

**TITLE:** MICROBIOLOGICAL QUALITY OF SPROUT BEFORE AND AFTER SANITIZATION PROCESS

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**ABSTRACT:**

Sprouts are vegetable foods rich in phytonutrients, such as glucosinolates, phenolics, and isoflavones. The encouragement to ingest these foods is in line with the current dietary guidelines that advocate more plant-based diets supported by the scientific evidence about the relationship between diet and health, but also related to environmental concerns. The germination process causes changes in the chemical composition of seeds that improves the nutritional value of sprouts, while decreasing their microbiological safety, since the germination conditions are ideal for bacterial growth as well. More than 65 outbreaks related to sprouts consumption have been reported in the last 30 years worldwide. This work aimed to evaluate the microbiological quality of different germinated grains before and after the sprout sanitization process. Wheat, lentil and broccoli grains were germinated in duplicates during 3 days. Microbiological analyses were performed on sprouts before and after sanitization with sodium hypochlorite (200 ppm) for 15 minutes, totaling 12 samples. The quantity of *Bacillus cereus*, total coliforms, *E. coli* and mesophilic aerobic bacteria were determined. The results showed high values ( $> 10^7$  CFU/g) of total coliforms and mesophilic aerobic bacteria before and after the sanitization process in all sprouts. However, values  $< 10$  CFU/g of *E. coli* were observed in all sprouts before and after the sanitization process. High amount of *B. cereus* was observed in broccoli before sanitization ( $6.5 \times 10^4$  CFU/g) and after sanitization ( $3.2 \times 10^4$  CFU/g), and in wheat before sanitization ( $1.9 \times 10^4$  CFU/g) and after sanitization ( $6.3 \times 10^3$  CFU/g). In lentils, values of *B. cereus*  $< 10^2$  CFU/g before and after sanitization were observed. The results showed that the sanitization process of sprouts was not able to reduce the microbial load of the sprouts sufficiently. Consumption of sprouts has become popular throughout the world in the last decades, owing to consumer preferences for foods with high nutrient content and less processing. The consumption of sprouts should be encouraged, but safety measures must be taken to ensure the microbiological quality of these foods. Germination of grain at the household level can be dangerous, since seed purchased in local markets is not suitable for germination. Seed intended for germination must undergo a decontamination process. It is also important to include microbiological criteria for sprouts in Brazilian legislation.

**Keywords:** Germination process; Food safety; Microbiological quality; Disinfection

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