

What factors influence the degree of starch retrogradation?

In conclusion, the degree of starch retrogradation is influenced by various factors, including storage time, temperature, additives, moisture content, and the types of starch. By combining different determination methods, researchers can effectively control the relevant conditions, and optimize conditions for starchy food processing and storage.

How can the retrogradation of starch-based foods be improved?

The retrogradation of starch-based foods can be improved by hindering the rearrangement of starch molecules, obstructing water migration, and inhibiting the recrystallization of amylopectin through the formation of complexes with starch. Table 1. Measures to delay the retrogradation of starch-based foods.

What is starch retrogradation?

Starch retrogradation is a key factor contributing to the deterioration of staple foods during storage. Common characterization methods assess the physical properties and crystallinity of starch. However, no single method can comprehensively evaluate starch retrogradation.

How does starch retrogradation affect viscoelastic modulus?

Retrogradation involves the reassociation of amylose and amylopectin chains within gelatinized starch, resulting in modifications to both viscosity and elastic modulus. A combination of multiple rheological methods was applied to better unveil the viscoelastic characteristics of starch retrogradation.

How do small molecular sugars affect starch retrogradation?

The mechanisms by which small molecular sugars affect starch retrogradation mainly include the following: Inhibition of starch Gelatinization: Small molecular sugars can combine with starch molecules to form starch-polysaccharide complexes, stabilizing the structure of starch and preventing its retrogradation after the gelatinization process.

Do different storage conditions affect starch-based foods?

Low-temperature storage typically slows retrogradation, but temperature fluctuations can cause ice recrystallization, hence accelerating the retrogradation process. Therefore, in-depth studies on the effects of different storage conditions on starch-based foods are necessary to formulate optimal storage strategies.

Scope and approach Significant efforts have recently been made to tailor the morphology, structure, and properties of many starch-based food systems, and thus to design various ...

The effect of starch modification and concentration on the dynamic shear properties of starch gels in water was studied. The four types of starches us...

Starch retrogradation is defined as the dynamic process in which gelatinized starch reconnects into an ordered structure, forming a new crystal structure, which significantly impacts its functional properties ...

Rezaei et al. (2017) investigated the effect of resistant starch and β -glucan on the steady and dynamic rheological properties of frozen soy yogurt blends. The authors found that adding ...

Typically, the degree of starch retrogradation gradually increases with storage time, and starch-based products become harder in texture.

A mathematical model able to predict the starch retrogradation kinetic of durum wheat bread and its influence on the crumb firming process is presented. The proposed model consists of ...

Small Amplitude Oscillatory Shear (SAOS) experiments are employed to determine the frequency-dependent storage modulus (G') and loss modulus (G'') of the swollen starch ...

Although retrogradation and storage are important for CSB properties, the impact of storage temperature on the starch retrogradation and digestion properties of CSB has not been ...

Similarly, the susceptibility of legume starch gels to retrogradation and syneresis makes these types of starches unsuitable for products requiring low-temperature storage. However, ...

Retrogradation is defined as the recrystallization or realignment of amylose and amylopectin chains upon cooling of gelatinization starch gels. The ...

Starch shows different deformation and flow characteristics under the action of external forces, which is called the rheological behavior of starch [15]. The elastic or storage modulus (G'), ...

The retrogradation behavior of corn starch treated with 1,4- β -glucan branching enzyme (GBE) was investigated using rheometry, pulsed nuclear magnetic resonance (PNMR), differential ...

Abstract Retrogradation is defined as the recrystallization or realignment of amylose and amylopectin chains upon cooling of gelatinization starch gels. The storage conditions such as the storage time ...

Therefore, how to enhance the gel structure of starch is of great significance to food science and industry. In this paper, the mechanism of starch gel formation was reviewed, and the ...

Presumably, some time is needed for nuclei of ordered regions to form. Conclusion It was shown that large deformation properties of concentrated starch gels change during storage: the ...

The gelatinization and retrogradation of starch are the most important attributes in food processing, cooking, handling, and storage. Gelatinization is a process in which starch granules gradually swell in ...

Abstract Starch retrogradation remains as an area of interest due to its technological implications. The long-term structural changes taking place during the retrogradation process of gels ...

In this study, two modes of starch retrogradation were kinetically investigated for short- and long-term retrogradation to assess starch retrogradation with high accuracy.

The growth increment of the storage modulus (G') and loss modulus (G'') values increases together with the increase in the starch concentration. This is due to the fact that the retrogradation process is ...

In this study, two modes of starch retrogradation were kinetically investigated for short- and long-term retrogradation to assess starch retrogradation with high accuracy.

Influence of the type of starch and emulsifier on the storage modulus G' , loss modulus G'' , iodine binding capacity (IBC), and complexation index (CI) of low ...

Abstract The impact of konjac glucomannan (KGM) with different molecular weight (Mw) on the retrogradation properties of pea starch, such as color, viscoelasticity, gel strength, water holding ...

Insoluble starch-chitosan foams were produced through a novel plasticization process that integrates glycerol via a post-expansion soaking and freeze-drying process. Starch foams ...

Cereal Chem. 81 (3):392-398 The increases in storage modulus (G'), retrogradation enthalpy change (ΔH) and ΔH -related Avrami kinetic parameters of gelatinized rice starch dispersions ...

Long-term retrogradation is mainly influenced by the initial crystals in starch, intrinsic properties of the source, and to a lesser extent, storage time. Starches show different retrogradation ...

Potato starch shows a higher tendency towards retrogradation than the cereal starches. The rheological properties, such as storage modulus (G') and loss modulus (G'') of the starches from ...

The impact of storage temperature on the starch retrogradation properties and digestibility of CSB also depended on the wheat variety, attributed to differences in the starch ...

Download scientific diagram | Storage modulus (G') and phase angle values of normal and waxy corn starch gels with and without isomaltodextrin measured with small amplitude oscillatory shear ...

Luo et al. (2020) found that the storage modulus and hardness of *Mesona chinensis* polysaccharide

(MCP)-starch mixed gels increased with the ...

This study performed mechanical experiments to investigate the mechanical properties of starch hydrogels across different degrees of ...

Gelatinisation and Retrogradation Behaviour of Some Starch Mixtures Differential scanning calorimetry (DSC) and dynamic rheological measurements were

Overall, the incorporation of MAX appeared to reduce the retrogradation tendency of starch, likely by interfering with the reassociation of amylose and amylopectin chains during storage, as ...

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