

Survival of *Leptospira icterohemorrhagiae* (M-20) in Composting Systems

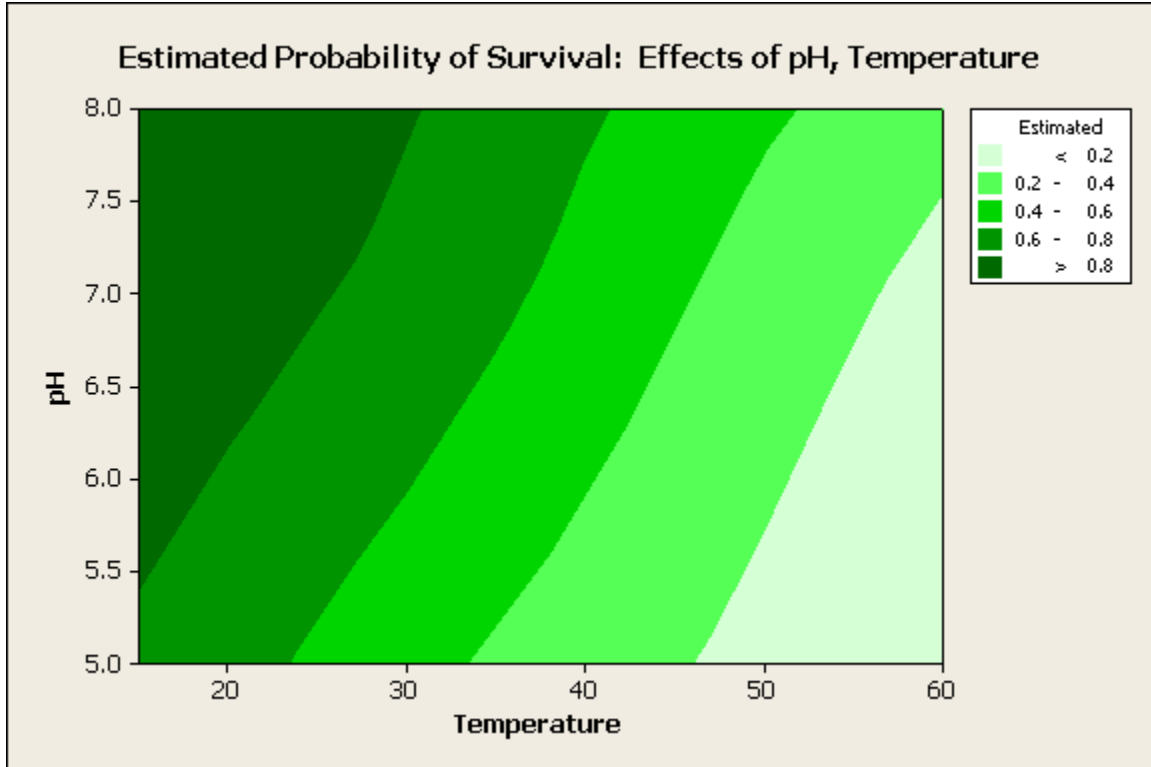


Figure 2: Preliminary results of exposure trials with serovar *Leptospira interrogans icterohemorrhagiae* (M-20). The graph presents estimates of the probability that spirochetes will survive exposure to combinations of ambient temperature and pH in ranges expected within composting systems in Western Samoa.

<p><i>Background/Need for Project:</i></p>	<p>A survey of the population of American Samoa conducted by the Centers for Disease Control in 2004 found that approximately 15% of residents had been exposed to <i>Leptospira</i>, based on antibody titres in blood samples. This prompted efforts to identify potential sources of <i>Leptospira</i>, which led to an intensive effort on the part of the American Samoa Environmental Protection Agency to regulate piggeries. Piggeries house few animals (generally less than six—ten) but often contribute wastes directly to surface waters. Passive composting is being considered as a method of managing piggery wastes to minimize the potential for contamination from <i>Leptospira</i> and other microbial and chemical contaminants that might be found in piggery wastes.</p>
<p><i>Location:</i></p>	<p>University of Nevada, Reno</p>
<p><i>People involved:</i></p>	<p>Mark Walker, John Parker (graduate student), Lawrence Duponcheel, Brian Rippy (as an interested party) – civil engineer with the American Samoa Soil and Water</p>

	Conservation District
<i>Started/ Expected end date:</i>	7/2008 – 4/2009
<i>Brief project description:</i>	<p><i>Project objectives:</i> to develop a reliable model of survival of pathogenic <i>Leptospira</i> spirochetes based on duration of exposure to ranges of temperature and pH expected in passive composting systems of the type that might be used in the western Pacific to reduce the risk of off-site water contamination with <i>Leptospira</i> spirochetes in piggery wastes.</p> <p><i>Project activities to date:</i> We carried out preliminary trials with a full factorial experimental design (five replicates per treatment)</p> <p><i>Accomplishments/Findings:</i> Initial trials demonstrated two things – first, duration of exposure did not seem to be an important factor; second, the results produced a statistically significant model of survival, treating survival as a proportion and assuming a logistic form for the model.</p> <p><i>Plans for the future:</i> We are repeating trials and increasing the time resolution of exposures, to determine if short durations of exposure (< 1 day) have the potential to kill spirochetes. In addition, we are intensively monitoring temperatures in demonstration composting piles managed by Lawrence Duponcheel.</p>
<i>Outcomes:</i>	Preliminary outcomes estimate the probabilities of survival under a range of pH, temperature conditions (Figure 2, above).