

# **Evaluation of Methods to Isolate, Detect, and Recover *Salmonella* from Irrigation Water in the Suwannee River Watershed**

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Salmonellosis is a major public health burden, resulting in millions of illnesses and thousands of deaths each year. Caused by the bacteria *Salmonella*, the disease is commonly associated with foods of animal origin such as eggs and poultry. However, produce is now associated with *Salmonella*, and irrigation water is a potential risk factor for crop contamination. Case rates of salmonellosis within the Suwannee River Watershed are 1.5 times greater than the national average, making the land a prime location for this study. The area lies in the heart of a region characterized by intensive agriculture, utilizing ponds as a source of irrigation for crops. My project will evaluate a combination of various laboratory methods in order to determine the most feasible way to detect and maximize recovery of *Salmonella* in irrigation water.

## Issue / Problem

The Food and Drug Administration (FDA) plans to implement regulations for irrigation water quality in the upcoming year. This constitutes a need for standard procedures to scientifically evaluate *Salmonella* incidence in irrigation water. However, the bacteria are difficult to detect at low concentrations in the environment.

The objective of my study is to establish scientific methods to isolate and detect *Salmonella* at low concentrations in water and sediment samples. Secondly, my project will establish cost-effective methods to maximize recovery of *Salmonella*. Lastly, baseline data regarding *Salmonella* incidence in farm ponds will be determined.

## Methods

I conducted several biochemical tests utilizing various laboratory procedures in order to isolate *Salmonella* from the sampled ponds.

## Results

The methods used to recover *Salmonella* showed that PCR is the most rapid, promising technique to confirm presence of *Salmonella*. Presumptive positives on both XLT-4 and Chromagar selective medias are indicative of *Salmonella* presence, and have been confirmed by PCR analysis. Preliminary data suggest that higher temperatures may result in higher concentrations of *Salmonella* in farm ponds.

## Implications

My project will serve as a foundation for a 2-year study to design good agricultural practices, reducing risks associated with produce consumption.