

FACTSHEET AND FREQUENTLY ASKED QUESTIONS

The carbon footprint of New Zealand sheepmeat and beef

Introduction

Knowing how our food is produced and the implications for the health of the planet is more important now than ever before.

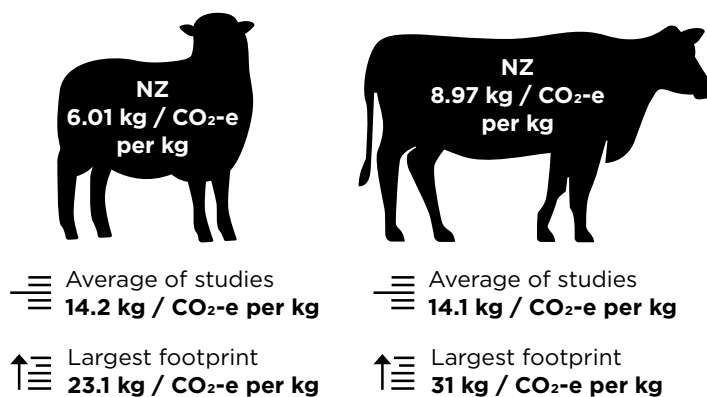
Global consumers are increasingly demanding transparency in the food they purchase. They are not only seeking food that is nutritious and delicious but they want robust assurances that it's been sustainably raised with a minimal environmental impact.

New Zealand has a naturally better farming story.

Our more natural, low-impact farming methods are quite different to the intensive high-impact systems often used around the world – particularly when it comes to beef and sheepmeat.

Beef + Lamb New Zealand and the Meat Industry Association commissioned a Life Cycle Analysis (LCA) to examine the carbon footprint of beef and sheepmeat including transport and consumption.

The findings – how we stack up globally



GWP100 farmgate live weight

- New Zealand sheep and beef farmers are amongst the most efficient in the world.
- Eating red meat 2-3 times a week over the course of a year is the equivalent of a single return flight from Auckland to Christchurch.
- NZ red meat's carbon footprint is among the world's lightest even when exported to international markets and competing with domestically produced meat.
- The cradle to grave footprint of sheepmeat is 14.73kg and of beef is 21.94 kg.
- Consumers can be confident that by choosing New Zealand beef and sheepmeat, they're making a sustainable choice for the planet.

"Accurately measuring and reporting the environmental impact of products has never been more critical to creating a sustainable future."



"LCA analyses the full life cycle of a product including transport and consumption, and is an effective and important tool to help the world understand a carbon footprint."

Dr. Stewart Ledgard, lead study researcher at AgResearch

GWP*: another way of examining a product's LCA

GWP* is a novel new way to look at LCAs. The United Nations Food and Agriculture Organization (FAO) is currently investigating the potential use of GWP* in understanding the climate impact of methane. Preliminary advice is that it has some merit in an LCA but also limitations in that account also needs to be taken of ongoing warming.

Combining GWP* with on-farm sequestration shows that sheepmeat has not added any additional warming for the last 20 years. **This means sheepmeat has arguably been 'climate neutral' during this time.** The footprint of beef was half that of its footprint using GWP100. However, it does not mean the job is done, and further ongoing emissions reductions will be required by sheep and beef farmers to reduce their warming impact.

Our naturally better farming story

New Zealand's sheep and beef farmers are making great progress towards being carbon neutral when you take into account the significant areas of carbon-sequestering woody vegetation on our farms, which is offsetting a substantial amount of our on-farm agricultural emissions.

This woody vegetation (made up of indigenous forest, mānuka/kānuka, exotic forest, indigenous shrubland and exotic scrub) covers around 2 million hectares, or just under 20 percent of all sheep and beef farmland area, and around 77 percent of it is indigenous.

Since 2003, the pastoral sector has invested around \$80 million towards ways to reduce greenhouse gas emissions across the sector – including progress in selective breeding programmes in sheep which could reduce methane emissions by up to 1 percent per year. Other reductions have been made through improvements in factors such as feed and nutrition, and pasture management.

Greenhouse gas emissions from sheep and beef farming have decreased by 30 percent in absolute terms since 1990, while production levels have remained stable.

LAND

There is concern globally about the amount of land used for livestock production and deforestation as a result of increased livestock production (for example to grow crops for animal feed in feedlots). In New Zealand the trend has been in the opposite direction. The sheep and beef sector is using 4 million hectares less land than it was 30 years ago, with similar numbers of animals per hectare.

At most times of the year, New Zealand beef and sheep farmers follow a form of rotational grazing, believed to be one of the most sustainable forms of livestock production.

Ninety-three percent of land used for sheep and beef production in New Zealand is not suitable for growing food crops because it is rolling or steep hills.

BIODIVERSITY

New Zealand's indigenous biodiversity is unique and our farmers are kaitiaki (guardians) of the land. Twenty-four percent of New Zealand's total native vegetation (including woody native vegetation such as mānuka/kānuka and other native plants such as tussock) occurs on sheep and beef farmland - with land-use changes over the past 30 years adding 2 million hectares to the country's conservation estate (the largest private sector contribution to biodiversity in New Zealand).

WATER USAGE

Our pasture-fed free-range sheep and beef farming uses significantly less extracted water such as irrigation than other forms of farming, such as plant-based production that often requires high levels of irrigation.

Globally, there's a lot of attention on water use. With plenty of natural rainfall in New Zealand, the vast majority of water used in livestock production comes from the sky ('green' water, as opposed to being extracted from surface or ground water sources – or 'blue' water).

WATER QUALITY

While there's still work to do to improve freshwater health in some areas of New Zealand, including reducing nutrient losses to freshwater, New Zealand sheep and beef farms are doing their bit as they already have very low nitrogen leaching levels in comparison to other food producing systems. This is due to our generally low number of animals per hectare and low use of nitrogen fertiliser.

The main impacts on water quality from sheep and beef production are sediment and *E. coli*. Measures of sediment and *E. coli* levels in waterways have been steadily improving over the last decade.

The farmer-led catchment communities movement has been described as sweeping New Zealand. There are hundreds of groups working together to make real differences to water quality, biodiversity and more in their areas.

ECO-EFFICIENCIES

Over the last 30 years, the sheep and beef sector has been producing more, with less. For example, New Zealand sheep numbers have reduced significantly (from 50 million, to 27 million) on 4 million hectares less land, while sustaining similar levels of production, through innovation and improvements in farm practice.



Frequently asked questions

How was the research conducted?

The researchers compared New Zealand's on-farm emissions to a range of countries' cradle-to-grave footprints across the globe (12 for beef, 9 for sheep).

The LCA comparison was calculated using the standard GWP100 approach for converting methane to carbon dioxide equivalent to enable valid international comparisons.

What does "one of the best in the world" mean?

Most studies of livestock look at the carbon footprint of animals up until the farm gate and use the GWP100 metric to calculate this. Farm gate means calculating a liveweight footprint. When looking at international studies New Zealand is amongst the smallest footprints. For sheepmeat this means in a band of 6 to 23kg CO₂-e, NZ sits at 6.01 kg CO₂-e kg and the average is 14.2kg CO₂-e kg. For beef the band is 6.68 to 31 kg CO₂-e kg, New Zealand sits at 8.97 kg CO₂-e kg and the average is 14.1 kg CO₂-e kg.

Why are there so many different numbers for sheep and for beef?

As part of the lifecycle of a sheep and cow, the emissions are calculated while the animal is on farm (to the farm gate) – this is called the liveweight. When the animal is processed, not all of the animal turns into meat. This conversion process means that the meat weight/carcass weight produces a heavier carbon footprint than liveweight. Processing, transport, packaging and other parts of the post processing all create an impact, which creates a third number, the cradle-to-grave number which is slightly heavier again than the carcass weight.

What about the food miles?

More than 90 percent of a sheep and cattle animal's emissions occur on farm. The transport and packaging are minor in comparison to the overall figure, and when put together with the on-farm emissions, still represent a similar or a lower figure than the overall emissions from a domestically produced product overseas. This means that international consumers can buy New Zealand beef and sheepmeat without worrying that food miles are causing more climate damage than buying local.

How can we trust this information?

Researchers Stewart Ledgard, Andre Mazzetto and Sally Falconer are academics from AgResearch, a New Zealand Government-owned Crown Research Institute. The report has been published in *The Environment Review Assessment*, which means it has been peer reviewed and held up to academic rigour.

Why did you not combine sheep and beef into one footprint?

LCAs are typically done to provide consumers with a benchmark for an individual product. Combining sheepmeat and beef would not allow for consumers to differentiate.

What is climate neutrality?

The FAO notes that climate neutrality is "a situation where an organisation or industry is making no additional contribution to radiative forcing (and) could be regarded as consistent with climate stabilisation and described as climate neutral. This does not resolve the question of what an acceptable level of radiative forcing from this organisation or industry is."

With New Zealand sheepmeat having reduced the amount of emissions by 32 percent from 1990 and on-farm sequestration absorbing a proportion of the remaining emissions, the average carbon footprint of sheepmeat is -0.32kg CO₂-e. It has created zero additional warming for over twenty years. But as noted by the FAO, some account also needs to be given to ongoing warming.

Have any other countries done an LCA using GWP*?

Australia has used similar science to GWP* - radiative forcing – and found that its sheepmeat has also been climate neutral. The US beef and dairy industry has recently released a strategy to become climate neutral based on GWP*.





What is B+LNZ and MIA's position on GWP*?

We believe that GWP100 is not a good measurement of the climate impact of methane, especially if methane is stable or reducing. As more focus goes on addressing methane, we want more appropriate metrics or models used, and for more of a focus to go on warming to ensure that methane is asked to play an appropriate role.

Based on discussions with GWP* experts, we believe that GWP* or warming models are very appropriate to use at the global and national level for helping to determine what reductions methane needs to make. We request the Government to start to report on warming as well as emissions – and to immediately review New Zealand's current methane targets as we believe the current targets are asking agriculture to do more than what is being asked of CO₂.

The use of GWP* in an LCA and at the farm level is more complicated, and further work is needed to determine how GWP* could be used.

What are the implications of this for our industry?

While New Zealand red meat producers are among the most efficient farmers in the world, there's still work to do to keep a lid on global temperature rises. What we're asked to do as part of these efforts, however, needs to be fair – work on this is ongoing. The Split-gas approach is central to this, as is the use of GWP* to assess warming impact.

It is complicated to apply GWP* at the farm level. GWP* grandparents where a farm is currently at and requires 20 years' worth of data that is auditable. Sales, moving boundaries, and consolidation of smaller farms into bigger farms have implications for how to account for methane emissions. If emissions go up, the price would be extremely punitive. Māori land, which has been historically underdeveloped, would also be unfairly penalised, should they wish to develop their land.

What is your view on the New Zealand Government's methane targets?

We want the methane targets amended so methane's targets are similar in effect on the climate to CO₂'s target: i.e. no additional warming by 2050.

We want the Government to start to report on annual warming and annual emissions.

Using GWP*, New Zealand sheepmeat has been climate neutral, but we acknowledge our ongoing warming and that we still need to continuously improve.

It is important the Government acknowledges GWP* and the warming approach.

We want to build consumer understanding of the different impacts of production and the world-leading footprint of New Zealand beef and sheepmeat.