



***Economic Measures of Interventions:
Building a Framework for Prioritizing Opportunities to Reduce Risk***

***December 2-3, 2004
University of Massachusetts Amherst***

Defining Best Practices to Move Forward

What should be the criteria for studies of the technical effectiveness, benefits, and costs of interventions to improve food safety?

Are there design features that are essential?

What types of data are required?

What sensitivity analysis is needed?

Can we define reporting practices for research that will maximize its usefulness?

How should research be designed to be of most use to risk management decision making by governments, companies, and consumers?

Here is a start for our discussion:

A User's Guide to Cost of Interventions Studies

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Incidence of foodborne illnesses, inadequate manufacturing practices for microbial reduction, inefficient government regulations concerning food safety due to insufficient considerations in the supply chain, and fragility of food products lead to further studies in the food industry to search for a safer food system. In this work, economists analyze cost-effective ways to produce safer food products. Economists need to use economic evaluation techniques, such as benefit-cost analyses, cost-effectiveness analysis, and meta analysis to determine whether a new or already implemented intervention is efficient with respect to food safety and economics. At this stage, analysts are faced with difficulties regarding data sources. These difficulties help highlight what types of data are needed.

During the development of the Effectiveness and Costs of Interventions Ranking Model (ECIRM), the obstacles I came across gave me clues about the relevant data needed to analyze interventions.

Assumptions or Measures That Need to be Clearly Defined

Lack of full information reported in studies does not allow an economist to analyze the given data and model completely. Therefore, there should be following specific information provided within the data source (i.e., published articles, surveys):

1. The type of the food product (e.g., beef patties, carcass, hog).
2. The technology used (e.g., steam pasteurization, vacuum pasteurization, hot water wash) and the targeted pathogen reduction achieved by the technology.
3. Characteristics of the intervention implemented (e.g., the capacity, size, and microbial reduction and heat efficiency of specific steam pasteurization).
4. Clear representation of cost elements (e.g., which elements are included in the function/data? Is operating cost is included?).
5. The characteristics of the cost and benefit data (e.g., industry-level? plant-level? regional? annual? capital cost?).
6. How representative are the data?
7. Specification of microbial reduction.
8. Explanation of sensitivity analysis.

These are the desired characteristics of the study reporting. The (assumed) reduction in (assumed) pathogen(s) in an intervention should be clearly indicated in a study. As it is very difficult to measure a specific pathogen reduction and in turn, the effect of reduction on the manufacturing cost of a food product, it is “desirable” to have information about the reduction and the intervention that achieved the appropriate reduction. However, the reliability of the data depends on other assumptions and conditions in manufacturing.

Knowing as much about the characteristics of the data and study as possible can make the results of economic analyses become more representative. The reliability and the precision of the results depend on not only the availability but also the quality of the data used.