



Dr. Ampofo[★]

THE FOOD FACTS DOC[★]

30 SAFE FOOD ADDITIVES



SMART Food Choices for Scientific Eating

LIST OF COMMON SAFE FOOD INGREDIENTS

Acetic acid

What is it?

It's an organic compound naturally present in foods like grapes, pineapple, strawberries and many more. For industrial food applications, synthetic acetic acid is used.

Where is it found?

In processed foods like apple cider vinegar, sauces, ketchup, salad dressings, mayonnaise and many more.

Why is it used?

Acetic acid is used as a preservative to enhance shelf-life. It's also used as a flavouring agent.

Any health hazard?

Regarded as safe by Health Canada, FDA, EFSA, and WHO



Alginate

What is it?

It's a seaweed extract. Alginate can be chemically modified to produce calcium alginate, sodium alginate and propylene glycol alginate.

Where is it found?

Canned frostings, candies, soups, beverages, margarine, alcoholic beverages, dairy products and many others.

Why is it used?

It's used as thickening, stabilizing, coating and coagulating agents.

Any health hazard?

Regarded as safe by Health Canada, FDA, EFSA, and WHO



Advantame

What is it?

A synthetic non-caloric sweetener, produced from aspartame and vanillin. It's 110 and 20,000 times sweeter than aspartame and sucrose, respectively.

Where is it found?

Sugar-free and no-added sugar foods, soft drinks, confectionaries, baked goods, toppings and other foods.

Why is it used?

Advantame is used as a sugar replacer to reduce calories and glucose spikes.

Any health hazard?

Regarded as safe by Health Canada, FDA, EFSA, and WHO



Beta carotene

What is it?

Beta-carotene is a carotenoid that provides vibrant orange-yellow hue. Naturally found in carrots, microalgae and fungi. Commercial beta-carotene is obtained from microalgal extraction, GM microbes and synthetic methods.

Where is it found?

It's found in processed foods such as infant formula, breakfast cereals, dairy products, soups, sauces protein powders, beverages and many more.

Why is it used?

As a colouring agent and pro-vitamin A supplement.

Any health hazard?

Generally regarded as safe by Health Canada, FDA, EFSA, and WHO. However, its abuse as oral supplements is associated with lung cancer by research.



Cellulose

What is it?

A complex carbohydrate naturally found in plants. Naturally present in vegetables, cereals, fruits and veggies. Commercial cellulose are obtained from wood pulp and cotton lint.

Where is it found?

In sauces, soups, dressings, baked goods, frozen dinners etc

Why is it used?

As agent of thickening, stabilizing, bulking, anti-caking, and emulsifying. Also, to improve food fiber content and as natural fat replacers.

Any health hazard?

Generally regarded as safe. However, overconsumption can lead to digestive issues and reduced absorption of calcium and magnesium.

Citric acid

What is it?

Versatile ingredient abundant in lime and lemon. Also present in grapefruits, pineapple and many others. For commercial applications, citric acid is obtained from synthetic methods.

Where is it found?

In diverse foods like snacks, jams, canned foods, sodas, frozen foods and lots of others.

Why is it used?

As a preserving, flavouring, acidulating and chelating agent

Any health hazard?

Generally regarded as safe



DATEM (Diacetyl tartaric acid ester)

What is it?

A synthetic food additive

Where is it found?

You can find DATEM in baked goods, biscuits, pastries, cookies, ice creams and other foods.

Why is it used?

As an agent to strengthen dough gluten network necessary for bread texture. Also used as a preservative.

Any health hazard?

Generally regarded as safe by Health Canada, FDA, EFSA, and WHO.



Diacylglycerol

What is it?

It's a lipid that naturally occurs in soybean and canola oils. For industrial applications, diacylglycerol is produced from the esterification of fatty acids.

Where is it found?

In salad dressings, sauces, baked goods, meat products, vegetable oils and other food products.

Why is it used?

As fat replacers, stabilizing and emulsifying agents

Any health hazard?

Considered as safe by Health Canada, FDA, EFSA and WHO



Ferrous gluconate

What is it?

An artificial ingredient formed from the chemical combination of natural compounds such as iron and gluconic acid.

Where is it found?

In black olives, milk, rice flour and other foods.

Why is it used?

As a colouring agent to give black olives a uniform black colour. For food fortification as a source of iron

Any health hazard?

Generally regarded as safe. However, abusing intakes in cases of iron supplements can lead to black stools and digestive issues. Although this observation is reported as not harmful, it is important to take it at recommended levels, because the body and its metabolic processes is very complex.



Guanosine monophosphate (GMP)

What is it?

Also called disodium guanylate on the food label. GMP is a synthetic flavour enhancing ingredient.

Where is it found?

In potato chips, soups, sauces, instant noodles, snacks, cured meats, savoury rice, canned vegetables and other foods. It is also naturally present in shiitake mushrooms.

Why is it used?

As a flavouring agent. It is used to enhance the umami flavour of foods. GMP is sometimes combined with other flavouring agents like monosodium glutamate (MSG) to enhance its flavour potency.

Any health hazard?

Generally regarded as safe. Scientific on toxic effects is scanty. However, abusing their recommended food formulation levels can lead boating, diarrhea, nausea and constipation.



Sodium propionate

What is it?

An artificial ingredient made from ethylene

Where is it found?

In baked goods, puddings, jams, fillings, desserts, dairy products, confectionaries, non-alcoholic beverages and other foods.

Why is it used?

As a preservative to enhance shelf life

Any health hazard?

Considered as safe by Health Canada, FDA, EFSA, and WHO



Silicon dioxide or silica

What is it?

A natural ingredient obtained from silicon and oxygen. Natural sources include grains, leafy green, eggs etc.,

Where is it found?

In salt, spices, soups, soups, beverages, coffee creamer, flour, cake mixes, flour, and other powdery foods.

Why is it used?

As an anti-caking agent. Also used as a preservative to prolong shelf life. It's also used to enhance thinness and flow in liquid-based foods.

Any health hazard?

Generally regarded as safe. Abuse can lead to celiac disease and allergic reactions.



Ingredient	Why it is used	Where it is found	Safety
Amylase	An enzyme used: to produce sugars during fermentation; for juice clarification and flavour development in beverages and baked goods	Baked goods, alcoholic drinks, flour, fruit juice, starch syrup and other foods	GRAS
Ascorbyl palmitate	A synthetic fat-soluble antioxidant produced from the combinations of ascorbic acid (vitamin C) and palmitic acid; used as a preservative	Fats, margarine, shortening, infant formula, fish, poultry, meat and others	GRAS
Cysteine	An amino acid used as a conditioner to soften dough for improvement of bread texture; antioxidant to shield vitamin C from oxidation	Baked goods, infant formula, breakfast cereals and many other foods	GRAS
Ethylenediamine tetraacetic acid (EDTA)	An artificial ingredient used as a chelating agent to preserve food colour, flavour and texture. It is also used for preservation purposes	Spreads, mayonnaise, canned veggies, pickled veggies, sauces, dressings, canned seafoods, alcoholic beverages, canned carbonated soft drinks and many others	GRAS
Ascorbic acid	An antioxidant used to retain the red colour of cured meat. Also used for vitamin C fortification	Breakfast cereals, fruit juices, tomato paste, canned fruits, baked goods, candies and others	GRAS
Erythritol	A low calorie sweetener used to replace sugars. It is 60 to 70 % sweet as sugar	Baked goods, candy, beverages, tabletop sugar, ice cream, chewing gum, protein bars and others	GRAS

Ingredient	Why it is used	Where it is found	Safety
Fumaric acid	It is used as a coagulant, antimicrobial agent, acidulator, flavoring agent and preservative	Baked goods, beverages, confectionaries, desserts, fruit drinks, wine, jams, jellies etc.,	GRAS
Gelatin	Protein obtained from the collagen of animal bones. Used as fat replacers, stabilizers, texturizers, thickeners and gelling agents	Yoghurt, ice cream. soups, beverages, gummy candies, broths, sauces, marshmallows and other foods	GRAS
Inosine monophosphate	A nucleotide used as flavour enhancer	Seasoning, soups and sauces	GRAS
Lactic acid	A natural ingredient added to foods as an agent for flavouring, curing, preservation, acidulation and prevention of discolouration	Olives, desserts, bread, fermented foods, carbonated beverages etc.,	GRAS
Lecithin	A natural ingredient used as emulsifier, stabilizer, preservative, wetting agent, viscosity reducer and antioxidant	Beverages, ice cream, confectionery, margarine, baked goods, beverages, soups, sauces and others	GRAS
Pectin	A carbohydrate used in food formulations as a stabilizing, thickening, gelling and emulsifying agent	Beverages, jams, jellies, sauces, yoghurt and many others	GRAS

Ingredient	Why it is used	Where it is found	Safety
Sodium diacetate	Commercial sodium acetate is a synthetic ingredient used as a flavour enhancer, acidulant and preservative	Fats, oils, baked goods, snacks, soups, candies, meat products and many more	GRAS
Stevia	A natural sweetener obtained from the plant <i>Stevia rebaudiana</i> . Stevia is about 200 to 300 times sweeter than sugar	Beverages, dairy products, condiments, baked goods, confectionaries, canned fruits and many more	GRAS
Triacetin	Also known as glyceryl triacetate. It's used as a wetting agent, humectant, emulsifier, and plasticizer	Gums, batter, baked goods, canned fish, instant noodles, breakfast cereals, confectionery and other foods	GRAS
Vanillin/ethyl vanillin	The main flavour compound in vanilla bean. Used as a flavourant	Coffee, tea, beverages, ice cream, baked goods, and others	GRAS
Vitamin B1 (thiamin mononitrate), vitamin B2 (riboflavin), vitamin B3 (niacin), vitamin B5 (pantothenic acid), vitamin B6 (pyridoxine), vitamin C (ascorbic acid; sodium ascorbate), vitamin D & vitamin E (alpha tocopherol)	These are synthetic ingredients used to fortify vitamin levels in foods	Breakfast cereals, dairy foods, margarine, wheat flour, plant-based milk, eggs, bread, fruit juice	GRAS
Yellow prussiate of soda	Used as an anti-caking agent	Table salt, sea salt, iodized salt, and non-iodized salt	GRAS

POP QUIZ

Ok guys, it's time to test our understanding!! Based on our discussion and other resources available to you, lets try these 2 quick quizzes. Please share your answers in the comments section.

SMUCKER'S

Ingredients: Strawberries, glucose-fructose, sugar, pectin and citric acid.



Task 1: Identify an additive among the ingredient list

Task 2: Is it a direct or indirect food additive?

Task 3: What will be the purpose for adding the identified additive?

Task 4: Out of curiosity, do you think the jam really needed this additive? Could it have been produced without the identified additive? Please provide at least 1 reason for your answer.

Cheetos

Ingredients: Enriched cornmeal (cornmeal, niacin, iron, thiamine mononitrate, riboflavin, folic acid), vegetable oil, seasoning (modified milk, cheddar cheese, vegetable oil, maltodextrin, salt, monosodium glutamate, lactic acid, citric acid, sunset yellow FCF, natural and artificial flavour), and salt.

Task 1: Identify at least 2 direct and 2 indirect food additives

Task 2: Why are these additives direct or indirect?

Task 3: Why do you think the identified food additives were added to the cheetos formulation?

Task 4: Considering our definition of 'safe' food additives and using internet resources, is there any additive that fall outside the 'safe' category? If your answer is YES, why do you think so?



Selected references

<https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/food-additives.html>

<https://usda-eu.org/food-drinks/food-additives/>

https://www.cspinet.org/page/chemical-cuisine-food-additive-safety-ratings#letter_G

<https://www.sciencedirect.com/science/article/pii/B9780123849472005687?via%3Dihub#s0015>

<https://www.efsa.europa.eu/en/topics/topic/food-additives>



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