No. 9749 Development of a New Food from Difficultly Freezable Material, Soy Sauce

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Soya sauce was frozen in the presence of ice nucleation-active bacterial cells at -25℃, and the resulting frozen soya sauce was filtered through a 22-mesh screen to obtain a freeze concentrated product. Salt formed in part eutectic crystals and eliminated from the product by filtration. The product retained well the original aroma and taste substances. A part of salt in soy sauce formed no eutectic $H_2O \cdot 2NaCl$ crystals at a subzero temperature and remained in a freeze concentrated product which tasted less salty than its material at the same NaCl concentration. In the high-resolution NMR spectrometry for ^{23}Na a broader line width was obtained in the concentrated soy sauce than in the material. A broader line width of ^{23}Na was also observed in an aqueous NaCl solution added with a non-diffusible soy sauce fraction. The line width became narrow by acidification. The data indicate that a part of the salt in soy sauce interacts with its non-diffusible fraction by ionic bonding and also that such a bound salt formed no eutectic crystals and caused a mild taste of the resulting product.