

Title: MICROBIOLOGICAL QUALITY IN THE PRODUCTION CHAIN OF LETTUCE (*Lactuca sativa*) IN ORGANIC AND PESTICIDE-FREE CULTIVATION (SISTEMA SAT)

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Summary:

With the growing demand for a healthier lifestyle and incentives for organic farming, the region of Sete Lagoas, in the state of Minas Gerais, has sought to increase local or regional production of vegetables. The lettuce production chain involves extensive handling and the use of fertilizers produced from animal waste and the quality of this vegetable to the consumer may be limited and it is vulnerable to contamination by a multitude of microorganisms. Thus, the main objective of this study was to evaluate microbiological quality throughout the entire production process of lettuce, specifically of the curly, smooth and purple varieties, under organic and pesticide-free cultivation (*Sistema SAT*). Samples of the water, soil, compost, handlers, and shipping boxes were analyzed. The microorganisms studied were *Salmonella* spp. and *Escherichia coli*. Furthermore, samples of water, shipping boxes, and handlers were tested for aerobic mesophilic organisms. The samples were collected in four farms (two using organic cultivation methods and two using pesticide-free cultivation). All samples from all properties showed negative results for *Salmonella* spp. *E. coli* showed the highest contamination in samples of organic lettuce as opposed to those cultivated using pesticide-free methods. The results showed a prevalence of contamination of the smooth variety under organic system and of the curly variety under pesticide-free system. Search results for the same microorganism in the soil of the four farm properties showed that one farm from each system had levels from 2.1×10^2 CFU/g and 1.0×10^3 CFU/g, whereas for the shipping boxes, just one organic farm exceeded the permissible limit, with 5.1×10^3 UFC/cm². For the handlers, the levels were 1.0×10^3 CFU/hand in one organic farm and 1.0×10^3 CFU/hand in one pesticide-free farm. For the fertilizers analyzed, the results were 2.0×10^2 CFU/g in one pesticide-free farm and 9×10^3 CFU/g in one organic farm. For mesophilic microorganisms in water, only one organic property complied with the limit required by law. However, all the results of that microbiological analysis in handlers showed within the standards established by law. On the other hand, the shipping boxes showed better results than required by law. With the data obtained, it is confirmed that there are shortcomings in the production processes of these farms, which may result in contamination of the finished product.

Keywords: microbiological quality, lettuce, organic farming, pesticide-free cultivation.

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