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Inactivation of Cereal Mycotoxines to Gain Income Security Over Biogas Production

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Abstract

As the Food and Agricultural Organisation of the United Nations (FAO) classified 25 % of the world's crops contaminated with Fusarium and its intermediate catabolic products (FAOstat, 2005), cereal production is facing severe yield losses through mould infections. One of the dominating toxins produced by an indigenous population of moulds is Deoxynivalenol (DON). It is know to provoke harmful anorexia and emesis caused by short- or long-term administration to living beings. This forms a hazardous situation for nutrition safety. Due to the known negative impacts of toxins produced, the most feasible, environmentally compatible and economical option has to be found to detach contaminates off the human food chain. A substitutional generation of income is imperative, to secure farmers income. Current research at Hohenheim's State Institute of Farm Machinery and Farm Structures focus on a potential deactivation of mycotoxines by biogas fermentation processes. A set of novel routines have been run in test series. The parameter variation of temperature, infection rate and time of exposure in a bench-scale set-up was used to evaluate chances of a toxine deactivation and a simultaneous production of biogas. First findings of the running cooperative project under foundation of the German FNR prove the inactivation potential of biogas fermentation to either *Fusarium* (CFU), DON or DOM^{-1}. Retention times of 0.5 days showed no evidence of Fusarium spores after extraction and examination. A simultaneous and suitable production of biogas underlines the realistic economic potential of this approach in the course of practical retention times and conditions of a fermentation process. Thus food security is potential to be gained over income production.

Keywords: Anaerobic Fermentation, Biogas, Energy Production, Fusarium, Inactivation, Mycotoxine

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