Microbiological Investigations of Mushrooms: Health Hazards due to Improper Storage?

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We investigated the growth of mould fungus on button mushrooms under different storage conditions. Interestingly, we found that improper storage of button mushrooms lead to increasing rates of the carcinogenic myotoxin aflatoxin. The concentration of aflatoxin was measured with a quick test after two days of storage at different temperatures. To our surprise the concentration of aflatoxin exceeded the rates above allowed EU levels by far. An aflatoxin concentration of up to 20 ppb was measured when mushrooms were stored in Tupperware, which is four times higher, than the recommended EU limit. Additionally, the levels of different mould fungus and yeast were determined as well as we identified the mould fungus species Penicillium, Cladosporium, Fusarium, Paecilomyces and Mucor. Summarizing, we observed that storage of mushrooms in a refrigerator resulted in less mould contamination. Interestingly, we did not observe a correlation between the amount of moulds and the aflatoxin concentration. In order to automatically quantify the amount of microorganism colonies we developed an algorithm. An evaluation of the algorithm showed a good correlation of automatically and manually counted colonies, which will make the counting process considerably less time consuming in future.

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