F1
THE PREVALENCE OF BACTERIAL CONTAMINATION AND MICROBIAL DIVERSITY USING 16S RRNA GENE SEQUENCING, OF COMMERCIAL EGGS FROM RETAILS MARKET IN SCOTLAND

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In this study, the aim was to describe bacterial diversity of table eggs using both culture and molecular approach. Total viable counts (TVCs) were obtained from shell and content of 88 commercial eggs in Scotland. Eggs from 3 different sources were sampled including organic farm (22 eggs), free range (33 eggs), and caged system (33 eggs). Free range eggs had higher TVCs isolated from eggshell, a mean of 5.5 $\log_{10}$ CFU/eggshell, and 5.2 $\log_{10}$ (caged eggs) CFU/eggshell. Egg content ranged from 3 log (organic egg) to 2.4 log (caged egg) cfu/ml. ANOVA test showed no significant difference between the two variables, TVCs and housing system, for both eggshell, and content respectively (p <0.14, 0.59).
59 bacterial isolates were genotyped by 16SrRNA sequencing. The results obtained indicate large number of eggs inspected was contaminated with *Staphylococcus* bacteria. Among the bacterial strains isolated, *S*taphylococcus *equorum* was the most occurring strain (32%), followed by *Micrococcus luteus* (17%), and rest of the sequences were less than (10%). No evidence was found for presence of *Salmonella*, *Escherichia coli, Campylobacter,* Listeria *monocytogenes*, or *Clostridium perfringens*. The proportion of Gram-positive bacteria was significantly higher than Gram-negative bacteria (p<0.05). It can be concluded that table eggs sold in Edinburgh's groceries were of good quality for human consumption.

Keywords: *egg, bacteria, DNA, PCR, isolation*

F2
QUANTIFICATION OF POLYBROMINATED DIPHENYL ETHERS AND NOVEL BROMINATED FLAME RETARDANTS IN FOOD ITEMS BY GC/ECNI–MS

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Brominated flame retardants (BFRs) are chemicals used in a wide range of commercial and household products in order to reduce their flammability. Because most BFRs are not chemically bonded to the products which they are added to, they can easily leach into the environment. The main exposures of the population to BFRs is via the diet, inhalation of indoor air and ingestion of indoor dust. In particular, the lack of data on the presence of BFRs in food can lead to a wrong estimation of the human intake. The main aim of this project is to follow up the EU Commission Recommendation 2014/118/EU on the monitoring of BFRs in various food items from the Belgian market, to provide data on their presence and levels. The main purpose of the present work was to develop and validate a sensitive analytical method for the quantification of polybrominated diphenyl ethers (PBDEs), novel BFRs (HBB, BTBPE, DBDPE, TBB, TBPH), tribromoanisole (TBA), and Dechlorane plus isomers (syn-DP and anti-DP) at the levels required by the EU regulation in various food items. The method was developed and optimized using three different matrices (lyophilized salmon fillet, chicken breast, and chicken eggs) by modifying the method published by Xu et al. (1). After extraction with acetonitrile:toluene (9:1, *v/v*), the obtained extract was evaporated to dryness, reconstituted in hexane and subjected to Florisil clean-up, and then to an additional acidified silica (5%, w/w) clean-up. The final extract was concentrated to nearly dryness, reconstituted in isooctane:toluene (9:1, *v/v*) and injected into the GC/ECNI system. The analysis of the target analytes was performed with an Agilent 6890 GC, equipped with electronic pressure control and a programmable-temperature vaporizer (PTV) inlet, coupled to an Agilent 5973 MS operated in electron capture negative ionization mode and equipped with a DB-5 capillary column (15 m×0.25 mm×0.10 µm). The reliability of the method was then tested on several food matrices, including different types of fish, meat, eggs, milk, vegetarian food, and vegetable oil (n=58). For all the tested matrices, the recovery rates for all the analytes ranged between 83% ±11 and 104% ±13. The method was finally validated for a variety of food categories (including fish, meat, eggs, milk, and vegetable oil), and the following parameters (linearity, LOQ, trueness, selectivity, repeatability, accuracy, and measurement uncertainty) were evaluated according to the guidelines of ICH and FDA. Based on the obtained results, the developed method was found suitable for the analysis of PBDEs and novel BFRs in different food matrices by GC–MS.

[1] Xu F, García-Bermejo Á, Malarvannan G, Gómara B, Neels H, Covaci A. Multi-contaminant analysis of organophosphate and halogenated flame retardants in food matrices using ultrasonication and vacuum assisted extraction, multi-stage cleanup and gas chromatography-mass spectrometry. J Chromatogr A. 2015, 1401:33-41.

Keywords: *PBDEs, novel BFRs, food items, monitoring program*

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