

Animal Carcass Disposal under Trial Event

Qi Gao, Yanhong Jin, Bruce A. McCarl, Michael P. Ward,
Linda Highfield, Raghavan Srinivasan, Jennifer Jacobs

This research was supported by the Department of Homeland Security (DHS) funded Foreign Animal and Zoonotic Disease Defense Center headquartered at Texas A&M University and also the Technical Support Work Group (TSWG) of DHS.

Should a major outbreak of foot-and-mouth disease (FMD) occur it is likely to involve mass slaughter and disposal of animal carcasses. A rapid and effective disease eradication response is vital to minimizing livestock losses, economic impacts, and public health hazards. Rapid slaughter and disposal are integral parts of effective disease eradication efforts. However, realization of a rapid response requires emergency management plans that are based on a thorough understanding of disposal alternatives under various circumstances. This paper describes carcass disposal concerns arising in association with simulated animal disease outbreaks in Texas.

A stochastic, state transition simulation is used to develop carcass disposal loads under a disease outbreak under three mitigation strategies. Based on the simulated disease outbreaks, the daily carcass disposal load and available capacities of disposal facilities in events area (eight rendering, two composting and five incinerator facilities), the carcass disposal operation will last from 15 to 60 months if only local facilities are utilized (Table 1). Among alternative disposal techniques, burial is fastest and least direct cost. A geographical information system (GIS) package, which integrates spatial disposal capacity and daily animal carcasses load help to determine disposal locations and the corresponding "best" disposal technique. Using these data a unifying model was developed to minimize transportation cost and risk developing a disposal plan. The GIS model is also limited by regulatory specifications such as the disposal site must be at least 1,000 feet from public water supply wells, 1000 feet from a primary highway, etc. Further, each mitigation strategy will utilize 39, 188, or 160 burial sites with 200 by 400 feet of cell size and require approximately 5000, 25000, or 21000 of labor personnel (Table 1).

Table 1: Estimates of burial sites and the number of labors needs

Mitigation Strategies	Mortality (# of head)	Epidemic Length(days)	Disposal Length(month)	Assume Disposal Length (4 month)	
				# of Burial Sites (200 by 400 foot)	Labor Needs (person)
1	2180000	75	15.6	39	5072
2	8470000	76	60.6	188	24709
3	6860000	76	49.1	160	21013

