

Validation of a method for measuring the colour and determining the proportions of myoglobin redox forms on beef

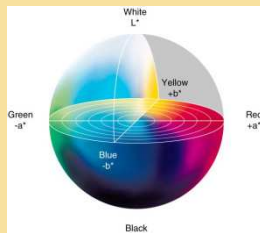
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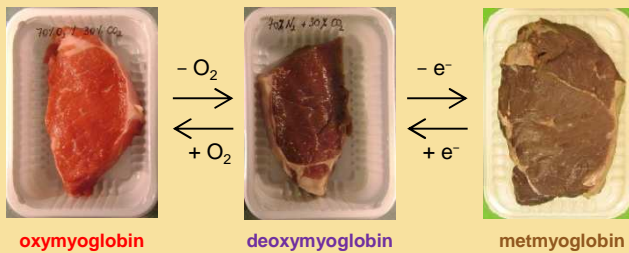
INTRODUCTION

The first impression consumers have of any meat or meat product is its **COLOUR**. Colour influences consumer buying decision and affects the perception of the meat freshness.

CIE L*a*b* is the most used colour space in the objective determination of meat colour.



Myoglobin plays the largest role in determining fresh meat colour. Bound atoms or compounds (O₂ for example) and oxidation state influence the colour of this pigment.

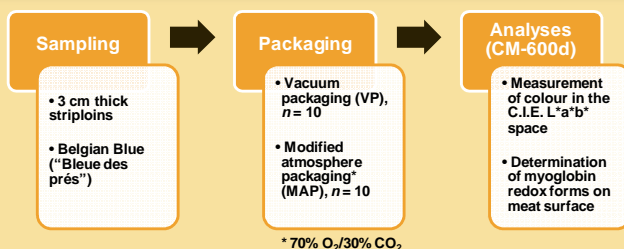


OBJECTIVE



Validate the use of the spectrophotometer Minolta CM-600d for measuring the colour and determining the proportions of different myoglobin redox forms (using reflectance) on the surface of meat.

MATERIALS AND METHODS



* 70% O₂/30% CO₂

Comparison of results with two reference methods:

- Minolta CR-400 chromameter (C.I.E. L*a*b*)
- extraction and spectrophotometry (myoglobin redox forms determination in meat extracts)

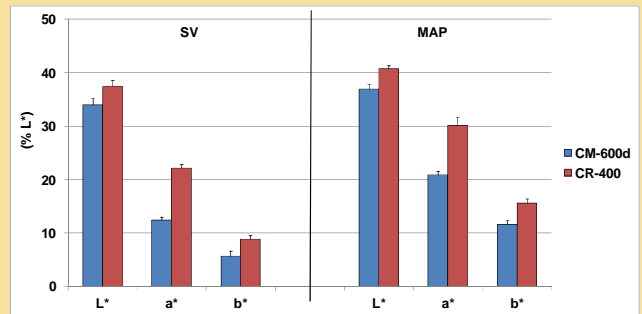
Statistical analyses:

- F-test (precision)
- t-test (accuracy)

significance level = 5 %

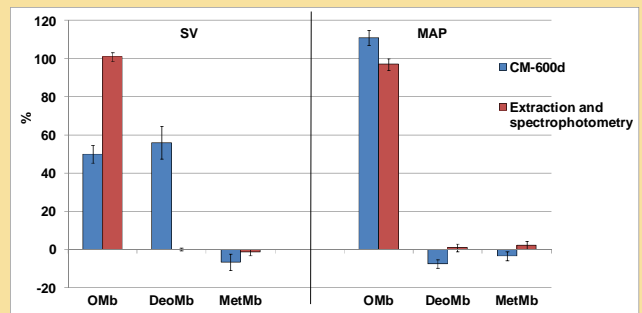
RESULTS

Comparison of the colour measurement performed by the spectrophotometer CM-600d and the chromameter CR-400



The two colour measurement methods presented the same precision, when considering VP samples only, and different accuracies, probably because of the different detectors and observation angles used by both devices.

Comparison of the two methods for determining the proportions of the different myoglobin forms



The two methods for determining the different myoglobin forms presented also the same precision but different accuracies, probably due to the fact that measurement was not limited to the meat surface and oxygenation was favoured during some steps of the reference method (e.g. extraction, filtration).

CONCLUSIONS

In conclusion, the results of colour measurement obtained by both devices cannot be compared. It is necessary to compare both methods for determining oxymyoglobin, deoxymyoglobin, and metmyoglobin in complete anaerobic conditions in order to eliminate the oxygenation bias.

ACKNOWLEDGEMENTS



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