Food Stock, Food Storage, and Potential Acrylamide Levels

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Personal Background

- Ph.D. (1974), Agricultural Chemistry, UC Davis
  (Thesis: Formation of Pyrazines in Sugar-Amino Acid Browning Model Systems)
- Professor, Department of Environmental Toxicology, UC Davis, since 1979
- Research: Chemical and Biological Studies on Browning Reaction (Anti-oxidant, anti-mutagen, anti-carcinogen, volatile chemicals)
- Over 230 publications on articles associated with browning reactions out of over 290 publications
Food Storage

- Does food storage have a significant impact on acrylamide levels in food?
- A complex question with many factors to consider
- Very little research on acrylamide and food storage completed to date
  - Nothing has been published in scientific journals
  - Understandable, given April 2002 discovery of acrylamide in food
  - Some research may be published in the future
- Impact of food storage on acrylamide is difficult to predict now, based on complexity of acrylamide formation in cooked food
General Scheme of Maillard Browning Reaction

**Amine**
- Ammonia
- Alkyl amines
- **Amino acids**
- Proteins
- Phospholipids

**Carbonyl**
- Aldehydes
- Ketones
- **Sugars**
- Carbohydrates
- Lipids

**HEAT**

**Amino-Carbonyl Interaction (Amadori Products)**

**Melanoidins** (pigments)

**Volatile Compounds** (aroma chemicals)

**Carbonyls**
- Furans
- Pyrroles
- Thiophenes
- Thiazoles

**Amides (Acrylamide)**
- Oxazoles
- Imidazoles
- Pyridines
- Pyrazines

**Heterocyclic Compounds**
Based on model system using amino acids and sugars
  • Includes asparagine and glucose

Fundamental inquiries:
  • Does acrylamide form during storage?
  • If so, what impact does storage have?

Model system is stored at 60