Concise description

Sodium alginate (SA) inhibited the leach of molecules, reduced MW of adhesive layer (AL), decreased starch content of escaping substances (ES) and AL, decreased shear viscosity of rice analogues (RA), and enhanced hydrogen bonding interactions. The Ca²⁺ in the solution increased the dry matter content of cooked rice analogues (CRA) and AL, enhanced hydrogen bonding interactions of ES and CRA, and decreased MW of ES. The gelatinous properties of RA were enhanced after SA was added. The Ca²⁺ in the solution increased the adhesiveness of RA, and while decreased their elasticity.

Graphical Abstract 100°C water Deionized ice Analogue cooking water RA preparation 1. Water flour Rice without Ca2+ Twin screw **OR** 2. Water Sodium with Ca2+ alginate Inhibit dry matter Reduce molecular content Decrease starch weight Reduce molecular weight Escaping substances Rice analogues Solution Solution Dynamic change Adhesive layer 00°C Water Cooked rice analogues

Increase dry matter content