



Nordic Sugar
Member of Nordzucker Group



Product Portfolio

Lennart Axelsson, KAM & Application Specialist Bakery

Catharina Antonsson, KAM & Project Manager PD

Nordic Sugar - Product Portfolio

- ***Some basics of sugars***

- ***Dry sugar Products***

- Granulated Sugar

- Icing Sugar

- Nib Sugar

- Instant Sugar

- Brown Sugar

- Special Dry Products

- ***Liquid Products***

- Liquid Sucrose

- Liquid Invert Sugar

- Syrup

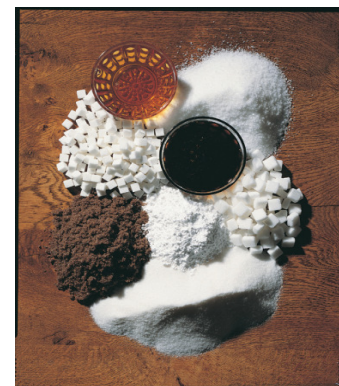
- Special Liquid Products



Beet and Cane Sugar

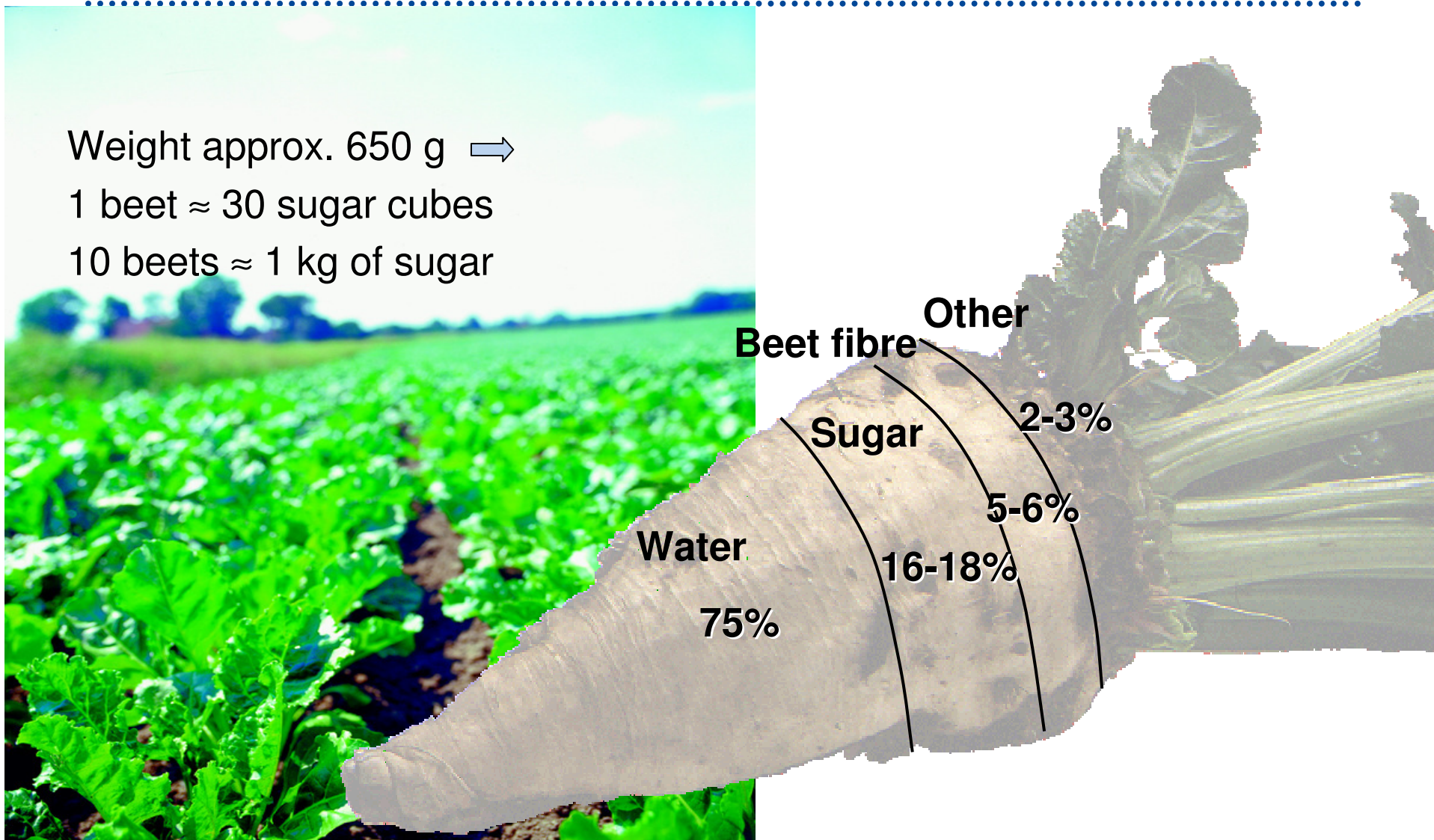


Pure white sugar made from beet and cane is the same chemical molecule, the di-saccharide **sucrose**.



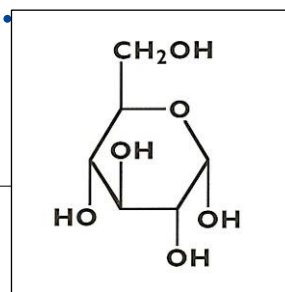
The sugar beet – the root of sweetness

Weight approx. 650 g →
1 beet ≈ 30 sugar cubes
10 beets ≈ 1 kg of sugar

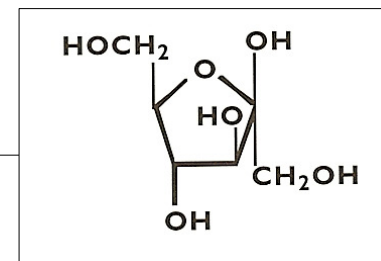


Basic Saccharides

Monosaccharides
(*glucose*, *fructose*, galactose)



Glucose

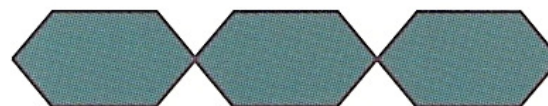


Fructose

Disaccharides
(*sucrose*, maltose, lactose)



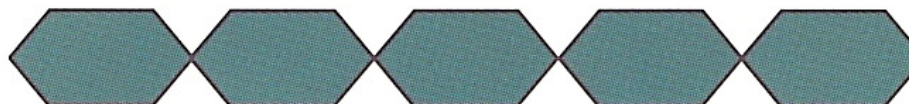
Trisaccharides
(raffinose)



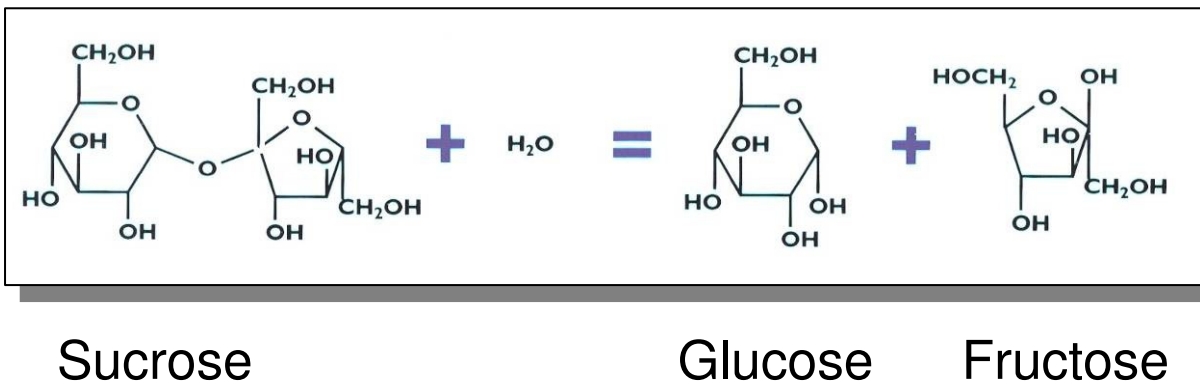
Tetrasaccharides
(stachyose)



Pentasaccharides
(verbascose)

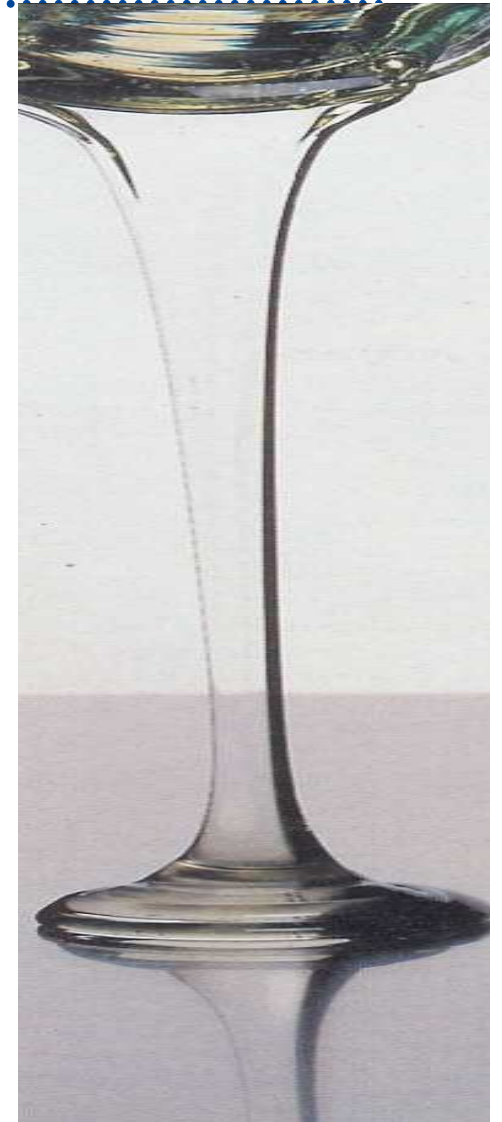


Invert Sugar



Invert sugar is a mixture of equal amounts of glucose and fructose.

Invert sugar is a liquid product made from inversion of sucrose

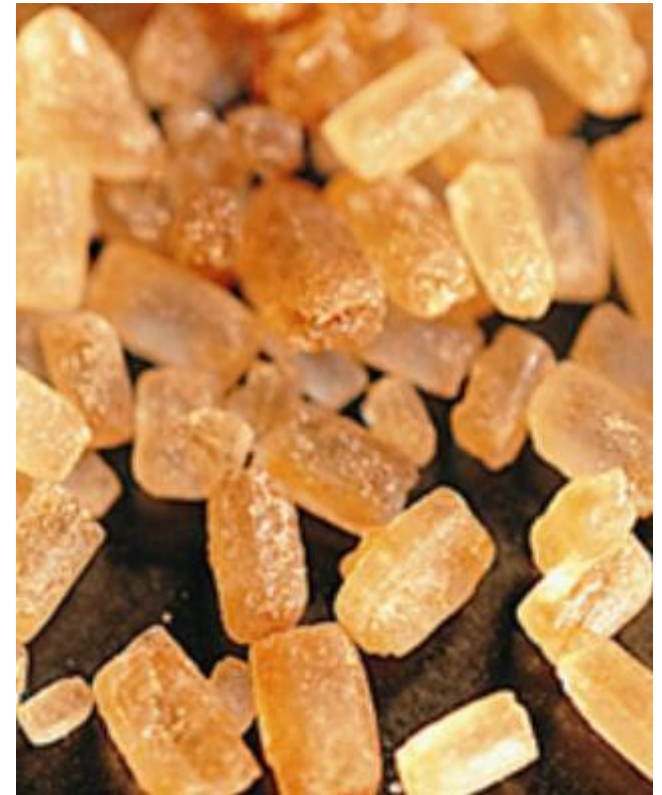


Beet and Cane Sugar - The Difference

Sucrose crystal

Syrup inclusions

Syrup layer



The difference is the quality of the syrup left on and in the crystals !

Where does the taste come from ?

.....

Components in the cane and beet syrup/molasses define the taste.

The syrup/molasses contain:

Sucrose

Glucose

Fructose

Salts

Organic acids

Amino compounds

Other components from the sugar cane or beet.

Various caramel and Maillard products from the sugar processing step



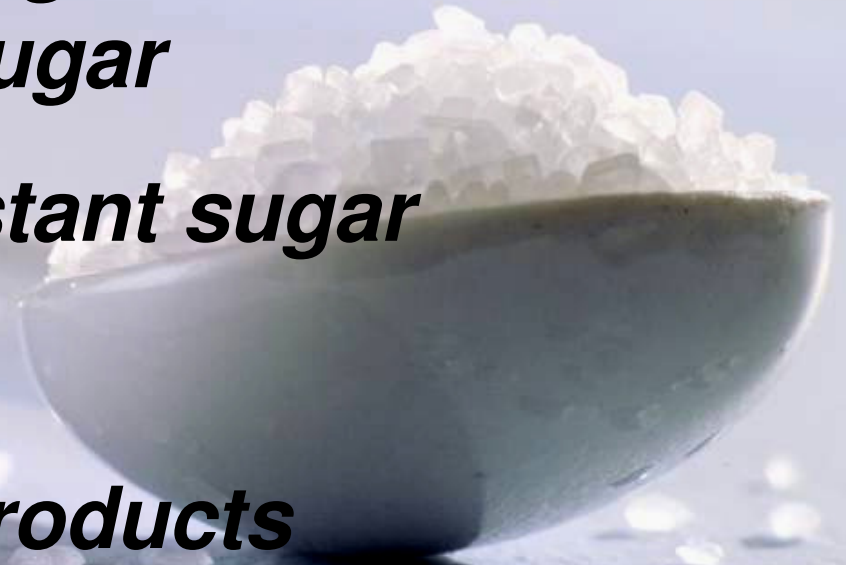
Summary of basic properties

Sweetener	Relative sweetness	Energy value, kJ/g	Energy per sweet eqv, kJ/g SE
Fructose	1,0-1,3	17	15
Glucose	0,6-0,7	17	26
Tagatose	0,9	6	7
Invert sugar	1,0	17*	17
Sucrose	1,0	17	17
Lactose	0,4	17	43
Trehalose	0,4-0,5	17	38
Maltose	0,5	17	34
Glucose syrup	0,4-0,6	17*	34
Isoglucose / HFCS	0,8-1,0	17*	19
Mannitol	0,6-0,7	10	15
Xylitol	0,9-1,0	10	11
Sorbitol	0,6	10	17
Isomalt	0,5-0,6	10	18
Lactitol	0,4	10	25
Erythritol	0,5-0,7	1	1,7

* dry basis

DRY SUGAR PRODUCTS

- *Granulated sugar, Screened Granulated Sugar*
- *Icing, Nib, Instant sugar*
- *Brown sugar*
- *Special dry products*



Granulated Sugar

Crystalline sucrose

Transparent, white sucrose crystals

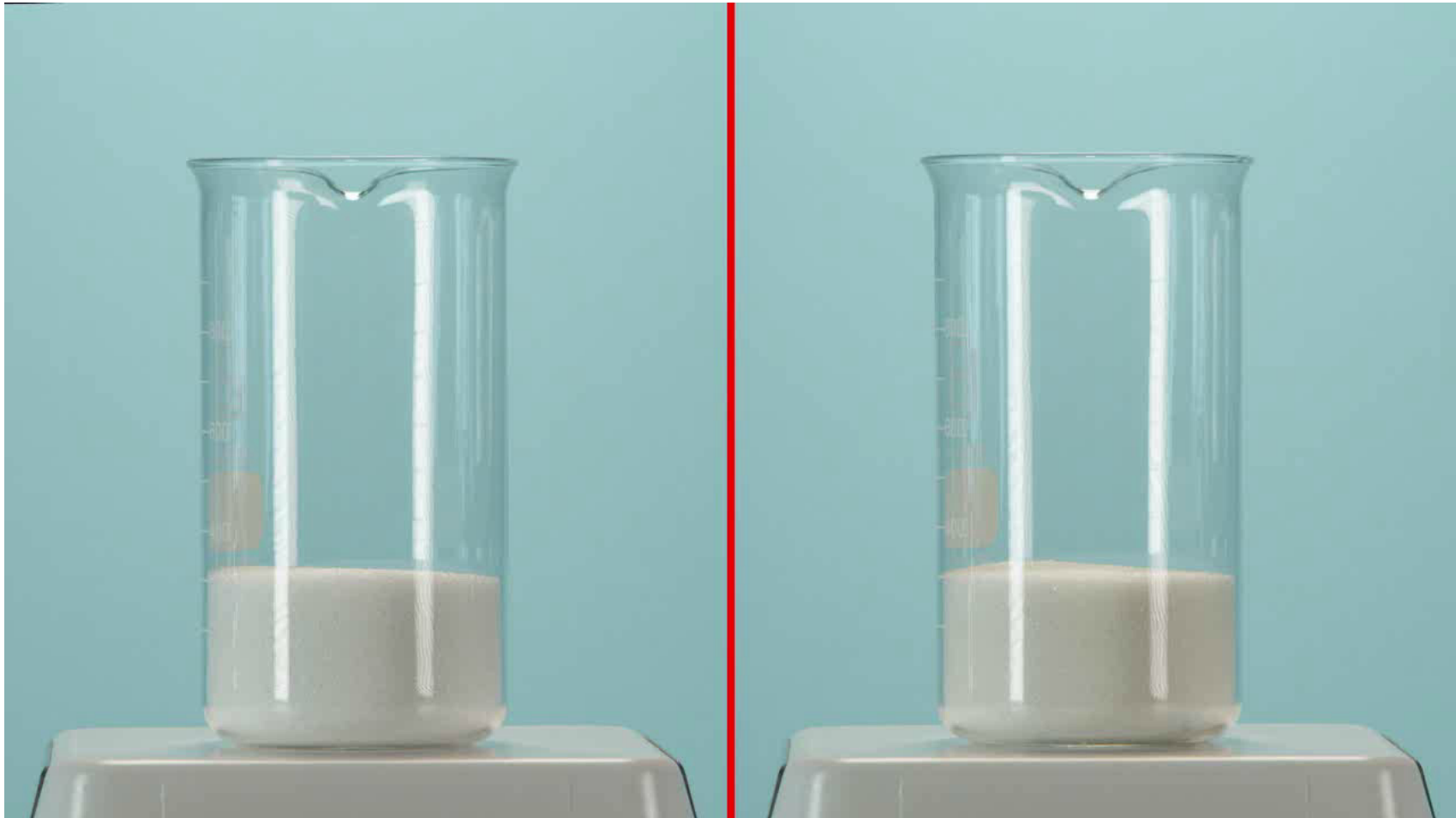
Mean crystal size varies according to market, 400-800 µm

Standard EU Qualities EU1 and EU2

	EU2/Standard	EU1/Refined
Sucrose	> 99,7 pol	> 99,7 pol
Colour	< 45	< 22,5
Ash	< 0,027 %	< 0,0108 %
Invert	< 0,04 %	< 0,04 %
Water	< 0,06 %	< 0,06 %



Comparing Foaming in EU1 and EU2 Quality Sugar



Screened Granulated Sugar

Sieved, crystalline sucrose

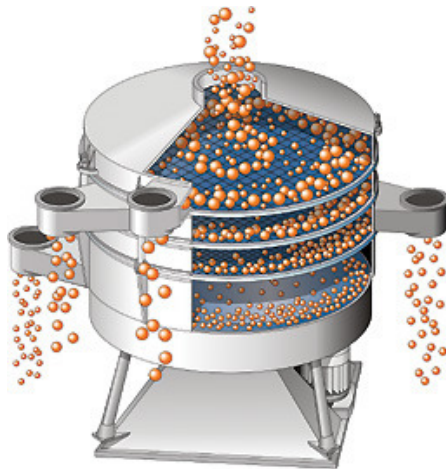
The sugar passes through vibrating screens

The crystals are separated into different size fractions

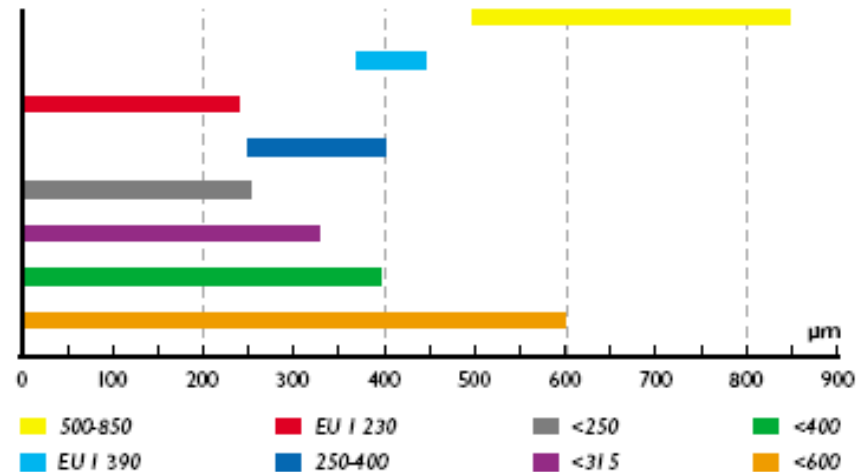
Typically large crystals are removed or both small and large crystals are removed

Available in various sieved fractions, eg. <315, <400 & 250-500 μm

EU 2 and EU1 qualities



Overview of crystal sizes



Screened Granulated Sugar

Areas of application

- Used in dry mixtures for spices, sauces, soups, desserts and beverages.
- Also used for surface treatment of pastries and confectionery and for coating confectionery.
- Suitable for pastries where a fine structure is required.

Why use screened granulated sugar

- The right crystal size reduces the risk of separation in dry mixtures and agglomerated products.
- The crystal size affects the texture of pastries.
- Powdered beverages are dissolved faster.



Icing Sugar

Milled sucrose

The sugar crystals are crushed in a sugar mill

Normally 2 % anti-caking agent is added (starch or TCP)

Anti-caking gives less lumps and better flow

Mean particle size of standard product is 20 µm

Mean particle size of extra fine product is 10 µm



Product facts	Sugar, %	Water content, %	Anti-caking agent, E-no	Anti-caking agent %	Density, kg/l	Allergens/gluten
Icing Sugar	99.8	0.05	—	—	0.65	no
Icing Sugar PS	98	0.4	Potato starch	2	0.65	no
Icing Sugar TCP	98	0.4	TCP E 34 I	2	0.65	no
Extrafine Icing Sugar TCP	98.5	0.15	TCP E 34 I	1.5	0.39	no
Decorating Icing Sugar	87	0.7	Corn starch	8	0.63	no
Organic Icing Sugar PS	98	0.4	Potato starch	2	0.65	no

The values in the table are indicative. Read more about extra finely ground sugar with a particle size <10 µm in the Fondant product sheet.

Icing Sugar

Areas of application

- Icing sugar is mainly used in fillings for biscuits, chocolate, liquorice and toffees.
- Also used for icings and sifted decoration of pastries.
- Used in the production of marshmallows, marzipan and bakery products such as meringue, pastries and pies.
- Icing Sugar is used as a crystallising agent in confectionery such as fudge.
- Organic Icing Sugar is used in organic pastries and other organic products.
- Decorating Icing Sugar is mainly used to decorate bakery products, e.g. buns, but also to bind spices to various "surfaces".



Particle size

.....

Particle size affects structure or consistency of foods - sugar only partially dissolved.

Examples:

Sugar particle size has impact on texture of cookies and sweet biscuits

Small sugar particles give a smooth or even powdery texture

Larger sugar particles give a crisper texture

Small sugar particles increase the dough spread during baking

Sugar particle size has impact on texture of icings and fillings

Particles above 25-30 μm can be sensed in the mouth



Coarse Grain Sugar

Crystalline sucrose

Large, transparent sucrose crystals

Obtained by prolonged crystallisation process

EU1 quality except for 700 μm

Applications

Mainly for decoration of cookies and pastry



Product facts	Ash, %	Colour, IU	Mean grain size, μm	Grain size, limit value, μm	Density, kg/l
Coarse Grain Sugar 700	0.02	40	650	particles > 1 000 μm max 2 %	0.8
Coarse Grain Sugar 1400	0.01	15	1 200 – 1 500	particles < 630 μm max 2 %	0.85
Coarse Grain Sugar 1500	0.01	25	1 300 – 1 600	–	0.86

The values in the table are indicative.

Nib Sugar – Pure Sucrose

Nib sugars

- Compacted sucrose crystals
- *Nib Sugar 1400, Nib Sugar 2000, Nib Sugar 3000*
- *Nib Sugar Crispy 3000*
- Decoration, filling, ice cream topping



Nib Sugar

Areas of application

- Used mainly for decoration of pastries and confectionery.
- Nib Sugar 3000 is used mainly for decoration of large pastries.
- Nib Sugar 1400 is used mainly for decoration of small pastries, e.g. biscuits.
- Colour and flavour can be added to make topping products for ice cream.
- Nib Sugar can also be used in confectionery and bakery fillings to add crispiness or as a surprising feature inside the pastries.

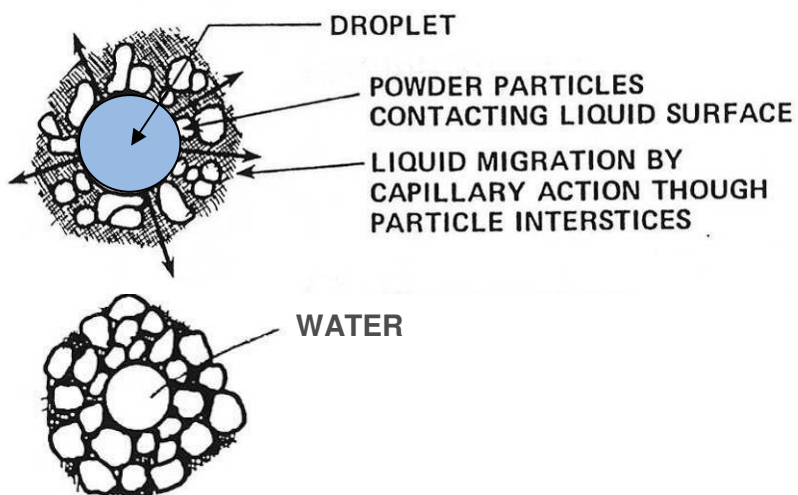


Product facts	Water content, %	Colour, IU	Mean grain size, μm	Grain size, μm	Density, kg/l
Nib Sugar 1400	0.1	20	1 400	800 – 2 000	0.78
Nib Sugar 2000	0.1	20	2 000	1 000 – 3 000	0.78
Nib Sugar 3000	0.1	20	3 000	2 000 – 4 000	0.80
Nib Sugar Crispy 3000	0.25	20	2 600	2 000 – 3 500	0.65

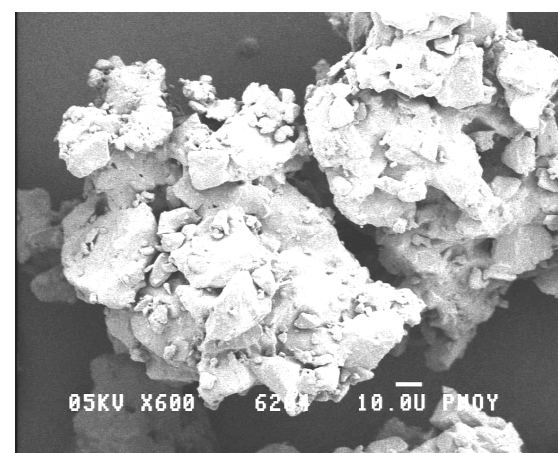
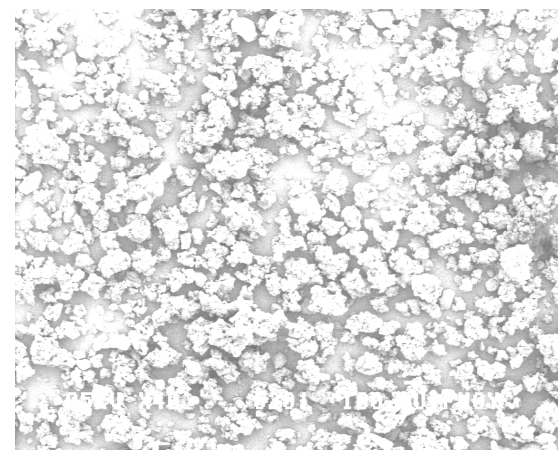
Instant Sugar

Milled, agglomerated sucrose

- Unique porous structure
- Particle size 200-400 μm , particle density 0.4-0.5 kg/l



Finely ground sugar spray-dried onto water drops



Instant Sugar

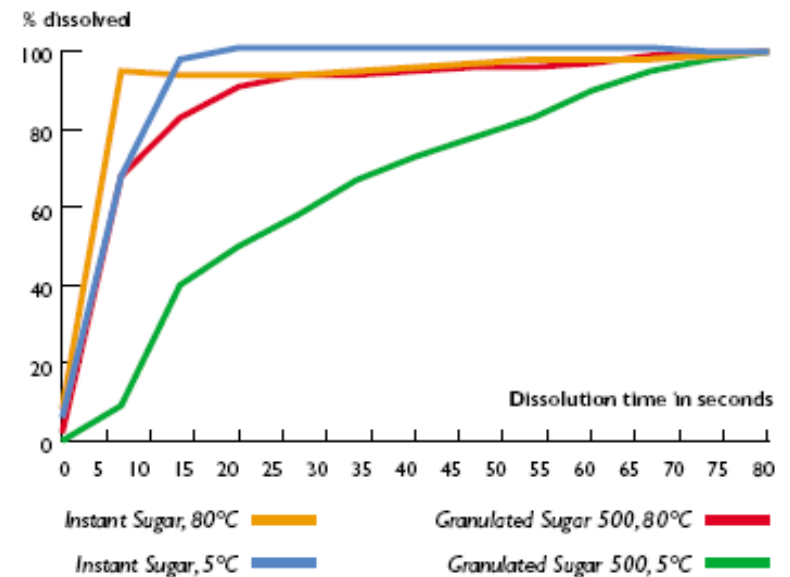
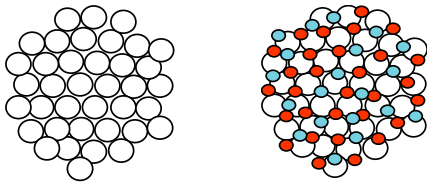
Special functional properties

Quick dissolving in hot and cold liquids

Free-flowing

Directly compressible

Binds ingredients, i.e. good carrier



Areas of application

- Vending machine products and mixtures, e.g. dry mixtures for vending machines and sports and energy drinks.
- Tablet production, e.g. tablets in the confectionery industry.
- In dry mixtures with e.g. flavours.





Brown sugar

Brown Sugar – made from beet sugar

Soft Brown Sugar

Granulated Sugar flavoured with 8-10 % cane molasses

Mean crystal size 0,55 mm

Rich aroma and flavour



Dry Brown Sugar

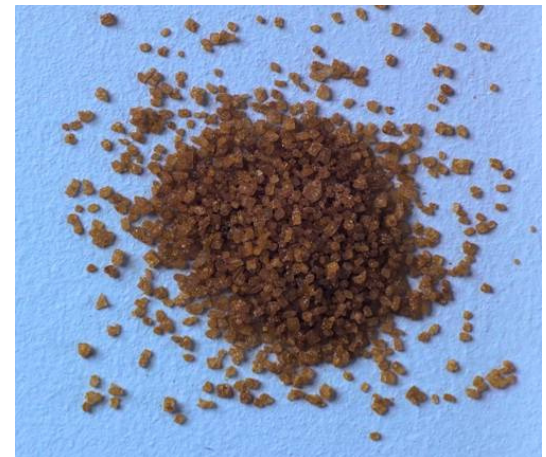
Granulated Sugar flavoured with 4 % cane molasses

Contains maltodextrin as anti-caking agent

Mean crystal size 0,50 mm

Free-flowing

Less pronounced aroma and flavour



Brown Sugar – made from beet sugar

Areas of application

- Flavour and colour additive in pastries, beverages, dressings, marinades, sauces, muesli, desserts, ice cream
- Used in bakery products such as pastries, biscuits and cakes.
- Also used in confectionery such as fudge and liquorice.
- Used as filling in pastries and confectionery (gives a crispy structure).



Brown Sugar – made from cane sugar

Demerara Sugar - Brown Cane Sugar

Crystal size 1 mm

1% cane syrup on/in crystals

Mild taste of cane syrup

*Demerara is named after a river in Guyana,
South America*

Produced in many countries

Our product is Fair Trade from Malawi



Brown Sugar – made from cane sugar

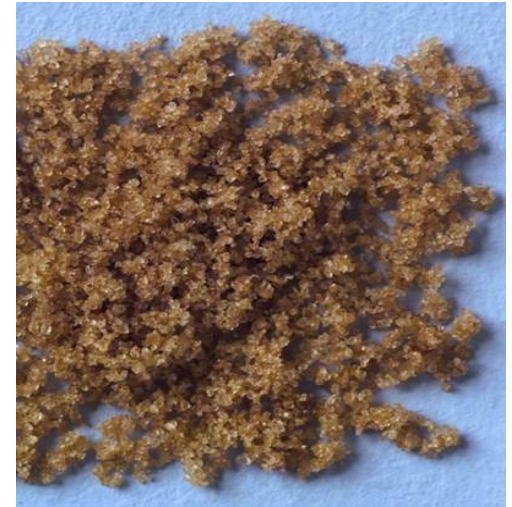
Light Muscovado is a slightly moist, light brown cane sugar

Crystal size 0,3-0,4 mm

5% cane syrup on/in crystals

Mild taste of cane molasses and caramel

Produced in Mauritius



Dark Muscovado is a moist, brown cane sugar

Crystal size 0,3-0,4 mm

10% cane syrup on/in crystals

Strong taste of cane molasses, liquorice and caramel

Produced in Mauritius



Brown Sugar

Why use Brown Sugar?

Sweetness

Taste

Colour

Storytelling

Areas of application

- Addition of taste in and decoration of desserts, ice cream, pastries and chocolates.
- Addition of taste in dressings, marinades, sauces and spices.



Product facts	Sugar, %	Water content, %	Colour, IU	Mean grain size, mm	Flavour profile	Density, kg/l	SO ₂ , mg/kg	Microbiological values, max CFU/10 g		
								Total number	Yeasts	Moulds
Demerara Sugar	98.5	0.2	1 500 – 2 500	0.90 – 1.20	Full-bodied flavour	0.90	max 40	5 000	1 000	1 000
Light Muscovado Sugar	94 – 95	2	7 000 – 10 000	0.30 – 0.40	Toffee-like flavour	-	max 40	100 000	10 000	1 000
Dark Muscovado Sugar	89 – 91	4.5	24 000 – 28 000	0.30 – 0.40	Liquorice-like flavour	-	max 40	100 000	10 000	1 000



Special Dry Products

Decoration Sugars – White and Moisture Resistant Sugars

Decoration Icing Sugar

Icing sugar coated with a vegetable fat and starch



Decoration Sugar

Fine granulated sugar coated with vegetable fat and starch



Decoration Nib Sugar

Nib Sugar coated with a high-melting vegetable fat



Decoration Sugar

.....

Packed Doughnuts – i.e. humid storage conditions

Screened Granulated Sugar EU1 390



Decoration Sugar 390



Day 1

Day 4

Decoration Sugars

Areas of application

- Decoration Icing Sugar is used for decorating cooled bakery products such as cakes, tarts and iced buns.
- Decoration Sugar is mainly used for decorating doughnuts and Swiss rolls.
- Decoration Nib Sugar is used for decorating cinnamon buns, Danish pastry and other sweet bread and cakes.
- All Decoration Sugars can be used as a finish on confectionary.

Why use Decoration Sugars

Improved shelf life, especially under humid and cold conditions

Decoration Nib Sugar more heat tolerant

Less dust and better flow in dosing equipment



Decoration Sugar Take Up Water Very Slowly



Dry Fondants

A mixture of sugar and dried glucose syrup
Very small particle size, approx. 10 µm, for optimal mouthfeel

Available in white and red colour
Constant quality



Product facts	Sugar, %	Water content, %	Mean grain size, µm	Density, kg/l	Gluten	Declaration
Dry Fondant	92	0.7	8–12	0.33	no	sugar, glucose syrup
Dry Red Fondant	92	0.7	8–12	0.33	no	sugar, glucose syrup, food colouring (Carmine/E120)

Dry Fondant for Water or Fat Based Fillings

Quick and simple manufacturing process :

Water based fillings

mix Dry Fondant, invert sugar and glucose syrup

Fat based fillings

mix Dry Fondant, fat + taste and colour components

Smooth mouth feel

Low investment costs



Product facts	Sugar, %	Water content, %	Mean grain size, µm	Density, kg/l	Gluten	Declaration
Dry Fondant	92	0.7	8–12	0.33	no	sugar, glucose syrup
Dry Red Fondant	92	0.7	8–12	0.33	no	sugar, glucose syrup, food colouring (Carmines/E120)

Sandings for Decoration and Flavouring

New ideas and possibilities for product development

Different appearance

- Colours
- Other ingredients etc. spices

Special tastes

- Flavours
- Acids
- Salmiac
- Spices
- Other ingredients

Product advantages

- Dust free
- Constant / uniform quality
- Improved shelf life through fat coatings



Sandings and special blends

Areas of application

- Sanding Sugars are used primarily for decoration of confectionery and bakery products.
- Also used in fillings in bakery products and confectionery.
- Topping for ice cream.
- Surface treatment of confectionery, such as sour coating.
- The products can be used in dry mixtures for vending products, cake mixes, sweet sauces and custards, confectionery and jams.
- The products – for instance sugar with cinnamon – can be used in dry mixes for cake and pastry fillings.
- Sugar with HIS can be used for drinks, sweet sauces and custards etc.
- Sugar with pectin can be used for dry mixes containing berries for making jams, desserts or jellies.



LIQUID SUGAR PRODUCTS

- *Liquid Sucrose*
- *Liquid Invert Sugar*
- *Syrup*
- *Special Liquid Products*

Liquid Sucrose

Sucrose dissolved in water

The water is typically demineralised or at least decalcified

Qualities from Bottlers to semi-refined (SFL). Organic Liquid Sugar.

Product facts	Sucrose, %	Colour, IU	Density, 20°C, kg/l	Viscosity, 20°C, cP	Shelf life	Microbiological values max CFU/10 g D.S.E*		
						Total number	Yeasts	Moulds
Sugar Solution 65 %	65	max 25	1.32	150	2 weeks	200	10	10
Sugar Solution 67 %	67	max 25	1.33	230	3 weeks	200	10	10
Liquid Sugar SFL 65 %	65	max 75	1.32	150	2 weeks	200	10	10
Organic Liquid Sugar 62 %	62	max 80	1.30	120	1 week	200	10	10
Organic Liquid Sugar 65 %	65	max 80	1.32	150	2 weeks	200	10	10
Organic Liquid Sugar 67 %	67	max 80	1.33	230	3 weeks	200	10	10

*D.S.E = Dry Sugar Equivalent

The values in the table are indicative. Read more about other liquid products with higher levels of dry matter in the product information sheet on Liquid Invert Sugar, Syrup and Organic Sugar.

Product	In 700 kg steel container <i>only Sweden</i>	In 1300 kg One-way plastic container
Sugar Solution 65%	1 months 2 weeks after opening*	1 months 2 weeks after opening*

*) at controlled conditions

Issues to consider when choosing liquid sucrose

Easy transport / handling compared to dry

Easier dosing in application

No processing time for dissolution

Potentially less waste

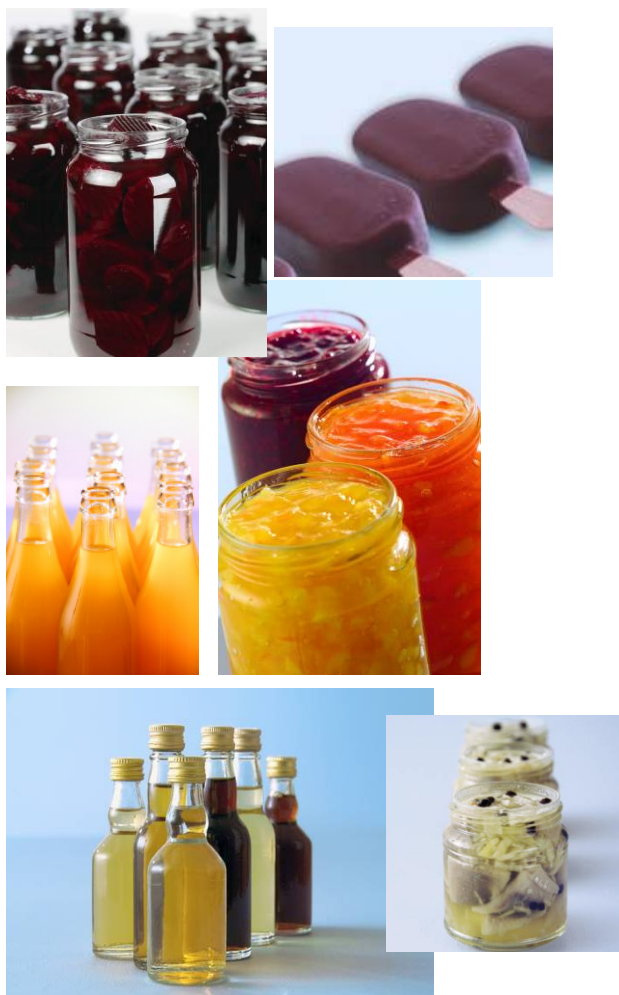
33-35 % of the product is water

Transport costs

Focus on hygiene in all parts of the supply chain



Liquid Sucrose



Areas of application

- Liquid Sucroses will reduce the number of process steps in the production and are best suited for foods containing water.
- Mostly used in the soft drinks industry, but also in the production of ice cream, dairy products and groceries.
- Sugar Solution 65 % and Neste 67 S are suitable for beverages of extra high quality, without the risk of flocculating substances.
- Liquid Sugar Special 65 %, which is delivered cooled, is used in processes where quick cooling is required, e.g. in the production of pickled herrings.
- Liquid Sugar SFL 65 % is used for products which have their own flavour and colour, such as marmalade, jam, pickled vegetables, sauces, ketchup and mustard.
- The products can also be used for non-food applications such as substrate in industrial fermentation.

Liquid Invert Sugar

A liquid mix of invert sugar and sucrose

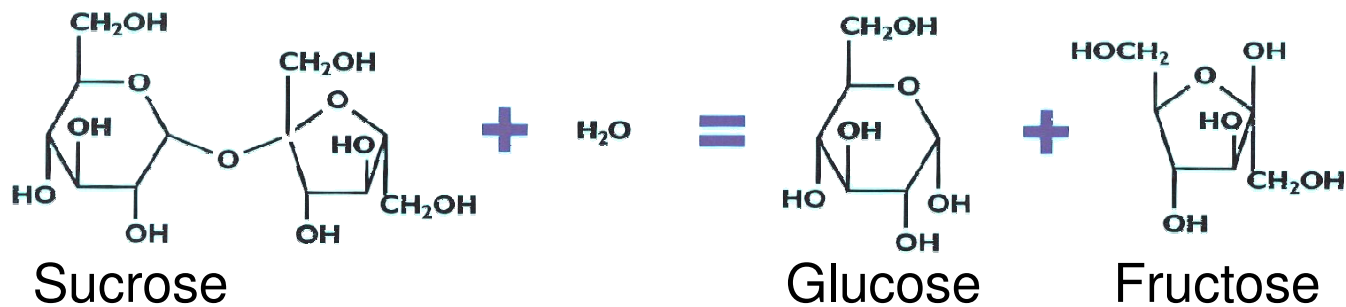
Fully inverted (nearly all sucrose converted to invert)

- Liquid Invert 68%
- Liquid Invert 73%

Partly inverted (only part of the sucrose converted to invert)

- Liquid Sugar DI 76

Both are produced from liquid sucrose



Why use invert sugar ?

The fructose part enhances the taste profile of fruits and berries

Beverages, juices, yogurts, jams, fruit fillings



Glucose & fructose give higher freezing point depression than sucrose

Improved water crystallisation in ice cream & frozen desserts



Fructose binds water better than sucrose & glucose

Soften hearings faster than sucrose

Keep moisture in bakery products

Glue müsli products together



Glucose & fructose participate & facilitate browning reactions when heated.

Bakery products, müsli, cereals



Why use invert sugar ?

.....

Low pH products, sucrose is inverted. By using invert no change will happen during production and storage

Soft drinks, preserved food, jams



Glucose & fructose prohibits sucrose crystallisation at high concentration

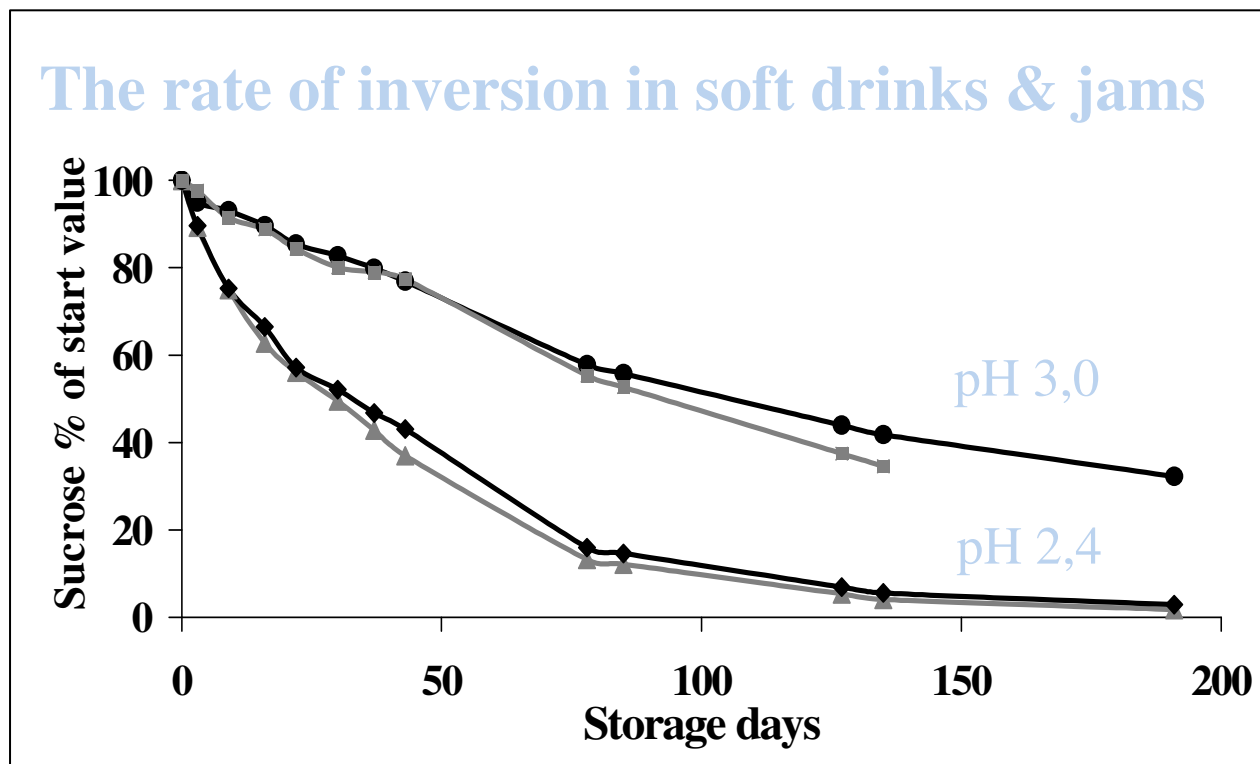
Confectionery gums, hard boils, canned fruits



Glucose is more readily available for yeast

Faster fermentation in dough

Rate of sucrose inversion in products



Liquid Invert and Sugar Solution in container



Nordic Sugar
Member of Nordzucker Group

Product	In 700 kg steel container <i>only Sweden</i>	In 1300 kg One-way plastic container
Liquid Invert 68%	6 months 2 weeks after opening*	6 months 2 weeks after opening*
Liquid Invert 73%	6 months 2 weeks after opening*	6 months 2 weeks after opening*
Sugar Solution 65%	1 months 2 weeks after opening*	1 months 2 weeks after opening*
Liquid Sugar DI 76%	6 months	6 months



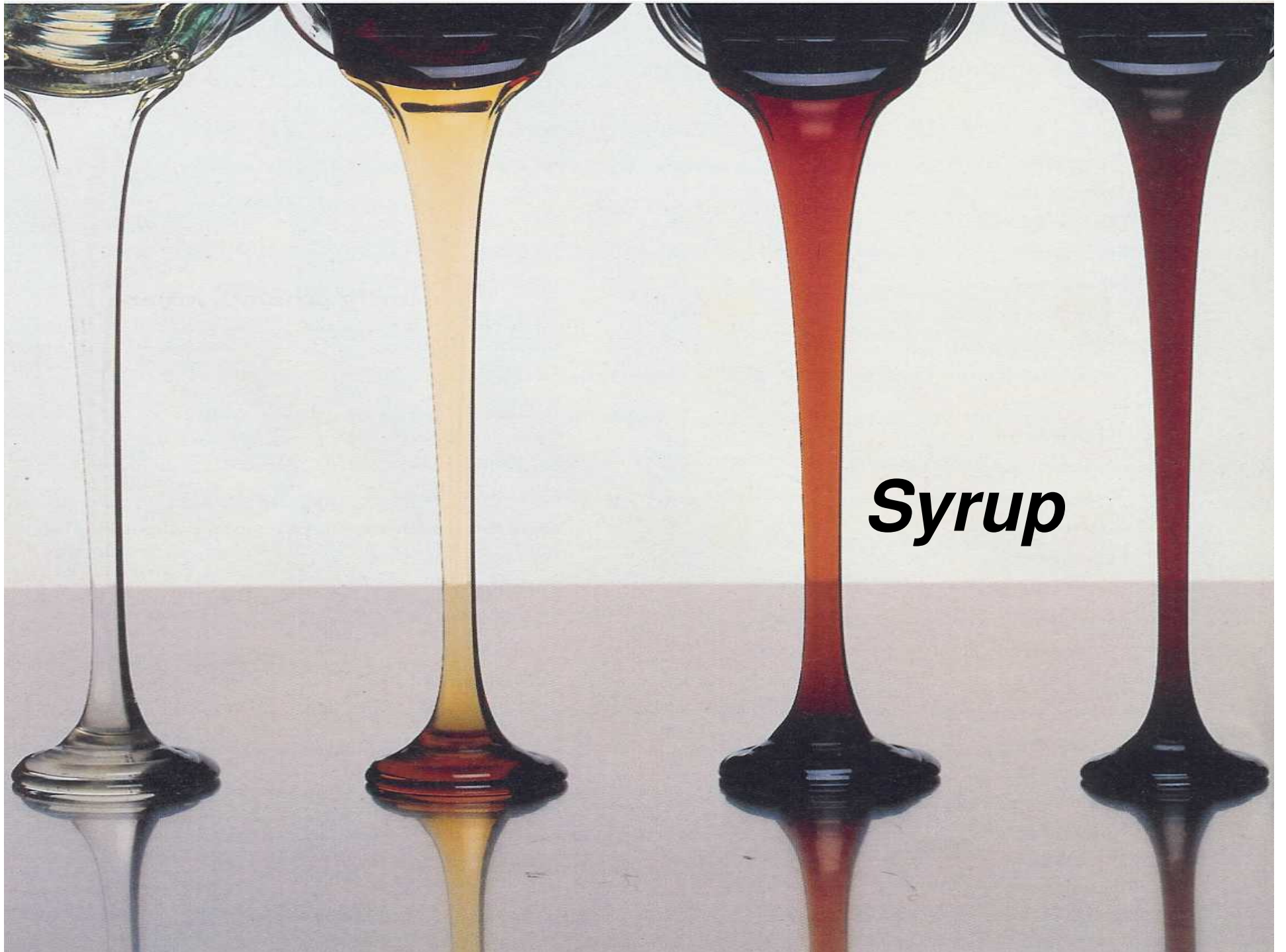
*) at controlled conditions

Liquid Invert Sugar

Areas of application

- Beverages
- Ice cream and dairy products
- Patisserie and bakery products
- Confectionery
- Canned Food
- Fermentation





Syrup

Syrups

Natural Sweetening, Flavouring and Colouring

Syrup is liquid invert sugars with various amounts of beet and cane molasses

Syrups are typically 60% inverted

Dry substance composition:

- 40% sucrose
- 30% glucose
- 30% fructose

The ratio between the different sugars prevents crystallization.

The dry substance is typically 80%, which give a long shelf life.



Syrup

Standard assortment (80% ds)

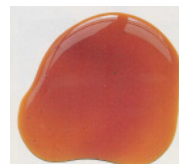
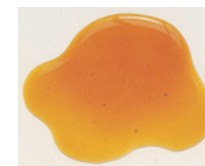
White Bakery Syrup
Yellow Bakery Syrup
Brown Bakery Syrup
Dark Brown Bakery Syrup
Black Bakery Syrup

White Syrup
Yellow Syrup
Brown Syrup
Dark Brown Syrup
Black Syrup

Malt Syrup
Caramel Syrup (76 % ds)

New Idea Sirups (not in stock)

Brown Farin Syrup
Muscovado Syrup
Honey Syrup
Syrup with maple flavour
Customer specific flavouring



Product fact Syrup

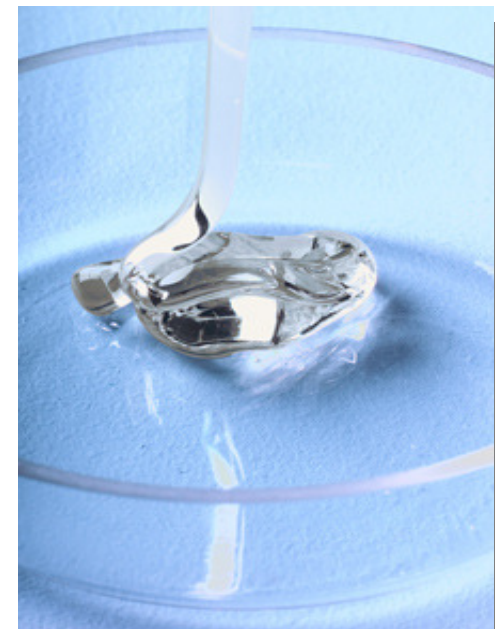
Product	Colour, IU	Viskosity, 20 °C, cP	Density, 20 °C, kg/l
White Syrup	70	7 200	1,41
White Bakerysyrup	150	7 200	1,41
Yellow Syrup	1 300	7 500	1,41
Yellow Bakerysyrup	4 000	7 500	1,41
Brown Syrup	9 500	7 800	1,41
Brown Bakerysyrup	20 000	7 800	1,41
Darkbrown Syrup	33 000	8 800	1,41
Darkbrown Bakerysyrup	45 000	8 800	1,41
Black Syrup	85 000	14 000	1,41
Black Bakerysyrup	80 000	11 000	1,41



Syrups - Taste, Colour and Smooth Texture

Syrups provide :

- Sweetness
- Taste & flavour (caramel, liquorice...)
- Colouring of crumb and crust (Maillard, caramelization)
- Keep moisture in bakery products
- Improve gluten bond formation in dough /bread
- Improve starch gelatination in dough /bread
- Invert sugar syrup gives a more aerated structure than sugar → more soft and "fresh" product
- Moistness → texture softening especially low fat products



Convenience

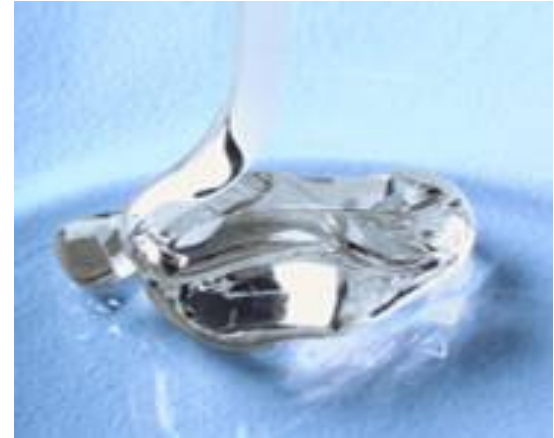
Customised Liquid Sugar Blends

Liquid blends of sucrose, invert sugar and other ingredients as

- other sweeteners, glucose syrups, HIS
- flavours, fruit extracts
- textural ingredients
- high dry substance (85%)

The blends can be tailored to support our customers end-products.

Bulk or one-way containers.



Confectionery Sugar Blends


.....

Development and optimisation of the customers recipes.

Potential advantages :

- Reduced need for tanks & mixers
- Reduced processing time for blending
- Increased utilisation of production capacity
- Reduced energy consumption
- Reduced errors / waste





Thank You
for Your Attention

Mix of Sucrose and Invert sugar – Saturation Curves

