Challenges in Data Needs for Assessment of Food Product Risk and Attribution of Foodborne Illnesses to Food Products in the United States

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Abstract: This paper presents discussions on data needs for assessment of food product risk and attribution of foodborne illnesses to food products. Working with the Foodborne Diseases Active Surveillance Network (FoodNet), FSIS adapted a Bayesian statistical model to quantify attribution of meat, poultry, and eggs as sources of human salmonellas in the United States. The model was fitted to observed number of domestic and sporadic salmonellosis cases using Markov Chain Monte Carlo simulation approach to estimate the joint posterior distribution.

Our study shows that to adequately assess food product risk and attribute illnesses to food products, we need to obtain data concerning pathogen prevalence and distribution in a wide variety of potential food vehicles and other for other important sources of human exposure, such as indirect sources of contamination and non-food sources. Another challenge we encountered is the need to ensure that existing data sources continue to adequately represent the burden of foodborne illnesses in the U.S. population and the distribution of the associated pathogen in food vehicles and exposure sources of interest. Additionally, we need to refine existing data so that the comparisons between data from various sources are based on similar units of observation at the necessary levels of discrimination for defined points along the farm-to-table continuum.

Assessment of food product safety and attribution of foodborne illnesses require extensive data originating from various sources. However, currently available data sources suffer from methodological limitations and the unavailability of certain types of data often result in critical data gaps. An expert elicitation conducted by FSIS shows that when epidemiologic data are lacking, are sparse, or are highly uncertain, data from expert elicitation are useful to fill the critical gaps in food safety studies.