

## **OPEN DATA**

### **USDA Food Recalls, 2006-2010**

#### **Humane Research Council<sup>1</sup>**

##### **Abstract**

This brief report details a dataset of all United States Department of Agriculture (USDA) food recalls from 2006-2010. The recalls have been compiled by the Humane Research Council into a single dataset that includes the severity of each recall, the amount of each recall, and the reason for each recall. This report also describes the methods of data collection and overall descriptive findings of the dataset.

##### **Introduction**

Following is a brief description of a dataset that contains the United States Department of Agriculture's (USDA) food recall data from 2006-2010. This is a presentation of a dataset only, with some descriptive findings included to give the reader an idea of the nature and scope of the data. The dataset was compiled by the Humane Research Council (HRC) with the intent of making it available to scholars and researchers who wish to use it in their research. The information contained in this dataset will likely be of interest to critical animal studies scholars, animal protection organizations, animal advocates, and food safety analysts. The following summary introduces the dataset, describes the data collection methods, and presents descriptive findings of the results.

We hope that scholars will utilize this data to address important research questions that may be of use to animals and animal advocates. The full data set is available for free to qualifying researchers or organizations in STATA, SPSS or Excel format, along with the codebook, a detailed data collection protocol, and other supporting documentation. To inquire, please contact the Humane Research Council.

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<sup>1</sup> The Humane Research Council (HRC) is a nonprofit organization dedicated to empowering animal advocates with access to the research, analysis, strategies, and messages that maximize their effectiveness to reduce animal suffering. HRC has assisted a diverse selection of national and local/grassroots organizations working on a wide variety of animal issues by conducting research on behalf of animals and animal advocacy groups. HRC's research director, Carol L. Glasser can be contacted at [cglasser@humanereseach.org](mailto:cglasser@humanereseach.org)

## **Why Study Food Recalls?**

A recent study prepared for the Food and Agriculture Organization of the United Nations found that, on a global scale, about one-third of all food produced for human consumption is wasted or lost each year (Gustavsson et al., 2011). This problem is even worse in affluent nations. The study's authors estimate that annual food waste and loss is between 13 to 24 lbs per person in sub-Saharan Africa and Southeast Asia, ranging as high as 254 lbs per person in Europe and North America.

The issue of food being wasted is of particular concern to animal advocates given that much of this "food" is animal flesh. For many animal advocates, the idea that an animal dies for food is problematic in and of itself. But even more disturbing is the reality that a huge number of these animals are killed in vain because of issues in processing, transport, or on the consumer end that lead to the flesh of the animal being thrown away. Many recalls also have a cost in terms of human health and social welfare. The Centers for Disease Control (CDC) estimates that in 2010 there were 1,397,187 cases of Salmonella alone; USDA's Economic Research Service estimates that premature deaths and illness resulting from this cost the U.S. \$2.7 billion (ERS, 2011).

It is important to understand the mechanisms of food waste and loss in order to ameliorate the problem. Understanding *how much* food is recalled and *why* it is recalled can help to elucidate some of these problems. A number of reports and media discuss changes in recall trends over time. However, these discussions often lack the nuance necessary to be meaningful. Recalls vary in severity, with the USDA labeling the recall a class 1 (most severe), 2, or 3, depending on its level of perceived threat to human health. Simply knowing the number of recalls is not sufficient. For example, a sharp decrease in class 1 recalls accompanied by an equal increase in class 2 or 3 recalls would still represent an improvement. Further, recalls also occur for various reasons—mislabeling, foreign objects in the product, processing errors, and contamination with food-borne pathogens such as *E. coli* or *Salmonella*. It is important to understand trends in the causes of recalls to truly understand how they can best be managed.

## Data

All U.S. food recalls are available online from the USDA, but each recall is recorded on a separate web page. This does not allow for a systematic way to track recalls over time and measure the amount and type of animal products/food recalled, why products are recalled, or the severity of the recall. This dataset consolidates information about all USDA food recalls for the five-year period from 2006-2010. There are two agencies that control most of the food recalls in the U.S.—the USDA and the FDA. The USDA inspects and manages recalls for most meat from land-based animals, while the FDA manages all other foods. This dataset is comprised of the USDA food recalls for animal products, which are derived from chickens, cows, ducks, pigs, and turkeys. Each recall was coded for: class of recall (i.e. level of severity of recall as determined by the USDA), reason for recall (coded on a number of levels), type of product recalled, and amount of the product recalled.

To the best of our knowledge, there is only one other dataset that compiles similar information about food recalls, produced by the Socially Responsible Agriculture Project (SRA).<sup>2, 3</sup> Scholars who want more detail regarding the reasons of the food recalls, want to work with the raw data to generate their own analyses, need detailed methodological information, or want to add additional years to the data, will likely prefer the HRC data set. The SRA dataset may be preferable for those who need to track historical recalls over a longer period of time, as the SRA data extends from 1998-2010 while the HRC dataset currently covers 2006-2010. SRA also has some information on the companies that initiate food recalls, while HRC does not.

The HRC dataset is reliable and reproducible; it has been compiled with methodological precision, and the coding scheme was developed and tested using measures of intercoder agreement, such that the final coding scheme has a high level of intercoder

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<sup>2</sup> See <http://www.sraproject.org/featured/>.

<sup>3</sup> The datasets are generally comparable for the variables covered in both sets, including amount of meat recalled by year and type of animal, with the exception of the year 2009. This is likely due to different coding criteria. There are different ways that the amount of a recall could be recorded. In cases where the *total* amount of food recalled was unknown by the USDA, we recorded it as missing so that we are only reporting on *known* recall amounts, rather than making estimations. This constitutes a total of 3.7% (N=10) of all recalls from 2006-2010. SRA may have approximated the recall number either by using the amount of a recalled food that was eventually recovered, or the initial amount of a recall, in the cases when a recall was updated and, though an *initial* recall amount was stated, the *final* recall amount was never determined. The SRA dataset also includes fewer recalls compared with the HRC dataset, for an undetermined reason.

agreement, attesting to the data's reliability. A detailed codebook is also available, making the coding scheme easily useable by researchers who wish to add more years to the dataset.

The lead researcher coded all cases with a 10% random sample co-coded with the lead researcher and a second coder to evaluate and test the coding scheme. A sample of 15% of the recalls from 2006-2010 was selected randomly from the remaining data and coded by the second coder independently to test for intercoder agreement.

All variables have intercoder agreement ranging from 90%-100%. Though intercoder agreement was high, coder agreement was also tested on all nominal variables<sup>4</sup> with Krippendorff's Alpha, which is considered to be a more robust test of intercoder agreement (Hayes & Krippendorff, 2007; Lombard et al., 2010). Krippendorff's Alpha was calculated using the online program, ReCal2<sup>5</sup>, which is accepted as a reliable program for computing this value, which is not available in most statistical software programs (Freelon, 2010; see also Hayes & Krippendorff, 2007). For most variables without 100% coder agreement Krippendorff's Alpha ranged from .84-.98. The only exception to this was one variable indicating, when mislabeling was the cause of a recall, if the mislabeling was due to an unlabeled ingredient that was an allergen. Though this variable had intercoder agreement of 95%, the more stringent Krippendorff's alpha score was negative. The negative score reflects that the variable lacks reliability, likely due to systematic disagreement between coders (Krippendorff, 2004: 222).

There were two cases of coder disagreement on this variable; for each, one coder coded the mislabeling as "unlabeled ingredient, allergen" while the other coder coded the mislabeling as "unlabeled ingredient, non-allergen." Since the coder disagreement was systematic, to ameliorate this lack of reliability these two variables were collapsed into one variable. This new variable indicates if the mislabeling is due to an undeclared ingredient, including both allergens and non-allergens; this variable has 100% intercoder agreement. The full dataset with the revised and original variables, as well as information regarding percent of coder agreement and Krippendorff's alpha scores for all variables, are available from HRC to qualifying researchers.

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<sup>4</sup> All variables in this dataset, except for the amount of each recall, which is measured in pounds, are nominal.

<sup>5</sup> An explanation of and access to ReCal2 is available from Freelon (2010) and the program is accessible at <http://dfreelon.org/utills/recalfront/>.

## Descriptive Findings

The number of total recalls each year generally held steady. In 2006 there was a low of 34 recalls, but the number of recalls held steady between 54-58 from 2007-2010, with the exception of a spike of 69 recalls in 2009. Although the number of recalls did not vary widely, the nature and total amount of the recalls did vary. Both the severity of food recalls, as measured by the USDA, and the amount of food recalled decreased during this period.

The USDA classifies recalls by severity; a class 1 recall indicates that there is “a health hazard situation where there is a reasonable probability that the use of the product will cause serious, adverse health consequences or death” (USDA). A class 2 recall indicates that there is a “remote” possibility of adverse health consequences. And a class 3 recall is one in which no adverse health consequences are expected. The class of the recall varied significantly ( $p=.009$ ) by year, decreasing over time. From 2006-2008 class 1 recalls accounted for 76%- 86% of all recalls but in 2009 class 1 recalls accounted for 65% of all recalls, and in 2010 they accounted for just over half (55%) of all recalls.

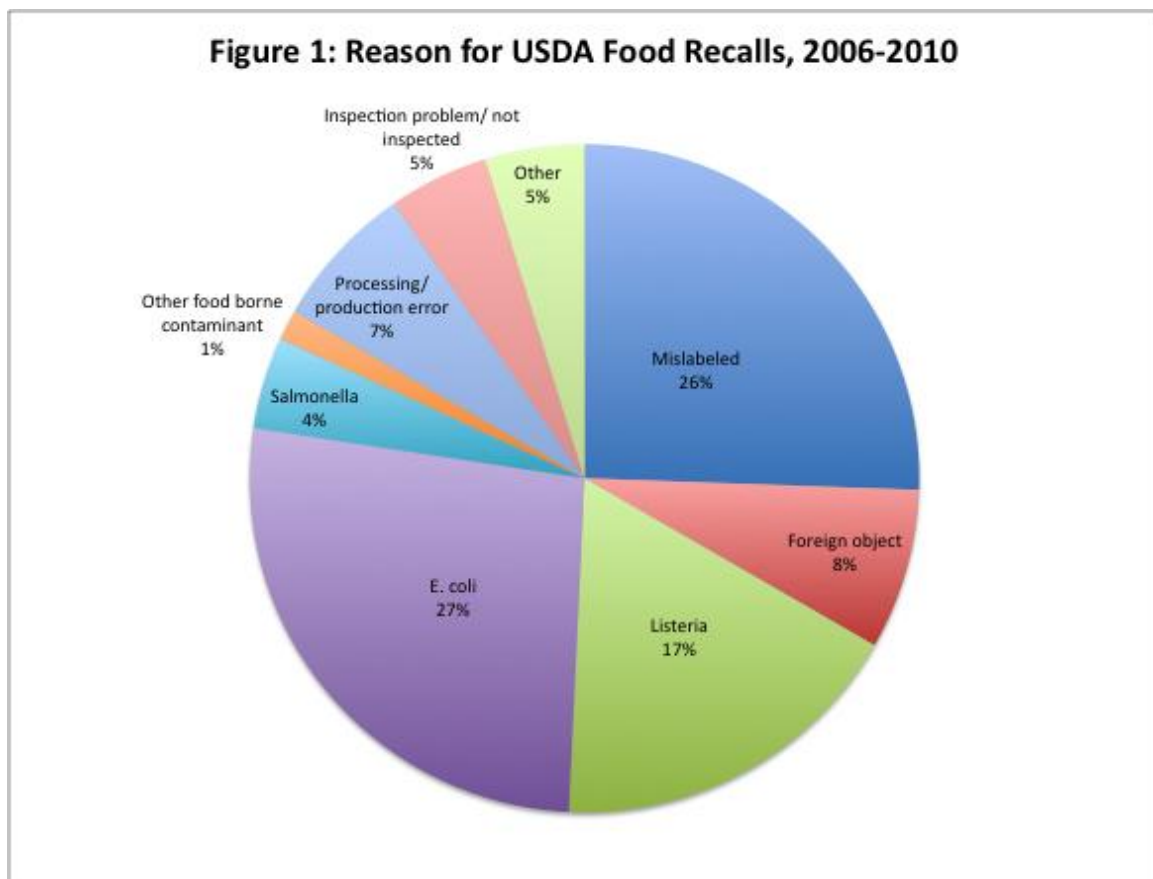
<b>Amount* of Food recalled, in pounds, by type and year</b>							
		<b>Year</b>					<b>Total (lbs.)</b>
		<b>2006 (lbs.)</b>	<b>2007 (lbs.)</b>	<b>2008 (lbs.)</b>	<b>2009 (lbs.)</b>	<b>2010 (lbs.)</b>	
<b>Type of animal product</b>	<b>Cow</b>	689,281	30,414,289	151,891,393	3,760,293	1,693,851	<b>188,449,107</b>
	<b>Pig</b>	48,905	318,182	121,677	2,724,119	43,923	<b>3,256,806</b>
	<b>Chicken, turkey, other "poultry"</b>	216,450	2,936,597	2,167,133	1,880,401	392,343	<b>7,592,924</b>
	<b>Other</b>	4,911,297	3,794,754	546,470	984,020	2,289,983	<b>12,526,524</b>
	<b>Total (lbs.)</b>	<b>5,865,933</b>	<b>37,463,822</b>	<b>154,726,673</b>	<b>9,348,833</b>	<b>4,420,100</b>	<b>211,825,361</b>

**Table 1**

\* This is the minimum amount of food recalled, as data is missing for the total amount of food recalled for one recall in 2006, two recalls in each year from 2007-2009, and three recalls in 2010.

The amount of food recalled varied by year as well. Table 1 details the amount of food recalled, by the type of meat, for each year. During this five-year period the USDA recalled a total of 211,825,361 pounds of meat-based products. Over half of this was recalled in 2008 (154.7 million pounds) with the majority of the recalls coming from cow-based food products (188.4 million pounds).

Recalls occurred for a variety of reasons, with the majority occurring because they were in some way contaminated (60%). Of the 162 recalls due to contamination, 83% were due to a food-borne pathogen, including *Listeria*, *E. Coli* and *Salmonella*. Most of the remaining recalls due to contamination were a result of a foreign object or material, such as metal or plastic, in the food. A quarter of the recalls (N=69) by the USDA from 2006-2010 were a result of mislabeling, with 88% of these recalls due to the label failing to list one or more of the product's ingredients, often allergens, on the label.



## **Moving Forward**

There are various research questions that one can address utilizing this dataset. For example, what is driving food recalls? Do reasons for recalls differ depending on the type of animal being processed? What presents a greater health risk, careless mislabeling, or contamination through food borne pathogens? Ideally, these questions can generate research projects that have the potential to be used to motivate slaughterhouse reform or to motivate individuals to reduce or eliminate the consumption of animal meats. In the future, HRC intends to create a

similar dataset for all FDA food recalls; interested researchers and potential partners, please contact us for more information.

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