Is the household food waste bin a source of potential health impacts?

Other

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1. Food waste – The problem

- Food waste refers to any food and inedible part of food which is discarded or intended to be discarded.
- Globally, 1/3 of total food production made for human consumption is wasted yearly\(^1\).
- Food waste is responsible for 6% of global greenhouse gas emissions\(^2\).
- In UK, almost 10 million tonnes of food is wasted with a value of over £30 Billion.
- UK households alone generated 6.6 Mt of food waste in 2018\(^3\) as shown in figure.

2. The Impacts of food waste

- Bioaerosol emissions?
- Indoor storage: Increase microbial contaminations inside homes
- Collection: Emission of airborne microorganisms (Bioaerosols)
- Processing: Type of waste containers, collection vehicles and transferring activities generate bioaerosols.
- It may cause allergic and respiratory disorders in the householders.
- Bioaerosol exposures cause respiratory and infectious diseases in waste management workers\(^4\).
- Processing: Bioaerosols emissions from composting, anaerobic digestion and landfilling sites.

3. Project objectives

- Microbiological characterisation of food waste materials in the laboratory including identification of pathogens.
- Understanding the role of microorganisms in the breakdown of the food waste materials.
- Identification and measurement of biological agents arising from household food waste that can cause health problems in key-populations (householders, waste handlers).
- Determination of potential exposure routes of bioaerosols for the householders and waste handlers.
- Provision of information regarding risk and health issues for the waste industry in terms of separate storage, collection and processing of food wastes.

4. Methodology

- Sampling
- Cultivation
- Non-cultivation
- Identification
- Bioaerosol sample collection
- Bioaerosols
- Bacteria
- Fungi
- Endotoxins
- Mycotoxins
- β-glucans

- Cultivation
- Biochemical screening
- Nucleic acid based identification (Sanger Sequencing)
- Microscopy

- Non-cultivation
- Spectroscopic assays
- Direct RNA and DNA extraction
- PCR, qPCR
- Next generation sequencing (Amplicon and whole genome sequencing)

References

1. FAO 2019. The state of food security and nutrition in the world.