**Using Flavour Chemistry to Identify Biomarkers Behind the Sensory Perception of Irish Grass-fed Beef and Lamb**

For many consumers, the origin of the food they buy is of great importance. For instance, Irish beef and lamb is often seen as superior quality meat, as the animals are typically reared outdoors on a diet of predominately fresh grass. However, are Irish beef and lamb actually any different to meats produced elsewhere, from animals reared indoors in less sustainable production systems? And if so, can it be scientifically proven?

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Previous research in this area explored consumers’ perceptions of different meats. While these studies have shown that there are noticeable differences in texture, it’s much more difficult to identify differences in flavour – especially those potentially linked to the animal’s diet and origin. Scientists still do not fully understand dietary impacts on meat flavour, and what compounds are responsible.

Professor Kieran Kilcawley and his team at the Teagasc Agriculture and Food Development Authority in Ireland, in conjunction with University College Dublin, are investigating the ‘flavour chemistry’ of beef and lamb. Their aim is to determine whether there are fundamental differences in the chemical properties of meat due to the animal’s diet and origin.

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The solution proposed by Professor Kilcawley is to identify chemical compounds that contribute to the taste and aromas of meat. Some of these compounds may originate directly from the animal’s diet, while others might be indirectly linked to diet and the environment. By identifying these so-called ‘chemical biomarkers’, it might be possible to determine whether diets such as grass-fed impact the sensory characteristics of beef and lamb in a unique way compared to other feeds.

Previous studies have shown that chemical biomarkers found in milk can reveal information about the diet of the cow, and how these can influence the sensory characteristics of milk and dairy products, such as butter and cheese.

Currently, the project team is exploring a variety of analytical techniques to identify chemical biomarkers whose presence or abundance is influenced by diet, geographical location or farming practices. This project combines state-of-the-art flavour chemistry technology, including a variety chromatography and mass spectrometry techniques, with sensory analysis to identify such biomarkers in beef and lamb.

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Professor Kilcawley hopes to find the specific chemical biomarkers that are responsible for the unique flavours of Irish grass-fed beef and lamb. These biomarkers could be used to provide a ‘signature’ for an animal’s diet and geographic region, which would aid in marketing these products internationally. Such information may also aid ‘Protected Geographical Indication’ certification for these specific meat products, which would reassure consumers that they are purchasing high-quality meats, and that they are supporting sustainable, high-animal welfare farming practices.

**////Bio slide:**

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Summary of the project ‘Flavoromics of Grass-Fed Beef and Lamb’, <https://www.researchgate.net/project/Flavoromics-of-Grass-Fed-Beef-and-Lamb>