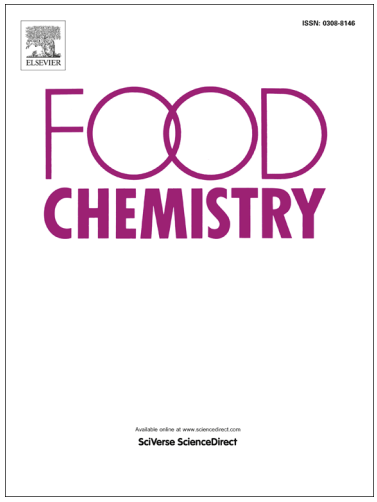

Ion Mobility Spectrometry coupled to Gas Chromatography: a rapid tool to assess eggs freshness

Daniele Cavanna, Sandro Zanardi, Chiara Dall'Asta, Michele Suman

PII: S0308-8146(18)31362-1
DOI: https://doi.org/10.1016/j.foodchem.2018.07.204
Reference: FOCH 23319

To appear in: *Food Chemistry*

Received Date: 4 April 2018
Revised Date: 22 July 2018
Accepted Date: 26 July 2018

Please cite this article as: Cavanna, D., Zanardi, S., Dall'Asta, C., Suman, M., Ion Mobility Spectrometry coupled to Gas Chromatography: a rapid tool to assess eggs freshness, *Food Chemistry* (2018), doi: https://doi.org/10.1016/j.foodchem.2018.07.204

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

*Daniele CAVANNA[a,b], Sandro ZANARDI[a], Chiara DALL'ASTA[b], Michele SUMAN[a]**

[a]Barilla Advanced Laboratory Research, Via Mantova 166 - 43122 Parma, Italy E-mails: daniele.cavanna@barilla.com; sandro.zanardi@barilla.com
[b]Department of Food and Drug, University of Parma, Parco Area delle Scienze 95/A- 43124 Parma,Italy E.mail: chiara.dallasta@unipr.it

*CORRESPONDING AUTHOR
Dr. Michele Suman, Ph.D
Barilla G. R. F.lli SpA, Food Research Labs
via Mantova 166
43122 Parma (Italy)
Phone: +39-0521- 262332
Email: michele.suman@barilla.com

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