Artificial sweeteners in our diet

Clàudia Tuneu Valls - June 2022

Universitat Autònoma de Barcelona

Facultat de Veterinària

1 INTRODUCTION

Sugar reduction is recommended due to its negative effects on human health. To reduce the sugar consumption Decree-law 13/2019 was adopted in view to establish a compulsory tax on sugary drinks. As a result, of the application of this Decree, the use of artificial sweeteners has increased (WHO, 2016).

Objectives:

- To describe artificial sweeteners and legal framework.

- To describe the effects that sweeteners have on diseases commonly affected by sugar.

2 SWEETENERS

- *Sweeteners or table-top sweeteners.*

Monosaccharides, disaccharides and oligosaccharides used for sweetening properties or foods containing them are not sweeteners.

- ***Natural*** (glucose, sucrose, essential amino acids, proteins, ...) or ***artificial*** (synthetic sugar substitutes, derived from natural substances or sugar, where there has been a chemical modification)

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- ADDITIVES: Intentional addiction for a technological purpose

3 LEGAL FRAMEWORK

International

Main organism = Codex Alimentarius

Joint program Food and Agriculture Organization (FAO) + World Health Organization (WHO)

Responsible for developing standards

(The rules adopted by Codex Alimentarius and its Member States are not binding)

Table 1.- Artificial and natural sweeteners approved by Codex Alimentarius (General Standard for Food Additives Codex Stan 192-1995)

Mannitol (E-421)	Sucralose (E-955)
Acesulfame K (E-950)	**Alitame** (E-956)
Aspartame (E-951)	**Steviol glycosides** (E-960)
Cyclametes (E-952)	Neotame (E-961)
Saccharins (E-954)	Salt of aspartame-acesulfame (E-962)

European Union

European Commission = executive body in charge of elaborating new legislation based on scientific opinions of European Food Safety Authority (EFSA).

EFSA = risk assessment and communication; establishes the Acceptable Daily Intake (ADI).

Table 2.- Artificial and natural sweeteners approved by European Union (Commission Regulation (EU) No 1129/2011)

Sorbitols (E-420)	**Thaumatin** (E-957)
Mannitol (E-421)	**Neohesperidine DC** (E-959)
Acesulfame K (E-950)	Neotame (E-961)
Aspartame (E-951)	Salt of aspartame-acesulfame (E-962)
Cyclamates (E-954)	**Maltitols** (E-965)
Isomalt (E-953)	**Lactitol** (E-966)
Saccharins (E-954)	**Xylitol** (E-967)
Sucralose (E-955)	**Erythritol** (E-968)

Label: EU standards are implemented (Commission Regulation (EU) No 1129/2011)

Statal & Regional

Spain: Spanish Agency for Food Safety and Nutrition (AESAN) = risk assessment and communication

Catalonia: Catalan Food Safety Agency (ACSA) = risk assessment and communication

EU standards are implemented by (Commission Regulation (EU) No 1129/2011)

4 HEALTH EFFECTS

Caries

Sugars ingested in the diet are broken down by *Streptococcus mutans* bacteria and alpha-amylase enzyme, producing compounds that lower the pH level and causes damage to the teeth.

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Reduction of sweets consumption, brushing teeth and **chewing gum without sugars (xylitol)** prevent the appearance of caries (Newton et al., 2020).

Diabetes

Pancreas does not produce enough insulin or the body does not use it properly.

Type 2 diabetes: inability of the body to use insulin properly (especially in *obese* people).

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changing to a healthier lifestyle
or
avoiding sugar intake (Fagherazzi et al., 2017)

In the past: artificial sweeteners in foods were suitable for diabetics.

Currently: there is no scientific evidence that sweeteners are suitable for diabetics.

Weight gain & Obesity

Satiety control is a complex mechanism influenced by multiple factors.

Conventional sugar and artificial sweeteners do not follow the same metabolic pathway and they don't have the same effect in relation to weight control.

Studies show no conclusive effects: **no cause-and-effect relationship between sweetener intake and weight** (EFSA, 2011).

5 CONCLUSIONS

- There has been an **increase** in the **consumption** of sweeteners.

- All sweeteners have undergone an EFSA assessment and approval by the Commission and Member States , meaning sweeteners are **safe** at the consumption of established doses.

- EU is less restrictive than the Codex Alimentarius.

- Sweeteners are **good** sugar **substitutes** for chewing **gum** but **not for diabetic foods or dietary** (*studies show that they do not have a beneficial effect but it is unknown if there are any negative ones*).

- It is very **difficult** to **establish a cause-effect** relationship in relation to the intake of sweeteners because they are present in many products, there are effects that are multifactorial and (studies need to be done for each specific sweetener).

6 REFERENCES

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