Identifying adulterants and contaminants

using a multi-method approach

Ensuring the safety and integrity of food is fundamental to food safety standards and retailer codes of practice

It can take more than one approach and require different high-end technologies to determine if food or drink has been adulterated or contaminated.

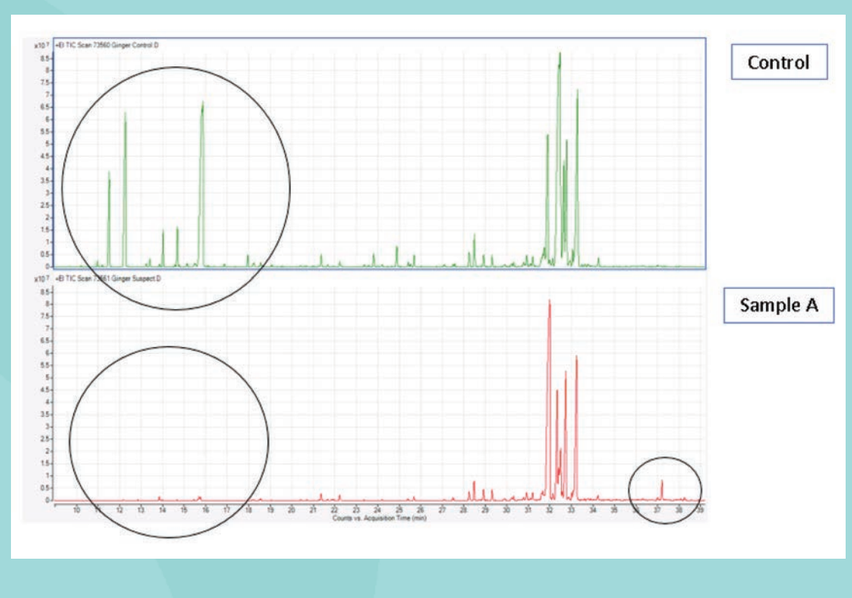
Multi-method approach to investigate a suspect spice powder

Spice sample A was suspected to be adulterated. A control sample was sourced for comparison purposes.

Method 1: Total volatile oil analysis

The volatile oil content of Sample A was almost three times lower than the control sample, which suggests an issue with the quality or authenticity of Sample A.

Method 2: GC/HRMS analysis (volatiles)



Sample A contained far lower levels of the most volatile compounds (large circles) due to their removal either through mistreatment or deliberate processes.

A peak of ar-turmerone was only detected in the Sample A (small circle). This compound is found in turmeric and other plants of the genus Curcuma, but typically not common to Sample A.

Method 3: LC/HRMS analysis (non-volatiles)

Curcumin was detected in Sample A at a level almost 100 times that in the control.

Curcumin is a major ingredient in turmeric and other plants of the genus Curcuma, which supports the GC/HRMS analysis.

Method 4: Next generation sequencing

Revealed that Sample A contained DNA sequences from ginger, maize and turmeric

Conclusion

We concluded that Sample A had been adulterated or contaminated as the presence of turmeric and other plant material was not consistent with the description of the spice powder.

Campden BRI, Station Road, Chipping Campden, Gloucestershire, UK, GL55 6LD Tel: +44(0)1386 842000 information@campdenbri.co.uk
www.campdenbri.co.uk