

# Acrylamide: Best Practices for Exposure Assessment

**PRESENTED AT PROP.65 CLEARINGHOUSE ANNUAL  
CONFERENCE**

**SEPTEMBER 21, 2020**

**MARGARET H. WHITTAKER  
TOXSERVICES LLC**

# Acrylamide in Foods: Best Practices in Analysis and Exposure Assessment

- **A Proposition 65 exposure assessment for acrylamide relies upon:**
  - Robust product sampling
  - Accurate and sensitive chemical analysis of acrylamide in the food item
  - Robust dietary intake assessment
- **#1: Robust product sampling**
  - The 13 categories of foods/food groups in OEHHA's August 2020 proposed regulation specify how maximum average content and maximum unit concentration are calculated for each food/food group, so this will guide your selected samples for chemical analysis
  - If your food is not covered in the proposed regulation, design a sampling plan that comprises at least four to six product lots per product (and if your food is baked and/or fried, make sure to analyze both sets) so that the acrylamide analysis is sufficiently robust
- **#2: Chemical Analysis**
  - Work with an analytical laboratory that has experience analyzing foods **and** acrylamide!
  - Analytical method should be appropriate for acrylamide in food (e.g., Musser/FDA 2003 "Detection and Quantitative of Acrylamide in Foods" or European Standard EN 16618:2015: Food analysis – Determination of acrylamide in food by liquid chromatography tandem mass spectrometry (LC-ESI-MS/MS), generally with a level of detection of >10 ppb)

# Acrylamide in Foods: Best Practices in Analysis and Exposure Assessment

- **A Proposition 65 exposure assessment for acrylamide relies upon:**

- #3: Robust dietary intake assessment

- **#3: Robust dietary intake assessment**

- Direct oral exposure ( $OE_{P \rightarrow M}$ ) to acrylamide is a function of the concentration of acrylamide in the food (**C**), mass of the food consumed per eating occasion (**MEO**), frequency of eating occasions for food (**FEO**), duration of time over which consumption of food type occurs (**ED**), and averaging time (**AT**)

$$OE_{P \rightarrow M} (\mu\text{g acrylamide/day}) = C (\mu\text{g acrylamide/g food product}) * MEO (\text{g food product/EO food product}) * FEO (\text{EO food product/year}) * ED (\text{years}) / AT (\text{days})$$

- Food producers can supply food intake data if they have in-house intake surveys
- CDC's National Health and Nutrition Examination Survey (NHANES) is a free database that includes dietary surveys split into two-year periods that serve as the basis for many Prop 65 dietary exposure assessments (we usually use NHANES)
- If NHANES has outdated or limited intake data relevant to your client's food/food type, consider going to a commercial database for intake estimates, such as those sold by The NPD Group, Inc. ([justin.stile@npd.com](mailto:justin.stile@npd.com))
- Work with exposure assessors who provide complete output for each part of the exposure assessment so that you can be sure the exposure assessment is sufficiently robust and likely to withstand challenge.



# Thank You

[MWHITTAKER@TOXSERVICES.COM](mailto:MWHITTAKER@TOXSERVICES.COM) – 202-429-8787