

# Relationships between muscle characteristics and quality parameters of Arabian camel meat

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This research aims to evaluate chemical composition, quality parameters and structural characteristics of meat from four breeds of Saudi Arabian camel.

**Animals:** Four Saudi Arabian camel breeds were selected : Magaheem, Wodoh, Shoal and Sofor. At the time of slaughter, the average weight of the animals was  $281.3 \pm 9.32$  kg with no significant differences among breeds (Basmaeil et al., 2012).

**Animal slaughtering and muscle sampling:** The slaughter process was Halal in accordance with the Islamic legislations. After exsanguination, *Longissimus thoracis* (LT) muscles from the 9<sup>th</sup> to 12<sup>th</sup> thoracic vertebrae were collected.

## Measurements:

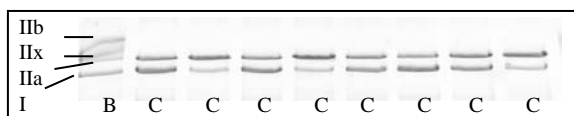
- Moisture, protein, fat, ash, as well as contents of total and insoluble collagen.
- The myofibril fragmentation index (MFI) and the sarcomere length (SL).
- The shear force for the LT samples was assessed using a Warner Bratzler device.
- The cross sectional area (CSA) of muscle fibres.
- pH and color.
- The metabolic type of muscle was determined by measuring enzyme activities: Glycolytic enzyme activities: phosphofructokinase (PFK) and lactate dehydrogenase (LDH) for glycolytic metabolism, and isocitrate dehydrogenase (ICDH), citrate synthase (CS), and cytochrome-c oxidase (COX) for oxidative metabolism.
- The contractile muscle type was determined by quantifying the different myosin heavy chain (MyHC) isoforms.

**Statistical analysis:** Data was analysed with a one way analysis of variance.

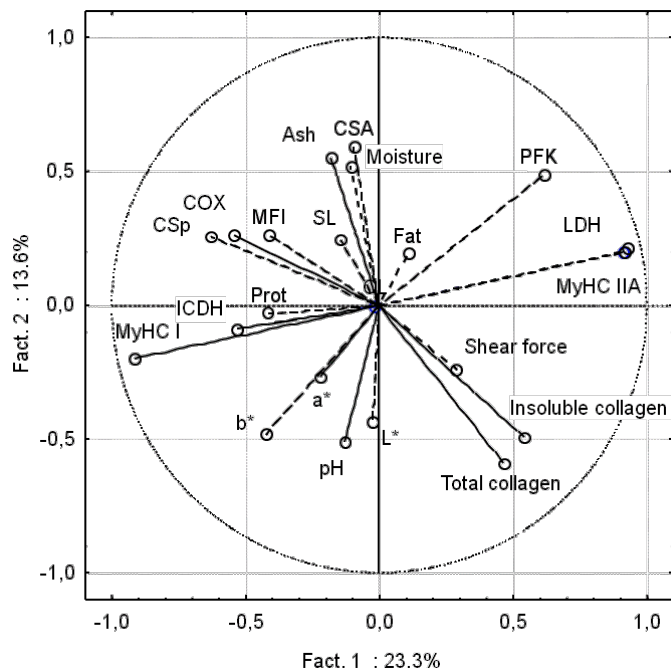
In addition, a Principal Component Analysis (PCA) was performed with all variables.



## Results : Correlation between variables



Unlike in bovines (B), the LT muscles from camels (C) expressed the Myosin Heavy Chain I (MyHC I) and IIa (MyHC IIa) isoforms only.



Chemical, biochemical and structural characteristics of the *Longissimus* muscle did not differ significantly among the four camel breeds reported here.

Activities of the mitochondrial enzymes (CS, COX, ICDH) were positively correlated to each other ( $r > 0.49$ ). As were the glycolytic activities (PFK and LDH) ( $r = 0.61$ ).

A positive correlation was observed between MyHC IIa proportions and LDH activity.

Toughness (shear force) had a slight positive association with collagen content and muscle glycolytic metabolism and a negative association with muscle oxidative metabolism and muscle fibre area.

## Conclusions

1. Characteristics of the *Longissimus* muscle do not differ between the four breeds of camel.
2. Most of the relationships between muscle characteristics and quality traits of camel meat were similar to those previously observed for beef.
3. The muscle biochemical characteristics explained only part of the variability in shear force value (an indicator of meat toughness) of camel meat