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Submission to the
Agricultural Competitiveness Issues Paper

by

The Australian Academy of Technological Sciences and Engineering
(ATSE)

to

Agricultural Competitiveness Taskforce
Department of the Prime Minister and Cabinet
Australian Government

April 2014

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President

Dr Alan Finkel AM FTSE

The Secretary
Agricultural Competitiveness Taskforce
Department of the Prime Minister and Cabinet
PO Box 6500
CANBERRA ACT 2600

17 April 2014

Dear Sir/Madam

ATSE Submission: Agricultural Competitiveness Issues Paper

The Australian Academy of Technological Sciences and Engineering (ATSE) welcomes this opportunity to provide some high-level input to the Government's Agricultural Competitiveness White Paper Issues Paper.

ATSE advocates for a future in which technological sciences, engineering and innovation contribute significantly to Australia's social, economic and environmental wellbeing. The Academy is empowered in its mission by some 800 Fellows drawn from industry, academia, research institutes and government, who represent the brightest and the best in technological sciences and engineering in Australia. The Academy provides robust, independent and trusted evidence-based advice on technological issues of national importance. ATSE fosters national and international collaboration and encourages technology transfer for economic, social and environmental benefit.

ATSE has recently developed an Agriculture Position Statement, and launched an agriculture-focussed report – *Food and Fibre: Australia's Opportunities* – through intensive consultation with the Academy's Fellowship. This submission draws on these documents, both of which are attached as appendices and are available to the Taskforce through the ATSE website at www.atse.org.au/agriculture/reports.

The focus of ATSE's Agriculture Policy Statement – *Enabling Growth in Agriculture* – is how increased innovation, productivity, and investment can position Australia's agrifood industries to seize the opportunities presented by a growing population and increasing demand for safe, high-quality food and fibre products, especially from an increasingly affluent middle class in Asia.

Securing the future competitiveness, profitability and growth of Australia's agrifood industries, will require an integrated pursuit of increased productivity and the enhancement of ecosystems – that is, the ongoing protection and restoration of ecosystems to continue to provide the natural resources fundamental to agricultural production. Technology, science, and engineering-based innovation will be crucial to achieving these outcomes.

ATSE considers that the competitiveness, profitability, and future growth of Australia's agricultural and food sectors will depend on:

- The development and implementation of a long-term vision and strategic plan to focus and direct the sustainable growth of agrifood and fibre export industries;
- Leveraging the provenance, enhanced specifications, and increased value-add of Australian agricultural and food produce to demand a premium position in local and export markets;
- Investing in Australia's innovative capacity by industry and governments to support the knowledge creation, technological innovation, and skills-base required to improve productivity and sustainability; and

- Building collaborative networks connecting research organisations and Australian and international agrifood businesses, to enable better access to new technologies and cutting-edge research.

Specific priority areas in technology, science and engineering innovation for the agricultural and food sector have been identified by ATSE. These include:

- biotechnology;
- information technology services, real time data analysis and agri-informatics;
- water – better water conservation technologies and infrastructure, and enhanced climate and long-term weather forecasting;
- environmental impacts and natural resource management;
- biosecurity;
- enhanced product specifications and certification;
- advanced food processing techniques; and
- waste reduction across entire value chains, and recovery and recycling of non-renewable and scarce resources.

ATSE has recently established a Working Group on Agriculture, which will be developing implementation Action Plans based on these areas throughout 2014 among other tasks. These will be provided to the Taskforce in due course.

Australian agriculture is reliant on innovation driven-productivity improvements to increase production and remain competitive. Significantly bigger improvements to productivity than we have observed in recent years will be required to underpin future competitiveness. This will require a strong agricultural and food innovation system, with ongoing investment from industry and governments.

ATSE welcomes the approach being taken by the Government, in which the development of the Agricultural Competitiveness White Paper will be assisted by the industry advisory council for the agriculture sector. ATSE recommends that for the development of a long-term strategy for the agricultural sector, this group should be expanded and formalised as an Australian Agrifood and Fibre Forum, representing governments, researchers, industry and communities, chaired by the Minister.

We look forward to ongoing constructive dialogue with the Agricultural Competitiveness Taskforce and continued participation in the White Paper process. I assure you that the expertise of the Academy will be made available to the government on this important activity.

The contact at ATSE is Dr Andrew Hastings (Research and Policy Officer) on (03) 9864 0909 or via email at Andrew.Hastings@atse.org.au.

Please find below ATSE's Agriculture Position Statement, *Enabling Growth in Agriculture*, and the short guide to the report *Food and Fibre: Australia's Opportunities*. The full report is also attached below for this submission.

Yours faithfully

A handwritten signature in blue ink, appearing to read 'Alan Finkel', with a long, sweeping underline.

Alan Finkel



ENABLING GROWTH IN AGRICULTURE POSITION STATEMENT

APRIL 2014

This Agriculture Position Statement supports the ATSE 2013-2017 Strategy Plan which sets out the priorities and approaches the Academy will take to promote the application of technological sciences and engineering into innovation for the benefit of Australia.

ATSE CALLS FOR THE INTEGRATED PURSUIT OF INCREASED PRODUCTIVITY AND THE ENHANCEMENT OF ECOSYSTEMS TO SECURE THE FUTURE GROWTH AND PROFITABILITY OF AUSTRALIA'S AGRICULTURAL AND FOOD SECTORS.

THE FUTURE OF AUSTRALIAN AGRICULTURE

The world is facing a confluence of pressures which, on current indications, will increasingly threaten global food security and agricultural production for the foreseeable future, arising mainly from the effects of population growth, changing dietary preferences, climate change, and increasing competition for natural resources. Concerted action by industry and governments is required across agricultural and food value chains to increase the use of technology, science and engineering in off-setting and reducing these pressures.

Australia's agrifood industries face new opportunities in production, processing, and marketing to meet growing international demand for safe, high-quality food and fibre products, especially from an increasingly affluent middle class in Asia. To be in a position to create enduring advantage from growth opportunities in these competitive markets, the output, quality, value, and sustainability of Australian agriculture must improve. The availability of water, infrastructure, transport systems, and global market access are also critical to agriculture's success.

There is increasing pressure on the availability of natural resources for agricultural production, due to drought, changing land and water use patterns, competition from other industries, increased input costs (e.g. energy and nutrients), and environmental degradation. In order to maintain and accelerate growth in agricultural production where possible, Australia's natural resources must be utilised more efficiently and protected against future depletion.

By embracing all the tools for innovation in production, processing and marketing that are available, Australian agricultural and food industries can meet these challenges and take advantage of new opportunities. This will require partnerships and collaboration between industry, governments and financial systems to invest in future international competitiveness.

THE VISION

ATSE sees vigorous and globally competitive Australian agriculture and food industries thriving through investment in technology, science and engineering innovation. These industries will seize the considerable market opportunities arising now and in the coming decades, in the face of significant competition and environmental challenges. Greater engagement across agrifood value chains will be crucial, as will the ability of industries to respond rapidly and flexibly to changing market needs.

Through ecologically responsible intensification, innovative agrifood businesses will reap the rewards from the increasing wealth in Asia while building resilience for future challenges.

VALUE

The production, processing, and export of safe and high-quality food and other agricultural products is a crucial part of Australia's economy, particularly in rural and regional areas, and a major contributor to the country's wealth and high standards of living. Affordable and nutritious food is also fundamental for people's health and well-being.

In 2011-12 the food value chain in Australia had a combined worth of \$270 billion¹. This included \$43 billion in farm and fish production, \$91 billion in food and beverage processing, and \$136 billion in retail food sales. Australia also exported \$30 billion and imported \$11 billion worth of food and beverages. In the same period, the entire food industry, from farm production and manufacturing to retail food service, employed 1.6 million people, around 15 per cent of Australia's total employment.

Australia has significant comparative advantages in agriculture and food production over regional trading partners, making these sectors an essential strategic economic investment. A focus on improving profitability from the farm-gate across the whole value chain will see excellent returns on this investment. A strong and innovative agriculture and food sector is also an integral part of Australia's contribution to the global community.

PRIORITY FOCUS AREAS

Technology, science and engineering-driven innovation have key roles to play in achieving this vision. Priority areas include:

- ☐ **Biotechnology**, integrated with modern genetics, breeding, and other techniques, offers opportunities to improve agricultural productivity, natural resource management, and consumer demand, while offering new opportunities for bio-industries across the agricultural value chain. Appropriate regulation is essential for public acceptance and safe deployment.
- ☐ **Information technology services** can revolutionise agricultural production systems. Increased deployment and penetration of ICT and high-speed internet access will enable greater use of real time data analysis and agri-informatics, and improve the competitiveness of industries and services.
- ☐ **Water** is fundamental to agricultural production. Efficient use of water resources, better water conservation technologies and infrastructure, and enhanced climate and long-term weather forecasting can deliver better environmental outcomes and productivity in both rain and irrigation based systems.
- ☐ **Environmental impacts and natural resource management** are critical to the future of agriculture. Mitigation of environmental damage through reducing emissions-intensity, soil degradation, and nutrient pollution, among others, is essential for both commercial and sustainability imperatives. Maximising the availability of scarce resources in a more sustainable way through improved regional and local natural resource management capabilities will secure ongoing agricultural production while maintaining ecosystem health.
- ☐ **Biosecurity** is essential to protect natural ecosystems, farm productivity, and access to sensitive export markets. Stronger partnerships with industry would enhance Australia's biosecurity capabilities and capacity in prevention, response and recovery.
- ☐ **Enhanced product specifications and certification** requiring high standards of environmental management, safety, and quality can offer a premium market position to Australian agrifood exports. Advanced food processing techniques can also produce high-performing, highly-specified functional foods and ingredients.
- ☐ **Waste reduction** across entire value chains is increasingly essential. The recovery and recycling of non-renewable and scarce resources, such as nutrients and water, maximising value chain efficiency and transforming waste streams into output will enhance the productivity, sustainability and profitability of agricultural and food production.

THE WAY FORWARD

ATSE will analyse these priority focus areas through the following reference matrix to clarify actions to strengthen innovation in agriculture and food industries in Australia.

PUBLIC POLICY

- ☐ The interaction of industries, individual businesses, research institutions, and government departments in the agriculture and food policy space will determine the level of success or failure in securing Australia's agricultural future. This includes interaction around regulatory environments, public funding mechanisms, international relations and trade, and the finance and investment sectors, among others.

INNOVATION

- ☐ Ongoing, broad-based innovation provides the foundation to adapt to and mitigate threats while increasing productivity, profitability, and sustainability into the future. A strong scientific, research, and engineering capability in agriculture, food, and related areas will enable innovation through knowledge, practices, and technologies. Developing and maintaining this capability requires a strategic, long-term approach, increased business investment, and a focus on international and national collaborative research partnerships.

EDUCATION

- ☐ Enhancing Australia's human capital in agriculture, food production and natural resource management will be essential to achieve this vision. A greater appreciation of the opportunities in and importance of food and agriculture across the whole of society, alongside the revitalisation of agriculture and food science related education, will ensure the continued strength and growth of this key economic sector.

Australian Academy of Technological Sciences and Engineering (ATSE) Enhancing Australia's prosperity through technological innovation

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A SHORT GUIDE TO THE REPORT

FOOD AND FIBRE

AUSTRALIA'S OPPORTUNITIES

Prepared by the Australian Academy of Technological Sciences and Engineering (ATSE)

MARCH 2014

FOOD AND FIBRE: AUSTRALIA'S OPPORTUNITIES

Australian agriculture and agrifood industries have a major opportunity to capitalise on the projected growth of Asia's middle class over the next decades by exporting high-quality, high-value food and fibre products.

To seize on these opportunities, Australia's agriculture sector must increase its productivity and competitiveness while managing the competing demands on our limited natural resources (land, water, and nutrients), environmental sustainability, and climate change adaptation demands. This will require renewed investment in the agricultural and agrifood innovation system from governments and industry, as well as a coordinated national vision and strategy for sustainable growth.

These are the key findings of a research project by The Australian Academy of Technological Sciences and Engineering (ATSE). They are set out in an Academy report – Food and Fibre: Australia's Opportunities – which

investigates opportunities for sustainable future economic growth in the context of limited natural resource availability and projected adverse effects due to climate change.

Australia is established as one of the world's premier food and fibre exporters, but has historically failed to capitalise on its safe, sustainable, and well-regulated image to secure premium prices for its produce, instead dealing mostly in raw food commodities.

By leveraging increasingly sought-after credence attributes, through a coordinated 'Brand Australia' campaign, and by collaborating to produce new and innovative value-added products, Australian agrifood and fibre industries will see much greater sustainable economic returns in the future thanks to the Asian 'dining boom', all the way to the farm-gate.

The report is on the ATSE website at <http://www.atse.org.au/FoodandFibre>

KEY FINDINGS

1) Develop a long-term strategy

Australia needs a long term policy vision with focus on export growth and high value-add, resulting in enhanced profitability that flows back to all sectors, including the farm-gate. Targeted sustainable growth of agrifood export industries should be substantial, add materially to Australia's wealth, and should involve a whole-of-government approach. The pathways, potential impediments and goals for growth should be advised by a high-level Agrifood and Fibre Forum chaired by the Minister. The need for significant investment in the sector has been strongly acknowledged by recent business consultancy reports. International investment in agricultural production and agrifood processing and trading facilities has not been matched domestically. The need for patient and committed capital indicates the potential benefit of partnerships with capital-rich export markets such as China, Korea and Japan in food production and processing, as well as jointly funded research, facilitated by bilateral trade agreements.

2) Leverage Australia's competitive advantage through 'Brand Australia'

To target high-value export markets, Australia needs to build and promote global brand recognition of Australia's food and fibre products – Brand Australia. Australian agricultural produce is some of the safest and highest quality in the world. To better leverage this comparative advantage, an accreditation system that guarantees the safety, quality, and provenance of Australian grown and processed agrifood produce should be developed, to be marketed through a 'Brand Australia' concept. Brand Australia-certified produce would command a premium position in both local and export markets. The guiding

principle of the design of Brand Australia accreditation would be the utilisation of the latest technologies to collect and transform production, environmental, and statistical data that is already routinely collected, to minimise business costs.

Natural resource management planning, ongoing investment, and monitoring has not previously been utilised systematically to authenticate the safety, bio-security and environmental credentials of Australian food and fibre exports. Utilised strategically at a national, regional and individual product level this attention to and monitoring of the safety and environmental performance of Australian food and fibre industries has the potential to provide a competitive advantage to generate premium returns in the growing middle class markets of Asia.

3) Improve Australia's innovative capacity

To be globally competitive, Australia's agricultural innovation system must be focused, coordinated and well-resourced to enable world-class research to be translated into innovative Australian agribusiness, with a focus on value-add. There are opportunities to re-invigorate components of Australia's agricultural innovation system, including investing in knowledge creation, enabling uptake by industry and facilitating essential workforce development. Investments in research and development have been shown to produce high rates of return in both the Cooperative Research Centre and Rural Research and Development Corporation programs over extended periods. Over the past decade research, development and extension investment in the sector has waned and annual productivity gains have declined. The agrifood innovation system has also undergone

significant change in the past decade, including governance changes in the Rural Research and Development Corporations, re-organisation and shifting of focus of Commonwealth and State Departments, changes in university research and development, and educational focus. The nature of Australia's international partnerships in agricultural research and development is also changing, with the rapid emergence of new trading and scientific powers raising the possibility of developing relationships and encouraging investment from target export markets.

4) Enable collaboration & translation for value-adding

To build a more robust Australian industry sector, we need enhanced networks and connectivity nationally between researchers, growers, industry producers and marketers. This requires re-thinking current linkages. Global collaboration is an important aspect of enhancing the quality of our research as well sharing risks associated with deployment of innovation and development of new value add business opportunities. Collaborative networks such as the Food Innovation Australia Limited Collaborative Centre of Excellence provide a platform for agrifood businesses to connect with researchers through rural research and development corporations, universities, cooperative research centres, and the CSIRO. By investing in collaborative networks, governments can encourage and facilitate innovation across the whole food and fibre value chain, and better translation of new agrifood processing technologies. Being involved in collaborative networks with international agrifood businesses will also allow Australian small and medium enterprises to take advantage of greater opportunities to participate in global value chains.

RECOMMENDATIONS

The report makes four key recommendations to Australian governments, industry and researchers to help position Australian agriculture to take advantage of sustainable growth opportunities in the future.

Recommendation 1

Develop a multi-decadal, bipartisan national vision and rolling five-year strategy to focus and direct the sustainable growth of agrifood and fibre export industries, guided by a high-level Australian Agrifood and Fibre Forum, representing governments, researchers, industry and communities, chaired by the Minister.

1.1: As part of this strategy, convene an agrifood investment taskforce incorporating industry, finance and superannuation sectors to recommend innovative mechanisms to encourage patient investment in all aspects of the Australian agrifood and fibre sector.

Recommendation 2

Develop and implement a robust 'Brand Australia' concept through industry and government collaboration with credible accreditation and authentication processes that utilise Australia's existing agrifood regulatory system.

2.1: 'Brand Australia' accreditation and authentication processes should utilise strategic advantages in nationally available natural resource management systems, including environmental, phytosanitary and livestock identification, to demonstrate and authenticate the safety,

traceability and environmental credentials of Australian agrifood and fibre produce.

2.2: The Rural Research and Development Corporation system should be supported to participate in cross-sectoral programs to develop the required accreditation processes and demonstrate and authenticate the superior safety and quality attributes of 'Brand Australia' agrifood and fibre produce.

Recommendation 3

Significantly increase investment in agricultural and agrifood-based research, development, and advisory programs by industry and governments, including investment in substantial international partnerships, to provide a platform for Australia to achieve the continued increases in productivity necessary to remain competitive and develop emerging export opportunities.

3.1: Encourage cooperation between industry, governments and research providers to better coordinate, connect and translate research, as well as identify future research needs.

3.2: Enhance student recruitment into agrifood-related education programs, including research.

Recommendation 4

Invest in collaborative networks connecting research organisations and businesses to encourage and enable Australian and international agrifood businesses to undertake local value-adding, through better access to new technologies and cutting-edge research, and to participate strategically in global value chains.

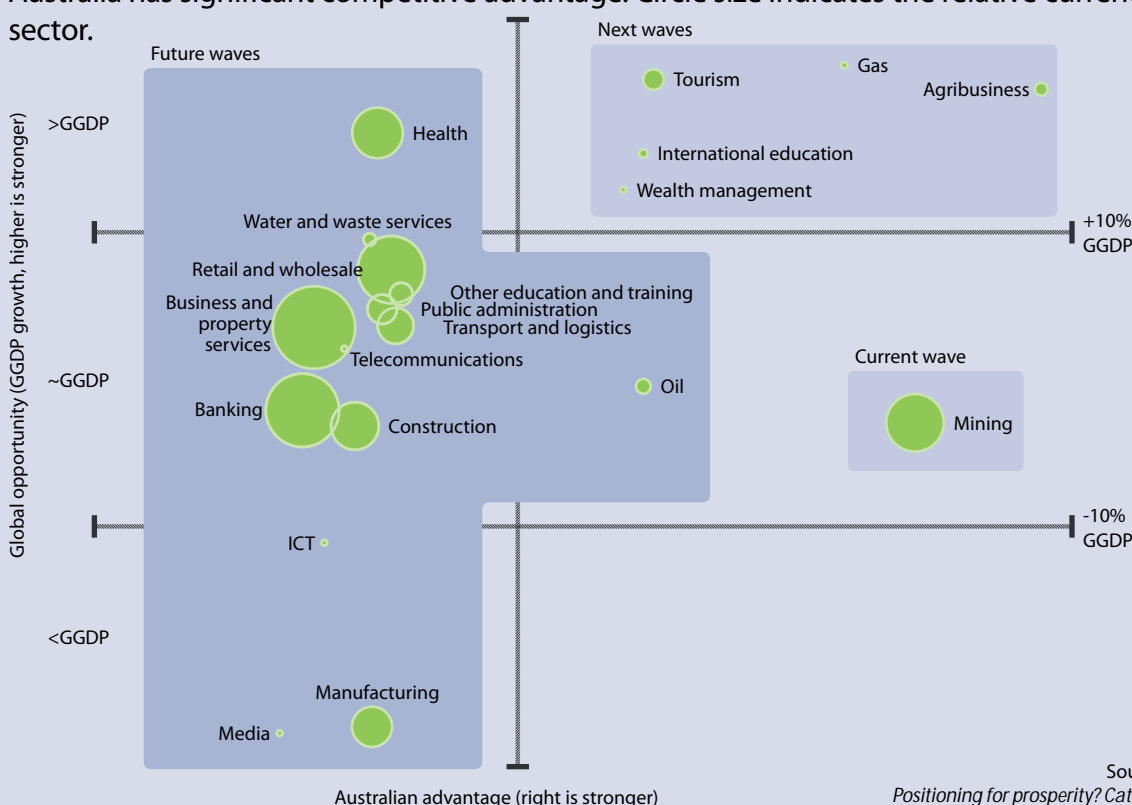
THE REPORT'S CONTEXT

The Australian Academy of Technological Sciences and Engineering report, *Food and Fibre: Australia's Opportunities*, investigates opportunities for sustainable future economic growth in the Australian agriculture sector that takes into account the constraints on natural resource availability and likely effects due to climate change.

Food and Fibre: Australia's Opportunities is the third and final report in ATSE's three-stage research project: 'Green growth in Australia: examining the linkages within – and potential of – sustainable resources management to enable environmentally responsible economic growth'. Stage 1 examined sustainable water management strategies, and stage 2 examined green growth opportunities in Australia's energy industries – these reports are also available on the ATSE website at www.atse.org.au.

The Food and Fibre: Australia's Opportunities report's principal author was Professor Snow Barlow FTSE. The project was funded by the Australian Research Council's Linkage Learned Academies Special Projects (LASP) scheme

Figure 1 Waves of growth: potential Australian export growth sectors for the period 2013 to 2033. Agribusiness, in the top right, is identified as an opportunity with strong potential growth where Australia has significant competitive advantage. Circle size indicates the relative current size of each sector.



Source: Deloitte Australia, 2013, *Positioning for prosperity? Catching the next wave*, Deloitte.

SUSTAINABLE GROWTH OF FOOD AND FIBRE INDUSTRIES

Australia's response to the Asian 'dining boom', resulting from a confluence of increasing population and increasing wealth, could focus on optimising production, value, and profitability from existing strengths, or it could take advantage of opportunities to engage in new food and fibre industries that would generate better value from the existing renewable natural resources base. Whatever the ultimate combination of strategies may be, the national response to these opportunities must be secure, sustainable and smart.

Secure

National food security and exports must not be threatened, while at the same time Australia should be perceived internationally, particularly by near neighbours, as following an appropriate response from a developed nation aware of its global humanitarian responsibilities.

Sustainable

In terms of intergenerational equity within Australia, by utilising natural resources in such a way that they are equally available for future generations with the capacity to produce food and fibre with equal, if not greater, effectiveness using the technologies of the day.

Smart

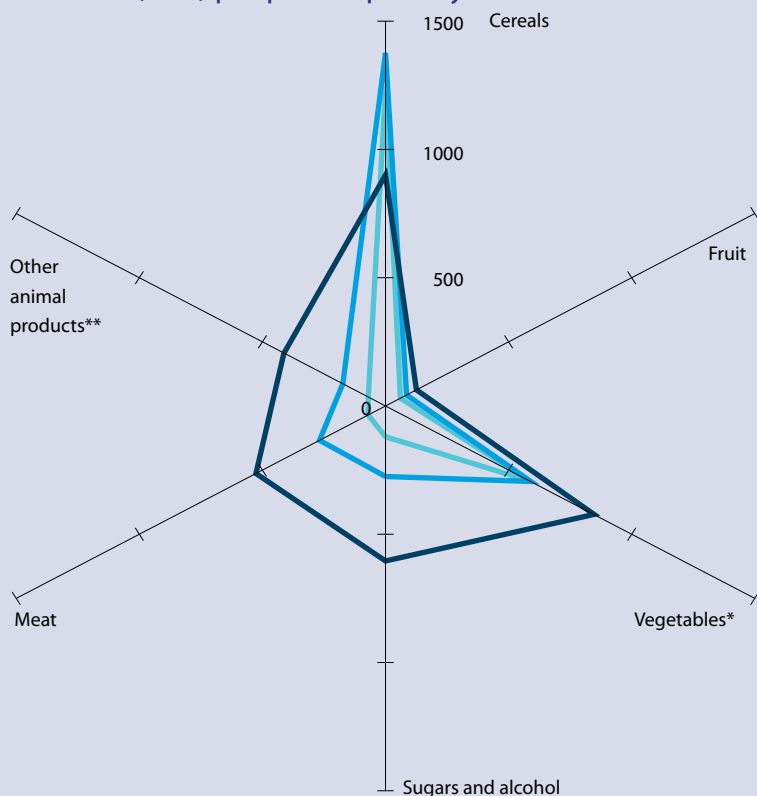
By optimising natural capital and competitive advantage to ensure the nation and regional communities dependent on wealth generation from food and fibre industries derive the greatest possible benefit from these opportunities. This must necessarily mean that in the medium term Australia seeks to strategically derive the maximum value per unit of product by progressing as far up the value chain as possible before sale. Smart also means strategically capitalising on the potential value of services as well as products from our food and fibre industries. These can arise throughout the full value chain including derivative technologies, education and research.

The ultimate goal of this secure, sustainable, and smart approach to sustainable growth in the food and fibre industries is to create a 'virtuous cycle'. The application of knowledge, know-how, and technology to produce safe, high-value food and fibre products for international markets in a sustainable way should generate an international demand for services as well as products, which in turn further enhances Australia's reputation as a smart producer of safe, high-quality food and fibre products.

Above all, sustainable growth requires a focus on increasing natural resource use efficiency and productivity, protecting the natural resource base, and reducing reliance on fossil fuel-intensive inputs. A major driver of increased productivity growth is innovation through the application of research and development. The only way to achieve the increases in productivity growth required to realise sustainable growth from agricultural and agrifood businesses in Australia's unique environment is to continue to invest in a strong, collaborative and strategically focused innovation system, including education and agricultural workforce development.

Figure 2 Comparison of sources of calorie consumption between least developed, developing and developed countries. As a country's per capita income levels increase, dietary preferences move from lower-value products, e.g. cereals, to higher-value products, e.g. meat and animal products, sugars and alcohols, and vegetables.

Calorie intake by food type Kcalories (Kcal) per person per day



— Least developed countries — Developing countries
— Developed countries

* Includes pulses, spices, roots and oil crops.

** Includes milk, eggs, aquatic products and cheese and excludes meats.

Source: Port Jackson Partners, 2012, *Greener Pastures: The global soft commodity opportunity for Australia and New Zealand*, ANZ Insight issue 3, Sydney.

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