

Seasonal quality variation of Bresaola from grass-fed Angus beef

Bolletta, V. ^{a*}, Lilli E. ^a, Valenti, B. ^a, Roscini, V. ^b, Pauselli, M. ^a

^a Department of Agricultural, Food and Environmental Sciences (DSA3), University of Perugia 06121, Perugia, Italy.

^b L'Agricola farming group, Aboca S.p.a., 06012 Cerbara, Perugia, Italy.

*Corresponding author contact: viviana.bolletta@dottorandi.unipg.it

Presenting author



Emanuele Lilli

Introduction

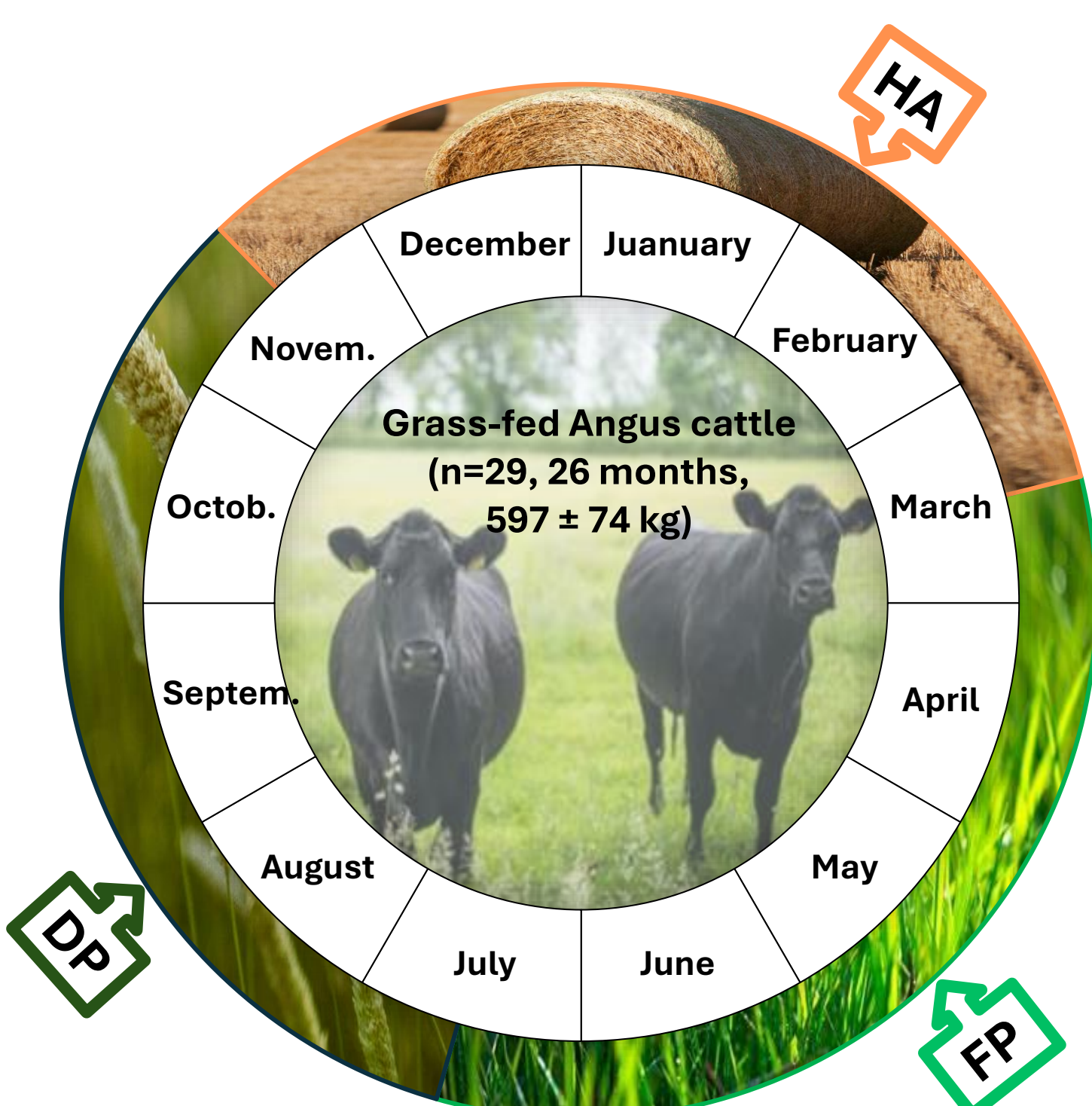
Bresaola is an Italian typical cold cut obtained from bovine meat. **Grass-fed beef** has shown high nutritive value due to its $\omega 3$ fatty acids, rumenic and vaccenic acid, vitamins A and E, and antioxidants content ^[1,2]. The nutritional and chemical composition of meat plays a crucial role in determining the **nutritional quality and shelf-life** of derived meat products. Consequently, in forage-based feeding systems like grass-fed, **seasonal variability** of forage availability and quality can greatly impact the overall quality of meat products such as Bresaola.

Objective

This study aimed to assess the **effect of the feeding season** on the **quality traits of Bresaola** made from grass-fed Angus beef.

Material and Methods

Animals, diets and pasture composition



HAY (HA):
Grazing (20%)
Alfalfa and reygrass
Hay (80%)

FRESH PASTURE (FP):
Grazing (80%)
Mixed meadow
Alfalfa and reygrass
Sudan grass
Hay (20%)

DRY PASTURE (DP)
Grazing (80%)
Sudan grass
Alfalfa and ryegrass
Mixed meadow
Hay (20%)

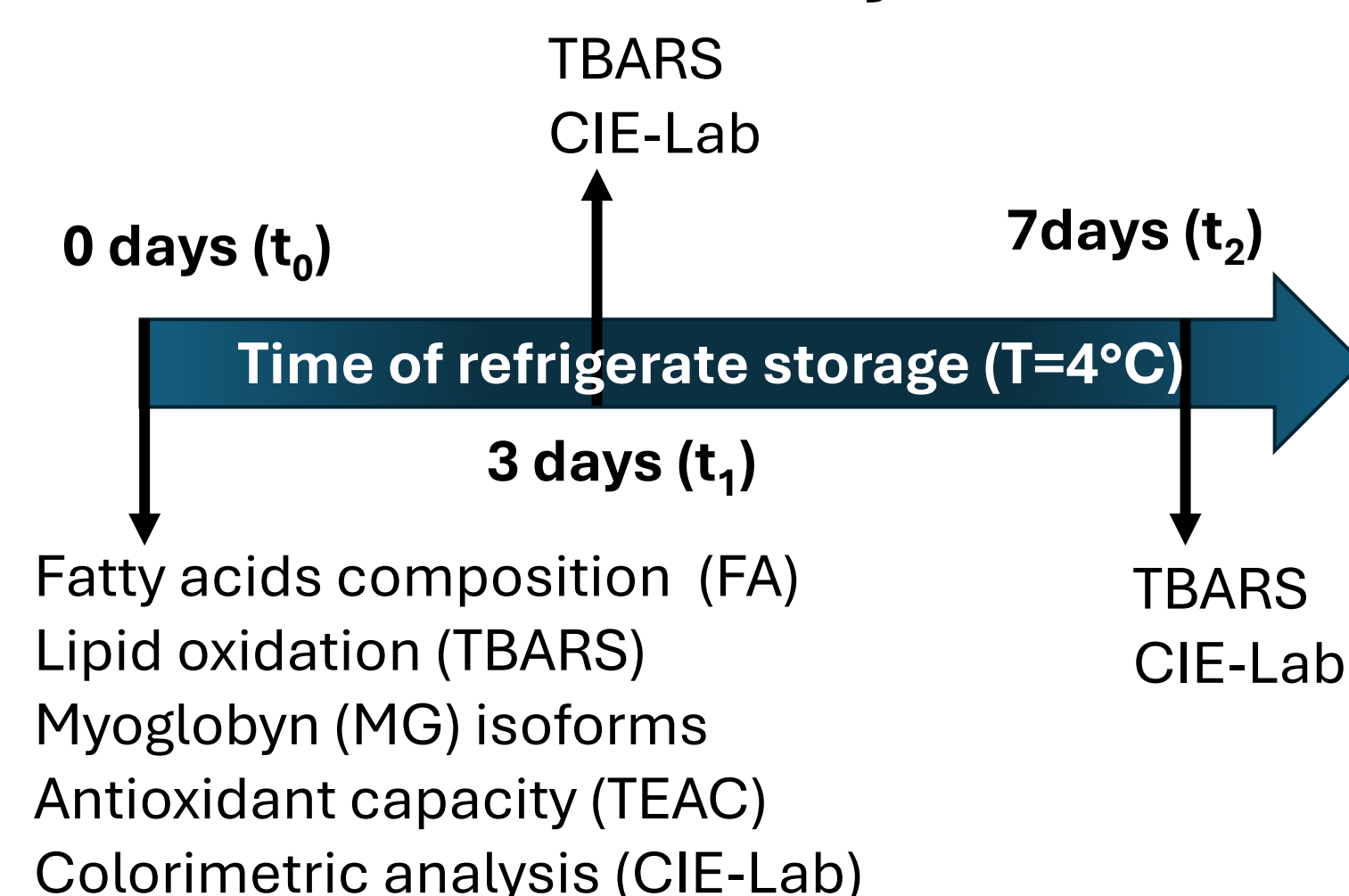
Bresaola making

- Biceps femoris* from individual Angus cattle (n=29);
- Dry salting and seasoning with Himalayan salt, goji berries, and spices;
- Stuffing in natural casing;
- Ageing (T= 12-15°C, UR > 70%).



- DP Bresaola** (n=7)
- FP Bresaola** (n=12)
- HA Bresaola** (n=10)

Chemical analysis

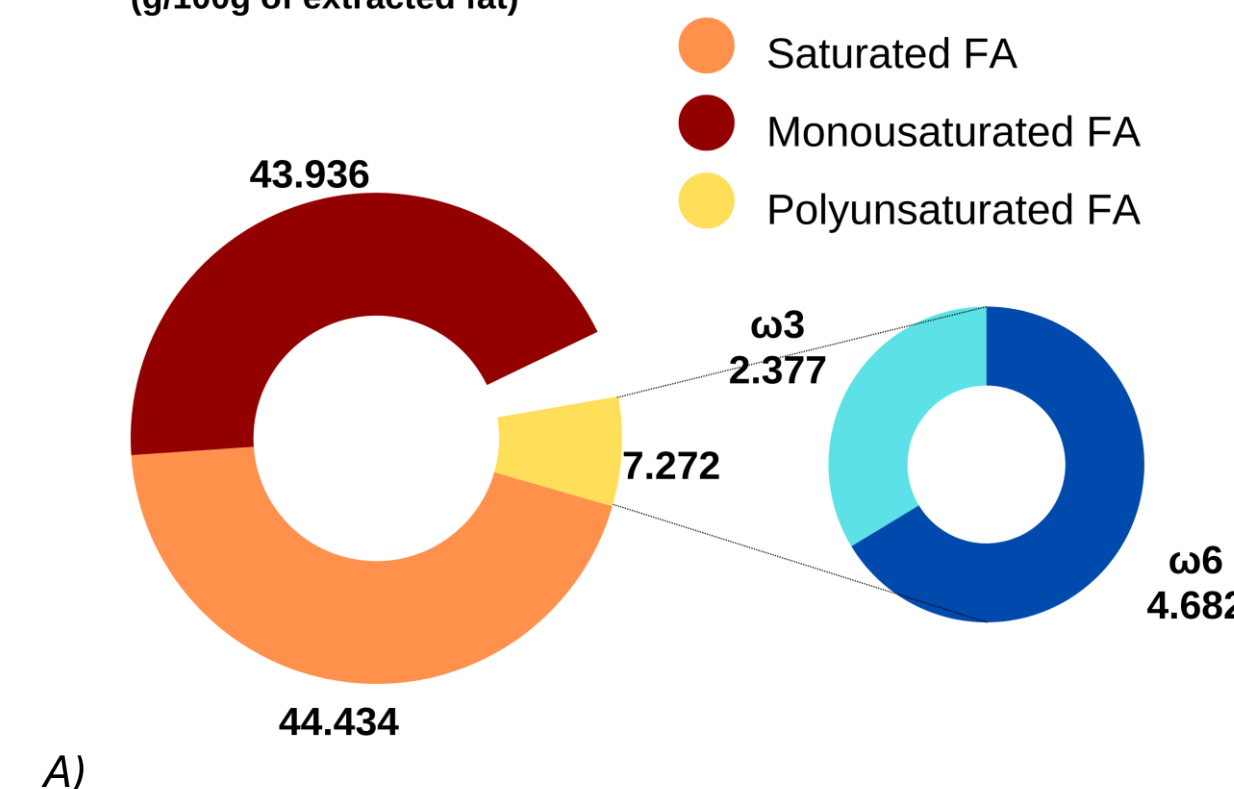


Statistical analysis

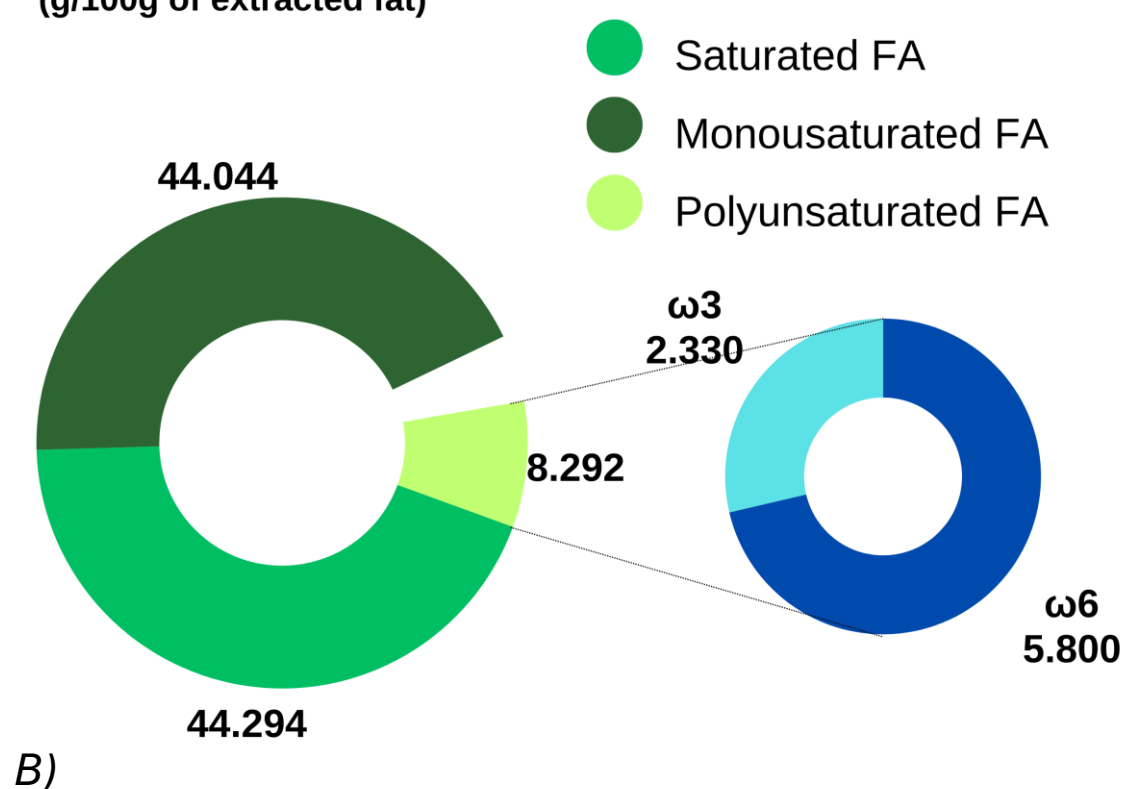
- Mixed model, using Diet (fixed) and Animal (random); Time (fixed), Diet × Time added when appropriate.
- Significance: P≤0.05. Bonferroni's test: different letters (a, b, c, d) indicate significant differences.

Results and Discussion

HA Bresaola - Fatty acids composition



FP Bresaola - Fatty acids composition



DP Bresaola - Fatty acids composition

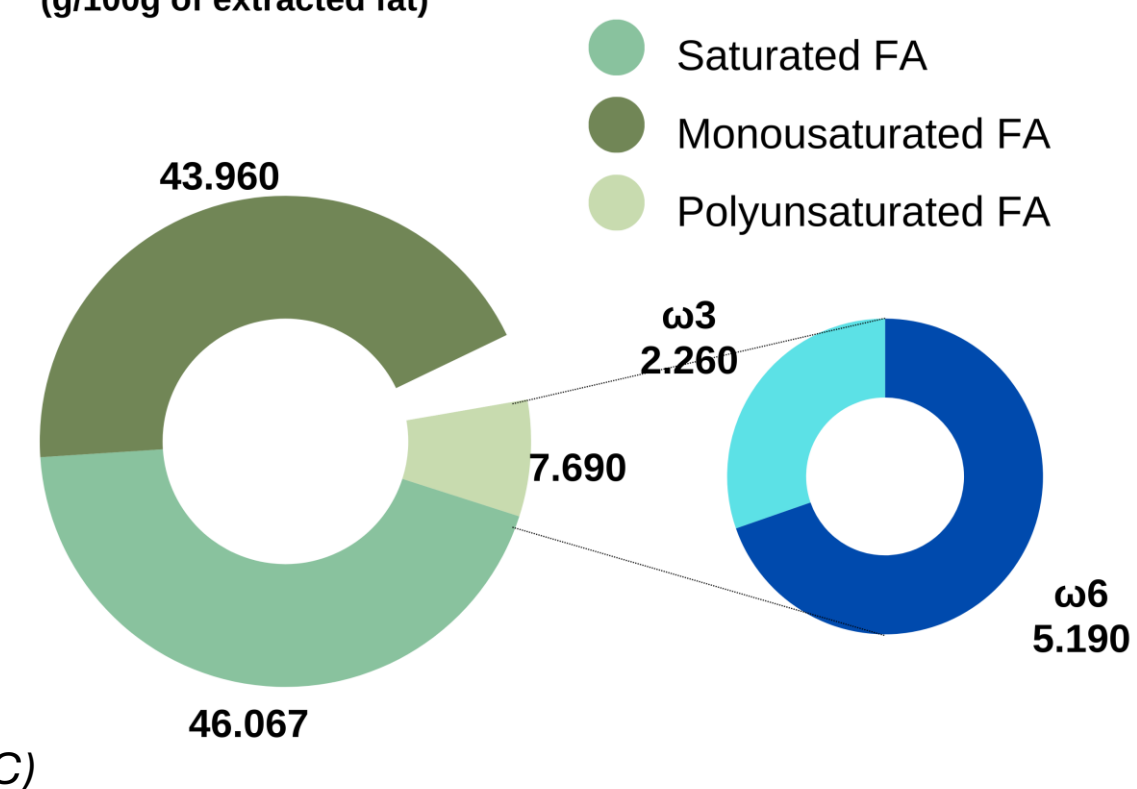


Fig.1 A,B,C - Fatty acids composition of Bresaolas from Angus cattle fed hay (HA), fresh pasture (FP) or dry pasture (DP) diet. P>0.05.

Lipid oxidation - TBARS

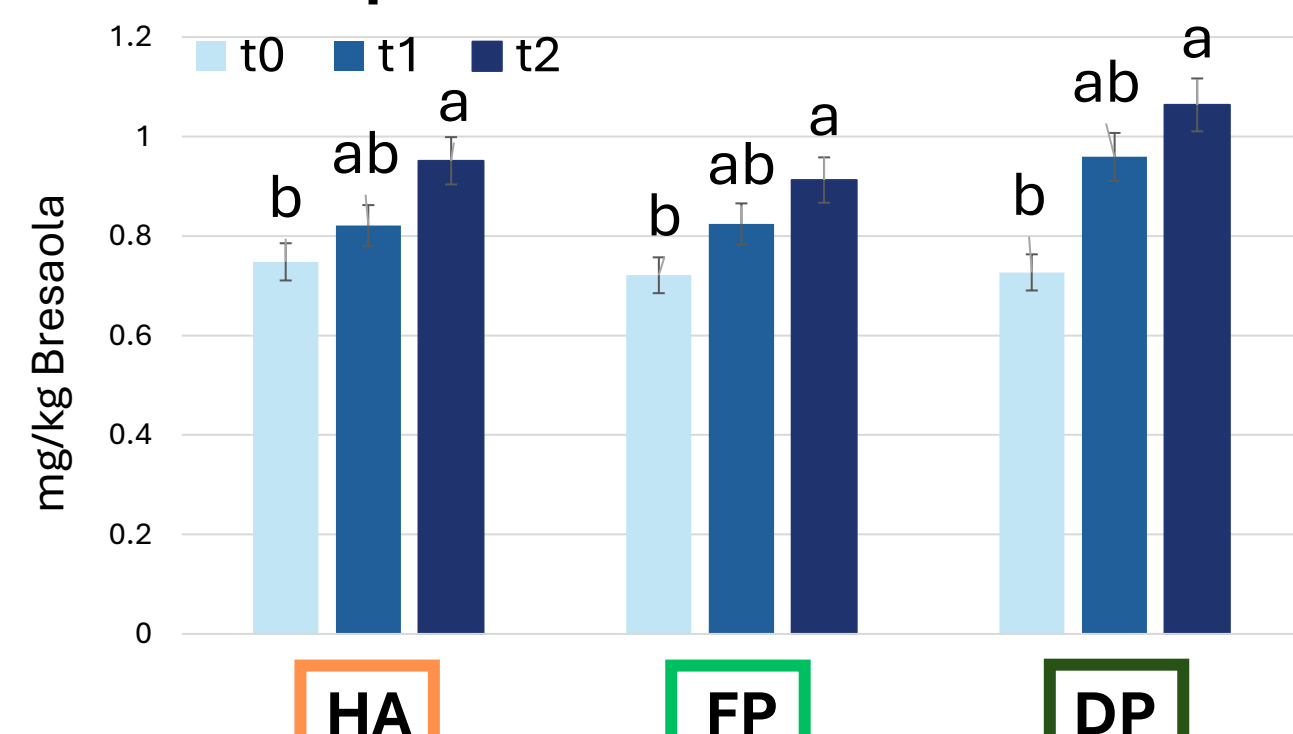


Fig.2 - Lipid oxidation evolution of Bresaolas from Angus cattle fed hay (HA), fresh pasture (FP) or dry pasture (DP) diet.

Trolox equivalent antioxidant capacity

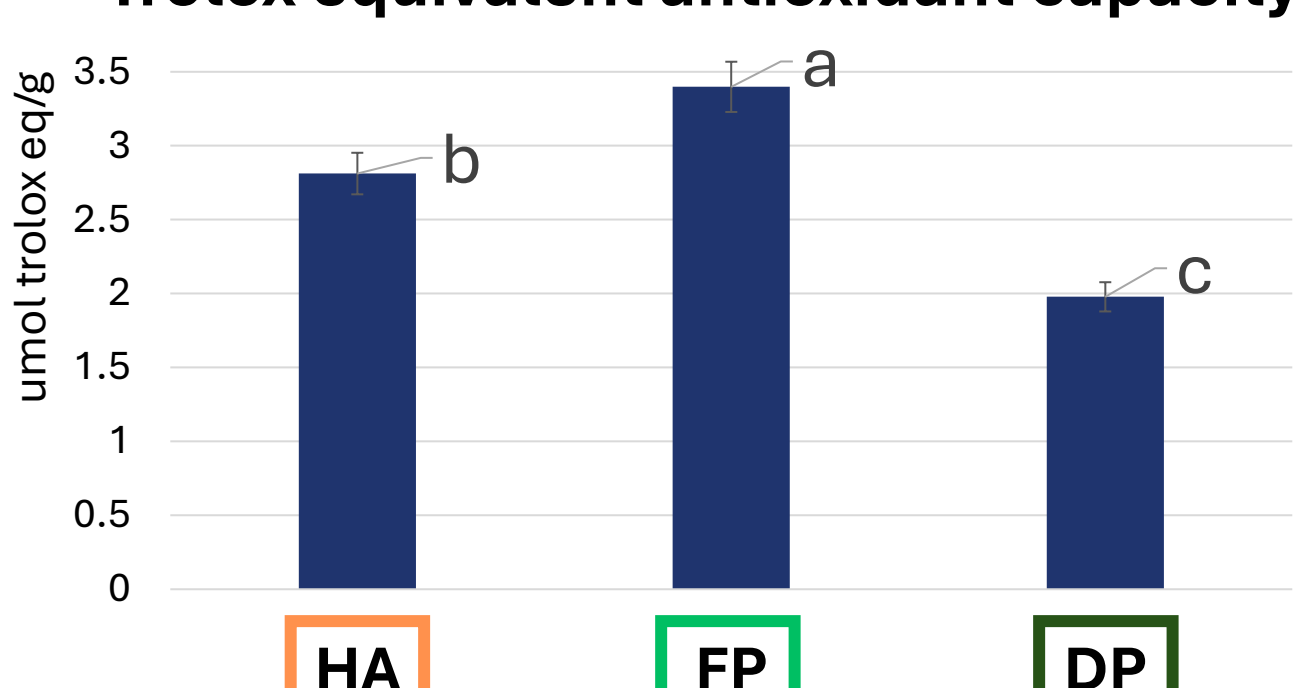


Fig.3 TEAC of Bresaolas from Angus cattle fed hay (HA), fresh pasture (FP) or dry pasture (DP) diet.

The feeding season did not significantly affect FA composition of Bresaolas (Fig.1 A,B,C). Notably, the diet had no significant effect on TBARS (Fig.2), but the values increased over storage time across all groups, as expected. Also, all color indices deteriorated over storage time. Among these, yellowness (b^* , Fig.4) and hue angle (h^* , Fig.5) were influenced by the interaction between storage time and feeding period. Specifically, after 3 days of storage, b^* values decreased for DP and HA but remained stable for FP. The h^* index remained stable during storage for FP and HA, while it increased at day 3 for DP. FP Bresaola exhibited the highest TEAC (Fig.3). The significantly higher TEAC in FP and in HA compared to DP may have preserved the color of the Bresaola, preventing discolorations.

CIE-Lab - b^* index

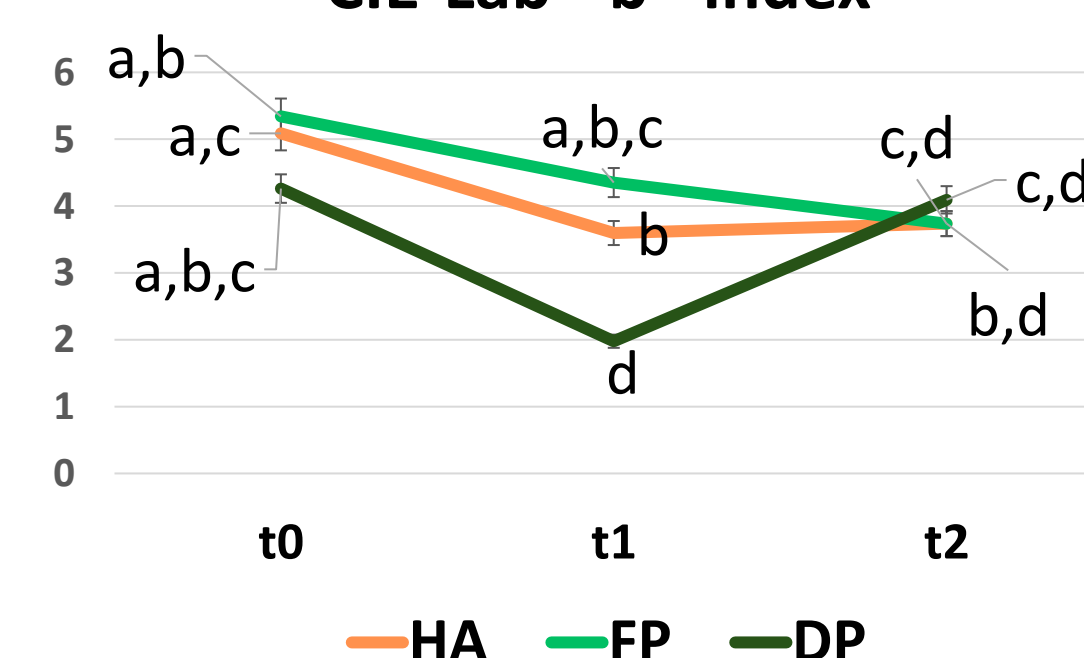


Fig.4. Color analysis: yellowness index (b^*) of Bresaolas from Angus cattle fed hay (HA), fresh pasture (FP) or dry pasture (DP) diet.

CIE-Lab - h^* index

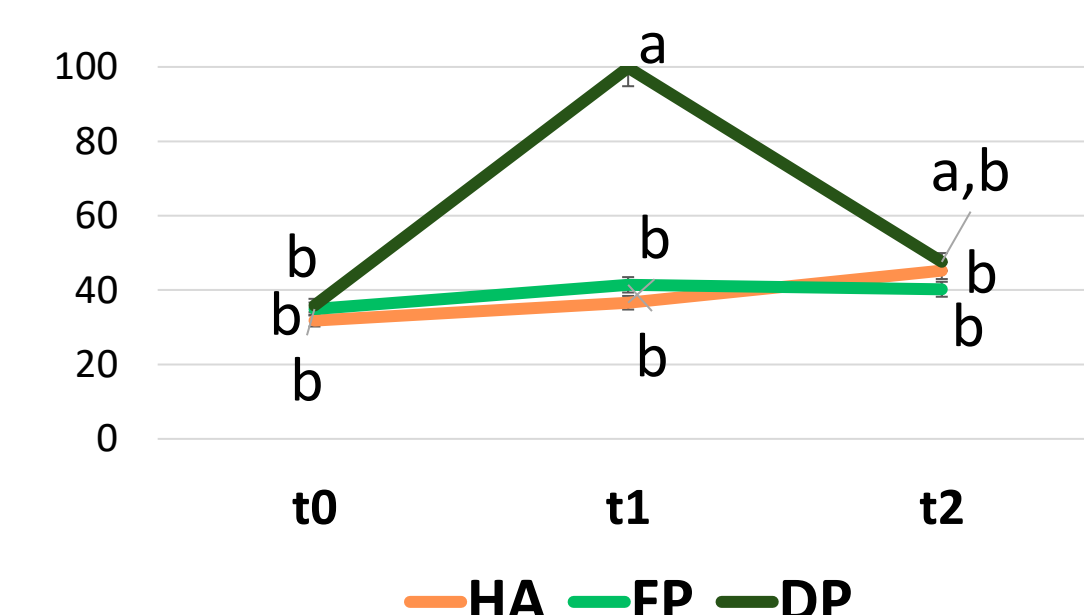


Fig.5. Color analysis: hue angle (h^*) of Bresaolas from Angus cattle fed hay (HA), fresh pasture (FP) or dry pasture (DP) diet.

Supporting this hypothesis, total myoglobin content did not differ between Bresaolas, whereas the levels of the oxidized isoform metmyoglobin were higher in DP compared to FP and HA (Fig.6).

Myoglobin isoforms: MetMG

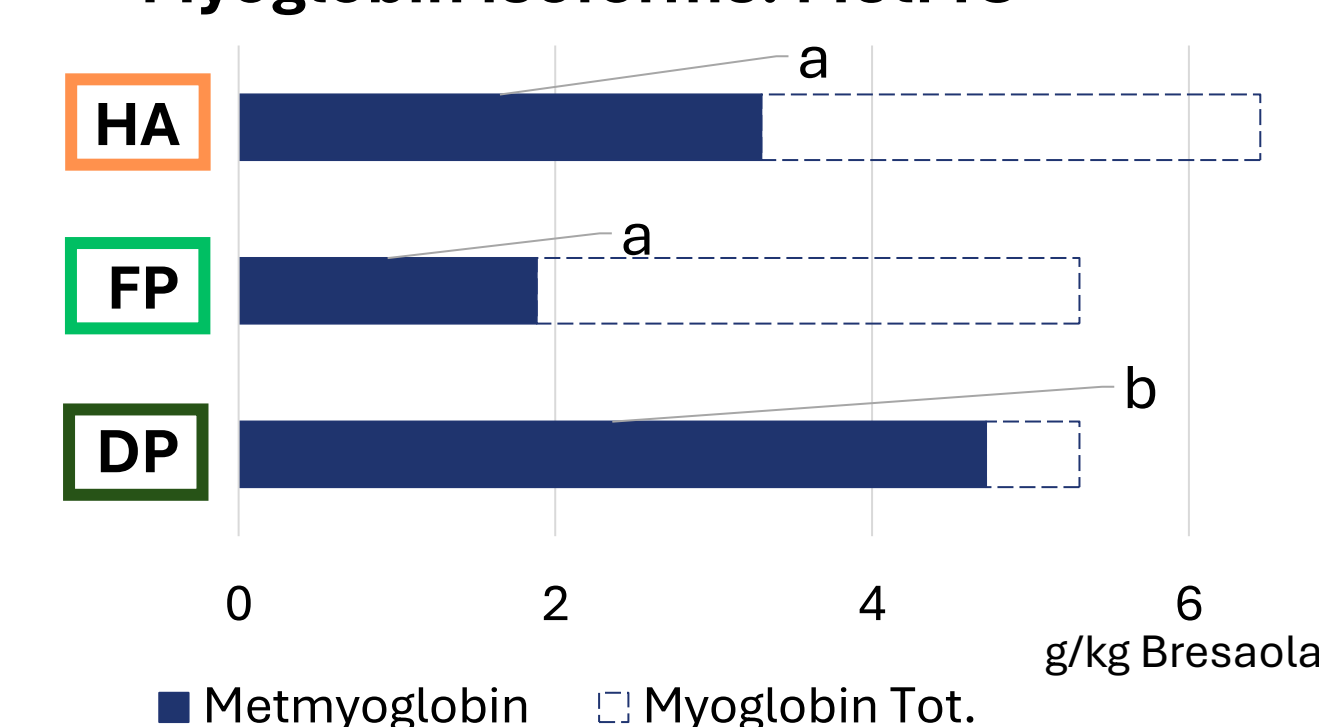


Fig.6. Metmyoglobin (MetMG) isoform of Bresaolas from Angus cattle fed hay (HA), fresh pasture (FP) or dry pasture (DP) diet.

Conclusions

In a grass-fed system, seasonal dietary variations can influence some quality parameters of Bresaola.

Specifically, DP showed worse parameters related to appearance compared to HA and FP, though the **nutritional value** did not differ among the Bresaola types. Sensory tests on grass-fed Bresaolas from different seasons could be performed to assess consumer perception.

Acknowledgments

The research was funded by Aboca Group. Bolletta, V. was granted fellowship by PON Ricerca e Innovazione 2021. The authors thank Cavalier Valentino Mercati for the fundings and Chiara Fodaroni for her meaningful contribution to the research.

References

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