Onibasu.com Health & Nutrition Blog

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How Frying and Baking form the Carcinogen, Acrylamide

You may have heard about an undesirable substance created when frying or baking starchy food in high heat. In 2002, Swedish researchers discovered acrylamide in a variety of fried and baked goods. This substance is used in a variety of industries and is known to cause nerve damage and cancer in large quantities. In a recent post on Native Nutrition, Heidi Schuppenhauer posted some links showing the relative levels of acrylamide in various food products. She also points out that Nourishing Traditions advocates boiling or slow baking which may avoid this issue.

Some digging in Google produces some interesting results. As Heidi points out, the amino acid asparagine is an important part of the acrylamide-forming reaction. Foods that have higher levels of asparagine tend to yield more acrylamide. More specifically, this page summarizes:

> *In October 2002, articles in the journal Nature confirmed earlier observations that acrylamide may be formed in foods during baking and frying, but has not been found in raw food, or food cooked at the lower temperatures reached during boiling.*
>
> *The authors showed that acrylamide is formed during the Maillard reaction. Products of the Maillard reaction are responsible for much of the flavour and colour associated with fried, roasted and baked foods. This reaction requires sugars, proteins (or free amino acid) and high temperatures to proceed. Model systems used by the authors showed that heating the amino acid asparagine with glucose at 185°C results in most of the asparagine reacting to form acrylamide.*

A very recently published paper says further that lower temperatures and longer cooking times can also produce acrylamide:

> *... reaction time and temperature were found to be covariant parameters: acrylamide was preferably formed by reacting glucose and asparagine at 120 degrees C for 60 min, whereas 160 degrees C was required at shorter reaction time (5 min).*

And finally, this page suggests certain herbicides may be another source of acrylamide in your food, via the breakdown of polyacrylamide which acrylamide is a constiuent of:

> *Strangely, the WHO releases did not mention the fact that polyacrylamide is a well known additive to commercial herbicide mixtures (25% to 30% solutions) to reduce spray drift and to act as a surfactant [2]. The glyphosate (ie Roundup) herbicides of Monsanto Corporation are of particular concern because the herbicide interacts with the polymer [2-4]. Experiments showed that heat and light contribute to the release of acrylamide from polyacrylamide, and glyphosate was found to influence the solubility of polyacrylamide, so care was advised in mixing the two.*

However this does not address how much acrylamide would survive until it reaches the final food product. The EPA says "Acrylamide does not bind to soil and will move into soil rapidly, but it is degraded by microbes within a few days in soil and water. Its has little tendency to accumulate in fish."

P.S. Your Onibasu blogger has been under the weather all week and quite unproductive. Maybe I can get Liat to post about her fermentation experiments while I recuperate. :-)

posted by onibasu at 9:33 PM

Direct link to this entry:
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