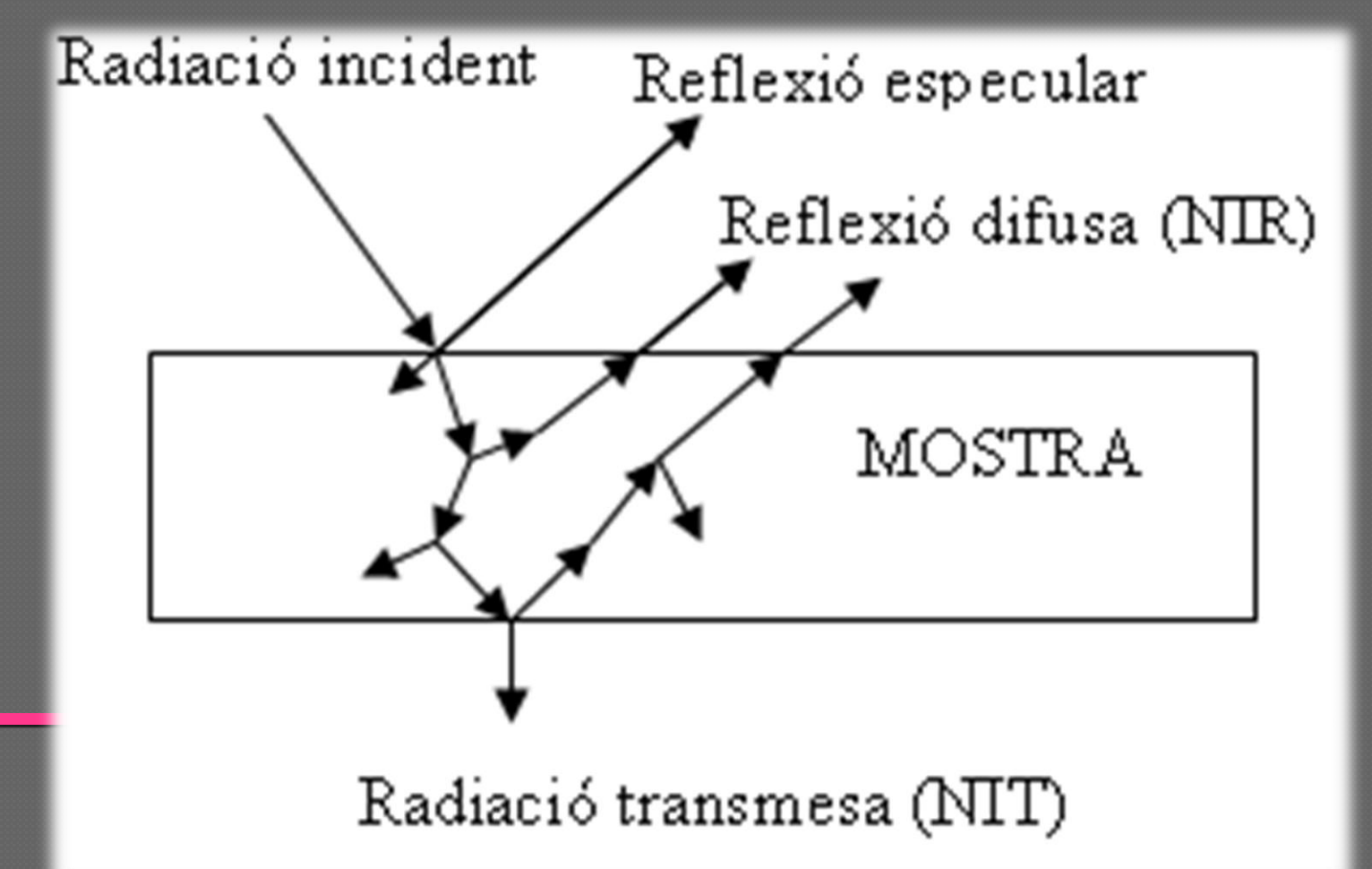


APPLICATION OF NEAR INFRARED REFLECTANCE SPECTROSCOPY IN FOOD QUALITY

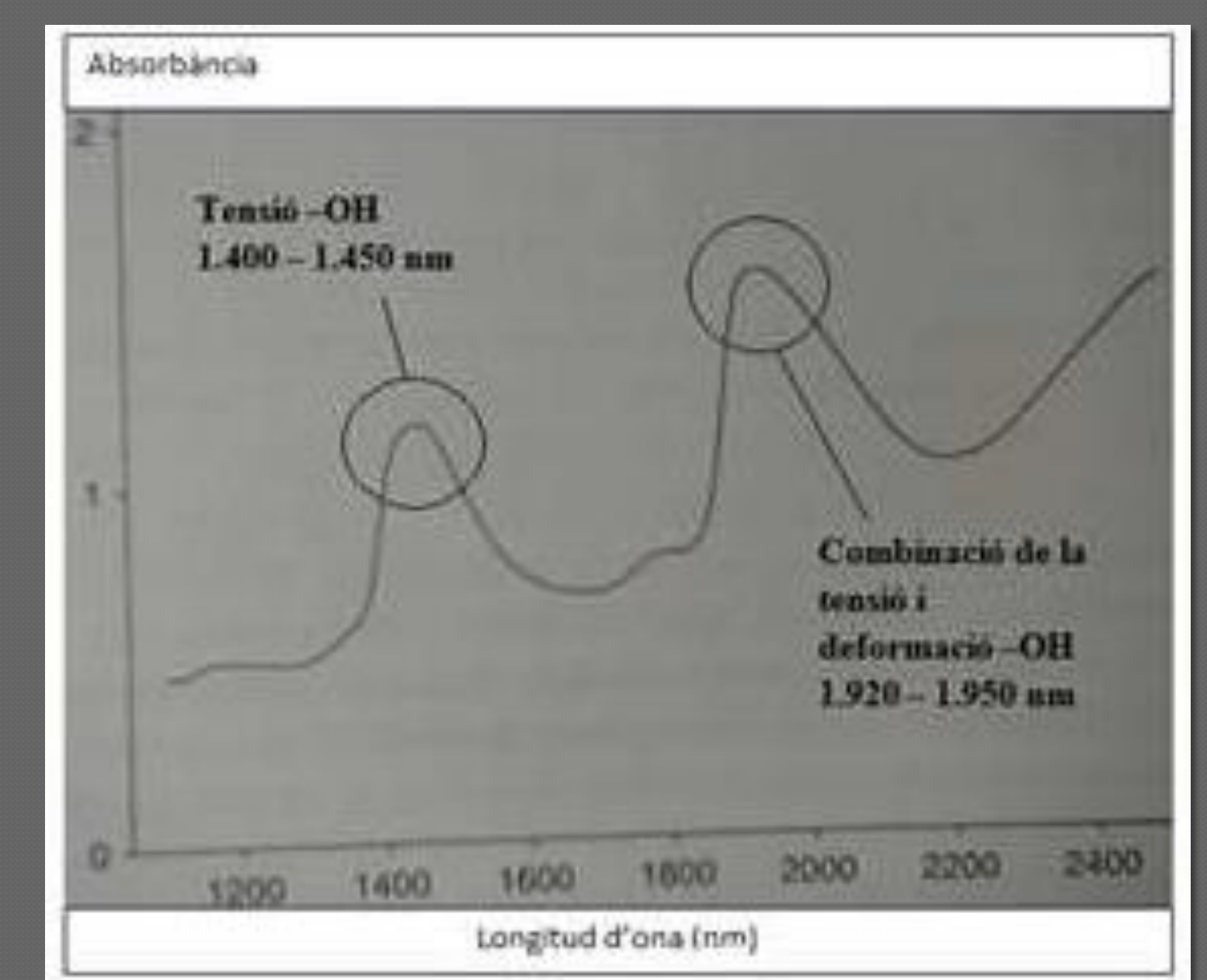
Introduction

- ❖ 1800: Frederick William Herschel discovered near infrared.
- ❖ Initial rejection of near-infrared spectroscopy.
- ❖ Finals 1960: Karl Norris initiates the measurement of diffuse reflectance.

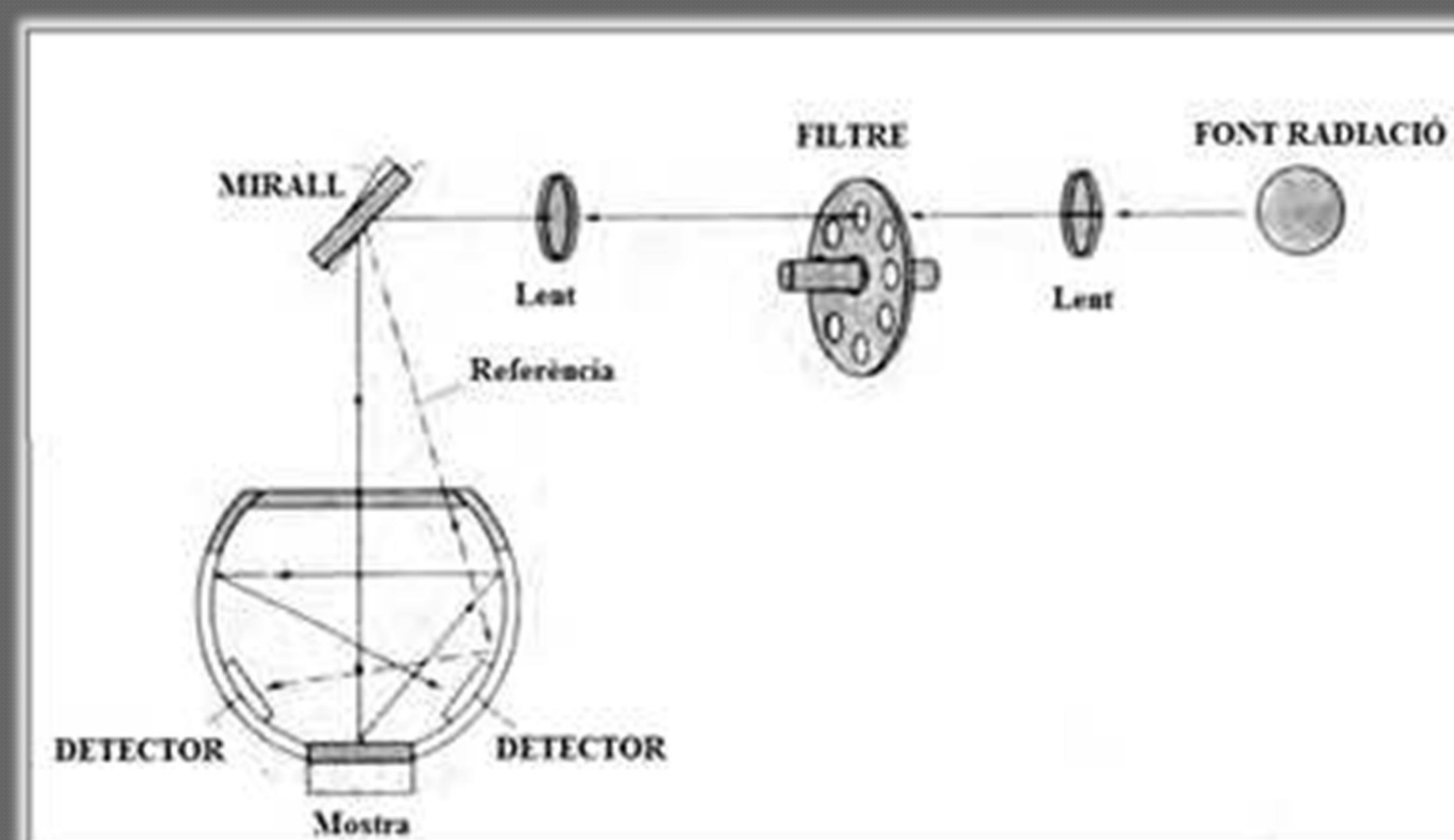


Basis of near-infrared spectroscopy

- ❖ Electromagnetic radiation :
- ❖ Infrared: NIR (750-2500nm) / MIR (2500- 25000nm)/ Far (25000-100000nm)
- ❖ Molecular vibrations: C – H, N – H, C – O, O – H (links functional groups)
- ❖ Measurement of radiation absorbed:
 - Reflection: specular reflection and diffuse reflection
 - Transmittance
- ❖ Absorption Spectra: View the absorption of the links.



Structure and operation of the devices NIRS



Types of measures

- Measure at laboratory
- Analysis *atline*
- Analysis *online*
- Analysis *inline*

Calibration

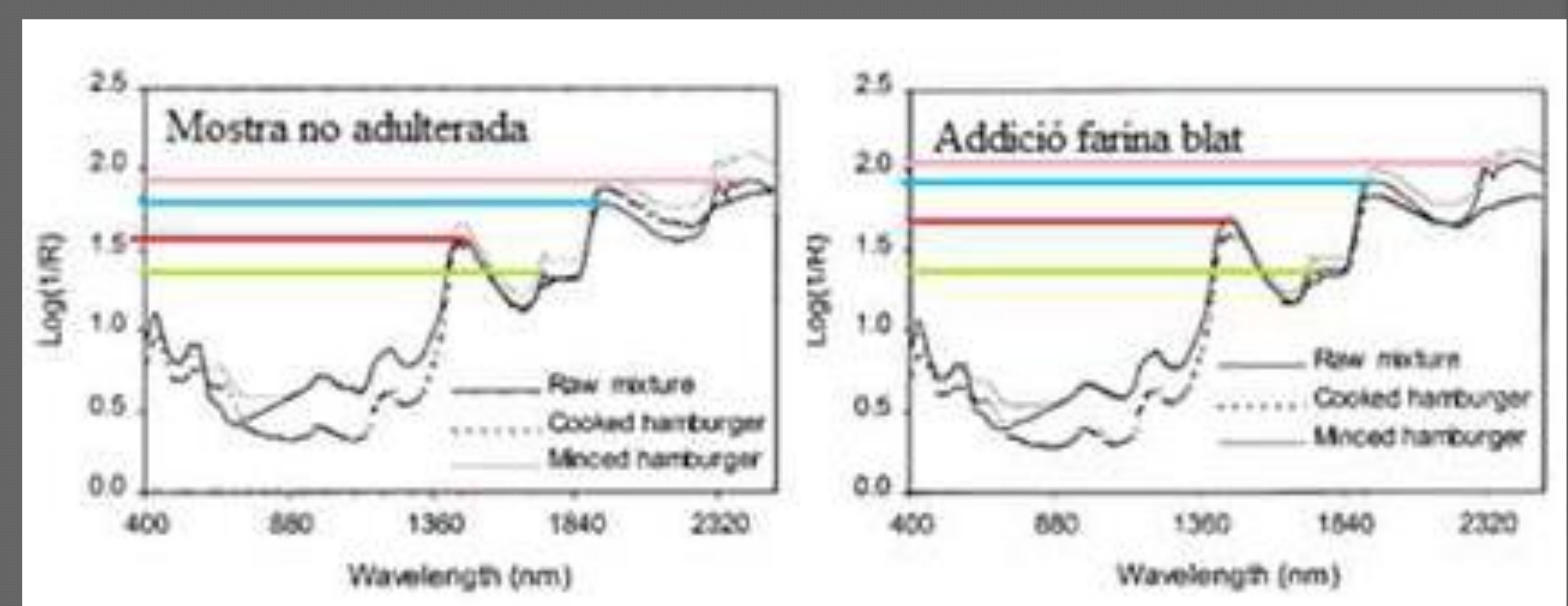
- ❖ The NIRS device requires a pre calibrated using conventional methods.

Application of NIRS in food quality

- ❖ Quality of food: a set of measurable parameters, which provide a level of satisfaction of consumer needs.
- ❖ The NIRS to measure various chemical parameters that define the quality of a food.
- ❖ Measuring qualitative and quantitative moisture, proteins, lipids, carbohydrates ...

Examples:

- Fraud Detection: Adulteration of meat
- Maturation



Advantages and inconvenient

Advantages	Inconvenient
<ul style="list-style-type: none">- Nondestructive- Quick measurement- Reduces environmental pollution- Fewer errors due to low sample treatment- Allows analysis anywhere- Low maintenance cost	<ul style="list-style-type: none">- High initial investment- Needs calibration

Conclusions

- ❖ The introduction of NIRS in food industry led to a breakthrough between the methods.
- ❖ The investigation of a continuous calibration that can be used in various analytes and food shows how this method is of great interest to industry.