Identifying the Source and Scale of Plastic in Compost Derived from Household and Commercial Food Waste + EU Updates

REA Organics Conference 2025

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Composting & Anaerobic Digestion Association *of* Ireland

FOOD WASTE BIN COMPOSTABLE

Introduction to Cré

- Cré is the Irish word for soil
- Established in 2001
- Represent all stakeholders in Irish biowaste industries
- Work to promote best practice in composting and anaerobic digestion including use of composts and digestates
- Operate a certification scheme for compostable products
- Member of European Compost Network (Board), European Biogas Association, Irish Bioeconomy Forum

General background on Irish sector

- Waste collection and treatment is privatised in Ireland
  - Almost unique in Europe
- Food and garden waste ~35% of municipal wastes (1.3MT)
- As of 2024, most Irish households should avail of a brown bin service
- Regulated facilities
  - Many relevant Govt departments and divisions
- Currently organic recycling contributes ~1/3 of national recycling
- Significant opportunity for expansion
- Members have many issues, no 1 complaint is contamination

Foster ENVIRONMENTAL

Tony Breton Consulting

epa Research

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Overview of Project on Plastics in Food Waste

LITERATURE REVIEW

ENGAGE WITH STAKEHOLDERS

FOOD WASTE CHARACTERISATION STUDIES TO IDENTIFY PLASTIC PRODUCTS

LABORATORY TESTING OF PRODUCTS TO DETERMINE IF THEY CONTAIN PLASTIC

RECOMMEND SOLUTIONS TO ELIMINATE HIDDEN PLASTIC IN FOOD WASTE

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Key findings of Literature review

- Very few studies looking purely at contamination in biowaste feedstocks
  - Range from 0–18%
  - Even fewer published methodologies for assessing biowaste quality
- Processors globally have similar key issues (soft plastics, glass, etc)
- Little evidence of national / regional 'regulation' – UK, DE, Catalonia
  - Catalonia – payments are made based on quantities and quality collected biowaste
  - https://sdr.arc.cat/cform/ListCaracteritzacions.do
- A few examples of targeted (voluntary) measures, mainly on (collection) bags, PLU and teabags

The Biowaste Analyses

- Developed new protocol based on IT, BGK+REA systems
- 130 kg sample size
- 36 household collections
- 14 commercial collections
- Due to nature of the study analyses looked at:
  - ~ 50 types of material / item
  - 22 items where plastic proven to present

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Collection Systems &Contamination Levels

Table 3.1. Collection systems and contamination levels

Type of collection	Number of characterisations	Contamination (%)		
		Average	Median	Lower to upper limit
All household	36	8.9	8.1	3.4–21.7
Household food and garden	28	9.8	9	3.4–21.7
Household food waste only	8	5.8	5.7	3.4–7.9

Table 3.3. Commercial food waste collection systems and contamination levels

Type of collection	Number of characterisations	Contamination (%)		
		Average	Median	Lower to upper limit
Commercial food waste	14	7.8	7.7	3.9–13.6

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3.4 to 21.7% Range

Household Collections Contamination Levels Vs EPA studies

Table 3.2. Household collection contamination levels identified in this study versus levels identified in EPA studies

Waste type	All household	Food and garden	Food waste only	EPA (2018a)	EPA (2023a)
Number of characterisations					
	36	28	8	6	8
Contamination (%)					
Organic waste	83	82	86	84	94
Paper, card and beverage containers[a]	5	5	4	4	1
Plastics	7	8	6[b]	4	4.2
Textiles, metals, glass, wood and others	3	2	0.2	9	1.2
Compostables[c]	3	2	4		

[a]Contain plastics; in this study, we categorised these items as plastics.

[b]If tea bags were compostable, this value would reduce to 1%.

[c]Added category – not in the 2018 EPA study (EPA, 2018a).

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3.9 to 13.6% Range
7.8%
Commercial

Table 3.5. Percentage of contaminants in household and commercial collections

Type of contaminant	Contamination, as a percentage of total contamination (%)		
	Household food and garden[a]	Household food waste	Commercial food waste
Tea bags	4.99	78.28	6.75
Total glass before breaking into categories (18 samples)	2.07	0	15.97
Glass food jars	0.37	0	1.97
Glass drink bottles	0.60	0	1.73
Glass – other	0.10	0	0.00
Total metal before breaking into categories (18 samples)	2.77	0.21	2.43
Metal – aluminium can	0.66	0	0.34
Metal – tin can	1.23	0.35	0.75
Metal – aluminium tinfoil/tray	1.27	1.64	1.45
Metal cutlery	0.08	0.26	0.32
Metal – other	1.05	0.28	2.34
Soft plastics – bags/film	31.28	10.80	22.55
Biodegradable plastic bags	0.76	0.64	16.18
Plastic bottles	2.19	0.18	1.31
Rubber bands	0.02	0.04	0.02
Butter sachets	0.19	0.10	1.01
Fruit/vegetable stickers/labels	0.02	0.16	0.03
Plastic bottle rings	0.07	0.01	0.01
Vegetable nets	0.62	0.95	0.13
Coffee pods	0.26	0.32	0.52
Food condiment sachets	0.37	0.08	0.89
Bottle seals	0.01	0.01	0.01
Salt and sugar paper sachets	0	0.01	0.15
Hard plastics	12.36	3.02	4.60
Nappies – sanitary products	7.76	0	1.43
Wet wipes – hands	0	0	2.81
Plastic bread bands	0.02	0.01	0.00

- Soft plastics account for a large percentage (36- 40%) in all collection systems, except the household food waste (10%).
- Tea bags a large source in food waste only household collections

Table 3.5. Percentage of contaminants in household and commercial collections

Type of contaminant	Contamination, as a percentage of total contamination (%)		
	Household food and garden[a]	Household food waste	Commercial food waste
Metal bread ring	0.02	0	0.01
Flower ribbons/bands	0.00	0	0.01
Waste from electrical and electronic equipment	0.11	0	0.00
Batteries	0.01	0	0.00
Hazardous – e.g. aerosol cans, medical related	0.35	0	0.12
Textiles	6.02	0	2.28
Coated paper/board/Tetra Pak/cartons	13.7	2.18	5.93
Treated wood	2.30	0	0.12
Stones greater than inch	2.03	0	0.47
Non-compostable coffee cups/lids	0.70	0.20	1.09
Pet faeces in compostable bags	0.00	0	0.00
Pet faeces in conventional plastic bag	0.96	0.12	2.13
Plastic gloves	0.18	0	0.89
Egg boxes	0.08	0.07	1.25
Roof tiles	0.06	0	0
Ceramics	1.37	0	0
Cigarette butts	0.01	0	0
Banana paper wrap	0.04	0	0

Est. of Small Plastics Extrapolated to 220,000 t

Contaminant	Total Units / 220,000 Tonne of Household Food Waste / Year	Confidence Interval: 95% confident it will be + or -
Teabags	206,353,200	87,866,375
Fruit Stickers	8,670,783	3,281,780
Food Condiments	7,443,864	2,825,544
Rubber Bands	6,533,254	1,493,789
Butter Sachets	6,532,026	2,879,458
Veg Netting	4,983,699	1,774,125
Plastic Bottle Rings	3,383,885	1,182,648
Coffee Pods	2,233,325	1,005,678
Bottle Seals	1,924,948	1,038,478
Plastic Bread Band	690,213	410,393
Salt and Sugar Sachets	322,061	554,338
Metal Bread Ring	245,360	252,209
Flower Ribbons	92,134	130,384

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Extrapolation of the study's data to the total yearly Irish household food waste (as per the figures on food waste compiled by the EPA, 2022).

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Proposed solutions

- Contamination limit of 3%, with a maximum of 1% plastics, in waste collection permits and processing facilities licences
- Establishment of a regulated feedstock quality control programme along the lines of the German Biowaste Ordinance
- Continuation of education programme mywaste.ie
- Uniform collection policies
- Enforcement of SUP e.g. on oxo-(bio)degradables and bottle caps/rings
- Mandating specific items – e.g. teabags, PLU, all bags which could be used for collection, coffee pods – to be locally compostable and labelled
- Ban on sachets, dog waste in brown bins, specific labelling on nappies

Since the report was published

- PPWR published:
  - From 2028, mandates PLU, soft filter bags to be compostable whilst providing MS to require additional items including bags
  - Classifies PLU, soft filter bags as packaging therefore liable for EPR which includes 100% cost of waste analyses
  - Requirements on labelling
- LIFE BIOBEST Project results worth a read: https://zerowasteeurope.eu/project/life-biobest/

Thank you for your attention

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