



# Ingredient

# Guide

FOR BETTER  
SCHOOL FOOD  
PURCHASING



This guide is a resource for school food leaders and manufacturers alike who are committed to improving the overall quality, nutritional value, and safety of food provided to all students in every school. It highlights unwanted ingredients to eliminate, or those to watch out for, as new food products are developed and others are modified.



[schoolfoodfocus.org](http://schoolfoodfocus.org)

# UNWANTED INGREDIENT LIST



Unwanted ingredients shall not be included in any amount in newly developed products, and should be eliminated over time from existing products.

## ARTIFICIAL COLORS

### Caramel Color: Class III, IV

**Description:** Caramel color is made by heat treatment of sugar compounds. Class III and IV are made with ammonium compounds as well. These ingredients are commonly found in processed foods such as soy and Worcestershire sauces, chocolate-flavored products, baked goods and pre-cooked meats, but the most significant sources in the diet are colas and caramel-colored beverages.

**Concern:** When produced with ammonia, caramel coloring contains contaminants (i.e., 2-methylimidazole, 4-methylimidazole), which have been found to cause cancer in animal studies conducted by the National Toxicology Program (NTP).<sup>2</sup> The International Agency for Research on Cancer (IARC), a division of the World Health Organization, has concluded that 2-methylimidazole and 4-methylimidazole are “possibly carcinogenic to humans.”<sup>3,4</sup> Furthermore, under Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, the state of California classifies 2-methylimidazole and 4-methylimidazole as carcinogenic.<sup>5</sup>

### Synthetic Food Dyes: Blue 1, Blue 2, Citrus Red 2, Green 3, Red 3, Red 40, Yellow 5, Yellow 6

**Description:** Dyes, originally derived from coal tar and now made from synthetic chemicals, are added to foods to make items look more appealing. Examples of these artificial colorings include: Blue 1, Blue 2, Citrus Red 2, Green 3, Red 3, Red 40, Yellow 5 and Yellow 6, and are commonly found in processed foods.

**Concern:** Studies demonstrate that food dyes trigger hyperactivity or other behavioral problems in some children.<sup>6-10</sup> Some dyes are also known to cause allergic or hypersensitivity reactions.<sup>11</sup> In Europe, most dyed foods carry a warning label, “may have an adverse effect on activity and attention in children.” Animal studies show that certain food dyes pose a risk of cancer.<sup>6</sup>

---

## ARTIFICIAL FLAVORS & UNSPECIFIED NATURAL FLAVORS

**Description:** The term artificial flavor or artificial flavoring is defined by the Food and Drug Administration (FDA) as “any substance, the function of which is to impart flavor, which is not derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, fish, poultry, eggs, dairy products, or fermentation products thereof.”<sup>12</sup>

The term natural flavor or natural flavoring is defined by the FDA as “the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products, or fermentation products thereof, whose significant function in food is flavoring rather than nutritional.”<sup>12</sup>

These types of flavors are commonly found in processed foods such as breakfast cereals, desserts, soft drinks, and many other foods.

**Concern:** The use of artificial and natural flavors indicates the absence of whole ingredients, most often fruits. Some people may be sensitive to certain flavoring ingredients.<sup>13</sup>

The FDA allows manufacturers to put natural flavor on ingredients lists without any specifics of what flavors are used. School food service departments are requesting that when natural flavors are used they include specific details explaining from which natural flavors the ingredients are derived. Many districts have students that are allergic or sensitive to certain ingredients. Therefore, products listing natural flavors without any additional specifics will not be permitted.

---

## ARTIFICIAL PRESERVATIVES

### Butylated Hydroxyanisole (BHA)

**Description:** BHA is an antioxidant preservative that retards rancidity in fats and oils; commonly found in processed products, particularly meats, cereals, potato chips and vegetable oils.

**Concern:** In the Report on Carcinogens the National Toxicology Program within the Department of Health and Human Services lists BHA as “reasonably anticipated to be a human carcinogen.”<sup>14</sup>

## Butylated Hydroxytoluene (BHT)

**Description:** BHT is an antioxidant preservative that retards rancidity in oil. It is commonly found in processed foods, particularly cereals, meats, and oils.

**Concern:** Some animal studies of carcinogenicity and chronic toxicity of BHT have shown contradictory results. Researchers conclude that BHT's pervasive presence and controversial toxicological data should be of concern to consumers.<sup>15</sup> The Center for Science in the Public Interest recommends that BHT be replaced by safer substitutes or left out of foods altogether.<sup>13</sup>

## Propyl Gallate

**Description:** Propyl gallate is an antioxidant used to protect fats, oils, and fat containing foods from going rancid, and is commonly found in meat products, soup bases and potato sticks. It is commonly used in conjunction with BHA and BHT.<sup>13</sup>

**Concern:** Safety studies published by the US government have shown concerning results. In one study propyl gallate appeared to cause cancers in rats treated with a low dose of propyl gallate as opposed to those treated with a zero dose or high dose.<sup>16</sup> The Center for Science in the Public Interest explains that this finding suggests this food additive could be an endocrine disruptor, as well as a carcinogen. More research is recommended to better understand how this additive impacts human health.<sup>13</sup>

## Tert-Butylhydroquinone (TBHQ)

**Description:** TBHQ is an antioxidant preservative that is used to prevent rancidity. Sometimes it is used in conjunction with BHA, BHT and propyl gallate. It is commonly found in vegetable oil, snack foods, cereals and other fat-containing foods.<sup>13</sup>

**Concern:** A government animal study showed TBHQ increased the incidence of tumors.<sup>13,17</sup>

---

## ARTIFICIAL SWEETENERS & OTHER SUGAR-FREE SWEETENERS

**Description:** Artificial and other sugar-free sweeteners include a wide range of sugar substitutes including but not limited to: Acesulfame-potassium, Aspartame, Brazzein, Cyclamate, Monatin, Monk Fruit, Neotame,

Saccharin, Stevia Leaf Extract (Rebiana), Sucralose, Sugar Alcohols (Erythritol, Hydrogenated Starch Hydrolysate, Isomalt, Lactitol, Maltitol, Mannitol, Sorbitol, Xylitol), Thaumatin. These sweeteners are used to improve sweetness in foods or beverages with fewer calories than those produced with caloric sweeteners (e.g., cane sugar, high fructose corn syrup). These ingredients can be found in a range of products such as diet beverages, baked goods, yogurts and cereals, and are not limited to products labeled as diet or low-sugar.

**Concern:** In general, these sweeteners are mainly used in foods and beverages that are of lower nutritional quality and do not serve a functional role in PK-12 students' diets. Research findings have been inconsistent, and some studies have shown that a few artificial sweeteners including acesulfame-potassium, aspartame, saccharin, and sucralose may pose a risk of cancer.<sup>13,18-20</sup>

---

## FLAVOR ENHANCERS

### Monosodium Glutamate (MSG)

**Description:** MSG is an amino acid that is used to enhance the meaty (i.e., umami) flavor of foods. It is commonly found in processed foods, and as an ingredient in artificial flavorings.

**Concern:** MSG is commonly used to substitute for flavor, allowing food manufacturers to reduce the use of nutritionally superior ingredients (e.g., using MSG to reduce amount of chicken needed in chicken soup). For certain sensitive individuals, MSG has been linked to adverse reactions including but not limited to headache, nausea, weakness, and a burning sensation on the back of the neck, forearms and chest. Some people report difficulty breathing, changes in heart rate or blood pressure, and chest pain.<sup>13,21</sup>

---

## FLOUR CONDITIONERS

### Azodicarbonamide (ADA)

**Description:** Azodicarbonamide (ADA) is a chemical substance used by commercial bakers as a dough conditioner for bread baking and as a whitening agent in cereal flour.<sup>22</sup> ADA is used in baked products such as breads, rolls and pizza crusts.

**Concern:** During bread making, ADA completely breaks down to form other chemicals, one of which is semicarbazide (SEM). At high levels, animal studies have shown SEM has increased the incident of tumors when fed to female mice.<sup>22</sup> Another chemical that is a result of ADA's break down is urethane, a recognized carcinogen.<sup>13</sup> The FDA explains that ADA is not necessary for bread making and there are alternative ingredients approved for use available.<sup>22</sup>

### Bromated Flours: Potassium Bromate

**Description:** Bromated flours are those that contain the additives potassium bromate or calcium bromate. These additives are flour "improvers" used to strengthen dough allowing for greater oven spring and higher rising. This type of flour is used in white breads, rolls, crackers, and pizza crusts.

**Concern:** The majority of bromate breaks down in the baking process. However, the main concern is that various animal studies demonstrate an association of potassium bromate with cancer.<sup>13</sup> The International Agency for Research on Cancer considers potassium bromate to be possibly carcinogenic to humans, and the US Environmental Protection Agency considers it to be a probable human carcinogen.<sup>23,24</sup> California's Proposition 65 also lists potassium bromate as a carcinogen.<sup>5</sup> Many countries with the exception of the US and Japan have banned bromates.<sup>13</sup>

---

## HIGH FRUCTOSE CORN SYRUP

**Description:** High fructose corn syrup (HFCS) is a sweetener derived from corn and chemically altered to change the natural fructose to glucose ratio. This caloric sweetener is commonly found in processed foods and beverages, and not limited to sweets.

**Concern:** Between 1970 and the late 1990's American's annual consumption of high fructose corn syrup (HFCS) increased from 3.6 pounds per capita to 62.4 pounds, primarily as a result of cheap HFCS available on the market.<sup>25</sup> At the same time childhood obesity was on the rise. Researchers have shown this increased consumption of HFCS has a temporal relation to the obesity epidemic.<sup>26</sup>

It is important to note that *all* added sugars—not just high fructose corn syrup—contribute empty calories linked to numerous health problems, including weight gain, type 2 diabetes, metabolic syndrome and high

triglyceride levels, which increase the risk of heart disease. *All* added sugars must be carefully watched and eliminated from food served in schools when not serving a vital functional or culinary purpose.

However, the proliferation of HFCS as a cheap caloric sweetener in the food supply, and its subsequent link to rates of childhood obesity, overweight, diabetes, and dental caries elevate it to the Unwanted List. This particular ingredient is placed here because it is ubiquitous in overly processed, low quality foods districts seek to eliminate from their menus. Many food manufacturers, restaurants and school districts have already eliminated its use; a trend Focus is reinforcing.

---

## NITRATES AND NITRITES

**Description:** Nitrates and nitrites are found in diets through vegetables (e.g., celery, lettuce, and spinach), fruits, cured meats, fish, dairy products and cereals. Some meats and meat products contain sodium nitrate and/or sodium nitrite as preservatives.<sup>27</sup> Additional functions include stabilizing the red color and adding flavor to cured meats. These ingredients are commonly used in processed meat products, such as bacon, ham, frankfurters, and luncheon meats.<sup>13</sup>

**Concern:** Nitrates and nitrites can lead to the formation of small amounts of potent cancer-causing chemicals known as nitrosamines.<sup>28,29</sup> Several studies link consumption of cured meat and nitrite by children, pregnant women, and adults with various types of cancer.<sup>13</sup> In 2015, the International Agency for Research on Cancer (IARC) at the World Health Organization classified processed meat as “carcinogenic to humans.”<sup>30</sup>

---

## PARTIALLY HYDROGENATED OILS

**Description:** Partially hydrogenated oil (PHO) is made by adding hydrogen to vegetable oil in a process called hydrogenation, which makes the oil more solid. These oils are used by food manufacturers to improve the texture, shelf life, and flavor stability of foods. During the hydrogenation process trans-fats are formed.<sup>31</sup>

**Concern:** Eating trans-fat raises one’s levels of low-density lipoprotein (i.e., LDL or “bad” cholesterol) and lowers high-density lipoprotein (i.e., HDL or “good” cholesterol) in the blood. Consumption of trans-fats can increase

one's risk of developing stroke, type 2 diabetes, and heart disease, the leading cause of death for men and women in the US.<sup>32</sup> In June 2015 the FDA took action to significantly reduce PHOs in the food supply and recommends keeping dietary intake of trans fat as low as possible.<sup>31</sup> An expert advisory committee for the 2015 Dietary Guidelines recommended that "partially hydrogenated oils containing trans-fat should be avoided."<sup>33</sup>

## WATCH INGREDIENT LIST

### ADDED SODIUM

**Description:** Sodium and sodium chloride are added to foods, often during processing, for preservative or flavor purposes. In the average American diet almost half of all dietary sodium comes from these 10 foods: breads and rolls, cold cuts and cured meats (e.g., deli or packaged ham, or turkey), pizza, fresh and processed poultry, soups, sandwiches (e.g., cheeseburgers), cheese, pasta dishes, meat-mixed dishes (e.g., meat loaf with tomato sauce), and snacks (e.g., chips, pretzels, and popcorn).<sup>34</sup>

**Concern:** Salt, at levels present in the diets of most people, is one of the single most harmful substance in the food supply. While the body needs small amounts of sodium to function properly, most Americans are consuming far too much of it, leading to high blood pressure, which in turn is associated with an increased risk of heart disease and stroke.<sup>34</sup> While these health problems typically manifest in adult populations, their precursors start in early childhood.<sup>35</sup> Children ages 2 to 19 consume more than 3,100 mg of sodium a day, which is over twice daily recommendation of the American Heart Association (AHA). The AHA recommends that Americans of all ages consume no more than 1,500 mg of sodium a day.<sup>36</sup>

Sodium levels in school meals are already regulated by the USDA. Sodium limits and tiered reductions are currently in place.<sup>37,38</sup> The inclusion of added sodium on this list is intended to support planned reductions in sodium limits by removing excess added sodium from highly processed food products.



These ingredients can be a red flag as they are frequently overused, common in foods of lower nutritional quality, and tend to indicate a highly processed food. As a result, we encourage school districts and food manufacturers to Watch Out for ingredients like these and demand transparency and accountability in their use.

Items in the Watch List will be scrutinized by buyers, and their function must be understood and justified through dialogue between Focus, districts and food manufacturers.

---

## ADDED SUGARS

**Description:** Added sugars are caloric sweeteners added to processed and prepared foods that include but are not limited to: agave, anhydrous dextrose, brown sugar, cane juice, cane sugar, confectioner's powdered sugar, corn syrup, corn syrup solids, crystal dextrose, date sugar, dextrose, evaporated cane juice, fructose, fruit juice concentrate, high-fructose corn syrup, high-maltose corn syrup, honey, invert sugar, isomaltulose, lactose, malt syrup, maltose, maple syrup, molasses, nectars (e.g., peach nectar, pear nectar), pancake syrup, raw sugar, sucrose, sugar, sugar cane juice, trehalose, white granulated sugar. These types of sweeteners are commonly found in all types of foods and beverages but the major source of these are in sugar-sweetened beverages (e.g., soft drinks, energy drinks, sports drinks), baked goods (e.g., cakes, cookies, pies, cobblers, sweet rolls, pastries, donuts), fruit drinks (e.g., fruitades, fruit punch) and dairy desserts (e.g., ice cream).<sup>39</sup>

**Concern:** Added sugars are ubiquitous and appear on ingredient labels of heavily processed foods in many forms. Excess daily consumption of added sugars, especially in beverages, has been linked to poor nutrient intake, tooth decay, overweight, obesity, diabetes, as well as the development of cardiovascular disease and its associated risk factors.<sup>40-43</sup> Over the last decade American's consumption of added sugars has started to decrease but still remains higher than recommended levels.<sup>44,45</sup> While most everyone enjoys a sweet, the majority of Americans of all ages consume too much of it.

While it is understood that certain foods and beverages require some level of added sugars, the quantities of these ingredients need to be within reason, and other foods and beverages do not require them. School food professionals have to be mindful of total grams of added sugar and total calories from such sweeteners to ensure that their menus meet USDA Meal Pattern Guidelines as well as contribute to healthful diets for students throughout the year. The school food environment is a place to model healthy eating by reducing added sugars.

---

## ARTIFICIAL PRESERVATIVES

### Benzoates and Benzoic Acid

**Description:** Benzoates (e.g., sodium benzoate, potassium benzoate, calcium benzoate) and its close relative benzoic acid are used as preservatives



**BIGGEST CONCERNS:**  
Too much added sodium and sugars. The science is clear that added sodium and all added sugars are the food ingredients that pose the greatest dietary threat to human health in the US. These two ingredients are included in a vast array of foods and beverages, and consequently consumed in excessive amounts leading to poor health outcomes and serious chronic diseases.

to prevent the growth of microorganisms in acidic foods, and are commonly used in fruit juices, carbonated beverages, pickles and processed foods.

**Concern:** There is some evidence that benzoates such as sodium benzoate may cause hives, asthma, or other hypersensitivity reactions in sensitive individuals.<sup>46</sup> Benzoates can also react in beverages that contain ascorbic acid (i.e., vitamin C) or erythorbic acid, a chemical cousin of vitamin C, to form small amounts of benzene, a chemical linked to leukemia and other cancers.<sup>13</sup> In 2006, the FDA's Center for Food Safety and Applied Nutrition shared findings on their survey of benzene in beverages in which 4 out of 100 beverages had elevated levels of benzene.<sup>47</sup> While this occurrence is uncommon school districts plan to keep an eye on products containing these types of preservatives.

## Sulfites

**Description:** Sulfites are used as a preservative to prevent discoloration in foods such as dried fruits and processed potatoes (e.g., dried, fried or frozen potatoes).

**Concern:** This preservative destroys vitamin B1 in foods, thus, reducing the foods nutritional profile. For some sensitive individuals, in particular asthmatics, sulfites can cause severe reactions.<sup>13,48</sup> The US FDA requires that foods that use sulfites as an ingredient or during processing declare its presence on food labels. Sulfites are prohibited from use with certain foods such as raw fruits and vegetables. However, they are still allowed with minimally processed potatoes and dried fruits.<sup>49</sup>

---

## BLEACHED FLOUR

**Description:** Bleached flour is flour that has been treated with an oxidizing agent, most commonly benzoyl peroxide, to accelerate the natural aging process that results in a whiter color and improves its baking properties.<sup>50</sup>

**Concern:** Bleached flour tends to be used in highly processed foods. There is limited information available documenting the impact that bleaching has on flour's overall nutrient content. In 2001, a WHO's Expert Committee on Food Additives "noted the importance of assessing the nutritional and toxicological implications of treatment of foods treated with benzoyl peroxide

with respect to potential effects on proteins, vitamins, antioxidants and physiologically important lipids,” however, at the time of assessment no information was available.<sup>51</sup> Unbleached flour that has been aged naturally without bleaching agents is preferred.

---

## SPECIFIED NATURAL FLAVORS

**Description:** The term natural flavor or natural flavoring is defined by the FDA as “the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products, or fermentation products thereof, whose significant function in food is flavoring rather than nutritional.”<sup>12</sup>

**Concern:** These flavors serve no nutritional function and they are commonly found in many kinds of foods of low nutritional value. The use of natural or artificial flavors indicates that the real ingredient has been left out. School districts report that some of their children may have allergic or hypersensitivity reactions to certain ingredients. School food service departments are requesting that when natural flavors are used they include specific details from which natural flavor ingredients are derived. For example, an ingredient list should include details such as “natural flavors (banana extract)”.

---

## THICKENING AGENTS

### Carrageenan

**Description:** Carrageenans are large molecules called a polysaccharide that are extracted from edible red seaweeds. They are used in foods as gelling, thickening and stabilizing agents, and are commonly found in dairy products (e.g., chocolate milk, skim milk, evaporated milk, milkshakes and instant breakfast power, cottage and cream cheese products, yogurt) , dairy alternatives (e.g., almond milk, soy milk), fruit drinks, desserts (i.e., flans and custards, pudding, pie fillings), salad dressings, sauces (i.e., relish, pizza, BBQ), and tofu.<sup>13,52</sup>

**Concern:** Carrageenan has no nutritional value.<sup>53</sup> Some people report that these thickening and texturing agents cause gastro intestinal problems.<sup>13</sup> A number of animal studies have highlighted concern with findings demonstrating an association with “degraded” carrageenan with cancer.<sup>54,55</sup> Small amounts of degraded carrageenan may contaminate food-grade carrageenan, and a bit more probably forms in the acidic conditions of the stomach.<sup>13</sup>

---

## VEGETABLE PROTEINS

### Isolated Vegetable Protein (IVP), Hydrolyzed Vegetable Protein (HVP) & Texturized Vegetable Protein (TVP)

**Description:** Isolated vegetable protein is typically extracted from soybeans but can also be derived from other foods such as peas. Textured vegetable protein is soy protein that has been combined with chemical additives and processed into granules, chunks, or strips that can function as a meat analog. Hydrolyzed vegetable protein is used as a flavor enhancer in a wide variety of foods including soups, frankfurters, sauce mixes and beef stew.<sup>13</sup>

**Concern:** These ingredients are found in many processed foods, in particular animal products. They serve various functions such as fillers, extenders or flavor enhancers, especially to make meat products cheaper. Most of these proteins that serve as meat analogs undergo processing with hexane, which the Center for Disease Control has classified as a neurotoxin, and it’s unclear how much of this remains in the proteins after processing.<sup>56</sup> In addition, HVP is made through the process of acidic hydrolysis of a vegetable protein. During the hydrolysis process carcinogenic compounds can be produced, and the resulting product is high in salt.<sup>57</sup> HVP also contains monosodium glutamate, which some individuals are sensitive to.<sup>58</sup> 🇺🇸

1. Kena G, Hussar W, McFarland J, et al. *The Condition of Education 2016*. Washington, DC: National Center for Education Statistics; 2016. <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2016144>. Accessed July 6, 2016.
2. U.S. Food and Drug Administration (FDA). Questions and Answers on Caramel Coloring and 4-MEI. <http://www.fda.gov/food/ingredientspackaginglabeling/foodadditivesingredients/ucm364184.htm>. Published 2014. Accessed June 3, 2016.
3. IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Some Chemicals Present in Industrial and Consumer Products, Food and Drinking-Water- 2-METHYLIMIDAZOLE. In: *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*. Vol 101. Lyon: International Agency for Research on Cancer (IARC); 2013:435-445. <http://monographs.iarc.fr/ENG/Monographs/vol101/mono101-014.pdf>.
4. IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Some Chemicals Present in Industrial and Consumer Products, Food and Drinking-Water- 4-METHYLIMIDAZOLE. In: International Agency for Research on Cancer, ed. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*. Vol 101. Lyon: World Health Organization; 2013:447-459. <https://monographs.iarc.fr/ENG/Monographs/vol101/mono101.pdf>.
5. Office of Environmental Health Hazard Assessment CEPA. The Proposition 65 List. <http://oehha.ca.gov/proposition-65/proposition-65-list>. Published 2016. Accessed June 3, 2016.
6. Lefferts LY, Jacobson MF, MacCleery L. *Seeing Red: Time for Action in Food Dyes*. Washington D.C.; 2016. <http://cspinet.org/reports/seeing-red-report.pdf>.
7. Conners CK, Goyette CH, Southwick DA, Lees JM, Andrulonis PA. Food additives and hyperkinesia: a controlled double-blind experiment. *Pediatrics*. 1976;58(2):154-166.
8. Stevenson J, Buitelaar J, Cortese S, et al. Research review: the role of diet in the treatment of attention-deficit/hyperactivity disorder—an appraisal of the evidence on efficacy and recommendations on the design of future studies. *J Child Psychol Psychiatry*. 2014;55(5):416-427. doi:10.1111/jcpp.12215.
9. Bateman B, Warner JO, Hutchinson E, et al. The effects of a double blind, placebo controlled, artificial food colourings and benzoate preservative challenge on hyperactivity in a general population sample of preschool children. *Arch Dis Child*. 2004;89:506-511. doi:10.1136/adc.2003.031435.
10. McCann D, Barrett A, Cooper A, et al. Food additives and hyperactive behaviour in 3-year-old and 8/9-year-old children in the community: a randomised, double-blinded, placebo-controlled trial. *Lancet*. 2007;370(9598):1560-1567. doi:10.1016/S0140-6736(07)61306-3.
11. Kobylewski S, Jacobson MF. *Food Dyes: A Rainbow of Risks*. Washington D.C.; 2010. <https://cspinet.org/new/pdf/food-dyes-rainbow-of-risks.pdf>.
12. USDA Food and Drug Administration D of H and HS. Specific Food Labeling Requirements. Code of Federal Regulations. <http://www.ecfr.gov/cgi-bin/text-idx?SID=4387710052bb3232d013ff06256a40fe&mc=true&node=sp21.2.101.b&rgn=div6>. Published 1993. Accessed June 3, 2016.
13. Center for Science in the Public Interest. Chemical Cuisine, Learn About Food Additives. <http://www.cspinet.org/reports/chemcuisine.htm>. Published 2014. Accessed June 3, 2016.
14. NTP (National Toxicology Program). *Report on Carcinogens, Thirteenth Edition*. Research Triangle Park; 2014. <http://ntp.niehs.nih.gov/pubhealth/roc/roc13/>.
15. Nieva-Echevarría B, Manzanos MJ, Goicoechea E, Guillén MD. 2,6-Di-Tert-Butyl-Hydroxytoluene and Its Metabolites in Foods. *Compr Rev Food Sci Food Saf*. 2015;14(1):67-80. doi:10.1111/1541-4337.12121.
16. National Toxicology Program. *CARCINOGENESIS BIOASSAY OF PROPYL GALLATE IN F344 RATS AND B6C3F1 MICE*. Bethesda; 1982. [https://ntp.niehs.nih.gov/ntp/htdocs/lt\\_rpts/tr240.pdf](https://ntp.niehs.nih.gov/ntp/htdocs/lt_rpts/tr240.pdf). Accessed June 15, 2016.
17. Abdo KM, Kari FW. The sensitivity of the NTP bioassay for carcinogen hazard evaluation can be modulated by dietary restriction. *Exp Toxicol Pathol*. 1996;48(2-3):129-137. doi:10.1016/S0940-2993(96)80033-9.
18. Soffritti M, Belpoggi F, Degli Esposti D, Lambertini L, Tibaldi E, Rigano A. First experimental demonstration of the multipotential carcinogenic effects of aspartame administered in the feed to Sprague-Dawley rats. *Environ Health Perspect*. 2006;114(3):379-385. <http://www.ncbi.nlm.nih.gov/pubmed/16507461>. Accessed June 15, 2016.
19. Schernhammer ES, Bertrand KA, Birmann BM, Sampson L, Willett WC, Feskanich D. Consumption of artificial sweetener- and sugar-containing soda and risk of lymphoma and leukemia in men and women. *Am J Clin Nutr*. 2012;96(6):1419-1428. doi:10.3945/ajcn.111.030833.
20. M. S, M. P, E. T, et al. Sucralose administered in feed, beginning prenatally through lifespan, induces hematopoietic neoplasias in male swiss mice. *Int J Occup Environ Health*. 2016;22(1):7-17. doi:10.1080/10773525.2015.1106075.
21. Raiten DJ, Talbot JM, Fisher KD. Executive summary from the report: analysis of adverse reactions to monosodium glutamate (MSG). *J Nutr*. 1995;125(11):2891S - 2906S. <http://www.ncbi.nlm.nih.gov/pubmed/7472671>. Accessed June 3, 2016.
22. US Food and Drug Administration. Frequently Asked Questions on Azodicarbonamide (ADA). <http://www.fda.gov/Food/IngredientsPackagingLabeling/FoodAdditivesIngredients/ucm387497.htm>. Published 2016. Accessed June 3, 2016.
23. International Agency for Research on Cancer (IARC). *Summaries & Evaluations, Potassium Bromate (Group 2B)*; 1999. <http://www.inchem.org/documents/iarc/vol73/73-17.html>.
24. US EPA IRISD. Bromate CASRN 15541-45-4. IRIS Assessments. [https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance\\_nmbr=1002](https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1002). Published 2001. Accessed June 15, 2016.
25. Putnam JJ, Allshous JE. *Food Consumption, Prices, and Expenditures, 1970-97*. Washington D.C.; 1999. <http://www.ers.usda.gov/publications/sb-statistical-bulletin/sb965.aspx>.
26. Bray GA, Nielsen SJ, Popkin BM. Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. *Am J Clin Nutr*. 2004;79(4):537-543. <http://www.ncbi.nlm.nih.gov/pubmed/15051594>. Accessed June 3, 2016.
27. Agency for Toxic Substances & Disease Registry C for DC& P. ToxFAQs for Nitrate and Nitrite. <http://www.atsdr.cdc.gov/toxfaqs/faq.asp?id=1186&tid=258#bookmark02>. Published 2011. Accessed June 3, 2016.
28. Jakszyn P, Gonzalez C-A. Nitrosamine and related food intake and gastric and oesophageal cancer risk: a systematic review of the epidemiological evidence. *World J Gastroenterol*. 2006;12(27):4296-4303. <http://www.ncbi.nlm.nih.gov/pubmed/16865769>. Accessed June 3, 2016.
29. Althoff J, Grandjean C. In vivo studies in Syrian golden hamsters: a transplacental bioassay of ten nitrosamines. *Natl*

- Cancer Inst Monogr.* 1979;(51):251-255. <http://www.ncbi.nlm.nih.gov/pubmed/481578>. Accessed June 3, 2016.
- 30.** International Agency for Research on Cancer (IARC). IARC Monographs evaluate consumption of red meat and processed meat. 2015. doi:[https://www.iarc.fr/en/media-centre/pr/2015/pdfs/pr240\\_E.pdf](https://www.iarc.fr/en/media-centre/pr/2015/pdfs/pr240_E.pdf).
- 31.** US Food and Drug Administration. Talking About Trans Fat: What You Need to Know. <http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm079609.htm>. Published 2016. Accessed June 3, 2016.
- 32.** American Heart Association. Trans Fats. [http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/Trans-Fats\\_UCM\\_301120\\_Article.jsp#.V2HUvkrjHE](http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/Trans-Fats_UCM_301120_Article.jsp#.V2HUvkrjHE). Published 2015. Accessed June 15, 2016.
- 33.** Dietary Guidelines Advisory Committee. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee- Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture*. Washington D.C.; 2015. <http://health.gov/dietaryguidelines/2015-scientific-report/PDFs/01-DGAC-staff-membership.pdf>. Accessed June 3, 2016.
- 34.** Center for Disease Control and Prevention. Where's the sodium? There's too much in many common foods. CDC Vital Signs. <http://www.cdc.gov/vitalsigns/sodium/>. Published 2012. Accessed June 3, 2016.
- 35.** Appel LJ, Lichtenstein AH, Callahan EA, Sinaiko A, Van Horn L, Whitsel L. Reducing Sodium Intake in Children: A Public Health Investment. *J Clin Hypertens.* 2015;17(9):657-662. doi:10.1111/jch.12615.
- 36.** American Heart Association. Sodium and Kids. <http://sodiumbreakup.heart.org/sodium-411/sodium-kids/>. Accessed June 3, 2016.
- 37.** US Department of Agriculture Food and Nutrition Services. Nutrition Standards in the National School Lunch and School Breakfast Programs; Final Rule. *Fed Regist.* 2012;77(17):4088-4167. <https://www.gpo.gov/fdsys/pkg/FR-2012-01-26/pdf/2012-1010.pdf>. Accessed June 3, 2016.
- 38.** USDA Food and Nutrition Service. Sodium Reduction: Timeline and Amount, Final Rule "Nutrition Standards in the National School Lunch and School Breakfast Programs (1/26/12). 2012. <http://www.fns.usda.gov/sites/default/files/sodium.pdf>. Accessed June 3, 2016.
- 39.** US Department of Agriculture. What are added sugars? ChooseMyPlate.gov. <http://www.choosemyplate.gov/what-are-added-sugars>. Published 2016. Accessed June 3, 2016.
- 40.** Welsh JA, Sharma A, Abramson JL, et al. Caloric Sweetener Consumption and Dyslipidemia Among US Adults. *JAMA.* 2010;303(15):1490. doi:10.1001/jama.2010.449.
- 41.** Fung TT, Malik V, Rexrode KM, Manson JE, Willett WC, Hu FB. Sweetened beverage consumption and risk of coronary heart disease in women. *Am J Clin Nutr.* 2009;89(4):1037-1042. doi:10.3945/ajcn.2008.27140.
- 42.** Vartanian LR, Schwartz MB, Brownell KD. Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis. *Am J Public Health.* 2007;97(4):667-675. doi:10.2105/AJPH.2005.083782.
- 43.** Johnson RK, Appel LJ, Brands M, et al. Dietary Sugars Intake and Cardiovascular Health: A Scientific Statement From the American Heart Association. *Circulation.* 2009;120(11):1011-1020. doi:10.1161/CIRCULATIONAHA.109.192627.
- 44.** Bethene Ervin R, Kit BK, Carroll MD, Ogden CL. *Consumption of Added Sugar Among US Children and Adolescents, 2005-2008*. Vol 87. Hyattsville; 2012. <http://permanent.access.gpo.gov/gpo31816/db87.pdf>. Accessed June 3, 2016.
- 45.** Welsh JA, Sharma AJ, Grellinger L, Vos MB. Consumption of added sugars is decreasing in the United States. *Am J Clin Nutr.* 2011;94(3):726-734. doi:10.3945/ajcn.111.018366.
- 46.** Wibbertmann A, Kielhorn J, Koennecker G, Mangelsdorf I, Melber C. *Benzoic Acid and Sodium Benzoate*. Geneva ; 2000. [http://www.who.int/ipcs/publications/cicad/cicad26\\_rev\\_1.pdf](http://www.who.int/ipcs/publications/cicad/cicad26_rev_1.pdf). Accessed June 3, 2016.
- 47.** US Food and Drug Administration. Data on Benzene in Soft Drinks and Other Beverages. Chemical Contaminants. <http://www.fda.gov/Food/FoodbornIllnessContaminants/ChemicalContaminants/ucm055815.htm>. Published 2007. Accessed June 3, 2016.
- 48.** Timbo B, Koehler KM, Wolyniak C, Klontz KC. Sulfites—A Food and Drug Administration Review of Recalls and Reported Adverse Events. *J Food Prot.* 2004;8(6):1568-1811.
- 49.** Food Allergy Research and Resource Program I of A and NR. Sulfites - USA. <http://farrp.unl.edu/sulfites-usa>. Accessed June 3, 2016.
- 50.** Saiz AI, Manrique GD, Fritz R. Determination of Benzoyl Peroxide and Benzoic Acid Levels by HPLC during Wheat Flour Bleaching Process. *J Agric Food Chem.* 2001;49(1):98-102. doi:10.1021/jf9912304.
- 51.** World Health Organization (WHO). Evaluation of Certain Food Additives and Contaminants 55th report of the Joint FAO/WHO Expert Committee on Food Additives. 2001. [http://apps.who.int/iris/bitstream/10665/42388/1/WHO\\_TRS\\_901.pdf](http://apps.who.int/iris/bitstream/10665/42388/1/WHO_TRS_901.pdf). Accessed June 14, 2016.
- 52.** Zhanjiang Fisheries College. Properties, manufacture and application of seaweed polysaccharides- agar, carrageenan and algin. In: *Training Manual on Gracilaria Culture and Seaweed Processing in China*. Zhanjiang; 1990. <http://www.fao.org/3/contents/cc376c9c-954f-5009-bb07-15150f974f26/AB730E00.htm>.
- 53.** World Health Organization (WHO). Evaluation of Certain Food Additives and Contaminants 57th report of the Joint FAO/WHO Expert Committee on Food Additives. 2002. [http://apps.who.int/iris/bitstream/10665/42578/1/WHO\\_TRS\\_909.pdf](http://apps.who.int/iris/bitstream/10665/42578/1/WHO_TRS_909.pdf). Accessed June 14, 2016.
- 54.** Tobacman JK. Review of harmful gastrointestinal effects of carrageenan in animal experiments. *Environ Health Perspect.* 2001;109(10):983-994. <http://www.ncbi.nlm.nih.gov/pubmed/11675262>. Accessed June 3, 2016.
- 55.** International Agency for Research on Cancer (IARC). *Summaries and Evaluations, Carrageenan.*; 1983. <http://www.inchem.org/documents/iarc/vol31/carrageenan.html>.
- 56.** Berkeley Wellness. Ask the Experts, Hexane in Soy Food. *Berkeley Wellness, Univ Calif.* May 2012. <http://www.berkeleywellness.com/healthy-eating/food-safety/article/hexane-soy-food>.
- 57.** Aaslyng MD, Martens M, Poll L, Nielsen PM, Flyge H, Larsen LM. Chemical and Sensory Characterization of Hydrolyzed Vegetable Protein, a Savory Flavoring. *J Agric Food Chem.* 1998;46(2):481-489. doi:10.1021/jf970556e.
- 58.** Scopp AL. MSG and Hydrolyzed Vegetable Protein Induced Headache: Review and Case Studies. *Headache J Head Face Pain.* 1991;31(2):107-110. doi:10.1111/j.1526-4610.1991.hed3102107.x.