Wildfire Helpful Information, Links & Resources

In response to industry questions about the safety of produce and the appropriateness of fields resulting from wildfires, United Fresh reached out to FDA and UC Davis and received the following information:

General Resources

- U.S. Environmental Protection Agency, 2002. Emissions of Organic Air Toxics from Open Burning. Available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P1001G31.PDF?Dockey=P1001G31.PDF

- Arizona Department of Health Services Wildfire Emergency Response Plan. Available online at: http://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/extreme-weather/wildfires/adhs-wildfire-emergency-response-plan.pdf

- Natural Resources Conservation Service, January 2006. Management after wildfire. Available online at: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_001731.pdf

- United States Department of Agriculture, Food Safety and Inspection Service. August 2013. Fires and Food Safety at: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/emergency-preparedness/keep-your-food-safe-during-emergencies/ct_index

- The Australian Wine Research Institute. Smoke Taint. Available online at: https://www.awri.com.au/industry_support/winemaking_resources/smoke-taint/

The following may help growers and testing laboratories determine appropriate testing methods for chemical and metal contaminants in foods:

- Toxic Elements, including cadmium, mercury, lead, and arsenic. Analytical testing methods for toxic elements can be found in FDA's Elemental Analysis Manual (EAM) for Food and Related Products: https://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm2006954.htm

- Polychlorinated Biphenyls (PCBs). For total PCB analysis, FDA recommends methods described in Volume 1 of FDA's Pesticide Analytical Manual (PAM), Chapter 3, Chapter 5, and Appendix I: https://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm111455.htm

- For individual PCB congener analysis, FDA recommends methods published by the US Environmental Protection Agency (EPA): Method 1668C. Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS, April 2010 http://water.epa.gov/scitech/methods/cwa/upload/M1668C_11June10-PCB_Congeners.pdf

- Other contaminants as appropriate to the specific wildfireand crop situation. For example, if it is known that a significant amount of pesticide products were stored at an establishment burned by the wildfire, the grower may consider testing salvaged crop for possible pesticide contamination. Analytical testing methods for pesticides can be found in FDA's Pesticide Analytical Manual (PAM): https://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm2006955.htm

- Tolerances for pesticides can be found in 40 Code of Federal Regulations (CFR) part 180 https://www.ecfr.gov/cgi-bin/text-idx?SID=05968162fc1662ca234bf254bc344f39&mc=true&tpl=/ecfrbrowse/Title40/40cfr180_main_02.tpl

FDA Links and Resources

- **Guidance from FDA's Inspection Operations Manual 2017 (relevant sections included at the end of this document):** https://www.fda.gov/downloads/iceci/inspections/iom/ucm123515.pdf

- **Food Contaminants & Adulteration:**
  http://www.fda.gov/Food/FoodSafety/FoodContaminantsAdulteration/default.htm

- **FDA Compliance Policy Guides, Chapter 5 – Foods, Colors, and Cosmetics**
  http://www.fda.gov/ICECI/ComplianceManuals/CompliancePolicyGuidanceManual/ucm119194.htm

- **FDA Compliance Policy Guide Sec. 675.200: Diversion of Adulterated Food to Acceptable Animal Feed:**
  https://www.fda.gov/ICECI/ComplianceManuals/CompliancePolicyGuidanceManual/ucm074694.htm

- **Guidance for Industry: Action Levels for Poisonous or Deleterious Substances in Human Food and Animal Feed:**
  https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ChemicalContaminantsMetalsNaturalToxinsPesticides/ucm077969.htm

Publications

Estrellan, C.R., and Lino, F., Review: Toxic emissions from open burning. *Chemosphere,* 80(3), 193-207. Available online at: http://www.sciencedirect.com/science/article/pii/S0045653510003711.

Statheropoulos, M. and Karmaa, S., 2007. Complexity and origin of the smoke components as measured near the flame-front of a real forest fire incident: A case study. *Journal of Analytical and Applied Pyrolysis*, 78(2), 430-437. Available online at: http://www.sciencedirect.com/science/article/pii/S0165237006001409.

Nakao, T., Aozasa, O., Ohta, S., and Miyata, H., 2002. Formation of dioxin analogs by open-air incineration of waste wood and by fire of buildings and houses concerning Hanshin Great Earthquake in Japan. *Chemoshere*, 46(3), 429-437. Available online at: http://www.sciencedirect.com/science/article/pii/S0045653501001424.

Guidance from FDA's Inspection Operations Manual 2017
https://www.fda.gov/downloads/iceci/inspections/iom/ucm123515.pdf

Chapter 8 Investigations: https://www.fda.gov/ICECI/Inspections/InspectionGuides/ucm103128.htm

8.5.5.5 - Fires, Explosions, Riots
FDA operations following these disasters are usually localized and do not normally involve a large number of personnel or extended resources. Examine products for exposure to excessive heat, physical damage from flying particles and falling debris, and lack of refrigeration in down-power areas. Examine for water damage from firefighting activities and handle these as a flooding situation. Also, be alert for possible pollution from using non-potable water in firefighting.

Firefighting often involves use of chemicals, so examine products for residues from possible toxic fire extinguishing materials, and question fire authorities regarding this issue.

In addition, chemical contamination in fire disasters can also be present from other sources, including:

1. Stored chemicals rupturing from heat or from impact of falling debris;
2. Spraying or leaking chemicals (liquid, powder, dust, granules) as damaged containers are being removed or salvaged from the fire area;
3. Tracking of chemical material from contaminated areas to other areas by fire crews or others;
4. Burning or melting plastic containers, insulation, and other building materials;
5. Leaking fuels, storage batteries, anti-freeze, etc., from burning, damaged or overheated equipment;

6. Chemicals from melting or vaporizing electrical insulation and, in particular, cooling chemicals from leaking or exploding electrical transformers. Large commercial transformers are often directly involved in the fire area and may leak or explode from the heat, spreading toxic liquid chemicals (some transformer oils contain concentrations of PCB) over a large area, even contaminating products in non-fire areas.

8.5.7.7 – Reconditioning Plastic, Paper, Cardboard, Cloth and Similar Containers

Products packed in plastic, paper, cardboard, cloth and similar containers that have been water damaged usually cannot be reconditioned. (In some instances, sugar has been permitted to be returned to a refinery for reprocessing, but each case must be decided individually). Fire and/or smoke damaged pre-packaged products may be permitted to be relabeled if the contents have not been affected.
General rules for reconditioning of products in these types of containers are the following:

1. The product is not contaminated and the product is not highly susceptible to bacteriological contamination;
2. If the external container is torn, the interior liner must be intact, and the external container must be repaired or replaced to eliminate possible contamination of the product;
3. Soiled containers may be cleaned, if the product is not damaged and the container can be cleaned;
4. Foods from torn packages, where the product has been exposed but not obviously subjected to contamination, may be repackaged;
5. Water, chemical or other liquid damage, where the exterior package may be replaced, providing the internal containers were not affected and the external containers can be replaced without contaminating the product;
6. Fire damaged products (e.g. wet, burned, heavy smoke or toxic fume contamination), are generally not reconditionable.

NOTE: Foods for infants, the aged or infirm, and drug products must be strictly controlled to assure the product is acceptable.

8.5.7.8 – Reconditioning Screw-top, Crimped-cap, and Similar Containers

Products in containers with screw-caps, snap-lids, crimped-caps (soda pop bottles), twist-caps, flip-top, snap-open, and similar type closures must not be reconditioned.
Sediment and debris from flood water becomes lodged under the cap lips, threads, lugs, crimps, snap-rings, etc. and is impossible to remove, especially after it has dried. If these container/closure systems are affected only by fire or smoke, but the contents are not affected by the heat, they may be relabeled.
General rules for reconditioning are:
1. Product is not contaminated, or rendered unfit for food.
2. Soiled containers may be reconditioned if soil can be removed, and it does not involve the closure or contents.
3. Rust on closure: No rust allowed; surface rust may be removed by buffing or other suitable means.
4. Cap or crown dents: slight indentations obviously not affecting the rim seal would be reconditionable.
5. If there is evidence of exposure to extreme temperatures or pressures (hurricanes-tornadoes), products are not reconditionable.
6. If there is soil around the closure, products are not reconditionable.
7. If submerged in water, chemicals, or other liquids, products are not reconditionable.
8. If container/closure is defective or not properly sealed, products are not reconditionable.

8.5.7.9 – Reconditioning Hermetically Sealed (Top & Bottom Double Seam) Cans

Products in this type container which have been exposed to fire and smoke, and which are not damaged by the heat or exposed to water contamination, may be relabeled.