



VEG FACTS 2021



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With special thanks to our Veg Advocates, for their help and research looking into the availability of veg

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We all know vegetables are good for us.

But we're still not eating enough of them. Back in 2016 we published our very first Veg Facts report, a fact file outlining the scale of the problem and making the case for change. *Veg Facts 2016* also marked the start of Peas Please, a UK-wide initiative working to bring people, places, and organisations together to overcome the many food system barriers to vegetable consumption.¹

Since then, many of you have joined us in our mission to make it easier for everyone in the UK to eat more veg, and *together we've achieved a great deal*. But we still have a long way to go before the UK becomes a truly veg-eating nation.

Veg Facts 2021 follows on from 2020's *Veg Facts: in brief* and looks once again at how much veg the UK is eating, exploring the headwinds and tailwinds we've seen over the intervening five years that may both help and hinder future progress, and pointing to potential solutions for tackling the challenge.

Veg are the golden thread connecting diets that are both more healthful and more sustainable

With 2021 being the United Nation's *International Year of Fruit and Vegetables* and with the eyes of the world on the UK ahead of Glasgow hosting COP26 (the UN's climate change conference) this November, now is the time to work together to support production and consumption of vegetables. Veg are the golden thread connecting diets that are both more healthful and more sustainable, and with post Covid-19 recovery plans now dominating the political agenda there has never been a better time to champion vegetables.

¹Unless specified as 'fruit and veg', all references to veg and portions focus on vegetables alone. The Peas Please definition of veg includes fresh, frozen and tinned, and those veg such as tomatoes that are botanically classified as fruit but nutritionally classified as veg. Potatoes are excluded in line with the Eatwell Guide.



Top 10 veg facts

1 Diets that are low in veg and legumes are associated with **18,000** **PREMATURE DEATHS** in the UK every year

2 Almost **A THIRD** (29%) of children aged 5-10 years old **EAT LESS THAN ONE PORTION** of veg a day

3 **A FIFTH** (20%) of children and teenager's vegetable intake now comes from foods classed as **ULTRA-PROCESSED**

4 Baked beans and pizza together contribute **16%** of **CHILDREN'S VEGETABLE INTAKE**

5 **77%** of adults are eating **LESS THAN THE AMOUNT OF VEG RECOMMENDED** in the Eatwell Guide

6 **£** The **RICHEST 20%** on average eat **ONE MORE PORTION OF VEG** a day compared to the **£** **POOREST 20%**

7 Increasing vegetable intake so that everybody gets **5-A-DAY** (with the extra consumption coming from veg) could contribute **EIGHT ADDITIONAL MONTHS** to the UK's average life expectancy and **DECREASE GREENHOUSE GAS EMISSIONS** by 8.2%

8 Raising population consumption to **5-A-DAY OF FRUIT AND VEG**, while maintaining the UK's current production to supply ratio, would increase the value of UK veg production by **£261 MILLION**. Upping consumption to **7-A-DAY** would add another **£1 BILLION** to the economy.

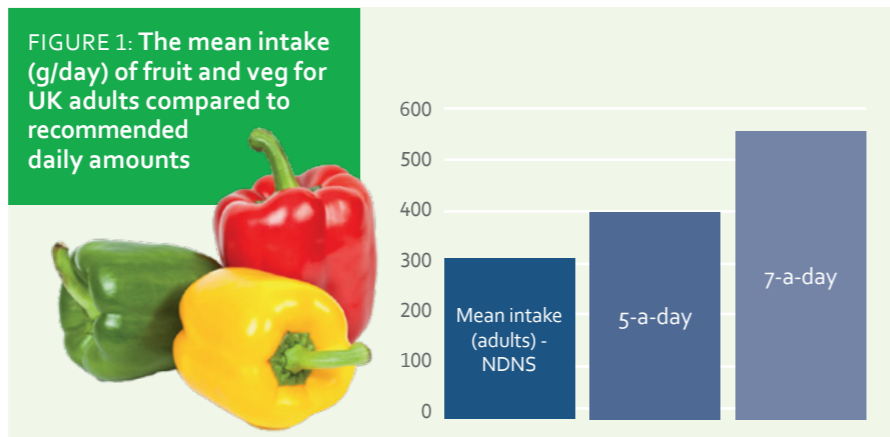
9 Just **1.9%** of food and soft drink advertising spend goes towards **promoting veg**

10 Calorie for calorie, foods high in sugar or fat are **A THIRD** OF THE COST OF VEGETABLES

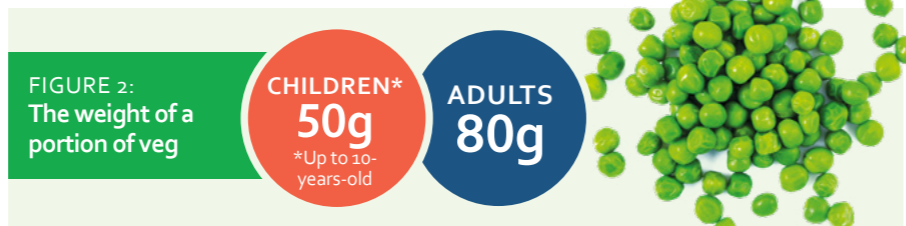
How much veg are we eating?

WHAT SHOULD WE BE EATING?

Although the 5-a-day message has been widely communicated since the early nineties, with estimates that up to 90% of individuals are aware of the message (Rooney *et al.*, 2016), average intake remains stubbornly below the 5-a-day recommendation for fruit and veg. Only 33% of adults and just 12% of 11–18-year-olds currently achieve the target (Public Health England, 2020b). Public Health England's (PHE) recommended quantity, as indicated in the Eatwell Guide, is actually closer to 7-a-day (554g) (Public Health England, 2016). Others suggest we should be eating even more, with the EAT Lancet commission suggesting up to 11-a-day, with between 2.5 and 7.5 portions of that coming from veg (Willett, 2019). Either way, we've some way to go before we hit dietary recommendations for fruit and vegetable consumption (Figure 1).



Sources: NDNS, years 9–11, 2016/17 – 2018/19; NHS, Eatwell, 2018; PHE, 2017



Sources: One adult portion is 80g based on the recommended 4,00g a day of fruit and veg. For our calculations, we have used a portion size of 50g for primary school-aged children. This is the midpoint value of the 40-60g recommended for children aged 4-10 years old in the School Food Plan.

Focusing just on vegetables, if we assume a 50:50 split between fruit and veg for PHE's portion guidance, then adults should be eating 3.5 portions of vegetables a day.

HOW MUCH ARE WE EATING?

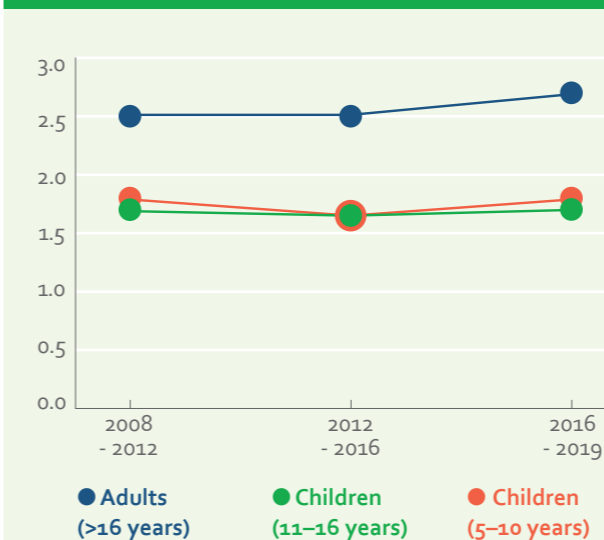
The Peas Please partnership has been tracking the intake of vegetables using the National Diet and Nutrition Survey (NDNS) data since launch. Although there has been a slight (but encouraging) improvement in the average number of portions adults are eating since 2008, children's veg intake has remained fairly static over the same period of time, with consumption remaining low. **However, despite an increase in average intake among adults, of particular concern are those**

eating less than one portion of veg a day. The proportion of people eating little to no veg has actually increased over the past decade for both adults and children aged 5–10 years old, with almost a third (29%) of primary school aged children eating less than one portion of veg a day. The situation is not much better for children aged 11–16, with 23% eating less than one portion a day.

Again, a small but encouraging improvement can be seen when it

comes to the proportion of British adults meeting the government's recommended intake of vegetables, with 23% now meeting the Eatwell Guide's suggested 3.5 portions a day. This is up from 20% in 2008–12, although there is certainly room for improvement, given the vast majority of children are eating below recommended amounts. 94% of secondary school aged children eat less than 3.5 portions of veg a day, with just 11% of primary school aged children meeting the recommended amount.

FIGURE 3: The average number of veg portions eaten per day by age*



*all averages are means and were weighted to adjust for differences in sample selection and non-response.

FIGURE 4: The proportion (%) of people eating less than one portion of veg a day

	2008-2012	2012-2016	2016-2019
ADULTS (>16 YEARS)	10%	11%	12%
CHILDREN (11-16 YEARS)	25%	26%	23%
CHILDREN (5-10 YEARS)	25%	33%	29%

FIGURE 5: The proportion (%) of people eating less than 3.5 portions of veg a day

	2008-2012	2012-2016	2016-2019
ADULTS (>16 YEARS)	80%	80%	77%
CHILDREN (11-16 YEARS)	95%	96%	94%
CHILDREN (5-10 YEARS)	90%	94%	89%

Sources: NDNS, years 1–4, 2008–2012; years 5–8, 2012–2016²; years 9–11, 2016–2019²

WHAT'S THE PICTURE ACROSS THE UNITED KINGDOM?

There has been an improvement across all four devolved nations over the past decade in the average amount of veg eaten. The average number of portions consumed each day is broadly similar across England, Scotland and Wales, with Northern Ireland reporting the lowest consumption of veg on average and the highest proportion of people eating less than one portion a day.

FIGURE 6: The average number of portions of veg eaten per nation for those aged 11 years and over

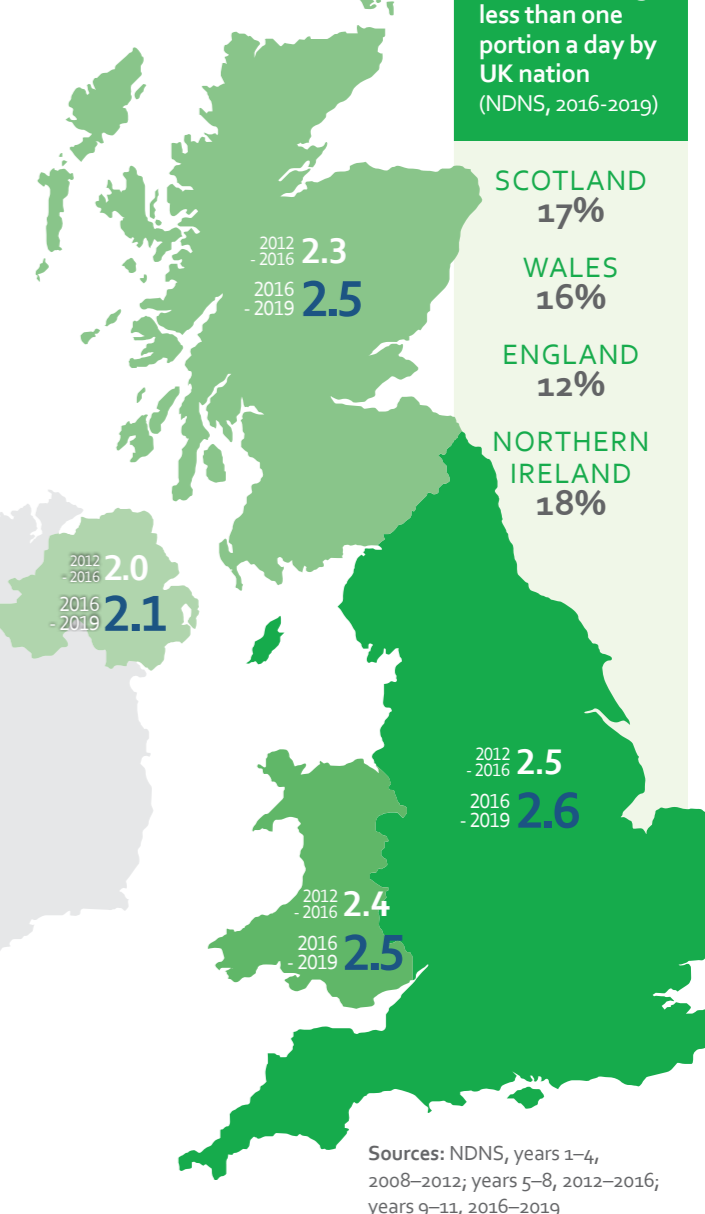


FIGURE 7: The % of people aged 11 years and over eating less than one portion a day by UK nation (NDNS, 2016-2019)

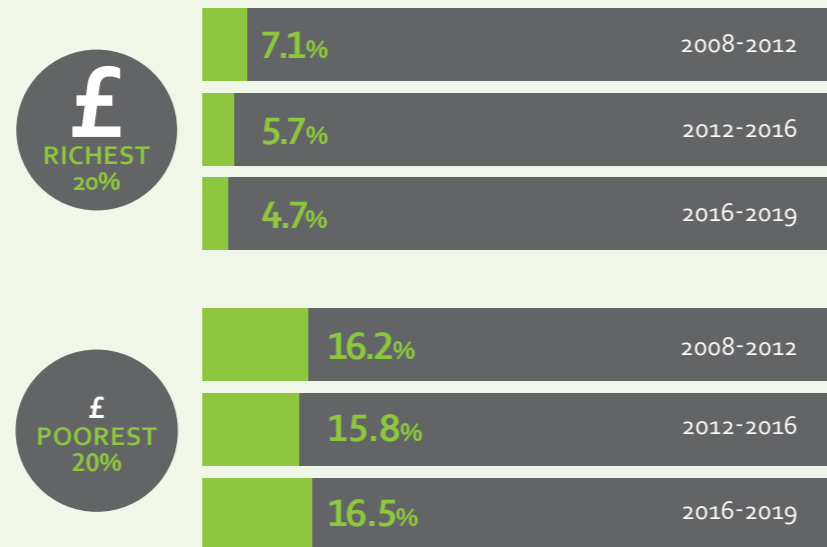
²Please note that the figures reported for NDNS waves 5–8, 2012–16, are very slightly different to those reported in Veg Facts in brief: 2020. Year 9 was included within last year's Veg Facts report as the data were released ahead of years 10–11. This year we have included year 9 data with years 10–11 to ensure the sample is sufficiently powered, and rerun analysis on years 5–8 to exclude year 9.

DOES INCOME AFFECT VEGETABLE CONSUMPTION?

Vegetable consumption follows a strong income gradient, with the poorest 20% eating an average of one portion of veg less a day than the richest 20%. Although there has been a welcome drop in numbers of those in high income groups eating less than one portion of veg a day over the past decade, the same cannot be said for low income groups, suggesting widening dietary inequalities.



FIGURE 8: The % of people aged 11 years and over, eating less than one portion a day



Sources: NDNS, years 1-4, 2008-2012; years 5-8, 2012-2016; years 9-11, 2016-2019

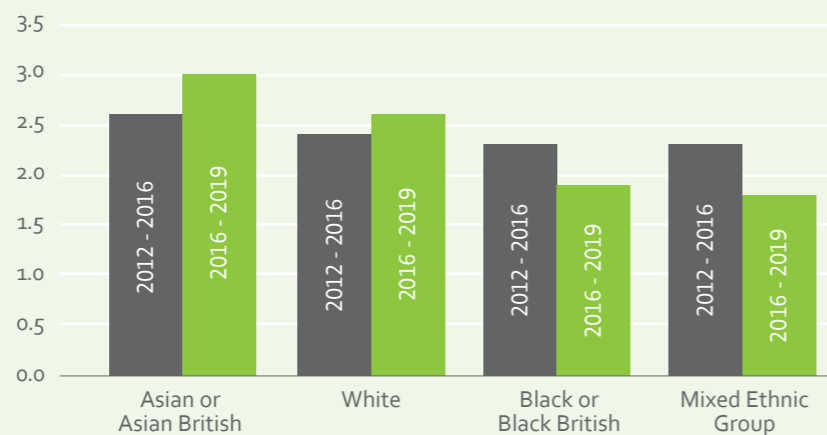
ARE THERE DIFFERENCES IN VEGETABLE CONSUMPTION AMONG DIFFERENT ETHNIC GROUPS?

White, Asian and Asian British groups eat a greater amount of veg on average than Black, Black British and Mixed ethnicity groups. It is particularly concerning to see that the average number of portions eaten a day among those groups with the lowest levels of consumption actually decreased between 2012-16 and 2016-19, with both Black and Mixed Ethnic groups now eating less than two portions of day. This is the opposite trend to that observed for White, Asian and Asian British ethnicities where vegetable consumption increased during the same period. This mirrors data captured on food insecurity during the Covid-19 pandemic, with those from Black and Mixed ethnicity groups twice as likely to have experienced food insecurity between September 2020 and March 2021 compared with as

White groups (Goudie and McIntyre, 2021), suggesting that there may be structural inequalities associated with ethnicity that can affect access to healthy diets. Cultural differences

in dietary patterns may also play a role, with South Asian and South East Asian cuisine a notable example of a more veg-centric food culture (see case study, page 28).

FIGURE 9: The average number of portions of veg eaten by different ethnic groups for those aged 11 years and over

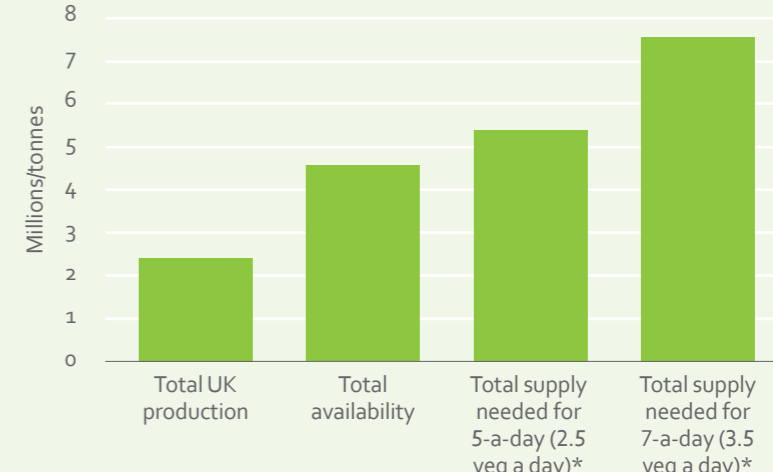


How much veg is in the supply chain?

DO WE PRODUCE ENOUGH VEG TO HIT RECOMMENDED AMOUNTS?

The UK has a gap between current availability and the ideal level of consumption. **If every person in the UK wanted to eat 5-a-day tomorrow, they could not do so as there would not be enough fruit and veg available.** The gap would be even wider if they wanted to eat 7-a-day. The UK currently has 4.6 million metric tonnes of veg available, of which it produces 53%, that is, 2.4 million tonnes (Defra, 2020b). For the UK population to meet 5-a-day (assuming half comes from veg) there would need to be 5.4 million tonnes available (allowing for 15.3% wastage) or 7.6 million tonnes for 7-a-day.

FIGURE 10: Tonnes of UK veg produced, available and required for optimal UK population health



* Amounts include optimal demand + 15.3% waste
 Note: The definition of veg used to calculate waste excludes potatoes, but includes 91,000 tonnes of processed veg waste

Of the 7.6 million tonnes needed to provide the UK's 3.5-a-day veg requirement, England's population would require 6.4 million tonnes, Scotland 0.6 million tonnes, Wales 0.36 million tonnes and Northern Ireland 0.2 million tonnes.

If the population increased consumption to recommended levels (7-a-day of fruit and veg) and we continued to produce 53% of our veg, there would need to be another 1.6 million tonnes of veg produced in the UK, a 65% increase. However, production cannot just be turned on overnight, and alongside actions to increase consumption of veg, measures to increase UK production should also be considered.

For the UK population to meet 5-a-day there is currently a 0.8 million tonnes deficit in availability for veg. For 7-a-day, this increases to nearly 3 million tonnes, which translates to a 37 billion portion deficit in the availability of veg in the UK.

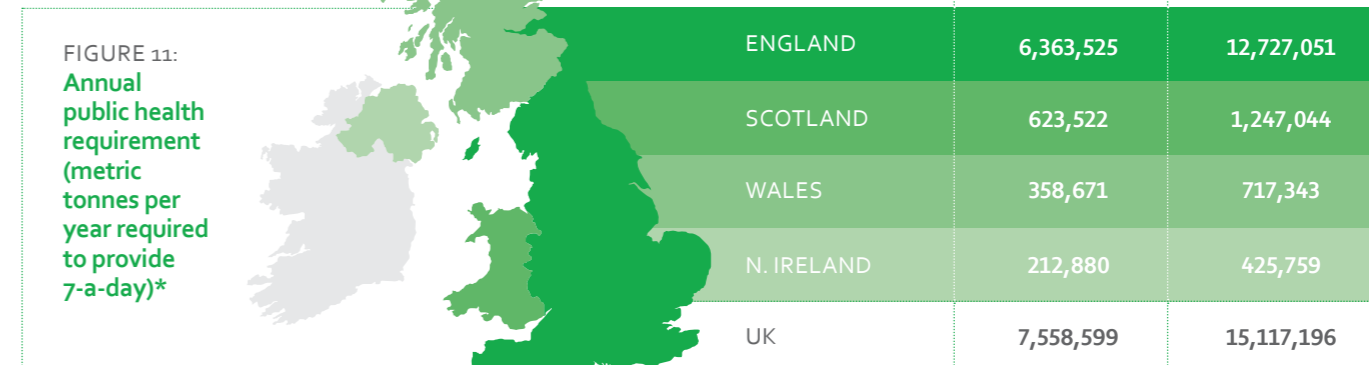
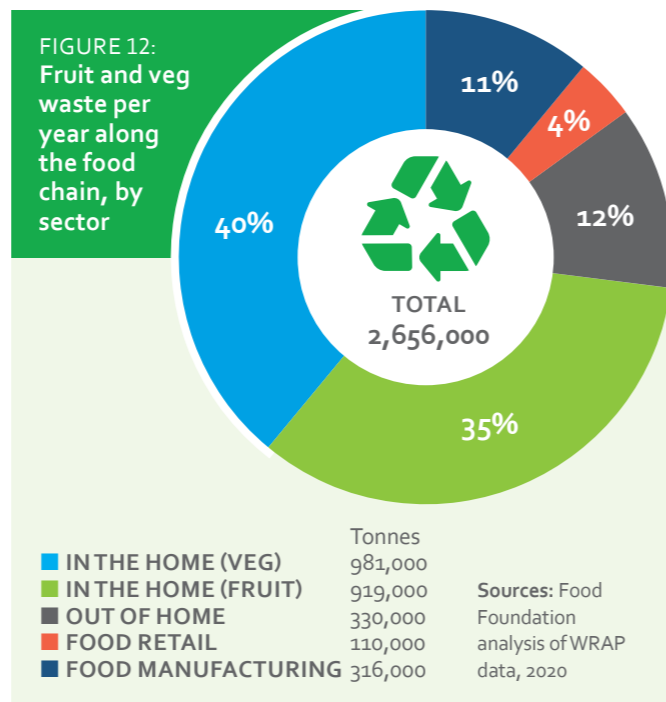


FIGURE 11: Annual public health requirement (metric tonnes per year required to provide 7-a-day)*

ARE WE WASTING TOO MUCH VEG?

One third of all food produced is lost or wasted, responsible for an estimated 8–10% of global GHG emissions (United Nations Environment Programme, 2021). As fruit and veg are highly perishable foods, they are particularly vulnerable to wastage. An estimated 756,000 tonnes of fruit and veg are wasted every year in the UK supply chain: 316,000 tonnes in manufacturing, 110,000 tonnes in retail and 330,000 tonnes Out of Home. This figure does not include farm gate or pre-manufacturing waste. An estimated 1.9 million tonnes are wasted in the household (of which 981,000 tonnes are veg). This brings the amount of fruit and veg wasted after the farm gate to 2.7 million tonnes: 30.6% of the total available.

1.9 MILLION tonnes of fruit & veg are wasted in the household



In addition to wider regulatory changes that will be required if we are to reduce the amount of food lost on farms and minimise food waste in supply chains, **purchasing fruit and veg as loose produce – rather than pre-cut or pre-packaged – is one tactic for helping to reduce household food waste** (WRAP, 2018). This is because buying loose fruit and veg allows people to buy only what

they expect to use. Data from WRAP’s Household Food Waste Tracker survey show that those defined as ‘high food wasters’ are significantly less likely to buy loose fruit and vegetable produce compared to the population average. 72% of those categorised as ‘high food wasters’ are likely to buy loose produce compared to 78% of the general population. ‘High food wasters’ were also

significantly more likely to buy pre-cut/ready-to-cook produce (32% vs. 26%) and packaged salad (45% vs. 40%). With concerns around hygiene during Covid-19 unlikely to have helped sales of loose produce (with purchases down 7% between 2018–20) there is an opportunity for the benefits of buying loose fruit and veg to be highlighted as the UK emerges from the pandemic (WRAP, 2020).

How do we eat our veg?

THE TOP TEN CONTRIBUTORS TO VEG INTAKE IN ADULTS AND CHILDREN

Salad, tomatoes, carrots and peas remain the most commonly eaten vegetables in the UK with little change to our top ten list since 2016. ‘Other vegetables including homemade dishes’ are the greatest contributor to vegetable intake for both adults and children, although this may simply be because the group includes such a large number of different items, from boiled and stir-fried veg to homemade

meals where vegetables are the main component (e.g. vegetable curry).

Baked beans and pizza together contribute 16% of children’s vegetable intake. This is concerning given that these are all foods likely to be high in salt and sugar which may therefore negate some of the health benefits associated with eating vegetables.

TABLE 1: Top ten vegetables consumed in the UK

Rank	Adults >16y	% contribution	Children ≤16y	% contribution
1	Other vegetables including homemade dishes	24.8	Other vegetables including homemade dishes	20.6
2	Salad and other raw vegetables	12.1	Baked beans	11.1
3	Raw tomatoes	7.4	Salad and other raw vegetables	10.2
4	Cooked leafy green vegetables	7.1	Sauces & pickles	7.5
5	Cooked tomatoes	6.9	Cooked carrots	7.2
6	Baked beans	6.6	Cooked leafy green vegetables	6.8
7	Cooked carrots	6.2	Cooked tomatoes	6.4
8	Peas	5.5	Pizza	4.5
9	Sauces & pickles	4.2	Peas	4.4
10	Beans and pulses including ready meal & homemade dishes	3.4	Raw tomatoes	4.0
		>80% of all veg eaten		>80% of all veg eaten

Sources: NDNS years 9–11, 2016–2019. Sub food groups in the NDNS were ranked based on their % contribution by weight to total daily vegetable intake (grams/day)

A NOTABLE AMOUNT OF THE VEG WE EAT NOW COMES FROM ULTRA-PROCESSED FOODS

Recent years have seen increasing levels of concern around the association between high intakes of ultra-processed foods (UPFs) that are characteristic of typical ‘western style’ dietary patterns and a number of corresponding negative health outcomes. Although the evidence base is mostly observational, and questions remain relating to the precise mechanisms through which these foods can impact on health, there is now compelling evidence linking high intakes of ultra-processed food to an increased risk of cancer, heart disease, overweight and obesity (Hall *et al.*, 2019; Elizabeth *et al.*, 2020). Globally, the UK is the third leading consumer of UPFs (Vandevijvere *et al.*, 2019), with 50% of daily calorie intake now coming from UPFs (Monteiro *et al.*, 2017) which can often be the most affordable, convenient and available option for families and individuals.



► We used the NOVA classification system to group food entries in the NDNS dataset based on their degree of processing. Group 1 contains unprocessed foods that are consumed without much further processing and preparation, such as chopped veg. Group 2 contains culinary ingredients such as plant oils and sugar, group 3 contains processed foods, and group 4 is comprised of foods and ingredients defined as ultra-processed – for example sweet, fatty or salty packaged snack products or highly processed vegetable dishes.

A fifth of children's vegetable intake in the UK now comes from ultra-processed foods, something that ought to be closely monitored given the increasing amount of evidence linking such dietary patterns to negative health outcomes.

FIGURE 13: Average % of total vegetable intake coming from ultra-processed foods (NOVA category group 4)

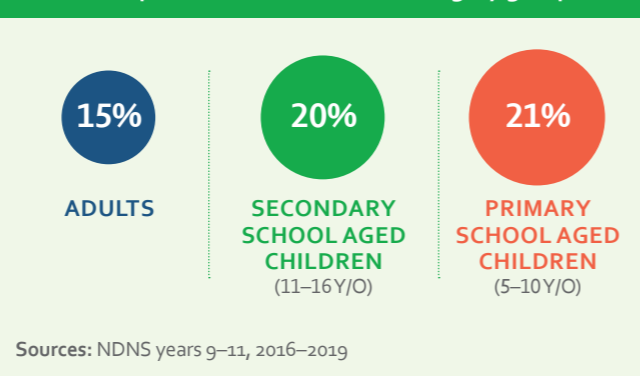
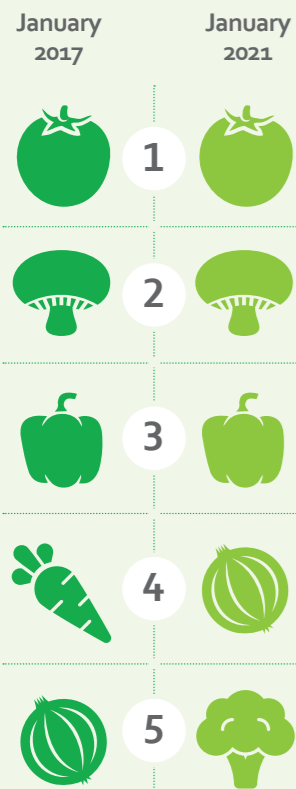


FIGURE 14: Top five fresh veg by total spend in the UK



Source: Data kindly provided by Kantar, 2021

ARE WE EATING DIFFERENT TYPES OF VEG?

Data from Kantar show that the top five most popular fresh veg by total spend has barely changed over the past five years. The exception to this is broccoli, a notable new entrant in the top five for 2021. Purchases of vegetables tend to spike in January, decline, and then pick back up again in the summer, but these data suggest there is scope to encourage greater diversity in the type of vegetables the British public buy and eat.



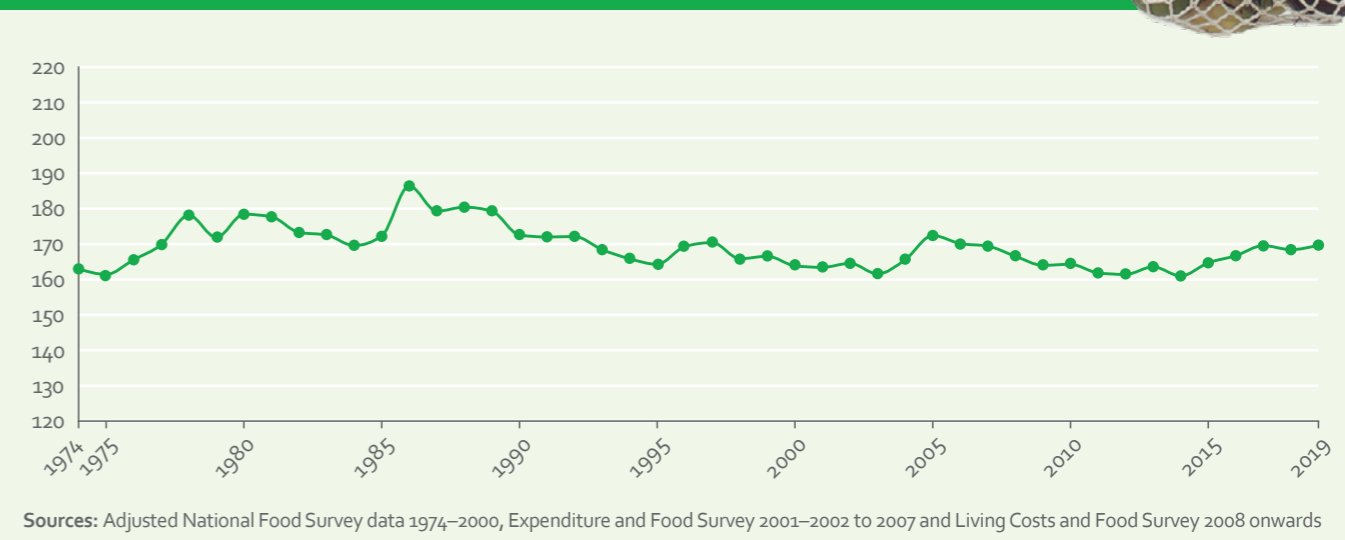
Sources: Food Foundation analysis of Living Costs and Food Survey, 2019

Are we buying more or less veg than in the past? And are our buying habits changing?



Since *veg Facts 2016* there has been a positive trend towards purchases of vegetables increasing in the UK, reversing the downward trend seen during the early noughties to 2014. There has been an increase in average vegetable purchases of 8.5g per day per person between 2014 and 2019. However, looking beyond the past decade we can see that vegetable purchases are now only where they were in the late 1970s, and have remained fairly stagnant for over 40 years.

FIGURE 15: Trends in vegetable purchases (household and eaten out) g/per person/per day, 1974–2019



WHAT IMPACT HAS COVID-19 HAD ON HOW WE BUY OUR VEG? AND HOW DID THE PANDEMIC IMPACT ON VEG BOX PROVIDERS?

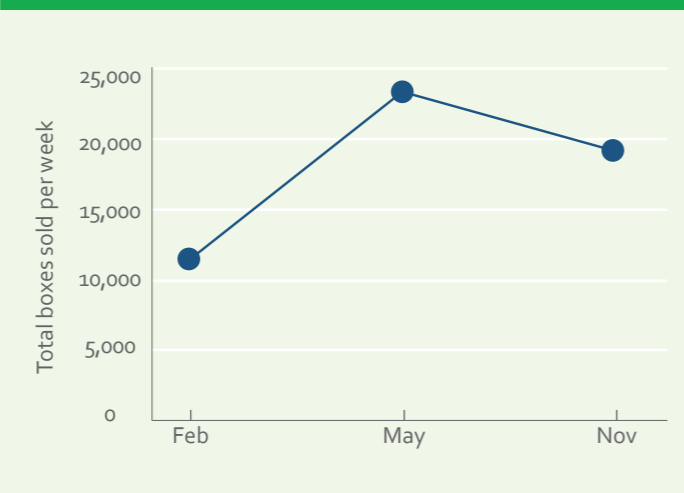
It is currently hard to ascertain for certain what impact Covid-19 has had, and continues to have, on total sales of vegetables. Although grocery food retail sales increased in 2020, the Out of Home sector has been significantly impacted by restaurant, school and workplace closures. This makes it difficult to know if total sales of vegetables have increased over the course of the pandemic once all sales channels have been accounted for. We intend to look at this in more detail towards the end of the year once more data spanning 2020–2021 have been released.

However, with the pandemic having impacted on normal routines for a great many, vegetable purchasing behaviour does appear to have changed. During the first lockdown we undertook a survey of veg box providers to evidence anecdotal feedback at the time that suggested sales of veg box schemes were soaring. Our first *veg box survey* of 101 providers covered February–April 2020 and found that sales of veg boxes in the UK increased by 111%, with a particularly notable impact for smaller box schemes (those supplying up to 300 boxes ►





FIGURE 16: Average number of veg boxes sold per week in 2020



► a week) which reported sales were up by 134%. To explore whether increases in sales of veg boxes were maintained throughout 2020 as lockdown restrictions changed, we conducted a second survey of 99 veg box schemes to cover the period from February–November 2020. The sample was different from the first veg box survey, although with some cross-over. Total sales of veg boxes per week across the veg box schemes showed that although sales peaked in May 2020 (23,587 boxes per week), sales in November 2020 (19,252) were still higher than in February 2020 (11,658) (Wheeler, 2020).

Although there was an 18% decrease in veg box sales from May to November 2020, sales still increased by 65% overall from February to November 2020. Many box schemes saw a wave in Spring 2020 of what one box scheme termed ‘Covid refugees’ – customers who couldn’t get fruit and veg through their usual supply channels and had to look elsewhere in haste. There was some concern from schemes that this would be a short-term phenomenon, and that they would see sales return to pre-lockdown levels, but although some customers did move back to their usual supply channels many stayed with their veg box supplier and this has helped the sector to develop.

mentioned working actively to help their communities. They did this, among other things, by providing outdoor, Covid-compliant volunteering opportunities, education and recipes, mental health support and referral, and donations of fresh produce to people in need. More formalised support of veg box schemes could therefore offer a number of cross-cutting benefits to communities.

TABLE 2: The proportion of veg box schemes surveyed selling own-grown veg

Box scheme content	Percentage of veg box schemes
None own-grown (0%)	26%
Less than half own-grown (1–49%)	22%
More than half own-grown (50–99%)	41%
All own-grown (100%)	11%

"Providing people with healthy fresh fruit and vegetables without them having to leave the house has been especially important to people who are having to shield or isolate. We also look to provide customers with mainly locally grown produce and minimise waste by reusing packaging, composting waste fruits & vegetables and donating any excess fruits and vegetables to a local food bank"

"Covid transformed our business and helped spread our name in the community. It made us sort out our packing systems, our online shop, our computer systems! Although sales steadily decreased from June many of the customers still shop with us"

Veg box schemes often but not always grow their own produce to supply their boxes (Table 2). 55% of box schemes were involved in certification schemes, meaning they have to adhere to certain standards for their produce. The majority of those certified were Soil Association (79%). Other certification included Better Food Traders, Red Tractor and LEAF (Linking Environment and Farming). As well as producing and delivering fresh fruit and vegetables to certified environmental standards, 53% of veg box schemes

WHAT DOES INCREASING INTEREST IN PLANT-BASED AND SUSTAINABLE DIETS MEAN FOR VEG CONSUMPTION?

Surveys repeatedly find that the British public are increasingly interested in more sustainable diets – particularly younger generations. IGD’s Appetite for Change survey found that over half of people claimed to be open to, or already changing, their diets to be more sustainable and healthy (IGD, 2020). This is increasingly reflected in purchasing patterns, with Kantar data showing a 23% growth in the number of plant-based meals eaten between 2015 and 2019 (Peas Please, 2020). However, it should be noted that the starting baseline for sales of plant-based categories is low, so percentage sale increases tend to look much more significant than overall market share.

Nevertheless, there are reports that sales and interest in plant-based and vegan foods have increased following the pandemic. A Mintel survey in January 2021 found that a quarter (25%) of young British millennials aged 21–30 reported that the Covid-19 pandemic had made a vegan diet more appealing, and there was a 17% increase in plant-based meals eaten in January 2021 compared to the same month the year before (Mintel, 2020; Kantar WorldPanel, 2021).

Reducing meat while increasing vegetable consumption can have both health and environmental benefits (and for some is driven by ethical considerations), yet some research suggests that meat eating can actually be a driver of vegetable consumption with protein-centric meals often including more veg (think meat and two veg) compared to composite, processed ‘dishes’ such as ready meals (Kantar WorldPanel, 2019). This has significant ramifications for new product development

initiatives that focus on plant-based ready meals consisting of meat alternatives, such as Quorn or seitan, over veg or more plant-based proteins like pulses. We will need both approaches in reformulation and new product development if we are to increase the UK’s vegetable consumption and reduce the environmental impact of our food.

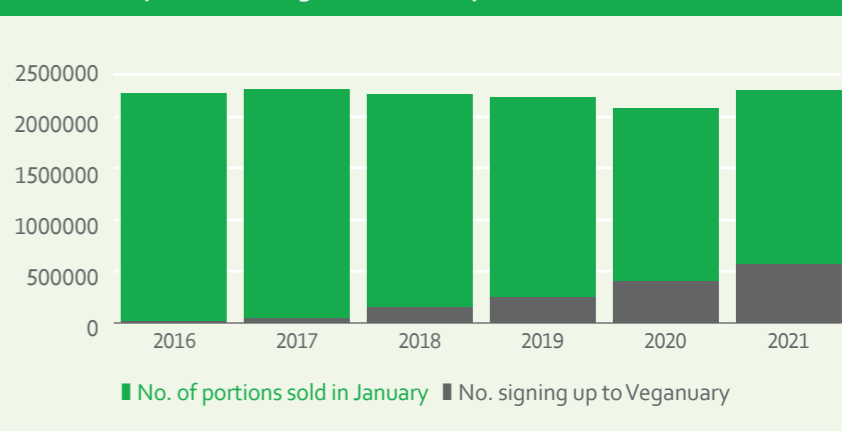
We need to be careful about assuming that plant-based or vegan diets automatically equate to more veg.

We need to be careful about assuming that plant-based or vegan diets automatically equate to more veg. Not all plant-based, vegan foods contain veg (for example, many meat protein alternatives), so we need to consider what types of plant-based

foods we want to encourage the public to eat more of if the objective is to reduce meat consumption and increase veg consumption. Moreover, there are concerns that some plant-based foods may have negative impacts on the environment, for example palm oil as a contributor to deforestation (FAO, 2020). Interestingly, although the numbers of people signing up to take part in Veganuary have increased 25-fold between 2016 and 2021, retail sales of vegetables in January increased by just 3.7% during the same period. What’s more, the increase in sales

of veg during this six-year period is skewed by 2021’s data, where retail sales increased by 11% year on year – likely due to the impact of Covid-19. **Sales of vegetables sold in January pre-pandemic were down 6.5% between 2016 and 2020.**

FIGURE 17: Number of people signing up to Veganuary compared to the number of portions of veg sold in January

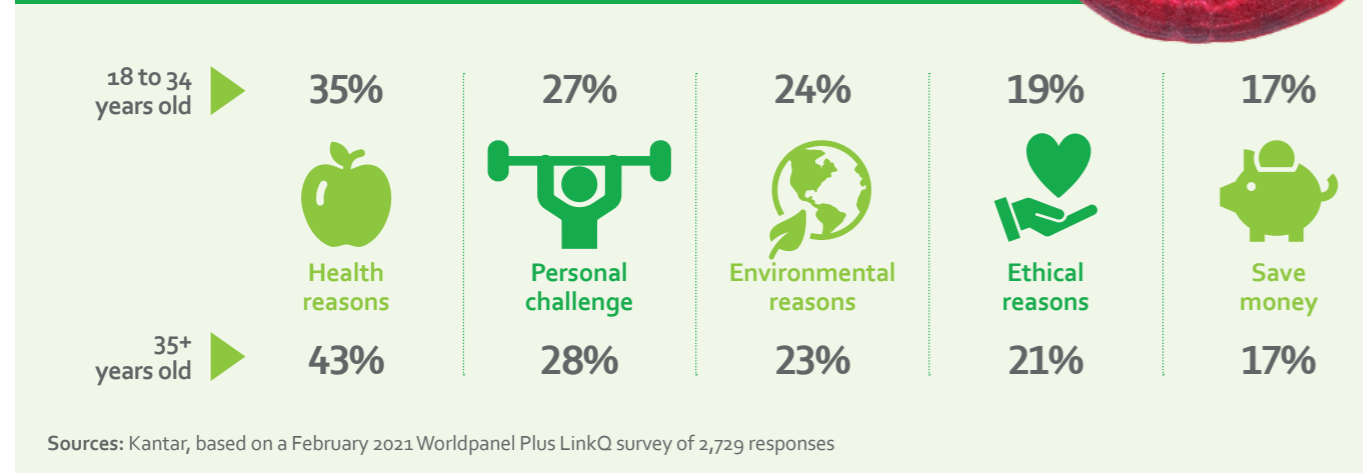


Sources: (Kantar, 2021) and (Veganuary, uk.veganuary.com/categories/press-releases)

Nevertheless, in 2021 almost 600,000 people signed up for Veganuary, a 46% increase on the year before (Veganuary, 2021). **The increasing willingness of many to eat less meat certainly feels like an opportunity for veg, particularly given that health motivation is the primary driver for Veganuary participation** (Figure 18) and vegetables have a number of obvious health benefits. However, despite its increasing popularity and the fact it can encourage people to try new things with their diets, it is not clear whether Veganuary encourages more sustainable or healthy dietary shifts to be sustained in the long-term. 72% of people who signed up to Veganuary in 2021 gave up within 2 weeks and only 17% successfully completed the whole month (Kantar WorldPanel, 2021).



FIGURE 18: Reasons given by participants aged 18–34 and 35+ for taking part in Veganuary 2021



Additionally, those identifying as vegan may not be all that representative of the general population. 87% of those signing up to Veganuary in 2019 were female and the initiative remains most popular with the 18–24 age group (Jones, 2020). Those identifying as ‘meat reducers’ or flexitarians may therefore be more representative of the general population in terms of age and gender, and offer wider opportunities for promoting veg-focused dishes and foods. 19.4% of people reported being ‘meat reducers’ in a 2018 Kantar panel survey compared to 4.7% of people following vegan, vegetarian and pescatarian diets (Kantar WorldPanel, 2019).

Why should we eat more veg?



A poor diet is now the biggest risk factor for death and disability globally, with four out of the five top risk factors for death and disability in the UK now diet-related (Afshin *et al.*, 2019; IHME, 2020).

The UK’s high levels of obesity and non-communicable diseases are currently firmly in the spotlight following the Covid-19 pandemic, with type 2 diabetes and obesity associated with an increased risk of severe outcomes from Covid-19 (Public Health England, 2020a). In fact, a recent report exploring the links between BMI and Covid-19 outcomes found that those countries with higher intakes of pulses and starchy root vegetables were significantly less likely to have experienced high Covid-19 death rates as of spring 2021 (World Obesity, 2021).

Diets high in vegetables (and fruit) are routinely associated with a number of health benefits.

There is strong consensus that vegetables are a fundamental building block of healthy dietary patterns. A 2019 systematic review of meta-analyses found that increasing intake of vegetables could significantly decrease the risk of developing a number of common diseases (Yip, Chan and Fielding, 2019). Higher intakes of vegetables when compared to lower intakes were associated with:

- 13% reduction in all-cause mortality
- 14% reduction in coronary heart disease
- 12% decrease in strokes
- 11% reduction in the metabolic syndrome

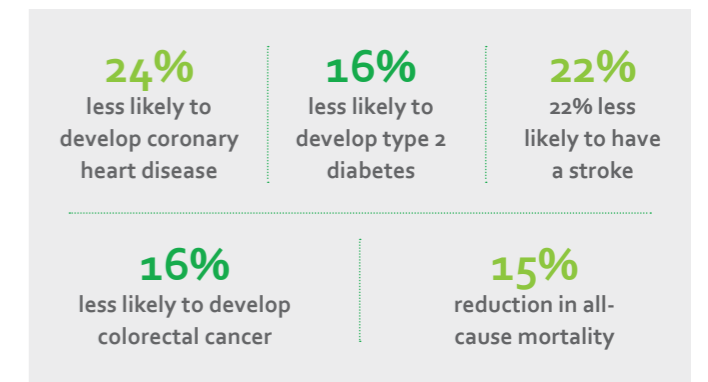
There is no single reason as to why vegetables are so consistently linked to positive health outcomes. Rather, it is likely that their high fibre and micronutrient content, in addition to the fact they are often a good source of prebiotics, low in salt, sugar and saturated fat, and contain a variety of different phytonutrients, combine to produce diverse health and nutrition benefits. We have summarised a few of the most notable health outcomes associated with sufficient vegetable consumption below.

*This includes deaths attributed to diets low in vegetables and legumes. The Global Burden of Disease (GBD) consortium recently changed their methodology for measuring veg consumption. Vegetables and legumes have therefore been summed to maintain consistency with historical GBD data and previous Veg Facts reports

Vegetables are a good source of fibre, the Cinderella nutrient

Rarely the focus of public health campaigns or reformulation targets, fibre is nonetheless associated with a large (and growing) number of beneficial health outcomes. High fibre foods include wholegrains such as oats and brown rice, beans and legumes, and – of course – fruit and vegetables.

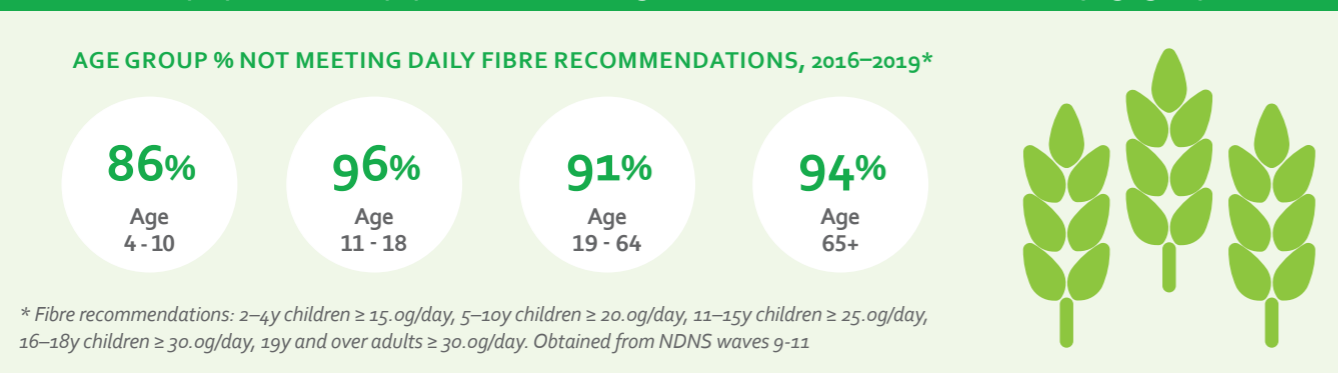
A large systematic review in 2019 (Reynolds *et al.*, 2019) that pooled the results of 243 studies looking at the impact of fibre on health found that, compared to people eating lower intakes, those with diets higher in total fibre were:



Despite the benefits associated with fibre, and the emerging evidence highlighting the importance of soluble and insoluble fibre for supporting a healthy gut microbiome, average intake in the UK remains well below the government’s recommended intake of 30g per day. Adolescents and older people have particularly low intakes of fibre (see Figure 19), with just 9% of adults meeting the recommendation.



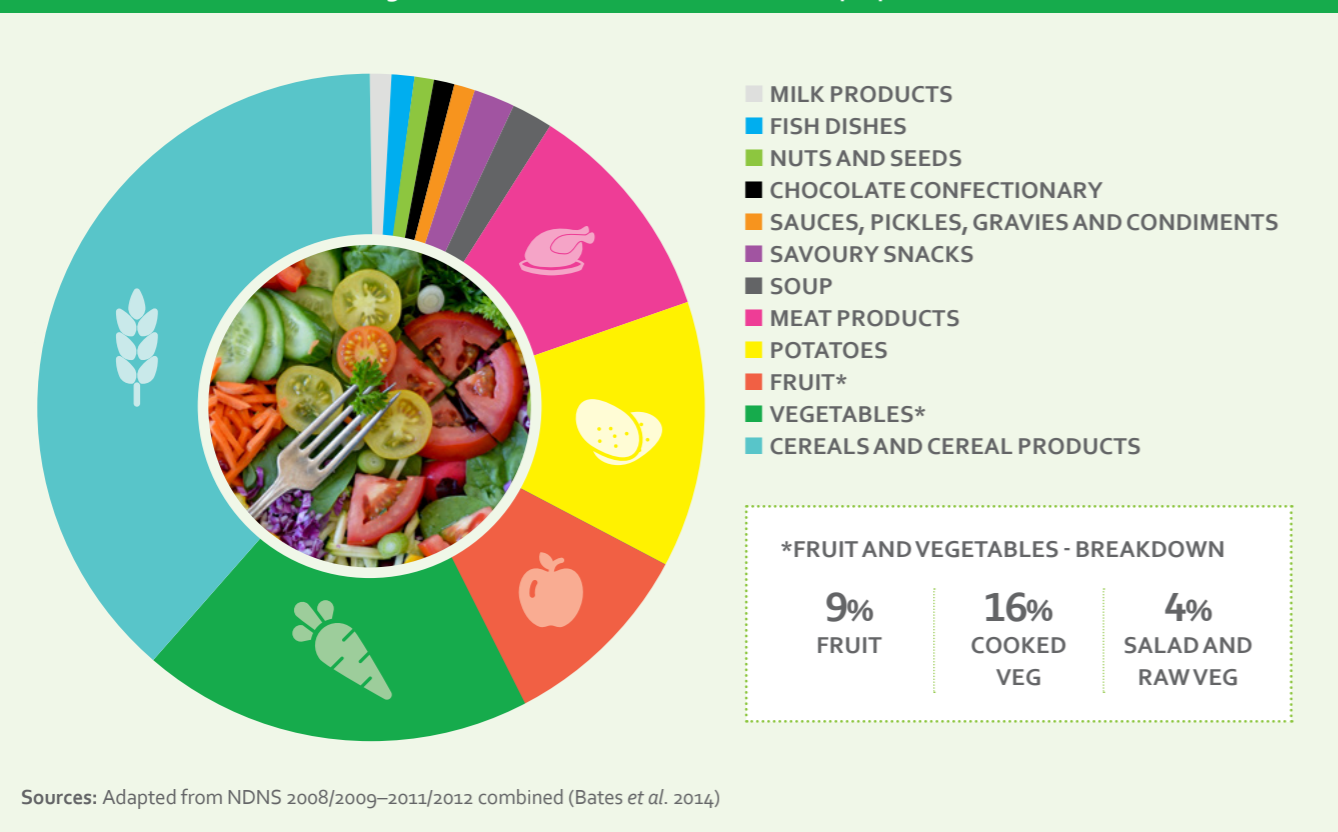
FIGURE 19: The proportion of the population not meeting the UK's recommended fibre intake, by age group



Vegetables are an important contributor to fibre intake. After cereals and cereal products, which contribute 39% of fibre intake in adults, vegetables come a close second (20%). When we analysed the most recent NDNS data for 2016-19 to see what proportion of actual fibre intake (AOAC) the top ten vegetables consumed in the UK – as in Table 1 – contribute, we found that these ten veg actually

contribute a quarter (25%) of current fibre intake. If we were consuming as much fibre as is recommended (and we assume the amount of veg consumed remains the same), the contribution of these ten veg to total fibre intake drops to 17%. Nevertheless, these data suggest that increasing vegetable consumption could offer a route for simultaneously driving up fibre intake.

FIGURE 20: The contribution of vegetables to fibre intake in UK adults as a proportion of the total



Vegetables are a valuable source of micronutrients

Vegetables contribute a number of vitamins and minerals to our diet, helping to support the normal functioning of the immune system and other essential biological processes, as well as preventing deficiencies that can cause disease. Globally, an estimated 2 billion people suffer from vitamin or mineral deficiencies (WHO, 2007). Although micronutrient deficiencies or 'hidden hunger' is often assumed to be an isolated problem affecting only low income countries they remain a cause for concern in the UK.

As Figure 21 demonstrates, there are still micronutrients for which a sizeable proportion of people fall below the lowest intake amount recommended for normal health and well-being. We looked at

over 10% of total intake to the average diet. We found that 16% of adults are not consuming a sufficient amount of potassium, which is found mainly in fruit and veg and supports normal

We found that 16% of adults are not consuming a sufficient amount of potassium, which is found mainly in fruit and veg

consumption (NDNS data) of those micronutrients where vegetables are an important contributor of dietary intake, contributing

muscle contraction and nerve functioning, while 13% have low intakes of magnesium. Meanwhile 38% of 11-16-year-olds are consuming less than the lowest recommended amount of magnesium. Requirements for magnesium increase during teenage years due to the role magnesium plays in bone formation and development (BNF, 2019, 2020). Additionally, a fifth fall below the lower reference nutrient intake (LRNI) for Vitamin A, which plays a key role in growth and development as well as in supporting a normal immune system.

FIGURE 21: Micronutrients – the percentage of adults and adolescents below the lower reference nutrient intake where vegetables contribute more than 10% of intake

	Vitamin A	Folate	Magnesium	Iron	Potassium
ADULTS (>16YEARS)	10%	3%	13%	9%	16%
CHILDREN (11-16YEARS)	21%	4%	38%	N/A	N/A

Source: Secondary analysis of NDNS, wave 9-11, 2016-19

Vegetables can reduce the risk of certain non-communicable diseases

70% of deaths globally are now caused by non-communicable diseases such as cancer and heart disease. The World Cancer Research Fund's Continuous Update Project (CUP) reviews evidence relating to dietary patterns and the risk of developing cancer, with a third of cancers now estimated to be a result of poor diets and low levels of physical activity. Their third CUP report in 2018 found strong evidence for non-starchy vegetables and fruit decreasing the risk of some cancers, and suggestive evidence that non-starchy vegetables decreased the risk of oral, lung, breast and oesophageal cancers. Conversely, they found suggestive evidence that low intake of starchy veg could increase the risk of colorectal cancer (WCRF, 2018).





We urgently need to reorientate our food systems towards more sustainable and healthy production and consumption patterns if we are to halt the impact of climate change and protect the health of our planet.

Although food systems are but one part of the jigsaw puzzle when it comes to sources of GHG emissions, based on current trends, even with elimination of emissions from fossil fuels we will be unable to meet the Paris Agreement's target of limiting warming to 1.5°C without significant reductions in global food system emissions (Clark *et al.*, 2020).

Vegetables, which have both health and environmental benefits, play a key role in more sustainable dietary patterns. A systematic review of empirical and modelling studies looking at sustainable dietary patterns from around the world found that diets high in plants and low in animal-sourced and processed foods could confer both health and environmental benefits. Positive health outcomes were reported for the majority (87%) of studies, with GHG emissions on average 25.8% lower

for more sustainable diets when compared to current consumption patterns (Jarmul *et al.*, 2020).

This is largely due to the fact that plant foods have a much lower carbon footprint than animal-based foods. Two large systematic reviews of Life Cycle Assessment studies have found that vegetables and pulses have much lower GHG emissions per kilogram of produce than meat and dairy foods (Clune, Crossin and Verghese, 2017; Poore and Nemecek, 2018), even when emissions from transportation are taken into account (Ritchie, 2020). That said, when comparing between different methods of vegetable production (rather than vegetable versus animal food production), there are still some GHG emission savings to be had when growing veg without additional energy requirements. For example, globally, field-grown and seasonal veg have a lower footprint compared to vegetables grown in heated greenhouses, as *Figure 22* demonstrates. And while using averages can obscure examples of more and less sustainable production practices within individual food categories, they are still a good indication of general GHG emission trends. Eating more veg and less and better meat, fish and dairy could therefore play an important role in helping to mitigate climate change.

FIGURE 22: The mean amount of CO₂ produced per kg of fresh produce for different food categories



Sources: Adapted from Clune *et al.*, 2017, using the mean values provided in Table 4

BETTER FOR HEALTH, BETTER FOR THE PLANET?

Eating more veg is a win-win for both the UK's health and environment. Recent research by the Sustainable and Healthy Food Systems research consortium (*% SHEFS*) found that increasing fruit and veg intake to five-a-day (while also reducing meat and sugar consumption) would lead to significant health and environmental benefits in the UK.



Doing so would contribute seven to eight months (13%) of the five-year target that the NHS has set for extending healthy life expectancy in the UK by 2035. It would also contribute 10–31% of the UK Climate Change Committee's target to reduce GHG emissions from agriculture, land-use and peatlands by 2050.

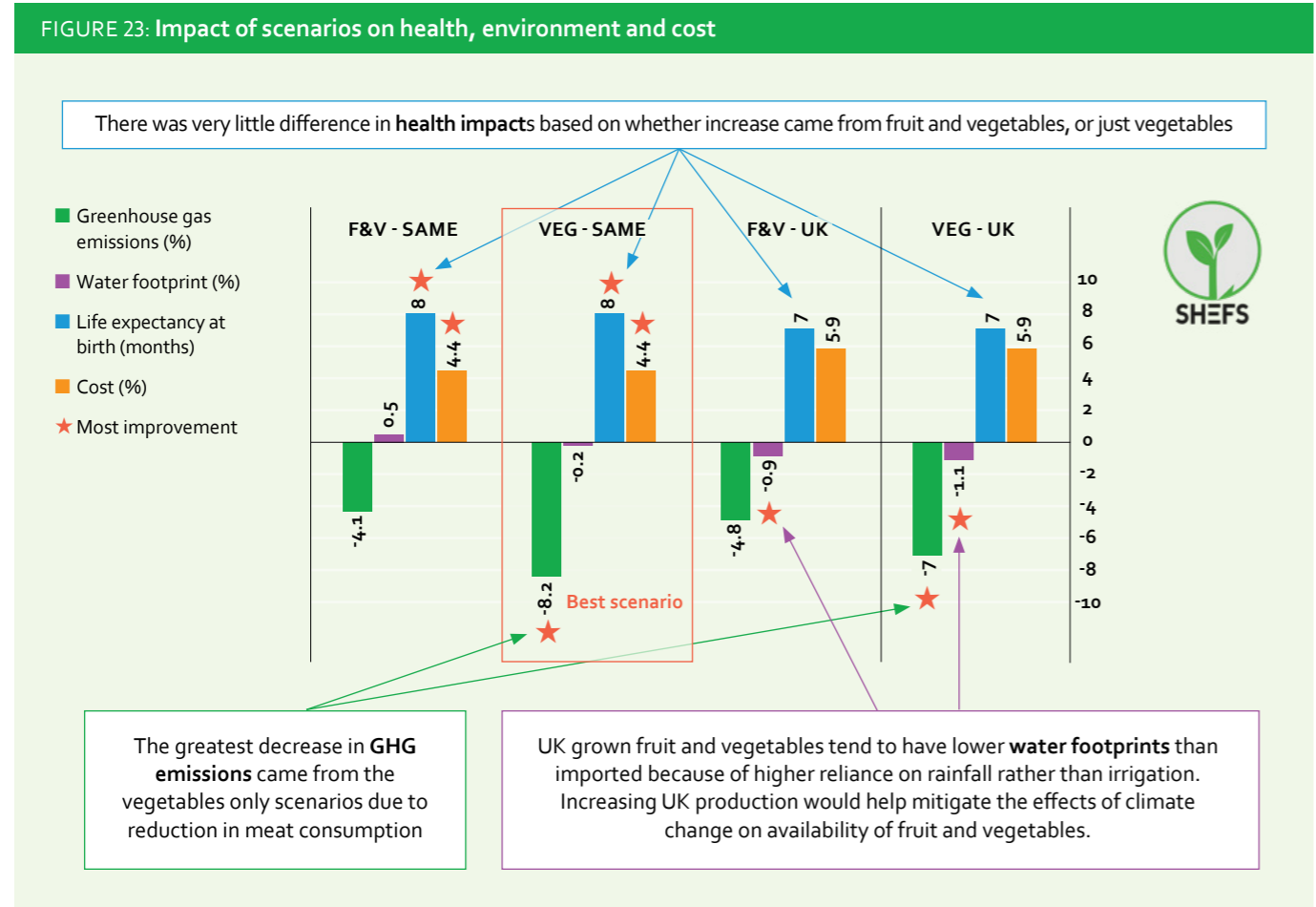
Of four scenarios modelled by SHEFS, the best pathway to five-a-day in terms of life expectancy and carbon footprint reduction was one where vegetable intake (rather than both fruit and vegetable intake) increased, and for these vegetables to come from the same vegetable groups that are currently imported and home grown (*% Figure 23*).³ Although there was little difference in the impact that increasing either vegetables or both fruit and veg had on health outcomes, increasing vegetables rather than both fruit and veg had a greater impact on reducing GHG emissions. This is due to the expected reduction in meat consumption that increasing veg would have – not so relevant for fruit which is commonly considered a sweet food in the UK.



However, planetary health is about more than just GHG emissions. Protecting biodiversity and water footprints is also important, and there are opportunities for the horticulture sector to support these objectives. Happily, the notoriously wet British climate does have some benefits when it comes to the environmental impact of increasing home-grown veg production. UK grown vegetables tend to have lower water footprints than imported veg because of our higher levels of rainfall which can reduce the need for irrigation (SHEFS, 2020).

³For further information on the four scenarios modelled, see the Veg Facts 2021 technical report.

PATHWAYS TO 5-A-DAY: FOUR DIFFERENT SCENARIOS OF GETTING TO FIVE-A-DAY AND THEIR HEALTH AND ENVIRONMENTAL IMPACTS



The best scenario of those modelled found that increasing vegetable intake so that everybody gets 5-a-day could contribute eight additional months of average life expectancy and decrease GHG emissions by 8.2%. Alternatively, increasing consumption to 7-a-day would contribute nearly a year of additional life expectancy.

Moreover, further research by the SHEFS team suggests that if the UK was to reach the 5-a-day recommendation by increasing consumption of vegetables only, the resultant expected decrease in meat consumption would lead to a reduced land requirement for meat production with potential benefits for biodiversity. A

reduced requirement for land to support livestock could allow more land to be converted from grazing to natural land covers and species diverse habitats. Current horticultural land has low numbers of species, but if a proportion of the land currently used for grazing livestock was converted to natural land cover, a number of species could stand to gain habitable area (SHEFS, 2021).

SEASONAL VEG – AN OPPORTUNITY FOR UK GROWERS AND RETAILERS?

The least GHG intensive vegetables are seasonal, field-grown, UK-cultivated vegetables grown without additional heating or protection, which are not fragile or easily spoiled. Overseas-grown produce cultivated without heating or other protection, and which is transported by sea or short distances by road is also fairly low in its GHG emission intensity, although demand for air-freighted fruit and veg produce is growing (TABLE Debates, 2011). Buying more seasonal British veg could therefore support growers and lessen the environmental impact of our diets.

The British public seem willing to engage with the topic. A YouGov survey run on behalf of Veg Power in 2021 found that 51% of adults would like to know more about which vegetables are in season and when, with almost a third

(30%) reporting that they don't know when different British vegetables are in season.

Environmental concerns are important to citizens with almost half (48%) reporting that they were concerned with the environmental impact of the food they eat. There may also be an opportunity to celebrate seasonal vegetables as a way of encouraging people to eat a wider variety of veg; 19% of people said they didn't feel as though they ate a wide variety of veg, rising to 22% of those in the lowest income category (C2DE).

Three quarters of adults said it should be easier to identify which veg are in season when shopping, with 80% saying that they would like supermarkets to do more to promote seasonal veg, for example through clearer advertising and messaging for in-season vegetables (Veg Power, 2021).



The latest figures show that we currently produce 2.4 million tonnes of veg a year in the UK, export 141,170 tonnes, and import 2.3 million tonnes. This means that **UK production as a percentage of the total supply of veg is just over half (52.8%)**. Defra estimates the value of UK veg production to be £1.48 billion.

Upping population consumption to 5-a-day, while maintaining the same production to supply ratio, would increase the value of UK veg production by £261 million and upping consumption to 7-a-day would add another £1 billion.

TABLE 3: UK veg production, import and export (metric tonnes)

Horticulture statistics 2020	Total UK production	Imports	Exports	Net imports	Total supply
Veg (field & protected)	2,422,900	2,309,300	141,700	2,167,600	4,590,500

52.8%
the % of UK veg grown domestically



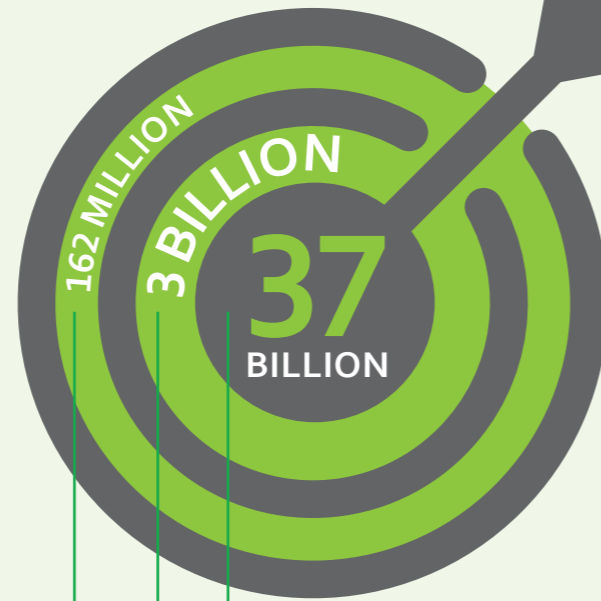
How do we encourage more veg consumption?

WE WILL NEED CONTINUED SUPPORT FROM INDUSTRY WITH MORE AMBITIOUS TARGETS TO HELP PEAS PLEASE GO FURTHER FASTER

Peas Please has made good progress since its inception but much more remains to be done if we are to have an impact on dietary patterns at a population level.

To accelerate progress towards our goal, we will need ambitious sales-weighted targets for increasing sales and servings of vegetables that are measurable, time-bound and supported by actionable strategic plans for better promoting vegetables by organisations across the food system.

As the map of Peas Please pledgers shows (Table 4), our retailer pledgers could make the biggest impact most quickly if they were to move towards SMART-er, more ambitious targets for sales of veg. The success of Peas Please in delivering impact will also depend on the continued support of the Out of Home sector once the hospitality industry is able to operate without restrictions, given the high proportion of pledgers in this sector with SMART targets for increasing the amount of veg they serve.



The number of additional portions we need to eat in the UK each year to be in line with the Eatwell Guide's recommend intake of veg

The Peas Please goal for additional portions of veg served by pledgers between 2018 and 2023

The number of additional portions of veg served or sold by our pledgers since 2018



WE NEED TO MAKE VEG MORE AFFORDABLE

Affordability remains a key barrier for vegetable purchases, with vegetable consumption following a strong income gradient. **The richest 20% eat one portion of veg more a day than the poorest 20%, and are much less likely to be eating no veg at all.** The reasons for

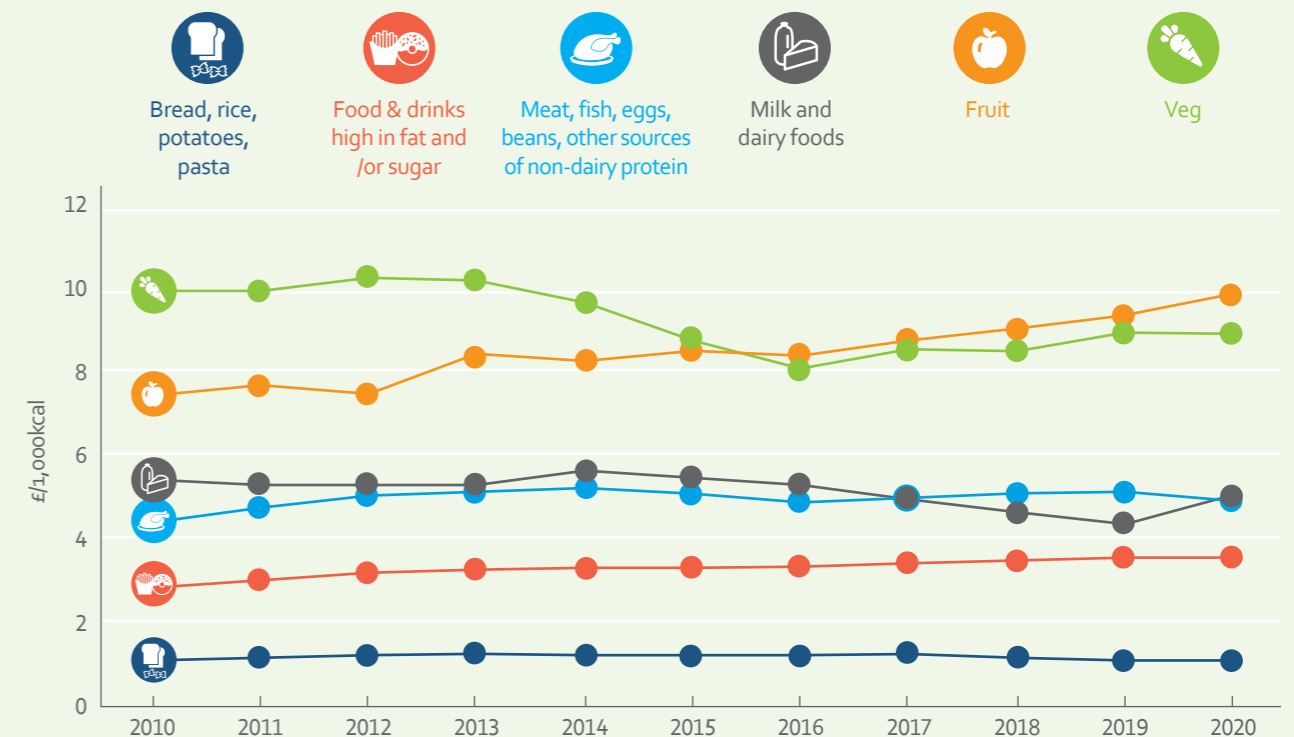
this are complex, but one factor is price – a major driver of food choice. Although many cite the relatively low price of fruit and veg by volume in their raw form as evidence that the price of more healthful food is not an issue, foods that are filling and convenient are often prioritised

when money is tight, which can mean cheaper calories are the easier option. **Calorie for calorie, foods high in sugar and fat are typically a third of the cost of veg, despite vegetables being much more nutrient dense** (© Food Foundation, 2020a).

Sector	Number of PP pledgers	What reach do our pledgers have within their sectors?	% of pledgers with targets that are SMART
Retail	9	82% of retail grocery market share	66.7%
Catering	16	3 pledgers are in the top ten catering firms by turnover	87.5%
Casual dining	12	2 pledgers are in the top ten casual dining brands by turnover	100%
Wholesale	3	1 pledger is in the top ten wholesalers by turnover	66%
Manufacturing	4	1 pledger is in the top ten manufacturers by turnover	75%

Sources: Estimates of market share for Peas Please pledgers (as of April 2021) were taken from Kantar 2021; Statista 2016; The Grocer 2021; The Grocer 2021; OC&C 2018

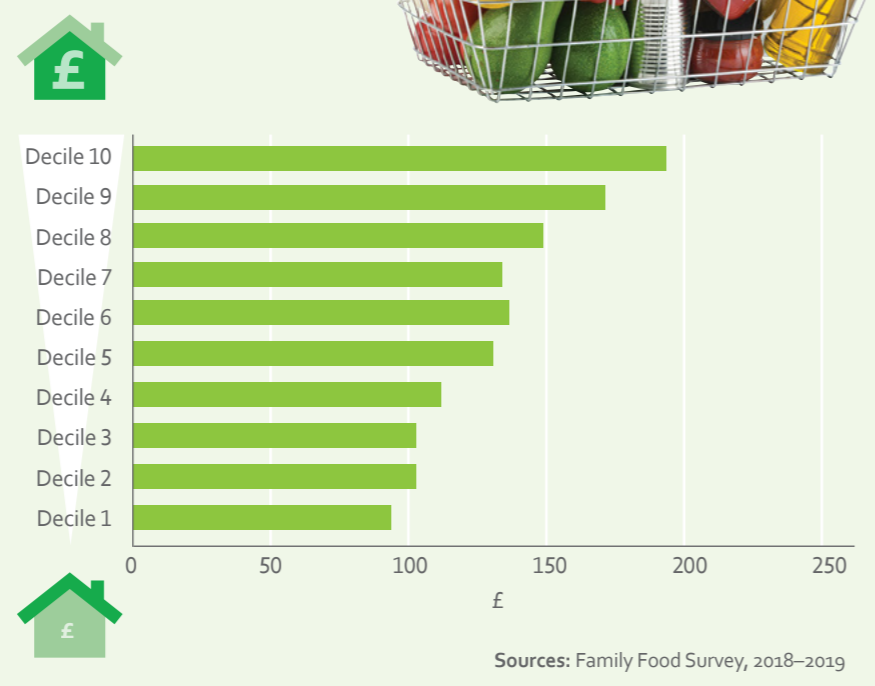
FIGURE 24: Mean price (£/1,000kcal) of foods by Eatwell food group, 2010–2020



Sources: ONS, CPI food price indices, 2010 – 2020. Please note 2020 only includes data for the first quarter of the year. For further information on the methodology used see the Broken Plate 2020 technical report. With thanks to CEDAR, at the University of Cambridge.

Although perceptions of vegetables as expensive may influence household purchasing patterns, affordability is also key (Wheeler and Williams, 2021). After housing and other fixed costs such as tax and energy bills are taken into account, the food budget is often the first to be squeezed. The poorest 20% of households would need to spend 40% of their disposable income after housing costs to afford the government's recommendations for a healthy, balanced diet as set out in the Eatwell Guide, compared to just 7% for the richest 20% (Food Foundation, 2021). **There are clear differences in household spending on vegetables based on income, with those in the highest income group or decile spending an average of 107% more on vegetables per person per week than those in the lowest decile (Figure 25).**

FIGURE 25: Average expenditure on vegetables per person per year by income decile, household and Out of Home.



More recently, retail prices of veg increased in January 2021 compared to the preceding month following the end of the Brexit transition period and new border and trade regulations, highlighting the continuing price vulnerability of the category to external pressures. Food Foundation analysis found that vegetable retail price indices increased by 4.5% between December 2020 and January 2021 following delays on entry to the UK as the new trade agreement with the EU was implemented (Food Foundation, 2020b).

Could financial incentives be one way of encouraging veg purchases?

Although national food policies often focus on implementing financial disincentives for purchasing less healthy foods (such as the UK's sugar levy on soft drinks), financial incentives that encourage or subsidise purchases of more healthy foods are less common. **Nevertheless, a large and growing body of evidence suggests that fiscal incentives can impact on consumption and population health.** The World Health Organization cites the European Union's School Fruit and Vegetable Scheme as a successful example of a targeted fruit and veg subsidy (WHO, 2015). In 2020/11 the EU subsidized 55% of the cost of providing school children with free fruit and vegetables, with a formal evaluation of the scheme in 2012 finding that it had both increased fruit and veg consumption in the short-term and generated additional demand equivalent to 44,000 tonnes of produce a year. Recent modelling

of the subsidy on estimated purchases were greater for vegetables than for fruit, with purchases of veg increasing by 32% compared to 16% for fruit (Blakely et al., 2020). Another study looking at the impact of a 10% subsidy on fruit and veg estimated this would lead to an 11g increase in average daily fruit and veg consumption, with the subsidy having a greater impact on reduction of coronary heart disease deaths than a 15% or 30% meat tax (Broeks et al., 2020).

An opportunity for more innovative industry pilots

Retailers can also act to ensure price is not a barrier for veg consumption. Peas Please recently undertook a rapid review of academic and grey literature looking at interventions in UK retail settings that aimed to increase sales of fruit and veg. We found that more studies looked at information provision and



What's been the impact of the pandemic on the cost of veg?

According to analysis of the Consumer Price Index (CPI) (Food Foundation, 2020b), although the average retail price of vegetables initially increased between March and June 2020, overall they did not increase during the course of the year, with prices actually remaining lower than in 2019. However, data from the Institute of Fiscal Studies suggests that the CPI may not have provided a complete picture of the pandemic's impact on food prices. Grocery prices increased by up to 3% in the first weeks of lockdown, primarily due to a reduction in the number of price promotions available – something which is not fully captured in the CPI (O'Connell and Jaravel, 2020). Certainly, the pandemic has particularly affected those on low incomes, who were three times as likely as high earners to have been furloughed and four times as likely to have lost their jobs in the first phase of the crisis (Bell, 2020). This may well further impact on the affordability of a healthy diet given the likely impact this will have had on disposable income.

"There is little published evidence from UK retail settings on the outcome of interventions specifically targeting sales of fruit and veg, but this is an area ripe for innovative pilots and trials"

studies exploring the potential for subsidising fruit and veg in high income countries have consistently identified potential health benefits to adopting this approach, although combining subsidies with taxes on less healthy foods may be a more effective approach by helping to mitigate any unintended consequences arising as a result of price changes such as substitution effects (Cobiac et al., 2017; Blakely et al., 2020).

A study modelling the effects of a 20% subsidy on fruit and veg, for example, found that the health gains were higher than for an 8% tax on 'junk food', with all-cause mortality decreasing by 2.5% in men and 2% in women. Additionally, the effects

messaging interventions than did price promotions and discounts, despite price promotions proving one of the most effective strategies for increasing sales of fruit and veg (Peas Please, 2021). For example, when Tesco price promoted fresh fruit and veg as part of a 2019 pilot in Lambeth and Southwark, sales increased by 13% during the six-month trial period (Guy's & St Thomas Charity, 2020).

There is little published evidence from UK retail settings on the outcome of interventions specifically targeting sales of fruit and veg, but this is an area ripe for innovative pilots and trials that could be included as part of Peas Please commitments.

ASIA – UNPICKING HOW THE REGION BUCKS THE TREND WHEN IT COMES TO VEGETABLE CONSUMPTION

Globally, 88% of countries have average vegetable intake below the World Health Organization's recommendation of $\geq 240g$ a day. A recent systematic review of 162 countries estimated that average vegetable intake was just 186g a day (Kalmpourtzidou, Eilander and Talsma, 2020), so the UK is by no means alone when it comes to consuming diets low in vegetables. The exception to this is Asia, where both supply and intakes of veg are above average.

Almost a third (29%) of countries in Asia meet veg intake recommendations. Moreover, 19 out of 31 countries (61%) have a domestic vegetable supply with enough produce available to meet intake recommendations. Average intake of veg is highest in East Asia, where 67% of countries met intake recommendations compared to 9–29% of countries in other Asian regions. Average vegetable supply is also highest in East Asia. China, Timor-Leste, Laos and South Korea are all countries where the average amount of veg eaten is comfortably above recommendations.

Food culture plays a role, with East and South East Asian dishes often including more veg than typical western meals, with many citizens still relying on frequent visits to wet/fresh markets and street vendors for fruit and veg (Cheung *et al.*, 2021). In addition to traditional food purchasing and cooking patterns, demand for veg has risen in line with income growth in the region. Between 2000 and 2011 per capita consumption increased by 20% in South East Asia according to the FAO (Kyojuzuka and Ito, 2014). Food businesses with modernised systems, cold-chains and the ability to transport refrigerated fruit and veg have significantly fostered the consumption of fresh produce according to a recent systematic review of South Asian food environments (Cheung *et al.*, 2021). However, increasing urbanisation and fruit and veg inflation in urban environments, as well as a shift towards western dietary patterns, may well pose a threat to higher population intakes of veg or risk widening levels of dietary inequality in the future.



Food businesses should also look to support low income and vulnerable groups in accessing fruit and veg as part of wider corporate commitments to supporting health. Following the publication of part one of England's National Food Strategy for example, seven UK retailers committed to add value to the Healthy Start voucher scheme. Although there are likely to have been other factors that will have had an impact on uptake, over the course of the six months that the Healthy Start retailer offers were available to citizens, uptake of the scheme increased by 7% in England, 6% in Wales and 4% in Northern Ireland (NHS, 2021). What's more, Healthy Start



recipients tended to have healthier baskets containing a higher proportion of fruit and veg than comparable customers.



A CLOSER LOOK AT CONVENIENCE STORES AND FOOD ON THE GO

We need a food environment where veg is readily available

To encourage increased consumption we need to ensure that veg is the easy, convenient option. One area where this matters is food bought while on the go or from smaller shops. Working with the Peas Please Veg Advocates (180 individuals working with us to support our mission), we undertook a citizen research survey between April and May 2021. Our Advocates visited different convenience stores on local high streets and in petrol stations over the course of two weeks to help

us better understand the type of food on offer. Sixteen different stores were visited from across the UK (two in Northern Ireland, two in Scotland, and the rest spread across England) between 20 April and 4 May 2021.

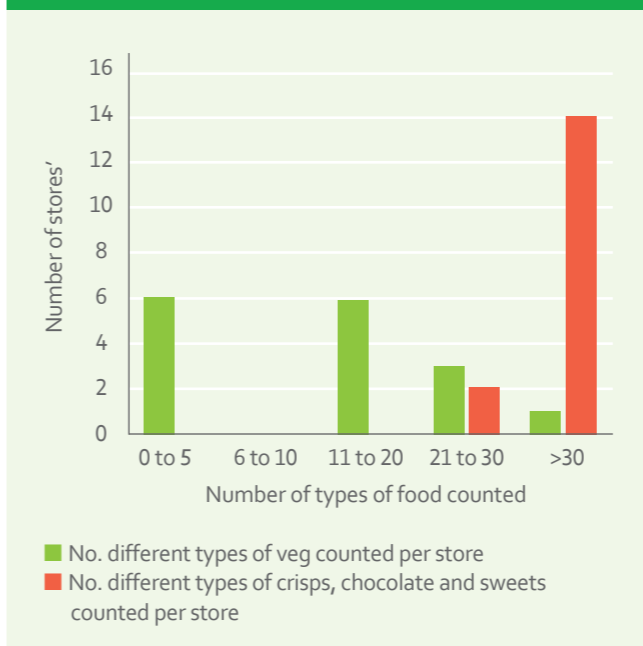
We asked our Advocates to:

1. See whether any fresh veg was available to buy in store
2. Count how many different types of veg were available (including fresh, tinned and frozen but excluding potatoes)
3. Count how many different types of chocolate, crisps and sweets were available

While only a small number of shops were visited over a short period of time by the Advocates, meaning we cannot draw any generalised conclusions, the results nevertheless suggest that there is a real opportunity for convenience stores to offer more healthful options.

Overall, 6 out of 16 outlets (38%) had no fresh veg available at all. Over 30 different types of veg (fresh, tinned and frozen) were counted in just one store, compared to 14 stores where over 30 different types of chocolate, crisps and sweets were available (88%).

FIGURE 26: The different types of food on offer by store



Seven of the convenience stores visited were situated in petrol forecourts; these were found to have the poorest selection of veg on offer. Five out of seven stores visited (71%) had no fresh veg, with six of the seven (86%) having fewer than six different types of veg available. Conversely, all but two of the stores had over 30 different types of chocolate, sweets or crisps available to buy. This matters given that convenience stores are often the main option for buying food in some areas. The Association for Convenience Stores found in 2020 that 37% of all convenience stores were classed as 'isolated' with no other retail or service businesses close by (ACS, 2020).

Interestingly, the three stores that were 'express' stores and franchised or branded as part of larger retailers had some of the best vegetable offers observed, with all three offering fresh veg. This is encouraging, and demonstrates the progress that UK retailers (the majority of which are Peas Please pledgers) have made over the past few years.



"No fruit/veg at all. Not even frozen."

"No veg of any kind whatsoever. Only in a small number of sandwiches was there the odd lettuce leaf."

"There are so many HFSS items I feel dizzy with the choice. They're at the entrance and most part [sic] of the shop is full of them."

"Placement was dreadful, just two part shelves mixed in with

everything else. Did not look welcoming or appetizing."

"The fresh veg was a tiny section hidden at back of store and prices very high, e.g. £1.20 cucumber, £1.09 for a lettuce?!"

WE NEED MORE SUPPORT FOR UK EDIBLE HORTICULTURE

Since the EU Common Agriculture Policy reform in 2003, farmers have been subsidised to produce food through direct payments based on land area, but in the UK, subsidies were not made available to farms under five hectares. This means that, as horticultural businesses tend to be smaller, they have received on average one of the smallest amounts of subsidy of any farm type and many have received none at all. According to Defra's analysis of Farm Business Income (from 2014 to 2017), government subsidy accounted for 10% of the income of horticulture holdings, versus 79% for cereal producers. Fruit and vegetable production, particularly production on under five hectares, has therefore been underinvested in compared to

Government subsidy accounted for 10% of the income of horticulture holdings, versus 79% for cereal producers.

Defra's analysis of Farm Business Income (from 2014 to 2017)

other farming sectors for at least 18 years. This is despite the fact that fruit and vegetables are one of the only food groups which the government recommends we eat more of. That, along with narrow profit margins for producers, has meant that there has not been the optimal investment in horticulture for it to flourish and there has been little room for investment in environmental innovation.

WHAT ARE THE NEW OPPORTUNITIES EMERGING FOR HORTICULTURE?

There is an opportunity for edible horticulture to simultaneously contribute to rises in consumption, environmental improvement and economic development. This could be facilitated at a governmental level by championing:

1. Bold new visions for horticultural development to be adopted by governments and administrations across the UK nations
2. Bespoke support available for all producers, to replace Producer Organisation (PO) schemes, for productivity (including capital investment schemes and targeted research), supply chain fairness and public engagement in healthy eating
3. Continued access to seasonal labour alongside development of new entrant opportunities and training
4. A Sustainable Farming Incentive that works for horticulture:
 - a. Payments based on environmental outcomes not land area
 - b. Payments appropriate for a highly diverse sector – ranging from intensive peri-urban market gardens and high-tech glasshouse production of tomatoes and soft fruit to medium- and large-scale top fruit producers, field scale vegetables and vineyards
5. Investment in vegetable marketing
6. Public procurement with targets for UK produce, e.g. government buying standards that include two portions of veg per meal with 60% of this UK produced
7. There is also an opportunity to support controlled environment agriculture.



WE NEED A VEG-FOCUSED RECOVERY IN THE OUT OF HOME SECTOR

Among restaurants, casual dining chains and caterers there is a real opportunity to rethink menus and the health and sustainability credentials of business offers following the pandemic. Interest in plant-based diets does not appear to have been dented during Covid-19, with more than £1 billion of consumer spending

now linked to vegetarian and vegan menu options. This represented almost 4% of total foodservice spending in the year to February 2021, up from around 2% pre-Covid, and is an opportunity for the Out of Home sector as they rebuild following the pandemic (Waddell, 2021).

WE NEED TO LEVEL THE PLAYING FIELD WHEN IT COMES TO ADVERTISING

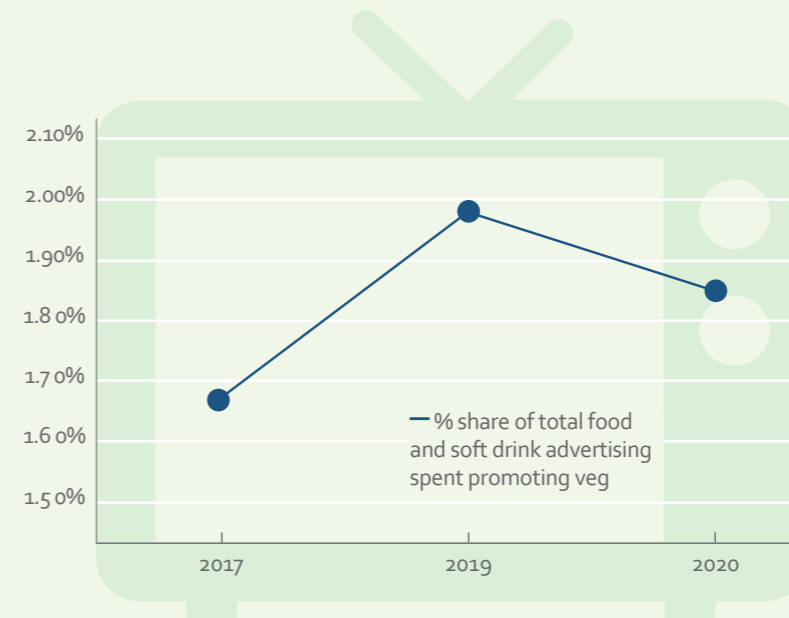
The way vegetables are marketed, as well as other social and cultural norms relating to the perception of vegetables as somehow less desirable than other foods, also needs to be tackled if we are to support the UK in becoming a veg-eating nation. The issue is one that often starts right at the beginning of an individual's relationship with food, making it a difficult cycle to break.

Just 2.5% of all food and soft drink advertising in the UK is spent on fruit and vegetables, with young people in Britain exposed to 15 billion online ads for foods high in sugar, salt and fat every year (nearly 500 adverts per second) (Bite Back, 2021). With research finding that children often perceive vegetables as 'boring' or 'disgusting' (Veg Power, 2019), we

need improved regulation, greater corporate responsibility, and more innovation in the creative industries to inspire and encourage children to adopt vegetable loving habits that they will keep for life.

Figure 27 shows the proportion of UK advertising spend on vegetable promotion out of the total spent promoting food and soft drink over the course of four years. While 2019 saw an encouraging increase compared to 2017, advertising spend on vegetables as a proportion of the total dropped in 2020 to just under 1.9% – a negligible amount when compared to the amount spent promoting confectionary and soft drinks. By way of contrast, in 2020 17.5% of food and soft drink advertising spend went towards advertising confectionary, and 11% towards soft drinks.

FIGURE 27: The proportion of total soft drink and food advertising spend that goes towards veg in the UK



Sources: With thanks to Nielsen AdDynamix, 2017; 2018; 2019



TENDERSTEM® AND BROCCOLINI – REBRANDING BRASSICAS FOR THE 21ST CENTURY

Tenderstem – also known as broccolini in North America – is a green vegetable that is very similar to broccoli but with smaller florets and longer, thinner stalks. It is a hybrid of broccoli and gai lan (which is sometimes referred to as 'Chinese kale' or 'Chinese broccoli') and was originally developed in Japan, becoming available in US markets in 1996. It was first grown in the UK in 2005.

In both the UK and US the vegetable is trademarked with significant investment going into marketing and promotion of the brands. In the UK, Tenderstem's marketing campaigns focus on the versatility of the vegetable, providing recipe ideas and links to cookery programmes that aim to inspire. Tenderstem can be grown in the UK, with the brand highlighting a number of British growers on their website.

As a result, in the course of just two decades, Tenderstem has become a widely purchased vegetable. In 2020 Tenderstem broccoli reached a new record in volume sales, beating the 2 million kg mark twice in three months (Cheshire, 2021). This followed a decade of steady sales growth, with double-digit sales growth over the past decade and a 26% year on year increase in the first six months of 2019 (Searle, 2019).

The success of Tenderstem, or broccolini, in a relatively short period of time shows that it is possible to reinvent vegetable categories through investing in marketing and promotion.

WE NEED TO MAKE VEG MORE DELICIOUS AND APPEALING

Among adults as well as children, complex attitudes also often exist around vegetables. Although surveys consistently find that a majority of adults express a desire to eat 'more healthily', with a recent survey by IGD finding that 87% of adults want to eat more fruit and veg, vegetables are often associated with restrictive diets or seen as somehow less filling or palatable than other foods (Suher, Raghunathan and Hoyer, 2016).

Peas Please sees a huge opportunity for chefs and culinary education providers training up the chefs of tomorrow to showcase how delicious vegetables can be. Chefs routinely transform raw ingredients into desirable and even fashionable meals, and in doing so, they influence what we grow, what we cook, and how we think and talk about food. Evidence suggests that labelling foods and dishes as 'healthy' or 'vegetarian' can actually be off-putting. Research conducted by

the World Resources Institute and the Behavioural Insights Team found that using indulgent language or highlighting providence ('field grown', 'garden') on vegetarian dishes was

Meals should scream flavour and whisper health

much more popular with citizens than a 'meat-free' description (Park, 2020). Focusing on flavour and taste instead of nutrient content and health benefits are more appealing options. The Chefs Manifesto, supported by the SDG2 Advocacy hub, recommends chefs include a focus on plant-based ingredients in their cooking, place vegetables, beans and pulses at the centre of dishes and suggests meals should 'scream flavour & whisper health' (Food is Life, 2020).

However, most mainstream culinary training remains heavily influenced by 'classic' European and French gastronomy, with much of it structured around techniques for cooking with animal protein rather than plant-based foods (Forum for the Future, 2020). A 2019 analysis of a sample of 1,254 ingredients from 123 recipes featured in the four most popular MasterChef UK and US formats of the show found that vegetables and pulses were overshadowed by fish, red meat and game (Erskine, 2019).



As of 2017 there were 325,483 chefs across the economy as a whole in the UK and some 28,390 chef students (People1st, 2017). This represents a sizeable audience of potential agents of change. Peas Please currently only has two pledgers in this sector (the University of West London and the University of Stirling) but would love to see many more join us in our mission.

Our recommendations for change



INVEST IN AND SUPPORT UK EDIBLE HORTICULTURE

➤ **Financially incentivise sustainable horticultural production of all scales** through, for example, the Sustainable Farming Incentive scheme

➤ **Better connect producers with citizens.** Encourage producers to have a role in promoting public engagement with growing and healthier eating that in turn

stimulates citizen demand for British and seasonal veg that could help to support the horticultural sector.



MAKE VEG AN AFFORDABLE OPTION FOR EVERYONE

➤ **Make sure that veg is an affordable option for those on low incomes.** Use the government's costing of the Eatwell Guide as the reference point for welfare payments by legally enshrining the cost of healthy living in social security legislation.

levelling-up agenda and the government's focus on the first 1,000 days, where nutrition plays a critical role but has to date been somewhat overlooked.

➤ **Improve the Healthy Start scheme to support more low income families to access a healthy diet.** Uptake of the scheme, which provides money for veg, fruit, pulses and other essentials to young pregnant women and low income families is at an all-time low. Driving up awareness of the scheme and extending eligibility (in line with recommendations in part one of the National Food Strategy) (Dimbleby, 2020) would support both the government's

➤ **Ensure that the cost of veg is not a barrier to purchase.** Re-design VAT on food to favour healthier and more sustainable choices that include veg and ensure that businesses commit to ensuring that veg feature as part of marketing and price promotions. The expected ban on price promotions on foods high in sugar, salt and fat (HFSS) from April 2022 offers a real opportunity to incentivise sales of healthier foods by running price promotions on fruit and veg instead of HFSS foods. Seasonal veg for example could be better promoted in stores.



MAKE VEG THE EASY, AVAILABLE OPTION

➤ **School Food Standards. All UK nations ought to commit to including at least two portions of veg as part of school food standards.** Scotland and Northern Ireland have already adopted this policy. England and Wales should follow suit. Schools could also explore other opportunities to increase access to veg within the school environment and encourage children to be engaged with food from a young age.

hospitals, prisons and other institutional settings to serve more veg. Including at least two portions of veg in every meal could help to drive system change. For example, linking producers to agile and dynamic procurement practices could also support more sustainable sourcing practices and British producers.

➤ **Review public procurement policies.** Public sector bodies spend an estimated £2.4 billion on procuring food and catering services annually, with around £1 billion of this going towards the cost of food and ingredients (Parliament UK, 2021). This represents a huge amount of potential for schools,

➤ **Expand the School Fruit and Vegetable Scheme to include all primary school aged children.** This government scheme entitles every child aged 4-6 in fully state-funded schools in England to a piece of fruit or veg each day, equating to 2.3m children in approximately 16,300 schools. As it has been some time since an evaluation of the scheme has been conducted, we would recommend running a pilot

to explore new ways of ensuring that the scheme is delivering, and properly evaluate these findings with a view to expanding the scheme to include more children.

➤ **Greater investment in social prescription schemes.** Social prescription or community referral schemes allow first-line health professionals to refer people to a range of local, non-clinical services. Such services could feasibly include community growing schemes, cooking classes, fruit and veg vouchers and veg box schemes. Although there is promising and growing evidence to support social prescribing, there is need for greater funding to support more robust trials with longer-term follow-ups to better understand whether such schemes can impact on diet.



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