Outline of technology
Control of retrograding of starch is important for its processing and storage. While sucrose is known to decelerate retrograding of starch, it tends to be avoided in modern society due to its high calorie. D-Psicose, a non-calorie sugar with about 70% of sweetness of sucrose, will be expected for its shown to be useful for the prevention of retrograding of starch, it will be the discovery of a new use of a rare sugar in the food field.
Therefore, we investigated the effect of D-psicose, D-alloose, psico-rare sugar (31 mixture of D-fructose and D-psicose), sucrose, and D-fructose on the retrograding of starch with the measurements DSC, amylose content, and texture of starch.
The temperature at the beginning of gelatinization was highest in the starch gel with sucrose, followed by the starch gel with D-allow and the starch gel with D-psicose (Figure). Measurement of the hardness stress of the gels after storage for 1 hour indicated that D-psicose inhibited gelatinization of kikyo (nonglutinous rice) similar as emulsifier. Measurements after storage for 7 days or longer showed that the addition of sucrose and D-psicose prevented hardening of both kikyo and momiji (glutinous rice), i.e. inhibited aging.

Sales points
High anti-retrograding effect on starch.

Expected application fields and products
(1) Emulsifiers
(2) Secondary food materials
(3) Food additives

Comparison with existing products

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<thead>
<tr>
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<th>Advantages</th>
<th>Disadvantages</th>
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<tr>
<td></td>
<td>Temperature at the beginning of gelatinization</td>
<td>Anti-aging effect</td>
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<tr>
<td>D-Psicose</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Sucrose</td>
<td>High</td>
<td>High</td>
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</tbody>
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References, patents, etc.
None

Other matters to note
(Developer’s comment)
Sucrose prevents retrograding of starch because of its strong hydration ability but increases the gelatinization temperature of starch. We think that sucrose also prevents hydration of starch because of its high hydration ability. In contrast, D-psicose has a similar preventive effect on retrograding of starch but increases the gelatinization temperature only slightly and shows no marked inhibitory effect on gelatinization. D-Psicose may improve the production efficiency of starch foods containing sugars.
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