



# The effect of fluorescent light exposure on meat colour stability from commercial Gascon calves and cull cows, produced in Catalunya and Midi-Pyrenees

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## Conclusions

- Meat colour from Gascon cull cows was more stable than meat colour from Gascon calves.
- Meat discoloration was faster and more intense under fluorescent light than in darkness.
- Under light exposure, the discoloration followed the same pattern independently of the category. However in darkness, the rate of discoloration was different between the two commercial categories.

## Introduction

➤ The meat shelf-life is a significant economic issue for beef industry. The cherry red colour in fresh beef is an extremely important attribute that influences a consumer's purchase decision (Faustman & Cassens, 1990).

➤ Meat discoloration limits the case-life, which affects negatively the profitability as it usually compels retailers to discount their products.

➤ The modification of colour on displayed meat depends on the atmosphere used for packaging, time of display, lighting, the chemical form of pigments and surface bacterial growth (Seideman et al., 1984).

**The objective of this study was to investigate the effect of display time and light exposure conditions on colour stability of the *Longissimus dorsi* muscle from commercial Gascon calves and cull cows, produced in Catalunya and Midi-Pyrénées.**

## Results

- ✓ The 3 ways interaction (Commercial categories\*Lighting conditions\*Storage time) was significant only for a\* values and the OxyMb/MetMb ratio.
- ✓ The double interactions : Commercial categories\*Storage time and Lighting conditions\*Storage time were significant for L\*.

**Table 1-** Probabilities of the main effects and interactions for colour parameters of Gascon breed.

Sources	L*	a*	OxyMb/MetMb
Lighting conditions	0.0404	<.0001	0.0083
Commercial categories	<.0001	<.0001	0.0111
Storage time	<.0001	<.0001	<.0001
Commercial categories*Storage time	0.0007	0.0431	0.0031
Commercial categories*Lighting conditions	0.9419	0.2634	0.6849
Lighting conditions*Storage time	0.0001	<.0001	0.0001
Commercial categories*Lighting conditions* Storage time	0.7893	0.0105	0.0024

- ✓ Samples stored under light showed a significant decrease in L\* values at the 5<sup>th</sup> day of display. However, this decrease started at the 8<sup>th</sup> day for meat stored in darkness (Figure 1).
- ✓ L\* values were significantly different between commercial categories over storage time (Figure 2).

## Materials and Methods

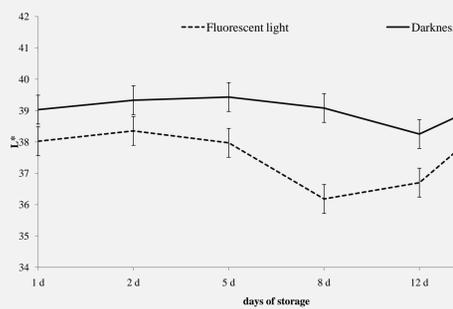
➤ 2 Commercial Categories were selected from commercial abattoirs

- 15 Gascon Cull cows (5-8 years) Midi-Pyrénées
- 15 Gascon Calves (10-11 months) Catalunya

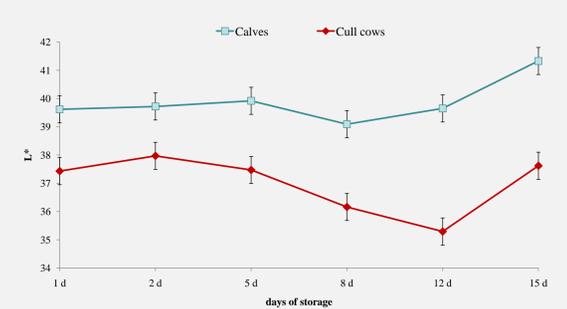
➤ The *Longissimus dorsi* muscle of 30 carcasses was removed at 48h post mortem. From each loin, 2 steaks (5 cm thick) were cut and stored under two different lighting conditions.

➤ Samples were placed on polystyrene trays and overwrapped with an oxygen permeable PVC food film.

**Figure 1-** Effect of light vs darkness on L\* during 15 days of storage



**Figure 2-** Effect of commercial category on L\* during 15 days of storage

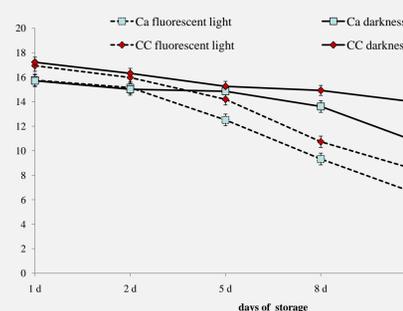


- ✓ Meat from cull cows had higher a\* values over the 15 days of display, whatever or not samples were exposed to light.

- ✓ a\* values showed that redness decrease was affected by storage time, commercial categories and lighting conditions (Figure 3).

- ✓ The ratio (OxyMb/MetMb) was more stable for samples from cull cows stored in darkness over the 15 days of storage (Figure 4).

**Figure 3-** Effect of commercial category and lighting conditions on a\* during 15 days of storage



**Figure 4-** Effect of commercial category and lighting conditions on OxyMb/MetMb during 15 days of storage

