

# Ability of visible spectroscopy to authenticate pasture-fed lambs in three breeds



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## INTRODUCTION

The sensory and nutritional properties of meat differ between pasture-fed and grain-fed animals, and consumers are demanding information on the diet fed to food animals.

**Aim of this study:** Assess the ability of visible spectroscopy to distinguish pasture-fed from stall grain-fed lamb carcasses using a large database of 3 sheep breeds.

## MATERIAL and METHODS

### Animals (n = 1054)

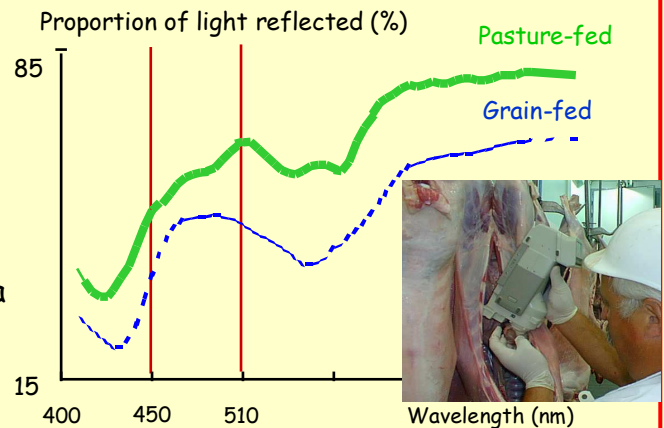
3 breeds : Romane, Limousine, Ile de France

### Measurements

Reflectance spectrum of perirenal fat at 24 h *post-mortem*

Method 1 : Quantification of light absorption by carotenoid pigments in the 450-510 nm area

Method 2 : Multivariate analysis over the full set of reflectance data (400-700 nm)



## RESULTS

The reliability of Method 1 proved variable across feeding regimes and breeds, with higher correct classification rates in pasture-fed than in grain-fed lambs, and in Romane than in Ile de France (the Limousine being intermediate).

On the contrary, the discriminatory ability of Method 2 was fairly comparable across breeds and enabled correct classification rates of between 85.7% and 92.2% for pasture-fed lambs and between 97.9% and 99.6% for grain-fed lambs.

	Breed	Romane		Limousine		Ile de France	
		Grain	Pasture	Grain	Pasture	Grain	Pasture
	Feeding regime						
	Number of lambs	258	148	286	168	92	102
	Index quantifying light absorption by carotenoids	131	355	137	290	169	267
	Correct classification rate using method 1	100.0	87.2	95.8	81.5	93.5	66.7
	Correct classification rate using method 2	99.6	89.9	99.6	85.7	97.9	92.2

## CONCLUSION

Measuring the optical properties of perirenal fat online at the slaughterhouse using a portable spectrophotometer is of interest for the development of on-the-spot methods for diet authentication in the meat.

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