Food Safety Information Infrastructure Project: Phase 1

Typology of Food Safety Data

Human Health		*Quantifying and characterizing foodborne illness, including source identification*
1	Illness Surveillance	Surveillance of human sicknesses, such as outbreak, hospital, lab testing data, patient characteristics (age, gender), basic patient outcomes (hospitalization, death), including underreporting information
2	Medical/Clinical	Details on illness beyond incidence, including % who have certain conditions, treatment options, etc, such as symptoms, severities, outcomes, durations, drug treatments, etc
3	Host Factors	Characteristics of persons that affect whether or not they may become ill – age, gender, race, diet, immunocompromised (e.g. AIDS), existing medical conditions
4	Attribution	Connecting human illnesses with sources of illness (beyond etiology) such as food vehicles or animal reservoirs (food attribution), location of food consumption, food preparation, or other risk factors.
5	Health Valuation	Valuing illness in economic or HRQL (Health Related Quality of Life) measures. Economic data include medical costs, productivity losses, & willingness-to-pay, while HRQL include QALYs, DALYs, etc
Measurements of Contamination		*Quantifying and characterizing foodborne illness, including source identification*
6	Microbial Pre-Harvest Contamination	Prevalence or levels (counts) of pathogens measured on live food animals or plants (measurements taken from flocks of animals, or on the vegetable farm prior to processing)
7	Microbial Post-Harvest Contamination	Prevalence or levels (counts) of pathogens on animals post-slaughter or plants post-harvest (during processing, packaging, transportation, retail, in the kitchen, etc).
8	Microbial Environmental Contamination	Prevalence or levels (counts) of pathogens in public environment (rivers, air) and along farm-to-fork continuum (e.g. in animal feed or irrigation water, on processor equipment, on cutting board, etc.)
9	Chemical Pre-Harvest Contamination	Prevalence or levels of chemical residues (antibiotics, pesticides, sulfonamides, etc) on live food animals or plants (measurements taken from flocks of animals, or on the vegetable farm)
10	Chemical Post-Harvest Contamination	Prevalence or levels of chemical residues (antibiotics, pesticides, sulfonamides, etc) on animals post-slaughter or plants post-harvest (processing, packaging, retail, in preparation, etc)
11	Chemical Environmental Contamination	Prevalence or levels of chemical residues (antibiotics, pesticides, sulfonamides, etc) in public environment (rivers, air) or along farm-to-fork continuum (e.g. animal feed, equipment, etc)
12	Other Post-Harvest Contamination	Prevalence or levels on post-slaughter animals or post-harvest plants of contaminants other than pathogens or chemicals, such as physical objects, rodent excreta, insect parts, radionuclides, etc.
13	Contamination of Imports	Prevalence or levels of pathogens or chemical residues (antibiotics, pesticides, etc) measured on imported food or at point of production or processing in source countries

Indicators of Contamination		*Other quantitative signals of food contamination, namely reporting*
14	Animal Health/Disposition	Data on animal illnesses – animal diseases and health issues including reports of when animals are condemned as unfit for human consumption (antemortem or postmortem).
15	Recalls and Violations	Data on foods recalled due to pathogen or chemical contamination, or data on firm violations of regulatory standards for pathogens or chemical residues
16	Sanitation and Inspection	Combination of environmental data and sanitation behavior throughout food production, processing, storage, and preparation, including retail establishments and restaurants
Hazard Identification		*Detecting, identifying, and characterizing food safety hazards*
17	Detection Methods	Research into methods for the detection and quantification of pathogens, toxins, and chemical residues on foods, animals, or in environments, including information on test sensitivity and specificity.
18	Pathogen Subtyping	Microbial fingerprinting for detailed identification of isolates, including phenotyping and genotyping: serology, phage typing, PFGE, etc. Method is used in prevalence testing, for source attribution, etc.
19	Pathogen Biology	Understanding pathogen characteristics, namely factors influencing pathogen survival, growth, virulence traits, and emergence (e.g. microbial genetics, microbial ecology, epidemiology), including information on antimicrobial resistance.
Hazard Modeling		*Estimating exposure to hazards and estimating illnesses from exposure*
20	Dose-Response	(Also Concentration-Response) Lab studies of exposure and health outcomes (e.g. epidemiological studies) includes toxicity, pathogenicity, virulence, etc - and DR models based on analysis of lab data & used in risk assessments
21	Exposure Assessment	Quantitative estimates of exposure to pathogens or chemical residues (e.g. cfu/person*year) based on ingestion of contaminated foods, food consumption patterns, and other variables
22	Risk Assessments	Includes full chemical and microbial risk assessments that may include exposure assessments but which include more substantial modeling (e.g. intervention assessments, regulatory impact assessments)

Trade and Industry		*Characterizing food production and food safety interventions from farm to consumer*
23	Facilities and Processes	Characterizing industrial organization, private sector facilities, and processes and practices in these facilities (e.g. rates of production, processing configurations, temperature control)
24	Food Safety System Management	Information regarding performance and nature of food safety management practices and systems (e.g. HACCP implementation). Baseline information on food safety activities prior to additional interventions.
25	Traceback	Data that allows foods found to be contaminated to be traced back through the food system to the farm or processing facility.
26	Intervention Efficacy	Effectiveness of specific new technologies, equipment improvements, process changes, and regulatory interventions, as well as unintentional consequences of interventions.
27	Intervention Costs	Direct costs of specific intervention technologies, process changes, or changes to food safety system management.
28	Economic Impacts	Analyses of the impacts to industry and the economy due to food safety regulations, interventions, or contamination events, (intentional or unintentional), including indirect costs such as market loss.
29	International Trade	Quantities and locations of food imports and exports, and other related information necessary to measure impact of contaminated imports and exports
Consumers and Consumption		*Characterizing population demographics, behavior, and consumption*
30	Food Consumption	Quantities of food consumed, produced, sold, etc, for different populations and consumption environments (e.g. home vs restaurant)
31	Consumer Behavior	Characterizing consumer activities such as food storage, handling, preparation, etc, as well as sensitivity to price, shopping patterns, and market behavior
32	Risk Perception/ Communication	Characterizing consumer perceptions, preferences, and beliefs about foodborne risks, including food safety knowledge, risk aversion, and research or educational activities communicating risks to consumers.
33	Population and Demographics	Information about population and demographics such as age, gender, race, income, immuno-compromised status, etc
Food and Environment		*Characteristics of foods and of the environment that influence food safety*
34	Food Composition and Characteristics	Chemical properties of foods such as nutrients, acidity, water content and other characteristics that may be related to food safety (e.g. characteristics that may mitigate or increase risk)
35	Environmental Characteristics	Measurements of temperature, humidity, pH, etc – may be taken from public environment (ie. oceans, soil, air) or private environment (ie. on the farm, in the plant)