

Proposal for a new 'Hot' Composting Solution for Excessive Food Waste at Woolmer Hill School

Introduction

Over the last year or so we have noticed that the amount of food wastage produced from Food Technology lessons in the DT Department is excessive. The food waste currently comprises of the following:

- Peelings and waste from raw vegetables and fruit including citrus
- Raw and cooked meat
- Leftover cooked food that won't fit in student containers
- Excess ingredients that haven't been used within recipes including dairy.

We also have a culture of students throwing away food that they have not used instead of taking it home for reuse. A small selection of students will also forget to come to collect their meals at the end of the day and due to food safety and hygiene, this food also has to be disposed of if left in the department.

Our current cleaning processes within the school mean that food waste is not distinguished from general waste and typically the waste has been put in black bags to go to landfill alongside the general waste. Packaging separated for recycling and clearly marked as such has also be dealt with as general waste and directed to landfill.

We feel that the amount of food waste we produce could be dealt with more positively and could be processed through adoption of a hot composting solution that will ultimately benefit of the whole school community.

Why Compost?

Legislation

It is generally acknowledged that we have an immediate world climate issue and that sustainability and environmentalism has become a recent 'hot topic'. The House of Commons Environment, Food and Rural Affairs Committee in their 2017 report identified that

"Food waste is a global public policy issue...one-third of food produced for human consumption is lost or wasted globally"

They also identified that recycling through composting and anaerobic digestion solutions played a large part in the Food Waste Hierarchy that was adopted into the Waste (England and Wales) Regulations in 2011.

Amazing Benefits

1. Reduction of methane and green house gases produced when food waste rots on landfill.
2. Reduction of waste disposal costs as less waste is diverted to landfill.
3. Benefits the environment by reducing 'waste' miles in transporting the waste elsewhere
4. Benefits the environment around the school by enriching the soil in the school garden (gardening club and general landscaping).
5. In addition, there are huge benefits to the school as the composting system can be directly used and studied within the Geography and Biology curriculums as well as showing students elements of citizenship and teaching them to be less wasteful, giving them a sense of ownership and responsibility.

Key Stakeholders

We have identified some key stakeholders within the school who have expressed an immediate interest in us obtaining a composting system and will directly benefit from implementation of a system:

1. **The Gardening Club** – the compost produced can be used directly on their garden
2. **Geography Department** – Lucy Hawkswell has identified that a "composting system could be used as a case study in several units at KS3 and 4 as an example of climate change mitigation and reducing waste to landfill."
3. **Science Department** – Tom Behan has stated that "It definitely would support what we teach in Ecology within the AQA specification in Biology. With direct links to managing waste, biodiversity/ecosystems, land and water pollution, biomass transfers and food security, this certainly has spec to be used in my lessons. It also, could link into the nutrient cycle within plant-based modules.
4. **D&T** – to teach students life skills in how to properly deal with waste and also to teach them overall about the importance of reducing food waste in the first place. This will also support the tenets of sustainability and the 5 'Rs' of recycling that we are promoting in all our subjects.
5. **Staffroom** – a food caddy used to collect teabags and food waste could also be used here.

On discussion with the **catering team** manager, it was discovered that the team there are unable to provide food waste for any school system and that their waste is disposed of

through an external company. However the Food for Life Partnership is currently promoting a 'Food for Life Catering Mark' for caterers to achieve through working together with the host school in working in a more sustainable way and reducing costs. As such it may be possible to approach and get agreement for food waste disposal from the catering company to allow the catering team here on site to also make use of whatever scheme we adopt.

Current Waste Production in Food Technology

The D&T department has recently introduced large green domestic food caddies (25 litres) into the food room in order to instil the practise of separating out food waste from the general waste. Younger year groups have been quicker to adopt this practise and this has allowed us to estimate how much waste we are producing.

In an average week we have **14-16** practical lessons and the caddy is typically filled within 2 lessons. We therefore estimate that on average **we produce 175-200 litres of waste a week**. This is roughly **84-96kg** per week just within the food tech room (3-4 tonnes a year).

As year groups and numbers of lessons are increasing in our department year on year, it is likely that this amount of waste will increase.

Year 10 and 11 classes can be more waste intensive and we have noticed that we can often fill a 80 litre black bin mostly with food waste after just one lesson. This indicates that there is a need to educate these students more on reducing waste and to get their buy in to any process that we adopt.

Processing Food Waste

It is widely accepted that for any food waste that includes citrus, meat and dairy products and both cooked and uncooked items, a cold domestic compost heap is not a suitable place for disposal. The risk of encouraging vermin and pests to the compost is high and there would also be a risk of contamination from spoiled meat and dairy products.

Animal By-Products Regulations (ABPR) states that for compost produced from food waste to be used on the land, it is important that any cross contaminants or pathogens from food are destroyed through treatment in an enclosed or under-cover system at a certain temperature and time. It must also be processed 'in-situ'.

A hot-composting or turning system is acknowledged to be required to process this waste safely. A high temperature of between 50 and 70 degrees centigrade can be produced which accelerates the composting process with thermophilic bacteria, which kill any pathogens and seeds.

In addition to a turning system the resulting compost will also need to then be matured in a static composting system such as the existing cold composting in the school garden or more speedily in a smaller 'hotbin' maturation box. For some systems the compost produced is of such high quality that it is possible to sell it although this is not permitted for us to do.

Hot composting systems work through the addition of both a nitrogen source – the food waste – and a carbon source in order to support the microbial biome within the composting system. The Carbon source is ideally from wood chips that can be obtained free from local carpenters or tree-surgeons. The local national trust teams or parents may have links or be able to help with this.

Possible Composting Systems to adopt

There are a variety of systems that are on the market at present but these would need to be able to process the amount of waste that we produce here at the school. The following systems have been identified as being suitable and are already being adopted in school settings:

1. The Ridan Composter



<https://www.ridan.co.uk/our-composters/composting-machines/medium-ridan-food-waste-composter/>

The Ridan composter comes in 2 sizes suitable for our school:

	Medium	Large
Capacity	Up to 200 litres per week	Up to 400 litres per week
Additional Requirements	<ul style="list-style-type: none"> • 2 Maturation boxes @ £290 plus VAT • Obtaining woodchippings from local tree surgeons or wood workers 	<ul style="list-style-type: none"> • 2 Maturation boxes @ £290 plus VAT • Obtaining woodchippings from local tree surgeons or wood workers
Overall Cost	£2,450.00	£3,400.00

If the School Catering department can be authorised to also use this system, the large composter will be more suitable for the quantity of waste produced.

Pros: - All food waste can be processed in large amounts with no risk of mess, odours, rodents or other pests.

- Compost is produced in an accelerated timeframe of 2-3 weeks

Cons: - Cost is high and would need additional grants and fundraising to purchase

- Additional woodchip is required to run although can be obtained from local businesses as a by-product.

- The machine would need to be sited close to the DT department.

2. The A500 Rocket from the Tidy Planet



	A500 Rocket
Capacity	Up to 300 litres per week
Additional Requirements	<ul style="list-style-type: none"> • Requires 240v Power supply connection for thermostatic control (average power consumption of 12kWh+ per week). • Needs some shelter to be built in order to house it safely
Overall Cost	Unknown at the moment however the next size up costs approximately £14,000.00 so it is likely to be significantly more expensive than the Ridan.

- Pros:**
- All food waste can be processed in large amounts with no risk of mess, odours, rodents or other pests.
 - Compost is produced in an accelerated timeframe of 6 weeks
 - The output compost is much purer and does not require further maturation in hotbins.
- Cons:**
- Cost is significantly higher than the Ridan option and would need additional grants and fundraising to purchase
 - Additional woodchip is required to run although can be obtained from local businesses as a by-product.
 - The machine would need additional power source, thus reducing the environmental benefit as there would be a running electrical cost involved.
 - A specialised shelter would need to be built in order to accommodate the Rocket.

3. The Jora Tumbler Composter



	Jora JK400
Capacity	Up to 400 litres
Additional Requirements	<ul style="list-style-type: none"> • Additional maturation bins • Obtaining woodchippings from local tree surgeons or wood workers
Overall Cost	£895.00 plus the cost of additional maturation bins

- Pros:**
- All food waste can be processed in large amounts
 - This is the cheapest option
- Cons:**
- Additional fundraising would still be required to purchase
 - Additional woodchip is required to run although can be obtained from local businesses as a by-product.
 - The system is not as enclosed as the other two systems and so the risk of odours and potential for mess would be higher.

Manpower costs

Each of these 3 systems requires manpower to turn them on a daily basis and the food waste would need to be transferred to the composter, however this can be built into the daily tasks for the DT Technician and as long as the composter is located close to the DT Department, the time taken to do this would not be prohibitive. Transfer of the resulting compost can be carried out by members of the gardening club

Output from the Composting System

It is possible that the amount of compost produced from this system may be more than could be used on-site and this would necessitate this becoming more of a community project!

The Animal By-Products Regulations has strict rules about how compost from food waste can be used. Their conditions are as follows:

- 1) Compost produced from food waste can be used directly on-site as long as it is from catering or kitchen waste.
- 2) Farm animals must not have access to areas on which the compost is kept (just in case we plan to keep school chickens in future!)
- 3) In order to dispose of the compost off site or sell it, you need to score 19 or less in their questionnaire (see Appendix A).
 - a) We currently score 10 if the compost is only provided for use on domestic gardens or allotments where farm animals (sheep, cattle, pigs, chicken and other poultry) do not have access.
 - b) If we plan to provide compost to community horticultural or park projects, then our score would increase to 13.
 - c) It would be advisable to implement a biosecurity or hygiene plan and to reduce access to the composter as much as possible for non-essential personnel in order to comply as much as possible to these regulations and to stay below the 19 point score.

We have the potential to either **sell or donate** excess compost to local gardeners and allotments or to local community projects. Parents may also benefit from using the compost. We could ensure that any bags are clearly labelled as not being suitable for use with livestock and could use donated empty, washed compost bags from students to bag up the output.

If we were to obtain the large Ridan composter, we could also offer a service to parents to use the system for their own kitchen scraps.

Future Enhancements and Benefits to the School and Community

The potential for the school to become a local leader in sustainability and waste reduction is huge. This would generate positive publicity within the community and also within the WMAT.

The introduction of a pupil-led 'Eco club' would help to sustain the use of such a system and to get essential buy in from the students. Pupils could also then link in with any community projects such as community gardens or allotments in order to share the output.

Compost could be sold for projects to benefit the school with help from the gardening club or eco club.

There is a national project called 'Eco-Schools' (<https://www.eco-schools.org.uk/about/howitworks/>) that promotes pupil-led sustainability within schools and gives recognition and awards. There are a number of other national awards schemes that reward and recognise such projects as this like the Prince's Trust Enterprise Scheme.

Next Steps

1. Choose the most appropriate option for us to use.
2. Put together a team of people from the key stakeholders to implement this project.
3. Identify organisations to approach for grant applications – a list of organisations can be obtained from the following websites:
 - a. <https://www.ridan.co.uk/our-composters/buy-a-ridan-food-waste-composter/financial-assistance/>
 - b. <http://www.ecofinancing.co.uk/Eco-school-grants-and-funds.html>
 - c. <https://www.greenschoolsproject.org.uk/>
 - d.
4. Notify the Waverley council of our intent and ensure there are no planning issues associated. Also to see if financial aid can be provided.
5. Find a local source for wood waste material – pupils may have family that can help with this.
6. Contact our catering company to obtain consent for the kitchens to use the composter
7. Identify local community projects or allotments that would benefit from donation of any excess compost.

Appendix A

GOV.uk advise on composting food waste following Animal By-Product Regulations advise:

Find out if you need approval

You don't need approval to use your compost on the property where the heap is located (but you must stop farm animals accessing the compost if you put catering waste in your heap).

If you want to use your compost at another location, use the following table to find out if you need approval from the Animal and Plant Health Agency (APHA).

If you score 19 or less, you can use your compost off-site or sell it to other people without taking any further action. If you score 20 or more, you must contact your [nearest APHA office](#) to seek approval first.

Question	If your answer is	You score	Your score
1. Do you produce, or intend to produce, more than 10 tonnes of compost in a year?	Yes	10	
	No	0	0
2. Will the compost be used on:	Domestic gardens or allotments	0	0
	Horticultural Land or Parks	3	
	Small holdings or farms	15	
3. Do any farmed animals, including those kept as pets, have access to the area where the compost is made?	Yes	20	
	No	0	0
4. Do farmed animals, including those kept as pets, have access to the place where the compost is used?	Yes	15	
	No	0	0
5. How many people, apart from regulators and inspectors and customers picking up compost, have access to the area where the compost is made?	0 to 5	0	
	6 to 10	3	

Question	If your answer is	You score	Your score
	Eleven or more	6	6
6. Do you have and follow a biosecurity/ hygiene plan for your composting site?	Yes	0	
	No	4	4
7. Do you follow the Association for Organics Recycling or Community Composting Network guidance code of practice ?	Yes	0	0
	No	4	
		Total	10

Published 5 September 2014

Last updated 9 October 2014 [+ show all updates](#)

<https://www.gov.uk/guidance/using-animal-material-in-home-work-or-community-compost-heaps>

