

ACRYLAMIDE IN FOOD II WORKSHOP 2004

Exposure and Biomarkers Work Group

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Important Areas of Progress



Acrylamide Concentration in Foods

- Acrylamide concentration levels for many additional foods have been determined
- Previously unknown food sources of acrylamide have been discovered (e.g. black olives, prune juice, certain coffee alternatives)
- Ongoing research has improved our understanding of how cooking processes affect acrylamide concentrations in foods, including foods prepared at home

Exposure Estimates

- Acrylamide concentration data and food consumption data have been used to generate reasonably reliable estimates of acrylamide intake from foods and food groups
- Various adducts (Hemoglobin, DNA) have been identified as useful biomarkers of acrylamide exposure
- Ongoing research has improved our understanding of the bioavailability of acrylamide in foods, although many questions remain

Current Research



Home Preparation

- Wanted to test french fries designed for home preparation
- Deep frying cooking option selected
- Various cooking times and temperatures analyzed
- Discovered that same degree of browning yields same acrylamide levels, regardless of cooking temperature

- Acrylamide levels also reduced with presoaking for at least 15 minutes, pretreating with acidic “wash,” or room temperature storage prior to frying
- Many other factors to consider for future analyses (variety and cut of potato, precooking by manufacturer, type of oil used for frying)

Acrylamide Levels in Toasted Bread

- Higher levels in potato bread than in other varieties
- As in French Fries, level of browning is a good indicator of acrylamide levels
- Can reduce acrylamide levels of toasted bread by 2/3 by scraping toast

Epidemiology

- Epidemiology studies have not found a statistically significant association between acrylamide exposure and risk of cancer

However

- Existing epidemiological studies do not have the power to detect cancer risk of acrylamide at the levels suggested by toxicology studies

Adduct Studies

- Study of acrylamide hemoglobin adducts in NHANES is underway. The results will provide data on acrylamide exposure from all sources for a nationally representative sample.
- Hemoglobin adducts good measure of acrylamide dose received, but not type of exposure; cover about 120 days of exposure

Research Priorities



Research Priorities

- Food exposure levels, biomarkers and toxicity of acrylamide must be integrated to provide a better understanding of risk assessment, management, and communication

Other Research Priorities

- More data collection of food acrylamide levels needed to strengthen existing data and to examine “specialty” foods (seasonal, ethnic, diabetic)
- More data sharing
 - Internationally
 - Between industry and government
- Applicability of animal studies to humans must be further examined (pure acrylamide dosing vs acrylamide from Maillard Reaction)

THANK YOU

