

# Artificial and non artificial ingredients in foods biology essay



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The aim of this research is to find out what are the differences between artificial and non artificial additives, and their modern use as well as the safety, benefits of their presence and side effects it might have on the body. As my examples of artificial additives I will discuss the properties of two synthetically obtained chemicals, a sweetener Aspartame and a flavor enhancer Mono sodium glutamate. Compounds vanillin and cinnamaldehyde as examples of natural ingredients.

My intended sources of information were websites found on the google search engine, and other links associated with this topic..

First time line for the research was due on 20/02/2013 and it was requested by Joanne mitchel.

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### **What are additives and what are they used for**

Food additives are ingredients added to foods during their manufacturing processes, food additives can also be identified as natural and artificial.

Natural or non-artificial are often considered to be of natural origin, and have been used for centuries by people. These natural ingredients were obtained from organic sources such as part of the plants or animals that contained the active compound in them. Methods of obtaining these ingredients and their uses varied as many cultures and regions had their own methods of seasoning and preserving foods. Ingredients obtained synthetically are artificial, these ingredients are often obtained through bacterial fermentation, some artificial additives are simply, separated and concentrated active compounds found in natural ingredients, however

synthetically obtained will never be the same as natural. Natural additives such as food dyes, preservatives and spices existed all throughout history, however their methods of preparation were often very time consuming and gave very little results, which not everyone could afford. Today the use of natural ingredients and natural ways of preserving foods has been greatly replaced by artificial additives. They can act as preservative to allow food to be eatable for longer, pH regulators to keep the food at its optimal pH, flavor enhancers to sharp the taste of other tastes and some additives can act as a substitute for tastes and flavorful such as sugar.

## **Chemical properties and uses of Aspartame and Mono sodium glutamate**

Aspartame or E951 and MSG (Mono sodium glutamate) are two artificial ingredients used in the EU in many foods. Aspartame is a white odorless powder and it is very sweet in taste which eventually becomes bitter, chemically aspartame is a methyl ester of two amino acids, phenylalanine and aspartic acid, in acidic conditions aspartame will breakdown to its components and also a 3rd dipeptide called aspartyl-phenylalanin, it will also produce methanol as a bi product. MSG is a sodium salt of an amino acid that is known as glutamic acid which is often found naturally in many animal proteins, chemically it is one sodium atom holding two glutamic acids together. Main use of aspartame are its properties that make it sweet in taste, aspartame is also widely used in soft drinks and chewing gums as a substitue for sugar. Although aspartame is not used in all sweetners, chemicals with similar chemcial properties are also used in other products such as confectionary and sweets. MSG is used as a flavor enhancer, it works

best when combined with other flavors. It is generally used in ready meals, processed meats, fast food restaurants and snacks such as crisps and many other, MSG is also used in seasonings and canned soups.

## **Chemical properties and uses of Cinnamon powder and Vanilla oil.**

Both cinnamon powder and vanilla oil are examples of natural ingredients that can be added to food to increase their taste quality, these ingredients are often less active on the body than their artificial forms, naturally these ingredients have to be prepared from the actual flower or part of the plant that contains the active ingredient found within the part of the plant.

Cinnamon powder is grated bark of the cinnamon tree, the active ingredient found in cinnamon is the cinnamaldehyde which gives cinnamon its taste in cinnamon based products. Presence of a compound known as vanillin gives vanilla its smell and taste and it is the active compound that is used in the production of vanilla tasting spices and all vanilla tasting products, however this chemical is obtained both naturally and synthetically.

These natural additives are just a fraction of what used to be an everyday spice, even though the active compounds can be produced synthetically.

These spices are still produced naturally, and are sold as everyday spices however products such as confectionary that resemble in taste may have been produced artificially.

## **Benefits of presence of additives in food**

The main benefit of presence of artificial additives in foods is that it is more economically efficient than obtaining and preparation of natural additives,

especially in additives that are used as food dyes, preservatives, pH regulators and flavourings, flavour enhancers and emulsifiers. Naturally preservatives would be just a matter of preserving the food keeping it in cool conditions but even that will not give it a long lasting date of expiration and preservatives can extend that date as well as pH regulators by keeping the food at it's optimum pH to preserve its freshness. Sugar substitutes can also be beneficial to people with disorders that excludes sugar from their diet. Some of the properties of certain compounds found within the additives could never be separated out naturally.

### **Possible side effects associated with foods containing natural and artificial additives.**

Natural additives like vanilla extract and cinnamon powder are non essential to the human body but will digest. The desired active compounds in them will correspond to their function and breakdown to smaller harmless compounds. Side effects that are often associated with consumption of foods containing these ingredients are allergic reactions to compounds found within them. Artificial additives work in similar way, when obtained and prepared it is in its pure form, then it is added during foods manufacturing process. Some artificial additives are synthetically obtained active compounds found in natural ingredients. Some like aspartame were designed using other compounds creating in effect a new compound, aspartame partially breaks down to methanol which is toxic in even small amounts and the more aspartame is consumed the more methanol is produced. Regular consumption of foods and drinks containing aspartame may result in headaches, dizziness, and even vomiting, another biproduct of

aspartame is L-phenylalanine which by some cannot be consumed as it gives allergic reactions to people sensitive to it. MSG contains glutamic acid that is naturally found in meat proteins, it is non essential but will breakdown and digest, MSG is purely an active compound, the role for glutamic acid in proteins is that it is a building block for muscles and also supports brain function. Foods containing MSG could alter the functions of the brain for the moment of consuming the food and its digestion, over consumption of foods containing these ingredients may cause headaches, bowel distress, acid reflux, indigestion, nausea and fatigue.

### **Long term effects and the impact on society.**

Natural ingredients added to foods should not be a cause of any physical or mental disabilities, there are always foods in nature that have low toxicity and are considered to be healthy and there are always those more toxic and should be avoided, many natural ingredients and spices were unique to different cultures and regions of the world which were renowned for them as well. It can not be ruled out that compounds found within artificial additives can be considered toxic and be potentially dangerous to the body if excess amounts of foods containing these chemicals are consumed on a regular basis over years. Children can be particularly affected by such foods that it can even be noticed, children require less food so it takes less to see the effects of such foods. Sugar causes hyper activity as well as other sugar based products, there are also concerns that the active compounds found in additives such as MSG can alter the brain chemistry to the point a person will be craving for this particular food without understanding that they were actually craving for the ingredient in that food. This might affect children

more severely because as they are developing they might become more prone to simply buying these foods over fully nutritional foods that they require. People prone to stress eating will be more likely to want to eat products containing, high sugar content and foods containing richer and stronger flavours, which many additives were designed to simulate. In my opinion it is not worth it to fill foods with ingredients that can be potentially harmful with just having this advantage that they can stay for longer or taste more stronger. The best solution would be by minimising the intake of foods containing these chemicals to only required mass their body needs. People in most developed countries are aware of what is in the food they buy and the daily amount required but it still does not help the growing population of obesity in most countries. It should also be noted that additives were disqualified from many markets through out their short period of existence because they were considered potentially harmful and those considered 'vital' were always replaced by new.

<http://foodmatters.tv/articles-1/top-10-food-additives-to-avoid>

[http://en.wikipedia.org/wiki/Food\\_additive](http://en.wikipedia.org/wiki/Food_additive)

[http://www.bbc.co.uk/health/physical\\_health/conditions/food\\_additives.shtml](http://www.bbc.co.uk/health/physical_health/conditions/food_additives.shtml)

[http://www.wholevegan.com/food\\_additives.html](http://www.wholevegan.com/food_additives.html)

<http://cdn.zentrum-der-gesundheit.de/images/titelbild/vanillin-ia.jpg>

<http://www.liquorpress.com/wp-content/uploads/2011/03/van.jpg>

<https://assignbuster.com/artificial-and-non-artificial-ingredients-in-foods-biology-essay/>

<http://en.wikipedia.org/wiki/Cinnamon>

[http://en.wikipedia.org/wiki/Ethyl\\_cinnamate](http://en.wikipedia.org/wiki/Ethyl_cinnamate)

### Health Benefits of Cinnamon

[http://www.bmrwisc.edu/metabolomics/mol\\_summary/show\\_data.php?](http://www.bmrwisc.edu/metabolomics/mol_summary/show_data.php?molName=methyl_3_4_5_trimethoxy_cinnamate&id=bmse010223)

[molName= methyl\\_3\\_4\\_5\\_trimethoxy\\_cinnamate&id= bmse010223](http://www.bmrwisc.edu/metabolomics/mol_summary/show_data.php?molName=methyl_3_4_5_trimethoxy_cinnamate&id=bmse010223)