

This Green Life

A Journal of Sorts



STICKY BUSINESS

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I'm fairly serious about cooking and cooking equipment, in my own amateurish way. For pans, I generally use cast iron or anodized aluminum as they heat evenly and are great for browning and deglazing. They're not too expensive either. When cooking eggs, though, I prefer Teflon. The non-stick surface lets me flip omelets with barely a flick of the wrist -- something that requires heaps more butter, and finesse, in a regular pan. There's just one drawback, as I recently learned. Non-stick pans may be hazardous to one's health -- not, as I used to think, due to chipping, but to fumes.



When non-stick pans are heated to high temperatures, the coating breaks down and vaporizes, releasing toxic substances into the air. DuPont, the maker of Teflon, admits as much, only the company claims that temperatures must exceed 500° F for "deterioration" to occur, and 660° F for "significant decomposition." According to DuPont, temperatures don't even get to 500° F in the course of "normal" cooking, except in the broiler.

Au contraire, says the Environmental Working Group. Non-stick pans do get that hot when preheated on high -- a practice many cooks follow. It doesn't take much time either for temperatures to climb. In tests conducted on ordinary gas and electric stoves, Teflon and other non-stick pans topped 700° F in three to five minutes.

With food cooking in the pan, temperatures stay lower. So people who don't preheat their pans wouldn't usually experience temperatures in the danger zone, unless, of course, they left the kitchen for a few minutes and the food burned -- say, when a neighbor knocked or a child called. Personally, I often step out of the kitchen on the slightest of pretexts -- a sudden urge to check my email, for instance. An unwise practice, certainly, but not, I think, abnormal.

Bird-owners have known about the dangerous fumes for years. There are many documented cases of birds dropping dead from exposure to "offgases" from non-stick products (including toaster ovens and heat lamps). Significantly, some occurred when the non-stick temperature was in the 400-500 degree F range. While it's not surprising that birds, with their sensitive respiratory systems, would be affected at these low temperatures, the fact that it happens does suggest that non-stick coatings can disintegrate below 500° F.

Though people are less susceptible to the fumes than birds, they can still sicken from polymer fume fever -- a flu-like condition with symptoms that include chest tightness and a mild cough. In severe cases, lung injury may result. More worrisome is the possibility of long-term damage from several of the toxins found in the fumes. Of particular concern is PFOA (perfluorooctanoic acid), also known as C8, which causes liver,



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Now you see it, now you don't. PFOA, a persistent toxin that accumulates in the bodies of humans and animals, is used in the manufacture of non-stick pans. It is not present in the pans themselves, but can reappear in fumes when pans are overheated and the coating decomposes.

To preheat or not to preheat. NEVER preheat non-stick pans, but DO preheat other types for better cooking results -- especially cast iron. To preheat, use a medium heat setting, never high.

pancreatic, testicular and mammary gland tumors in rats, as well as immune system problems, reproductive problems and birth defects. According to an independent EPA scientific advisory board, PFOA is a likely human carcinogen. It has been found in the blood of more than 90 percent of Americans -- and animals around the globe. In terms of persistence in the environment, it is unrivaled. As far as can be determined, PFOA never breaks down.

Of course, we don't all have PFOA in our bloodstreams solely as a result of cooking with non-stick pans -- or using other consumer products that are made with, or break down to, PFOA, of which there are many. In fact, scientists are rather mystified about how this synthetic chemical has come to be so pervasive, but suspect that manufacturing processes as well as consumption may be to blame.

A skeptical person might point out that Teflon has been in use for 50 years. If it was so dangerous, why was it ever allowed on the market in the first place? The answer is simple. When it comes to approving chemicals used in consumer products (as opposed to food), our regulatory system is relatively toothless. Basically, there are no federal requirements that the chemicals be proven safe for human health or the environment prior to being manufactured or sold. Essentially, the government has to wait till there's evidence that the substance does harm before it can act. That's where we are with PFOA right now. The evidence of harm is trickling in and the EPA is finally beginning to study the matter.

It's the same pattern we've seen before. Chemicals -- such as PCBs or DDT -- are introduced, gain widespread usage, and then are found to be harmful. At that point, the government steps in and bans or controls use of the substance. With persistent chemicals that degrade slowly in the environment, we're stuck with the ill effects for years. In the case of an indestructible chemical like PFOA, we may be stuck forever.

You may already be breathing air, drinking water and eating vegetables contaminated with PFOA. Until serious study, monitoring and regulation of this chemical occurs, you wouldn't know it or be able to do anything about it. One thing you can do, however, is to avoid buying products made with it, such as non-stick pans.

And if you already have a non-stick pan in your kitchen, be sure to use it carefully. Never preheat it or use with high heat, and always keep your eye on it while cooking. Watching a pot won't keep it from boiling, but will ensure it doesn't burn.

—Sheryl Eisenberg

Sheryl Eisenberg is a web developer and writer. With her firm, Mixit Productions (<http://www.mixitproductions.com>), she brought NRDC online in 1996, designed NRDC's first websites, and continues to develop special web features for NRDC. She created and, for several years, wrote the Union of Concerned Scientists' green living column, *Greentips*, and has designed and contributed content to many non-profit sites.

ONLINE RESOURCES

USA TODAY: Out of the Frying Pan, into a Fire - http://www.usatoday.com/news/health/2003-04-23-teflon-usat_x.htm
BBC: Teflon's Sticky Situation - <http://news.bbc.co.uk/1/hi/magazine/3697324.stm>
EWG: Canaries in the Kitchen - <http://www.ewg.org/reports/toxicteflon/es.php>
DUPONT: Teflon FAQ - http://www.teflon.com/Teflon/downloads/pdf/teflon_faq.pdf
EPA: Basic Information on PFOA - <http://www.epa.gov/opptintr/pfoa/pfoainfo.htm>
EHP: Another Fast-Food Fear - <http://ehp.niehs.nih.gov/docs/2003/111-16/forum.html>
BROADWAY PANHANDLER: Choosing Cookware - http://www.broadwaypanhandler.com/broadway/dept.asp?s_id=0&dept_id=610&
WHAT'S COOKING AMERICA: The Irreplaceable Cast-Iron Skillet - <http://whatscookingamerica.net/Information/CastIronPans.htm>

Naturally non-stick. For a great non-stick alternative, try a seasoned cast iron pan. Except for weight (it's heavy!), it is superior in every respect. It heats evenly, browns food beautifully, keeps cooked food warm in the pan, enables low-fat cooking, can be used with metal utensils and lasts a lifetime, literally. To season: wash with warm soapy water, rub with solid vegetable shortening, and heat in a 300° oven for an hour. Cook high-fat foods in it the first few times to lock in the seasoning. After that, anything goes.

To care for your pan: wash in hot water with a stiff brush. Dry thoroughly and store with the cover off so air can circulate. Do not store food in it. You'll know it's time to reseason if rust appears, food acquires a metallic taste or food sticks.



Repellent packaging? PFOA-based coatings are used to repel grease on a variety of fast food packages, including pizza boxes, microwave popcorn packages and french fry containers. There is concern that if the coatings break down when exposed to heat, PFOA might migrate to the food and be ingested. This is one of many PFOA questions requiring research.

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