

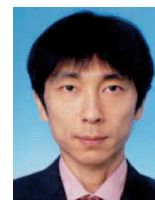
● Research theme

Safety of the rare sugar D-psicose

(Keywords: D-Psicose, Safety)

● Research representative

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Outline of technology

The safety of D-psicose must be confirmed before it can be used as a food material.

In the Intelligent Cluster Formation Project, its safety testing was entrusted to Mitsubishi Chemical Safety Institute, Ltd. Five items were tested, and (1) good decomposability on the “simplified decomposition test”, (2) no mutagenicity on the “mutagenicity test using microorganisms”, (3) acute toxicity of D-psicose being higher than an LD₅₀ of 2,000 mg/kg on the “single dose oral toxicity test using rats”, (4) very mild irritativity against the eye on the “primary eye irritation test using rabbits”, and (5) no irritativity to the skin on the “primary skin irritation test using rabbits” have been reported.

Also, on the acute toxicity test (rats), the LD₅₀ of D-psicose was 16.3 g/kg, which is classified as average in toxicity categories and is similar to that of sucralose already used as a food additive (used as a sweetener in diet coke). On chronic toxicity tests (6–18 months, rats), no marked difference was noted in the results of general hematology or serum chemistry tests compared with the control group, and the values were in the normal ranges.

Furthermore, when the D-psicose contents of various foods were measured to evaluate the routine D-psicose intake level, its contents were particularly high in sweets and seasonings, indicating that we are regularly taking D-psicose from various food materials (Figure).

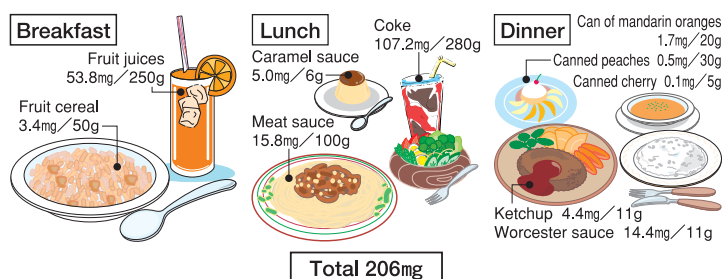


Figure: Daily D-psicose intake from various foods

Sales points

- The safety of D-psicose, mass production of which has become possible, is being established.

Expected application fields and products

- | | |
|-------------------------------------|-------------------------|
| (1) Foods in general | (4) Sweeteners |
| (2) Food additives | (5) Foods and beverages |
| (3) Foods for specified health uses | (6) Cosmetics |

Comparison with existing products

	Advantages		Disadvantages	
	Calorie	Responses of blood sugar level	Safety	Cost
D-Psicose	Low	Suppressed	High	A few thousand yen/kg
Sucrose	High	Marked	Very high	200 yen/kg

References, patents, etc.

References: Matsuo, T. *et al.*: Effects of oral acute administration and subchronic feeding of several levels of D-psicose in rats. *J. Nutr. Sci. Vitaminol.*, **48**, 512-516 (2002).

Oshima, H. *et al.*: Psicose contents in various food products and its origin. *Food Sci. Technol. Res.*, **12**, 137-143 (2006).

Other matters to note

(Developer's comment)

D-Psicose was shown experimentally (in rats and humans) to suppress increases in the blood sugar level, and inhibition of digestive enzyme activities and promotion of glycogen synthesis have been suggested as mechanisms of this effect. Therefore, D-psicose may be useful as a functional food.

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