Benefit of NIRS for products under Protected Geographical Indication label: the example of the Belgian Ardenne Ham

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Introduction

Ardenne ham is a typical belgian smoked ham. Since 1996, it carries the European quality label « Protected Geographical Indication (PGI) » for both on-bone ham and Ardenne cushion. At the same time, a producers association was created essentially to promote the product, to protect it from the usurpation of the name and to diffuse the information about the ham. At present, Ardenne hams suffers from the concurrence particularly from the Cobourg that have some similar characteristics. The producers wanted to reinforce the quality of their product by the improvement of the specifications that exist since 1974. The most important criteria added to the specifications is the increase of the maturation time during which the ham develops its typical flavours. The others criteria purposed, more analytical, were the moisture and salt contents, with 55 % and 6% maximum on final product respectively. In the framework of regional initiatives (Requasud network and Project about characterization of the Belgian Ardenne's ham), the Walloon Agricultural Research Centre and the Gembloux Agricultural University are investigating the potential of NIRS for the authentication assessment of the Ardenne Ham produced in Belgium under PGI label.

Objectives

- **Identify the chemical quality criteria of Ardenne ham to insert into the specifications.**
- **Confirm these quality characteristics with optimization trials of the manufacturing process, by studying the length of the drying stage and the method of salting.**
- **Assess the relevance of using NIR for the certification of the ham under PGI label.**

Materials and Methods

To determine the typical characteristics of Ardenne ham, samples from 9 different productions were analysed. A central slice was removed from the ham. The meat, the intermuscular fat and the adipose tissue were mixed together to homogenize the sample. The moisture, salt, ash, proteins and fat contents were determined by the AFNOR methods. A part of the sample was also analysed in quartz cells for NIR with a calibrated Foss-NIRSystem 5000 spectrometer. The collected data were analysed with WinIsi software.The ham from the optimization trials were also analysed with these methods. In final, a total of 67 hams were analysed.

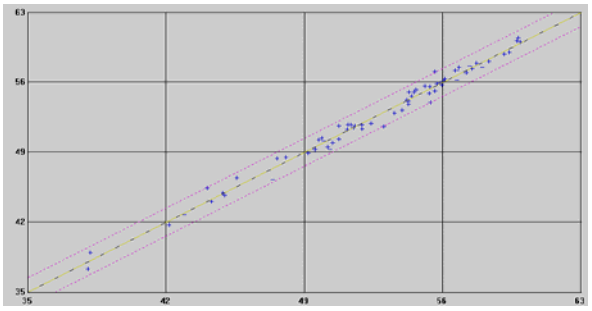
Sensory analyses with trained and consumer panels were realised to evaluate the typicity of the ham.

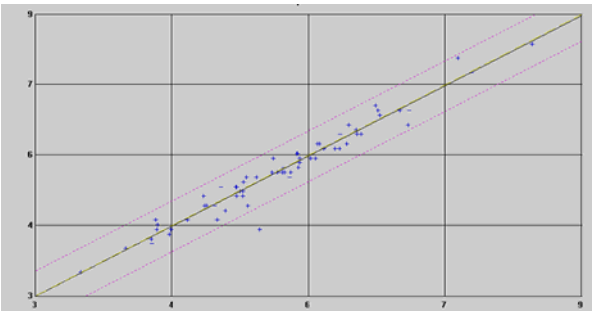
Results

Both the instrumental and sensory analyses put on evidence that the dried and salty characteristics are very important in the acceptability of the product.

The increasing of the drying time has a positive influence on the development of flavours, that are more pronounced and more accepted by the consumer panel. Also, there is an optimal salt concentration, between 5 and 6 % on the final product, and an maximum moisture content of 55% that please to the consumer panel.

The correlation between the results of the instrumental analyses and the NIR calibration MLR SNVD D1 5,5 for the moisture and salt are given in the following figures





The correlation coefficient are 0,985 and 0,956 for the moisture and salt respectively. The equation are in good relation with the instrumental analyses, the ratio between SD/SEC being superior to 3 for both the parameters.

Conclusions

The results lead us to improve the specifications in relation with the consumer expectation and with the market constraints.

The NIRS could be used for the authentication assessment of the Ardenne Ham produced in Belgium under PGI label. Some new analyses could be realised to reinforce the equation and to have representative results.