



Climate Change and School Catering

Measuring and reducing your emissions
with the Meal Analyser



MEALANALYSER



Economic
and Social
Research Council



The COP27 climate conference in December 2022 highlighted the simple truth that we are not currently on track to keep global warming to within 1.5°C – the level needed to secure a liveable future on Earth, according to the Intergovernmental Panel on Climate Change (IPCC).

Global food chains contribute up to one third of carbon emissions, so we must all act quickly. In the UK alone, school kitchens are estimated to serve up to 1bn meals annually, which means the choices made by school and service professionals can really make a difference.

What's been happening so far?

Already there is plenty of good work to build on:

- At Government level we have the UK's 'Net Zero Strategy: Build Back Greener' document that sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050. It requires most firms and organisations to have long-term targets with emission reductions of at least 90%-95% by 2050.
- At regional level, as of December 2022, 340 of the country's 409 local councils had declared a climate emergency. Of the 69 still to do so, 36 actually have a climate plan in place setting targets for emissions reductions across their departments.
- At sector level, LACA – the school catering association for England and Wales - adopted the theme 'go green' for its School Meals Week 2022, with days devoted to environmental awareness, plant-based meals, eating local and seasonal, and reducing waste.
- In business, increasing numbers of suppliers and caterers have signed up to programmes such as the Science Based Targets Initiative (SBTi), to set their paths to net zero.
- The Courtaulds 2030 Commitment now provides a carbon measurement standard for UK food and drink operators, including catering.
- The IGD, with Defra and WRAP, is working on an industry-wide standard for carbon labelling of food products.

How does the Meal Analyser help?

In 2020 our Meal Analyser carbon tool was launched with support of both LACA and ASSIST FM, the Scottish association of local authority service providers. Based on European research with school caterers, and designed in accordance with the Courtaulds carbon accounting standard, the tool measures emissions of recipes and dishes, benchmarks the carbon footprints of whole services, and identifies reductions towards net zero goals.

As more service providers use the Meal Analyser, they are helping us build a picture of how the sector is doing, collectively, on carbon emissions. In this e-brochure, we share some of the insights we've gathered from our growing database, and examine the data to show which of the various changes managers can make have the biggest impact on their carbon footprints.

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How is UK school catering doing?

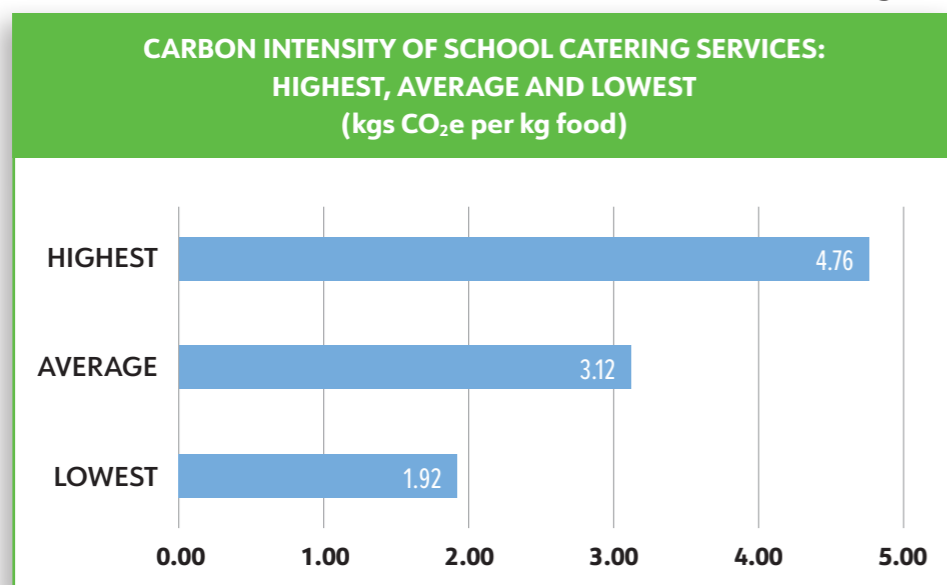
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Our Meal Analyser database contains emissions analysis for over a dozen school catering services across Scotland and England. Included are local authorities, School Trusts and privately operated services, at both primary and secondary levels. In every case, whole chain emissions have been estimated, including emissions from purchased foods (calculated directly from procurement and/or recipe data), plus estimates for transport, kitchen activities and waste handling (using assumptions derived from our own published research).

To present the results, we take the emissions intensity scores of the services. These show, in each case, the kgs of carbon produced per kg of food involved in the service's operation. The lower the score, the lower the carbon intensity.

Figure 1 shows the intensity scores of the highest and lowest carbon services in the database, and the average of all services to date. As can be seen, the average intensity is **3.12**. This means that for every kg of food procured, handled and disposed of, over 3 kgs of CO₂e are produced. However, the service with the highest carbon intensity in the database had a score of **4.76**, meaning that the amount of CO₂e generated was close to five times the weight of food. By contrast, the lowest intensity service had a score of **1.92**: in other words, total emissions were less than double the weight of food.

Figure 1



CO₂e refers to carbon dioxide equivalent, the common metric for all greenhouse gas emissions.



How is UK school catering doing?

To explore the reasons for these differences, we can look at the contributions of different foods and activities (transport, kitchen and food waste handling) to total emissions intensities (Figure 2).

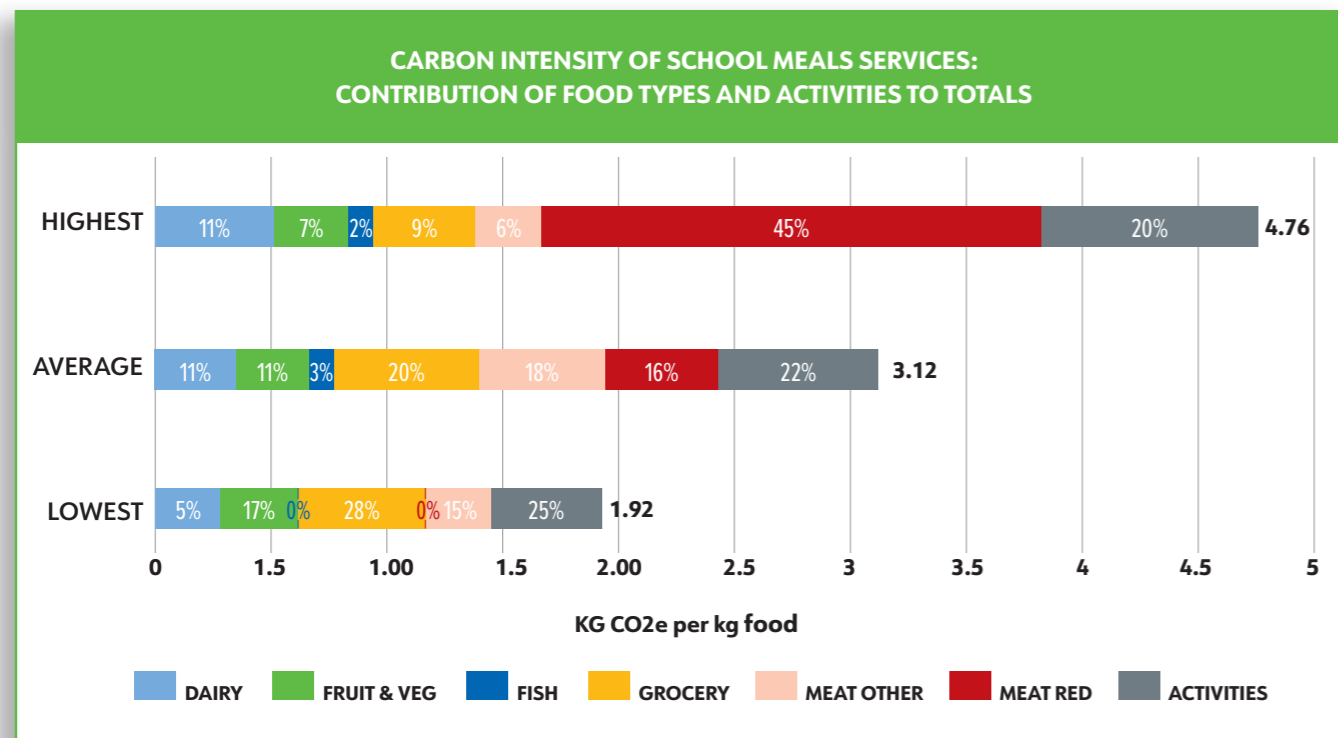
Figure 2 shows that as a whole, activities of transport, kitchen handling and food waste disposal ("Activities" in grey) comprise 20-25% of total emissions. All other emissions are due to purchased foods. Therefore, decisions around food types and menu design have the greatest impact on service emissions, although other activities on and off-site are also part of the story.

Focusing on food types, Figure 2 shows the food with the single greatest carbon burden is red (ruminant) meat. In the highest carbon case, it represented 45% of total emissions, whilst for the average service in our database, it comprised 16% of total emissions. Notably, it does not take high quantities of ruminant meat to generate these levels of emissions. In the highest case, our analysis

showed red meat was a relatively modest 6% of total food weight, and only 2% of total food weight for the average service.

The key reason for the intensity level of the lowest carbon case is that it operated an entirely vegetarian menu. By substituting animal meat and fish with plant-based alternatives, along with dairy, eggs, fruit and vegetables and groceries, the emissions intensity of this case was two thirds of the average, and less than half the intensity level of the highest case.

Figure 2



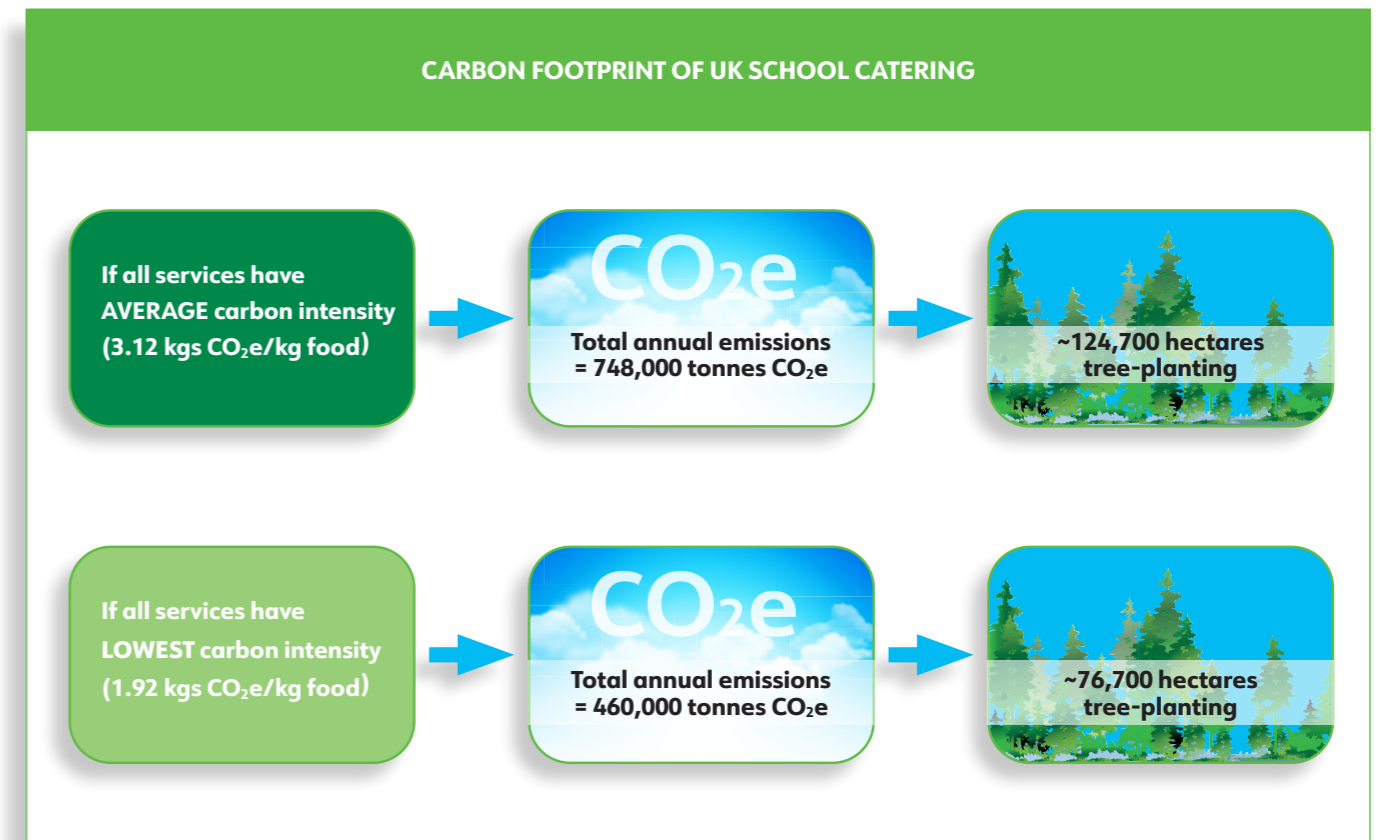
The Big Impact

What would be the total carbon emissions of UK school catering, if services nationwide had a carbon intensity similar to the average in our current database? And by how much would total emissions drop if services nationwide matched the intensity level of the lowest case? Figure 3 shows estimates for these scenarios, based on assumptions that the sector serves 3.8m meals per day, with an average meal weight of 350g.

As can be seen, if school catering services nationally matched the carbon intensity levels of the average service in our database, total annual emissions for the sector would be c.748,000 tonnes CO₂e. Sequestering

that amount of carbon would require trees to be planted over an area equivalent to Greater Manchester (124,700 hectares). However, if all services reduced their carbon intensities to the lowest level we found, annual emissions would drop by a third to c.460,000 tonnes CO₂e. Immediately, the area of tree-planting needed would reduce to the size of Anglesey (76,700 hectares). (Note that according to the GHG Protocol and Courtaulds standards, offsetting of emissions via tree-planting should be viewed as a last resort for residual emissions that cannot be reduced any further. Hence, the tree-planting scenarios here are for illustration purposes only.)

Figure 3



Three actions caterers can take to reduce emissions

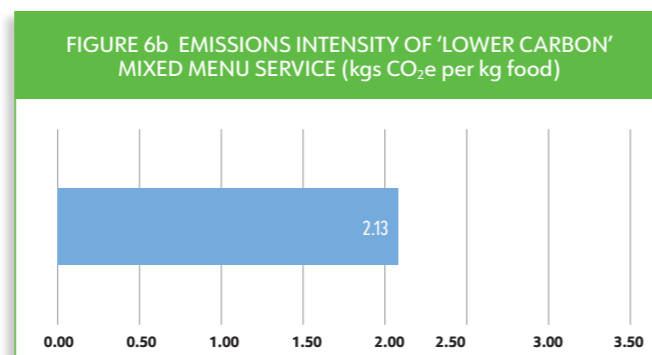
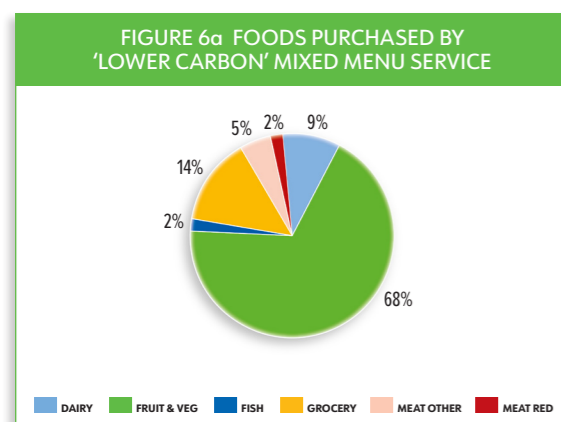
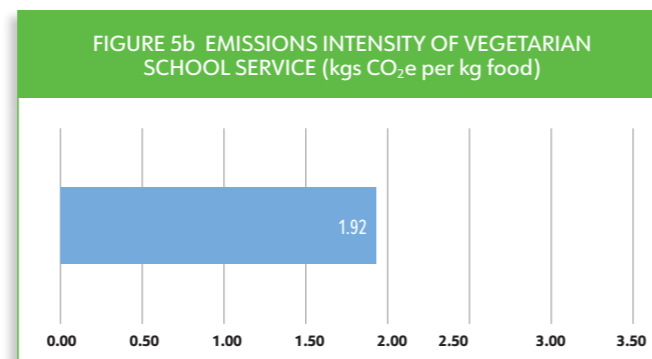
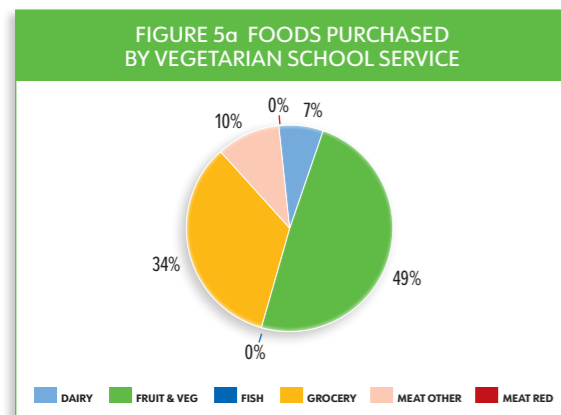
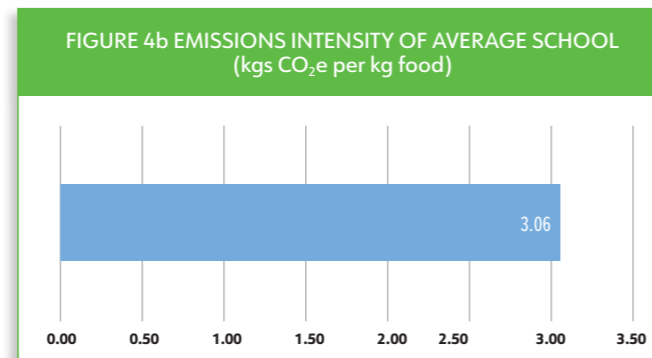
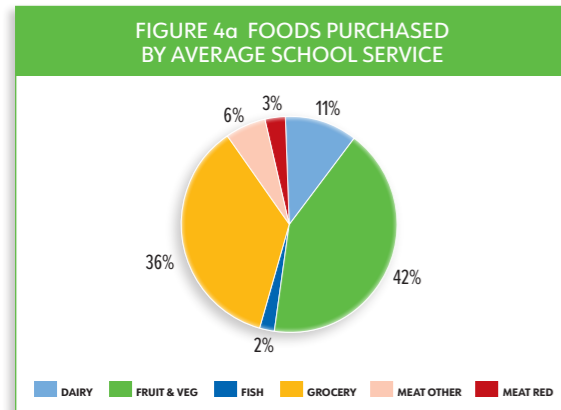
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● Action 1: Changing Menus

Many catering teams have already got the message that increasing the number of plant-based dishes while reducing the total volume of meat served can cut emissions.

But how much difference does it really make? Below are charts showing a comparison of three different approaches – an average menu, a completely vegetarian menu, and a mixed but lower carbon menu (Figs 4a to 6b). The emphasis here is very much on hot dishes rather than sandwiches and other cold options.

These charts show that the vegetarian menu has the lowest carbon emissions, but the mixed, low-carbon menu demonstrates the potential for schools to reduce emissions without going totally plant-based. By having a menu high in fruits and vegetables, which have a low carbon burden, modest proportions of dairy, and small quantities of fish and meat, it is possible to achieve carbon reductions. In the case of the mixed menu here, 68% of all food purchased was fruit and veg, a higher proportion than the entirely vegetarian menu, at 49%. The average case menu was only 42% fruit and veg.



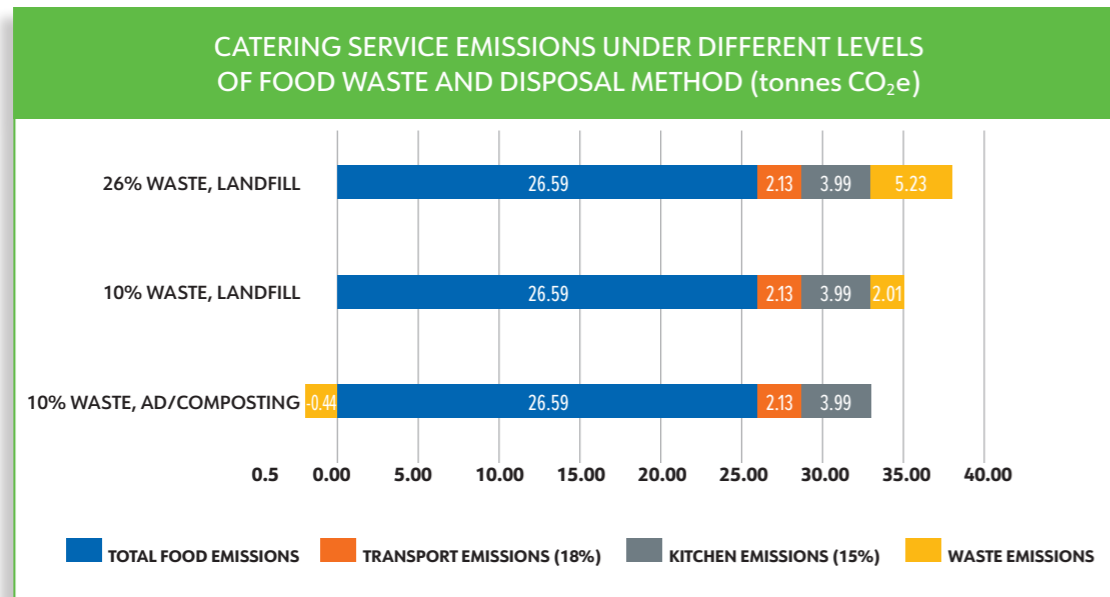
Three actions caterers can take to reduce emissions

● Action 2: Focus on Waste

Many schools understand the importance of reducing food waste, but a crucial element in carbon reduction remains the way that any unavoidable food waste is handled. Figure 7 illustrates the impacts of reducing food waste - and switching from landfill to anaerobic digestion (AD) - on the total emissions of one school catering service in the Meal Analyser database.

As Figure 7 shows, waste emissions drop by a third from 5.23 tonnes to 2.01 tonnes if levels of waste are reduced in the service. If the reduced waste is then processed via an AD unit or composting, then emissions drop even further, to produce a small net negative effect on the total. Overall, the carbon saving to total service emissions between the first and third scenarios is 5.66 tonnes.

Figure 7



● Action 3: Sustainable Sourcing and Transport

The Meal Analyser results confirm that the carbon footprint of a school catering operation depends more on what is on the menu, and how waste is disposed of, rather than where the food has come from.

Nevertheless, modest reductions are possible from changes to sourcing. So what should caterers do to make the most of these? The evidence suggests the following will help:

1. Buy from lower carbon sources: many manufacturers and wholesalers are signing up to reduction targets, e.g. SBTi. By committing to these programmes, suppliers should be sourcing products from farming/processing systems that are more sustainable and therefore lower carbon. So ask them! WRAP provides a handy questions guide at: <https://wrap.org.uk/resources/guide/scope-3-ghg-measurement-and-reporting-protocols-food-and-drink>

2. Focus on transport method: the biggest impact you can make on emissions due to the transport and delivery of food is to avoid air-freighted produce. But you could also encourage suppliers to use low emissions fleet vehicles, reduce the number of deliveries by consolidating ambient, chilled and frozen products into one, etc.

3. Going local? Coordinate logistics: one risk of sourcing from smaller local suppliers is it can multiply the number of separate deliveries made to schools, raising carbon emissions. Encourage local suppliers to coordinate their distribution activities, and use low emissions vehicles, to reduce this risk.



Case study – Leeds City Council

Leeds City Council, whose direct service arm Catering Leeds provides meals to the city's 182 primary schools, decided in 2021 to help its schools halve their carbon footprint by 2030.

Council leaders said that school food was the largest area of procurement and an opportunity to help give children a better diet.

To do this, the council has committed to:

- Buy local, serve local – source food from producers and suppliers based in Yorkshire and the surrounding counties
- Ban air-freighted imports
- Review menus to reduce meat and dairy and give catering staff the data to easily compare the carbon footprints of meals
- Establish a research partnership with the Consumer Data Research Centre at the University of Leeds to better understand the impact of the food it serves

Two meat-free days a week were introduced as well as new Planet Friendly Menus that use more plant protein and less meat on non-vegetarian days. Vegan options have been expanded across the board and menus feature lots of seasonal fruit.

Importantly, the new menus exceed the National School Food Standards and meet the Bronze Food For Life accreditation.

What impact has it had?

A plant-based school meal generates, on average, significantly lower greenhouse gas emissions than a meat-based one, and council leaders in Leeds estimate their primary schools can save up to 75 tonnes of carbon by making the meal switch.

A word about bottled drinks...

Lots of school catering services offer items for purchase at the counter, including bottled drinks, and many are changing their practices for the latter with the introduction of bottle return schemes.

All such efforts are designed to reduce reliance on plastic bottles, and increase rates of recycling, which is obviously good for the environment.

However, there's a quirk about bottled drinks that affects their contribution to the carbon emissions of a catering service. As these products are physically heavy, they can make up a big proportion of the total weight of food and drink sourced by service.

Our Meal Analyser research finds that up to 75%, by weight, of all items purchased in some secondary schools can be bottled drinks. Further skewing the data is the fact that these drinks are also relatively low in carbon per kilogram compared with other food items.

So when measuring the carbon footprint of a service, it's important that bottled drinks are reported separately, otherwise they have the effect of either flattering or concealing the emissions intensity of core menus.



More about the Meal Analyser

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The Meal Analyser tool originated from EU-funded research and has been subsequently refined in partnership with LACA and ASSIST FM. It provides useful and actionable carbon assessments for a range of audiences in school catering.

For service managers, association leaders and policymakers, the Meal Analyser's growing database provides cross-case assessment of emissions levels, and an indication of how the wider sector is performing. The preceding sections have given a flavour of some of those results, to date.

For front-line professionals, the Meal Analyser offers a detailed and reliable means to help you track a path to net zero. In 2022 a new feature was added that offers results based on recipe data. You supply us with your menus and recipes, plus a few other details about your service, and we estimate your service emissions and help you trace the best path to net zero.

So the Meal Analyser will tell you:

- The intensity of your emissions (EI) and how this compares with sector average as well as the lowest and highest figures from our database. (see Figure 1 on page 4, for illustration)
- How that EI is broken down, in terms of which foods you buy (Figure 8), and what their emissions are (Figure 9). This can help you see which parts of your catering procurement have the biggest impact on your emissions.
- What proportion of the dishes on your menu fall into 'very low' to 'very high' carbon, using traffic-light scoring (Figure 10). This allows you to assess and compare the total carbon burden of your menus.

Figure 8

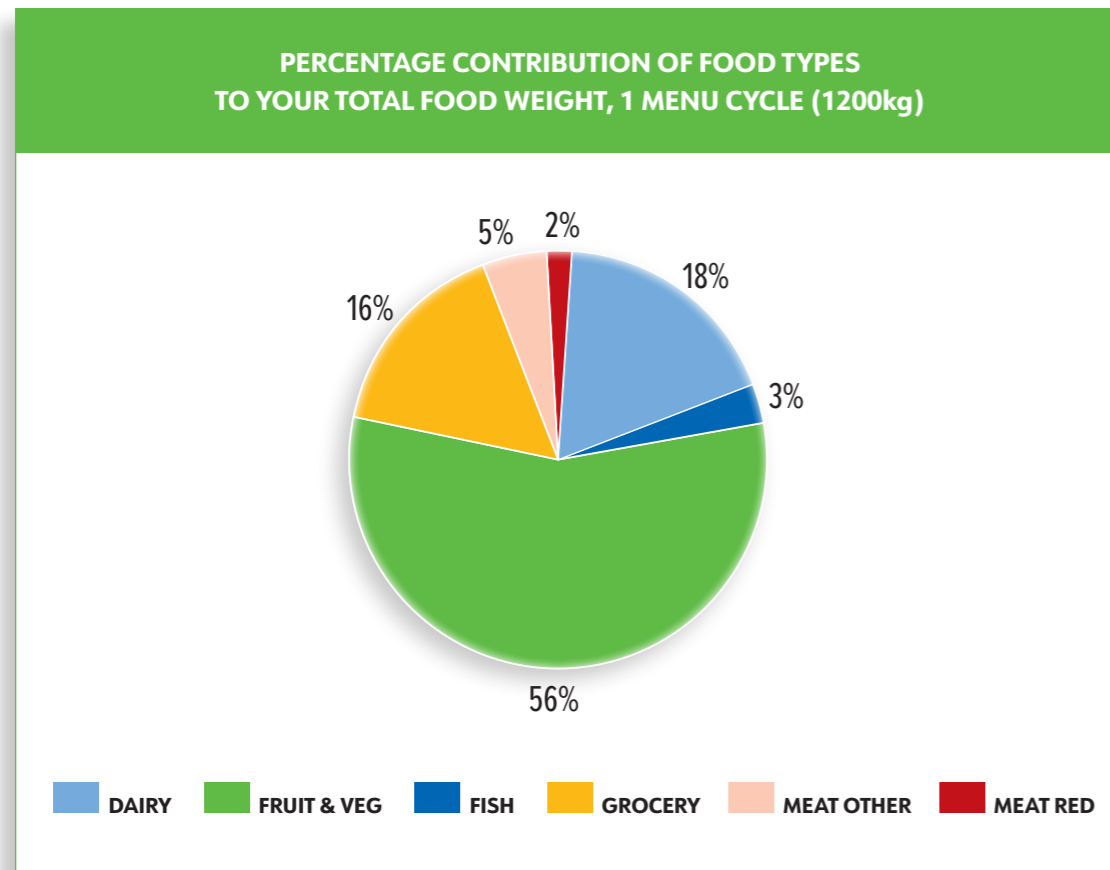


Figure 9

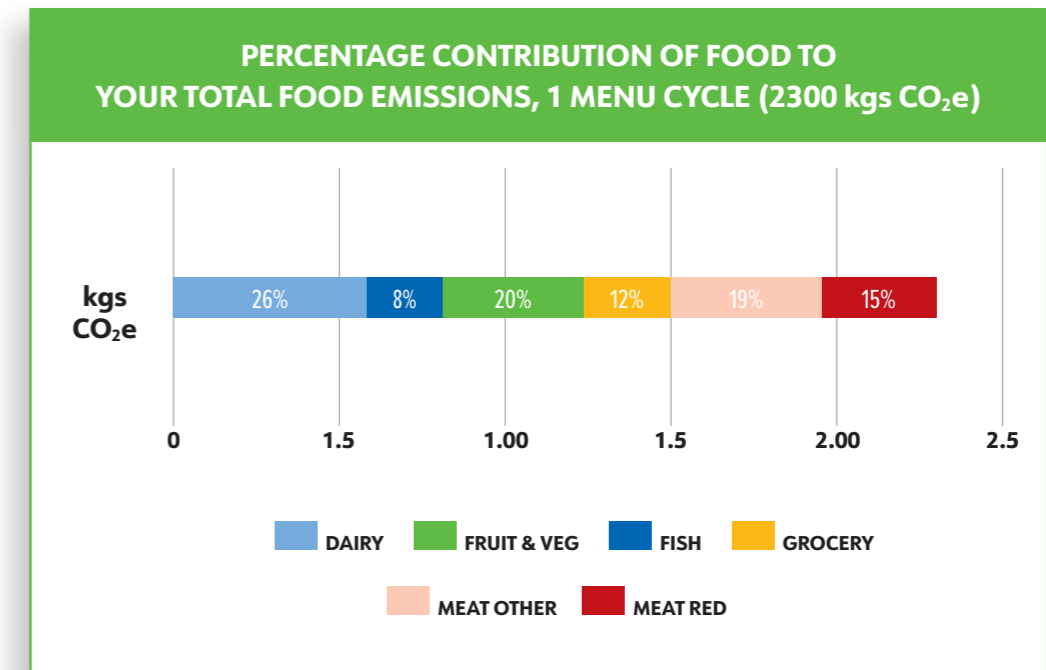
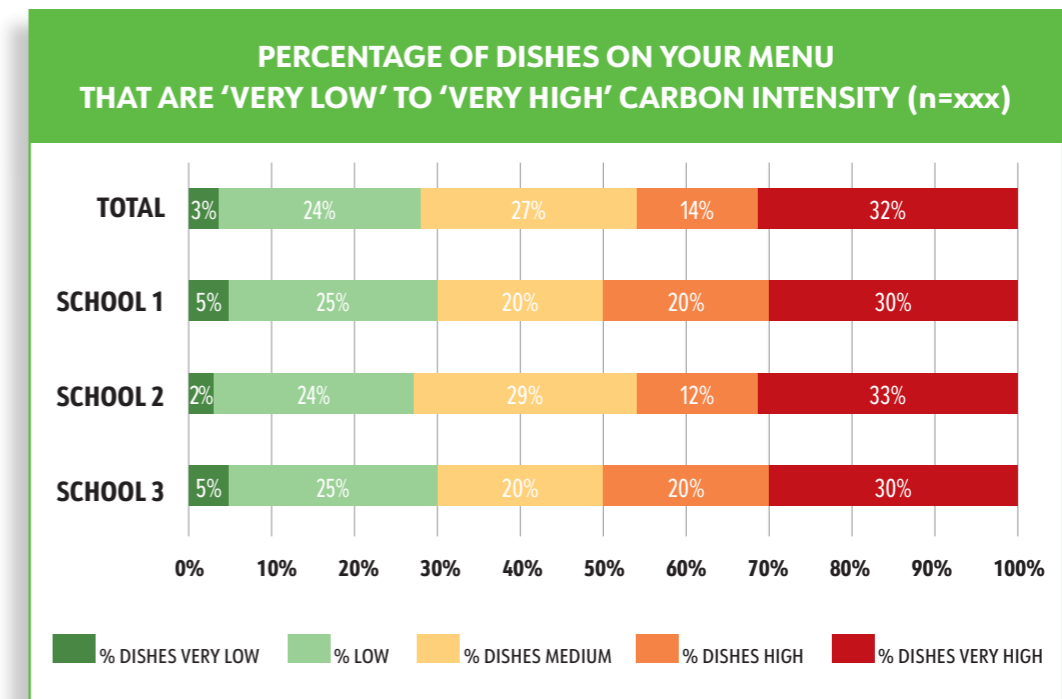


Figure 10



More about the Meal Analyser

The Meal Analyser also gives you:

- What the emissions are for individual dishes (Figure 11). This allows you to target specific recipes for revision. You can also use the information to encourage pupils and staff towards lower carbon options.
- What the total emissions are for your whole service chain (Figure 12). This allows you to see what the impacts are of other activities in the service, and track improvements over time.
- Advice and recommendations for reducing emissions in different parts of the service, to move towards net zero.

Figure 11

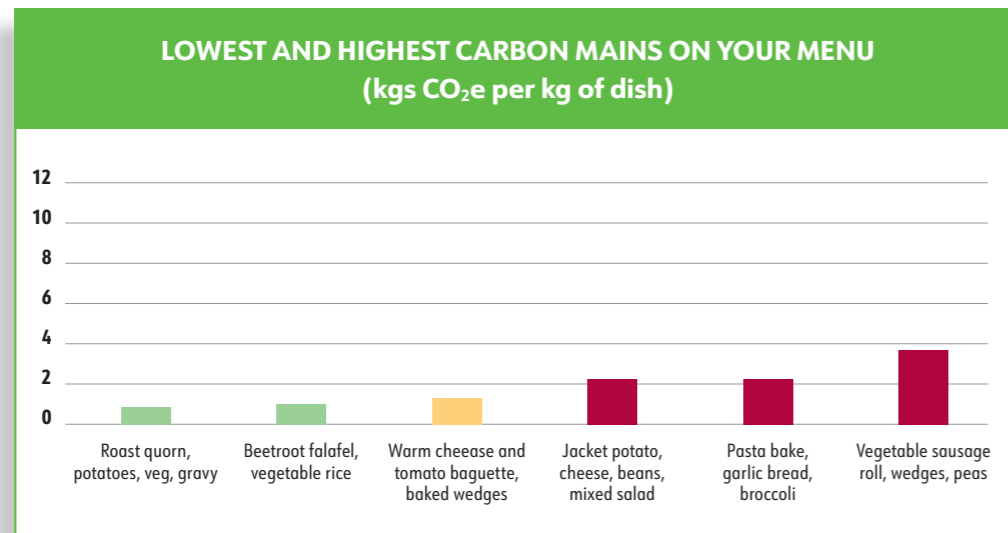
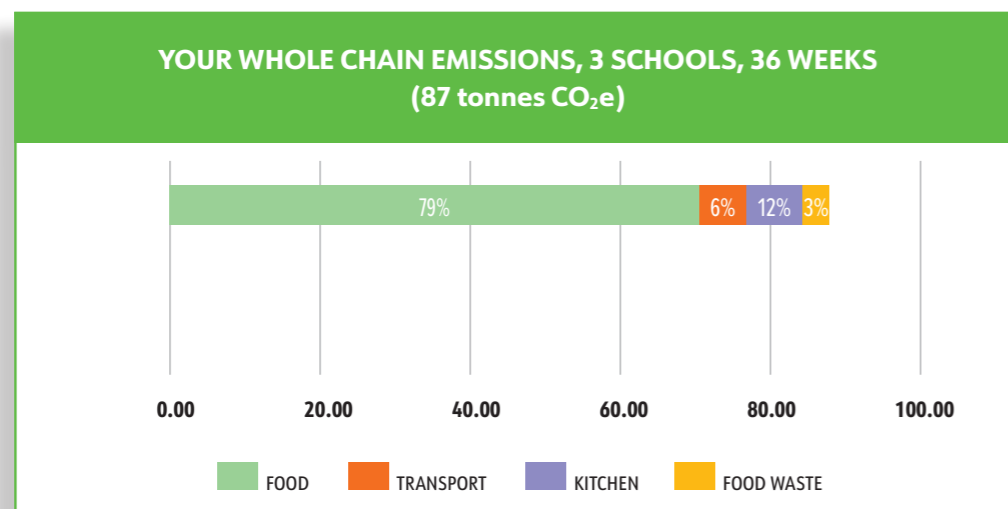


Figure 12



Conclusion

To get started, all you need is your recipes and uptake figures for one full menu cycle, for each time period you want to know about (e.g. school term, season or year). With these data, plus a few additional pieces of information including waste disposal method, the Meal Analyser can produce the emissions results described above, or we can do more bespoke analysis according to where you are on your net zero journey.

For more information, visit www.mealanalyser.com

or email us:

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Useful links:

LACA - www.laca.co.uk

ASSIST FM - www.assistfm.com

Eating Better alliance - www.eating-better.org

ProVeg School Plates programme - <https://proveg.com/uk/school-plates-the-programme>

Courtauld Agreement - <https://wrap.org.uk/taking-action/food-drink/initiatives/courtauld-commitment>

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