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# *Ion Mobility Spectrometry coupled to Gas Chromatography: a rapid tool to assess eggs freshness*

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## **ABSTRACT**

Egg products freshness is a crucial problem for the production of safe and high quality food. Ion Mobility Spectrometry (IMS) coupled to Gas Chromatography (GC), provides a rapid, sensitive, cost-effective tool for the detection of freshness issues. A chemometric model was created recording the volatile fingerprints of the different egg products batches, analyzed as fresh, then left at room temperature and daily controlled: 97% was correctly predicted by the model. Beside this, a selection of chemical marker compounds, coherently related with eggs thermal degradation processes, was also identified through the exploitation of Solid-Phase Micro Extraction Gas Chromatography (SPME-GC-MS) technique and associated to the parallel IMS volatile fingerprinting. The GC-IMS system was successfully challenged with the analysis of mixtures in which the predominant component was fresh egg product and different aged eggs were progressively added as adulterants, certifying the reliability of the method also for the detection of sharper fraudulent activities.

## **KEYWORDS**

Egg products; freshness; ion mobility spectrometry; gas chromatography

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