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学 位 論 文 要 旨
Dissertation Abstract

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学位論文題目：
Title of Dissertation
Studies on the occurrence of aflatoxin M_1 in powdered milk and ochratoxins in coffee products, which were commercially available in Thailand
(タイ国内で市販されていた粉ミルクのアフラトキシンM_1及びコーヒー製品のオクラトキシン類の汚染に関する研究)

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Dissertation Abstract

Occurrence of mycotoxins, which are secondary toxic metabolites produced by fungi, in foods and feeds are health risks to humans and animals. Thailand is located in tropical regions where is an area suitable for growth of fungi. Possibility contaminated with mycotoxins in the Thai farm products is high. However, there is a few data on mycotoxins in commercial foods in Thailand. So that, to make clear the risks of mycotoxins in Thai commercial foods, immunoaffinity column-HPLC methods for aflatoxin M_1 (AFM_1) in powdered milk and ochratoxin A (OTA) and B (OTB) in coffee products were developed and commercially available 79 powdered milks, 30 roasted and 38 instant coffees in Thailand, and 32 Vietnamese roasted coffees, which were for reference, were collected, and were analyzed.

The results of AFM_1 in 79 Thai powdered milks were that 12 samples (15%) were contaminated with 0.005 to 0.135 ng/mL of AFM_1 (the positive average; 0.024 ng/mL and the overall average; 0.004 ng/mL) in reconstituted powdered milk. Two samples (0.066 and 0.135 ng/mL) exceeded the limit of E.U. (0.05 ng/mL), but none exceeded the limit of Codex (0.5 ng/mL). The liver cancer risk of AFM_1 in these powdered milks was sufficiently low. However, powdered milks made in Thailand contained more AFM_1 than imported powdered milks.

In total, the 59 (59%) of the 100 commercial coffee samples from Vietnam and Thailand were contaminated with OTA or B, and the OTA values in these coffees were lower than the regulatory limit of E.U. (5 μg/kg in roasted, 10 μg/kg in instant coffee). Arabica coffees are cultivated in the mountains at high altitude in the north Thailand as Royal project. It was good news that only 4 (13.3%) of 30 samples in Thai Arabica roasted coffee were contaminated with OTA with an average of 0.66 μg/kg (the overall average; 0.17 μg/kg). The concentration of OTA was lower than previous reports in other countries. 73.7% of Thai instant and 81.3% of Vietnamese roasted coffee were contaminated with OTA. The overall averages were 2.19 μg/kg in Thai instant and 0.75 μg/kg in Vietnamese roasted coffee. The concentration of OTA in these coffees was a relatively high. However, as the results of risk evaluation, the risk of OTA in commercial Thai and Vietnamese coffees was acceptably low. This report was the first on OTA and B in Thai instant coffee.

From my studies, the risks of AFM_1 in commercial powdered milk and OTA in coffee product were low in Thailand. Also, OTA in Vietnamese Robusta coffee product was acceptably low. In order to reduce AFM_1 in powdered milks made in Thailand, it is necessary to lower regulation for Thai dairy cows to stricter regulation level, and then to enhance the education of the farmers to enforce cultivation and preservation management of the crops for cow feeds at the same time.