

WHERE DOES RED MEAT FIT

in today's **healthy & sustainable** diets?



A summary of the evidence exploring red meat's place in optimal healthy and sustainable dietary patterns.

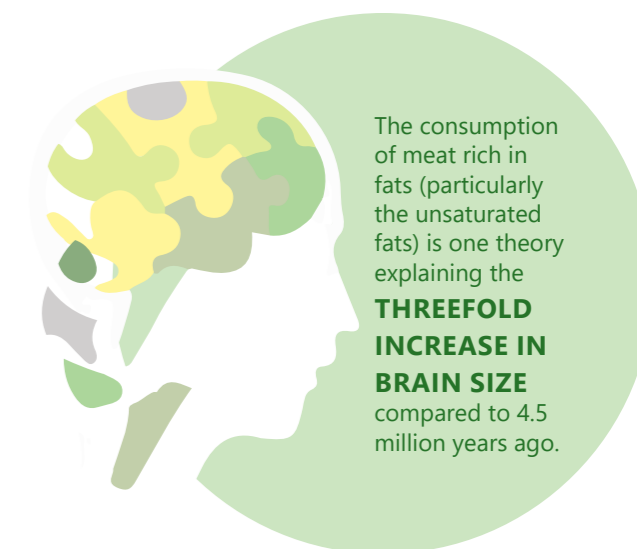
This summary of the full report *The Role of Red Meat in Healthy and Sustainable New Zealand Diets*, aims to inform readers that health and sustainability do not have to be a trade-off with pasture-raised New Zealand beef and lamb. In fact, both factors can be simultaneously honoured, and have a mutual benefit to both people and planet when red meat is farmed in a sustainable way and consumed in moderation.

Where does New Zealand beef and lamb fit in healthy and sustainable diets?

For as long as humans have roamed this earth, the need for food has been driven by one thing: survival. Food choice for our ancestors was limited to availability and accessibility, and while this is still the case in some parts of the world today, most of the Westernised world has the privilege of ample food choices. With more choice comes more decisions on what to eat, and the general consumer landscape is evolving to favour foods that are not only good for health, but also good for the planet.

Red meat had a central role in the diet in pre-historic humans. It has been a part of the diet for 2.6 million years, providing an important source of essential nutrients throughout time.

Today, red meat has been shown to support optimal health and well-being as part of a varied and balanced diet, but as consumers grow more environmentally conscious, it is important to shed light on the role of red meat from both health and sustainability perspectives.



What do sustainable diets look like?

To support growing global and local populations, sustainable and nutritious diets are of paramount importance. The attributes of a healthy and sustainable diet include long-term low environmental impact, which contribute to food and nutrition security, healthy lives for present and future generations, and optimisation of natural and human resources. Sustainable diets should be culturally acceptable, accessible, economically fair, affordable, safe and nutritionally adequate.

All food production has an environmental impact. When it comes to meat, international research that examines the sustainability of beef production primarily draws on feedlot and grain-finished production. This has a very different environmental footprint to pasture-based systems as conducted on New Zealand beef and sheep farms, where the sector has one of the lowest input and lowest impact production systems in the world.

Agriculture is an essential link in the food system. Some parts of the world, including New Zealand, are geographically suited to livestock farming with hilly terrain and good rainfall. Grazing livestock play an important role

in grassland ecosystems, biodiversity and soil regeneration. Pasture-fed ruminants, such as sheep and cows, are effective up-cyclers, converting low-quality protein from pasture into highly-bioavailable protein. Lean red meat is well recognised as a nutrient dense and bioavailable source of a range of essential nutrients, playing a valuable role in achieving nutritional status and addressing malnutrition in the nutritionally vulnerable.

Greenhouse gas emissions (GHGE) are a widely discussed element of sustainable diets. Plant-derived foods generally have lower GHGE per gram of food than animal source foods, however, the environmental impact can vary when calories, nutrient density and nutrient quality is considered, highlighting the importance of animal source foods delivering a lot of nutrition in a little.

It is often believed meat-inclusive diets require more energy, land and water resources than a lacto-ovo-vegetarian diet. However, the Intergovernmental Panel on Climate Change (IPCC) report on Climate and Land highlighted how resilient, sustainable and low-GHG emission systems, similar to New Zealand's pastoral systems, can play a role in minimising the impacts of global warming and adjust to changing climates.

A food systems framework

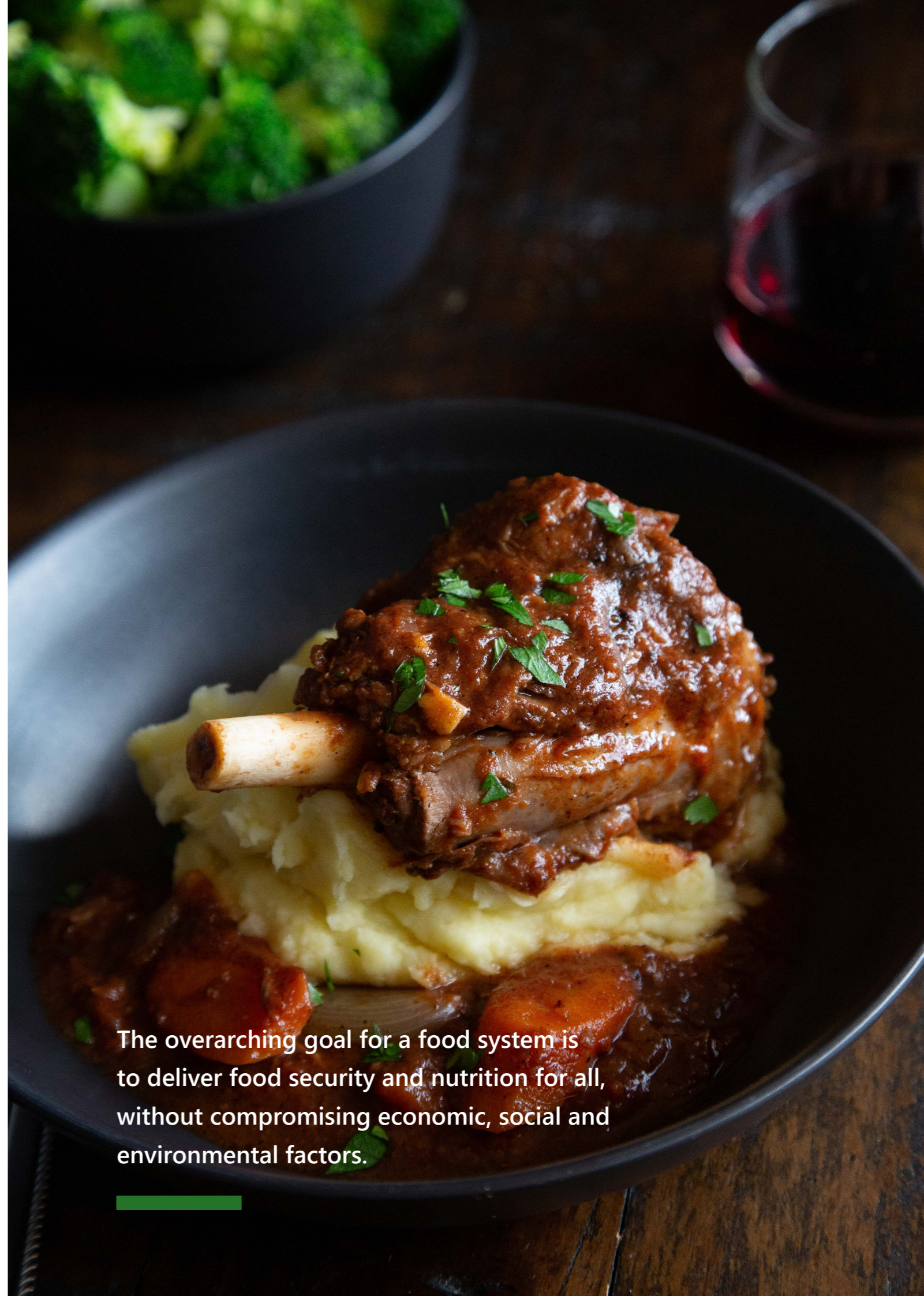
Underpinning healthy and sustainable diets are resilient food systems that encompass all activities and people involved in food production, manufacturing, distribution, consumption and disposal of food, originating from agriculture, horticulture, forestry and fisheries. The overarching goal for a food system is to deliver food security and nutrition for all, without compromising economic, social and environmental factors. As the world's population is set to reach 10 billion by 2050, it is crucial to understand how the food system works globally and nationally to elicit change, and align with the UN's Sustainable Development Goals related to food production, hunger, health and nutrition.

Climate change can and will undoubtedly put significant pressure on the food system, particularly as farmers rely on predictable weather and sufficient growing seasons. Issues with water quality and accessibility, soil health and land development can negatively affect the food system. Therefore, there is a pressing need for the food system to be adaptable, intervention-focused and resilient to withstand environmental implications, and be sustainable for future generations.

How much are we eating?

Red meat consumption has changed over the past decade. The last adult national nutrition survey (2008/9) showed New Zealanders were eating an average of 400g of beef and lamb per week. In comparison, recent data from OECD-FAO shows New Zealanders are eating approximately 284g (221g beef, 63g lamb) per week. For those who only eat beef or lamb as their red meat choice, this is well below the recommended red meat intake of 350-500g per week advised by the Ministry of Health and World Cancer Research Fund.

While the consumption of beef and lamb appears to have decreased, more research and data is required at a population level to ascertain the representation of all meat consumption in the diet.



The overarching goal for a food system is to deliver food security and nutrition for all, without compromising economic, social and environmental factors.



Meat is a rich source of many key nutrients including protein, iron, zinc and vitamin B₁₂. These are particularly essential in the diets of population groups with higher nutrient needs, including children, adolescents, pregnant women, athletes and older adults.

Nature's power pack: a lot in a little



Red meat provides nutrients that enable optimal growth and development in childhood, and maintenance of health and well-being throughout adulthood into older age.

Red meat's unique package of essential nutrients provides 'a lot in a little', meaning a moderate portion contributes significantly to daily nutrient requirements. It is a rich source of bioavailable protein that is highly absorbable, digestible and provides all essential amino acids necessary for DNA repair and muscle synthesis.

Red meat is more than protein and iron; it is also a rich source of bioavailable zinc, and vitamin B₁₂, and provides selenium, vitamin D and B vitamins. It contributes monounsaturated fat and omega-3 fatty acids which are important for optimal health. A significant portion of the lipids in lean meat are in the form of phospholipids, which are a source of choline, contributing to normal fat and homocysteine metabolism. When trimmed of visible fat, red meat is low in total fat and saturated fatty acids.

Red meat and health

Associations linking red meat and chronic diseases have been well-publicised, however the strength of these associations are debated in the scientific community, given associations do not imply cause. This is because identifying a single food as a cause of a disease or illness is very difficult to prove and disentangle from other dietary and lifestyle factors that may be involved. Therefore, the current body of evidence supports the recommendation of moderate amounts of lean red meat as part of a healthy, balanced diet and lifestyle.

Since the introduction of the Quality Mark in 1997, a **reduction of 65% saturated fat** has been removed from the meat supply by trimming standards, ensuring consumers are purchasing high quality meat.



CARDIOVASCULAR DISEASE

Whilst there are studies that show red meat can have a sub-optimal effect on heart health, there are many countering studies demonstrating how lean red meat can be incorporated into a heart-healthy and cholesterol-lowering diet. When meat is trimmed of external fat and is lean, it does not lead to a rise in total blood cholesterol or increased risk of cardiovascular disease in both individuals with high and normal cholesterol. The New Zealand Heart Foundation recommendation for a heart healthy diet can include up to 3 meals of red meat a week (350g cooked/week). Preliminary evidence from research conducted in New Zealand suggests that red meat consumption, within the WHO guidelines does not negatively impact markers of cardiovascular disease in hypocholesterimc (low levels of cholesterol in the blood) men compared to soy-based diets. Red meat contains good amounts of stearic acid and monounsaturated fat, which have been shown to have a neutral and lowering effect on LDL cholesterol levels respectively, and can help maintain HDL cholesterol levels.

CANCER

To date, there is no scientific evidence to show eating lean red meat is a direct cause of cancer. Some studies have suggested a modest association between excessive levels of red meat consumption, particularly processed meats, and colorectal cancer. However, general dietary patterns and lifestyle appear to be more important determinants of cancer risk than specific foods. As research continues, dietary guidelines advise avoiding very high intakes of red meat, particularly of processed meats, and to limit very high temperature cooking methods. The World Cancer Research Fund and the Ministry of Health recommend up to 500g of cooked red meat (equivalent to about 750g raw) per week. The majority of New Zealanders eat to these recommendations.

WEIGHT MANAGEMENT

Lean red meat is low in saturated fat and calories and can be part of a diet for a healthy weight. Evidence is growing around the importance of high-quality protein in weight management. This may be related to the positive effects of protein on appetite control, satiety, food cravings and reduction of intake of fat and carbohydrate. Review of the current evidence supports a higher protein diet benefits weight loss and weight maintenance, in comparison to low or standard protein diets. However, a consensus on optimal amounts and sources of protein have not been determined from current research.

TYPE 2 DIABETES

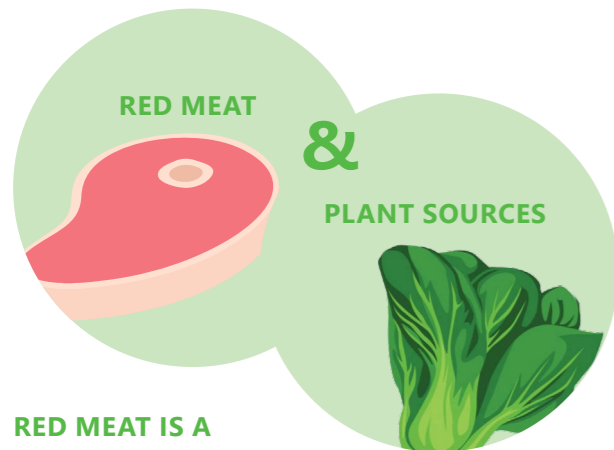
High protein diets have been examined in relation to type 2 diabetes risk. There is mixed evidence as to whether high protein diets can be helpful or harmful in individuals with type 2 diabetes, although they can have positive effects on glycaemic regulation for those without diabetes. As the research continues to evolve, the evidence supports current advice to enjoy lean red meat in moderation as part of a varied, balanced diet, for those with or without type 2 diabetes.

MENTAL HEALTH

The World Health Organisation recognises mental health as an integral part of health and well-being. The rates of mental health diagnoses in New Zealand are on the rise and recent evidence suggests nutrition plays an important role in mental health status. While some authors have shown increased red meat consumption may independently play a positive role in mental health, it is likely that overall dietary patterns as a whole are more indicative of mental health than a single food.

IRON DEFICIENCY

Inadequate intakes of iron can lead to varying levels of deficiency with or without anaemia. Iron deficiency is the most widespread nutritional disorder worldwide and commonly affects the most vulnerable populations including infants, children, adolescents and pregnant women. New Zealand research suggests one in 14 women are low in iron, 14% of children under the age of two are iron deficient, and 8 out of 10 toddlers and a third of teenage girls don't meet their recommended daily intake of dietary iron. In 2019, it was reported that the New Zealand District Health Board cost of hospitalisations of iron deficiency anaemia doubled in the last ten years, yet messaging for a climate-friendly diet often suggests reducing or eliminating the intake of red meat (one of the highest sources of bioavailable dietary iron). An iron-rich diet that includes guidance on dietary patterns that can include moderate amounts of lean red meat is recommended by health authorities, including the Heart Foundation of New Zealand and the Ministry of Health. Plant-based sources of iron should also be encouraged along with foods containing vitamin C to enhance iron absorption.



RED MEAT IS A GOOD SOURCE OF IRON
with high bioavailability (15-25% is absorbed compared to 5-12% from plant sources).

What are the nutritional implications of not eating meat?

A meatless diet can be nutritionally adequate but needs careful planning to ensure nutritional requirements are met. Iron, zinc, protein and vitamin B₁₂ demand particular attention to prevent deficiency. Replacing meat with plant-based foods, such as beans and pulses will increase intakes of iron and zinc inhibitors, such as phytates. This is one reason why current recommended dietary intake (RDI) advice suggests vegetarians need up to 80% more iron and 50% more zinc. To meet protein requirements on a plant-based diet, consuming higher quantities of food is often required to fulfill amino acid requirements.

It is imperative those choosing to exclude animal foods from their diet are well informed of the risks and implications that can be associated with an exclusively plant-based diet. It is recommended to seek professional advice from a Registered Dietitian or Registered Nutritionist, particularly for children.

Meatless products

With a growing interest and investment in meat substitutes, such as lab-grown meat, insect proteins and plant-based meat mimicking products, these foods have been socially deemed more sustainable than meat. However, on the whole there is currently limited research regarding the environmental impact, resource requirements, nutrient quality, nutrient density, toxicity and health consequences of these proteins. While the promise of animal-free alternative foods appears to have its advantages, at this stage, the potential sustainability gains of meat alternatives such as existing plant-based meat alternatives, and whole insects is moderate to uncertain.

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What's happening on the farm?

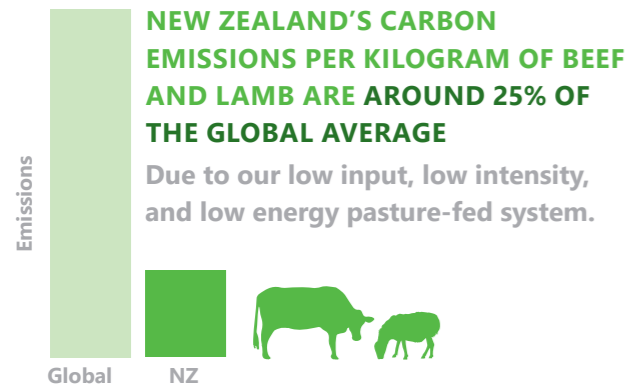


This makes it one of the lowest input and most efficient livestock farming systems in the world.

Much of the commentary about the sustainability of livestock production is based on the intensive systems overseas, which require grain for feed. In New Zealand, where our red meat is pasture raised, our farmers, the stewards of the land, are involved with continuous, innovative work to reduce greenhouse gas emissions, diversify and optimise land use, enhance biodiversity, optimise water quality and care for the animals.

GREENHOUSE GAS EMISSIONS

Nearly half of New Zealand's GHGE come from agriculture.



Since the 1990s, the New Zealand sheep and beef sector has made major productivity and eco-efficiency gains, and consequently reduced their GHGE by over 30%, with a goal of being carbon neutral by 2050.

One way to help achieve this goal, and offset carbon emissions, is through trees on farms.



AT PRESENT THERE ARE **2.8 MILLION HECTARES OF NATIVE VEGETATION ON SHEEP AND BEEF FARMS (24% OF ALL NATIVE VEGETATION)**

Including 1.4 million hectares of native forest (17% of all native forest) and 180,000 hectares of pine.

EQUIVALENT TO NEARLY... **2.8 MILLION RUGBY FIELDS**



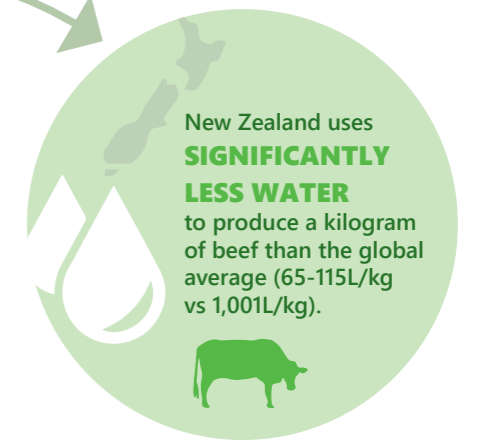
Woody vegetation on New Zealand beef and sheep farms is estimated to be offsetting between 10,934 to 19,665 kt CO₂e, **WHICH IS 63-118% OF ON-FARM AGRICULTURAL EMISSIONS. THIS MEANS NEW ZEALAND BEEF AND SHEEP FARMS ARE WELL ON THE WAY TO BEING CARBON NEUTRAL.**

LAND USE

Sheep and beef production uses 34% of New Zealand's total land mass. Of that land, 93% is best suited for rearing animals, rather than crops, due to its hilly terrain. That leaves only 7% suitable for cropping and 6% of sheep and beef farms have already adopted some form of crop farming. Historically, deforestation was significant on sheep and beef farms, however considerable reforestation has occurred and is still underway, ensuring the right tree is planted in the right place.

WATER USE AND QUALITY

Interestingly, New Zealand beef uses significantly less water than the global average for fruit and pulse production (236L/kg and 875L/kg, respectively). This is in part due to limited use of irrigation on sheep and beef farms, as the majority of water used is natural rainfall. The sector is working on improving its impact on water quality. For example, sediment loss is being improved through planting erosion-prone areas and retiring areas from production; phosphorus fertiliser use has decreased significantly over the last decade, and nitrogen leaching on sheep and beef farms is significantly lower than other sectors due to lower stocking rates and lower nitrogen fertiliser use.



ANTIBIOTICS, HORMONAL GROWTH PROMOTANTS AND GENETICALLY MODIFIED ORGANISMS

New Zealand has among the lowest antibiotic usage globally in sheep and beef production due to strict controls. In addition, the extensive outdoor farming system means animals are not cooped up in confined spaces and therefore are less likely to catch infections and require antibiotics. Likewise, hormonal growth promotants are virtually never used in New Zealand due to strict controls (used only with 0.001% of livestock). Moreover, New Zealand has one of the most rigorous genetically modified organism approval regimes in the world, whereby no genetically modified food is grown in New Zealand.

ANIMAL WELFARE

New Zealand has a high standard of animal welfare set through regulation and a progressive approach from industry, by adopting new technologies to meet public expectation. Development of assurance programmes aim to capitalise on the farmers exceeding minimum legal standards.

What's next?

- A deep dive into the health and nutritional attributes of New Zealand beef and lamb is currently underway to investigate the advantages of eating pasture-raised red meat.
- The carbon footprint of New Zealand beef and lamb is being analysed to provide a current picture of the lifecycle analysis (LCA), using the latest methodologies.
- Research exploring how regenerative agriculture differs from New Zealand farming practices, and its market potential.



The vast majority of on-farm emissions are being offset by the woody vegetation on New Zealand beef and sheep farms.

BEEF + LAMB

NEW ZEALAND

This is a summary of the report *The Role of Red Meat in Healthy and Sustainable New Zealand Diets*, which has been independently peer-reviewed and is fully referenced. To view a copy, visit www.beeflambnz.co.nz or request a copy from Beef + Lamb New Zealand, freephone 0800 733 466 or email enquiries@beeflambnz.co.nz