

Reducing contamination in waste is a high priority for organics recyclers as they strive to produce the best quality end product possible. Dr Hugh Bulson and Anna Tiefenbacher from consultancy Organic Resource Agency discuss how to work with local authorities and businesses to accomplish this

CONTAMINATION

It was around 20 years ago that the Organic Resource Agency assisted its first local authority client to set up the source separated collection of organic waste for compost production. Things have moved on a lot since then, but finding ways of maintaining contamination at acceptable levels has remained a constant challenge. This is particularly true now, in this time of reduced budgets for local authorities and with financial pressure on householders and businesses alike.

Contamination in source separated organic waste can occur in multiple forms – from a non-compostable plastic bag used for lining the kitchen caddy and accidentally discarded cutlery, to whole bags of residual waste placed in the wrong bin. Once unwanted material has entered the organic waste stream, it lowers the energy output of the waste via anaerobic digestion (AD), contaminates the process output material (digestate, compost), may endanger achieving recycling targets and can pose problems for processing machinery.

So, what can be done, particularly in this time of financial constraint, to avoid non-target material contaminating organic waste feedstocks and what are the possible solutions for reducing contamination?

THE EXTENT OF CONTAMINATION

To put the issue of contamination into context, an estimation of the average composition of UK food

waste is shown in Figure 1. The level of contamination in local authority collected organic waste is typically in the range of 1-2% by weight, according to WRAP, and the level of contaminants accepted by composters and AD operators is usually contractually limited. This suggests that even under current financial constraints the overall level of contamination is reasonably well managed.

However, there is variation in the amount and type of contamination within and between local authority catchment areas. There is certainly no room for complacency though, as it has been observed that the quality of local authority collected waste deteriorates over time after the initial launch of a recycling scheme. Possible reasons for this include that newly implemented schemes are supported by education and information campaigns and without frequently encouraging residents to recycle, the quality of organic waste decreases.

Most of the contamination is typically in the form of non-compostable plastic bags that are used to line the bins. A recent study conducted by the Organic Resource Agency investigated physical contaminants in the food waste feedstock of an in-vessel composting plant in the south of England. The study found an average 1.12% by weight of non-compostable material, 87% of which was non-compostable plastics (see Figure 2).

The amount of contaminants in the organic waste can also impact the quality of the end product of the treatment, i.e. compost and digestate.

In July 2014, the minimum quality criteria for digestate specified in the PAS 110 standard were updated and they now include tighter limits for physical contaminants such as plastics.

In Scotland and Wales, local authorities often prefer organic waste treatment facilities as partners who are PAS 100 or PAS 110 certified, because these certifications are required to count the treatment of their food and garden waste towards their recycling targets. This emphasises the point that it is in the interest of both the local authority and the facility operator to reduce contamination in the feedstock.

COUNCIL COLLECTED WASTE

Even under tighter budgets, local authorities spoken to by the Organic Resource Agency regard the costs of educating residents to be lower than the costs of not doing so. Failing to educate the public can result in higher waste disposal costs for rejected loads and/or additional waste treatment costs, and also make it more difficult to maintain the residents' recycling behaviour in the long term.

Typically, when the organic waste is collected, the collection crew does a visual check of the bins prior to emptying them. In this way obvious large size contaminants on the surface can be removed. If the crew have reason to believe that the whole bin is contaminated, they reject it and leave a tag or card to explain the problem of unsuitable material in the bin. Data on handed-out tags and cards is logged and provided to the council to enable staff to advise residents whose



IN CONTEXT

bins were rejected if they contact the council.

When collecting food waste from caterers and retailers, some waste management companies line waste bins with clear plastic liners, this allows contamination to be spotted and heavily contaminated bags to be kept out of the treatment process.

PROCESS ENGINEERING

Once contaminants have entered the organic waste stream and end up at the waste treatment plant, a range of mechanical equipment can be put in place to remove any undesired materials. However, using advanced systems for the removal and disposal of the contaminants can incur higher gate fees in the contracts between local authorities and waste treatment facilities.

Some local authorities whose food waste is treated in AD facilities, encourage residents to use non-compostable plastic carrier bags rather than compostable ones (as specified in BS EN 13432) because they report that non-compostable plastic bags can be more easily removed by de-packaging equipment. It is reported that non-compostable plastic bags tend to rip more easily, whereas compostable bags have been found to stretch and cause problems with de-packaging equipment.

CHALLENGES

Achieving high quality organic waste is typically easier from kerbside properties than from high rise buildings. Door-stepping, to engage face to face, combined with written information has been shown to be a

more effective means to decrease contamination in food waste than by only using written information. However, financial cuts in the budget

of councils make it more difficult to find the resources to train and deploy staff to engage face to face with
Continued on page 38

COMPOSITION OF FOOD WASTE IN THE UK

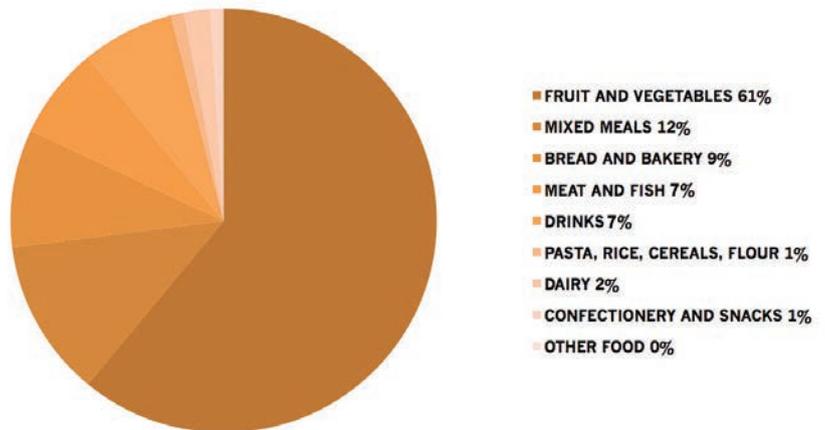


Fig. 1: Average composition of UK food waste (Zhang et al., 2013)

NON-COMPOSTABLE MATERIAL

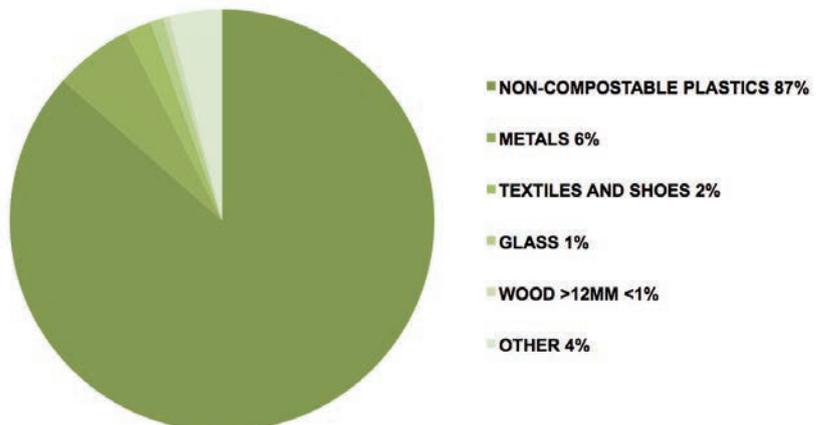


Fig. 2: Proportions of non-compostable material in food waste feedstock to a composting plant (Organic Resource Agency, 2013)

Continued from page 37

residents on the doorstep. Typically only residents in areas where specific contamination issues were identified would receive face to face advice.

Contamination levels in organic waste from kerbside properties are typically lower where food and garden waste recycling is well established and residents are frequently encouraged to recycle. Investing in ongoing, effective public education by local authorities is still perceived to result in a “win-win-win” for all stakeholders: local authorities more than recoup their costs via avoiding elevated gate fees that result from

contamination levels being higher than the upper contractual limit, waste treatment facility operators receive high quality feedstock that is less expensive to process and householders are provided with up-to-date information on how to recycle appropriately. However, door-stepping to engage with residents face to face is particularly effective in hard to reach areas, such as multiple occupancy and high rise accommodation. It has been reported to have become a too expensive way of engagement with residents for some authorities given their current budgetary constraints.



Credit: St Edmundsbury BC, 2014

Left and below: Organic waste containers being collected in St Edmundsbury



Credit: St Edmundsbury BC, 2014

BEST PRACTICE EXAMPLE FOR MANAGING CONTAMINATION: TONBRIDGE AND MALLING BOROUGH COUNCIL

Tonbridge and Malling borough council operate an alternate weekly collection using a single green-lidded bin for the collection of food, garden and cardboard waste from kerbside properties. Cardboard waste includes brown corrugated and flat grey cardboard, and greeting cards if they do not contain any metal, plastic or glitter. The organic waste is sent for treatment in the in-vessel composting facility at the Blaise Quarry operated by New Earth Solutions which produces PAS 100 compost.

The council uses several means of communication to encourage residents to minimise the level of contamination in their organic waste bin, e.g. leaflets explaining the composting process and the impact of contaminants on the compost output material. The organic waste bin is clearly labelled and information on the lid of the bin states what can and cannot go in it.

The residents receive a newsletter on recycling several times a year and can find additional information on the council’s website.

In case any contamination actually ends up in the organic waste bin, it may be spotted by the waste collection crew conducting visual checks prior to emptying the bins. The initial training of the crew involves a site visit to the in-vessel composting facility to demonstrate the impact of waste items other than organic material in the composted end product and highlight the importance of the crews’ role as visual inspectors. The collection crews log the data on their round sheets regarding the advice cards handed out and rejected bins, and feed the information back to the council. If a bin is continuously rejected due to contamination, it can be removed by the council as a last option.

Arriving at the in-vessel composting facility, each lorry load is graded from A to D according to its level of contamination, A to B indicating no or little contamination and C to D highlighting more significant contamination problems. This information is fed back to the council. If loads from a specific area repeatedly receive lower grades, this area will be targeted for an information campaign.