

## PRODUCTION AND OCCURRENCE – L13

**Correlation of ergot alkaloids and sclerotia in German rye and wheat and recommendation to simplify analyses**

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Fungi of the genus *Claviceps* produce sclerotia instead of a grain kernel which may contain a wide range of bioactive compounds, e.g. ergot alkaloids. The scientific opinion published by the EFSA in 2012 advised to determine the contents of the most important ergot alkaloids amongst others in cereals [1]. The aim of the investigation was first to examine the levels and types of ergot alkaloids in German rye and wheat samples of harvests 2010 and 2011 and second to correlate them to the overall ergot alkaloid and sclerotia content, respectively.

The rye and wheat samples were collected during the German official harvest survey called “Besondere Ernte- und Qualitätsermittlung BEE”. About 500 rye and nearly 900 wheat samples of the harvests 2010 and 2011 were analyzed. After grinding (500µm) the samples were screened for ergot alkaloids with an LC-MS/MS-method [2]. Positively screened samples were further analyzed according to the validated method from Müller et al. [3].

**Results:** There were fewer samples tested positively for ergot alkaloid in 2011, but the total ergot alkaloid contents were higher compared to 2010. Comparison of the two years of harvesting shows various significant differences between the German states in the statistical evaluation. Analyses do not show any significant differences between the diverse rye and wheat varieties neither in the harvest year 2010 nor in 2011.

We did not find any correlation between the total ergot alkaloid content and the sclerotia content in rye samples. In contrast various correlations arose between the total ergot alkaloid content and the contents of different ergot alkaloids, but it was not possible to specify lead substances. Good correlations also occurred between the values of ergotamine, ergocornine, ergocryptine and ergocristine and their 8-(S)-diastereomers in rye and wheat samples in both years of harvest letting us conclude, that it might be possible to calculate the -inine form from the corresponding -ine content. Results of the calculation method will be discussed as well as advantages and limitations.

### References

[1] European Food Safety Authority, 2012. Scientific Opinion on Ergot alkaloids in food and feed, EFSA Journal 10 (7), 2798

[2] M.C. Spanjer, P. M. Rensen, J. M. Scholten, 2008. LC-MS/MS multi-method for mycotoxins after single extraction with validation data for peanut, pistachio, wheat, maize, cornflakes, raisins and figs. Food Additives and Contaminants Part A – Chemistry Analysis Control Exposure & Risk Assessment 25 (4), 472-489

[3] C. Müller, S. Kemmlin, H. Klaffke, W. Krauthause, A. Preiß-Weigert, R. Wittkowski, 2009. A basic tool for risk assessment: A new method for the analysis of ergot alkaloids in rye and selected rye products. Molecular Nutrition and Food Research 53, 500-507.