Effect of Salt on the Quality and Sensory Attributes of Cooked Rice

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Summary

1. ***Inorganic elements of brown and milled rices of several varieties***

The inorganic elements in brown and milled rices *Koshihikari*, *Sasanishiki*, *Akitakomachi*, A (high-amylose rice), B (high-protein rice) and *Nihonbare* rice varieties were determined by lithium metaborate fusion-inductively coupled plasma (ICP) atomic emission spectroscopy. *Koshihikari* had the lowest nitrogen content and relatively high proportions of magnesium and phosphorous in the milled rice. The silicon content of *Koshihikari* was higher than that in *Sasanishiki*, *Akitakomachi* and *Nihonbare*. The proportion of manganese in the milled rice differed little among *Koshihikari*, *Sasanishiki*, *Akitakomachi* and *Nihonbare*, but it was lower in the A and B varieties. The proportions of magnesium, phosphorus, potassium and manganese in B variety were lower than those in the other varieties. The proportions of zinc, sulfur, calcium, carbon and nitrogen in each milled rice was high as 59% to 100%.

2. ***Effect of salt on the quality and sensory attributes of cooked rice***

The effect of various types of salt on the quality and sensory attributes of cooked rice then investigated. In swelling power and solubility, the original rice starch alone had the highest values, which were decreased by adding salt. In cooking properties, the water uptake ratio, expanded volume and starch-iodine blue value of the residual liquid were highest with unsalted cooked rice, while the addition of salt decreased the values.

The creep curve for rice was analyzed according to a Voigt model with six elements. Cooked rice with various these of added salt gave higher values than unsalted rice for the instantaneous elastic modulus and static viscosity, NaCl producing the highest values, although sample commercial table salt gave slightly lower values than the sample

without salt. The recovery strain was higher and the permanent strain was lower in cooked rice with the addition of salt, making the sample hard to chew.

Cooked rice with added salt tended to rapidly degrade because its gelatinization properties were decreased. In the sensory evaluation, each cooked rice sample with added salt was more liked than those without salt. By X-ray microdiffraction, a large quantity of inorganic elements was located on the surface of unsalted rice, but these elements were moved inside by salting.