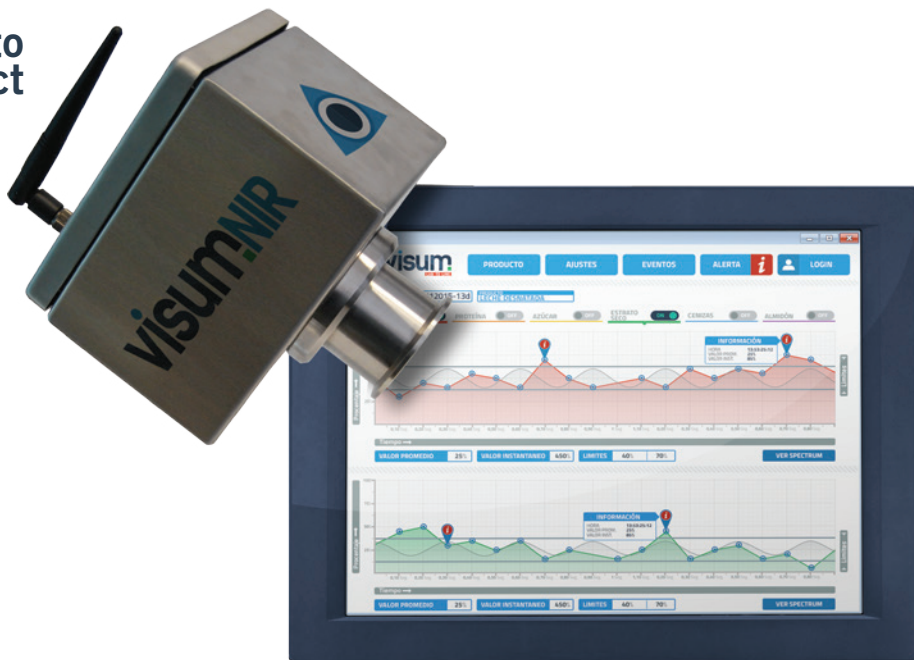


HOW TO AVOID THE HORSE MEAT SCANDALS OF TOMORROW



In-line chemical analysis to prevent adulteration and detect the “Undesired Unknown”

- Monitoring of chemical composition, invisible to the human eye
- Measurement of each product unit, not only samples from a batch
- Continuous and non-destructive measurements
- Real-time in situ analysis



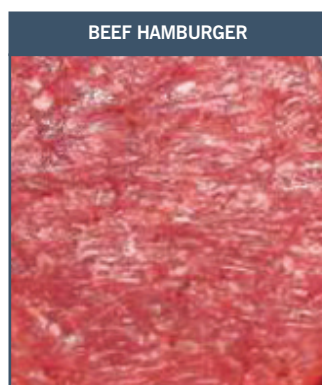
VISUM IN-LINE: Quality control by detecting “The Undesired Unknown”

Detection of fraud and adulteration of incoming material is crucial for food processing companies in an increasingly globalised economy. In 2013, the horse meat scandal, which shook the meat

industry to its core, drove food processing companies to ask the question: 'What will the next counterfeit scandal be and how can we protect ourselves against the 'Undesired Unknown'?

Case study

Three sets of spectra were acquired by the VISUM INLINE NIR analyser: Pure beef hamburgers, pure horse meat hamburgers and mixtures of beef/horse meat hamburgers. Subsequently, a chemometric model was developed to determine the weight percentage of horse (adulterated) meat.



While the human eye cannot detect the differences between beef and horse meat, the VISUM INLINE NIR analyser is perfectly capable of distinguish “beef pattern” from “horse meat pattern”. The pure beef histogram peak is located around $x=100$ and is higher and sharper; pure horse meat histogram peak is located around $x=0$ and is

lower and duller. The mixture histogram looks like a proportional superposition of both histograms.

Distinguishing beef hamburgers from horse meat ones is indeed possible. Counterfeit could be detected with a minimum of 5% of adulterant.

Conclusions

“VISUM NIR is capable of detecting horse meat adulteration in beef with a precision of 5%. Furthermore, it is possible to define the desired product features by establishing a “chemical fingerprint” with the spectra of high-quality products, so that future adulteration can be detected: the detection of the “Undesired Unknown”.