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**WHO IS MOST RESPONSIBLE FOR ENSURING  
THE MEAT WE EAT IS SAFE?**

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# WHO IS MOST RESPONSIBLE FOR ENSURING THE MEAT WE EAT IS SAFE?

## **Abstract**

We report results of an analysis of the attribution of relative responsibility across the stages of the food chain for ensuring food safety. Specifically, we identify perceptions of the share of the overall responsibility that each stage in the food chain has to ensure that the meat people cook and eat at home does not cause them to become ill. Results are reported for two groups of stakeholders: consumers and farmers, and for two types of meat: chicken and beef.

The stakeholders' opinions regarding the relative degrees of responsibility of the sequential food chain stages (feed supplier, farmer, livestock transportation, abattoir,... consumer) are elicited via surveys using the Maximum Difference technique (best-worst scaling). The data are analyzed using mixed logit models estimated via Bayesian techniques.

We find that consumers and farmers both tend to allocate a relatively low share of responsibility to their own food safety role. So, consumers tend to think farmers are more responsible for ensuring meat safety than farmers do. Similarly, farmers tend to think consumers have a greater degree of responsibility than consumers themselves believe. Thus, there is a consistent pattern of downplaying the extent of one's own responsibility.

Further, consumers tend to allocate the highest shares of responsibility to the middle stages of the meat food chain. This contrasts with farmers who tend to allocate the highest shares of responsibility to the latter stages of the chain towards consumers, believing that the earlier stages of the chain (until the livestock arrive at the abattoir) have a relatively low share of responsibility. The analysis is currently being extended to a third group of food chain actors: abattoir workers.

*Keywords:* Maximum Difference, Best Worst Scaling, Responsibility, Food Safety, Perception

*JEL codes:* Q18, Q51, D03, D12

# WHO IS MOST RESPONSIBLE FOR ENSURING THE MEAT WE EAT IS SAFE?

## Summary

There has been an increasing concern in recent years over the human health risks posed by biological, chemical, and physical hazards in food. Consumers have become more aware of food quality and safety, and in the UK trust in the food chain has been strained by foodborne diseases (e.g., Creutzfeldt–Jakob disease due to BSE) and food poisoning outbreaks, such as the *E. coli* outbreak that resulted in 118 cases in South Wales in 2005, in which a 5-year-old child died.

Meat may become hazardous to human health at various points in the food chain and, similarly, steps can be taken at each of those stages to reduce the potential risk to humans. In the case of BSE, both the feed cattle received and also the techniques used in abattoirs and processors created the hazard that ultimately led to deaths from CJD.

The willingness of food chain participants to take actions which reduce hazard to human health is influenced by many factors. These include their awareness of the hazard, the extent to which they think their actions will reduce the hazard, and the extent to which they believe that even if they do undertake risk reducing behaviors the effects of these are, or will be, reduced/eliminated by the actions of others in the chain.

This research investigates how people in England and Wales allocate responsibility among the stages of the food chain for ensuring the meat they eat at home does not cause them to become ill, and how this differs between food types (i.e. chicken and beef) and across food chain stakeholders: consumers and farmers.

We constructed surveys employing a Maximum Difference (MaxDiff) Conjoint technique, also known as Best-Worst scaling (Louviere, 1987), which is an extension of Thurstone's (1927) Method of Paired Comparison. The elicitation process involves making choices between sets of items from which respondents identify the “best” and “worst”. In this case, the method is adapted so that, when faced with subsets of food chain stages, respondents are asked to identify the stage which they think is “most” and “least” responsible for ensuring the meat people consume does not cause them to be ill. The stages included in the surveys are: feed supplier, farmer, live animal transport, abattoir, meat transport, processor, wholesaler, retailer, and consumer.

The Maximum Difference method is used here because we have a set of items (food chain stages) which we want respondents to rank yet there is evidence that people struggle to rank long lists, and hence the desire to break the task down into something more cognitively manageable. The Maximum Difference choice tasks are relatively easy for most people to understand as they face only (repeated) subsets of the full set of items. In addition, there is evidence that people cope better when they only need to evaluate the extreme preferences rather than the levels of their preferences (Finn and Louviere 1992; Marley and Louviere, 2005). In addition to the responsibility rankings, we want estimates of the relative size of the responsibility shares that

people attribute to the food chain stages. These shares are retrievable from mixed logit analysis of the best-worst choice data.

The surveys were conducted in-person between June and August of 2009 with consumers and farmers in England and Wales. The surveys with farmers were conducted at agricultural shows. We contacted 267 respondents (110 consumers, 157 farmers) who were randomly assigned to one of two surveys: one in which chicken was the product featured, and another in which it was beef. In both cases, it was indicated that respondents were to consider meat that they bought and cooked at home.

We used mixed logit model via hierarchical Bayes estimation techniques to estimate stakeholders' allocation of shares of food safety responsibility across the meat food chain stages.

We find that consumers and farmers both tend to allocate a relatively low share of responsibility to themselves. So, consumers tend to think farmers are more responsible for ensuring meat safety than farmers do. While farmers tend to think consumers have a greater degree of responsibility than consumers themselves believe. Thus, there is a consistent pattern of downplaying the extent of one's own responsibility. Consumers allocate the highest shares of responsibility to the middle stages of the meat food chain (e.g. processor (c.20%) and abattoir (c.10%)). This contrasts with farmers who tend to allocate the highest shares of responsibility to the later stages of the chain towards consumers believing that the earlier stages of the chain (feed supplier, farmer, and live animal transport) are perceived to have a relatively low degree of responsibility (c.10%) compared to the mid (c.35%) and later stages (c.55%).

We find a similar pattern of share of responsibility allocations for the chicken and beef surveys, however we do find that consumers tend to believe themselves to have a greater share of responsibility in the case of chicken compared to beef. This is plausible given the higher occurrences of foodborne illness cases attributable to chicken products in domestic kitchens.

Using responses to debrief questions with survey participants we discuss some of the possible causes for the similarities and differences we see in the patterns of responsibility allocations across the stakeholder groups and meat products. We are currently extending the analysis to include a third group of food chain actors (abattoir workers) representing a mid-chain group.

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