

Gluten in flour and cookies

Gluten can cause allergic responses and even celiac disease if an intolerance occurs. The intolerance level is often depending on the gluten variety, which is relevant to the use of oats having low effect on celiac sufferers.

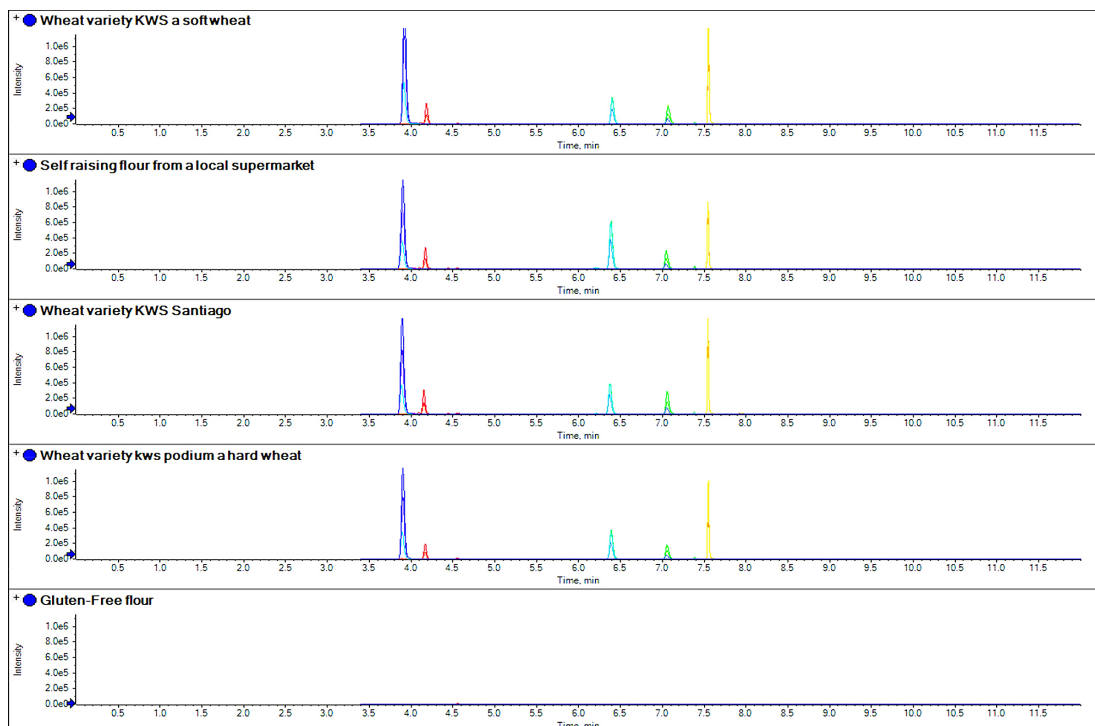
So far, ELISA based on R5 antibody detection is used. This assay can detect the presence of barley, rye and wheat, but cannot differentiate between them. It is not sensitive to oats. Further, it has the disadvantage of giving false positive or negative results due to either unspecific binding to the protein region or changes in the protein structure by processing.

MicroLC-MS/MS using YMC-Triart C18 capillary columns can not only detect gluten markers in processed food, but it can also distinguish between varieties.

Here, five different flour samples including a gluten-free and a supermarket self raising flour were analysed for wheat peptide markers.



In all the flours except the gluten-free one, wheat peptide markers can be found.



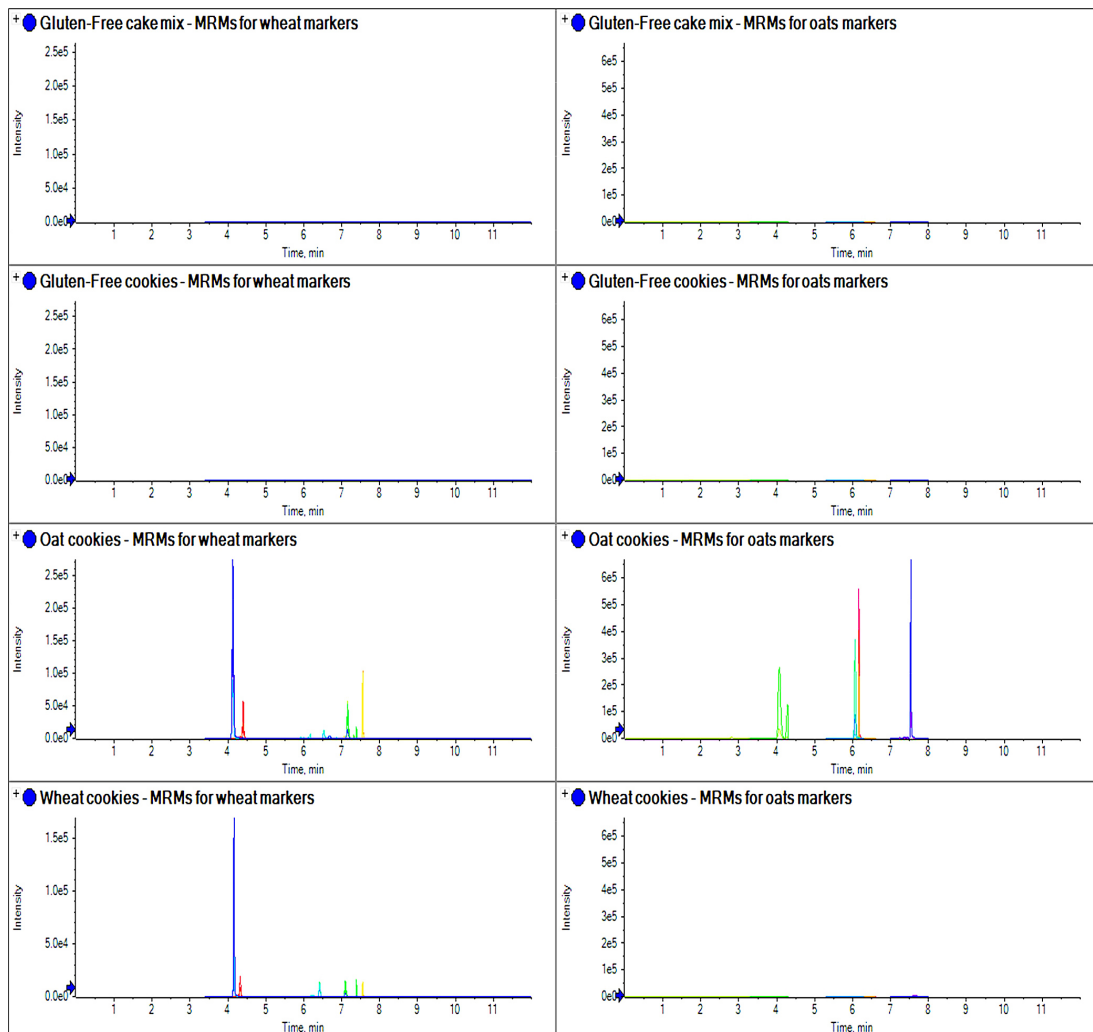
The comparison of separate extracts of several samples of wheat obtained from single variety grain samples, as well as a sample of gluten-free flour and the self raising flour obtained from a local supermarket.

Literature:

Heick, J.; Fischer, M.; Pöpping, B. First screening method for the simultaneous detection of seven allergens by liquid chromatography mass spectrometry. *J. Chromatogr. A* 2011, 1218, 938–943

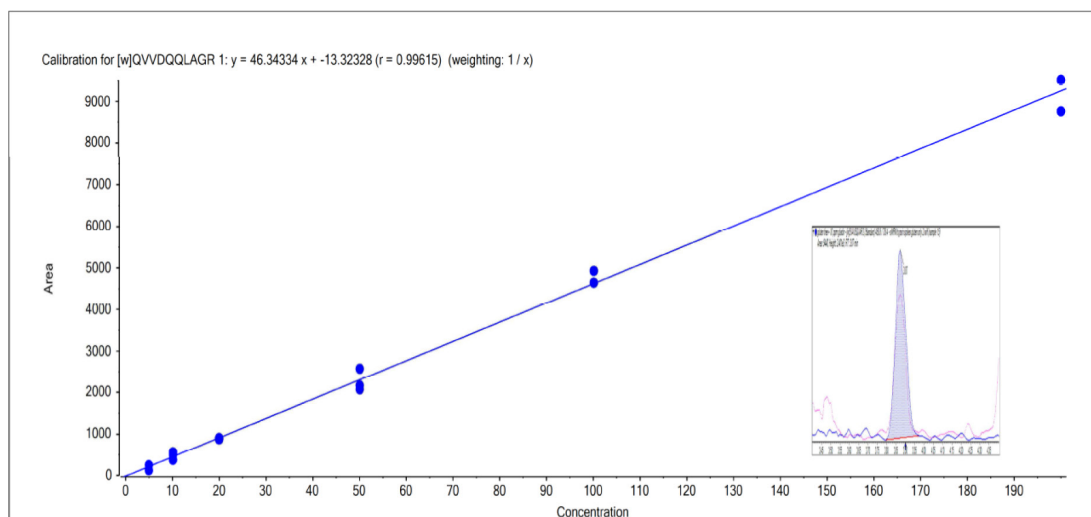
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With the help of microLC-MS/MS it is further possible to detect markers in processed food and also distinguish between varieties. In the oat cookies, wheat and oats markers were detected while in the wheat cookies only wheat peptide markers were found. The gluten-free products were actually gluten free, as no markers were detectable.



Column:	YMC-Triart C18, 12 nm, 3 µm, 100 x 0.5 mm ID, 1/32" OD						
Part No.:	TA12S03-10J0RU						
LC-System:	Eksigent ekspert MicroLC 200						
MS/MS-System:	AB SCIEX 5500 QTRAP, ESI						
Temperature:	40°C						
Flow:	25 µl/min (MicroLC)						
Injection:	10 µl						
Eluent:	A: H ₂ O + 0.1% FAC B: acetonitrile + 0.1% FAC						
Gradient:	Time	0 – 1 min	6 min	8 min	9 min	9.2 min	12 min
	% B	5	25	95	95	5	5

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The calibration line obtained from the spiking of gliadin, a specific wheat protein, into gluten-free wheat from the range of 5–200 ppm for wheat peptide 3. Inlaid in the calibration line is the chromatogram for the 10 ppm spike of gliadin into gluten-free flour.

By courtesy of: Stephen Lock, AB SCIEX, Warrington (UK)