Influence of selenium species in aquaculture feeds on the selenium status of farmed rainbow trout
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Aroma profiles, such as those for wine, contain a wide variety of components at a range of concentrations. Detection and identification of important keynote compounds with a low odour threshold and compounds responsible for off-odours is a challenging prospect.

Gas chromatography coupled with time-of-flight mass spectrometry (GC-TOF MS) is an ideal choice for such analyses. Fast acquisition speeds, full-range spectra and low detection limits allow trace components, including adulterants, to be identified even within the most challenging of matrices. Novel data-mining software for the pairwise comparison of complex chromatograms is described, allowing such minor differences to be readily distinguished.

An additional complication in the analysis of aroma profiles is the differentiation of isomeric compounds, such as the monoterpenes. Select-eV, a revolutionary variable-energy electron ionisation technology, has been developed to solve this problem by enabling fast and simple switching between hard and soft electron ionisation with no inherent loss in sensitivity. Select-eV provides enhanced molecular ions and reduced fragmentation to aid speciation of challenging compounds.

This poster describes the combination of GC-TOFMS with Select-eV ionisation and novel data mining tools for rapid and reliable aroma profiling.

ThPS36-40 / Enhanced aroma profiling by GC-TOF MS with variable-energy electron ionisation
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ThPS36-43 / Influence of selenium species in aquaculture feeds on the selenium status of farmed rainbow trout
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Introduction
The important development of aquaculture in the last decades has induced a significant rise in the use of aquaculture feeds. Due to the finite availability of fishmeal and fish oil, these traditional major ingredients of fish diets can no longer meet the growing demand. There is therefore an increasing interest in the development of a sustainable aquaculture using feeds based on plant products[1]. In order to match requirements of fish, a supplementation of these alternative feeds is often necessary. This is particularly true for micronutrients such as selenium (Se) which is essential to several metabolic functions like cellular redox status regulation[2].

Assessment of the efficiency of such supplementation is most often performed by measuring total concentration of selenium, but it is nowadays known that a more accurate evaluation of the metabolism is obtained by processing speciation of selenium[3]. Consequently, the aim of this work was to evaluate the inputs of selenium speciation in fish nutrition studies and the added value in studying metabolic utilization of selenium depending on the chemical form of Se brought through supplementation in fish diets.

Methods
Two feeding trials were performed in an experimental fish farm comparing different feeds and supplementations, as well as farming conditions. Total selenium determination and selenium speciation were carried out in both feeds and fish. Total selenium was measured after acid digestion by using inductively coupled plasma mass spectrometry (ICP MS). Selenium speciation was performed by the use of several extractions followed by liquid chromatography coupled to ICP MS measurements.

Results
Quantification of total selenium in feeds and fish tissues brought out significant differences. Selenoamino acids determination was able to differentiate forms of dietary supplementation and allowed for comparison of the use of selenium. Selenium metabolites were found in different tissue and levels were compared.

Conclusions
Speciation of selenium in such feeding trials allows for accurate comparison of different supplementations through metabolism evaluation. In particular, selenocysteine determination reflects the actual use of selenium and its expression through selenoproteins.

Novel Aspect
Selenium speciation takes one step further the results of a feeding trial and clearly brings new informations in comparison to the classic determination of total selenium usually performed.

References