This is provisional English translation of an excerpt from the original full report.

Risk Assessment Report

1-Methylcyclopropene (2nd edition)

(Pesticides)

Food Safety Commission of Japan (FSCJ)
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ABSTRACT

FSCJ conducted the risk assessment of a plant growth regulator, 1-methylcyclopropene (CAS No. 3100-04-7, referred hereafter to as 1-MCP), based on various documents. In addition to the data used for the 1st version data on fate in animals (rats), residue in crops (plum and banana), the data of 90-day subacute toxicity by feeding (rats and dogs) and two-generation reproductive toxicity (rats) by feeding were newly available in the current assessment.

The data used in the assessment include fate in animals (rats), fate in plants (apple), fate in water, residues in crops, acute toxicity (rats), subacute toxicity (rats and dogs), two-generation reproduction toxicity (rats), developmental toxicity (rats), and genotoxicity.

Major adverse effects of 1-MCP observed are suppressed body weight, decreased number of RBC, and increased hemosiderosis in the liver and spleen. 1-MCP showed no reproductive toxicity, teratogenicity and genotoxicity.
Based on the results from various studies, FSCJ identified 1-MCP (parent compound only) as the relevant substance for the residue definition for dietary risk assessment in agricultural products.

Toxicological evaluation of pesticide residues to human health has been conducted using toxicity data by oral administration of relevant items generally. However, 1-MCP is a gaseous substance in its physicochemical property, and oral administration of technical grade of 1-MCP is difficult. Therefore, the present assessment of 1-MCP was carried out with inhalation study and/or oral toxicity study of 1-MCP/α-cyclodextrin complex.

FSCJ recognized that the data for dietary toxicological assessment are insufficient because the lack of data of both long-term toxicity and of developmental toxicity in rodents by oral administration. As the results, FSCJ considered it infeasible to specify the ADI and ARfD precisely based on data of oral administration.

Nonetheless, FSCJ noted that the residue levels of 1-MCH in crops are a trace amount. FSCJ considers that dietary risk of 1-MCP to human health is substantially low as long as it is used appropriately in accordance with the usage described in the application for pesticide registration.

Table 1. *Levels relevant to toxicological evaluation of 1-MCP*

Species	Study	Dose (mg/kg bw/day)	NOAEL (mg/kg bw/day)	LOAEL (mg/kg bw/day)	Critical endpoints[1)]
Rat	90-day subacute toxicity study (feeding)	0 (basal diet) 0 (α-cyclodextrin) 1 500, 7 500, 20 000 ppm M: 0, 0, 4.6, 22.4, 60.6 F: 0, 0, 5.3, 26.5, 71.1	M: 477 [22.4] F: 564 [26.5]	M: 1 290 [60.6] F: 1 510 [71.1]	M/F: Hemosiderosis in red pulp of spleen
	90-day subacute toxicity study (inhalation)	0, 20, 100, 1 000 ppm M: 0.95, 4.05, 40.0 F: 1.58, 6.91, 66.8	M: 0.95 F: 1.58	M: 4.05 F: 6.91	M/F: Increased hemosiderosis in red pulp of spleen
	Two-generation reproductive toxicity study (feeding)	0 (basal diet) 0 (α-cyclodextrin) 1 500, 7 500, 20 000 ppm PM: 0, 0, 90, 456, 1 190 PF: 0, 0, 105, 540, 1 390 F_1M: 0, 0, 110, 547, 1 440 F_1F: 0, 0, 116, 567, 1 540	Parent: PM: 90 [4.1] PF: 105 [4.8] F_1M: 110 [5.0] F_1F: 116 [5.3] Offspring: F_1M: 1 190 [54.0] F_1F: 1 390 [63.1] F_2M: 1 440 [65.4] F_2F: 1 540 [69.9]	Parent: PM: 456 [20.7] PF: 540 [24.5] F_1M: 547 [24.8] F_1F: 567 [25.7] Offspring: F_1M: - F_1F: - F_2M: - F_2F: -	Parent: M/F: Suppressed body weight, decreased feed intake Offspring: M/F: No toxicity
	Developmental toxicity study (inhalation)	0, 100, 300, 1 000 ppm 0, 5.72, 17.6, 54.9	Dams: 5.72 Fetuses: 54.9	Dams: 17.6 Fetuses: -	Dams: Darkened spleen Fetuses: No toxicity (No teratogenicity)
Dog	90-day subacute toxicity study (feeding)	0 (basal diet) 0 (α-cyclodextrin) 2 500, 7 500, 20 000 ppm M: 0, 0, 95, 271, 771 F: 0, 0, 91, 270, 685	M: 95 [4.3] F: 91 [4.1]	M: 271 [12.3] F: 270 [12.3]	M/F: Brown pigmentation in hepatocytes

Note: Amount of specimen intake with NOAEL and LOAEL at inhalation exposure was obtained by converting a mean of the concentration measured throughout the exposure period using mean respiration volume (0.2 L/min, assuming that it follows the equation of state of ideal gas at 20℃ under a pressure of 1 atm) and mean body weight. As a transtracheal absorption rate, 10% was assigned estimating from tissue residual ratio and excretion rate in urine and feces determined in a fate in animals study.

[1)], The adverse effect observed at LOAEL; -, LOAEL could not be specified; [ ], Active substance conversion value