The objective was to understand the effects of contamination route, including Lazio, Emilia, Spinach Cultivars, S. Newport, Bacterial Strains, and S. Newport population on spinach, soil and water runoff: contaminated water.

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**Background & Objectives**

- Contamination of spinach by foodborne pathogens has resulted in sicknesses & losses in millions of dollars due to product recalls.
- The objective was to understand the effects of contamination route, including seed & water used for germination, on the persistence & internalization of Salmonella.

**Materials & Methods**

- Bacterial Strains: S. Newport SN78-Dual Antibiotic Resistant (Persistence Study)
- S. Newport SN78 (Lux)-(Biophotonic Imaging)
- S. Newport SN78 (GFP)-(Confocal Microscopy)
- Spinach Cultivars: Emilia, Lazio, Space, Waitiki

**Experimental Outline**

- Contaminated Water: Seeds placed in germination pouch - 15 ml Salmonella contaminated water, germinated 5 days
- The germinated seedlings were planted in soil
- Growth in plant Incubator- 4 Leaf Stage

**Microbiological Analysis**

- S. Newport enumeration of Leaf/Stem/Root
- Surface sterilization of plant tissue- Enrichment-Presence/Absence
- Soil & irrigation water runoff enumerated for S. Newport
- Biophotonic and Confocal Imaging

**Results**

- Germinated seedlings had an average S. Newport population of 7.6±0.43 Log CFU/g
- The average population of S. Newport on leaves was 2.83±1.69 Log CFU/ml of leaf macerate
- Leaves from cultivar Waitiki had the highest population of S. Newport 4.5±3.9 Log CFU/ml of leaf macerate (P<0.05)
- Cultivar Lazio had the lowest population of S. Newport- 0.8±1.4 Log CFU/ml of leaf macerate (P<0.05)
- Soil & water used for growing spinach had a S. Newport population of 2.52±0.16 and 0.78±0.47 Log CFU/ml respectively
- All four cultivars of spinach were positive for internalized S. Newport in the leaf tissue tested
- Internalized S. Newport was not isolated from the stems or roots of spinach cultivar Waitiki

**References**