（別紙）研究成果の概要（英文）

Title of research project	Study on the risk assessment for modified fumonisins
Research project number	1808
Research period	FY 2018 – 2019
Name of principal research investigator (PI)	Tomoya Yoshinari

Abstract/Summary

※ここに研究の概要を英文で記載する。（研究の目的、方法、結果及び考察を一連の文章で網羅的に記載すること。）

Fumonisins, which are secondary metabolites produced by some *Fusarium* species, are detected mainly in corn and corn-based products. Recently, the presence of modified forms of fumonisins in fumonisin-contaminated food products has been reported. In order to evaluate the health risk of modified forms of fumonisins to the Japanese population, we analyzed modified forms of fumonisins in corn-based products retailed in Japan. The modified and free forms of fumonisins in food samples were hydrolyzed by alkaline treatment. The resulting hydrolyzed fumonisins were quantified by LC-MS/MS, and total fumonisins (sum of modified and free forms) was calculated. A total of 206 samples of corn-based products were analyzed over two years. The relative ratios of mean total fumonisins to mean free fumonisins in the cornflakes, corn snacks, corn flour and corn soup samples were 4.7, 2.8, 2.1 and 1.2, respectively. The average daily intake of fumonisins from cornflakes and corn snacks by the Japanese population was estimated at 1.1 to 3.9 ng/kg body weight/day when the results of free fumonisins were used for the estimate, but when the results of total fumonisins were used, average daily intake increased about threefold and was estimated at 3.3 to 12.5 ng/kg body weigh/day. In order to clarify the property of modified fumonisins in corn snacks and cornflakes, analytical methods to determine fumonisin B_1-glucoside, hydrolyzed fumonisins and matrix-associated fumonisins were developed. Hydrolyzed fumonisins and fumonisin B1-glucoside were detected in corn snacks and cornflakes, but their contamination levels were lower than free fumonisins. It was found that matrix-associated fumonisins in corn snacks and cornflakes eluted as free fumonisins and might exert toxicity in vivo. These results indicate that a risk assessment of fumonisins, including the modified forms of fumonisins, is necessary in order to evaluate the true risk of fumonisins to Japanese people.

does not imply any opinion on the part of FSCJ.

1. List of papers published on the basis of this research

① Under submission

Title : Analysis of Modified Forms of Fumonisins in Corn-based Products Retailed in Japan by an Alkaline Hydrolysis Method

Journal : Food Hygiene and Safety Science

2. List of presentations based on this research

① Y. Koike et al. “Taxonomic study for productivity of fumonisins by *Fusarium* species” The 82nd meeting of Japanese Society of Mycotoxicology, poster presentation (August 24th, 2018）

② T. Yoshinari et al. “Study on the risk assessment for modified fumonisins” The 114th meeting of Japanese Society of Food Hygiene and Safety, oral presentation (November 15th, 2018)

③ Y. Koike et al. “Study on modified fumonisins in corn-based foods by an alkaline hydrolysis method” The 84th meeting of Japanese Society of Mycotoxicology, oral presentation（August 23rd, 2019）

④ T. Yoshinari et al. “Study on the analytical method for determination of modefied fumonisins in corn-based foods” The 56th national conference of the technology of hygienic chemistry, poster presentation (December, 6th, 2019)

3. The number and summary of patents and patent applications

Nothing

4. Others (awards, press releases, software and database construction)

Nothing

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