

SUGAR, SWEETENERS & FUNCTIONAL FOOD FORMULATION

SAAFoST Sugar Talk

22 May 2018

What is Sugar?

- Building blocks of carbohydrates, typically simple sugars i.e. monosaccharides and disaccharides, but also polysaccharides
- Typical products used in Food industry include Sucrose, Glucose & Fructose
- Sucrose more commonly known as “sugar”, though the term may refer to other saccharides
- Typically sourced from sugar cane and beet, though can also be from other sources

What is added sugar?

- Any sugar not naturally present in a foodstuff is classified as “free” or “added”
- Generally added during production/processing of foodstuffs
- Declared on labels under “Total Carbohydrates – Sugars”
- Agave syrup, Honey, Deflavoured fruit juice

SUGARS USES IN INDUSTRY



Uses of sugar in Foodstuffs

- Main application..... Sweetener!
 - *Beverages, Sauces, Medicine and General cooking*
- Volumiser..... Adding bulk
 - *Baked goods (cakes and biscuits), Dry goods*
- Texturiser..... Mouthfeel
 - *Confectionery (sugar), Beverages, Baked goods, Ice cream*
- Preservative..... Water binder/Osmotic pressure
 - *Jams & marmalades, Confectionery (sugar), Desserts*

Uses of sugar in Foodstuffs..... Continued

- Taste..... Flavour/Caramelisation
 - *Sauces, Desserts and general cooking*
- Colour..... Caramelisation/Maillard-reaction
 - *Baked goods (breads, cakes and biscuits), Desserts*
- Processing aid..... Fermentation/Leavening
 - *Alcoholic beverages, Baked goods*

WHAT DRIVES SWEETENER CHOICES?



Sweetener choices

- Active consumerism – Healthy choices, Clean label
- Regulatory frameworks – Allowed vs. disallowed
- Organoleptics – Taste and textural profile
- Functionality – Caloric content, inertness, cost

Sweetener choices Continued

- In a survey conducted in the US (Circa 2015):
- 51% respondents would want to reduce sugar intake
- 5% was not interested in any change

SOURCE: Customer Report – What sways sweetener choices (Food Product Design)

Calorie reduction

- Sugar replacement or elimination not an easy task
 - *Replacement product may not be effective in main objective*
- Changes in product characteristics and/or cost structure
- Consider consumer preferences (sensorial / nutritional)

Calorie reduction..... Continued

- Sugar alternatives such as non-nutritive sweeteners and/or bulking agents offer limited solutions – taste, colour, preservation, texture, etc.
- Combinations of sugar with alternatives or combo's of alternatives
 - *Isomalt, Aspartame, Sorbitol, Erythritol, Sucralose, Xylitol, Stevia, Lactitol, Maltitol, Monk Fruit, etc.*
- Sugar alcohols generally for bulking and NNS for sweetening/taste enhancement

Calorie reduction..... Continued

STEVIA: FROM FARM TO FRIDGE

WHAT IS STEVIA?

A sweetener from natural sources which we have been using to reduce the sugar and calories in some of our drinks, such as Sprite and Coca-Cola Life.

THE LOWDOWN ON STEVIA



A natural sweetener

The indigenous people of Paraguay have used powdered stevia leaves for centuries to sweeten their drinks.



A sweet, delicious taste

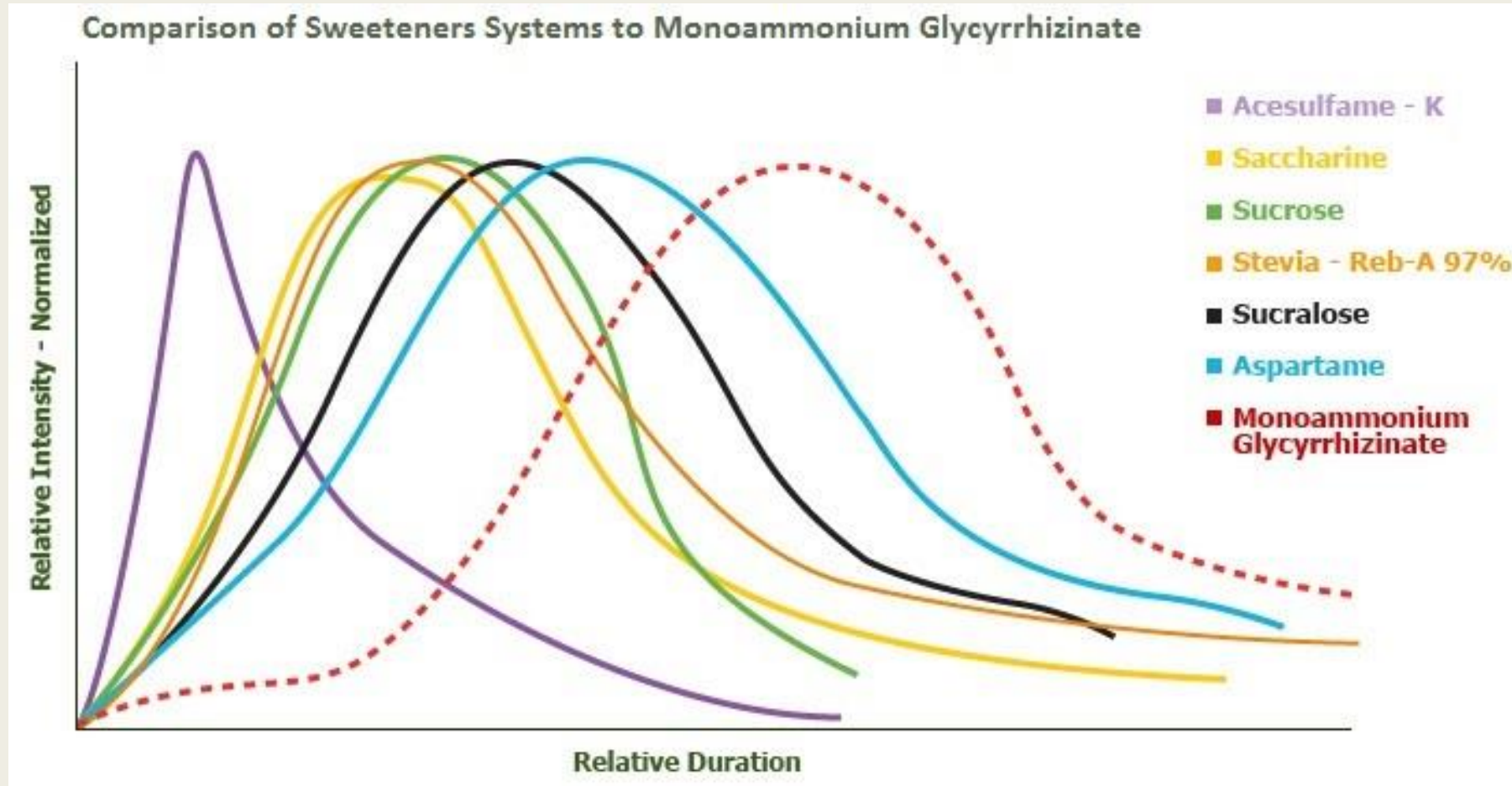
The sweet-tasting parts of stevia are found in leaves, and are extracted from there.



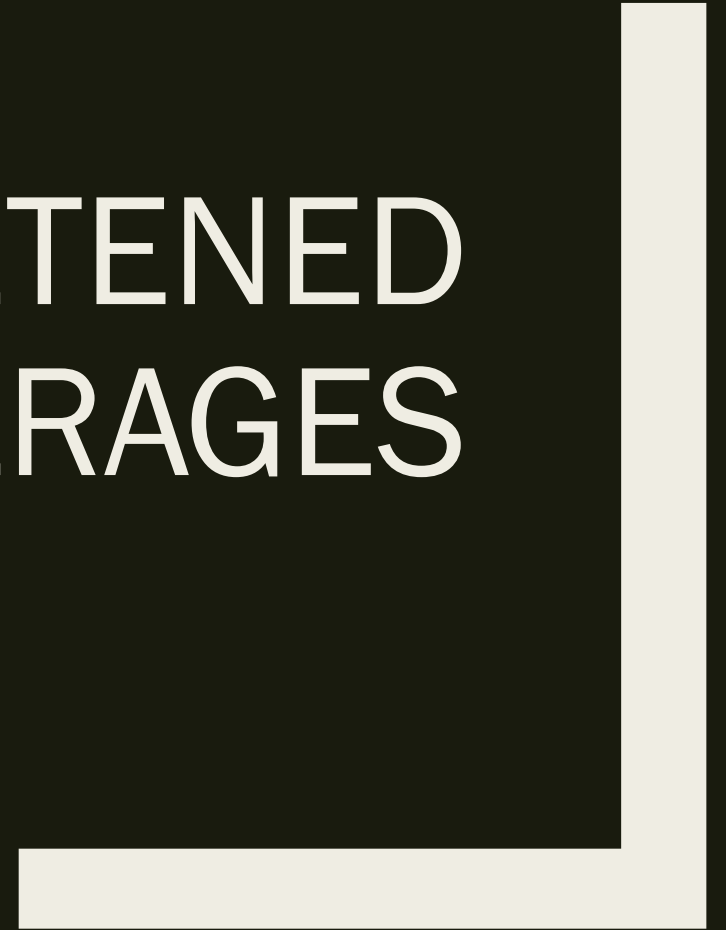
A zero-calorie sweetener

Sweeteners made from stevia are up to 200 times sweeter than table sugar and calorie-free.

Calorie reduction..... Continued



SUGAR SWEETENED BEVERAGES



Sugar Tax Introduction

- Reduced sugar content
- Reduced portion sizes
- Improved consumer communication????

Sugar Tax Implication

- Price calculation on same pack size
- Sugar in use will become more expensive at around R 0.02/gram i.e. DOUBLE!!!
- If cost is R 10.00/kg current cost = R 1.20/ltr (12° Bx)

Tax at R 0.21/gram over 4% = R 1.68/ltr

Revised total cost now = **R 2.88/ltr**

- Replace 2/3 sugar with sweetener (SRT 300)

Sugar @ R 0.40/ltr + SRT 300 @ **R 0.09/ltr** = **R 0.49/ltr**

Sugar-free offerings



Energy:	180 kJ/100ml	1 kJ/100ml	1 kJ/100ml	106 kJ/100ml
Glyceamic Carb's:	11%	0%	0%	6.6%
Sweetener/s:	Sugar	APM/Ace-K	APM/Ace-K/SUC	Sugar/Stevia

Sugar-free offerings



Energy:

Glycemic Carb's:

Sweetener/s:

628 kJ/100g

38-41%

Sorbitol

767 kJ/100g

50% (5.2%)

Polydextrose,
Isomalt, Ace-K,
Cyclamate

392 kJ/100ml

25% (12.1%)

Polydextrose,
Sorbitol, Polyfructose,
APM, ACE-K, Maltodex.

Sugar-free offerings



Energy:
Glyceamic carb's:
Sweetener/s:

1,380 kJ/100g
55% (7% Sugars)
SUC/ERY/STEVIA

588 kJ/30g
41% (8% Sugar)
Maltitol

126 kJ/16g
100% (0% Sugar)
Isomalt/Sucralose

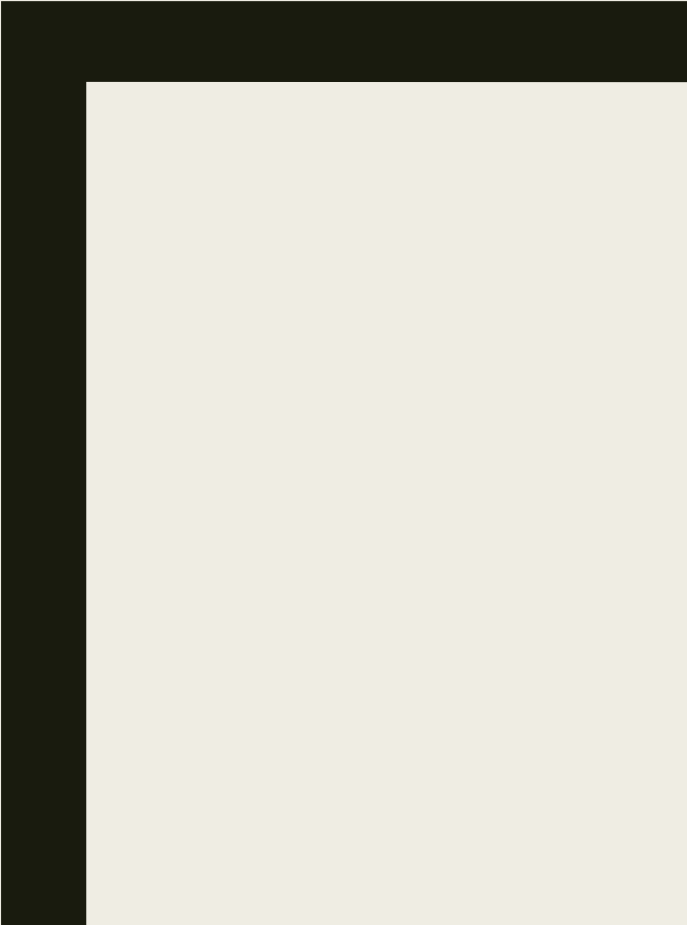
Moderation in consumption is key

- **“Reduced-calorie and reduced-fat foods and beverages** will not replace a person’s need for moderation and overall good nutrition. However, they do provide palatable alternatives which can make the difficult task of reducing fat and calories in the diet easier. Thus, **when incorporated into a nutritionally balanced diet, these products can contribute positively to a healthy lifestyle.”**

- <https://caloriecontrol.org/multiple-ingredient-approach/>

THANK YOU FOR YOUR ATTENTION

David Kruger
Email: David.Kruger@lake.co.za



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THE EUROPEAN FOOD INFORMATION COUNCIL

CHEMICAL ECONOMICS HANDBOOK

PREPARED FOODS (WWW.PREPAREDFOODS.COM)

INTERNATIONAL SWEETENERS ASSOCIATION (WWW.SWEETENERS.ORG)

SWEETENER SOLUTIONS (2009)

