Risk Assessment Report
Deoxynivalenol and Nivalenol (Mycotoxin)

Food Safety Commission of Japan (FSCJ)
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Executive summary

The Food Safety Commission Japan (FSCJ) conducted a self tasking risk assessment on deoxynivalenol (DON) and nivalenol (NIV).

The risk assessment was based on scientific data, including in vivo kinetics, acute toxicity, sub-acute toxicity, chronic toxicity, carcinogenicity, reproductive/developmental toxicity, genotoxicity, and immunotoxicity.

Major critical effects of DON derived from animal toxicity studies included emesis, decreased feed intake, suppressed body weight gain, and influence on the immune system. At higher dose levels than those at which the above effects were shown, fetal toxicity and teratogenicity were induced. While weak chromosomal damage was observed in several genotoxicity studies, DON showed no carcinogenic effects on mice in a two-year chronic toxicity study. Based on these results, DON was considered unlikely to have any significant genotoxic activity in vivo. The International Agency for Research on Cancer (IARC) has classified toxins derived from *Fusarium* species including DON as Group 3, i.e. not classifiable as to its carcinogenicity to humans. The FSCJ has, therefore, concluded that the currently available toxicological data have not sufficiently proved DON to be genotoxic or carcinogenic, and that it is appropriate to establish a Tolerable Daily Intake (TDI) for DON.

After reviewing various toxicity studies, the NOAEL was set at 0.1 mg DON/kg bw/day based on the dose causing suppression of weight gain observed in the two-year chronic toxicity study in mice. By applying an uncertainty factor (UF) of 100 (10 for inter-species differences and 10 for inter-individual variations), the TDI for DON was set at 1 μg/kg bw/day.

Major critical effects of NIV obtained from animal toxicity studies included decreased feed consumption, suppressed body weight gain, and impact on the immune system. Embryotoxicity was observed at doses greater than the dose producing such effects. Although chromosomal damage was reported in some genotoxicity studies, the available data were considered to be inadequate to assess the genotoxic properties of NIV. Since NIV showed no carcinogenic effects in a two-year chronic toxicity study in mice, and the IARC has classified toxins produced by *Fusarium* species including NIV as Group 3, the FSCJ concluded that a TDI can be set for NIV.

Various toxicity studies have been reviewed, and the LOAEL was set at 0.4 mg NIV/kg bw/day based on the decreased WBC counts observed in sub-acute toxicity study in rats with 90-day oral administration. By applying a UF of 1,000 (10 for inter-species differences, 10 for inter-individual variations, and 10 for the adopted LOAEL value derived from sub-acute toxicity study), the TDI for NIV was set at 0.4 μg/kg bw/day.

Establisment of a group TDI for DON and NIV was considered difficult at present, due to the limited number of studies and varied test results on the combined effects of the two toxins, and the fact that the mechanism of action of each toxin has not been fully clarified.

Estimates of exposure to DON and NIV in Japan were considered below the established TDIs (1 μg/kg bw/day for DON; and 0.4 μg/kg bw/day for NIV). Therefore, dietary intake of DON and NIV was considered unlikely to cause adverse effects on health in the general population of Japan.