FOOD SAFETY: ECONOMIC
CONSIDERATIONS AND FEDERAL POLICY OPTIONS

by

Thomas L. Sporleder
Professor, Agricultural Economics
and

Carol S. Kramer
Extension Economist, Kansas State University

ABSTRACT

A myriad of local, state, and federal laws and regulations exist with the intent to assure consumers a "safe" food supply. This paper addresses some of the economic aspects of federal food safety laws and regulations. A brief summary of federal food safety legislation and programs is offered, with some assessment of issues which impact on the performance of these programs. Finally, broad alternatives to current federal programs are enumerated along with each alternative's potential consequences in economic terms.

THE ECONOMIC ASPECTS OF
FOOD SAFETY

Safe food supplies are an obvious goal of consumers, producers, and government. In common usage, "safe" means the absence of risk or hazard. But there is a cost trade-off between absolute safety and some acceptable level of risk or hazard. Absolute safety may be either physically impossible to achieve or evaluated as too costly, given some small but acceptable risk at a lower cost. Determination of "safe" food does not necessarily imply zero risk but rather reflects a personal or societal judgement. Designations of "safe" also represent an implicit or explicit economic choice.

The basic economic problem inherent in food safety is one of balance between acceptable risk (in terms of health consequences) and cost.
"Food safety" therefore, refers to socially determined levels of risk judged acceptable in food products. Qualities of high information costs, high exclusion costs, jointness in supply, high consumer costs of organization and policing combine in varying proportions to create problems in articulation and satisfaction of consumer preferences through the market. Legislative and administrative channels thus substitute for market provision of food safety services. Problems of market provision are replaced with those of public provision. (Sporleder, Kramer, and Epp).

Summary of Current Food Safety Legislation and Programs

The intent of the major legislation involving food safety may be summarized as follows:

- regulate food processing to prevent adulteration
- assure consumers a safe food supply
- protect public health
- prevent degradation of food products over time
- promote truthful labeling and information on food product ingredients

These broad categories reflect the intent of food safety legislation during the twentieth century. Since the intentions are broad, the particular agencies and regulations that are a result of the intentions are wide ranging. Literally thousands of specific regulations have been promulgated in an effort to accomplish the broad intent of the legislation.

The current agency structure for administering federal programs for food safety include the:

- Food and Drug Administration of the Department of Health and Human Services
- U.S. Department of Agriculture
- Federal Trade Commission (FTC)
- Departments of Commerce and Interior
- Environmental Protection Agency

In addition to these agencies, the Department of Defense assumes responsibility for food safety for all military personnel. Sometimes even the State Department may become involved in food safety issues as recently occurred with regard to DES and meat exports from the United States.

The U.S. Department of Agriculture has primary responsibility for inspection of red meats. The fresh fruits and vegetables area has shared responsibility between the Environmental Protection Agency and FDA. The EPA sets standards on pesticide tolerance for fresh fruits and vegetables while FDA actually enforces the tolerances established by EPA.

A patchwork of responsibility and regulatory authority exists across broad commodity areas and agencies. The current situation can frustrate attempts to coordinate food safety policy at the federal level with various state and local food safety regulatory agencies. In addition, federal agencies may not coordinate current regulatory programs due to several agencies involvement with food safety policy. The National Academy of Sciences Report emphasized the lack of coordination at the federal level in 1979 (National Research Council). Another report by the Food Safety Council summarizes the concern by indicating that the regulatory process is accomplished in "inconsistent and wasteful" ways (Food Safety Council).

Performance Assessment

Food safety laws and regulations in the United States have achieved a remarkable degree of success when judged by the criterion of "immediate" danger of health risk from ingestion of food. Consumers may choose from a wide variety of food and are reasonably sure that their next meal will not pose any serious threat to their health. From this standpoint, the food safety programs have been effective.
However, evaluation of current food safety programs and procedures also raises some major questions. These include the following:

* Methodology for decision-making
* Definition of "safe" and public health
* Agency coordination and policy implementation

These issues are not necessarily current "political" issues regarding food safety. Rather, they represent issues which our performance assessment leads us to conclude are basic and endemic to food safety. Each issue is treated briefly below.

**Methodology for Decision-Making**

Some observers and analysts argue for food safety policy based on a foundation of risk/benefit assessment. Such a foundation would involve decision-making based on judgment concerning the trade-off between estimated potential hazard and the possible benefit of a particular substance. The framework for decisions would not change the basic laws and regulations concerning environmental contaminants.

The notion of risk/benefit is a derivative of the broader notion of cost/benefit analysis. Cost/benefit methodology as a rational approach to evaluation of most economic activity is an accepted practice, but in some sense is revolutionary when applied to the food safety area. The implication of "risk/benefit" rather than "cost/benefit" is that costs attributable to substances which may cause illness or death to portions of the population are not quantifiable or measurable in monetary units with any degree of certainty.

However, risk associated with a particular additive can be more precisely measured. Scientists can and do objectively quantify the risks associated with many different additives and contaminants. For example, these risks typically are quantified as some percent chance of one additional disease occurrence per 1,000 persons attributable to use of a particular substance in the food supply. The translation of this quantified risk into a cost (or value in the case of risk avoidance), either to society as a whole or to an individual, is the step which lacks precision. Use of the phrase "risk/benefit" is an explicit recognition of this measurement difficulty when these notions are applied to food safety.

Additional difficulty with the risk/benefit framework is encountered with the valuation of human life as part of the analysis. There are several methods commonly proposed for this problem, none of which are totally satisfactory to economists or policy-makers. The willingness to pay method common in evaluating industrial projects cannot easily be applied to risk avoidance associated with food additives (if they are avoided in the food supply). Lives and risks to life are not traded directly in conventional markets. No direct observations of various consumers' willingness to pay to avoid risk can be made. Thus, if risk/benefit calculations attempt to incorporate the value of human life, subjective judgments are necessary (Zeckhauser).

The core issue is whether or not an explicit accounting for the positive and negative aspects of food additives should be attempted given the recognized imprecise nature and subjectivity of such calculations. Some argue this is the only rational policy framework for decisions. Others argue that since the calculations would be imprecise and subjective, the decision framework should not depend on such methods.

**Definition of "Safe" and Public Health**

The basic issue of a legislative definition of safe has been an issue virtually since the passage of the 1958 Delaney Amendment. The definition of safe is essentially a policy question
and must be decided in the political arena.

The current Delaney Clause is based on the presumption that additives which may prove to be carcinogens in laboratory animals do not have a no-effect level. That is, Delaney does not recognize a dose-dependent response possibility for carcinogens. However, scientific literature on toxicology clearly recognizes this dose-dependent phenomenon (Roberts). The intent of amendments to the Food, Drug and Cosmetic Act has been to alter the traditional burden of proof for additives, animal drugs and other chemicals. The old standard presumed safety until a regulatory agency demonstrated otherwise. This shifted to one which presumes danger and prohibits use until safety data are supplied by industry for government approval.

Recognition of an estimated no-effect level for a particular food additive is vitally important to food safety policy. Estimation of no-effect levels would translate directly into tolerance or permissable levels of additives in the food supply in the absence of a legal restriction such as Delaney. This would represent a significant shift in the current definition of safe.

Allied with this notion is the wording contained in Delaney which states that an additive must be banned if found carcinogenic to man OR animal. Recommendations to alter the phraseology of Delaney have been made by numerous groups. As one example, the Society of Toxicology Technical Committee has suggested the wording and therefore the intent of the law be changed to "...induce cancer in animal species that metabolize the additive in a manner similar to man." (Roberts, p. 308) Others suggest changes in wording that would reflect banning a substance when shown carcinogenic only to humans.

Agency Coordination and Policy Implementation

Two separate aspects of the issue of federal agency coordination are intra-agency and inter-agency. Intra-agency coordination refers to the structure within agencies such as FDA or USDA while inter-agency coordination refers to mechanisms for coordination among agencies which have regulatory responsibility for food safety.

Intra-agency coordination probably is the most serious of the two. The current structure within agencies can lead to differential treatment of identical risks and inconsistency in toxin classification. Intra-agency coordination should be changed sufficiently to produce simplified and uniform treatment of substances that may produce identical risks.

Inter-agency coordination, especially between FDA and USDA, is accomplished to some extent currently. This issue is one of improving the consistency of food policy application to processors and manufacturers, regardless of the federal agency which has authority. Attention is needed to differing regulatory philosophies which vary from cooperation to policing diffusion of regulatory authority, and assessment of specific regulatory impacts on individual firms. Increased inter-agency coordination is necessary for effective and efficient policy implementation.

Food Safety Program Alternatives and Consequences

The issues raised suggest some broad alternatives to current food safety programs. The enumerated broad public policy alternatives are not necessarily mutually exclusive. The specifics of actual regulations or even legislation that would be necessary to implement any one of the alternatives is not clear. Rather, the alternatives are more philosophical guidelines or alternative general approaches to food safety policy.
The suggested alternatives, in no particular order, are:

* Greater reliance on market forces to provide safe food supplies
* Extend coverage of Delaney
* Shift legal and regulatory framework to acceptable risk
* No substantive change in current food safety situation

Greater Reliance on the Market

This alternative is to abandon the Delaney Clause and allow market forces to operate more fully in the provision of various levels of food safety to consumers. There seems to be substantial support for this alternative, particularly from the food processing and manufacturing industries (Roberts, p. 307).

A portion of this alternative could include increased labeling and information to consumers from the private sector. The basis of the alternative would be that the private sector could provide information to consumers regarding the risks and/or relative safety of the various products that they marketed. The provision of such information would need to be coordinated and verified for accuracy by some agency of the federal government. However, no particular level of risk would be, a priori, banned from the market through legislative or regulatory edict. Presumably, many different levels of food safety would be provided in the market and consumers would be free to choose among those provided, given adequate information to do so.

Provision of safety information to the consumer presents some difficulties. Is the information to be produced by the suppliers of the food products or by an independent source? If the supplier provides the information, will the consumer believe its accuracy? Since the supplier may have a financial interest in supplying inaccurate, misleading or wrong information, close inspection of the information supplied may be required. This could increase the amount of government inspection or the amount of regulation.

Alternatively, an independent testing service (either public or private) could determine the risks to health or safety in a product and supply this to consumers. While the information might have more credibility with consumers, it would require an elaborate system of sampling, testing and publication of the results. Examples of this service (Consumer Reports) focus on standardized products, such as consumer durable goods or standardized processed foods, such as orange juice concentrate or instant coffee. The quality and safety of these products does not fluctuate greatly from item to item or from day to day in production.

A different problem exists for food products which are perishable or significantly variable from item to item. Meat, milk, fruits and vegetables sold by a single processor may come from hundreds of producers. The consumer is unlikely to find information about the average risk of a sample of items tested very helpful. A sophisticated consumer might be able to interpret information about the range or probability distribution of risk, but the average buyer today would not gain much information from such data.

A significant disadvantage of relying on informed consumers is the burden placed on the consumer to process the information that is presented. Data about risks to health and safety are often difficult to understand by individuals without advanced training and experience in subjects such as toxicology, epidemiology, and statistical inference. Even if such information were put in "layman's language," it is doubtful that a majority of consumers could understand the implications of their consumption. In addition to the problem of understanding the information, there is a problem of frequency of purchases and number of food items that must be con-
sidered, in terms of the information processing task. Weekly food purchases for a typical family include scores of items. The information processing task is formidable since each item would need to be checked to verify that it presented an acceptable level of risk. The time, and therefore individual consumer cost required to process the available information makes it unlikely that consumers would regularly use the information. This could result in more frequent occurrence of adverse health effects and a resultant loss in consumer welfare.

There also is considerable doubt that consumers acting as individual can appropriately consider society-wide impacts of food risks. For example, contamination of a food product by a mutagen may result in few noticeable effects for several generations, but then cause a seeming explosion of genetic disorders in the population. This "time bomb" effect may be difficult for most consumers to factor into price and other quality characteristics of a product. Also, the individual's preferences for incurring such risk may place a significant burden on society at a future time. It can be argued that decisions about incurring such risks should only be made from a society-wide perspective, and resolved through the political process.

Because of the public goods aspects of food safety information, it is likely that the choices under this alternative are: 1) food suppliers labeling their products with relevant safety information that is specified by the government, or 2) government inspection of food products and either attaching the results to the product or publishing results and giving these publications wide distribution. In either case, the government is involved in the food safety process, but to different degrees.

The advantage of this alternative is that it attempts to minimize public sector costs for food safety and maximize consumer choice. Private costs of processor compliance with government regulations could be reduced under this alternative. However, depending on how this alternative were manifest in the marketplace, total consumer welfare relative to other alternatives may be less. Individual consumer costs with regard to food safety may increase relative to the other alternatives discussed below. Retail food prices, on the average, may be lower if processor or distributor costs savings from "deregulation" were passed on to consumers and if "less safe" but lower cost food were supplied at retail than is available currently under existing regulation. And government or private firm costs of evaluating safety, monitoring food manufacturing and distribution, and disseminating the information may not be reduced much from the current situation.

Extend Delaney-Type Coverage

A second alternative to current food safety programs would be to extend Delaney-type coverage and broaden the extent of publicly funded information on food safety. A cornerstone of this alternative would be a total ban on additives suspected of carcinogenicity in man or animal. No risk/benefit or cost/benefit framework would be part of food safety policy implementation.

The alternative would include increased public funding for toxicological and basic biological research. In addition, budgets for FDA, USDA, and other agencies currently possessing regulatory responsibility would be increased. These agencies would bolster their monitoring activities and provide additional information and regulation for consumers regarding food safety. Regulations would be implemented to whatever degree necessary to move the available food supply as close as possible to zero risk in terms of public health consequences, both present and future.

The costs of this alternative may be higher than the current food safety programs. However, since food safety has public good characteristics, it may be justifiable from a consumer welfare standpoint. The objective of this alter-
native would be to come as close as possible to providing the nation with food at zero risk. The burden of processing information and monitoring supplies would be put exclusively on the public sector. Implementation would be through FDA, USDA, and other appropriate agencies. Individual consumer costs associated with processing information likely would be less relative to the "Reliance on Market" alternative but the public cost via taxes would be relatively greater. Also, food prices would rise to the extent that processors and distributors passed on greater compliance costs to consumers.

This alternative also could include some restructuring at the federal level. The current set of agencies with regulatory responsibility might surrender their roles to a new agency which consolidates all food safety programs under the single new agency. Such consolidation under a new agency could provide the mechanism for maximizing coordination of all federal food safety programs.

Of course, restructuring federal agencies into one that is responsible for all food safety programs is not unique to this particular policy option. Federal restructuring could apply equally well to the acceptable risk option. A similar situation exists for broadening the extent of publicly funded information on food safety through additional research and education. This could apply to the reliance on market option as well as the acceptable risk option.

Acceptable Risk Framework

The performance of the system now in place must be given rather high marks for effectiveness. Fine tuning what is already established in terms of laws and agencies seems more appropriate than a revolutionary restart to implementation of food safety policy. This alternative would be to adopt an acceptable risk framework for food safety decisions rather than the current zero risk framework. There are some who might argue that this change alone is revolutionary, but relative to some of the other alternatives it may not represent as substantial a change. Already, some food safety decisions are made on the basis of risk/benefit calculations, whether these are systematic and explicit or not. A recent case in point is saccharin.

This alternative would explicitly mandate a systematic risk/benefit approach to food safety regulations and policy decisions. A conceptual advantage of this approach is the recognition that most food safety alternatives involve some risk to at least some people. There is no alternative that gives a truly zero level of risk. Shifting to the risk/benefit approach would keep consumers and governmental decision makers aware of the risk involved. It would change the decision from "Is the product safe?" to "What is the acceptable level of risk?" The latter question really is what is currently involved in the regulatory determination of safe levels. Keeping the true nature of the decision explicit would permit more realistic thinking about the risks and a constant realization of where efforts to reduce risks should be directed.

The implementational advantage of this alternative is that the current set of laws and regulations concerning food safety would still hold except for the Delaney zero risk objective. The current regulatory responsibilities would remain virtually unchanged. Mechanisms for this approach already exist within FDA and USDA so minimum transition to actual implementation of this alternative would be necessary.

This framework is not perfect. Some items entering particular cases would require judgements, especially where the hazards and the benefits cannot yet be measured in common terms. For example, a significant unresolved issue mentioned previously is the appropriate method for evaluating risk to human life and health. Methods do exist for estimating these effects in monetary terms, but there are
significant objections to each of the methods. A useful risk/benefit analysis can be conducted with risks to human life and health calculated in different units of measurement than are benefits.

No Substantive Change

This alternative essentially is to make no substantial change in the current federal food safety programs or the current methods for implementation of these programs. The argument for this alternative is quite simple—no significant food safety problem currently exists. Given this, some would argue that no major changes are necessary, particularly in terms of legislation.

Part of this alternative would be that FDS and USDA would continue their regulatory roles. Interpretation of Delaney and other existing food safety law would continue to manifest itself in regulations issued by these agencies. Current inter-agency coordination problems would likely continue, as would some confusion over time regarding interpretations within an agency. Identical risks might continue to be treated differentially within an agency. The advantage of this alternative relative to the other is that it represents minimal change.

REFERENCES


