

# A Food Classification Scheme to Summarize Epidemiological Patterns of Food-borne Illness

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The primary purpose of summarizing epidemiological patterns of food-borne illness is to prevent further illness. To prevent further illness, associated factors must be identified so preventive measures can be developed and implemented. To be effective, epidemiological data needs to be summarized and translated into a format easily used by health professionals.

In the U.S., epidemiological patterns of food-borne illness are summarized using the Centers for Disease Control (CDC) surveillance system (1). The CDC system classifies food vehicles into 16 categories (Table 1). These 16 food categories are used to periodically summarize outbreaks and cases of food-borne illness in the U.S. (2).

In the CDC summary of U.S. food-borne illness between 1973 and 1987, foods represented by the food-vehicle category "other" accounted for 33% (n = 1,219) of reported outbreaks and 45% (n = 74,359) of reported cases (2). The CDC defines "other" as foods that do not fit into any other classification.

The New York State Department of Health (NYS) developed a food-vehicle classification system to expand the CDC category "other" (4). The NYS system places food into two categories: the general food category, which classes implicated food vehicles by the method of preparation and the ingredient food category, which lists the ingredients deter-

mined to have introduced the agent and/or that categorize the vehicle.

The purpose of the present project was to expand the CDC food-vehicle categories into food groups based on microbiological, chemical, and physical risks contributing to food-borne illness. The basis of the proposed scheme was to provide greater specificity and ease in categorizing food implicated in food-borne illness outbreaks.

The proposed scheme groups foods into categories which have similar (but not identical) characteristics such as pH, processing, and water activity (Table 2). Expansion of the CDC system should facilitate a higher degree of specificity, especially for foods that have been coded as "other"; 33% of reported cases in the U.S. between 1973 and 1987 were coded by the CDC as "other" (1).

## METHODS

### Development of the Proposed Food-scheme Categories

The proposed food scheme contains 17 food categories (Table 2). Of the proposed food-scheme categories, 14 contain subcategories. Categories 2, 16 and 17 (eggs, physical, and unknown) do not have subcategories.

Table 3 contains the definitions and examples for each category of the proposed food scheme. Definitions were based on published sources (16). Examples of foods are included with each definition to in-

crease clarity of the definition and to reduce coding error. For example, the definitions and examples of two categories, "chicken" and "salads prepared with one or more cooked ingredients" are:

#### Chicken

**Definition:** chicken alone

**Example:** chicken, fried chicken, baked chicken, Cornish hen, chicken patty, chicken nuggets

#### Salads prepared with one or more cooked ingredients

**Definition:** one or more ingredients are cooked prior to combining with raw ingredients and then served cold; usually includes one or more potentially hazardous ingredients;

**Example:** egg salad, chicken salad, turkey salad, potato salad, pasta salad, rice salads

Thirteen (13) of the major vehicle categories (categories 1 to 13 in Tables 2 and 3) were based on foods with a similar degree of microbiological risk. Microbiological risk was defined as intrinsic and processing factors of food that affect the growth of microorganisms (5). Intrinsic parameters include the pH, moisture content, and nutrient content of the food. Processing factors were defined by handling methods, such as heat treatment. Foods included within a category do not have identical intrinsic and processing factors. The rationale behind the proposed category definitions was that they be broad enough to be easy to use but limited enough to have a high degree of specificity.

**TABLE 1. CDC Classification System: Number and percent of food in suspected food-borne illnesses as reported to the Michigan Department of Public Health (January 1, 1992 to December 31, 1992).**

Vehicle Category	Outbreak		Cases	
	n	% <sup>a</sup>	n	% <sup>a</sup>
Bakery products	2	<1	43	2
Beef	19	3	51	2
Chicken	74	11	169	7
Chinese foods	35	5	64	3
Dairy products	8	1	13	<1
Eggs	9	1	15	<1
Finfish	22	3	54	2
Fruits and vegetables	4	<1	39	2
Ice cream	7	1	12	<1
Mexican food	64	10	185	8
Mushrooms	1	<1	2	<1
Nondairy beverages	1	<1	1	<1
Pork	13	2	69	3
Shellfish	21	3	34	1
Turkey	1	<1	1	<1
Other	372	57	1634	68
TOTAL	653	100	2386	100

<sup>a</sup>Totals might be greater than 100% due to rounding.

For example, using the proposed scheme, a food item such as pickled cauliflower would be classified under category 13.3, pickled vegetable, while raw cauliflower would be categorized as 13.2, raw vegetables (Tables 2 and 3). This differentiation in categorization of vegetables products would allow for the identification of a food and its potential to support the growth of microorganisms. The growth of microorganisms on pickled vegetables would be less likely than on raw cauliflower due to the high acid environment of pickled vegetables. Microbial growth on raw cauliflower would most likely be due to the introduction of bacteria natu-

rally present on its surface into its interior and subsequent improper handling and/or refrigeration. Alternatively, if pickled cauliflower became contaminated with lead due to storage in a lead-soldered can, it would be placed into category 15 of the proposed scheme, chemical (Tables 2 and 3).

The proposed food scheme also includes water as a vehicle category (Tables 2 and 3, category 14). The CDC uses a separate surveillance systems for waterborne illnesses and food-borne illnesses. With the addition of waterborne illness, the proposed food scheme would conveniently classify all consumed items implicated in an outbreak into one

summary. If raw cauliflower was rinsed in water contaminated by microorganisms, the cauliflower and the water would both be classified as vehicles of illnesses.

Categories 15 and 16 are chemical and physical contamination (Tables 2 and 3). Usually food contaminated by chemical and physical elements do not have common intrinsic parameters—pH, water activity, or nutrient content—that contribute to their contamination by chemical or physical elements. Therefore, if a chemical or physical element is identified as the cause of the reported food-borne illness, it is important to classify the implicated food vehicle separately. Contamination and subsequent illness is usually not the result of intrinsic parameters but rather of special circumstances that have led to contamination of the food.

Category 17 of the proposed food scheme (Table 2) has been defined as unknown or food not reported. Reported outbreaks of food-borne illness in which a food vehicle was not reported need to be separated from outbreaks which have a related food vehicle.

#### Data

The Michigan Department of Public Health (MDPH) provided the data set used to evaluate the specificity of the proposed food scheme. Specificity was defined as the ability to group a food into a defined category. This data set included both confirmed outbreaks and suspected incidents of food-borne illness reported to the MDPH during 1992. All reported data was used for the evaluation.

#### Data Analysis

The number and percentage of incidents and cases were calculated for the major categories and subcategories of the food scheme and the 17 vehicle categories of the CDC classification system (Tables 2 and 3). Subsequent comparisons were made between the two classification systems to determine specificity.

**TABLE 2. Proposed food scheme: Number and percent of foods in suspected food-borne illnesses as reported to the Michigan Department of Health (January 1, 1992 to December 31, 1992).**

Code	Vehicle Category	Outbreak		Cases	
		n	% <sup>a</sup>	n	% <sup>a</sup>
1	Dairy				
	1.1 Cheese	0	0	0	0
	1.2 Cream/cream desserts	2	<1	2	<1
	1.3 Ice cream/ice cream desserts	7	<1	12	<1
	1.4 Milk	2	<1	12	<1
	1.5 Butter	0	0	0	0
	1.6 Other dairy	4	<1	9	<1
2	Eggs	9	1	15	<1
3	Fruit				
	3.1 Fruit juice	1	<1	11	<1
	3.2 Fruit salad	1	<1	1	<1
	3.3 Raw fruit	1	<1	1	<1
4	Legumes, nuts and seeds				
	4.1 Legumes	0	0	0	0
	4.2 Nuts and seeds	0	0	0	0
5	Meat				
	5.1 Beef	19	3	51	2
	5.2 Chicken	74	11	169	7
	5.3 Hotdogs, lunch meat, and sausage	28	4	103	4
	5.4 Lamb	2	<1	9	<1
	5.5 Pork	13	2	69	3
	5.6 Turkey	1	<1	1	<1
	5.7 Wild game	2	<1	9	<1
6	Mixed dishes				
	6.1 Casserole	3	<1	9	<1
	6.2 Chinese/Japanese foods	35	5	64	3
	6.3 Italian foods	13	2	21	<1
	6.4 Mexican foods	64	10	185	8
	6.5 Pizza	46	7	186	8
	6.6 Sandwich	100	15	313	13
	6.7 Soup	15	2	30	1
	6.8 Stew	0	0	0	0
	6.9 Other mixed dishes	18	3	54	2
7	Mushrooms				
	7.1 Domestic	1	<1	2	<1
	7.2 Wild	0	0	0	0
8	Other				
	8.1 Nondairy beverages	1	<1	1	<1
	8.2 Carbonated beverages	0	0	0	0
	8.3 Snacks/candy	2	<1	6	<1
	8.4 Condiments	3	<1	26	1
	8.5 Desserts	3	<1	7	<1
9	Salads				
	9.1 Salads with raw ingredients	53	8	380	16
	9.2 Salads with one or more cooked ingredients	26	4	40	2
10	Salad dressings				
	10.1 Commercial	0	0	0	0
	10.2 Fresh	1	<1	-	-

(Continued)

## RESULTS AND DISCUSSION

In Table 1, foods reported to the MDPH were categorized into the 16 CDC food-vehicle categories. The CDC category "other" accounted for 57% (n = 372) of outbreaks and 68% (n = 1,634) of cases during 1992. Chicken and Mexican foods, the next two most commonly reported CDC categories, accounted for 11% (n = 74) and 10% (n = 64) of outbreaks and 7% (n = 169) and 8% (n = 185) of cases, respectively.

In Table 2 the 1992 MDPH data is categorized using the proposed food scheme. The proposed food scheme did not include an "other" category. All foods were classified into a specific food category.

Using the food scheme, sandwiches (category 6.6 in Tables 2 and 3) accounted for 15% (n = 100) of the overall reported outbreaks in Michigan. Salads with raw ingredients (category 9.1 in Table 2) accounted for 8% (n = 53) of overall outbreaks. If the CDC vehicle classification had been used to summarize this data, these foods would have been reported as "other (category 8 in Table 1). Further, if the CDC classification had been used, food contaminated by chemical or physical agents would also have been classified as "other." The proposed food scheme groups these foods separately.

Outbreaks where no food vehicle was reported would also be classified as "other" if the CDC vehicle classification were used. When using the proposed food scheme, incidents with unknown food vehicles (category 17 in Tables 2 and 3) would be categorized separately. Unknown foods accounted for only 5% (n = 31) of outbreaks and 16% (n = 379) of cases in Michigan in 1992 (Table 2).

## CONCLUSION

The proposed food scheme (Tables 2 and 3) more specifically categorized foods from suspected food-borne illnesses in Michigan in 1992 than did the CDC vehicle-classification system (Table 1). All foods reported to the MDPH were grouped

into a specific category. With a food-borne illness summary that has a higher degree of specificity, health professionals can evaluate food and food handling practices to determine if attention and subsequent education is properly focused. A food scheme which categorizes all foods into categories should enhance the ability of public-health officials to prevent future illness incidents.

#### REFERENCES

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TABLE 2. *Continued*

Code	Vehicle Category	Outbreak		Cases	
		n	% <sup>a</sup>	n	% <sup>a</sup>
11	Seafood				
	11.1 Finfish	22	3	54	2
	11.2 Shucked shellfish	1	<1	1	<1
	11.3 Shellfish, other	20	3	33	1
12	Starchy foods				
	12.1 Bakery	2	<1	43	2
	12.2 Cereal	0	0	0	0
	12.3 Cooked rices	8	1	38	2
13	Vegetables				
	12.4 Potatoes	3	<1	5	<1
	13.1 Vegetable juice	0	0	0	0
	13.2 Raw vegetables	1	<1	26	1
14	Water				
	13.3 Pickled vegetables	0	0	0	0
	14.1 Liquid	1	<1	2	<1
15	14.2 Ice	0	0	0	0
	Chemical				
	15.1 Heavy metals	0	0	0	0
	15.2 Caustic	4	<1	7	<1
16	15.3 Organic	0	0	0	0
	15.4 Other	0	0	0	0
	Physical	8	1	8 <sup>b</sup>	<1
17	Unknown	31	5	379	16
	TOTAL	6563	100	2386	100

<sup>a</sup>Totals might be greater than 100% due to rounding.

TABLE 3. Proposed food scheme: definitions and examples of each category and subcategory.

## 1. DAIRY PRODUCTS

### 1.1 Cheese

Definition: consolidated curd of milk ripened by fermentation.

Example: cheese, American cheese, Brie, Mexican-style cheese, unpasteurized goat cheese, cottage cheese, cream cheese

### 1.2 Cream/cream desserts

Definition: yellow-tinged part of whole milk that is rich in butterfat and gradually rises to the top of the milk; includes any product where the predominant ingredient is cream.

NOTE: does not include nondairy coffee creamers.

Example: coffee creamer, whipped cream, cream-filled pastries, half-and-half

### 1.3 Ice cream/ice cream desserts

Definition: sweetened, flavored, frozen dessert containing cream.

Example: chocolate ice cream, vanilla bar, drumstick, milk shake, sherbet, soft-serve ice cream

### 1.4 Milk

Definition: fluid secreted by the mammary glands of cows, goats, etc.

Example: milk, chocolate milk, skim milk, raw milk

**TABLE 3. Continued**

**1.5 Butter**

Definition: solid emulsion of fat globules, air, and water made by churning milk/cream and used as a food.

Example: butter, whipped butter

**1.6 Other dairy products**

Definition: dairy products that are not included in the five categories listed.

Example: yogurt, frozen yogurt, dip, sour cream

**2. EGGS**

Definition: egg(s) alone or as the predominant ingredient in a mixed dish; includes eggs from birds, e.g., chicken, quail, duck, as well as from reptiles, e.g., turtle.

NOTE: does not include egg salad.

Example: boiled eggs, scrambled eggs, omelet

**3. FRUIT**

Definition: ripened ovary of a seed plant, usually sweet, with a higher acid content than vegetables.

Example: apple, apple sauce, cantaloupe, peaches, raisins, strawberries, watermelon

**3.1 Fruit juice**

Definition: 100% juice obtained from raw fruit.

NOTE: This does not include juice drinks which contain other ingredients.

Example: orange juice, apple juice, pineapple-orange juice, grape juice

**3.2 Fruit salad**

Definition: a cold dish of raw fruits or as the predominant ingredient in a mixed dish.

Example: fruit cocktail, Waldorf salad

**3.3 Raw fruit**

Definition: ripened ovary of a seed plant, usually sweet with a higher acid content than vegetables.

NOTE: Tomato is included under vegetable.

Example: apple, orange, banana, mango

**4. LEGUMES, NUTS, AND SEEDS**

Definition: legumes are a group of plants whose fruits consist of seed-bearing pods; nuts are a fruit with a hard or leathery shell that contains a single edible kernel, which is enclosed in a soft inner skin; seeds are pods within the fruit. Legumes, nuts, and seeds alone or as the predominant ingredient in a dish.

Example: chick peas, lentils, peanuts, soybeans, sunflower seeds, almonds, Brazil nuts, coconuts, pecans, beans, peanut butter, refried beans

**4.1 Legumes**

Definition: a group of plants whose fruits consist of seed-bearing pods.

Example: chickpeas, lentils, peanuts, soybeans, garbanzo beans, peanut butter, baked beans, tofu

**4.2 Nuts and seeds**

Definition: a fruit with a hard or leathery shell that contains a single edible kernel, which is enclosed in a soft inner skin; seeds are pods within the fruit.

Example: almonds, sunflower seeds, pumpkin seeds, pecans, walnuts, coconuts, Brazil nuts

**5. MEAT**

Definition: roasted, baked, etc. solid pieces of meat/poultry.

Example: roast beef, whole turkey, broiler chickens, baked ham, gyro meat, stuffed chicken breasts, turkey roll, venison, lamb chops

**5.1 Beef**

Definition: beef alone.

Example: ground beef, steak, veal, rolled roast

**TABLE 3. Continued**

**5.2 Chicken**

Definition: chicken alone.

Example: chicken, fried chicken, baked chicken, Cornish hen, chicken patty, chicken nuggets

**5.3 Hot dogs, lunch meat, and sausage**

Definition: processed meat and poultry products.

Example: bacon, ham, pork sausage, salami

**5.4 Lamb**

Definition: lamb alone.

Example: lamb chops

**5.5 Pork**

Definition: pork alone.

NOTE: This does not include processed meats made from pork, such as ham, sausage, etc.

Example: ribs, pork, pork chops, BBQ pork

**5.6 Turkey**

Definition: turkey alone.

Example: turkey, turkey loaf, ground turkey

**5.7 Wild game**

Definition: wild animals, including mammals and birds.

NOTE: This includes domestically raised game.

Example: bear, beaver, boar, buffalo, moose, seal, venison, alligator, whale, pheasant, duck, rabbit, squirrel, raccoon

**6. MIXED DISHES**

Definition: foods that are a combination of ingredients that require extensive food handling.

Example: casserole, Chinese/Japanese cuisine, Italian cuisine, Mexican cuisine, pizza, sandwich, soup, stew

**6.1 Casserole**

Definition: food preparation steps sometimes involve combining of several ingredients prior to cooking the food.

Example: tuna noodle casserole, broccoli cheese casserole

**6.2 Chinese/Japanese food**

Definition: food typical of Chinese/Japanese cuisine.

Example: chop suey, beef chow mein, egg drop soup, fried rice, sukiyaki

**6.3 Italian foods**

Definition: food typical of Italian cuisine.

Example: lasagna, spaghetti, manicotti;

NOTE: does not include pizza.

**6.4 Mexican foods**

Definition: combination foods typical of Mexican cuisine.

Example: burrito, enchiladas, tacos, tostada, Mexican rice, nachos and cheese, refried beans, Spanish rice, tamales

**6.5 Pizza**

Definition: an open-faced pie that consists of a layer of pasta dough, or yeast dough, spread with spiced tomato paste, and topped with mozzarella cheese and often other ingredients.

Example: cheese pizza, pepperoni pizza, vegetarian pizza

**6.6 Sandwich**

Definition: ingredients are assembled and served between two slices of bread or other baked good and served hot or cold.

NOTE: includes hamburger but not hot dog.

Example: bacon-lettuce-tomato sandwich, toasted cheese sandwich, Monte Cristo sandwich, pita pocket, hamburgers, hot dogs, sloppy joes

**TABLE 3. Continued**

**6.7 Soup**

Definition: cooking meat, fish, or vegetables and the like in such fluids as water or milk where the liquid part is predominant over the solid portion.

Example: chicken noodle, cream of broccoli, vegetable soup, borscht

**6.8 Stew**

Definition: cooking meat, fish, or vegetables and the like in water or milk where the solid food takes priority over the liquid portion.

Example: beef stew, venison stew

**6.9 Other mixed foods**

Definition: combination foods requiring extensive food handling that are not included in the categories listed.

Example: macaroni and cheese, meat loaf, meat balls, creamed dried beef, chili, microwave meals, goulash, pot pie

**7. MUSHROOMS**

Definition: any edible fungus.

Example: mushrooms, wild mushrooms, russula mushroom, lepiota jesseran

**7.1 Domestic**

Definition: any edible fungus grown under controlled conditions.

Example: gray cap mushrooms

**7.2 Wild**

Definition: any edible fungus grown in the wild.

Example: morelles, truffles

**8. OTHER**

Definition: foods that do not fit into any of the specific classifications.

Example: nondairy and carbonated beverages, snacks, candy, condiments, and desserts

**8.1 Nondairy, non-carbonated beverages**

Definition: sweetened or unsweetened beverages.

Example: Kool-Aid®, coffee, tea, snowcones, slush, cocoa, alcoholic beverages, drink box

**8.2 Carbonated beverages**

Definition: sweetened bubbly beverage.

Example: Coke, Pepsi, soda pop, tonic water

**8.3 Snacks/candy**

Definition: unsweetened and sweetened foods.

Example: popsicles, pretzels, crackers, chips, popcorn, turtles, graham crackers, fruit snacks, sour balls, gum, marshmallows

**8.4 Condiments**

Definition: any substance often aromatic, added to the food at the table in the function of flavor enhancer.

Example: catsup, sugar, syrup, mustard, jam, jelly, apple butter, honey, gravy, malt vinegar, lemon juice

**8.5 Desserts**

Definition: sweetened combination food that is not specific to any other vehicle category.

Example: caramel apple, Jello, pudding, Twinkies, Pop-Tarts, nutty bars

**9. SALADS**

Definition: usually cold ingredients mixed together and served with mayonnaise or other dressing.

Example: cole slaw, chef salad, Jello salad, macaroni salad, pasta salad, salad bar, tossed garden salad, three-bean salad

*(Continued)*

**TABLE 3. Continued**

**9.1 Salads with raw ingredients**

Definition: ingredients are generally not cooked and are served cold; usually do not contain a potentially hazardous ingredient except possibly the dressing.

NOTE: dressing should be coded separately.

Example: green salads, cole slaw

**9.2 Salads prepared with one or more cooked ingredients**

Definition: one or more ingredients are cooked prior to combining with raw ingredients and then served cold; usually include one or more potentially hazardous ingredients.

**10. SALAD DRESSINGS**

**10.1 Commercial**

Definition: dressing processed and hermetically sealed in a food-manufacturing facility.

Example: Seven Seas blue cheese dressing, Kraft mayonnaise

**10.2 Fresh**

Definition: dressing prepared on-site in the home or in a food service establishment.

Example: homemade mayonnaise, dressing prepared from a package, pesto

**11. SEAFOOD**

Definition: aquatic animals, excluding mammals.

Example: cod, shrimp, lobster, clams, tuna

**11.1 Finfish**

Definition: aquatic animal with fins.

Example: bluefish, tuna steak, fresh tuna, stuffed flounder, fried catfish, salmon croquette, pink salmon, lox, fillet of sole, sardines canned salmon

**11.2 Shucked shellfish**

Definition: aquatic animal whose external covering consists of a shell which is usually removed.

Example: raw clams, steamed clams, raw oysters, steamed mussels

**11.3 Shellfish, other**

Definition: aquatic animal whose external covering consists of a shell.

Example: shrimp, lobster, scallops, crayfish, prawns

**12. STARCHY FOODS**

Definition: foods derived from the seeds, roots, or stems of plants that are predominantly composed of carbohydrates that can be commercially extracted.

Example: boiled rice, steamed rice, wheat, oats, barley, sweet potatoes, potatoes

**12.1 Bakery**

Definition: baked products usually with flour as the main ingredient; exceptions are pies where fruit may be the main ingredient.

Example: bagels, biscuits, bread, breadsticks, brownies, cake, cookies, pie (apple, cream), cupcakes, eclairs, French toast, fry bread, muffins, pancakes, rolls, strudel, toast, waffle, sweet breads.

**12.2 Cereal**

Definition: grain product commonly consumed for breakfast.

Example: cold cereal, oatmeal, Cheerios, grits, gruel, cream of wheat, puffed rice cereal

**12.3 Cooked rice**

Definition: rice alone.

Example: steamed rice, boiled rice, wild rice

**12.4 Potatoes**

Definition: potatoes alone.

NOTE: does not include scalloped potatoes, potato salad, German-style potato salad

Example: French fries, potato sweet potato

**12.5 Other**

Definition: starchy foods that do not fit into the above categories.

Example: barley, linguine, butter noodles, bread pudding, stuffing

**TABLE 3. Continued**

**13. VEGETABLES**

Definition: an herbaceous plant cultivated for food.

Example: asparagus, beans, peppers, corn, cucumbers, egg plant, lettuce, carrots, onions, okra, olives, peas, pickles, raw vegetables, spinach, zucchini

**13.1 Vegetable juice**

Definition: juice obtained from raw vegetables.

Example: carrot juice, V-8, celery juice

**13.2 Raw vegetables**

Definition: vegetables that are served alone, hot or cold.

Example: carrot sticks, peas, corn, tomatoes

**13.3 Pickled vegetables**

Definition: any vegetable that has been immersed in a spiced vinegar or brine solution for varying lengths of time with the objective of both preserving and flavoring.

Example: olives, pickles, pickled cauliflower, salsa

**14. WATER**

Definition: water meant for human consumption.

Example: water, ice

NOTE: The Centers for Disease Control (CDC) in collaboration with the Environmental Protection Agency tabulate data on waterborne disease separately from those for food-borne disease outbreaks. A waterborne disease outbreak is defined as illness occurring after consumption of water intended for human consumption.

**14.1 Liquid**

Definition: water in the liquid form meant for human consumption.

Example: tap water, spring water, bottled water

**14.2 Ice**

Definition: frozen water meant for human consumption.

Example: ice cubes, crushed ice

NOTE: does not include slushes.

**15. CHEMICAL**

Definition: the accidental introduction of chemicals into foods that is not related to food-preparation practices.

Example: Sanitizer in soup, lead in acidic foods

**15.1 Heavy metals (copper, lead)**

Definition: the accidental introduction of lead, cadmium, copper into food.

Example: copper contamination of cherry topping

**15.2 Caustic**

Definition: the accidental introduction of a caustic chemical into food.

Example: floor cleaner in soup

**15.3 Organic**

Definition: the accidental introduction of an organic compound into food.

**15.4 Other**

**16. PHYSICAL**

Definition: the accidental introduction of physical elements into foods that is not related to traditional food-preparation practices.

Example: worm in food, wire in steak

**17. UNKNOWN**

Definition: causal foods not reported.