Improvement in food functions using rare sugars
(Keywords: D-Psicose, Food properties, Antioxidative activity)

Outline of technology
When food viscoelastic properties and antioxidative activity of custard pudding prepared by adding D-psicose were examined, both the instantaneous elastic and viscosity moduli were higher in pudding containing D-psicose than those containing other sugars (sucrose, D-fructose), and D-psicose was found to increase the viscoelasticity of pudding. Also, when antioxidative activities of antioxidative materials extracted from pudding were examined, the 1,1-diphenyl-2-picrylhydroxy (DPPH) radical scavenger activity was considerably higher in pudding containing D-psicose than those containing D-fructose or sucrose (Figure). Thus, pudding prepared by the addition of D-psicose showed high antioxidative activity and excellent food properties, and is promising as a functional dessert for elderly people. Also, egg white proteins bound with rare sugars (D-allocose, D-psicose) and reference sugars (D-glucose, D-fructose) were prepared by the Maillard reaction and used as materials for the production of sponge cake. By binding rare sugars to food proteins, food processing properties improved (prevention of hardening with time), and the antioxidative activity increased, adding extra values to the products.

Sales points
(1) Food properties can be improved by the addition of rare sugars.
(2) An antioxidative activity can be added by the Maillard reaction.

Expected application fields and products
(1) Bakery products
(2) Foods made of fish or meat pastes
(3) Emulsified foods
(4) Functional desserts for elderly people

Comparison with existing products

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<thead>
<tr>
<th></th>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td></td>
<td>Antioxidative activity</td>
<td>Preventive effect against hardening</td>
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<tr>
<td>D-Psicose</td>
<td>Very high</td>
<td>High</td>
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<tr>
<td>Sucrose</td>
<td>Low</td>
<td>Low</td>
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</tbody>
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References, patents, etc.
- Related industrial property rights: Patent number 4115301

Other matters to note
(Developer’s comment)
Food properties improve, and the antioxidative activity increases, by the addition of rare-sugar-bound protein as a food material. Also, low-calorie and highly antioxidative foods can be prepared by adding the rare sugar D-psicose to bakery products, such as pudding. Therefore, functional desserts contributing to the prevention of lifestyle-related diseases can be developed by using the rare sugar D-psicose.

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