

## Additives: Regulation in Colombia and Risks in the Salt of the Child Population

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### Abstract

In Colombia, there is little information regarding the serious health problems that children face as they are subjected to the consumption of food products from the family basket and school support, which have multiple additives harmful to their long-term health. In addition, the regulation of the food industry is ineffective. For this reason, three additives commonly found in food in the family basket and easily accessible to the child population were studied: tartrazine, aspartame and monosodium glutamate, in aspects such as their consumption, their effects and their regulation according to Colombian legislation. From this, it seeks to provide a bioethical perspective of the facts mentioned above by analyzing the decrees and policies that govern Colombian companies and how this could directly affect the child population.

**Keywords:** Additives; Bioethics; Degrees; Regulation; Child

### Introduction

Food additives, according to Codex Alimentarius, are substances that are not normally consumed as food and are also not used as a staple in them. Whether or not it has nutritional value, it affects the characteristics of the food either by itself or by its by-products in the production, processing, preparation, packaging, storage or transport phase (Viñuela, s.f).

These come from several sources, there are some that have a plant origin such as thickeners extracted from seeds, fruits and seaweed; additives can also be obtained from products identical to nature, made by biosynthesis or synthesis, such as ascorbic fruit acid, vegetable oil tocopherols or dyes such as carotenoids, also found thickeners such as starches and modified cellulose. In ad-

dition to these, there are artificial additives such as antioxidants, dyes, sweeteners, flavorings, among others (Viñuela, s.f).

Tartrazine (artificial dye) is one of the most widely used additives in the food industry, which gives drinks and food a yellow or orange tone, depending on the amount added. Since 1916 it has been widely used in pastries, sauces, ice cream, desserts, candy, soft drinks, among others. It is a dye used in more than sixty countries including the United States and the European Union (Arroyave., et al. 2008).

For its side effects, in the industry, it has been tried to replace this dye and it is recommended that food owners, beverages or medicines containing it be expressed on its nutritional labels:

"Contains Tartrazine that can produce allergic reactions, type of angioedema, asthma, urtic shock and anaphylactic" (Arroyave, *et al.* 2008). This in order for the consumer to observe the label decides whether or not to buy the product.

In addition to the physiological effects mentioned above, excessive consumption of tartrazine affects the behaviour of children of all ages, with a lack of concentration, hyperactivity and drowsiness as symptomatology (Jury 2014).

In an investigation carried out in England by the Food Standards agency, this close relationship between tartrazine and the hyperactivity of children was established, in the face of what several countries do to care for their consumers is regular in terms of quantity, being 7.5 mg/kg the maximum intake per day (Jury 2014).

On the other hand, aspartame is a non-caloric sweetener composed of aspartic acid and phenylalanine, this additive can be 180 to 200 times sweeter than traditional sugar and provides 4 calories per gram, a very low or almost zero caloric intake that does not provide the metabolic impact of sugars (Wakida, *et al.* 2017). Aspartame, which is used in more than 90 countries, is associated with cases of chronic hives, neurological damage, hypophosphatemia, calcemia, decreased feeling of satiety and phenylketonuria. The above effects occur when there is prolonged consumption and in high doses of this product, which, has been confirmed by several studies, in which it is mentioned that this additive does not represent major problems for health, since its consumption must be excessively high for side effects to occur (Wakida, *et al.* 2017).

As for monosodium glutamate (GMS), this is a flavor enhancer to provide meat-flavored foods, this additive has been widely used since the seventies in snacks and treats to make them tastier and thus promote their consumption, however, this seasoning not only favors the consumption of a certain food by improving its taste, it does so because it influences the hypothalamic regulation of appetite and interrupts the satiety signal, favoring the intake of such products, additionally associated with diabetes, hepatotoxicity, neurotoxic and genotoxic effects, among others [1].

However, monosodium glutamate is used in many products and is not regulated, since, the Codex Alimentarius defined that the doses of monosodium glutamate are under the parameters of good

manufacturing practices, this means that each company decides the amount it will add to its products, which is highly problematic, because, according to these, the safe levels of the additive are 16 mg/kg and there are products on the market that contain up to three times this figure, of this the likelihood of suffering side effects from gmS consumption is very high, especially in the child population, since daily children consume foods containing this additive in high doses [1].

### Health impacts of additives

#### Tartrazine

Cause allergic reactions, type of angioedema, asthma, hives, anaphylactic shock, changes in mood and behavior associated with hyperactivity, anxiety, sleep disorders, histamine liberating, causes eczema and immune disorders (Arroyave, *et al.* 2008). According to Amaya [2] "this substance was found to directly affect the brain by altering the synaptic spaces where information is exchanged between neurons" and this causes hyperactivity, attention deficit and other symptoms, which may worsen if tartrazine is combined with one of its salts such as sodium benzoate [3].

This additive is often found in most treats, packages and babies, but also in everyday foods such as pastas, vegetable preserves, canned, among others, therefore, the child population is over the past to tartrazine consumption and as Amaya mentions [2] if consumption of these substances occurs at an early age, the child's immune system will be more susceptible in the process of formation.

#### Aspartame

Aspartame is associated with diseases such as: phenylketonuria, insufficient myelination in the brain and possible uterine polyps. Currently, studies on this sweetener have shown that side effects from consumption are minimal, including several of the side effects previously thought to have caused, such as: inhibition of satiety, increased blood glucose, development of brain tumors in children, among others.

However, authors such as Kusunoki, *et al.* (2017) state that if aspartame is consumed in very high doses can be associated with lymphomas and leukemia, likewise, it can cause hypophosphatemia and calcemia, on the other hand, it is found that consumption in phenylketonurics should be restricted, as this sweetener can increase phenylalanine levels and cause harm at the brain level.

### Monosodium glutamate

Monosodium glutamate corresponds to an excitotoxin, it excites excessively and kills neurons, therefore it is the cause of addiction to a product. It also interferes with the hormone leptin, causing an unnecessary increase in appetite, which can lead to diseases such as obesity and other disorders in eating behavior.

This additive poses several health risks, is associated with cases of epilepsy, severe nerve depression, schizophrenia and suicidal tendencies in young people, as well as can promote the growth of cancer cells, asthma, infertility, among other conditions [1].

Likewise, this additive is associated with optical and auditory problems, in the case of hearing problems occurs when the newborn is exposed to substance, this interrupts the development of the auditory brainstem and affects calcium binding proteins, thus decreasing hearing function, and in terms of optical problems, GMS can cause glaucoma and damage to the retina [1].

### Legislation in Colombia

The Codex Alimentarius is a compendium of standards, codes and recommendations endorsed by the Codex Alimentarius Commission, which is regulated by FAO (United Nations Food and Agriculture Organization) and WHO (World Health Organization), the highest international food standards agency.

Codex Alimentarius' international food standards, guidelines and codes of practice contribute to safety, quality and equity in international food trade. Consumers can be confident that the products they buy and consume are healthy and calidad, both domestic and imported.

In Colombia, the representative of Codex to FAO and WHO, and the person in charge of compliance with it is INVIMA (National Institute for Surveillance of Medicines and Food), thus presenting to the Codex Commission the following regulation on additives in question:

- Degree 2106 of 1983 Ministry of Health: The standards of identity and purity of sweeteners used in foodstuffs are laid down.
- Resolution 10593 of 1985 Ministry of Health: List of dyes allowed in the food industry (including tartrazine).

- Resolution 4126 of 1991 Ministry of Health: Regulates the related acidulators, alkalizers, pH regulators of acidity used in food.
- Resolution 580 of 1996 Ministerial health Amends resolution 10593 of 1985 to make the express declaration of tartrazine mandatory.
- Specific resolution for additives 2606 of 2009.

Paragraph 1: Where tartrazine is used, it must be expressly stated on the label of the food product containing it.

Paragraph 2: According to the BPM (Good Manufacturing Practices), the quality of dye added to the food being processed and processed will not exceed the minimum required to achieve the purpose for which the dye is allowed to be added.

Article 12: When two to more dyes are used, the total amount of synthetic dyes in ready-to-eat food cannot exceed 300 mg/kg as long as the quantity of each synthetic dye, individually considered, does not exceed its maximum allowable limit.

Article 40: Safety of food additives: The following safety requirements must be met in the use of food additives:

1. Food additives that do not present risks to consumer health at permitted doses can only be used in accordance with the regulations issued by the Ministry of Social Protection on the subject matter.
2. Approval of a food additive should take into account the permissible daily intake (IDA) or equivalent assessment of safety and its probable daily intake from all sources.
3. The amount of additive added to a food shall be equal to or less than the maximum permitted dose and shall constitute the minimum dose necessary to achieve the intended technical effect.

### Analysis

As Eva Pagnussatt, 2017 in her article, The Right to Healthy Eating, points out. Food insecurity and human health: "The corrupt industrial food production system, highly toxic because of its dependence on chemicals and deeply unfair because of its economic monopoly, violates the food rights of millions of people and seriously harms their health", this system does not give its consumers food

free of toxic products, as it is in the case of tartrazine, monosodium glutamate and aspartame. They choose to add such additives for their ease of use and because they have a better price compared to natural alternatives, even knowing that these have side effects and impair health. The industry is hiding that side effects only occur when prolonged consumption occurs and in large quantities, for this reason they are regulated, but it is not taken into account that most foods consumed daily contain these additives, representing a public health problem, in the same way, it must be taken into question that some foods contain additives in quantities greater than the levels considered as normal, which implies that there must be greater regulation and control of this type of food to protect health (Jaimes, Marrugo and Severiche 2014).

In addition, in our context, there is a high degree of misinformation regarding the products that we normally consider would not harm our health and their additives. So it is prudent to look at why so unaware and whether the private interests of companies can be the cause of this point, as well as the basic need for consumer survival and food causes these factors that directly affect health to be overlooked.

However, given that most of the foods that have such additives are so-called greyhounds, greater regulation should be made against them, because the largest consumers belong to the infantile population. Taking as an example the monosodium glutamate, this additive is not regulated, the Codex Alimentarius defined that the dose of GMS will be under the parameters of good manufacturing practices (Codex Alimentarius, 2016), this means that the company will decide the necessary amount that must carry its product, however, in the case of no regulation of safe levels of consumption, such companies make excessive use of this substance, thus increasing the possibility of the manifestation of side effects, which are very alarming, since it can destroy neurons by allowing excessive calcium ingress in the cells, produces alterations in hypothalamic functions, obesity, among other consequences. It is important to mention that if a single product exceeds safe consumption levels, which can be up to 16 mg/kg, the intake of more of these foods significantly affects the health of young people, for this reason, as Jaimes J mentioned; Marrugo Y and Sereviche C 2014, "it is necessary to strengthen food control systems in order to protect public health, prevent fraud and deception", it is necessary to inform the general population of the effects of additives contained in the

product, so that the consumer can consciously decide on the foods to be ingested, but it is not only necessary to inform the general population of its effects, it is also necessary to indicate the quantity that each product contains of such additives (Zero E, Orjuela E s.f)

Considering the toxicity of these additives and that, in places such as Europe, Japan, Australia and Canada have been banned, it is clear that in Colombia it is considered a regulation of these components, since INVIMA accepts and adopts the standards set by the US FDA (Food and Drug Administration), standards that are more lax and therefore directly affect the high rates of obesity and nutrition-related problems, regulating not their use, but the maximum amount of food. This is in stark contrast to the advances in Bioethics of Nutrition taking into account FAO's 1996 World Food Summit in 1996 where it was concluded that each nation must be held accountable for minimal depending on its nutritional goals (FAO, 1996), goals that are diffuse in our country and accommodating the particular interests of companies such as Postobón, Bavaria, Alpina, among others, which arbitrarily abuse the amount of glutamate and tartrazine, products that have been found simultaneously in some of their beverages.

If you consider Article V, Chapter II of the 'Conditions for the Use of Food Additives' issued by the Ministry of Health, which states that it is possible to use these chemicals as long as they represent some benefit and have no appreciable risks in the health of consumers and given the crushing figures of public health damage presented by WHO, the approach, mission and vision of regulators in the Colombian food industry enters into an incongruity. In this way, as consumers in addition to requiring mention of the use of tartrazine, glutamate or aspartame in the packaging, it is required to warn of possible health risks in early childhood and adults. This constitutes one of our consumer rights to health and access to information. Also, that the doses be specified by particular content and not a maximum, since the daily dose would not be taken into account [4-9].

## Conclusion

It is understood that by population growth, companies in the food industry are looking for alternatives to improve their production, but this growing economy also means that so many additives are implemented that food leaves its naturalness and become products whose function is only to meet demand; leaving behind all nu-

tritional values. And it is clear that a drink like soda will not feed, but something as highly consumed and is supposed to be of a high nutritional value as milk, it is also affected by these often harmful ingredients.

Misinformation goes hand in hand with the misleading advertising these companies use to sell their products. It is clear that consumer health is not a priority for consumers, let alone the child population who is often the most vulnerable and affected; contrary to what it should be, children are the closest to these products such as sodas and packaging products with dyes and preservatives. In schools and schools, where you spend most of your time; and as discussed above this can directly influence your learning processes.

Although there are laws in Colombia to regulate these additives, the food industry does not yet have the awareness or responsibility to take care of the effects that additives have on the population.

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