

LAND USE  
FUTURES

# GLOBAL FOOD AND LAND USE TRANSITIONS



## Diversifying sources of protein

GLOBAL FOOD AND LAND USE TRANSITIONS |

Much of the world’s protein supply comes from meat from livestock. Emerging alternative sources of protein for both human and animal feed include high protein plants, plant-based meat substitutes, aquaculture, insect-, algae- and worm-based protein and lab-grown protein.

Globally, consumer demand for non-traditional proteins and aquaculture have increased faster than any other sources, by 872 per cent and 74 per cent respectively, but are expected to remain a small market share in the near future<sup>1</sup>. This trend is expected to accelerate as a result of changing consumer preferences due to “dietary shifts for health and ethical reasons, government regulations, environmental constraints and technological advances”<sup>2</sup> (see the [Promoting Healthy Diets](#) paper).

Production of alternative protein provides a sizeable new economic opportunity for farmers and food manufacturers. It could also provide health benefits, reduce demand for crops to feed animals, stabilise animal feed costs<sup>3</sup>, free up land and water for other uses, and cut methane and greenhouse gas emissions. For example, micro-algae require no chemicals and can be grown in wastewater or seawater<sup>4</sup>, while insects can be raised in shipping containers using waste products and minimal water<sup>5</sup>. It should be noted, however, that the lifecycle environmental impacts of different protein sources varies significantly and the evidence base is still developing.

Accelerating this transition would involve helping entrepreneurs achieve faster growth, and investing to ensure public good outcomes.



## AUSTRALIAN CONTEXT

### Global shifts in protein consumption patterns present a major opportunity

- Shifting Australia’s protein production mix to match projected global demand, including boosting aquaculture – could add \$55 billion to Australia’s food processing production value in 2025<sup>6</sup>.
- Increasing production of alternative proteins such as insects and algae has been estimated to present an economic opportunity of around \$6.6 billion by 2030 (\$4.1 billion domestic, \$2.5 billion export)<sup>17</sup>.
- Currently, the majority of ingredients in alternative proteins are imported, representing an opportunity for Australian farmers<sup>8</sup>.

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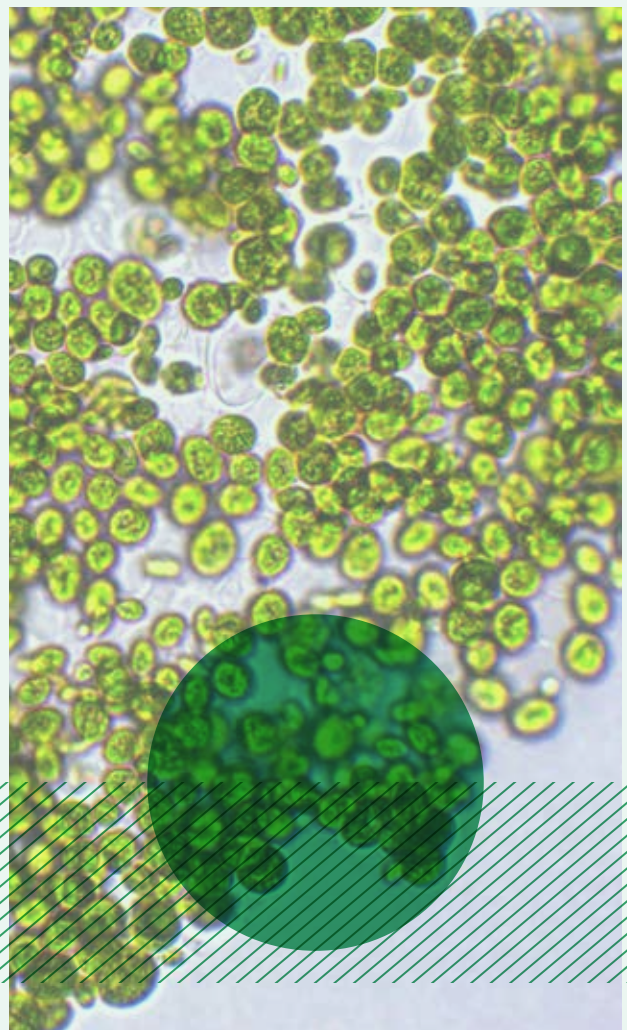
### Alternative protein industries are emerging

- Plant-based meat alternatives are currently estimated to generate \$150 million in Australian retail sales, almost \$30 million in manufacturing value added, and 265 jobs<sup>9</sup>. By 2030, this could grow to almost \$3 billion in retail sales, over \$1 billion in manufacturing and over 6,000 jobs<sup>10</sup>.
- Aquaculture has been identified as an area where Australia’s current production structure is ‘underweight’ compared to projected global demand, with only 2 per cent of the value of Australian production coming from aquaculture<sup>11</sup> (aquaculture and wild catch fisheries are discussed in the Securing a Healthy and Productive Ocean paper, to be released soon).
- Australia’s producers could capture new opportunities for value-added plant-based protein products, such as ‘cauliflower rice’<sup>12</sup>.
- Niche industries exist for protein sources such as micro-algae (e.g. Western Australia’s Hutt Lagoon, the world’s largest plant)<sup>13</sup>, insects (e.g. ACT-based Goterra)<sup>14</sup> and wild-caught native meats (e.g. kangaroo)<sup>15</sup>.

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### Cultural, governance, regulatory and investment factors will determine the extent of alternative protein uptake

- The alternative protein industry remains highly immature, with governance, quality assurance and regulation insufficient to provide transparency and confidence.
- Shifting attitudes to food are another key factor, with strong debates about how traditional and alternative proteins might fit into the Australian diet and culture in the future.
- Low levels of venture capital investment in Australia, compared to countries such as the US, Canada and Israel<sup>16</sup>, present a barrier to the development of competitive alternative protein companies and industries.



i It is important to note that estimates of the benefits and potential for alternative proteins can vary depending on the methodologies and assumptions applied.

## CURRENT STATE OF PLAY

Key action areas<sup>ii</sup> for diversifying sources of protein include:

- **INCREASE RESEARCH AND DEVELOPMENT** spending to support Australian farmers and businesses to capture economic opportunities, especially those that align with associated public good outcomes (e.g. more affordable protein products for low income households).

- **BUILD CONSUMER TRUST** by building the evidence base for alternative proteins costs and benefits, by developing regulatory standards and requirements, and through public procurement.

The table below outlines the current state-of-play for each action area, including major current and proposed initiatives.

KEY ACTION AREA	PROGRESS TO DATE
INCREASE RESEARCH AND DEVELOPMENT SPENDING TO SUPPORT AUSTRALIAN FARMERS AND BUSINESSES	<ul style="list-style-type: none"> <li>● CSIRO provides some public support for commercial ventures, e.g. v2food, which is developing plant-based protein products sold through Hungry Jacks and Marley Spoon<sup>17</sup>.</li> <li>● Food Innovation Australia (FIAL) undertakes publicly funded research on food innovation opportunities, including alternative proteins<sup>18</sup>.</li> <li>● AgriFutures Australia’s remit includes developing emerging or alternative agriculture industries, and they have recently conducted research into the opportunities for alternative proteins in Australia<sup>19</sup> and have produced a ‘roadmap’ for scaling up Australia’s insect industry<sup>20</sup>.</li> <li>● Food Frontier is an independent think tank established to support the growth of alternative proteins via data, research, reports, and events connecting business, innovators and policy makers<sup>21</sup>.</li> </ul>
BUILD CONSUMER TRUST THROUGH REGULATORY STANDARDS AND PUBLIC PROCUREMENT	<ul style="list-style-type: none"> <li>● Regulators have considered competing industry views (but as yet have not reached conclusions) on whether to regulate alternative protein terminology, especially the use of terms ‘milk’, ‘meat’ and ‘seafood’ to label alternative products not derived from animals<sup>22</sup>.</li> <li>● There are concerns that the quality of different types of plant-sourced meat analogues is “far from consistent across the market”<sup>23</sup>.</li> <li>● A 2020 Agrifutures report stated that “government officials and regulatory bodies need to ensure food safety, allergen testing, and biosecurity regulations are appropriately covering emerging products”<sup>24</sup>.</li> </ul>



ii Based on the Growing Better report.

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## FOR MORE INFORMATION

The Land Use Futures program is working to adapt the global transitions to reflect Australia's unique national and regional circumstances, and identify key actions to accelerate the transition. This paper is the first step in that process.

Find out more about Land Use Futures by visiting our website: [www.climateworksaustralia.org/project/land-use-futures](http://www.climateworksaustralia.org/project/land-use-futures)

The Land Use Futures program is led by ClimateWorks Australia (working within the Monash Sustainable Development Institute), Deakin University and CSIRO.

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