ...The objective was to determine the influence of HNE upon ...bovine skeletal OxyMb *in-vitro* under a variety of tempera... ...(4, 25 and 37° C) and pH (5.6 and 7.4) conditions and to ...assess the adduction of HNE to OxyMb using Western Blots. ...Bovine skeletal muscle myoglobin (Mb) was purified from beef ...via ammonium sulfate fractionation and gel filtration chro... ...tography. OxyMb was prepared by hyrdosulfite-mediated ...oxidation and adjusted to physiologic or post-mortem pH via ...phosphate (pH 7.4) or citrate (pH 5.6) buffer dialysis, respec... ...tively. OxyMb (0.15 mM) was incubated with 1 mM HNE ...(OxyMb:HNE) at 4, 25 and 37° C; controls were aldehyde-... ...free. Following incubation, samples were passed over a de... ...salting column to remove unreacted HNE, scanned spectro... ...photometrically from 650 to 450 nm, and the percentage of ...metMb calculated. Western Blot analysis was completed us... ...ing control and OxyMb:HNE reacted at pH 7.4, 37° C for 2 ...h. Identification of Mb bound HNE was visualized using a ...monoclonal antibody specific for HNE bound to histidine resi... ...dues. Overall, MetMb formation increased with increasing ...temperatures and was greater at pH 5.6 than pH 7.4 (P = 0.05). ...At 37° C, a prooxidant effect of HNE was seen at pH 7.4 but ...not at pH 5.6 when compared to control (P = 0.05). At both ...25° and 4° C, a prooxidant effect of HNE was seen at pH 7.4 ...and 5.6 relative to CON (P = 0.05). Western Blots revealed ...that OxyMb:HNE incubated at pH 7.4, 37° C yielded ...OxyMb-HNE adducts at histidine residues whereas control ...samples showed no reaction. This research suggests that HNE ...accelerates in-vitro bovine skeletal muscle OxyMb oxidation ...and appears to do so, in part, via covalent modification at ...histidine residues.

Key Words: 4-hydroxy-nonenal, Oxymyoglobin, ...Metmyoglobin

Goat kids meat quality: artificial rearing and weight at slaughter effects

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The objective of our study was to examine the effects of the rearing system and weight at slaughter on meat quality in young Canary Caprine Group kids. Forty twin, male kids were allotted to one of four groups based on feeding regimens: kids nursed by their dams (ND, n: 10), or kids fed a commercial milk replacer (23.7 percent CP and 22.8 percent fat) and controlled intake (CR, n: 10), and live weight at slaughter: 6 kg (WS6, n: 10), or 10 kg (WS10, n: 10). Immediately after slaughter, pH was measured on the Longissimus dorsii (LD). The carcasses were chilled at 4 ¦C for 24 h, and pH, Warner-Brazler shear force (WBSF), color (Lightness, L, Croma, C, Hue, H), water holding capacity (WHC), chemical composition (moisture, protein, fat, ash, collagen and his solubility), muscle fiber types proportions and their areas, were determined in the LD muscle. No interactions were observed in any parameter between rearing method and weight at slaughter. No statistic effect were founded in pH values, although the ND kids showed a higher pH values when the weight at slaughter increased, the evolution in CR kids were opposite. Compared with the WS10 kids, the LD muscle from WS6 kids had higher L (P<.05), but no differences were founded in Croma or Hue. Rearing method and weight at slaughter did not affect to WBSF, but a relation between WBSF and solubility collagen may be observed. The meat from ND animals were more exudative than CR kids (P<.001), while no statistic effect was observed by weight at slaughter. The chemical composition changed lightly, reducing moisture percentage (P<.001) and increasing protein proportion (P<.001) in WS10, probably due to hypertrophy growth muscle fiber areas were higher. No effects were described in muscle fiber type population. The WS10 muscle fiber area was higher than WS6 (P<.05), but in opposite the rearing system did not show statistic effects. Thus, the results show that using milk replacers in goat kids and increasing the weight at slaughter did not affect negatively to meat quality.

Key Words: Kid meat quality, Rearing system, Weight at slaughter