

**TITLE:** ASSESSING THE PREVALENCE OF *SALMONELLA* SPP. IN ORGANIC LETTUCE (*Lactuca sativa* L.) PRODUCED IN BRAZIL USING CULTURE-BASED AND PCR-BASED METHODS

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## **ABSTRACT**

The organic production system has been on the rise and attracting the attention of the food sector, since it uses eco-agricultural principles and provides products free of agrochemical residues. However, organic farming practices such as the use of animal manure may pose health risks to consumers if contaminated with pathogenic microorganisms, such as *Salmonella* spp. As part of a large project on microbiological risks associated with organic vegetables produced and retailed in Sao Paulo, Brazil, the aim of this study was to assess the prevalence of *Salmonella* spp. in organic lettuce samples using culture-based and PCR-based methods. A total of 140 samples of different lettuce varieties (Iceberg, Butterhead, Looseleaf, Red Looseleaf and Romaine lettuce) were collected at seven organic farms. Each sample (25 g) was homogenized with 225 mL of 0.1% buffered peptone water (BPW) for 1 min, incubated at 37±1°C for 18±2 h and tested for *Salmonella* spp. according to ISO 6579:2002 method. For detection of *Salmonella* spp. by Real Time PCR, an aliquot (1 mL) of each sample after enrichment in BPW was obtained for DNA extraction followed by Real Time PCR assay by using mericon DNA Bacteria kit and mericon *Salmonella* spp. kit (QIAGEN, Germany), according to the manufacturer's instructions. None of the samples was positive for *Salmonella* spp. in 25 g using culture-based method. On the other hand, two samples (one red looseleaf lettuce and one iceberg lettuce) were positive for *Salmonella* using Real Time PCR. These results showed that Real Time PCR was more sensitive than culture for detecting *Salmonella* spp., which suggest that the pathogen was present at low level in the samples analyzed, even after an enrichment step. Overall, the application of good agricultural practices is important to reduce the risk of contamination during production of organic vegetables and provide product safety.

**Keywords:** produce; organic practices; Real Time PCR; *Salmonella* spp.

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