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Review Article

THE UNBIASED TRUTH ABOUT ARTIFICIAL SWEETENERS

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ABSTRACT

Sugar contribute to tooth decay and obesity but still we spoon it. Artificial sweeteners are used in one of two ways. They may be used directly in commercially processed foods or they are mixed with one or more starch based sweeteners before sale to consumers. Artificial sweeteners are so intensely sweet so small Amounts are required to imitate sugars sweet taste. In this review paper, it is going to discuss about the basic five Artificial sweeteners like Aspartame, Acesulfame, Saccharin, Sucralose and Neotame.

KEYWORDS

Artificial sweeteners, aspartame, saccharin, sucralose and neotame.

INTRODUCTION

Change in life style and eating habits led to an increases obesity with the World Health Organization reporting 12% of the adult population being obese (WHO, 2012). A wide range of products are available for use to substitute for sugar in products. Recently, the reduce calorific value of high sugar food products have resulted in food manufacturers replacing sugars with a range of products including natural sweeteners. It is important to note that these products may offer a sweetness rating far greater than that of sugar but may not provide any of the technical functions of sugar and vice – versa. The objective of this article is to provide information and highlight some of technical considerations necessary when addressing sugar reduction.

FSSAI Approved Artificial Sweeteners which can be used in our products:

Artificial Sweeteners
Saccharin Sodium
Aspartame
Acesulfame potassium
Sucralose
Neotame

Table 1. *fssai* Approved Artificial Sweeteners [1]

FDA has approved the use of five artificial sweeteners; each one is far sweeter than regular sugar. They include:

Artificial Sweeteners	Brand name
Aspartame	NutraSweet, Equal
Acesulfame-K	Sunett, Sweet one
Saccharin	Sweet 'N Low, Necta Sweet
Sucralose	Splenda
Neotame	No brand names

Table 2. FDA Approved Artificial Sweeteners

Aspartame:

Aspartame is a white, odorless crystalline powder and consists of two Amino Acids. L-aspartic acid and L-phenylalnine. It is a low calorie sweetener that is 200 times as sweet as natural sweeteners.[2] It is used as a sugar substitute in many food items including low calorie soft drinks, sugar free chewing gum and as table top sweeteners. Aspartame, for its safety, has been very controversial. Since its approval in 1981. It is thought that it tricks the body into storing more fat and including diabetes. Recently, the European Food safety Authority (EFSA) concluded in 2013 that aspartame was safe for human consumption including pregnant women and children. However, since its breakdown products include phenylalanine, aspartame must be avoided by phenylke tonriaces and must be labeled “contains source of phenylalanine”. It acceptable daily intake in 40 mg/kg body weight.

As per FSSAI Aspartame is recommended for the use in food for the following:

- Carbonated water and soft drinks (700ppm)
- Biscuits, breads, cakes and pastries (2200ppm)
- Sweets (200 ppm)
- Chocolate (2000ppm)
- Ice cream, frozen dessert (1000ppm)
- Yoghurt(600 ppm)
- Non carbonated water based beverage(600 ppm)
- Chewing Gum/Bubble Gum(1000ppm)
- Flavored milk (600ppm)
- Jam, Jellies, Marmalades (1000ppm)

Acesulfame Potassium:

Acesulfame potassium also known as Acesulfame K. it is a calorie free sweetener, 200 times sweeter than natural sugar and as sweet as aspartame.[3] It is a unique Sweetener among all the other sweetener because it is completely broken down by the body to its components into amino acid, aspartic acid, phenylalanine and small of ethanol. Acesulfame K is used in a large number of food products like jams, dairy products, frozen dessert, chewing gum, soft drinks and as a table top sweeteners. The daily intake of Acesulfame is 9mg/Kg body weight.[4]

As per FSSAI Acesulfame Potassium is recommended for the use in food for the following:

- Chocolate(500ppm)
- Soft drinks(300ppm)
- Sweets(500ppm)
- Chewing gum/bubble gum(5000ppm)
- Ready to serve tea/coffee based beverages(600ppm)
- Ice candy(800 ppm)
- fruit Necters (300ppm)

Sucralose:

Sucralose is a calorie-free artificial sweeteners derived from sucrose and it is up to 650 times sweeter than natural sugar it is also used widely in food stuffs, including carbonated drinks, chewing gum, bakery products, breakfast cereals, salad dressings and as table top sweeteners. It does not have any appreciable effect on blood glucose levels and used by diabetics as recommended by EFSA (2011). It is acceptable when taking 15mg/kg body weight.[5]

As per FSSAI **Sucralose** is recommended for the use in food for the following:

- Soft drinks(300ppm)
- Biscuits(cookies), bread, cake and pastries(750ppm)
- Traditional Sweets (750ppm)
- Yoghurt(300ppm)
- Ice cream, kulfi (400ppm)
- Jam, jellies and marmalades(450 ppm)
- Chocolates (800 ppm)
- Vegetable juice/nectar(250 ppm)

Why Artificial Sweeteners are not healthy?

Sugar substitutes can be divided into four general categories: Artificial Sweeteners, Sugar Alcohol, Natural Sweeteners and dietary supplements such as stevia and lo Han.

Sugar Substitutes	Examples
Artificial sweetener	Aspartame (NutraSweet, Equal), Sucralose (Splenda), Saccharin (Sweet 'N Low), Acesulfame potassium, Neotame
Sugar alcohols	Sorbitol, Maltitol, Mannitol, glycerol and Lactitol
Natural Sweeteners	Honey and Agave
Dietary Supplements	Stevia and Lo Han.

Table 3. Sugar Substitute example

Artificial Sweeteners are also known as intense sweeteners because they are many time sweeter than the regular sugar. Artificial sweeteners are **synthetic sugar substitutes** but may be derived from naturally occurring substances, including herbs or sugar itself.

Harmful effects:

1. Aspartame has been found to cause cancer—leukemia, lymphoma and other tumors.[6,7,8]

2. Artificial sweeteners also appear to cause many of the same health effects associated with high sugar consumption like excessive weight gain, type 2 diabetes, cardiovascular disease and Stroke.[9,10]

3. The human brain responds to sweetness with signals to eat more. By providing a sweet taste without any calories, however, artificial sweeteners cause us to crave more sweet foods and drinks, which can add up to excess calories.

CONCLUSION

The review aims to discuss about the artificial sweeteners Types and their uses in different food as per FSSAI Rules. The main benefit of the artificial sweeteners is that they are helpful to control on tooth decay, diabetes and weight control. But the excess amount of any thing is harmful to the human body. In the light of these findings, a similar approach might be used to reduce sugar intake. Unsweetening the worlds diet may be key to the reversing all problems.

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