



## Simultaneous determination of sugars in Japanese fermented food, miso.

Miso is a traditional Japanese food, and it is fermented food made from rice, wheat, soybeans, and salt as raw materials.

Miso is classified as rice miso, wheat miso, bean miso, and mixed miso in Japan<sup>1)</sup>.

It is also known that there is a variety according to regional characteristics even in the same type<sup>2)</sup>.

We analyzed five kinds of sugars (fructose, glucose, sucrose, maltose, and lactose) for commercial miso. The samples after pretreatment are separated by hydrophilic interaction chromatography (HILIC), and then detected by RI detector.

Different profiles of the sugar were obtained according to the kind of the miso.



High performance Liquid Chromatograph  
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## Chromatogram and sugar amounts of commercial miso

### Analytical conditions

Mobile Phase : H<sub>2</sub>O / CH<sub>3</sub>CN = 25 / 75 ( v/v )  
Column : Asahipak NH2P-4E, 4.6 X 250 mm  
Column Temperature : 40 °C  
Flow rate : 1.0 mL/min  
Injection vol. : 20 μL  
Detection : RI (Refractive Index)

### Sample pretreatment

Weighing 1.0 g of miso  
↓  
Dissolve into 10 mL with pure water  
↓  
Extract for 30 min. with ultrasonic bath  
↓  
Centrifuge at 3000 min<sup>-1</sup> for 30 min.  
↓  
Take the supernatant 1 mL, add 5 % TCA 1 mL  
↓  
Centrifuge at 15000 min<sup>-1</sup> for 15 min.  
↓  
Filter the supernatant with 0.45 μm membrane filter

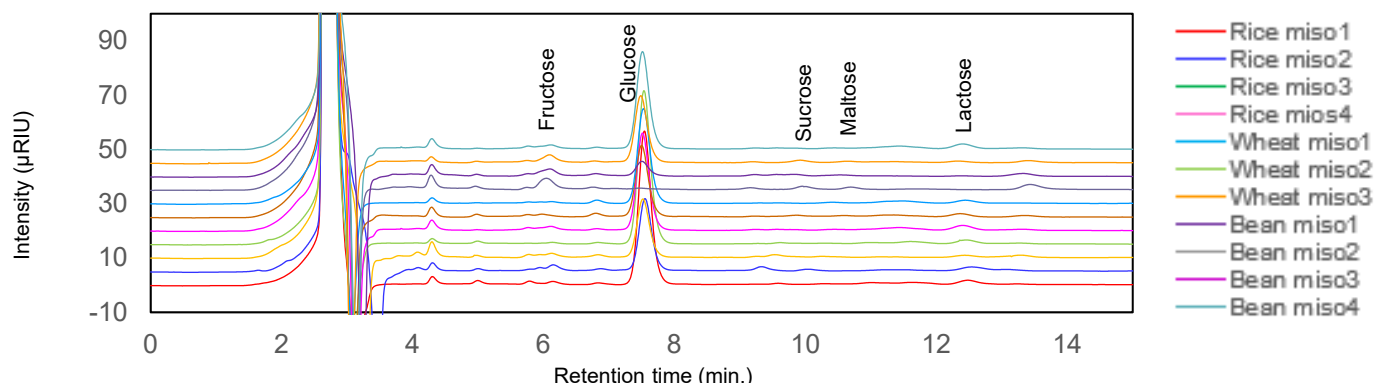


Fig. 1 Chromatogram for Sugar analysis

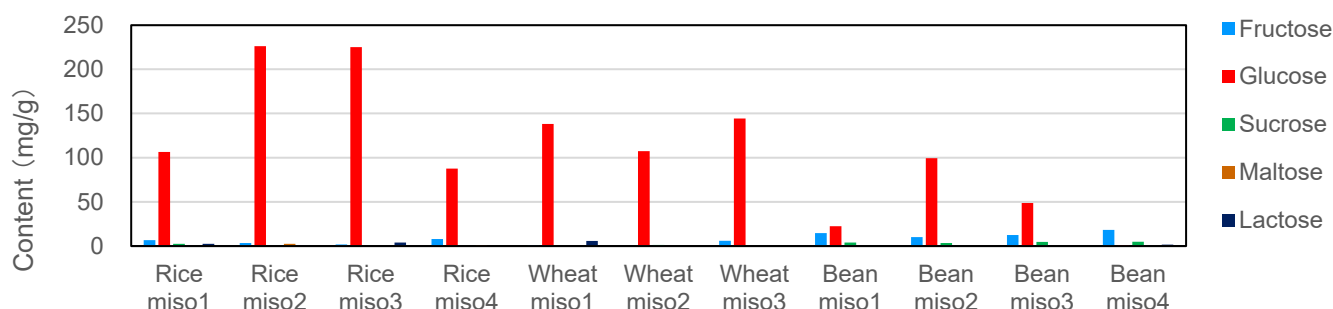


Fig. 2 Sugar content in miso

- ✓ Bean miso has tended to have a low content of glucose.
- ✓ Bean miso has tended to have a high content of fructose

### Reference

- 1) 「みそ品質表示基準」平成23年10月31日消費者庁告示第11号
- 2) 堂本康彦. 麦味噌の地域特性について. 日本醸造協会雑誌, 1982, 77.7: 432-438.

NOTE: These data are an example of measurement; the individual vales can not be guaranteed.