

TITLE: SEMI-QUANTITATIVE RISK ASSESSMENT OF PATHOGENS ON LETTUCE

AUTHORS: ELIAS, S.O.; NORONHA, T.B.; TONDO, E.C.

INSTITUTION: Departamento de Ciências dos Alimentos – Universidade Federal do Rio Grande do Sul, Instituto de Ciência e Tecnologia de Alimentos (Av. Bento Gonçalves, 9500, Prédio 43212, Agronomia, CEP: 91505-970 – Porto Alegre/RS/Brazil)

ABSTRACT:

Lettuce is the most consumed leafy vegetable worldwide. It is consumed raw without an efficient treatment able to completely eliminate all pathogens. Then this fresh produce has been involved in several foodborne outbreaks. Therefore, this study aimed to assess the semi-quantitative risk of pathogens on lettuce. Initially, the identification of pathogens involved in foodborne diseases with vegetables was carried out using scientific literature. This search was performed using PubMed database to identify potentially relevant publications. The keywords included in the literature search were: lettuce, leafy vegetables, leafy greens, salad and foodborne outbreaks. The published studies dates were between January 1, 2000 and January 1, 2016. After that, Risk Ranger® software was used to develop an estimation of relative risk of identified pathogens involved in vegetable outbreaks. This tool includes all elements that affect food safety risks. The criteria considered for the literature search of the pathogens on lettuce consisted of occurrence of reported foodborne outbreaks associated with fresh leafy vegetables consumption. Then about 100 scientific articles were found, and 36 studies were chosen to select the pathogens. The identified microorganisms involved in these outbreaks were *Bacillus* spp, *Campylobacter* spp, *Clostridium perfringens*, *Escherichia coli* O157:H7, *Listeria monocytogenes*, *Salmonella* spp, *Shigella* spp, *Staphylococcus aureus*, Hepatitis A virus, Norovirus, Norwalk, *Cryptosporidium parvum*, *Cyclospora* spp, *Enterocytozoon* spp and *Giardia* spp. Viruses and parasites did not be considered since they cannot grow on food. In this assessment, it was assumed that lettuce was consumed weekly and by most (75%) population in Brazil. Also, the size of Brazilian population assumed was 206,081,432 people. It was assumed that the effect of processing on lettuce slightly reduces the hazards, such as, the effect of preparation before eating; also, there is a minor potential for recontamination after processing; and the post-processing control system is controlled. As the semi-quantitative results the highest risk rankings were observed for *Salmonella* spp. and *E. coli* O157:H7 which scored 67 these results agree with the scientific search that found these pathogens as the most involved bacteria in outbreaks associated with leafy vegetables.

Keywords: leafy greens, vegetable, microbial pathogen, risks.

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