Role of Australian red meat in a healthy and sustainable diet

Report 1: Environmental impact of red meat in a healthy diet

MEAT & LIVESTOCK AUSTRALIA

Introduction

This Report is the first of a series on the role of Australian red meat in a healthy and sustainable diet.

Each of the Reports describe different aspects of healthy and sustainable diets and provide direction for nutrition communications.

1

Environmental impact of red meat in a healthy diet

Evidence on the role of production systems, waste reduction systems and dietary strategies to meet the dual objectives of human and planetary health.

2

Healthy diets by life-stage

Enablers and barriers to sustainable consumption of red meat in a diet that is nutritionally adequate and in line with chronic disease prevention goals.

3

Australian red meat and healthy meals

Australian red meat consumption, its nutritional value and ways to support its sustainable consumption in three to four enjoyable and healthy, balanced meals a week in line with Australian Dietary Guidelines.

OUR APPROACH

Australian

Data and insights to contextualise global evidence on red meat consumption in the Australian diet.

Practical

Behavioural insights to find ways to enable consumers to enjoy red meat in healthy and sustainable diets.

Current

Research, monitoring and impact evaluation to maintain relevance with emerging science, public health priorities and changes in consumer behaviour.

Executive summary

ENVIRONMENTAL FOOTPRINT

- Relative to other foods in the Australian diet, the impact of Australian beef and lamb on water and cropland scarcity is low.
- Australian lamb is one of only two Australian foods that is climate neutral – since 1990, the contribution of Australian lamb production to global temperature increases has plateaued, making no further contribution.
- Climate neutral beef production can also be achieved through the adoption of production and waste reduction strategies outlined in the Australian red meat industry's Carbon Neutral by 2030 Roadmap.

IMPACT OF DIET

- The amount of food consumed is the main dietary determinant of environmental impacts. The more food consumed, the higher the impact of the diet, regardless of whether it is a healthy or unhealthy diet.
- The relative impact of reducing red meat consumption below amounts recommended in the Australian Dietary Guidelines is relatively small and results in trade-offs such as higher water scarcity impacts.
- Provision of portion guidance of all foods, including red meat, in line with the Australian Dietary Guidelines is an effective way to help Australians follow a healthy diet and reduce the impact of overconsumption on health and the environment.

RED MEAT

- Current average red meat consumption is 57g per day in Australia. This is stable and in line with the Australian Dietary Guidelines (65g per day).
- Consumption is typically across three to four meals per week, with little difference across socio-economic groups.
- Adopting meal-based recommendations to provide portion guidance helps consumers adjust intake of all foods consumed as part of the red meat meal occasion in line with the Australian Dietary Guidelines.

IN CONCLUSION

Supporting current red meat consumption in three to four healthy, balanced meals a week aligns dietary and environmental objectives.

The environmental footprint of Australian beef and lamb

Evidence

Framework

- Research conducted by CSIRO provides a framework for describing the environmental impact of Australian beef and lamb within the context of the Australian diet.
- The evidence is unique to Australian production systems and dietary patterns and describes the relative impact of foods in the Australian diet against three environmental indicators – water scarcity, cropland scarcity and climate impacts.
- The footprint of the Australian diet is currently within planetary boundaries for freshwater, marginally exceeding the cropland boundary and entirely exceeding the climate change planetary boundary[1,2,3].
- The findings, based on Life Cycle Assessments (LCA) studies, explain how foods in the Australian diet impact on the environment in different ways according to how and where they are produced and how much is consumed.

Indicators

Water scarcity impact

Water use within the context of local water scarcity[4].

Impacts are higher in areas where water is scarce and food production is reliant on irrigation. It is low where water is abundant or where crops are not reliant on irrigation[5].

Cropland scarcity impact

Land use within the context of productive land scarcity (i.e. the productive capability of cropland[6]).

Impacts are generally higher on more productive, arable land than on less productive, marginal land not suitable for cropping. For livestock, utilisation of crops as feed increases impacts[6].

Climate impact

The imbalance of incoming and outgoing radiation in relation to temperature-based climate stabilisation objectives of the Paris Agreement[7].

Climate neutral production is achieved when there is no net increase to radiative forcing (i.e. the industry is not contributing to further climate change[8]).

Key findings

1.

Water and cropland scarcity footprints of Australian beef and lamb are low

- Impacts are relatively low because Australian cattle and sheep are predominantly grassfed, mostly on marginal land not suitable for cropping, providing little competition for productive cropland[4,6].
- Grain-feeding is typically limited to short periods depending on climatic conditions and market requirements.
- Since cattle and sheep typically graze on native grasses, bushes and pastures, their production requires little to no irrigation, providing little competition for water use or productive cropland[7,8].

2.

Australian lamb is climate neutral

- Lamb is one of only two foods (along with rice) in the Australian diet that is climate neutral[9].
- 'Climate neutral' means the production system is no longer contributing to global temperature increases because emissions produced are balanced by emissions removed from the atmosphere[9].
- Research by CSIRO shows that since 1990, the contribution of Australian lamb production to global temperature increases has plateaued, making no further contribution[9].

3.

Reducing the climate impact of Australian beef is the main priority

- While the impact of Australian beef is relatively higher, the Australian red meat industry is committed to reducing this.
- Strategies are outlined in the Australian red meat industry's Carbon Neutral by 2030 Roadmap (CN30), which provide pathways for achieving climate neutral production[10].
- Production and waste reduction strategies that reduce emissions entering the atmosphere include legumes and livestock supplements such as red algae, methane capture from waste and its reuse as an energy source, genetics and husbandry practices and vegetation management[11].
- Production strategies that remove emissions from the atmosphere include planting trees, legumes and pastures and introducing dung beetles that improve carbon storage and increase nutrient cycling from manure into the soil[12].

Practical Implications

- A localised approach is critical to understand the environmental impact of the Australian diet, including beef and lamb, and to identify mitigation strategies[13,14].
- Through its Beef and Sheep Sustainability Frameworks and programs such as the CN30 Roadmap, the Australian red meat industry is committed to reducing its environmental impact[15,16].
- The adoption of new technologies and practices provide pathways for achieving climate neutral beef production and provide multiple other environmental and industry benefits.

Australian beef and lamb impacts are relatively low for water and cropland scarcity – Australian lamb is already climate neutral and climate neutral beef will be achieved through adoption of production and waste reduction strategies.

Impact of dietary strategies

Evidence

Modelling conducted by CSIRO describes how the dual objectives of lower environmental impact and higher diet quality can be achieved in the Australian diet[17].

Using Australian data representative of Australian dietary patterns and food production systems, quadrant analysis, illustrated in Figure 1, was conducted to determine the type of dietary changes required to achieve consumption of a healthy diet with a lower environmental impact.

The impact of two dietary changes were evaluated:

1. **'Portion guidance' strategy** – involved shifting average intake of core and discretionary food groups in the Australian diet to amounts recommended in the Australian Dietary Guidelines.
2. **'Swap' strategy** – involved swapping higher for lower environmental impact food choices within each food group in a dietary pattern containing amounts of core and discretionary food groups recommended in the Australian Dietary Guidelines.

Figure 1: Impact of dietary strategies

Developed by CSIRO, the impact of the dietary strategies is scored on two factors:

Environmental Impact Score – represented on the y-axis, measures improvements from high to low environmental impacts based on the combined impact of the dietary strategy on climate, water and cropland scarcity.

Diet Quality Score – represented on the x-axis, measures improvements from low to high diet quality in line with the Australian Dietary Guidelines.

Goal:
Low impact,
healthy diet

To achieve the goal of low impact, healthy diets, the larger share of impact reduction must occur through production and waste reduction strategies.

Key findings

1. Portion guidance is a key strategy for a healthy diet

- Dietary changes in line with the Australian Dietary Guidelines improves the diet quality of the Australian diet but not its environmental impact – overall a net 6% increase[17].
- The amount of food is the main determinant of the environmental impact of the diet across all indicators, regardless of whether the diet is healthy or unhealthy[2,3,5,18].
- Since few Australians follow a healthy diet, the reduced environmental impact associated with reducing consumption of discretionary foods (18%) did not offset increases in environmental impact resulting from increased consumption of core foods (+26%)[17].

2. Production and waste reduction strategies are key for a low environmental impact diet

- The 'swap' strategy reduced the environmental impact of the Australian diet by 15%, however, the impact was modest relative to planetary boundaries and resulted in trade-offs. For example, improvements in climate impact were offset by increases in water scarcity impact[17].
- The lack of climate neutral foods available in Australia makes it impossible to construct a healthy diet within planetary boundaries from available foods[3]. Only two foods in the current Australian diet are climate neutral – lamb and rice[3].
- Few foods have low impacts across all the environmental indicators. For example, vegetarian alternatives can have higher water scarcity footprints and poultry and pork have higher cropland scarcity impacts compared to red meat[2,6].

Practical implications

- Since few Australians are eating a healthy diet, portion guidance in line with Australian Dietary Guidelines benefits both human and planetary health.
- Portion guidance helps individuals to adapt their intakes to amounts recommended in the Australian Dietary Guidelines because the research found that the average Australian diet is made up of a wide range of dietary patterns.
- Production and waste reduction strategies are more effective ways to achieve a low environmental impact, healthy diet in Australia since most impacts occur in the production system and these can differ depending on how and where the food is produced.
- Portion guidance also has the potential to help consumers manage their household food waste, an important contributor to environmental impact.

Portion guidance of all foods, including red meat, in line with Australian Dietary Guidelines supports consumption of a healthy diet and minimises the negative impact of overconsumption and household food waste on the environment.

Red meat consumption strategies

Evidence

Measuring red meat consumption is challenging. Various estimates are provided, many of which overestimate actual consumption.

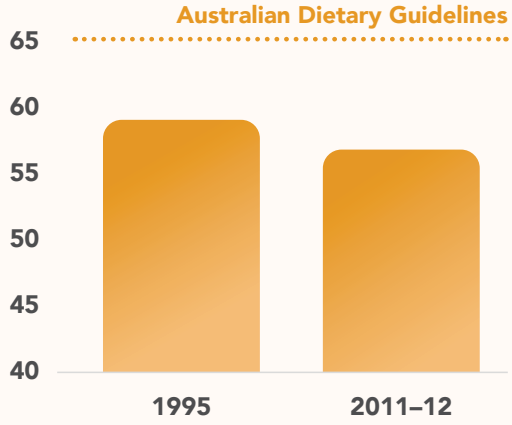
- A secondary analysis of data from the Australian Bureau of Statistics' national nutrition surveys (1995 and 2011–12) was conducted by the University of Sydney to explore how Australians are currently consuming red meat[19,20].
- A meals-based approach was used to better understand how the meal occasion influences amounts of red meat consumed in Australia[21].
- The consumption data reflects edible weight and includes only foods defined as 'red meat' in the Australian Dietary Guidelines.

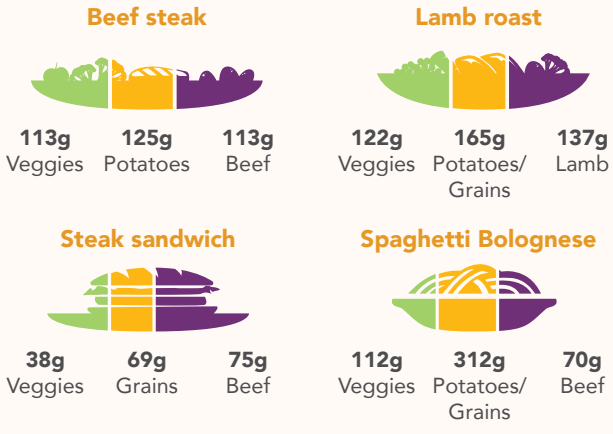
The secondary analysis provides a more accurate estimate of Australian red meat consumption:

- Estimates based on apparent consumption data such as FAO Balance Sheets and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) commodity statistics tend to overestimate consumption because they do not account for waste and non-human consumption such as pet food.
- Data sources that do not account for non-edible meat and include foods containing meat like sausages (unless lean and low sodium), pies and salami defined as 'discretionary foods' in the Australian Dietary Guidelines overestimate Australian red meat consumption.

Current Australian red meat consumption

Average per capita consumption (g per day) → Three to four meals a week





Key findings

1. Current Australian red meat consumption is stable

- On average, red meat consumption (57g per day) is consistent with amounts recommended in the Australian Dietary Guidelines of 65g per day of lean and cooked meat[19].
- The Australian Dietary Guidelines' recommendation refers to red meat and excludes meat products categorised as 'discretionary foods'[22].
- Average red meat consumption in Australia has remained consistent with the Australian Dietary Guidelines since 1995[20].

2. Consumption is typically three to four times a week

- Meal portion sizes of red meat range from 70g to 160g cooked weight[21].
- There is little difference in red meat consumption by different socio-economic groups[18].

3. A variety of meals are consumed

- The type of meal influences the portion sizes of not only red meat, but also the other components of the meal (e.g., vegetables and starchy foods)[21].
- Frequently consumed meals include 'meat and veg' style meals, pasta, stir fries, slow cooked meals, salads, soups and sandwiches[21,23].
- Within the context of the typical Australian repertoire, a variety of red meat meals are consumed, alternating between meals with smaller and larger portion sizes of red meat[21,23].
- Meals made with mince, like pasta and Mexican, are typically served with smaller portions of meat while meals such as 'steak and veg' are typically served with larger portions of meat, reflecting the purchase weight of regular steaks such as sirloin or scotch fillet.

Practical implications

Recommending a meals-based approach:

- provides an effective way to give portion guidance for red meat as it is consistent with how Australians eat a variety of red meat cuts in meals three to four times a week
- helps Australians to understand how much red meat to purchase for serving meals with recommended amounts. For example, 500g mince (raw weight) serves four and a 200g steak serves one
- maintains intakes of not only red meat, but also accompanying foods like potatoes and grains in line with amounts recommended for a healthy diet, thereby reducing the impact of overconsumption
- supports meal planning and preparation of three to four healthy, balanced red meat meals a, which can contribute to reducing the environmental impact of household food waste.

Supporting current red meat consumption in three to four healthy, balanced meals a week aligns dietary and environmental objectives.

Glossary

Climate neutral	No contribution to further global temperature rise.
Cropland boundary	The total global area of croplands mainly used for food production. It is recommended that global croplands should not exceed 15% of the earth's ice-free surface.
Freshwater planetary boundary	The current "freshwater use" planetary boundary is based on allowable human blue water consumptive use and has been set at 4,000km/year blue water consumption. Other values for this boundary have also been proposed[1]. Blue water refers to freshwater in lakes, rivers, reservoirs and groundwater stores. Consumptive use of freshwater refers to the water amount used and not returned.
Grainfed	Grainfed meat comes from animals which are fed grass for most of their lives and then transition to grain-based diets for the remainder of their lives. The number of days during which they are fed a grain-based diet varies.
Grassfed	Grassfed meat comes from animals that have only grazed on grass. They feed on a range of different types of grasses, depending on climate and region. In Australia, cattle and sheep are predominantly grassfed and account for, on average, approximately two-thirds of overall beef and sheepmeat production.
Husbandry	All measures of animal production including procuring animals, animal welfare and final slaughter.
Life cycle assessments	An assessment method that analyses the impact on the environment throughout the entire food production lifecycle.
Meat defined as 'discretionary food'	Australian Dietary Guidelines define the following products as 'discretionary foods' – sausages (unless lean and low sodium), bacon, ham, burgers, pies, salami, cured meats and other meat products that are high in fat and sodium.
Net zero emissions	The balance between greenhouse gases being produced and being offset by processes that reduce existing greenhouse gases in the atmosphere.
Planetary boundaries	An important sustainability concept to avoid major earth systems changes. Considers a variety of environmental aspects for both natural resource use and emissions, including cropland-scarcity footprint, climate footprint and water-scarcity footprint.
Radiative forcing	Relates to the balance between incoming and outgoing radiation. Greenhouse gas (GHG) concentrations in the atmosphere can impact the earth's energy balance and contribute to climate change. The goal of limiting mean global temperature rise to 1.5 °C, described in the Paris Agreement, depends upon urgent action to stabilise radiative forcing.
Red meat	Australian Dietary Guidelines defines red meat as including unprocessed and lean beef, lamb, veal, mutton, pork, goat, kangaroo and game meat.

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MEAT & LIVESTOCK AUSTRALIA

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Meat & Livestock Australia Limited
ABN 39 081 678 364

Level 1, 40 Mount Street
North Sydney NSW 2060

Phone: 02 9463 9333
Fax: 02 9463 9393
Web: mla.com.au