Tracing the Costs of HACCP

Tracing the costs of HACCP implementation is seemingly less complex than tracing the benefits of reductions in foodborne illness. Although there may be debate about which costs to include in the HACCP analysis, all possible types of costs entail straightforward flows from one sector of the economy to another. Calculating the ultimate impact of the costs of HACCP on the economy simply requires determining the types of costs triggered by HACCP and the sectors of payment and receipt. This scenario, however, is complicated by the problem of how ultimately to distribute the increase in production costs incurred by meat and poultry slaughterhouses due to HACCP implementation. Are these costs absorbed by industry, thereby decreasing profits and investment? Or, are these costs passed on to intermediate and final purchasers in the form of higher meat and poultry prices? In the long run, it is reasonable to assume that these costs are passed on to consumers as higher prices. Unfortunately, a SAM is a fixed-price model, so simulating the effects of price changes is not straightforward. In the following simulation, we worked around the limitations of the SAM model to illustrate the ultimate impact on the general economy of meat and poultry price increases triggered by HACCP implementation costs. Again, we caution the reader to interpret this simulation as a pedagogical exercise and not as a new estimate of HACCP costs and benefits.

Initial Distribution of HACCP Costs

The initial costs of HACCP accrue both to meat and poultry slaughterers and processors in the form of increased production costs and also to the Federal Government in the form of increased FSIS supervision costs. The mid-point estimates of the distribution of costs, as calculated by Crutchfield et al. (1997) are shown in table 11, second column.

Table 11—Breakdown of HACCP costs

Regulatory component	Cost estimates[1]	Expenditures (Percent of regulatory component)[2]	
	1993 dollars (millions)		*Percent*
Sanitation Standard Operating Procedures	175	Storage Labor	1 99
Microbial testing generic *E. coli* testing	175	Laboratory supplies Laboratory labor Other labor	18 37 45
Compliance with *Salmonella* standards	153	Chemicals Laboratory supplies Labor	5 15 80
HACCP plan			
Plan development	56	Labor	97
Annual plan review	9	Travel	2
Recordkeeping	449	Storage	1
Initial training	23		
Recurring training	22		
Additional overtime	18	Labor	100
FSIS costs	58	Labor Laboratory supplies	99 1
Total	1,138		

[1] Crutchfield et al. (1997) average cost estimates converted to 1993 dollars. These costs are the present value of 20 years of HACCP costs; they include both initial and yearly costs.

[2] Extrapolations from USDA, FSIS, 1995 and 1996.

The expenditures entailed with the regulatory activities listed in table 11 include a wide range of goods and services. For industries, the major expenditure is for increased labor. Additional expenditures include document storage, travel to classes, and specimen collection supplies. For FSIS, most of the increased expenditures are also for labor.[9] Columns 3 and 4 of table 11 outline our estimates of specific expenditures arising from HACCP implementation. These estimates were extrapolated from FSIS's regulatory impact analysis for HACCP (USDA, FSIS 1995, and 1996).

Final Distribution of HACCP Costs

Like medical expenditures, the costs of implementing HACCP had direct and immediate impacts on the economy. These expenditures circulated throughout the economy, triggering economic activity and growth in some industries and reductions in others. We simulated the initial impact of these costs on the economy in two steps. First, we traced the $1.1 billion increase in implementation costs for HACCP to the industries or factors supplying goods and services to meat and poultry slaughterers and processors and to FSIS. We estimated that of the $1.1 billion, $66 million went to paying Medical Services (laboratory labor), $8 million to Chemicals, $54 million to General Manufacturing (laboratory supplies), $4 million to Other Services, $9 million to Transportation and $997 million to Labor. Second, we assumed that all cost increases were paid by consumers of beef and poultry. Consumers paid $1.1 billion more for beef and poultry; however, this money did not trigger an increase in demand for inputs into beef and poultry slaughter but was used instead by industry to cover the costs of HACCP. We simulated this cost increase by increasing industry expenditure on Medical Services, Chemicals, General Manufacturing, Other Services, Transportation, and Labor, as outlined above.

To absorb the impact of higher beef and poultry prices, households reduced expenditures on other goods and services. We modeled the impact of the increase in meat and poultry prices by forcing households to reduce expenditures on other goods and services by an amount equal to their increased expenditures for beef and poultry. We calculated average meat and poultry expenditures by household group and apportioned the "income decrease" (the $1.1 billion increase in meat and poultry costs) according to these average shares.[10]

After the SAM model accounted for general equilibrium effects, the ultimate impact of these costs was a *decrease* in output of $.36 billion and a decrease in household income of $.39 billion. Every dollar spent on HACCP resulted in an economywide income *loss* of $.35. However, these changes do not tell the whole story. The simulation illuminated the impact that increased costs and increased meat and poultry prices have on the general economy, but in order to achieve these results with a fixed-price model, we shocked the model with a decrease in household income. In essence, we modeled the real income effects of price increases—the effect of the increase of beef and poultry prices on household purchasing power. To calculate the actual nominal impact on household income, i.e., to keep nominal household income constant, we added $1.1 billion back to household income, meaning that the final impact on household income was actually an increase of $.71 billion. The spread between real and nominal results serves as yet another reminder of the potential incongruence between a monetary accounting of economic activity and measures of well-being. In figure 5, we report the nominal results of this simulation (with the $1.1 billion added back into household income).

Table 8, column 4 traces the distribution of the decrease in real household income—the decrease that is indicated by the SAM multiplier model. The distribution of this decrease in household income reflects the labor market ties of the household groups. Households below poverty incurred only 3 percent of the decrease in economywide income, although that group comprised 16 percent of the population; and elderly households incurred only 4 percent of the decrease, although they were 20 percent of the population.

[9] Jensen, Unnevehr, and Gomez (1998) show a different breakdown of factors and inputs. They calculated that electricity and water were more important components of cost than labor. Their breakdown of costs would have a different impact on economic activity than the one we examined.

[10] A more theoretically consistent approach would have been to recalculate expenditures given the price change, create a new SAM with the recalculated expenditures, and then compare the multipliers of the new and old SAM models. Our approach illustrates an approximation of this procedure that is valid for small shocks, such as the one triggered by HACCP implementation.