# *LISTERIA MONOCYTOGENES*

## RISK ASSESSMENT FOR *LISTERIA MONOCYTOGENES*-INDUCED STILLBIRTHS BASED ON DOSE RESPONSE IN PREGNANT GUINEA PIGS AND NONHUMAN PRIMATES

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Pregnancy-related listeriosis accounts for one-third of the total number of annual cases of listeriosis. Ingestion of *Listeria monocytogenes* by a pregnant woman can lead to undesirable fetal effects including septicemia, meningitis, encephalitis and even death. In joint efforts to reduce the amount of foodborne listeriosis, the FDA/USDA/CDC and the FAO/WHO developed risk assessments of *L. monocytogenes* in various ready-to-eat foods. Both risk assessments relied on dose response data gathered from studies conducted in mice. Recent animal studies using nonhuman primates and guinea pigs have both estimated $LD_{50}$s of approximately $10^7$ *L. monocytogenes* CFU. The FAO/WHO estimated a human $LD_{50}$ of $1.9 \times 10^6$ CFU based on an outbreak of listeriosis in pregnant women who had consumed contaminated soft cheese. We re-evaluated risk based on dose response curves from pregnant rhesus monkeys and guinea pigs. Using standard risk assessment methodology including hazard identification, exposure assessment, hazard characterization and risk characterization, risk was calculated based on the new dose response information. To compare models, we looked at mortality rate per serving at doses ranging from $10^4$-$10^{12}$ *L. monocytogenes* CFU. Based on a serving of $10^6$ *L. monocytogenes* CFU, the primate model predicts a death rate of $5.9 \times 10^{-1}$ compared to the FDA/USDA/CDC predicted rate of $1.3 \times 10^{-7}$. Based on the guinea pig and primate dose response models, the mortality rate calculated by the FDA/USDA/CDC may underestimate the risk for this susceptible population.

## INACTIVATION OF PATHOGENS IN CHICKEN LITTER COMPOST MIXTURES

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Initial C:N ratios of cow manure compost formulations were found to have a significant effect on survival of *Salmonella* spp. but not *Listeria monocytogenes*. A study was done to determine how C:N ratios influence pathogen survival when chicken litter was used as the manure source. Laboratory-scale bioreactors were used for composting manure mixtures formulated to initial C:N ratios of 20:1, 30:1, and 40:1. The initial C:N ratios had a significant effect on survival of both *Salmonella* spp. and *L. monocytogenes*, with greatest survival in formulations of 40:1 compared to 20:1 or 30:1. Heat was not the contributing factor to differences in pathogen survival as pathogens received slightly less heat in the 20:1 or 30:1 formulations than in 40:1 formulations. More ammonia was produced in the 20:1 and 30:1 formulations than the 40:1 formulations and likely contributed to pathogen inactivation.