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

Risk Assessment Report
Toluene (Beverages)

Food Safety Commission of Japan (FSCJ)
November 2008

Executive summary

The Food Safety Commission of Japan (FSCJ) conducted a risk assessment of toluene as a chemical substance pertaining to the revision of the standards and criteria for beverages.
The test results used in the assessment are related to acute toxicity (mice, rabbits and guinea pigs), subacute toxicity (mice and rats), chronic toxicity and carcinogenicity (mice and rats), reproductive and developmental toxicity (mice and rats), genotoxicity, etc.

As a health effect on humans, toluene has been observed to impair the central nervous system, but all reported cases are based on the inhalation exposure to highly-concentrated doses. There are no reports of the effects on humans based on oral exposure. On the other hand, there are many reports of the effects on the central nervous system in test animals, suggesting that neurotoxicity is the most typical toxicity of toluene. In fact a clear genotoxicity has not been observed, and it has not been recognized as carcinogenic. The IARC classifies it in Group 3, evaluating it as not classifiable as to its carcinogenicity to humans. From the above, toluene is considered to have no genotoxicity or carcinogenicity. Hence FSCJ judged it appropriate to establish Tolerable Daily Intake (TDI) with regard to non-carcinogenicity, thus evaluated its health effect based on animal testing.

In 13-week (5 days/week) rat oral gavage study, no histopathological changes were observed in the group administered at a dose of 625 mg/kg body weight/day, but in the 1,250 and 2,500 mg/kg body weight/day groups, the neuropathological effect on brain was seen, including necrosis of nerve cells in dentate fascia of the hippocampus and cornus ammonis. Because of this, 446 mg/kg body weight/day, which represents the average daily dose of 625/mg/kg body weight/day group, was adopted as a no-observed-adverse-effect-level (NOAEL). This NOAEL was divided by an uncertainty factor of 3,000, which consists of a species difference of 10, an individual difference of 10, subacute toxicity of 10, and toxicity severity (neurotoxicity accompanying histopathological changes) of 3. Thus FSCJ established TDI for toluene as 149 μg/kg body weight/day.