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What Are the Dangers of Air Fryers?

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STORY AT-A-GLANCE

- Air fryers have captured the interest of people who love the taste of fried food but not all the calories associated with traditional deep frying
- The chief selling point of an air fryer is the use of hot air and a little oil — instead of multiple cups of oil — to "fry" food quickly and crisply
- One of the biggest concerns about fried foods has to do with the way certain foods produce a toxic compound called acrylamide, a probable carcinogen, when heated to temperatures above 250 degrees F
- Eating food in its raw, natural, whole-food state (or as close as possible) is almost always your healthiest option; with respect to cooked foods, blanching, sautéing and steaming are far superior alternatives to frying
- Other concerns I have related to air fryers include the types of oils used at high heats and the potentially toxic materials, such as BPA and nonstick coatings, sometimes used in the fryer itself

This article was previously published March 5, 2018, and has been updated with new information.

As you may imagine, I am not a fan of fried food. For that reason, I admit I have not paid much attention to the air fryer craze. Although these gadgets have been around for years, they have skyrocketed in popularity in recent months. Given the traffic on

Amazon, Google and Pinterest alone, it's clear air fryers are capturing the interest of people who love the taste of fried food but not all the calories associated with traditional deep frying.

As part of their central marketing message, air fryers promise to provide you with a faster, healthier and less messy fried-food experience right in your kitchen. Before you rush out to buy one, let's take a few minutes to consider an important question both critics and fans of this kitchen appliance should be asking: Are air fryers healthy?

What Is an Air Fryer and How Does It Work?

Air fryers — a kitchen gadget that has been steadily capturing the imagination of fried-food lovers in recent years — promise great-tasting crispy food, fast, and with half the calories and fat of foods fried using traditional methods. The chief selling point is the use of hot air and a little oil instead of multiple cups of hot oil to cook food quickly and crisply.

Given their similar air circulation method, some compare air fryers to mini convection ovens. Check out the video above for more details on the innerworkings of air fryers. According to Women's Health,[1] hundreds of models of air fryers popped up on Amazon, Google and Pinterest in 2017, with peak consumer interest coinciding with the Christmas shopping season. The U.K.-based Alternative Daily offers the following details about air fryers:[2]

> *"An air fryer can 'fry' foods with just half a spoonful of oil. Instead of using fat and oil to fry foods, this appliance was designed to fry without needing to dunk food in oil. In fact, most foods [prepared] within this cooking device require no oil at all — just hot air. Based on Rapid Air Technology, air fryers blow superheated air to cook foods that are traditionally fried in oil.*
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> *Whether you want to make fish and chips, chicken or even donuts, air that's up to 200 degrees C (400 degrees F) begins to circulate, creating a browned, crispy surface. In just 10 to 12 minutes, for instance, you can cook a batch of fries,*

using just half a spoonful of oil. And, that's just the beginning. From cakes to nuggets [and] burgers to steaks, foods can be rapidly cooked to achieve the same results when frying, toasting, baking or roasting."

Is Air-Fried Food Good for You?

While most conventional health experts agree air frying is somewhat healthier than deep frying, the reality is fried food is still fried food and not something you should ever consider to be a healthy dietary choice.

As featured in Women's Health, Natalie Rizzo, a New York-based registered dietitian (RD), suggests air frying saves calories and fat, but in terms of your health what really matters isn't cutting calories and fat, but making sure the calories and fat you consume come from whole food (and not whole food that's been heated to high temperatures in any sort of fryer).

"With an air fryer, Rizzo says, you can prepare a somewhat healthier version of nearly any traditionally fried food. You can use to it to create a crispy coating on anything you would normally fry, like french fries, chicken fingers or even veggies."[3] By Rizzo's account, the cooking process using an air fryer is relatively simple: Brush oil on the foods you are about to fry and set the air fryer heat to the desired temperature.

While noting the temperature varies according to the type of food you are cooking, Rizzo says "usually the 300- to 400-degree F range (150 to 200 degrees C) is typical." To me, that high temperature range is an immediate red flag and my first caution about air fryers. As explained later in this article, heating certain types of foods beyond 250 degrees F may produce a neurotoxic compound called acrylamide.

Naturally, as Rizzo explains, you would not expect fried food — regardless of whether it emerges from an air fryer or deep fat fryer — to be as healthy as raw food or food prepared using non-frying preparation methods. I believe eating most foods in their raw, natural, whole-food state (or as close to whole as possible) is almost always your healthiest option.

With respect to cooked foods, blanching, sautéing and steaming are far superior to frying. In fact, lightly cooking some foods, such as asparagus, spinach and tomatoes, makes their nutrients more bioavailable. The antioxidant lycopene in tomatoes, for example, has enhanced bioavailability when heated.[4] Because fried food falls short as a health food 100% of the time, it's heartening Rizzo wisely cautions against adopting the air frying cooking method as a lifestyle choice.

I agree with her that using an air fryer on a regular basis would be unwise because it will likely give you a false sense of "healthy eating." As such, there is no point in owning an air fryer; it will serve only to tempt you to overconsume certain unhealthy foods. Most of those unhealthy foods, by the way, are likely to be highly processed. That said, the belief air-fried foods will be healthier for you solely because the preparation method is perceived to be healthier is quite simply a myth.

Neurotoxic Chemical Acrylamide Lurks in Fried Foods

As mentioned, one of the biggest cautions about eating fried foods has to do with the way frying changes certain foods into probable carcinogens. If you regularly enjoy fried foods, particularly those heated in such a way as to create a browned or charred surface, you need to know about a toxic compound called acrylamide.

In 2002, researchers discovered this cancer-causing and potentially neurotoxic chemical, which is created when carbohydrate-rich foods are cooked at high temperatures. This includes carbs that are baked, fried, grilled, roasted or toasted. Acrylamide is the byproduct of a chemical reaction that occurs at high temperatures between sugars and the amino acid asparagine.

While the toxic chemical can develop in a variety of foods cooked or processed at temperatures above 250 degrees F, carbohydrate-heavy foods are by far the most vulnerable. The presence of acrylamide is particularly noticeable when plant-based foods are heated to the point of a noticeable browning or charring. While not every single food within these categories is affected by acrylamide, the categories of food most likely to produce it include:[5]

- **Cocoa products —** Baking chocolate, cocoa mix, chocolate bars, chocolate milk mix, chocolate pudding and pie filling
- **Coffee —** Roasted coffee beans and ground coffee powder, as well as chicory-based coffee substitutes, which contain two to three times more acrylamide than real coffee
- **Grains —** Bread crust, breakfast cereal, cookies, crackers, crisp bread, toast and various processed snacks
- **Potatoes —** Chips and french fries, as well as other fried or roasted potato foods

How Much Acrylamide Is in Your Diet?

Since 2013, the U.S. Food and Drug Administration (FDA) has advised consumers to reduce their intake of acrylamide-containing foods, noting about 40% of the calories consumed as part of the average American diet is laced with this toxic byproduct. To cut acrylamides from your diet, the agency recommends:[6]

- Avoiding fried foods
- Baking bread, muffins and other baked goods, as well as potatoes, to a light golden color rather than dark brown or blackened
- Opting for untoasted or lightly toasted bread
- Storing potatoes at room temperature, because storing potatoes in the refrigerator can increase acrylamide during cooking

Rather than the fridge, store potatoes in a dark, dry closet or pantry. You can further reduce acrylamide formation in potatoes by soaking them in water for 15 to 30 minutes prior to cooking. While the FDA makes no mention of avoiding processed foods that are "browned," such as cookies, crackers, potato chips, roasted nuts (and nut butters) and snack mixes, you should know they may also contain acrylamide due to being processed at high temperatures.

Health Risks Associated With Acrylamide

The findings related to the potential health risks of a diet heavy in acrylamide are mixed. Animal-based research[7] suggests acrylamide "is capable of inducing genotoxic, carcinogenic, developmental and reproductive effects in tested organisms." About the potential harmful effects of acrylamide, the National Cancer Institute says:[8]

> *"Studies in rodent models have found that acrylamide exposure increases the risk for several types of cancer. In the body, acrylamide is converted to a compound called glycidamide, which causes mutations in and damage to DNA.*
>
> *However, a large number of epidemiologic studies (both case-control and cohort studies) in humans have found no consistent evidence that dietary acrylamide exposure is associated with the risk of any type of cancer.*
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> *One reason for the inconsistent findings from human studies may be the difficulty in determining a person's acrylamide intake based on their reported diet. The National Toxicology Program's report on carcinogens considers acrylamide to be reasonably anticipated to be a human carcinogen, based on studies in laboratory animals given acrylamide in drinking water."*

Based on the research completed to date involving lab animals, the American Cancer Society calls attention to the following agencies, each of which has weighed in with potential concerns about acrylamide for humans:[9]

- **International Agency for Research on Cancer (IARC) —** As part of the World Health Organization, the IARC seeks to identify causes of cancer. It has classified acrylamide as a "probable human carcinogen."
- **National Toxicology Program (NTP) —** Formed from parts of several different U.S. government agencies, including the Centers for Disease Control and Prevention, Food and Drug Administration, and the National Institutes of Health, the NTP, in its 2014 report on carcinogens, classified acrylamide as "reasonably anticipated to be a human carcinogen."

- **U.S. Environmental Protection Agency (EPA) —** As owner of the integrated risk information system, an electronic database containing information on human health effects from environmental exposures, the EPA classifies acrylamide as "likely to be carcinogenic to humans."

The Best and Healthiest Oils to Use for Cooking

While some air fryers live up to their claims of using up to 75% less oil than traditional deep-frying methods,[10] it's important to remember that not all cooking oils are created equal, even if you are using less of them. Most oils used for cooking, in fact, are heavily processed and some may even be hydrogenated or partially hydrogenated, which means they are full of trans fats. According to the American Heart Association, regular consumption of trans fats:[11]

- Lowers your HDL (good) cholesterol level
- Increases your risk of developing heart disease and stroke
- Is associated with a higher risk of developing Type 2 diabetes

In addition, I always advise you to steer clear of canola oil, corn oil, cottonseed oil and soybean oil, as well as any foods containing them or cooked in them. As you may already know, these are the primary oils used to prepare most fried and processed foods, as well as nearly all fast food. While these oils do not have trans fats, when heated they may degrade to even more dangerous toxic oxidation products, including cyclic aldehydes.

With seed oils, the primary culprit is an omega-6 fat called linoleic acid (LA), which acts as a metabolic poison when consumed in excess. It causes severe oxidative stress and mitochondrial dysfunction — two drivers of most disease processes.[12,13,14,15,16,17,18]

Much of the damage is incurred by advanced lipid oxidation end products (ALEs) and oxidized LA metabolites (OXLAMs), which form when your body digests the LA and breaks it down. OXLAMs, for example, are known to be cytotoxic, genotoxic, mutagenic,

carcinogenic, thrombogenic, atherogenic and obesogenic.[19] In other words, OXLAMs is a contributor to most lethal conditions.

LA also gets incorporated into your cells and stays there up to seven years. Sugar, on the other hand, is used up and depleted rather quickly once you cut it out. So, seed oils pose a far more persistent and long-term threat to your health. For this reason, I believe eliminating them will also take you the farthest.

Another reason to avoid these oils is the fact that many are genetically engineered (GE). GE foods can damage your health and are among the worst foods on the planet. Healthier oils include coconut oil, olive oil, organic grass fed raw butter, clarified butter called ghee and sesame oil. Take note that coconut oil is the only one useful for high-heat cooking, including frying, although ghee can also be used for cooking.

While you may be tempted to use olive oil for cooking or frying, its chemical structure and large amount of unsaturated fats make it very susceptible to oxidative damage. For that reason, only use olive oil (and sesame oil) cold, such as for drizzling over salads.

If you choose to use an air fryer, be aware of the possibility of increased free radicals from even small amounts of oil. As noted by Alternative Daily, "Even if little oil is used, the type of oil, the temperature, the food that's be[ing] cooked and aeration all influence the formation of free radicals. If you're a fan of air frying, at least use oils that do not oxidize easily, such as coconut oil." For more information about cooking oils, check out my Healthiest Cooking Oils infographic.

Final Thoughts About Air Fryers

Given the unhealthy nature of fried food, I would not consider an air fryer to be a must-have kitchen gadget, especially if one of your goals is to optimize your health. More often than not, you will likely be air frying processed foods using toxic oils, resulting in a manner of eating that simply cannot be considered part of a healthy lifestyle.

Furthermore, though I did not mention it previously, I also have concerns about the types of plastics and nonstick coatings used in some air fryers. Depending on the model you

choose, you may also be risking toxic exposures to bisphenol-A (BPA) and nonstick coatings, which I strongly caution against.

To wrap up my thoughts on this subject, I will close with a comment I read in one of the air fryer online reviews. If you have any lingering doubts, it may be the final piece of advice you need to help you decide if you should purchase an air fryer. The reviewer said, "Air fryers have the added benefit of making fried food healthier, but if fried food is not a staple within your diet, you probably will not benefit from owning an air fryer."

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