Rapid Biosensor for the Detection of Mycotoxin in Wheat
The MYCOHUNT system provides a novel method to detect Deoxynivalenol contamination

Did you know, that most mycotoxins hazardously contaminate crops and consequently animal feeds and food products? They cause significant **economic losses** associated with their **impact on animal and human health, animal productivity and domestic and international trade.** Toxic contamination is responsible for an average of 15% yearly crop loss, but for individual crops, fungal losses can reach a 100%. In 1998, direct and indirect losses through a single wheat epidemic in Hungary alone were estimated to be up to a 100 million Euros. The European Union continuously lowers acceptable contaminant limits; therefore additional costs associated with mycotoxins include prevention, sampling, mitigation and research. While analytical methods - compliant with EU regulations - are available, representative sampling remains to be the weakest link of the process.

The MycoHunt project has two main goals to contribute to solving these problems: on the one hand it has developed a new sampling technique guaranteeing a 90% bulk transparency, on the other hand it provides a biosensor technology for the detection of deoxynivalenol (DON), which is a frequently occurring, secondary metabolite produced by a number of Fusarium species, presenting a major threat to agriculture in Europe.

Fusarium forms on blooming wheat, therefore its presence can be detected during harvest or in storage. Since, DON levels in airborne crop dust correlate to actual grain contamination, reliable measurements can literally be 'pulled out' of air during loading procedures. Connected to transportation pipes, or purifying units of the wheat processing facility, the MycoHunt system collects and prepares an extract from the dust of each lot and forwards it to its bio-sensor containing specially developed DON detecting antibodies. Exact readouts will then be easily accessible through a user friendly control and monitoring unit. Instead of estimates based on a limited number of randomly taken, incremental samples, MycoHunt fully scans each and every wheat lot for contaminants in its entirety, guaranteeing a 90% bulk transparency.

The MYCOHUNT system incorporates a wheat dust sampling unit and an immunosensor unit where DON infection is detected by the application of DON-selective antibodies. The system is equipped with a user-friendly computer based control and monitoring unit. The system was fully designed based on the specific needs of grain producers, traders and other relevant players of the sector.

With the application of the MYCOHUNT DON detection technology data will be continuously available, with only a single, one-time investment. As an easy to use, environmentally friendly tool, MycoHunt will give reliable and truly representative, immediate on-site test results and provide a significant competitive advantage for wheat growers and traders. In the future, the MYCOHUNT system can be adapted for the detection of other mycotoxins in wheat or in other crop types such as maize.

Members of the Consortium: Project Coordinator: MFKK Invention And Research Center Services Company Ltd. (HU)

Project Partners: Hungarian Grain and Feed Association (HU) | Greek Associations of Traders and Exporters of Cereal By-products and Feeds (GR) | Confederacion Espanola de Fabricantes de Alimentos Compuestos para Animales (ES) | Asociación Española de la Industria de panadería, bollería y pastelería - ASEMAC (ES) | Synagra (BE) | Impuls (PO) | OSV (IT) | Dunagabona (HU) | Dimitriaki (GR) | Hogeschool Gent (BE) | Universiteit Gent (BE) | Lunds Universitet (SE) | Union of Agricultural Cooperatives of Rethymo (GR) | Evaluation technologique,Ingénierie et Applications (FR) | Veluwe Granen BV. (NL) | Electrochemical Sensor and Technology Ltd (UK)