



# SHANGDONG SAIGAO GROUP CORPORATION

Allulose





# Catalogue

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# PART ONE

## Allulose introduction

## – Production introduction

Allulose is a very low content six-carbon sugar in nature , with almost zero calories. It has special functions such as regulating blood sugar, which are beneficial to human health. It is evaluated as the most potential sucrose substitute by the US Food Navigation Network.

The Allulose is made from fructose and transformed by epimerase and then refined. D-allulose is difficult to digest and absorb, hardly provides energy for life activities, so it is a very useful low-calorie sweetener.



## Structure

Chinese name: Allulose

English name: Allulose

Chemical naming: hexulose

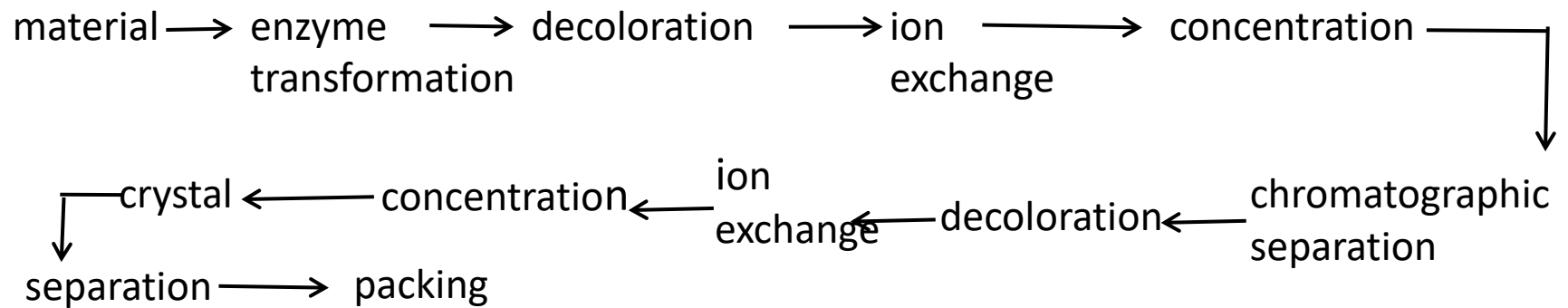
Chemical formula:  $C_6H_{12}O_6$

Molecular mass: 180

# – Production process flow chart

Raw material: fructose

## Process



# — Sensory and physical and chemical indicators

Sheet 1 Sensory indicators		
Items	Indicators	
	Liquid	Solid
Appearance	Colorless to light yellow liquid	White crystal powder
Color	Colorless or light yellow	White
Smell	It has the unique fragrance of the product and no peculiar smell	It has the unique fragrance of the product and no peculiar smell
Taste	Sweet taste	Sweet taste
Sheet 2 Physical and chemical indicators		
Items	Indicators	
	Solid	Liquid
Moisture, %	≤ 1.0	--
Solid, %	≥ --	70
Ash, %	≤ 0.1	0.5
D-Allulose (dry basis, %)	≥ 98.5	95
PH value	--	3.0-7.0
Total arsenic (in As)	< 0.5	0.2
Lead (in Pb)	< 1	1



## PART TWO

Physical and chemical properties of allulose



## – Physical and chemical properties

High sweetness: The sweetness of allulose is 70% of sucrose, and the sweetness is similar to that of sucrose.

Low calorie: calories  $\leq 0.39$  kcal, sucrose: 4 kcal, fructose: 4 kcal, glucose: 4 kcal.

Reducibility: can occur Maillard reaction , good coloring performance.

High osmotic pressure: high osmotic pressure, which is not conducive to microbial growth and prolongs shelf life.

Caries prevention: not used by oral microorganisms.



## PART THREE

# Functional characteristics of allulose

## Physiological function

The allulose is not digested and absorbed, and D-allulose can inhibit fatty liver enzymes and intestinal  $\alpha$ -glucosidase, thereby lowering the accumulation of fat in the body and inhibiting the increase in blood glucose concentration. Iida and Hayashi found that adding D-allulose to the diet can lower the blood sugar response after meal and improve the insulin sensitivity and glucose tolerance. In addition, compared with other rare sugars, d-allulose is more effective in scavenging reactive oxygen species. In mouse experiments, it was found that d-allulose could prevent the testis damage induced by bis - (2-ethylhexyl) - phthalate by inhibiting the production of reactive oxygen species. In addition, D-allulose has neuroprotective effect on 6-hydroxydopamine induced apoptosis, and can inhibit the expression of monocyte chemoattractant protein MCP-1 induced by high concentration glucose. This indicates that D-allulose has potential function in the treatment of neurodegenerative and atherosclerotic diseases.

## 2、 Applied to plants

The rare sugars such as allulose are not only work on animals, but studies have shown that it also has a great impact on plants. The Ministry of agriculture of Kagawa University is carrying out the research on how many rare sugars can be used to induce and discover rice and other crops' defense genes, and whether it can regulate plant growth. And they are developing materials that can induce plant disease tolerance and growth regulation, and they are also studying their utilization methods.

In order to be practical, Xiangchuan university is currently jointly developing agricultural materials with non-governmental enterprises. The project to develop agricultural materials is worthy of expecting to use natural substances and edible sugars from a safety perspective to produce pesticides that are beneficial to humans and the environment. This is unprecedented.

## Rat thorn

Rat thorn is a very precious plant which can produce and store allulose by itself. There is a reason that is not very obvious to prove that the leaves of rat thorns containing allulose inhibit the growth of other plants around, and the rat thorns can create a good fertility environment for themselves. After escaping the natural elimination, Rat thorn, which can produce and store rare sugar by itself, is called "coelacanth (living fossil) in the plant kingdom". It is estimated that this special method is used to overcome the survival challenge.

## Matters needing attention

Allulose: male 0.5g, female 0.6g;xylitol:0.3g;Reduced palatinose:0.3g.



## PART FOUR

# Application of allulose

# Application area

## Inhibit blood sugar, lose weight

It is not digested and absorbed, and can be eaten by diabetics.

## White sugar substitute

The best substitute for sugar, a new sugar.



## Medicine and health care

Treatment of neurodegenerative diseases and related diseases such as atherosclerosis.

## Extend shelf life

High osmotic pressure.

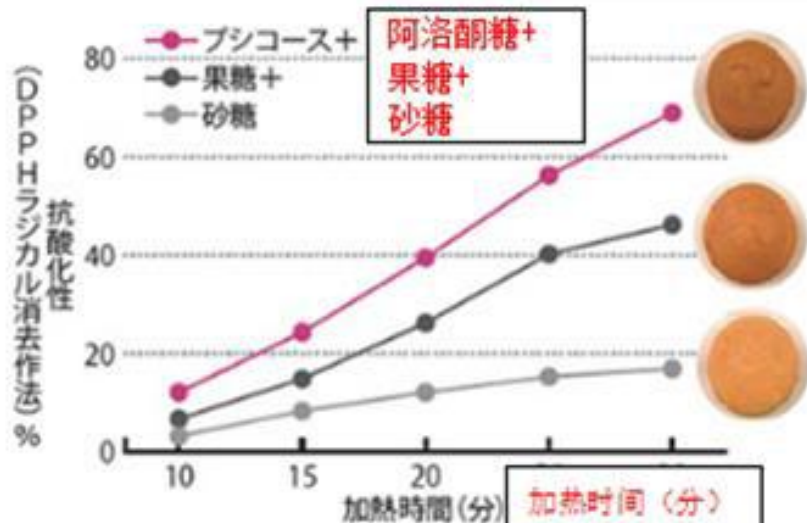
## Pesticides

Materials that induce plant tolerance and fertility regulation.



砂糖的 20%~50% 置換成阿洛酮糖

砂糖の 20~50% をブシコース置換



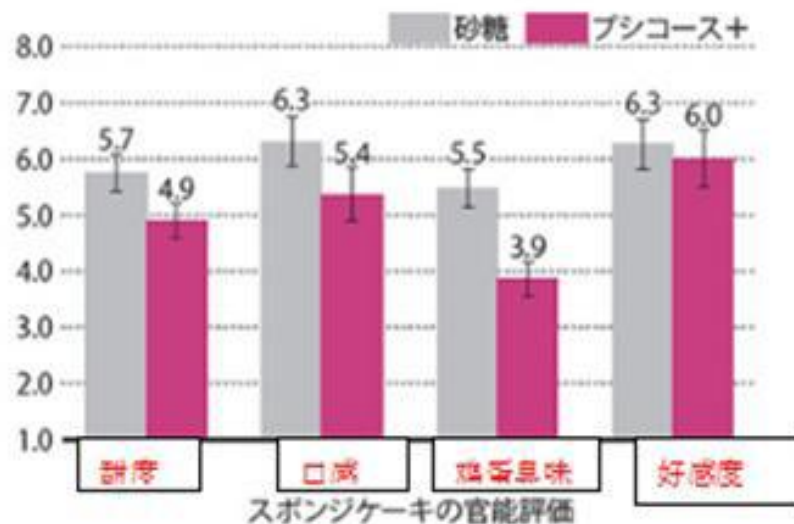
砂糖の一部 (20%) をブシコースに置き換えて焼成した  
ケーキの抗酸化性

砂糖的一部分 (20%) 转化成阿洛酮糖后  
蛋糕的抗酸化性



左：砂糖

右：ブシコース



※21人のパネリスト (20~28歳) のべ150回試験

- ・甘味 (甘さの強さ) 1: 弱い~9: 強い
- ・食感 (食べたときのやわらかさ) 1: 堅い~9: やわらかい
- ・卵臭 (卵のにおい) 1: 弱い~9: 強い
- ・好み (総合的な好み) 1: 嫌い~9: 好き

加入阿洛酮糖的蛋糕抗酸化性高，显色度高。  
抗酸化性和显色度之间有很大的关联。

ブシコースを加えたケーキでは、抗酸化性が高く、色彩度が高い。  
抗酸化性と色彩度の間には高い有意の相関がある。



THANK YOU