

## EPIDEMIOLOGY

### FROM EGG TO CARCASS: TRACKING THE ENTRY OF POULTRY FOODBORNE PATHOGENS INTO THE FOOD CHAIN (J. J. Maurer, D. Cole, C. Hofacre, and M. P. Doyle)

The federal government has invested significant resources in diagnosis and prevention of foodborne disease as well as food inspection and compliance with slaughter and processing plant sanitation procedures intended to reduce pathogen levels in food. However, these surveillance networks do not address preharvest food safety and therefore a major approach to *Salmonella* control is neglected. The long-term goal of the work proposed in this application is the reduction of *Salmonella* contamination levels in poultry so as to improve the safety of poultry intended for human consumption. The central hypothesis of this proposal is that vertical transmission through the poultry production pyramid is a significant contributor to carcass contamination by *Salmonella*. By collaborating with the poultry industry, we propose to develop an epidemiological database containing the prevalent strains of *Salmonella* present in parental breeder poultry flocks in order to quantitate the risk factors that contribute to the transmission of these strains to meat birds. To accomplish these goals and to further the goals of the United States Department of Agriculture, our multi-disciplinary epidemiology, diagnostic and research group offer the following aims to: 1) develop an epidemiologic model of *Salmonella* transmission through integrated poultry companies from pedigree chickens down to the meat processing plant and finished, poultry product; 2) establish a molecular database of *Salmonella* strains present in the parental poultry flocks and their progeny in order to quantitate vertical transmission of specific serotypes and pathotypes through the poultry production pyramid; and 3) develop a stochastic quantitative risk assessment (QRA) model of foodborne pathogens in processor-packaged poultry products.