

THE EFFECT OF DARK CUTTING AND WET AGEING ON THE TECHNOLOGICAL PROPERTIES OF THE BEEF



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AIM

- ✓ The study aimed to determine the effect of dark cutting and wet ageing on beef's technological and physico-chemical properties of beef.

MATERIAL AND METHODS

- ✓ 27 grass-fed beef cattle bulls from two farms were slaughtered at 13–18 months of age.
- ✓ The sires of the offspring belonged to the Hereford and Simmental breeds.
- ✓ The *semitendinosus* muscles were wet-aged for 7, 14, 21, and 28 days.
- ✓ Eight muscles had a pH 6 or higher, which served as the threshold for dark cutting.

CONCLUSIONS

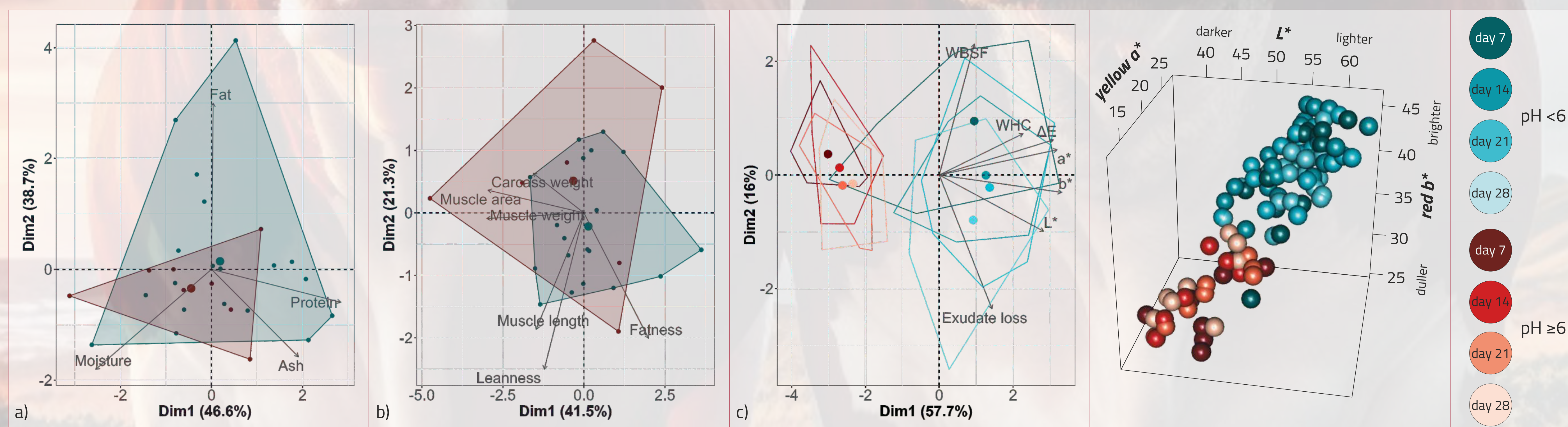
- ✓ Dark cutting significantly affects the CIE $L^*a^*b^*$ colour results.
- ✓ The dark cutting and ageing period of the beef have a significant effect on WHC and exudate loss.
- ✓ The denser structure and higher connective tissue content of the *semitendinosus* muscle, make it more resistant to tenderization during ageing, compared to muscles with a finer texture and less connective tissue.
- ✓ Dark cutting beef is often associated with leaner muscle tissue due to increased glycogen utilization and altered metabolic processes.
- ✓ The findings suggest that while dark cutting significantly influences the technological quality of *semitendinosus* muscle, it doesn't have a substantial impact on physico-chemical properties of beef.

RESULTS

- ✓ Meat samples with high pH tended to be darker and showed diminished intensity in red and yellow hues compared to muscles with normal pH (Fig. 2).
- ✓ No significant colour change was observed in groups within ageing period (Fig. 2).
- ✓ Meat samples with high pH retained moisture better at the last three ageing days.
- ✓ WHC exhibited a significant decrease between 7th day and later ageing days in meat samples with normal pH (Fig. 1c).
- ✓ An increase in exudate loss in vacuum bags was observed over the ageing period in both groups.
- ✓ Warner-Bratzler shear force (WBSF) results indicated that dark cutting beef was tenderer ($P > 0.05$) than meat samples with normal pH (Fig. 1c).
- ✓ The ageing period not affected the tenderness of the beef in both pH groups (Fig. 1c).
- ✓ Dark cutting was not related to the chemical composition and the physical measurements of the *semitendinosus* muscle and the growth performance of the bulls (Fig. 1a, b).
- ✓ Except, fatness score was significantly lower (1.61) in carcasses with higher muscle pH-values compared to normal ones (2.24) (Fig. 1b).

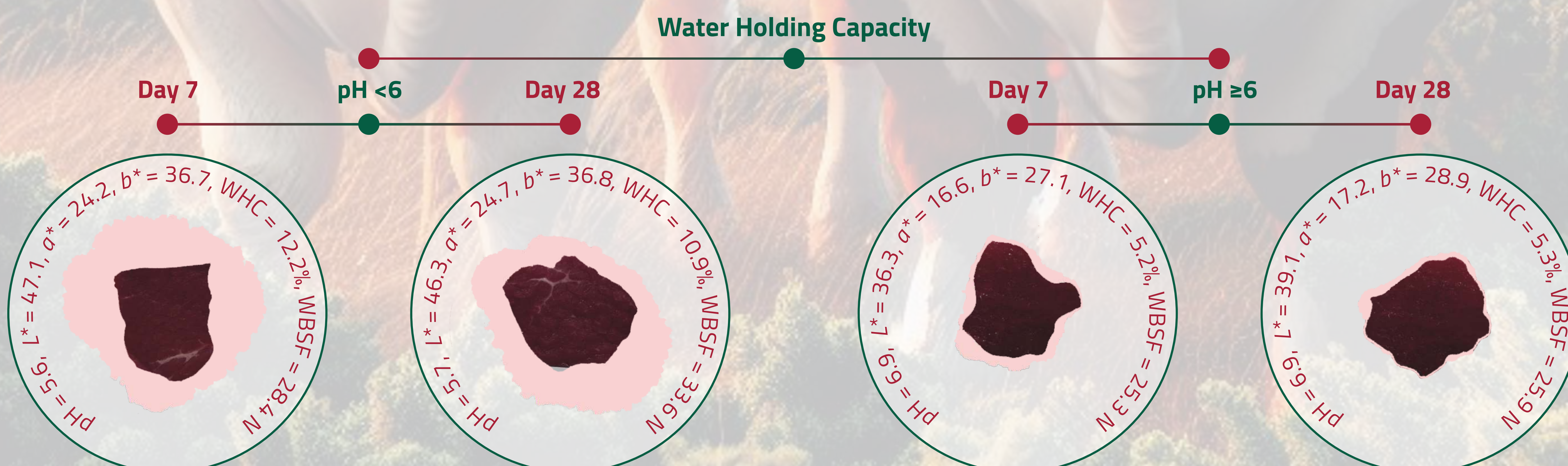
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Figures 1 a, b, c. Biplots with convex hulls of dark cutting effect on chemical composition (a), performance (b) and technological (c) traits by PCA.

Figure 2. 3D scatter plot of dark cutting effect on CIE $L^*a^*b^*$ colour.



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