Meat and poultry products are associated with approximately $4.5–7.5 billion and the remaining $1.1–1.9 billion is associated with non-meat and poultry sources.

TABLE 4.—Foodborne Illness Costs and HACCP Benefits, 1993

Food source	Foodborne illness	
	Costs billions)	Benefits (billions)
All Foods	$5.6–9.4	
Non-meat and Poultry	$1.1–1.9	
Meat and Poultry Only	$4.5–7.5	
Meat and Poultry Parasitic Pathogens	$2.7	
Meat and Poultry Bacterial Pathogens	$1.8–4.8	
USDA Target Bacterial Pathogens	$1.1–4.1	
Campylobacter jejuni/coli—.5–.8		
E. coli 0157:H7—.2–.5		
Listeria monocytogenes—.1–.2		
Salmonella—.3–2.6		
Reduction of USDA target pathogens attributed to HACCP (90%)	.....	.99–3.7

Source: Economic Research Service and Centers for Disease Control and Prevention.

The proposed HACCP system is designed to control all of the public health hazards identified in each meat and poultry establishment. FSIS regulation currently and under HACCP will address all public health hazards. Table 5 shows the bacterial pathogens largely responsible for meat and poultry illnesses.

The proposed near-term requirements and significant parts of HACCP will target pathogen reduction on carcasses and raw product, currently the least systematically controlled hazard. This is the most effective overall approach for reducing pathogen contamination. The benefits are calculated for the three most common enteric pathogens of animal origin: *Campylobacter jejuni/coli, E. coli 0157:H7, Salmonella* and one environmental pathogen Listeria monocytogenes. The reduction of these pathogens to as near to zero as possible in meat and poultry during slaughter and processing would produce an estimated 90% reduction in the foodborne illness attributed to these microbial pathogens. The remaining 10% are due to causes not affected by the proposed regulations because contamination also occurs after product leaves the inspected plant. (The estimated reduction is based on the expert judgement of FSIS microbiologists.) This would result in a $.99–3.69 billion saving annually, as shown in Table 4.

Two other pathogens—*Clostridium perfringens* and *Staphylococcus aureus*—primarily enter meat and poultry foods in restaurants, other commercial kitchens and in homes. Consequently, the proposed regulatory program, which focuses on federally inspected processing, will not significantly affect the incidence of disease caused by these organisms. It is expected, however, that the FDA's Food Code will dramatically reduce the cause of illness attributable to retail practices upon its adoption and implementation. Our continued consumer education activities coupled with safe handling labels should significantly impact practices in the home.

The costs described in this section for foodborne illness costs are borne not only by those who become ill, but by their families, and employers; the food industries; and taxpayers. Costs to stricken individuals include medical bills, time lost from work, pain, and inconvenience. Food industry costs include product recalls, loss of plant production due to closings for cleanup, and higher premiums for product liability insurance. Perhaps most costly to industry in the long-term is loss of product reputation and reduced demand when an outbreak is traced back and publicized. These and other ''defensive'' industry costs of foodborne disease run in the millions of dollars annually and are, for the most part, entirely avoidable. Taxpayer costs include medical treatment for those who cannot afford it, including higher health insurance premiums and costs of public assistance to disabled individuals and their dependents.

Table 5.—MEDICAL COSTS AND PRODUCTIVITY LOSSES ESTIMATED FOR SELECTED HUMAN PATHOGENS, 1993

Pathogen	Foodborne illness cases (#)	Foodborne* costs (bil. $)	Percent from meat/poultry (%)	Total costs* meat/poultry (bil. $)
Bacteria:				
Campylobacter jejuni or coli	1,375,000–1,750,000	0.6–1.0	75	0.5–0.8
Clostridium perfringens**	10,000	0.1	50	0.1
Escherichia coli O157:H7	8,000–16,000	0.2–0.6	75	0.2–0.5
Listeria monocytogenes	1,616–1,674	0.2–0.3	50	0.1–0.2
Salmonella	732,000–3,660,000	0.6–3.5	50–75	0.3–2.6
Staphylococcus aureus**	1,513,000	1.2	50	0.6
Subtotal	3,639,616–6,950,674	2.9–6.7	N/A	1.8–4.8
Parasite:				
Toxoplasma gondii	2,056	2.7	100	2.7