Food, farming and land use

A. Introduction

❖ What is this topic about?

This topic focuses on food, farming and how we use the land. We are looking at these things together because they impact on one another.

We can use land for different things:

- **To produce things we eat.** For example, farmers use land to grow crops like wheat and potatoes. They also use it to grow grass which only animals like cows and sheep can graze, which produce dairy products (milk, cheese, etc.) or meat for us to eat. Land is also needed to grow other crops like maize for animals to eat. Most of the land in the UK is currently used for farming.

- **To grow crops that we can burn to make energy.** These are often called 'energy crops' and the energy they create is called bioenergy. Using bioenergy can produce fewer greenhouse emissions than getting our energy from fossil fuels like coal and oil. Some crops can also be used for building materials and other things.

- **To grow trees or restore peatland.** This removes the greenhouse gas carbon dioxide from the atmosphere.

The choices we make about what we eat affect what we can use land for. For example, if we eat less meat or dairy, we won't need as much land to graze animals or grow the food they eat. This would mean we could use it for something else (e.g. growing crops or trees). What we eat also affects greenhouse gas emissions in other ways. How much we eat and waste, how food is produced, and how far it is transported, can all have an impact on emissions.

What we eat and how we use our land are not only important for climate change. It is important to think about the wider implications of the decisions we make in these areas.

About a tenth of the UK's greenhouse gas emissions currently come from farming and other ways we use the land.[1]

❖ How does this topic relate to net zero?

Land in the UK is mainly used for farming. This means it is used for things like growing crops and grazing animals. Only a small amount of land in the UK is left natural or used to plant trees (forestry).

To get to net zero emissions we need to change how we use our land. We need to reduce the amount of land used for food production (while still producing enough food) so that we can grow more trees and energy crops. This is going to affect what we can eat. Changing what we eat in other ways can also reduce greenhouse gas emissions.

Assembly members at Climate Assembly UK will look at these areas and make recommendations about how best the UK should get to net zero.

2. The topic in more detail

❖ Where do emissions from our food and land come from?

Some of the food we eat and the animal feed we use is grown or produced abroad. This still causes climate change as the greenhouse gases created when producing them end up in the atmosphere, whichever country they come from. However the UK's target of net zero greenhouse gas emissions by 2050 doesn't include these overseas emissions. Whether assembly members want to consider them or not is up to them. We also export some of our food, and these emissions would be included in our net zero target. Some of our food (fish) also comes from the sea around the UK.

Food systems are under pressure from a growing UK population, as well as a changing climate (e.g. more extreme weather, rising temperatures). This may make some foods scarcer and more expensive. We need to bear this in mind when making decisions about how to get food and land use to net zero.

❖ Reducing the amount of meat and dairy we eat

Not all foods are equal when it comes to climate change. Producing some types of foods creates a lot more greenhouse gas emissions. Red meat (e.g. beef, lamb) and dairy (milk, cheese, etc.) cause the most greenhouse gas emissions. This is mostly because of the way 'ruminants' (cows, sheep) digest their food, which produces a powerful greenhouse gas called methane. White meat (e.g. chicken) and fish produce less greenhouse gases; while vegetables and fruit tend to produce the least.

However, it also matters where food comes from and how it is produced. For example, beef from the UK is much lower carbon than that from Brazil.[14] How far food travels, though, only account for a small amount of our food's emissions, so vegetables and fruit from abroad are still lower carbon than red meat from the UK.

Over 95% of the UK public currently eat at least some meat or fish.[8] Most people eat dairy at least once per week. Nearly 60% of people eat beef, lamb and pork.[9] Over 80% of people eat chicken/turkey regularly. Those on lower incomes tend to eat slightly more red and processed meat (things like sausages and burgers) than those on higher incomes. They tend to eat less fruit and vegetables. But our diets are changing. The amount of red and processed meat we eat has decreased a lot in the last 10 years, mostly among young people.

It is generally accepted that eating a vegetarian or vegan (plant-based) diet would significantly cut greenhouse gas emissions.[3] For example, a vegan diet would reduce global food-based emissions by around 70%. Just cutting out dairy products would reduce them by around 25%.[13]

A low-carbon diet is also healthier.[4] Although eating meat helps give us protein and iron, health guidelines say we should cut down on red and processed meat, and eat more fruit and vegetables. Making these changes would cut emissions from food by 17%[7]. It would also reduce risks of cancer, heart disease, and diabetes, and increase life expectancy by around 8 months.[5]

Changing our diets would, however, have impacts on the meat and dairy industry. Farmers who produce meat would lose income if we shifted towards a more plant-based diet without taking account of their needs. Any changes that move us away from meat and

dairy to lower-carbon alternatives will need to consider the implications for jobs and skills.[10] Also, if we replaced red meat with more white meat, there may be implications for animal welfare, as pigs and chickens tend to be farmed more intensively in sheds rather than grazing outdoors.[15]

There are several alternatives to meat and dairy. We could get more of our protein from plant-based protein sources, including 'fake meat' (e.g. soya), pulses, fruit and vegetables (see Figure 1). We could in the future eat lab-grown meat. Or we could choose other sources of animal protein, such an insects. Even switching from beef to chicken would significantly reduce emissions.

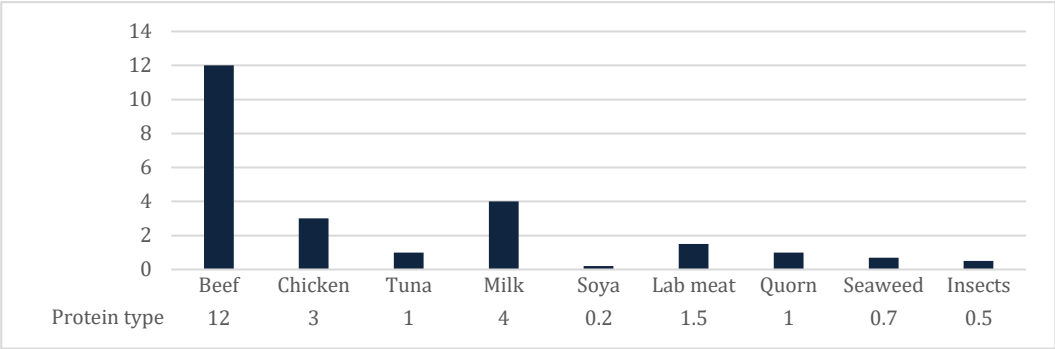

Figure 1. Emissions from different protein sources (per 50g protein)[6]

❖ Changing other food choices

Other choices we make about food can also help tackle greenhouse gas emissions. These include:

- **Eating foods that are in season and local:** Buying food that is in season locally reduces the amount of food we need to get from abroad. Reducing how far food has to travel can help to reduce greenhouse gas emissions (although 'food miles' are a relatively small proportion of the overall carbon footprint of food).

- **Avoiding takeaways and processed foods**: Takeaway foods tend to use more packaging, which means they result in more emissions. The same is true of highly processed foods like crisps, pies, sausages, ready meals, biscuits, and soft drinks. Eating more whole-foods and preparing food at home may help reduce emissions.

We can also think about **how much food we eat**, so that we avoid eating too much and wasting food.

A large amount of food is wasted in the UK. Some food waste, like vegetable peels and egg shells, is unavoidable. However most food waste can be prevented by taking steps like reducing portion sizes, avoiding over-catering (i.e., providing too much food for guests/events), planning meals and using left-overs. Cutting down on how much food we eat and waste would reduce emissions. It would also cut the amount of land we need to use for farming, meaning there was more space to grow energy crops or plant trees.

Reducing the amount we eat and waste would also save money and calories. Household food waste accounts for 70% of total food waste in the UK[1] and costs the average family

£700 a year.[11] Eating fewer calories would reduce obesity. Obesity costs the NHS a lot of money every year because it increases our risk of heart disease, diabetes and cancer.[12]

Supermarket practices can encourage us to buy more and contribute to food waste. For example, 'buy one get one free' (BOGOF) offers can lead us to buy more food than we really need. Freezing food at home helps it last longer. But freezing food uses energy, so reducing the amount of frozen food we buy could also cut emissions.

❖ Farming and land use

Changing farming practices can help to reduce emissions. Steps farmers can take include making better use of fertiliser, changing animal feeds, and using renewable energy to power equipment.

We may also need to consider what are known as different models of food production. At the moment we produce food mainly through large farms. Alternatives include:

- **Urban and community farming:** Growing food in towns/cities on public land, allotments or in gardens can reduce how far food needs to travel and so cut greenhouse gas emissions. This may create social and economic benefits for communities, as money goes directly to local food producers.

- **Vertical farming and new technologies:** This describes growing crops indoors on vertically stacked floors/layers. This reduces the amount of land required to grow plants (so freeing up land for storing carbon). It is only suitable for certain foods, such as lettuces, and may use more energy than traditional farming. New technologies are also producing synthetic foods, such as lab-grown meat, but these are not yet widely available and the benefits to climate change are not known.

Farming is also only one of the uses of our land. There are other ways we can use the land to reduce emissions. In particular, there are three main land uses that would help reduce emissions. All three work by absorbing emissions from the air. They are:

- **Restoring peatland:** Peat is a carbon-rich soil formed from plants breaking down (decomposing). Peat that is drained or burned releases a lot of carbon dioxide into the atmosphere. However, peatland that is restored can become a carbon sink (i.e. absorbs and stores carbon dioxide from the atmosphere).

- **Planting more trees:** Trees absorb carbon dioxide whilst they are growing, so planting trees can help reduce emissions. We can also manage the trees and woodlands that we have better so that they become more productive.

- **Planting more energy crops:** These are crops that we can burn to make energy. The energy produced is known as bioenergy. Using bioenergy can produce fewer greenhouse emissions than getting our energy from fossil fuels like coal and oil. Some crops can also be used for building materials and other things.

Using more land for these purposes would help to reduce emissions.

❖ How can these changes be achieved?

Policies to achieve net zero in 'food, farming and land use' include ideas targeted at both businesses and households. They include new regulations (e.g. laws), economic measures (e.g. taxes), and new ways of providing information (e.g. labels):[1,2]

(a) Ideas for regulations include:

- **Bans or restrictions on certain food types.** This could include red meat and processed foods. There could also be bans or restrictions on foods brought in by air travel or which use too much packaging or fertilisers. This might start with reducing meat and dairy in the public sector, so the amount of meat and dairy served in places like schools and hospitals.
- **Agri-environment schemes**. These are schemes that encourage farmers to reserve a proportion of their land for non-farming uses, such as planting trees.

(b) Ideas for economic measures include:

- **Additional charges for those types of food with the largest emissions**, for example meat and dairy products. These could also include influencing how foods are produced, packaged, stored and transported.
- **Financial support** could be provided for those affected by a loss of income. These could be farmers switching to new crops or tree-planting, for example.
- Funding can also support **research and technology development.** This could look at how to make farming practices more sustainable, or how to reduce the costs of meat and dairy made in labs.

(c) Ideas for providing information include:

- **Labelling on food and drink products** to show the emissions used in making them. This would, allow consumers to choose the least polluting foods if they want to.
- **Education** could raise awareness of issues around food and food waste.
- For land use, **information can be provided for those who own and manage the land.** This could encourage low-carbon farming practices and other ways of reducing emissions like planting trees.

3. What will assembly members consider?

Assembly members will consider two main questions:

- Where to focus efforts to reduce emissions from 'food, farming and land use'?
- What policy measures should be used to make sure change happens?

Their answers to these questions will be a key part of Climate Assembly UK's recommendations.

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