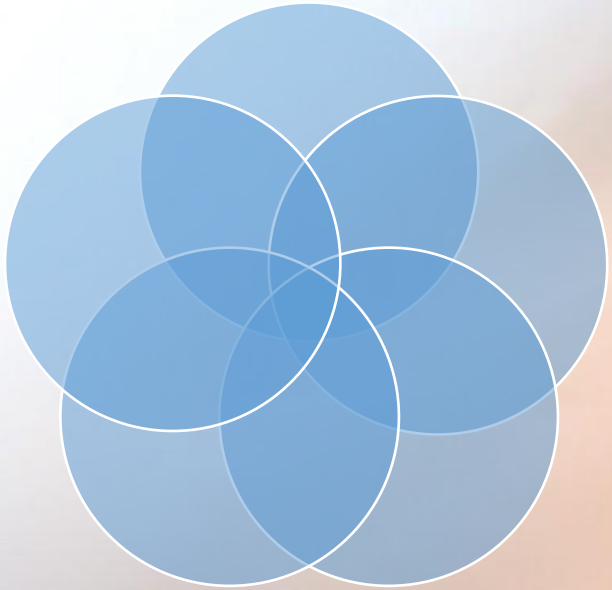
Galactomannans

Stability /
water binding

Gel /
Synergy



Body /
Mouth
feeling

Viscosity

Syneresis
prevention

Galactomannans

Raw Material

Tara Gum	Locust Bean Gum	Guar Gum
(Peru, Bolivia)	(Mediterranean area)	(India, Pakistan)

The cultivation of the plants is usually by an ecological dry-field system, which helps preserve the often meagre water resources.

UNIPEKTIN buys the raw material direct from local producers and processors. The imported raw material is examined by certified quality control parameter and classified for the further processing.

Properties of Galactomannans

	Native Guar Gum (standard quality, not modified) * *Does only partly apply to special products like e.g. VIDOCREM*	Native Tara Gum (standard quality, not modified) * *Does only partly apply to special products like e.g. VIDOGUM SP-SYN*	Native Locust Bean Gum, (standard quality, not modified)
Commercial Aspects			
Dosage to achieve comparable hot viscosity.	**100%**	**100%**	**110%**
Price	**low**	**intermediate**	**High**
Fluctuation in price	**Limited**	**medium**	**Critical**

	Native Guar Gum	Native Tara Gum	Native Locust Bean Gum
Solubility			
Cold solubility	Approx. 80% of the hot viscosity is achieved at 25°C and 1h stirring time	Approx. 70% of the hot viscosity is achieved at 25°C and 1h stirring time.	Approx. 5% of the hot viscosity is achieved at 25°C and1 h stirring time
Solubility up to	35 ° Brix (35 % sugar)	55° Brix (55% sugar)	55° Brix (55% sugar)
Suitability for instant products (e.g. powder for instant drinks)	Yes	Limited suitable.	No
Freeze – thaw stability	Yes	Yes	No
Viscosity increase in combination with other hydrocolloids.			
Modified Starch	Yes	Yes	Yes
Xanthan Gum	Very strong viscosity increase.	Viscosity increase and gel formation.	Viscosity increase and gel formation.
Viscosity reduction when heated.	25°C = 100% 75°C = 65%	25°C = 100% 75°C = 34%	25°C = 100% 75°C = 29%

	Native Guar Gum	Native Tara Gum	Native Locust Bean Gum
Sensory Aspects			
Off-flavour	Relatively strong, but premium qualities without any off-flavour are available.	no off-flavour	no off-flavour
Flavour release	The flavour is masked notably by Guar Gum.	Good flavour release.	Good flavour release.
Mouthfeel	Not creamy. At higher dosages (> 0.4%) quite slimy. Not suitable as fat replacer (exception = VIDOCREM).	Mouth-feel is between Guar Gum and LBG, but definitely closer to LBG. Provides a pleasant mouthfeel in many applications. Suitable us a fat replacer.	Creamy and pleasant mouth-feel. Suitable as a fat replacer.
Flow Behaviour	Solutions of Guar Gum have a slimy and longish texture but do not flow without interruption (e.g. from a spoon) = Yield Point. Quite pseudoplastic behaviour which is recognized as negative in many applications. Exception: Especially in dressings and seasoning sauces this property is often required and therefore widely used.	Solutions with Tara Gum are flowing continuously (without interruption), low Yield Point. Intermediate pseudoplastic behaviour which provides a nice flow behaviour.	Solutions with LBG are flowing continuously and smoothly (e.g. from a spoon), very low Yield Point (the force necessary to make a substance flow).

	Native Guar Gum	Native Tara Gum	Native Locust Bean Gum
Gel strength increase with			
k-Carrageenan	No increase	Some increase – especially interesting if a certain gel strength is required but the product still has to be creamy (e.g. processed cheese, curd cheese whipped, custard).	Strong increase – especially if quite a strong gel is required – e.g. 'jellies'.
Xanthan Gum	No increase	Builds a smooth gel which can be useful in sauces and mayonnaise which should not be too gelatinous.	Builds a quite strong gel. Useful in mayonnaise with a gelatinous texture.
Agar-Agar	No increase	Low to medium interaction. Though the effect is not extremely high, the dosage of Agar-Agar can be reduced.	Medium interaction. Recommended if the gel strength should be the most important property of the product.
Acid stability, heat stability, homogenisation stability	Properties are very similar for all three Galactomannans.		
Syneresis prevention	Properties are very similar for all three Galactomannans.		
Turbidity of the solution.	Properties are very similar for all three Galactomannans.		
Colour of the solution	Beige-brown. White solutions with VIDOGUM GH.	More neutral than VIDOGUM G 200 I (native guar gum).	More neutral than VIDOGUM G 200 I (native guar gum).
Freeze-thaw stability	Yes	Yes	No

Galactomannans

VIDOGUM L®	Locust Bean Gum
VIDOGUM L /C500®	Cold Soluble Locust Bean Gum
VIDOGUM SP®	Tara Gum
VIDOGUM SP-SYN ®	Low viscosity Tara Gum
VIDOGUM G®	Native Guar Gum
VIDOGUM GH®	Neutral flavour Guar Gum, Swiss made
VIDOCREM®	Viscosity reduced Guar Gum

Galactomannan Specialities

VIDOGUM GH Neutral flavour guar gum
VIDOCREM viscosity reduced guar gum
VIDOGUM SP-SYN viscosity reduced tara gum

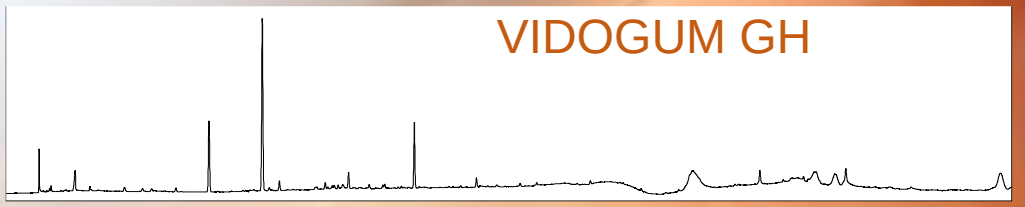
the perfect solution for:
texture
creaminess
mouthfeel

improved solubility in high Brix applications
excellent syneresis prevention

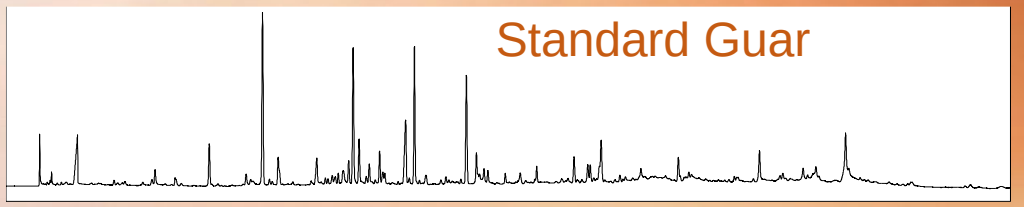
Galactomannan Specialities

VIDOGUM GH

High Quality Guar Gum, produced in Switzerland
Without the typical taste and flavor of guar gum



The perfect solution for all flavour sensitive applications



Galactomannans

Viscosity and Flow Behavior

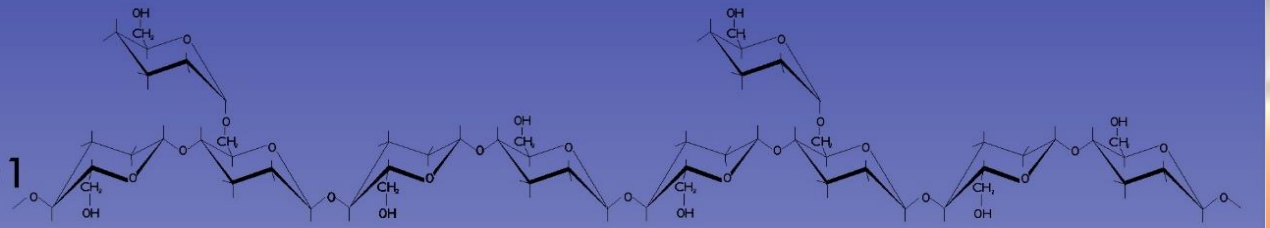
Solubility

Interactions with other hydrocolloids

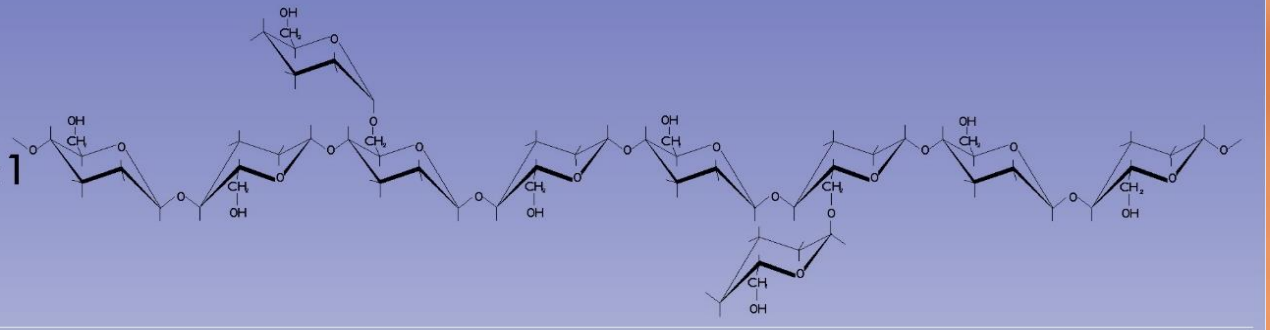
Freeze and Thaw Stability

Molecular Structure

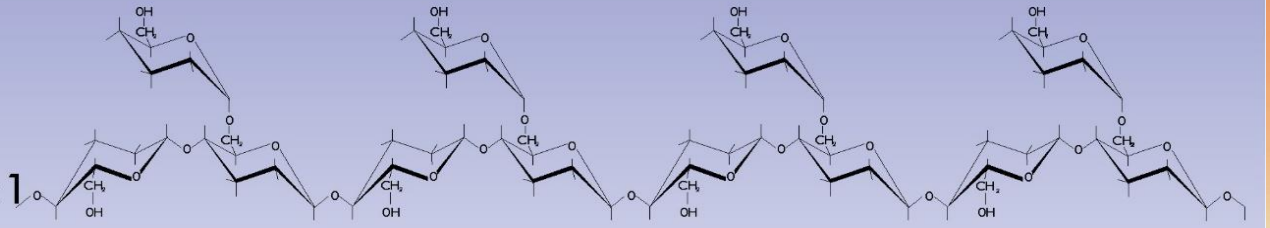
Locust Bean Gum
(Carubin)
Mannose/Galactose 4:1



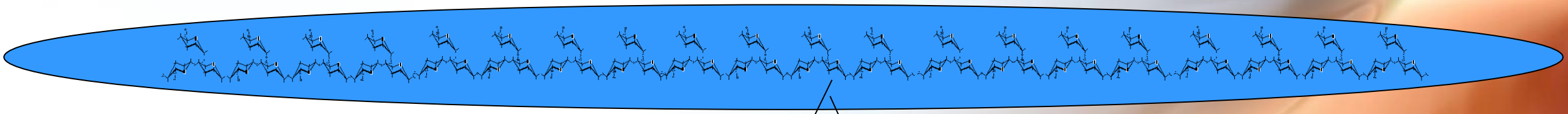
Tara Gum
(Tara-Galactomannan)
Mannose/Galactose 3:1



Guar Gum
(Guaran)
Mannose/Galactose 2:1



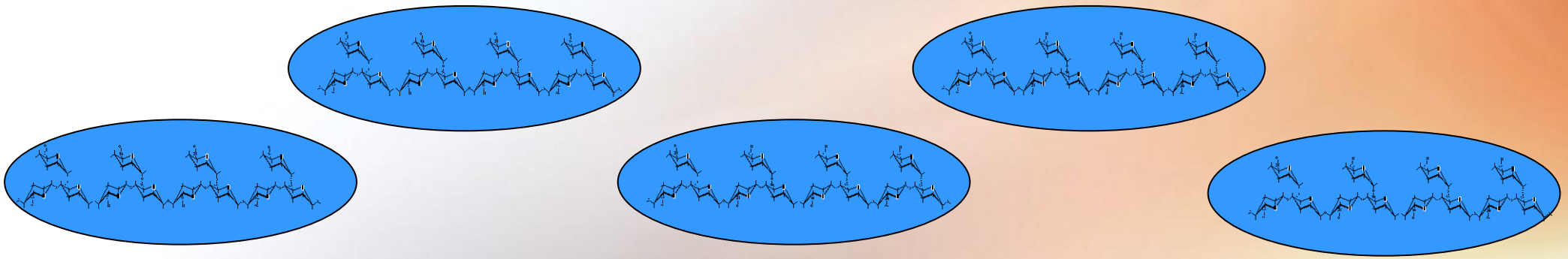
Molecular weight influences the characteristics of the hydrocolloid



molecule

water layer

Guar Gum (Guaran) ***VIDOGUM GH*** *Ratio Mannose to Galactose 2 : 1*

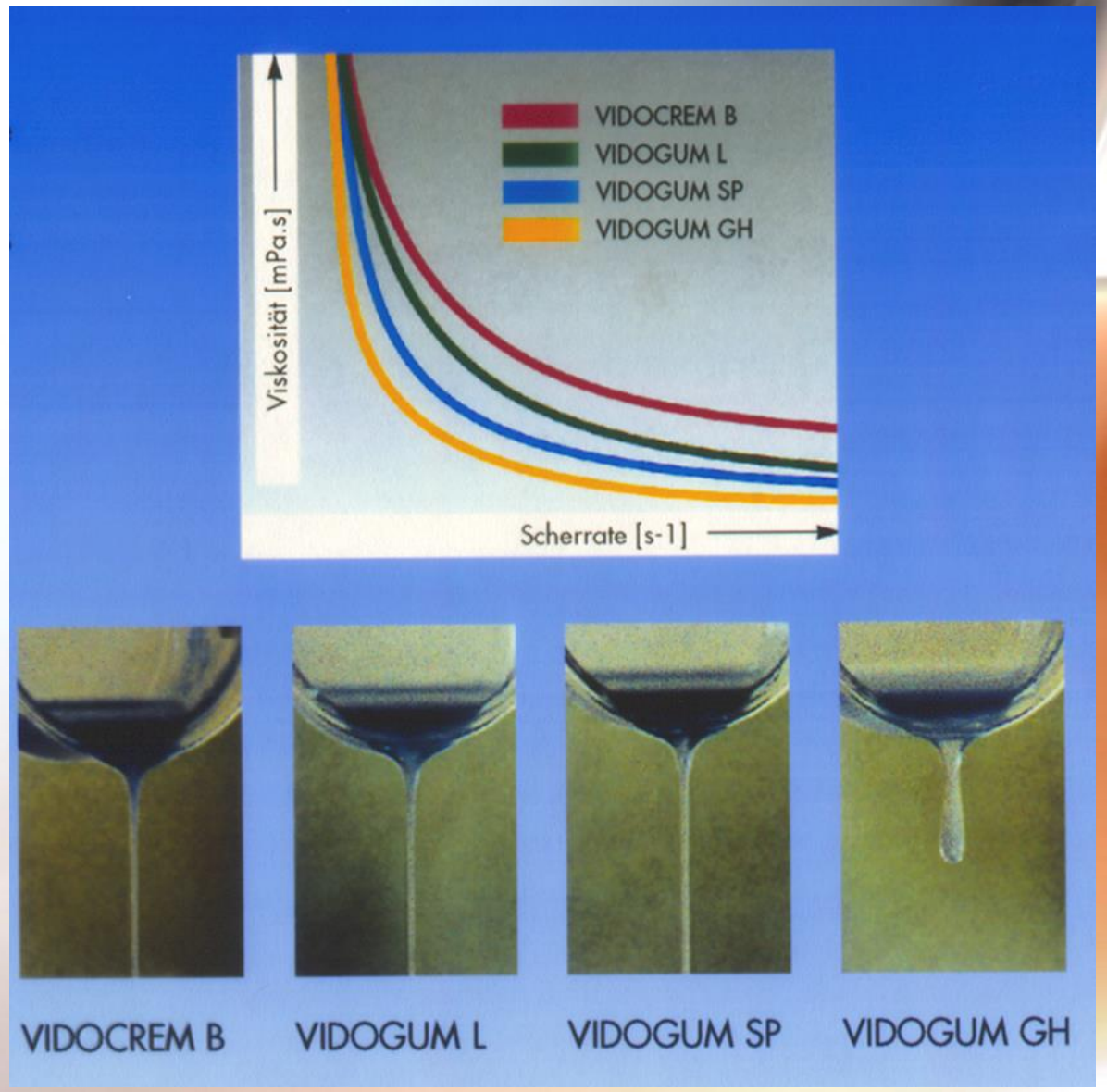


Guar Gum **VIDOCREM** *Ratio Mannose to Galactose 2 : 1*

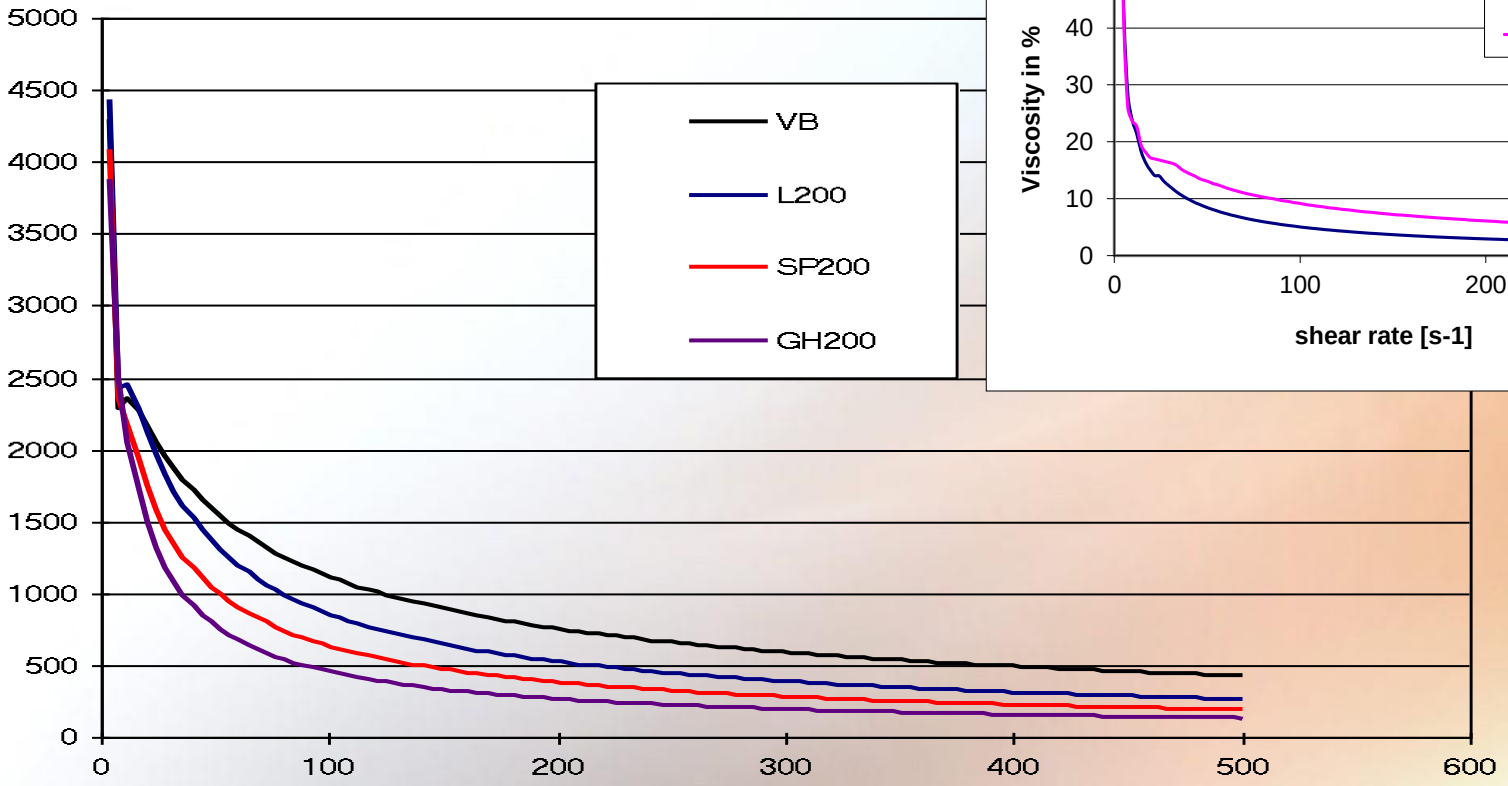
Flow Behaviour

The differences of the molecular structure of the galactomannans as well as the difference of the molecular weight are responsible for variations of the flow behaviour.

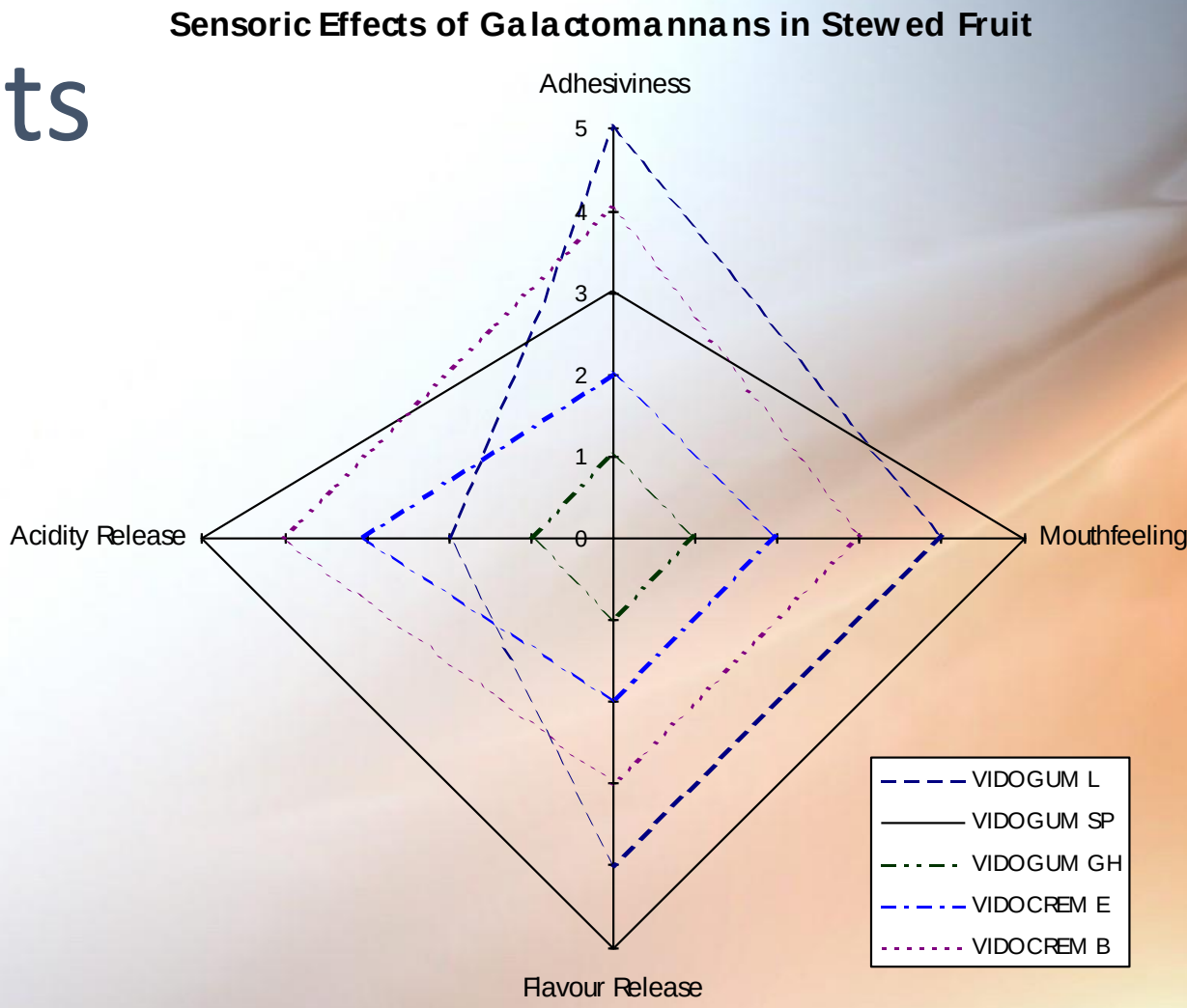
These variations can be detected by sensory tests.



Viscosity reduced guar gum



Sensory effects

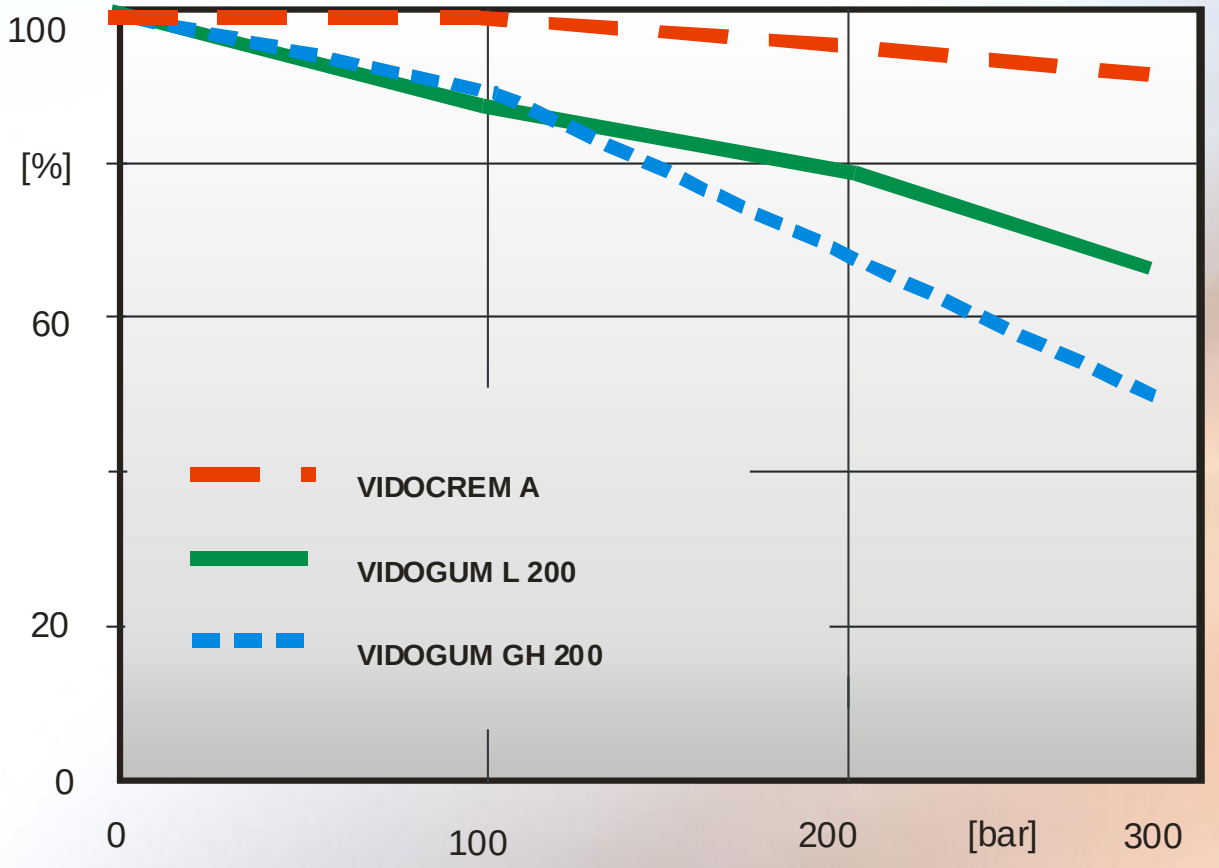


Viscosity at higher temperature

	Viscosity at 25° C	Viscosity at 75° C	in % of the hot viscosity
VIDOGUM L 175	2,380	700	29.4
VIDOGUM SP 175	3,890	1,300	33.4
VIDOGUM GH 175	4,300	2,800	65.1
VIDOCREM A	60	25	41.6

(all values in mPa.s)

Homogenisation effect



Chocolate Milk ‘light’

Galactomannans increase the texture and the stability of chocolate milk compared to a stabilisation with κ-Carrageenan alone.

Ingredients	
Skimmed Milk	93.30 %
Saccharose	3.50 %
Cacao Powder	3.00 %
κ-Carrageenan	0.02 %
VIDOCREM	0,10 - 0,20 %

The low viscosity Guar Gum VIDOCREM produces a creamy, smooth and pleasant texture.

Galactomannans

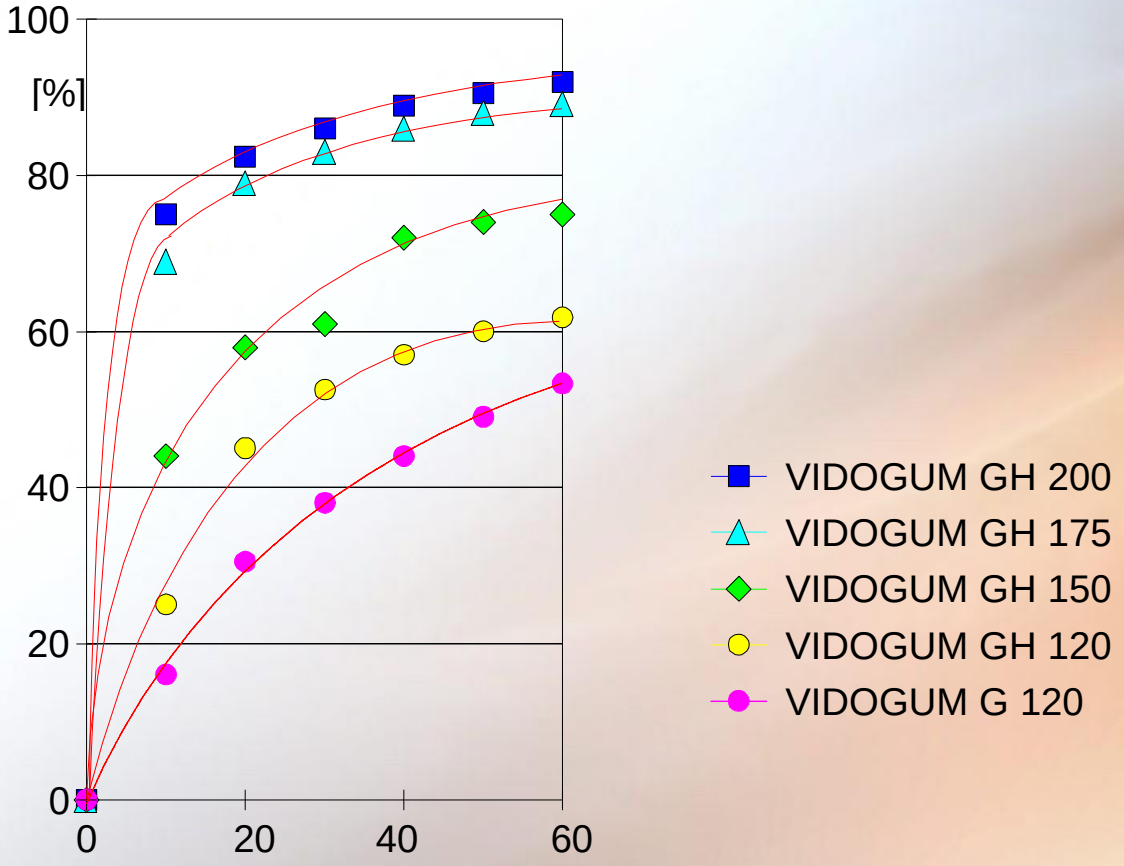
Viscosity and Flow Behavior

Solubility

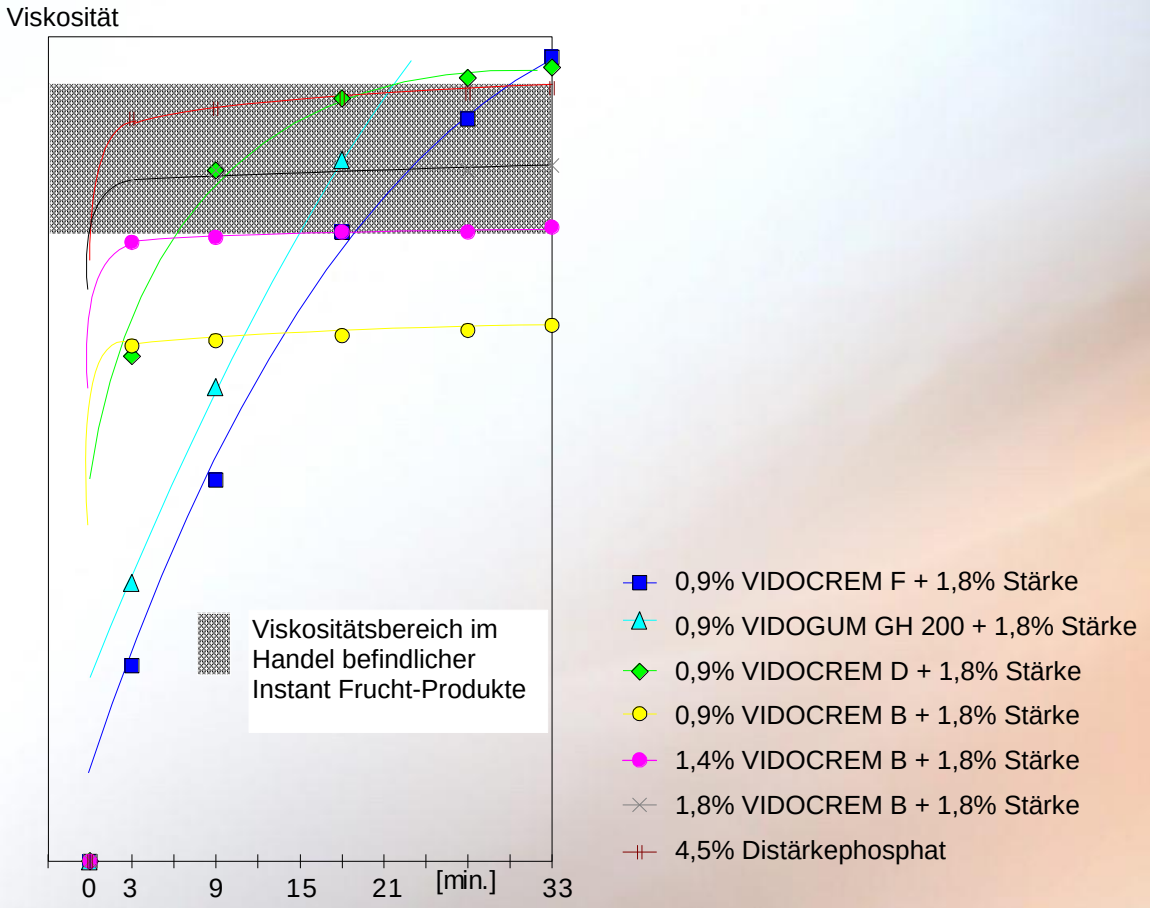
Interactions with other hydrocolloids

Freeze and Thaw Stability

Solubility at 20°C



Instant Solubility



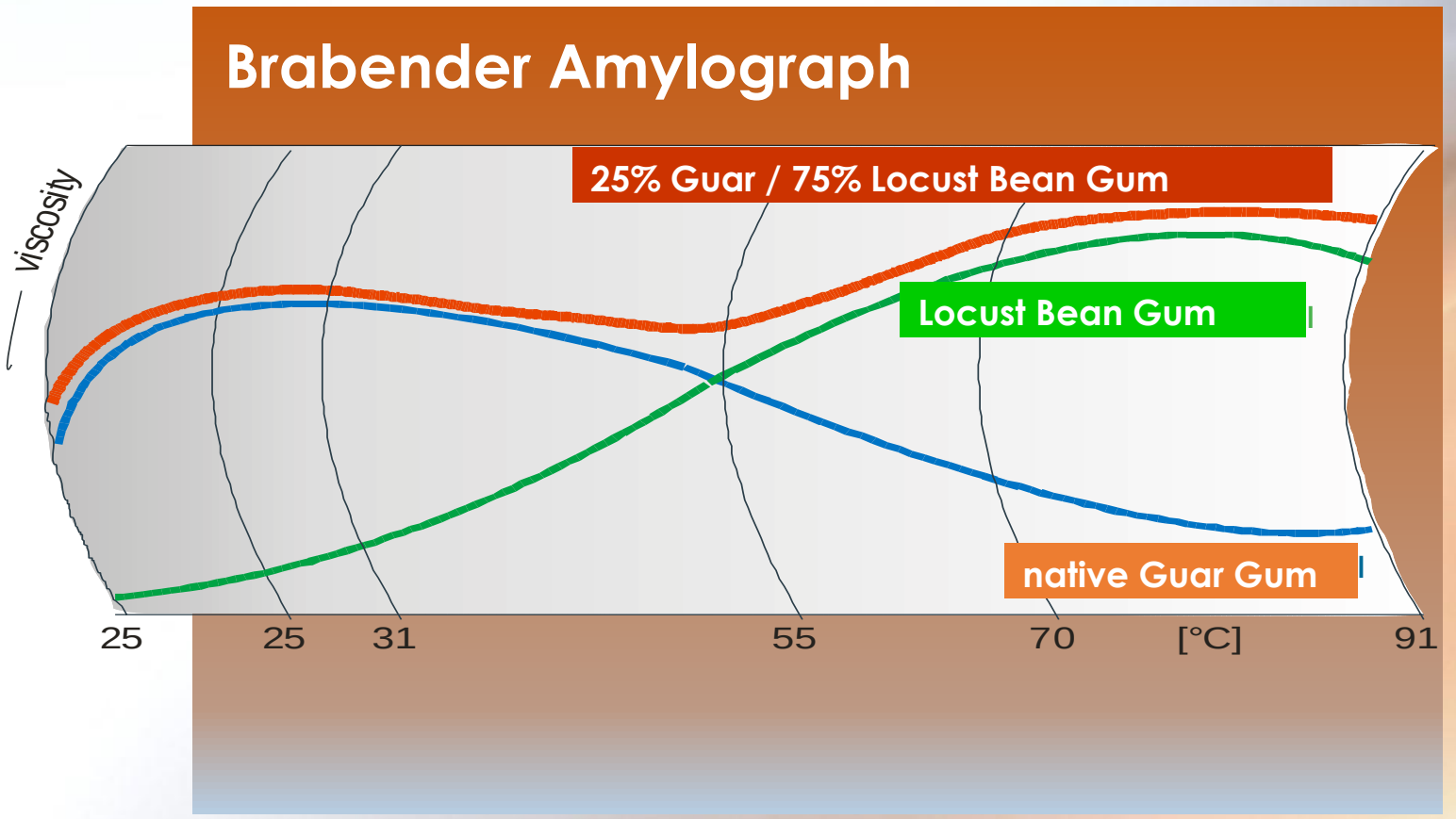
Crème Desserts

Galactomannans create the pleasant texture these desserts are known for, and particularly VIDOCREM A is used in ‘instant’ powder mixes for ‘Creme Desserts’.

Ingredients
Sucrose
Tapioca starch (modified)
VIDOCREM A
Carrageenan
Flavours, colours

The low viscosity Guar Gum VIDOCREM produces a creamy, smooth and pleasant texture.

Viscosity Development



Brioche

Brioche is made with a lot of butter and many eggs, like all “Viennoiserie” products. They are very popular in France but also more and more in other countries.

VIDOGUM L 200 (LBG) improves and preserves the pleasant texture during shelf life of 4 weeks.

The recommended dosage is 1% of flour. For specific products (e.g. frozen), the recommended dosage is higher.

Gluten-free

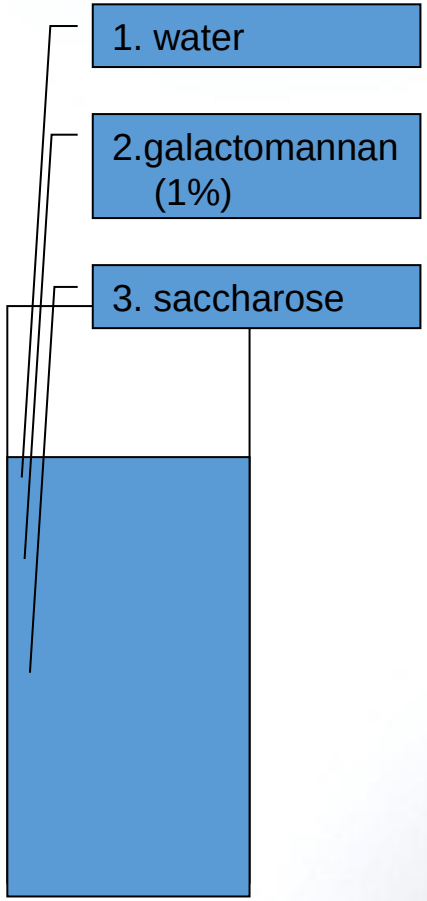
The trend for gluten free products and the market for gluten free bakery products and pasta grows strongly.

Ingredients

VIDOGUM and VIDOFIBRES replace the missing properties of the gluten and create tasty products.

UNIPEKTIN has served this market segment for decades and holds a strong position in Europe.

Solubility at high Brix



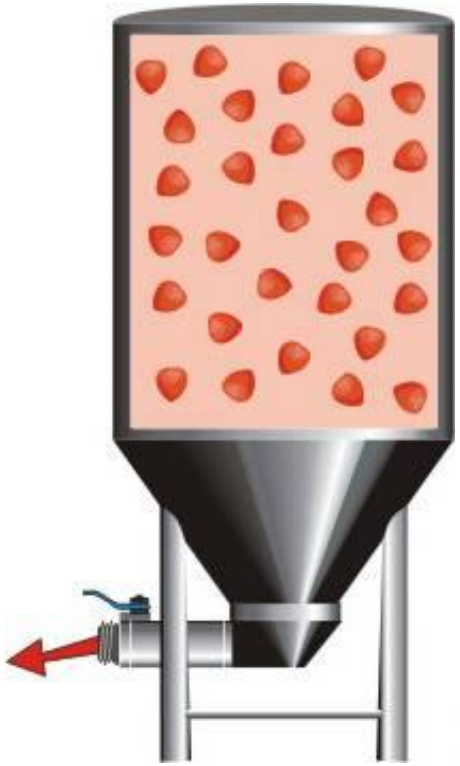
Locust Bean Gum

Tara Gum

Native Guar Gum

VIDOCREM

Fruit Preparations



In Europe, the major part of the fruit preparations has approx. 45° brix.
A smaller part has approx. 55-60° brix.

Recipe "Fruit preparation 45°Bx"

Fruits, Water	~55 %
Sugars	~42 %
modified Starch	2.50 %
Pectin	0.25 %
VIDOGUM SP-SYN / VIDOCREM	0.25 %
Flavours, colours, etc.	

Recipe "Fruit preparation 60°Bx"

Fruits, Water	~42 %
Sugars	~55 %
modified Starch	2.00 %
Pectin	0.20 %
VIDOGUM SP-SYN / VIDOCREM	0.20 %
Flavours, colours, etc.	

The rheological properties of low viscosity Guar and Tara gum offer

- a pleasant texture with creaminess and mouthfeel

- an improved solubility in high Brix applications

- excellent syneresis prevention

Galactomannans

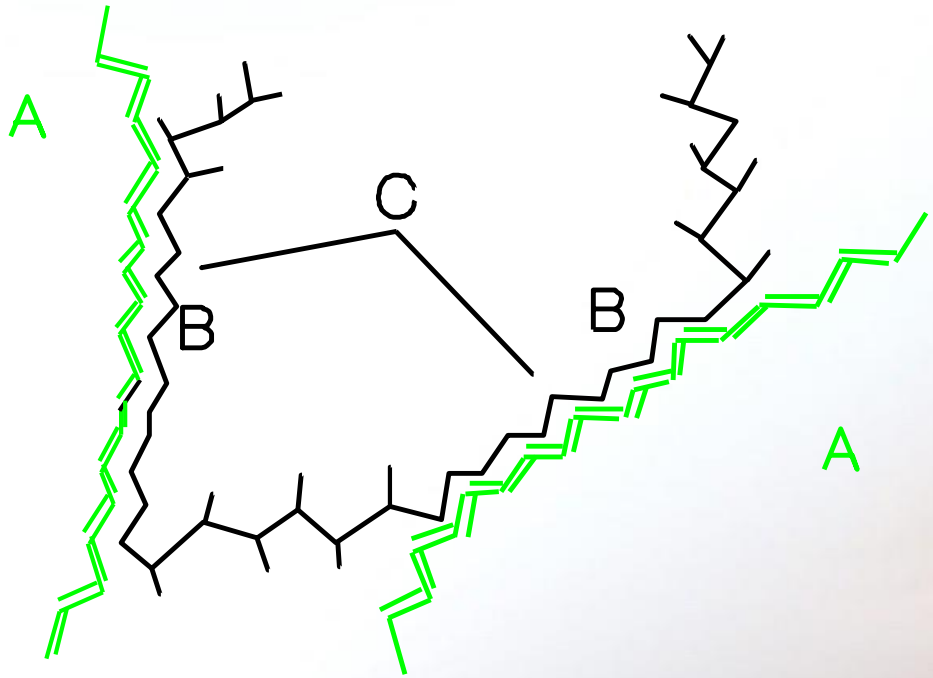
Viscosity and Flow Behavior

Solubility

Interactions with other hydrocolloids

Freeze and Thaw Stability

Synergy with Agar & Carrageenan



A = Agar Agar / Carrageenan / Xanthan Gum
B = Locust Bean Gum / Tara Gum
C = Helix-Bond Associations

Cream Cheese ‘Light’

This recipe shows a full bodied, creamy and smooth Cream Cheese Light with a natural appearance.

Recipe:

Curd cheese (0.2% fat)	45.50 %
Cream Cheese with 30% fat	54.00 %
Salt	0.20 %
VIDOGUM SP-SYN	0.20 %
k-Carrageenan	0.10 %

Preparation:

1. Mix the cheese in the Stephan cutter and heat to 40°C whilst stirring at 1,500 rpm.
2. Add the premixed dry components.
3. Heat to a maximum of 92°C and keep at this temperature for 10 min.
4. Homogenise at 200 bar.
5. Pack directly (hot filling over 70°C).

Canned meat

Locust Bean Gum shows a strong and brilliant interaction with carrageenan.

While carrageenan is widely used in processed meat products for its gelling properties, VIDOGUM L 175 improves the gelled texture of any kind of meat products such as ham, sausages, structured meat as well as canned meat.

VIDOGUM L 175 or in combination with Agar Agar.

Interaction with Starches

A separation into two phases is responsible for an increase in viscosity.

→ Liquid – Liquid phase separation

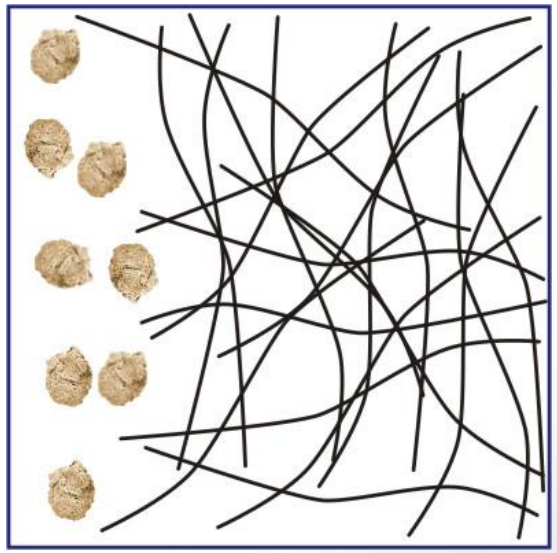
If the galactomannans are only present in a part of the solution, the concentration of it is increased in that part.
Based on the fact that the viscosity in relation of the concentration is progressive, the galactomannans will show a higher viscosity.
The same explanation applies for the modified starches.

Interaction with Starches

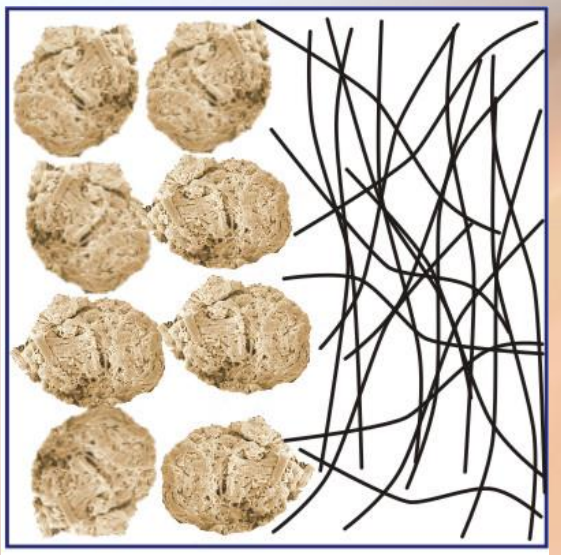
	VISCOSITY		viscosity increase	
	1% Solution mPa.s	1% mod. starch 1% galactomannan mPa.s	mPa.s	%
modified starch	10	-	-	
VIDOGUM GH 200	4,200	6,080	1,880	45
VIDOGUM SP 175	3,550	6,790	3,210	90
VIDOGUM L 175	2,610	5,830	3,220	123
VIDOCREM C	462	1,490	1,028	223

Interaction with Starches

Starch & Galactomannans BEFORE HEATING



Starch & Galactomannans AFTER HEATING



STABILIZER CONCENTRATION

Panna Cotta

Panna cotta is a cream-based Italian dessert. The combination of Locust Bean Gum VIDOGUM L 175 HQ and carrageenan forms the required delicately-melting gel structure and lends the product a harmonious texture, even with low fat content.

Recipe “Panna Cotta”

Skimmed Milk	~56 %
Cream (35% fat)	32 %
Sugar	~9 %
Starch	0,90 %
k-Carrageenan	0.40 %
VIDOGUM L 175 HQ	0,30 %

Cream Cheese Chocolate

A recent new Cream Cheese creation in Europe is the “Chocolate” type, texturized with locust bean gum in combination with carrageenan.

This new type is also promoted as ingredient for American style ‘Cheese-Cake’.

Galactomannans

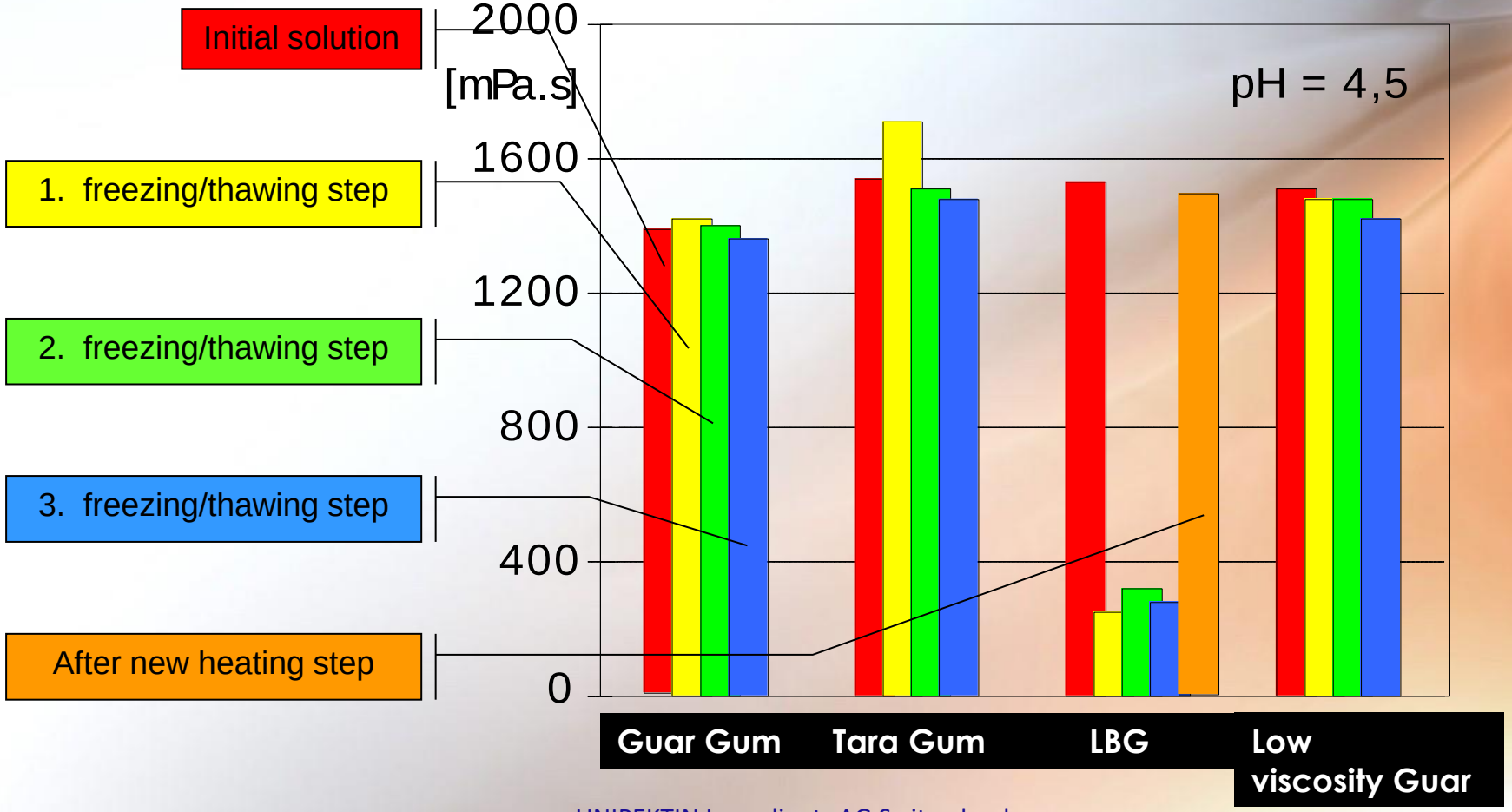
Viscosity and Flow Behavior

Solubility

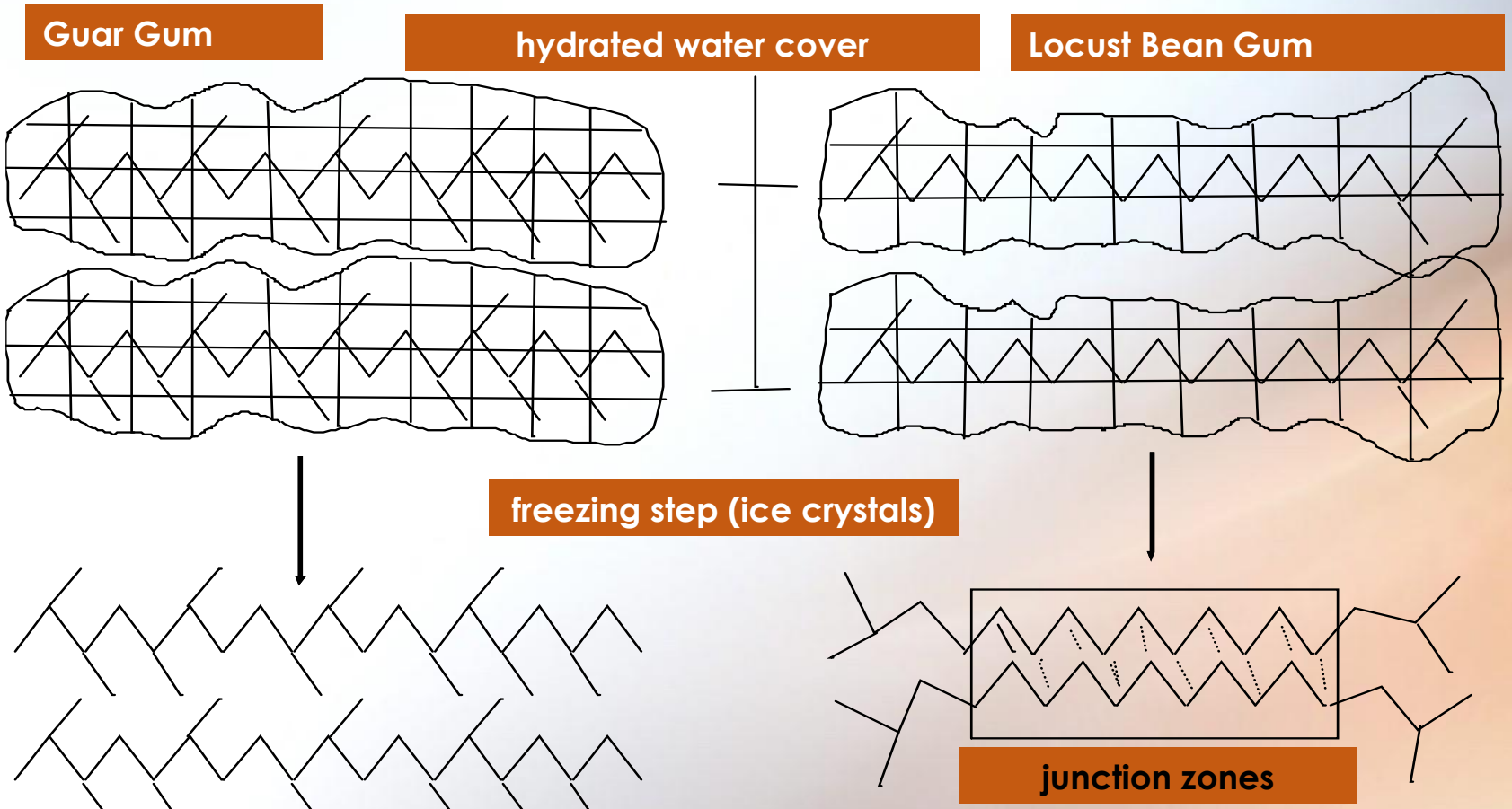
Interactions with other hydrocolloids

Freeze and Thaw Stability

Freeze & Thaw Behaviour



Freezing Steps - Model



Ice Cream

Standard recipe of a dairy Ice Cream with a pleasant and smooth texture and good stability over shelf life.

Recipe Ice Cream 8% Milk Fat

Water	65.00 %
Skimmed Milk Powder	12.50 %
Butter	9.60 %
Saccharose	10.00 %
Glucose Syrup	2.40 %
Vanilla Flavour	0.10 %
Riboflavin (E 101)	0.002 %
Emulsifier (E 471)	0.30 %
kappa Carrageenan	0.02 %
Galactomannan	0.15 %
	100.07 %

Heat shock stability of different systems

Only k-Carrageenan	with VIDOGUM L 175 (Locust Bean Gum)	with VIDOGUM SP 175 (Tara Gum)
 after 15 Minutes	 after 15 Minutes	 after 15 Minutes
 after 30 Minutes	 after 30 Minutes	 after 30 Minutes
 after 60 Minutes	 after 60 Minutes	 after 60 Minutes
Syneresis: 14 ml	**Syneresis: 13 ml**	**Syneresis: 7 ml**

Heat shock stability of different systems

with VIDOGUM GH (Guar Gum)	with VIDOCREM A (thermally degraded Guar)	with 0.35% VIDOCREM A (thermally degraded Guar)
 after 15 Minutes	 after 15 Minutes	 after 15 Minutes
 after 30 Minutes	 after 30 Minutes	 after 30 Minutes
 after 60 Minutes	 after 60 Minutes	 after 60 Minutes
Syneresis: 9 ml	**Syneresis: 8 ml**	**Syneresis: 4 ml**

Documentation

Content

Technical properties