



The Little-Known Secrets about Bleached Flour...

by Dr. Mercola

Nearly everyone knows that white flour is not healthy for you, but most people don't know that when white flour is bleached, it can actually be FAR worse for you.

It's generally understood that refining food destroys nutrients. With the most nutritious part of the grain removed, white flour essentially becomes a form of sugar. Consider what gets lost in the refining process:

- Half of the beneficial unsaturated fatty acids
- Virtually all of the vitamin E
- Fifty percent of the calcium
- Seventy percent of the phosphorus
- Eighty percent of the iron
- Ninety eight percent of the magnesium
- Fifty to 80 percent of the B vitamins

And many more nutrients are destroyed -- simply too many to list.

The Journey of the Wheat Berry

Have you ever wondered how white flour is made?

The website [Healthy Eating Politics](#) has an interesting article about the process.

Most commercial wheat production is, unfortunately, a "study in pesticide application," beginning with the seeds being treated with fungicide. Once they become wheat, they are sprayed with hormones and pesticides. Even the bins in which the harvested wheat is stored have been coated with insecticides. If bugs appear on the wheat in storage, they fumigate the grain.

A whole grain of wheat, sometimes called a wheat berry, is composed of [three layers](#):

- The bran
- The germ
- The endosperm

The bran is the layer where you'll find most of the fiber, and it's the hard outer shell of the kernel. The germ is the nutrient-rich embryo that will sprout into a

new wheat plant. The endosperm is the largest part of the grain (83 percent), making up most of the kernel, and it's mostly starch.

White flour is made from the endosperm only, whereas whole-wheat flour combines all three parts of the wheat berry.

Old time mills ground flour slowly, but today's mills are designed for mass-production, using high-temperature, high-speed steel rollers. The resulting white flour is nearly all starch, and even much of today's commercially processed whole wheat flour has lost a fair amount of nutritional value due to these aggressive processing methods.

White flour contains a small fraction of the nutrients of the original grain, with the heat of the steel rollers having destroyed what little nutrients remain. But then it is hit with another chemical insult--a **chlorine gas bath (chlorine oxide)**. This serves as a whitener, as well as an "aging" agent.

Flour used to be aged with time, improving the gluten and thus improving the baking quality. Now, it is treated with chlorine to instantly produce similar qualities in the flour (with a disturbing lack of concern about adding another dose of chemicals to your food).

According to [Jim Bair](#), Vice President of the North American Millers Association:

"Today, the US milling industry produces about 140 million pounds of flour each day, so there is no way to store the flour to allow it to age naturally. Plus, there is a shelf life issue."

It has not been determined how many mills are bleaching flour with chlorine oxide, but we do know the use of chlorides for bleaching flour is considered an industry standard.

The Environmental Protection Agency (EPA) defines [chlorine gas](#) as a flour-bleaching, aging and oxidizing agent that is a powerful irritant, dangerous to inhale, and lethal. Other agents also used include oxides of nitrogen, nitrosyl, and benzoyl peroxide mixed with various chemical salts.

The chlorine gas undergoes an oxidizing chemical reaction with some of the proteins in the flour, producing alloxan as an unintended byproduct. Bair and other milling industry leaders claim that bleaching and oxidizing agents don't leave behind harmful residues in flour, although they can cite no studies or published data to confirm this.

Why Bleaching Makes White Flour Even Worse

It has been shown that alloxan is a **byproduct of the flour bleaching process**, the process they use to make flour look so "clean" and -- well, white. No, they are

technically not **adding** alloxan to the flour -- although you will read this bit of misinformation on the Internet. But, they are doing chemical treatments to the grain that result in the formation of alloxan in the flour.

With so little food value already in a piece of white bread, now there is potentially a chemical poison lurking in there as well.

So what is so bad about alloxan?

Alloxan, or $C_4H_2O_4N_2$, is a product of the decomposition of uric acid. It is a poison that is used to produce diabetes in healthy experimental animals (primarily rats and mice), so that researchers can then study diabetes “treatments” in the lab. Alloxan causes diabetes because it spins up enormous amounts of free radicals in pancreatic beta cells, thus destroying them.

Beta cells are the primary cell type in areas of your pancreas called islets of Langerhans, and they produce insulin; so if those are destroyed, you get diabetes.

There is no other commercial application for alloxan -- it is used exclusively in the medical research industry because it is so highly toxic.

Given the raging epidemic of diabetes and other chronic diseases in this country, can you afford to be complacent about a toxin such as this in your bread, even if it is present in small amounts?

Just How Much is Too Much?

Similar to disinfection byproducts (DBPs) in water, alloxan is formed when the chlorine reacts with certain proteins remaining in the white flour after the bran and germ have been removed. Protein makes up between 5 percent and 15 percent of white flour, depending on whether it's cake flour, or high-gluten flour, such as what's used for pizza crust or bagels.

So, this would suggest that perhaps 5 to 15 grams of protein per 100 grams of flour could be contaminated.

However, according to Professor Joe Schwarcz, Director of the McGill University Office of Science and Society, alloxan is the byproduct of xantophyll oxidation only. [Xantophylls](#) are yellow compounds in wheat that react with oxygen, causing flour to turn white.

According to Mr. Schwarcz:

“One of the possible minor side products of xantophyll oxidation is alloxan. It may therefore be found in small amounts in flour. There is no available research that shows trace amounts are a problem or that alloxan builds up in the body. The

*amounts, if present at all, must be small because xantophylls themselves only occur to the extent of **1 microgram per gram of flour.***”

Alloxan has not been studied in terms of human exposure, particularly long-term. There is just so much we don't know, and you know what assumptions will get you.

Alloxan in Rats vs Alloxan in Humans

Scientists have long known that alloxan produces selective destruction of the beta cells of the pancreas, causing hyperglycemia and ketoacidosis in laboratory animals. Alloxan is structurally similar to glucose, which might explain why the pancreatic beta cells selectively take it up.

According to Dr. Hari Sharma's *Freedom from Disease*, alloxan causes free radical damage to DNA in the beta cells of the pancreas, causing them to malfunction and die. When they fail to function normally, they no longer produce enough insulin.

Even though the toxic effect of alloxan is common scientific knowledge in the research community, the Food and Drug Administration (FDA) still allows companies to use chemical processes in which the end result is toxic food. Until they unequivocally prove something is toxic by way of human deaths, severe side effects, or when the public screams loudly enough, the FDA is not likely to protect you.

Until then, it is **you** who must protect yourself.

If you have diabetes, or cancer, have a compromised immune system, or if you are in some other high-risk category as tens of millions of North Americans are, you need to know what foods contain hazardous ingredients so you can avoid them. But in the case of alloxan, **[there is no way to know, either by reading the ingredient list or by any other means, that it might be in your food!](#)**

History of Bleaching Flour -- Pillsbury and the FDA

An interesting sideline to this whole flour story lies in the origins of the FDA.

Bleaching and oxidizing agents weren't developed to produce quick aging of wheat flour (within 48 hours) until the early 1900s. Prior to that, it required several months for oxygen to condition flour naturally.

When bleaching was introduced, it was vehemently opposed.

The first major consumer advocate was Harvey W. Wiley, MD, who eventually became known as the “Father of the Pure Food and Drugs Act” of 1906. Mr. Wiley was head of the Bureau of Chemistry, which was the precursor to the FDA.

Wiley crusaded against benzoic acid, sulfites, saccharin, **and bleached flour**, among other food additives and adulterants.

Dr. Wiley felt so strongly about preventing the bleaching of flour that he took it all the way to the Supreme Court. They ruled that flour could not be bleached or “adulterated” in any way. However, it was never enforced.

Wiley believed that foods posed a greater risk to the public than adulterated or misbranded drugs. He constantly butted heads with Secretary of Agriculture James Wilson and President Roosevelt over food regulation.

Soon, Wiley’s personal administrative authority was undercut when Wilson created the Board of Food and Drug Inspection in 1907 and the Referee Board of Consulting Scientific Experts in 1908, one of which was reportedly headed by someone who had been working at Pillsbury, although I have not been able to verify this addendum.

Finally, in 1912, Dr. Wiley quit as director out of frustration, although he continued as a vocal consumer advocate for many years.

The government replaced Dr. Wiley with Dr. Elmer Nelson. Dr. Nelson was the polar opposite to Wiley , and was quoted as saying:

“It is wholly unscientific to state that a well-fed body is more able to resist disease than a poorly fed body. My overall opinion is that there hasn’t been enough experimentation to prove that dietary deficiencies make one susceptible to disease.”

Therein lies the foundation of the FDA. Since Dr. Wiley resigned, the FDA has continued to shift its focus on drugs, since Wiley was never able to convince the government of the dangers from chemicals in our foods. He was truly a pioneer and a century ahead of his time!

Food For Thought

The important point to take away is, beware of **any processed food** because chemicals are always used. And we simply don’t know what the long-term effects will be of ingesting chemicals, on top of chemicals, on top of more chemicals.

Strive to stick to whole unprocessed foods that are as close to their natural state as possible. If you’re going to eat grains, make sure they are at the least unbleached, whole, and organic, and eat them in the proportion that is best for your nutritional type.