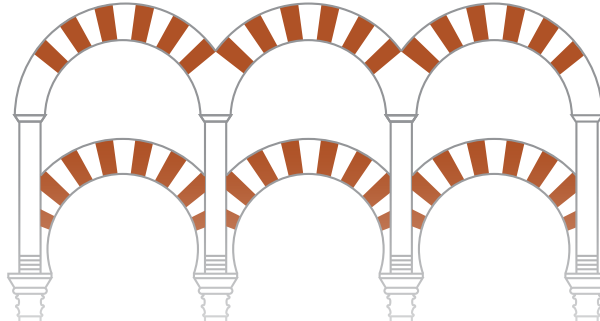

10TH INTERNATIONAL CONFERENCE ON PREDICTIVE MODELLING IN FOOD

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GOVERNMENT BUILDING OF THE UNIVERSITY OF CÓRDOBA

CÓRDOBA, SEPTEMBER, 2017
ICPMF10
INTERNATIONAL CONFERENCE ON PREDICTIVE MODELLING IN FOOD

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P. 83.- META-ANALYSIS OF THE INCIDENCE OF FOODBORNE PATHOGENS IN VEGETABLES FROM RETAIL ESTABLISHMENTS IN EUROPE.

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Keywords: Escherichia coli, Salmonella, Listeria monocytogenes, packed, unpacked

INTRODUCTION AND OBJETIVES

Over the last years, concerns regarding the effect of a healthy diet on one's quality of life have promoted the increase of vegetable consumption. However, these products can be contaminated by pathogens such as *Escherichia coli*, *Salmonella* spp. and *Listeria monocytogenes*. Thus, this work aims to summarise the incidence of foodborne pathogens in vegetables sold at European retail stores.

MATERIAL AND METHODS

Literature search was conducted to identify suitable scientific articles indexed since 2000 from Europe, using terms for combinations of the pathogen and the produce under study. Following study quality checking, forty-one primary studies remained, from which 284 observations of incidence (s positive samples/n total samples) of foodborne pathogens were extracted. Moderators such as country, vegetable class and packed/unpacked condition were codified. Separate multilevel meta-analysis studies were conducted: (i) on the incidence of pathogens in packed and unpacked vegetables; (ii) on the incidence of pathogens across four different vegetable categories; and (iii) on the incidence of pathogens in four specific packed and unpacked vegetable categories.

RESULTS

Results showed that the global mean incidence of pathogens in either packed or unpacked vegetables was 2.24% (95% CI: 1.81-2.75%), with unpacked vegetables having higher prevalence of pathogens (2.05%; 95% CI: 1.26-3.33%) than packed ones (1.67%; 95% CI: 0.97-2.86%). Shiga-toxin *E. coli* was the pathogen with the highest mean incidence in packed vegetables (2.48%; 95% CI: 1.50-4.10%) while *L. monocytogenes* had the top occurrence in unpacked vegetables (4.41%; 95% CI: 1.79-10.47%). Among salads, spices and herbs, sprouts and undifferentiated vegetables, sprouts were the most frequently contaminated by either *E. coli*, *L. monocytogenes* or *Salmonella* spp. (3.55%; 95% CI: 2.10-5.95%) while salads were the least contaminated (1.15%; 95% CI: 0.76-1.73%). Overall, *E. coli* was the main pathogen in the four categories of vegetables, packaged or not (3.41%; 95% CI: 2.42-4.79%) with *Salmonella* spp. being the pathogen of lower incidence (1.13%; 95% CI: 0.82-1.56%). Spain and the island of Ireland had the highest overall frequencies of contamination by the pathogens in the stated vegetable categories (6.03%; 95% CI: 3.83-9.36% and 5.65%; 95% CI: 3.72-8.50%, respectively), while Belgium and Great Britain presented the lowest levels (1.00%; 95% CI: 0.44-2.24% and 0.24%; 95% CI: 0.14-0.40%, respectively). There was no indication of relevant publication bias.

CONCLUSIONS

Since minimal processing technologies can reduce the levels of pathogens in packed vegetables, further research should be focused on the mitigation of *E. coli* and *L. monocytogenes* in such products. As control of pathogens in unpacked vegetables sold at retail may not be as easy, consumers must be further educated on ensuring proper washing and/or cooking of vegetables prior to consumption.