

5<sup>th</sup> World Congress on  
**MICROBIAL BIOTECHNOLOGY & VACCINE DESIGN**  
September 17-18, 2018 Lisbon, Portugal

**Escape of genetically modified microorganisms in the food and feed chain: Strategy to support enforcement laboratories**

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In the food/feed industry, Genetically Modified Microorganisms (GMM) are commonly used to produce food enzymes, food additives, feed additives and food flavorings. For instance, around 50% of food enzyme producing microorganisms from the 304 submitted dossiers to the European Food Safety Authority (EFSA) for authorization are GMM. The use of GMM presents several advantages such as an increase of the yield, an external secretion of the product using signal peptides, a production not constitutive of products and a safer strain in inhibiting the possible toxin production. In the European Union, the use of GMM has to respect the following regulations: EC/1332/2008 (food enzymes), EC/1333/2008 (food additives), EC/1831/2003 (feed additives) and EC/1334/2008 (food flavorings). These regulations required the absence in the final product of viable production GMM and associated recombinant DNA. Given that manufacturers are responsible for the quality control of their products, it is not mandatory to provide GMM-specific detection methods to enforcement laboratories. However, accidental escapes of unauthorized GMM have already been reported in 2014 (RASFF 2014.1249) and 2017 (RASFF 2017.1544). Therefore, there is a crucial need to develop a strategy for enforcement laboratories to control the food/feed chain. This strategy includes the DNA extraction from GMM earlier isolated from the food/feed matrix to subsequently perform a whole-genome-sequencing. Based on bioinformatics analysis, sequences of interest are selected to develop GMM-specific detection methods that could be then directly applied on the food/feed matrices. However, the implementation of this strategy could be challenging, especially with the sequencing of plasmids. This strategy will be tested on food enzyme preparations in the frame of the SPECENZYM project.

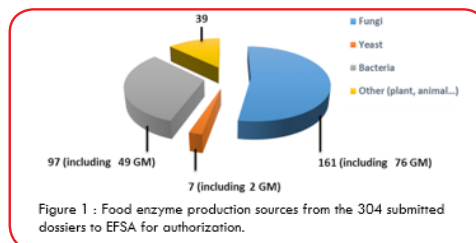


Figure 1 : Food enzyme production sources from the 304 submitted dossiers to EFSA for authorization.

**Biography**

Marie-Alice Fraiture is currently working as a scientific collaborator in transversal and applied genomics in Sciensano. She completed her PhD from Ghent University, Belgium and have a work experience in the Plant Sciences Division at the University of Nottingham (Great-Britain) in the laboratory of Prof. Malcolm Bennett. She has an expertise is in management and in collaboration of national and international projects, in detection of GMO in the food and feed chain, in detection of arboviruses in human samples, in detection of GMO and pathogens in case of accidental/deliberate escapes and in development of tools (such as high-throughput technologies) for applied genomics.

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