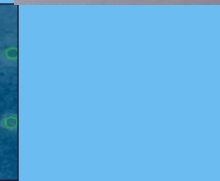
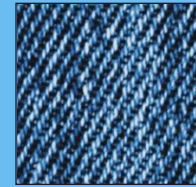


## Introduction to VideometerLab2 for the analysis of meat and fish

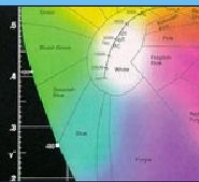


For more information contact:

**analytikLtd** (UK and Ireland Distributor)

Barn B, 2 Cygnus Business Park, Middle Watch, Swavesey, Cambridge, CB24 4AA

T: +44 (0)870 991 4044 F: +44 (0)870 135 2488 E: [info@analytik.co.uk](mailto:info@analytik.co.uk) [www.analytik.co.uk](http://www.analytik.co.uk)



# Why use imaging on food?

- Mimic human vision
- Eliminate subjective assessment
- Non-homogeneous samples
- Focusing on certain areas of a sample
- When shape, size and texture are of special interest



# Why measure color on food ?



- Conforming product
- Quality grading
- Shelf life
- Formulation
- Derived characteristics

Spectral imaging enhances color measurements into the domain of surface chemistry mapping



# Meat spoilage study



- Minced beef shelf life
- Stored at 5° under
  - Aerobic conditions (normal atmosphere)
  - Modified atmosphere packaging (MAP)
- Measured at 12 hour intervals over 7 days

Data acquisition and microbiological analysis: Ammor, M.S., Argyri, A., Nychas, G.-J.E. (2009) Rapid monitoring of the spoilage of minced beef stored under conventionally and active packaging conditions using Fourier transform infrared spectroscopy in tandem with chemometrics. *Meat Science* 81, 507-514



# Muscle pigments: myoglobins

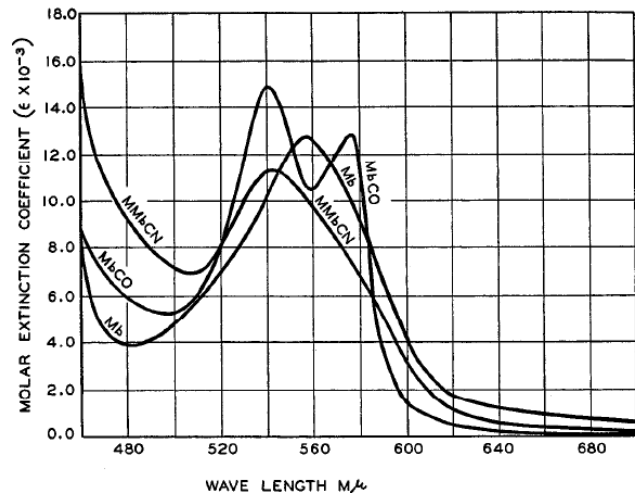


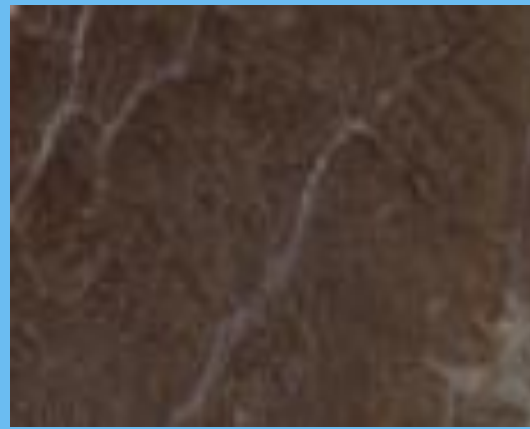
FIG. 3. Absorption curves for Mb, MbCO, and MMbCN in the visible region

- Myoglobin / Oxymyoglobin
  - It is the primary oxygen-carrying /storing pigment of muscle tissues
- Metmyoglobin
  - is the oxidized form of myoglobin

Source: W. Bowen, 1948.



**OxyMb**



**MetMb**



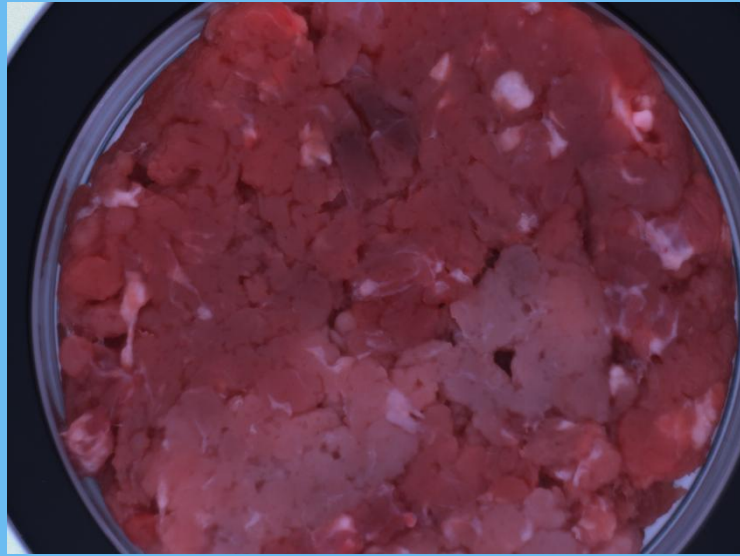
**DeoxyMb**

Image source Danish Meat Research



# Before storage

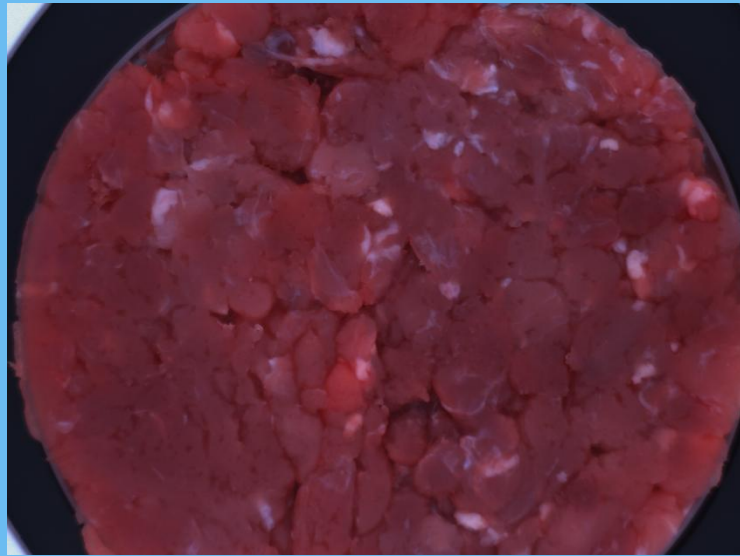
1a



1b



1c

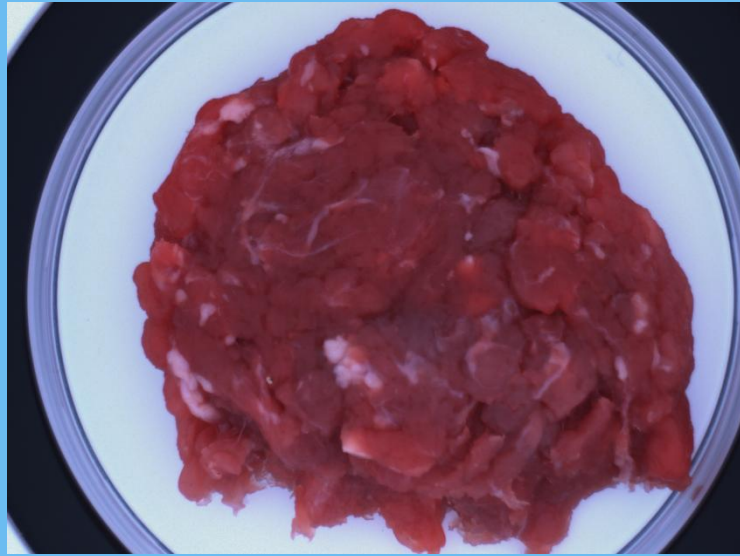


1d



# Aerobic storage

A4a



A8a



A12a



A13a

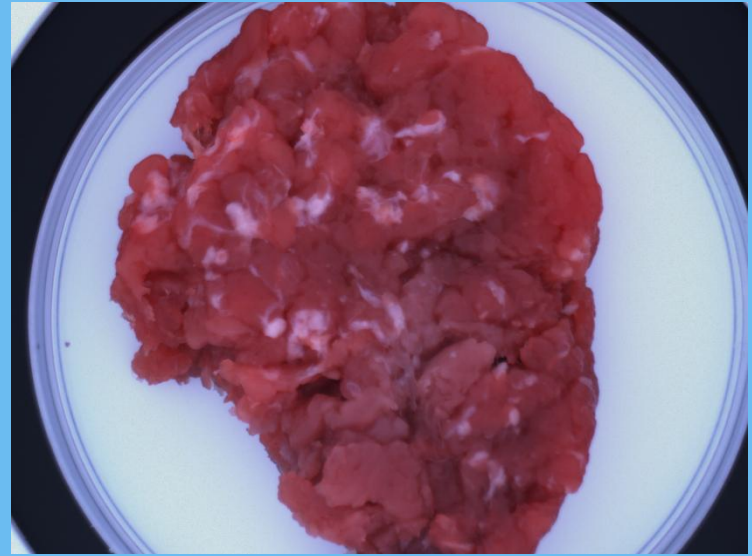


# MAP storage

M4a



M8a



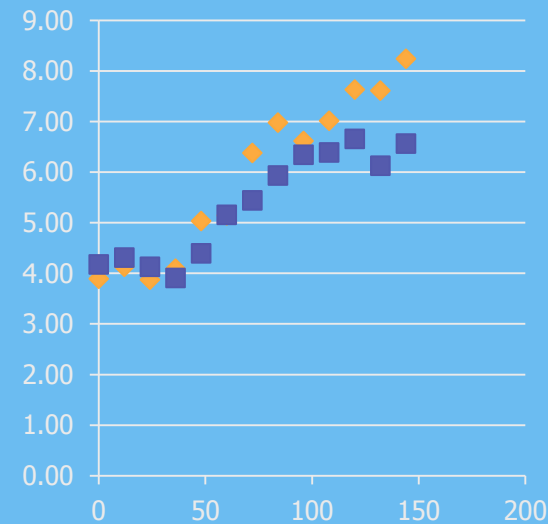
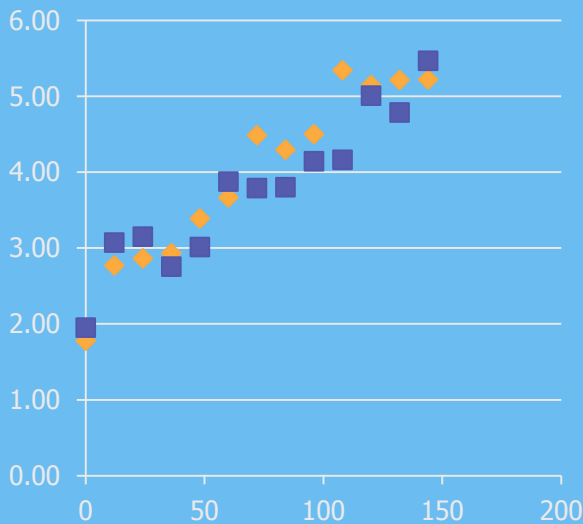
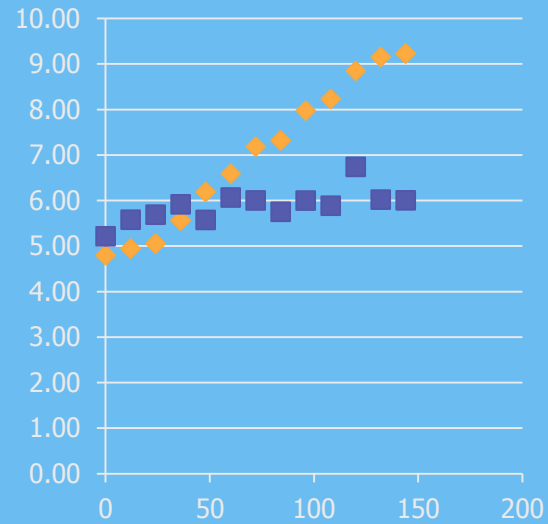
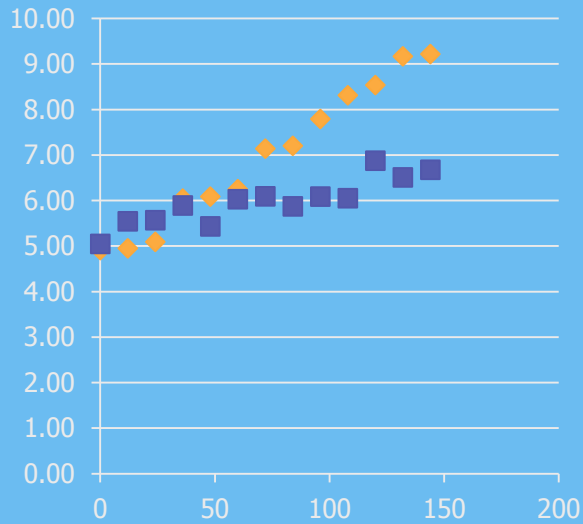
M12a



M13a

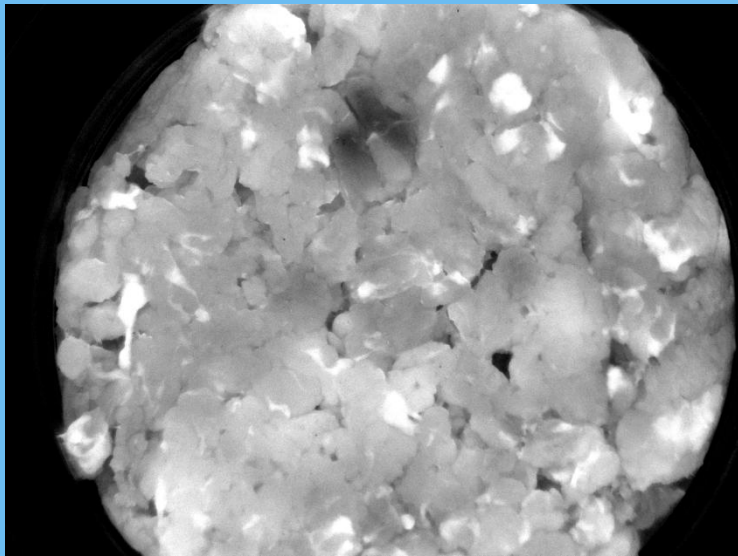


# Microbiological analysis

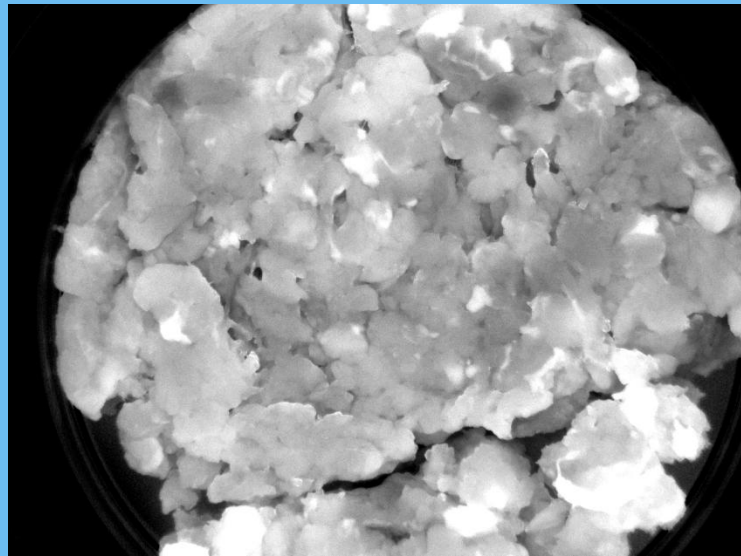


# Canonical discriminant images

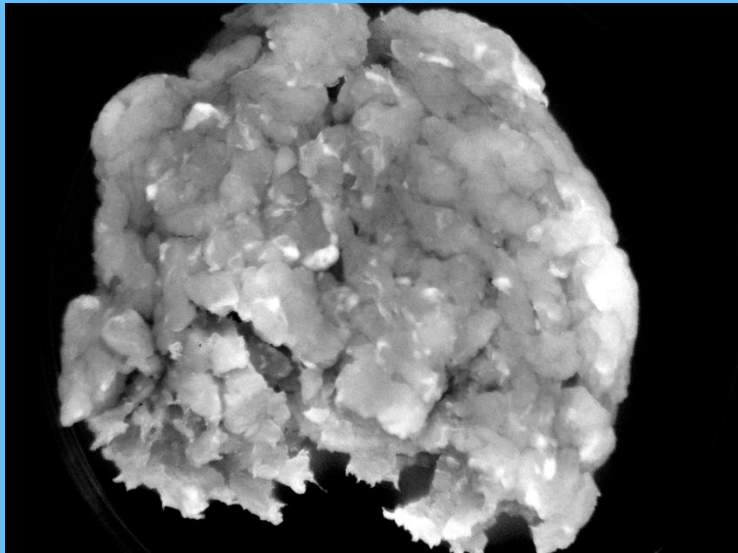
1a



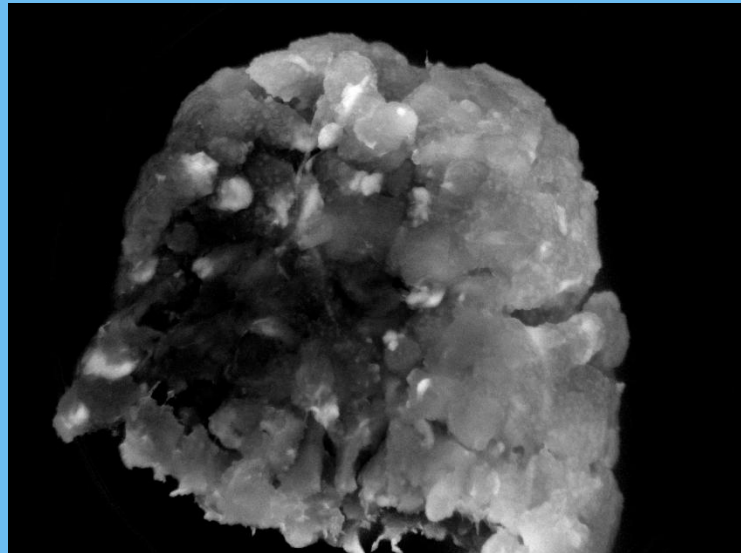
1b



M13a

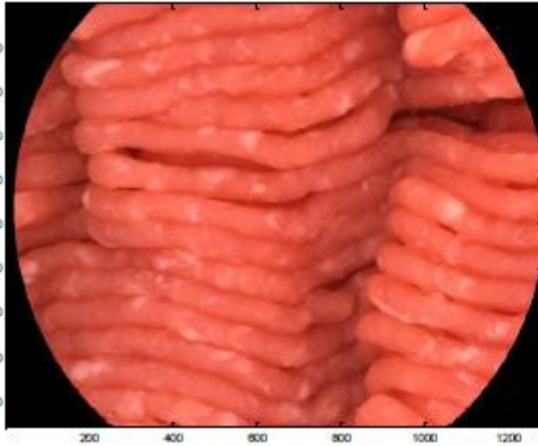


A13a

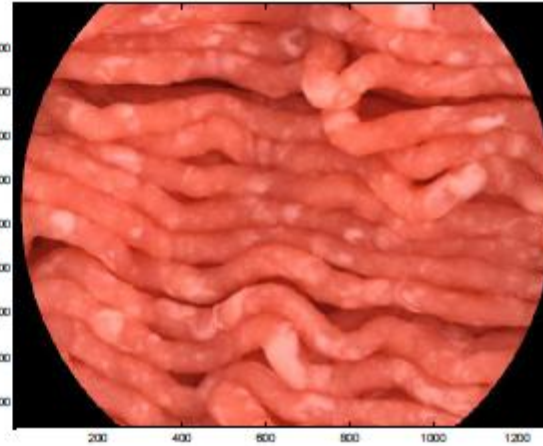


# Quantitation - % Fat in Pork

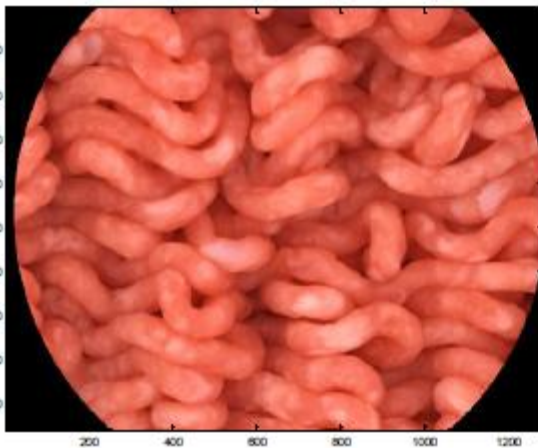
5%



9%



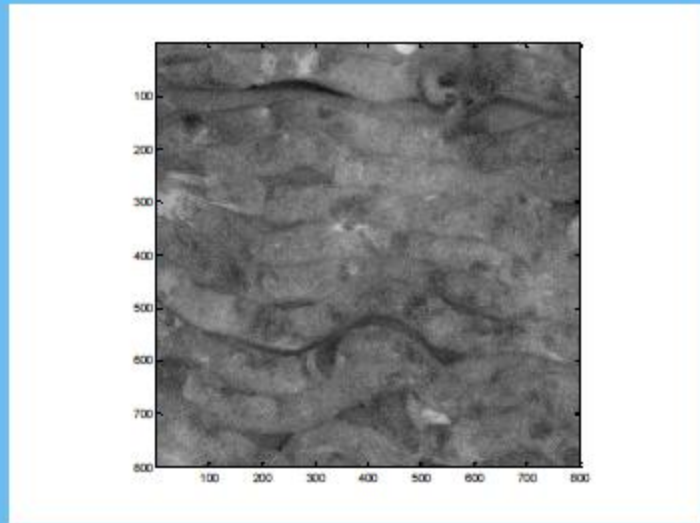
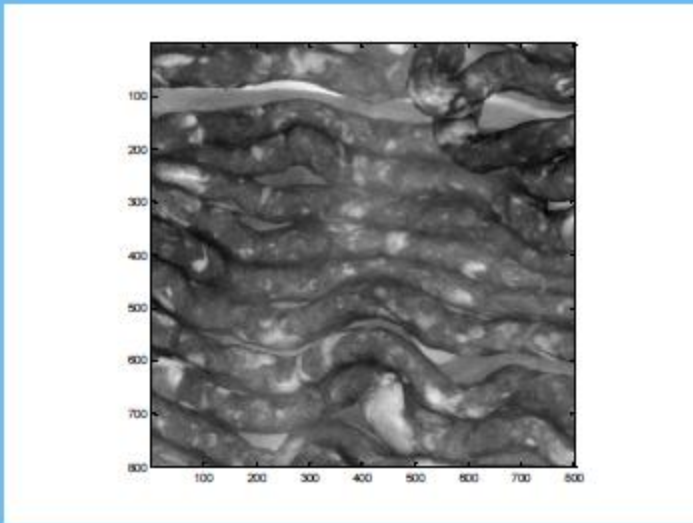
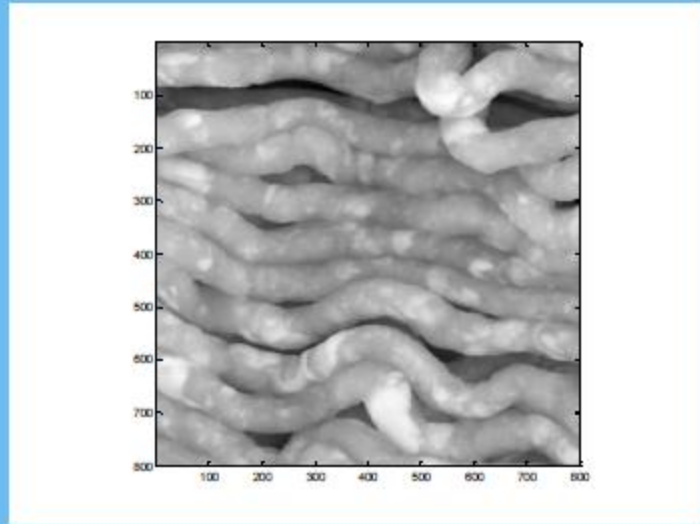
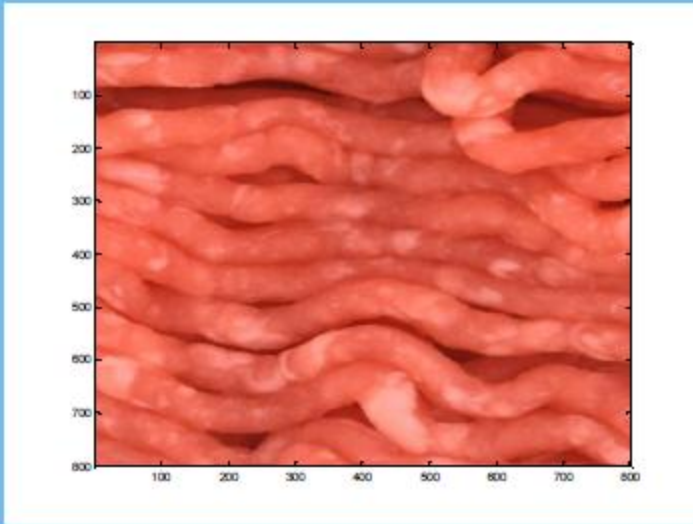
15%



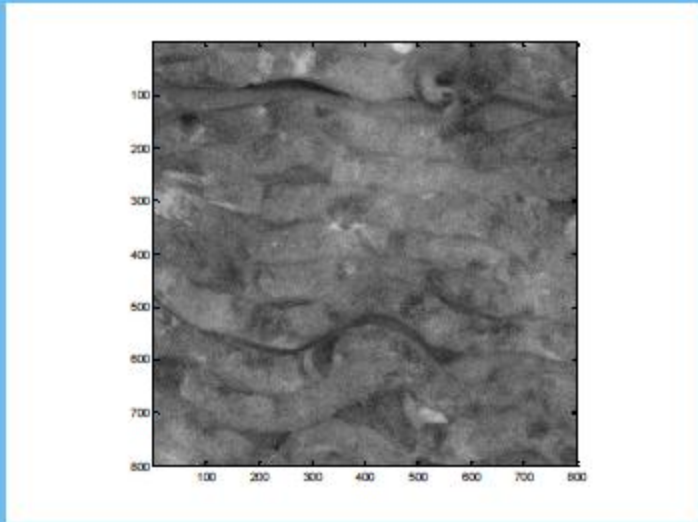
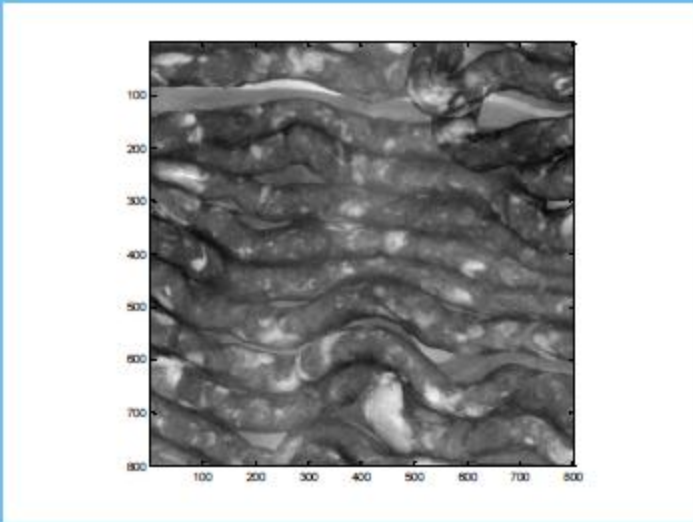
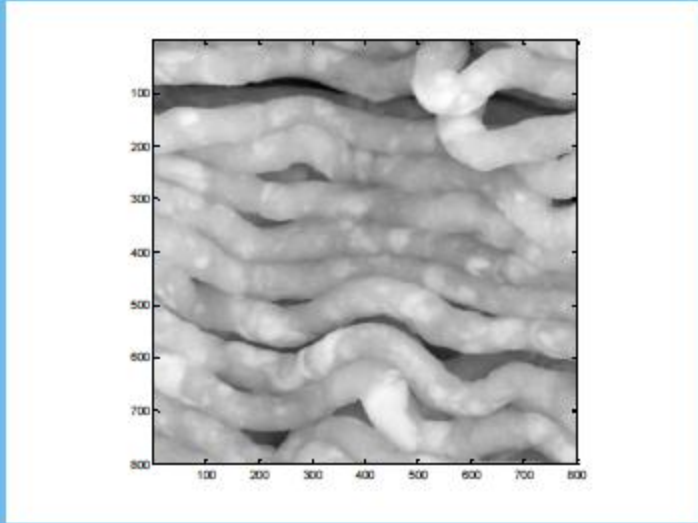
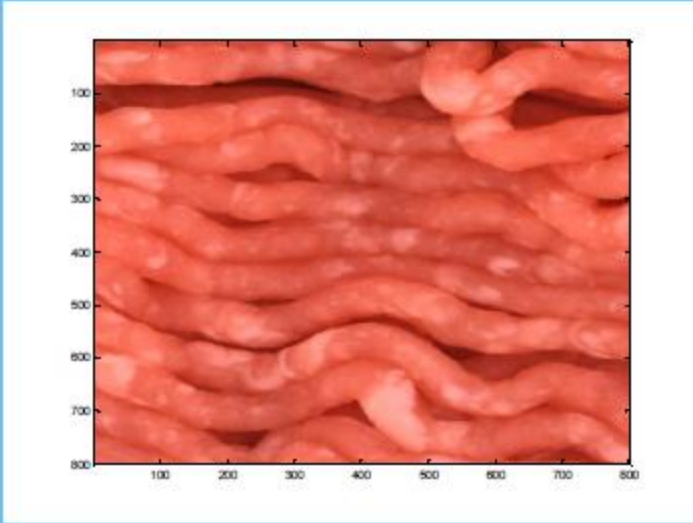
15% back



# 9%: RGB and PCA 1-3

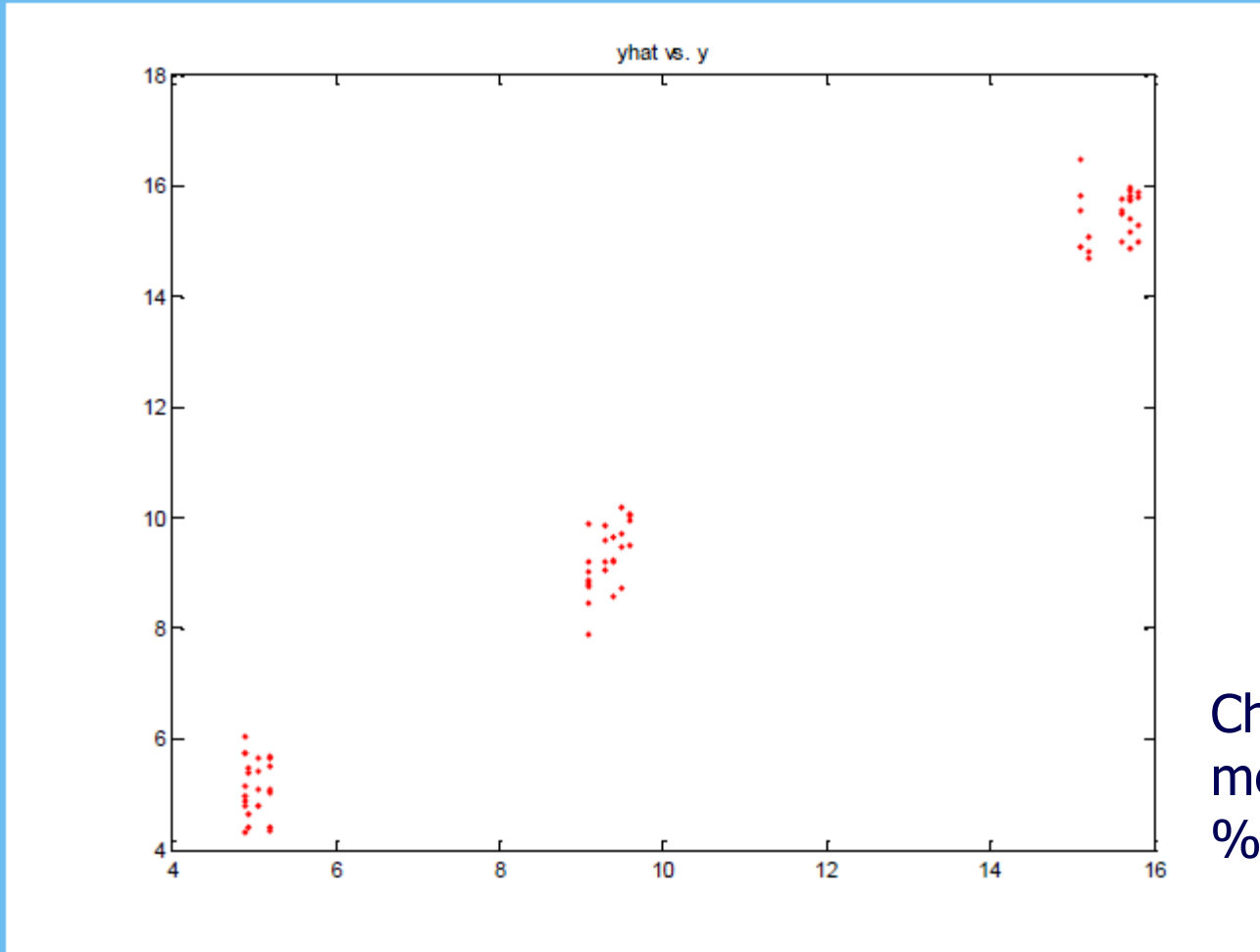


# 9%: RGB and MAF 1-3



# Estimated versus actual % fat

Estimated % fat by Videometer

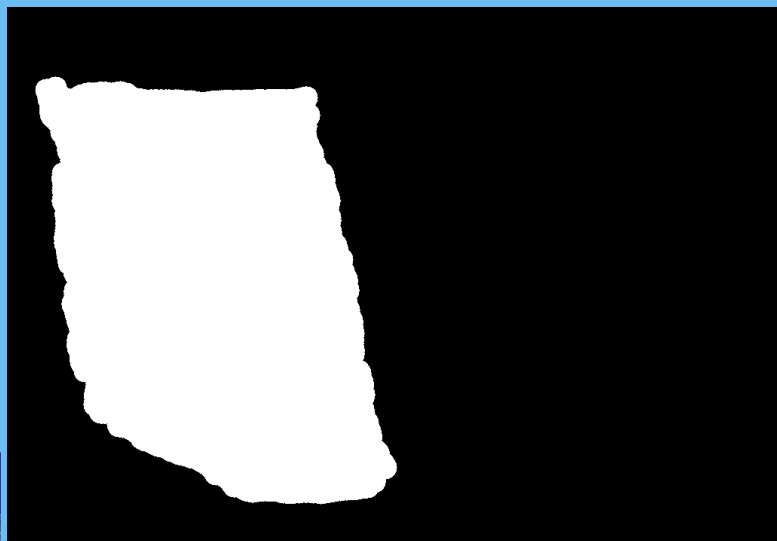
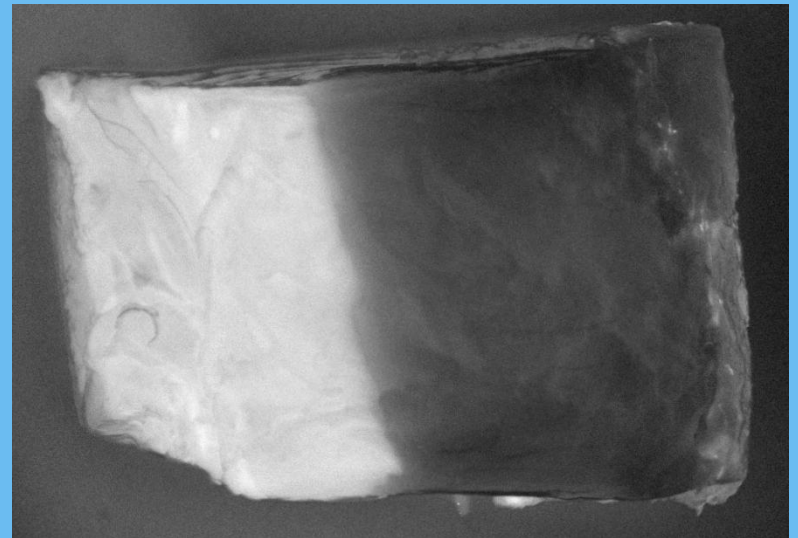


Chemically  
measured  
% fat

$$\sigma^2(\text{prediction}) \leq 1 \text{ fat}\%$$



# Tuna: detection of blood meat

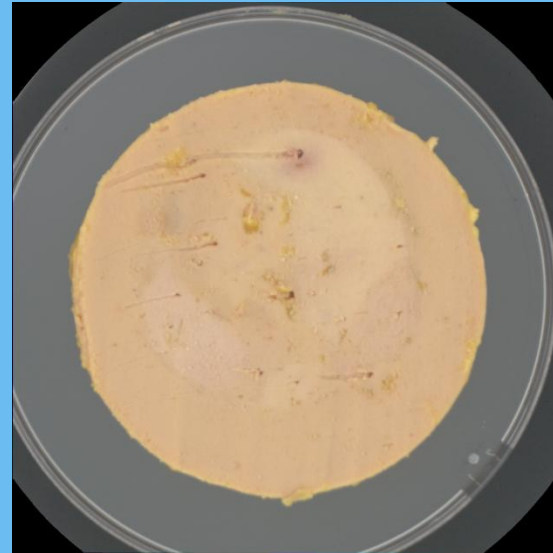
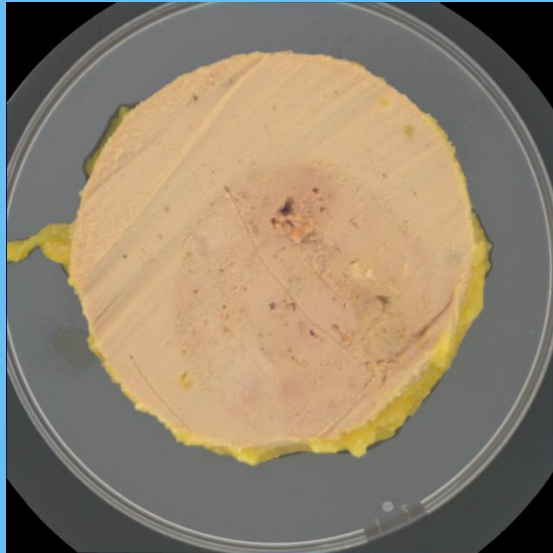


- Spectral detection and thresholding
- Blood meat marked in binary image

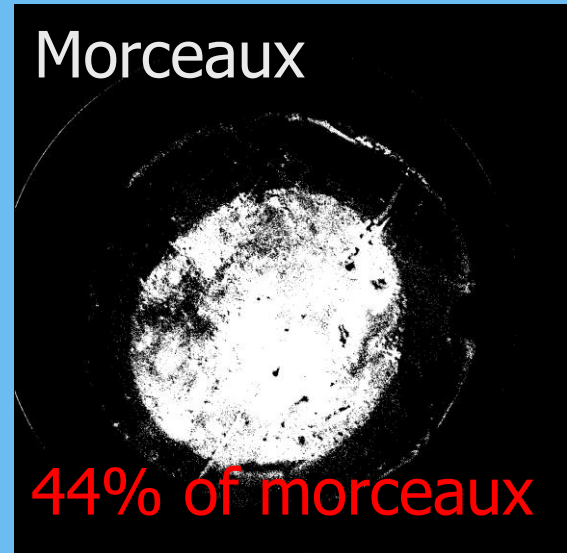
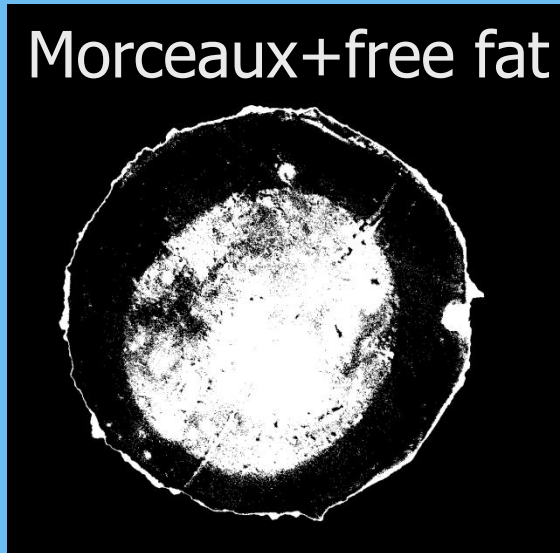
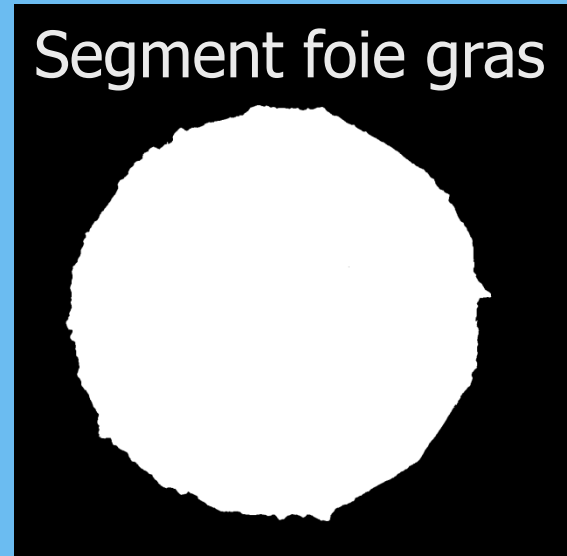
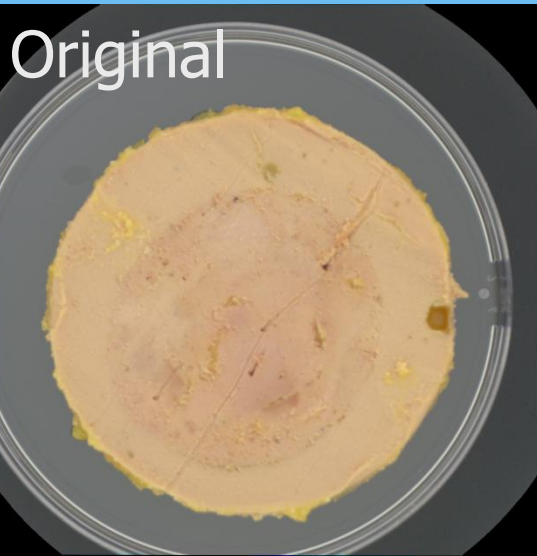


# Foie gras: Colour of morceaux

- Color of morceaux shows high variation, darker as well as brighter than emulsion



# Foie gras analysis

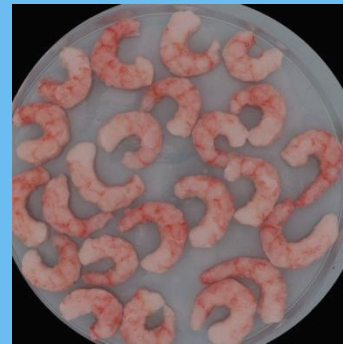
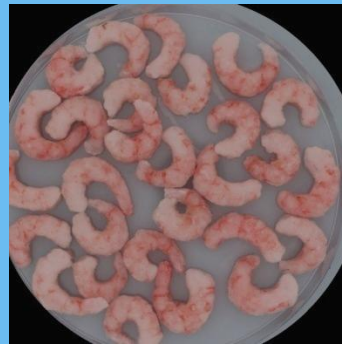
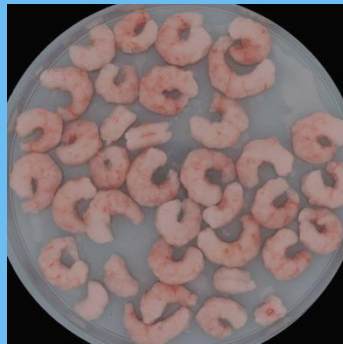
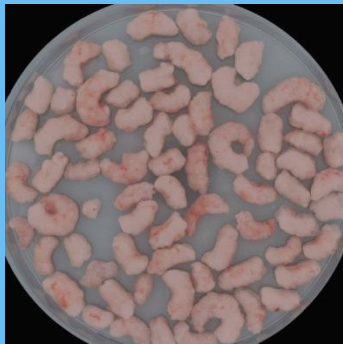
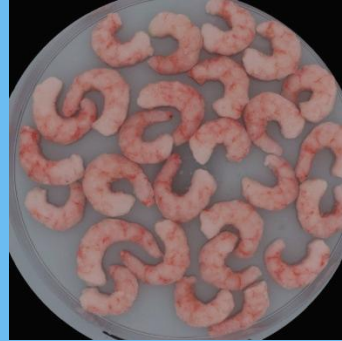
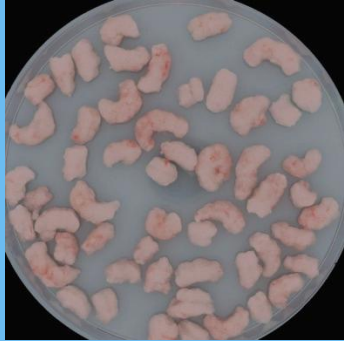


44% of morceaux



# Quantifying Prawn Quality

## Prawn color quality: Examples



Class 1

Class 2

Class 3

Class 4

Class 5



- There are many other applications of spectral imaging using VideometerLab in the meat and fish research and processing industries
- For more information contact Analytik (UK and Ireland distributor)

[www.analytik.co.uk](http://www.analytik.co.uk)

