

## Non-Natural Alternatives to Sugar (Low or No Calorie Artificial Sweeteners)

### Aspartame:

- 200 times sweeter than sugar and is metabolised into its two component amino acids - aspartic acid and phenylalanine.
- Contains 4 calories per gram, but since so little is used it only provides trace cal/serving.
- It comes closest to sugar's taste profile among approved artificial sweeteners.
- It is not safe for those with the rare but serious metabolic disorder phenylketonuria (PKU).

### Acesulfame K (potassium):

- A zero calorie sweetener 200 times sweeter than sugar.
- It is derived from acetoacetic acid and fluorosulfonyl isocyanate.
- It is not metabolised by the body.
- It still stimulates the secretion of insulin that may lead to reactive hypoglycaemia - due to the lack of actual circulating blood sugar.

### Potential problems with artificial Sweeteners:

- It is still unclear how the body responds to being primed for an influx of sugar that it never receives.
- Sweetness that is not associated with calories only partially activates food reward pathways and leads to a lack of satiation.
- Their use can lead to taste distortion and increased appetite for intensely sweet, highly calorific food.
- May fool the brain into thinking that it needs to release more insulin, which could lead to insulin resistance and diabetes.

### The Bottom Line:

Manufacturers have been trying to mimic sugar for over a century, but it is only the most natural form i.e. glucose (obtained from carbohydrates) that our body can utilise effectively. However, it is important to remember to consume any sugar in moderate quantities.



**FOODinFOCUS**

**SUGAR AND SUGAR  
SUBSTITUTES**

**Welcome to Vacherin's food in focus.**

Each month our nutritionist Gary Baverstock will provide some basic science with the aim of helping to demystify certain foods in our diet.

## Sugar:

Sugar is a simple carbohydrate made by plants, which can either be classified as a monosaccharide (single sugar unit) or a disaccharide (two monosaccharides).

### Monosaccharides

#### Glucose

Sugar in the blood

#### Fructose

Fruit Sugar

#### Galactose

Sugar Beets

### Disaccharides

#### Sucrose

Table sugar

#### Lactose

Milk Sugar

#### Maltose

Malted (barley) Beer

## Glucose:

- The most important monosaccharide - body's preferred energy source (blood sugar).
- The body processes most carbohydrates into glucose, either to be used immediately for energy or to be stored in muscle cells, or the liver as glycogen for later use.
- Insulin, a hormone, is secreted primarily in response to elevated blood concentrations of glucose and facilitates the entry of glucose into cells.

## Sucrose:

- Sucrose - known as table sugar is obtained from sugar cane or sugar beets.
- Fruits and vegetables also naturally contain sucrose (equal parts glucose and fructose).
- Body converts fructose into glucose before use as energy in the liver.
- A high intake of sucrose, due to the fructose content, can cause raised fat synthesis and corresponding fat deposition.

## Fructose (+ any fructose products like high fructose corn syrup - HFCS)

- Found naturally in many fruits and vegetables and is not the preferred energy source.
- High levels in diets - added to various beverages such as soda and fruit-flavoured drinks.
- Metabolised by the liver, not by insulin, but cannot process high levels to use as energy.
- The liver produces fats instead and sends them off into the blood stream as triglycerides.
- Unlike glucose it does not cause insulin to be released or stimulate production of the hormones for regulating energy intake and expenditure. This is known to be a common problem in obesity.

## Natural Alternatives to Sugar

### Stevia:

- A natural, high intensity, zero calorie sweetener from the stevia leaf.
- The active compounds in the plant are 200 times sweeter than sugar.
- Stevia's taste has a slower onset and longer duration than the taste of sugar.
- Stevia is metabolised in the intestines and is not absorbed by the gut.
- Does not affect blood glucose levels or cause the same detrimental effects as sugar.
- Needs to be used in small amounts and is more useful for sweetening beverages.

### Xylitol:

- Despite its synthetic sounding name, the natural sugar alcohol looks and tastes like sugar.
- Produced from the bark of birch trees, some fibrous vegetables and even by the body.
- One gram of Xylitol contains 2.4 calories, as opposed to 4 calories in sugar (40% less).
- As it not completely absorbed by the gut, it has a GI of 7 (100 for sugar) and has less of an impact on blood sugar levels.
- However, consuming large amounts (30 to 40 grams at a time) can cause diarrhoea and flatulence, which can be prevented if eaten in incremental amounts gradually.

### Agave nectar:

- Agave syrup is produced from the starch of the agave plant, just as high-fructose corn syrup is manufactured from the starch of corn.
- It is 1.5 times sweeter than sugar & is comprised primarily of fructose (47-56%) and glucose (16-20%), so you would have to use less.
- It has a lower GI than sucrose, but is comparable to that of fructose.
- High fructose levels can lead to resistance to insulin and dramatic increases in triglyceride levels, because the body is unable to readily use it for energy.

