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Twenty-four Saudi male Arabian camels of four different breeds were used to evaluate characteristics of their muscles and quality parameters of their meat. The camels were on average six-month-old and weighed 133.83±2.83 kg. The results indicated the chemical composition of Longissimus thoracis (LT) muscle did not differ significantly between the four camel breeds. This was also true for shear force and fiber cross-sectional area. On the contrary, myofibrill fragmentation index (MFI) and sarcomere length were statistically different ($P<0.05$ respectively) between the camel breeds. The four breeds of Saudi Arabian camel also did not show any significant differences in cooking loss, pHu, and color values, except ($P<0.05$) for the redness (a*) color of their LT muscles. The LT muscles were all found to express similar proportions of only the Myosin Heavy Chain I (MyHC I) and IIa (MyHC IIa) isoforms. They also contained similar proportions of total, insoluble and soluable collagen. Moreover, the four breeds did not differ significantly in the activities of the metabolic enzymes involved in muscle glycolytic metabolism and muscle oxidative metabolism. Activities of the mitochondrial enzymes (CS, COX, ICDH) were positively correlated to each other ($r>0.49$, $P<0.05$). As were the glycolytic activities (PFK and LDH) ($r=0.16$, $P<0.01$). The activities of the mitochondrial enzymes were negatively correlated with the glycolytic activities. A strong positive correlation was observed between MyHC IIa proportions and LDH activity. As in beef, intramuscular fat content was shown to be positively associated with redness and muscle oxidative metabolism whereas toughness (shear foce) had a slight positive association with collagen content and muscle glycolytic metabolism and a negative association with muscle oxidative metabolism and muscle fibre area.