Functional and Luxury Foods Research Project

Final Report

PREMIUM FOOD AND WINE FROM OUR CLEAN ENVIRONMENT

SOUTH AUSTRALIA

Government of South Australia

Primary Industries and Regions SA

Report's title

Study into the Functional and Luxury Food Value Chains in Asia and Australia including Foresights project.

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Summary

This report summarises the outcomes of a study into the functional and luxury food value chains in Asia and Australia. This report focuses on Pathways, and gives general conclusions and recommendations.

Based on the analysis on value chains, technologies, markets, and available opportunities in the target markets, six primary pathways are suggested for the South Australian food industry: (1) food technology upgrading, (2) functional food products, (3) ingredients for functional foods, (4) active, intelligent and polysensual packaging, (5) luxury food business strategy uptake and export promotion, and (6) luxury wine driven culinary tourism.

The six pathways differ significantly in terms of their target focus in the food value chain. Successful implementation of technologically-driven pathways for functional foods, food technology upgrading and packaging will require close collaboration with technology suppliers and co-operation with research and knowledge providers.

A single shortcoming identified in the local ecosystem concerning these pathways is the lack of applied research and piloting capacity necessary to upscale new products and processing technology. Another related need cutting across these pathways is capability for new technology adoption involving training, benchmarking, demonstration, technology transfer and other activities supporting particularly SME's with limited own resources.

The luxury export pathway and luxury culinary food tourism pathways are less driven by technological development and adoption. In contrast, progress depends more on effective customer understanding, collaboration in marketing, networking, and supply chain management. Nevertheless, information and communication technologies, such as social media and traceability solutions, do play an important role as necessary capabilities to be utilised.

The report presents conclusions, key findings and policy recommendations.

Espoo 15.12.2015

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1. Introduction

The primary objective of this project was to provide the Department of Primary Industries and Regions SA (PIRSA) with a roadmap outlining where food value chains may potentially be transformed to higher value add, i.e. functional and luxury food and beverages, with emphasis on domestic and Asian markets. The project consisted of three phases: Phase 1 (Market Opportunities) provided an analysis of high value food manufacturing, markets, and potential competition. Phase 2 (Industry Strengths and Value Chains) involved a survey of the region's main strengths such as industry assets, raw materials, R&D capabilities, value chains (Asian exports as the primary market, and the Australian domestic market as a secondary market), and geographical locations. Phase 3 (High Value Food Roadmap) developed an implementation plan of future options (short, medium and long-term horizons) for the South Australia food industry. It considered potential business opportunities based on the region's strengths and weaknesses, and included guidelines for implementation.

This report focuses on Pathways, conclusions and recommendations.

2. Resources

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Subcontractors: ESSEC Business School (Paris and Singapore), Frost & Sullivan (Australia) Pty Ltd, Food Innovation Centre of Mondelez Australia Pty Ltd.

3. Methodology

The main methodological approaches used in different phases of this project are briefly described below:

1) Value chain analysis

Value chain analysis was based on company interviews. Given PIRSA's contextual knowledge, PIRSA assisted in recommending companies based on their potential activities and interests in luxury and functional foods and Asian exports. In total, approximately 120 South Australian companies with functional and luxury foods potential were approached and of these 65, representing different food production areas, packaging industry, research institutes, and food associations were interviewed.

The methodology was complemented by innovation ecosystem approach that stresses the flow of ideas, technology and people among enterprises and institutions as the key to an innovative process. Well-known business analysis tools, SWOT and PESTLE, were used to assess the current state of the functional and luxury food industries and the challenges related to Asian markets.

2) Actor Mapping

Actor mapping was carried out in South Australian and Asian markets (China, Hong Kong, Singapore, Japan, Malaysia, South Korea). This was done to help to identify the strategic focus of selected high value food producers (R&D, partnerships, functional and luxury food product portfolio etc.). Key Institutions, major international players and investors doing

business, and developing technologies and products in the identified opportunity areas were identified. Figure 1 shows an overview of the actor mapping.

Figure 1. Actor mapping in an innovation ecosystem.

3) Technology assessment

The technology assessment described (near) commercially available technologies that can move the food industry towards higher value added business activities. The Technology Readiness Level (TRL) method was used to evaluate the maturity of technology for operational deployment. The selected technologies represent techniques that show growth potential and open up new opportunities in the future – the selection is not all-inclusive because there is no need for assessing all well-established traditional food technologies. Information was gathered through a desktop study and through interviews with VTT's food technology experts.

4) Market analysis

Understanding market trends is an important dimension in identifying value-chain opportunities for South Australia. Market analysis determined the attractiveness of a market and presented its evolving opportunities. The luxury food assessment covered markets for specific foods in specific countries as determined by the literature review. The information was gathered through interviews with relevant stakeholders in the luxury food value chains in these countries, including food importers and distributors, food retailers, restaurant and hotel executive chefs and food journalists (see Appendix). In total 12 separate foods were identified as luxury, which were assessed in more detail in the market analysis (see Table 4).

The functional food market analysis focused on 12 different products (see Table 2), which offer the most obvious opportunities for South Australia in the functional food market in Asia and Australia. The market analysis was undertaken in eight countries in the region, based on the size, maturity and growth potential of their functional food markets. The eight countries assessed in the market analysis are; Australia, China (including Hong Kong), India, Indonesia, Japan, Korea, Malaysia, and Singapore.

5) Strategic roadmapping

The strategic roadmapping process is a collaborative and iterative expert process that is achieved through data analysis and expert workshops. Industry views were collected by interviews. The strategic roadmapping process included collaborative workshops comprising local customer experts as well as VTT experts. Business related knowledge providers included companies from food, beverage, wine and food ingredient industries, packaging industry, and from specialised knowledge-intensive service providers. In addition, information from industry organisations, government representatives, researchers from universities and research institutes as well as technology organisations was utilised.

4. Summary of the findings

4.1 Value chain analysis

The value chain analysis included the stages and actors in the value chain, examples of goods and services produced, and support services across the value chain. Figure 2 presents the overall picture of the studied value chain and its components.

The first stage consists of **primary production**; the most important actors being farms and fisheries. The second stage along the value chain includes **trading** from the farms to the food companies. As noted, food companies interviewed prefer having direct contact with the farms that produce their raw materials, and third party traders are often not favoured at this stage of the value chain.

In the middle of the value chain, we have the actual **food companies**. Food and beverage companies are the main actors undertaking the value adding activities in the value chain. In practice, value adding examples include production processes such as marinating meats, making small goods, condiments and jams, special packaging, or anything that gives the product greater perceived value.

The fourth and fifth stages include **wholesale and distribution** from the food companies to domestic and international use through **retail and food service**. Wholesalers and distributors are optional actors in the value chain, however, for larger and export oriented companies they are generally critical.

At the end of the value chain are **consumers**. Retailers and food service are constantly responding to consumer trends which are influenced by changing household demographics, lifestyle preferences, personal aspirations and technology. All these consumer trends in turn affect the food manufacturers.

The majority of South Australian food manufacturers and producers – and similarly more than 90 % of interviewed companies – are micro and small to medium sized enterprises (SMEs), often owner-operated and family owned. There are 1,499 food, wine and beverage manufacturing companies in South Australia[1]. This project estimates that of those less than 10 % have a current focus on functional or luxury foods and beverages. Hence this is both a challenge and an opportunity. The challenge is closely linked to both the limited experience of operating in luxury food and wine markets and to a cultural reluctance of many Australian firms to supply products into luxury segments of the market. The opportunities are outlined in this report.

[1] Estrada-Flores, S. (2015). Food SA Industry Intelligence Report, March 2015.

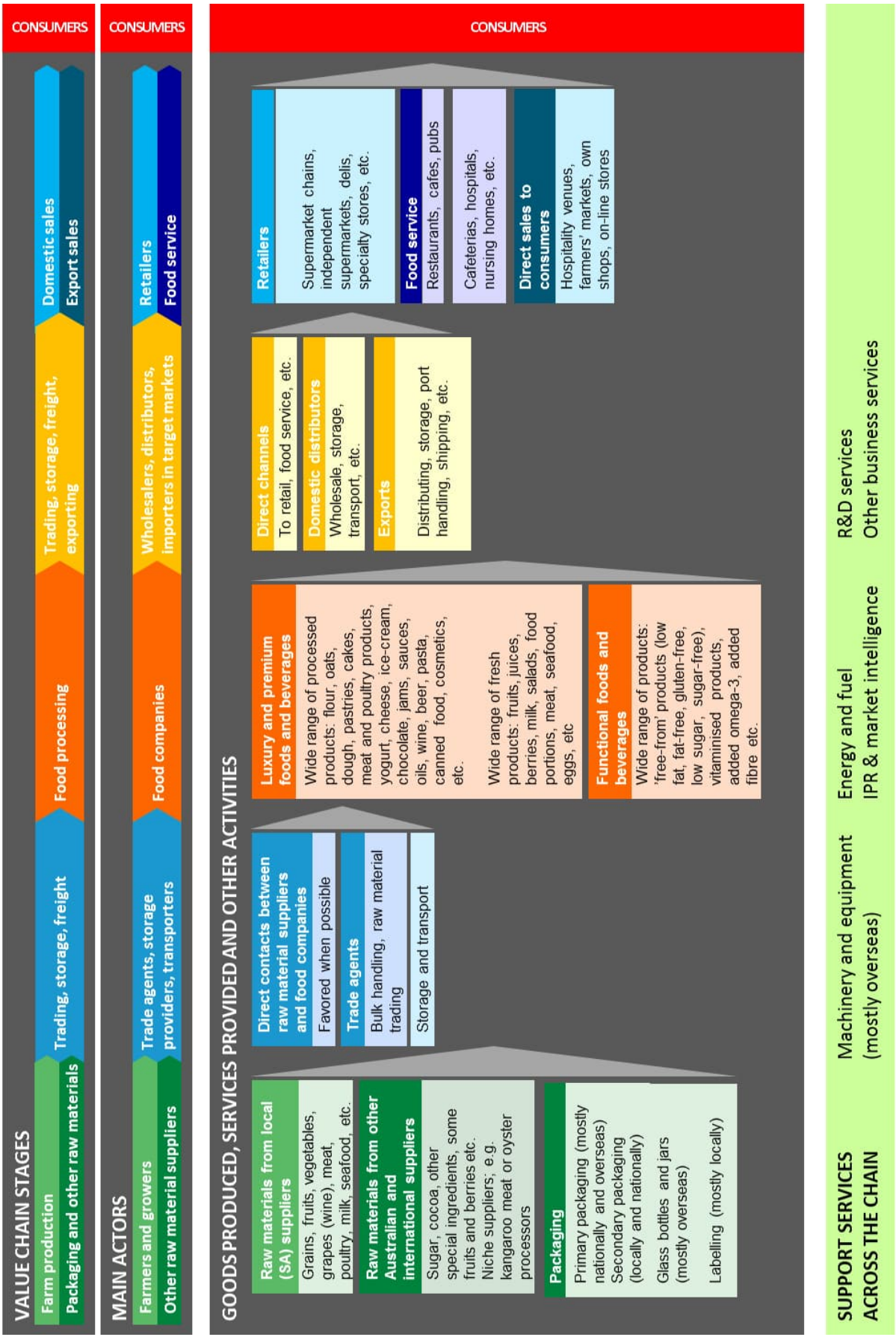

Figure 2 South Australian Food Value Chain (mapping template adapted from Economic Development Board South Australia, 2015).

As part of the value-chain analysis, a strengths, opportunities, weaknesses and threats (SWOT) tool was used. The SWOT was previously assessed in the South Australian Food Strategy 2010–2015 (Government of South Australia 2010); the SWOT in this study (Table 1) presents an updated analysis emphasising the recent industry insights from the interviews, with a focus on functional and luxury food businesses.

In summary, the main **strengths** build on the strong social capital of the food industry and on the many unique businesses, niche market players and 'gap fillers' with novelty value within the food industry. In addition, the foods produced are known to be safe and of high quality due the Australian safe food system and standards together with the existing biosecurity safeguards. Furthermore, the current weakness of AUD offers competitive exports.

Weaknesses stem, for example, from conservative and traditional attitudes and quite slow development, with a few exceptions. Product development and transition within the industry is in many places slow and cautious. Only a small amount of genuine luxury and functional products can be found, and where they exist, the value chains are generally quite short. Regarding luxury foods there may even be cultural reticence to move from premium towards luxury foods; this is mainly due a fear of losing loyal domestic market. An important weakness is that the size of the local customer base is too small for high value luxury and functional products; this has resulted in a limited interest in product development and innovation in the luxury and functional food areas. This weakness can be avoided by directly targeting export markets. However, the interest and capabilities related to exports are limited, and in addition there are some difficulties in finding the right partners for export. There are also challenges relating to continuous supply of raw materials to maintain a stable production level when operating using seasonal raw material supply, with imported raw material often unable to compensate. Growing production volume is sometimes limited by the availability of raw materials. Growing the production volume is sometimes limited by the availability of raw materials. There is also an unwillingness to prioritise investments in new machinery, automation, facilities and R&D. Finally, both interviews and studies[2] identify the high-cost level (for example energy, water, waste management and labour) as a competitive disadvantage for establishing, operating and growing food companies in South Australia.

Opportunities include, for example, collaboration opportunities in exports and in improving the readiness to enter Asian markets. Utilisation of the specialities and resources of the region can be both improved and increased. An unexploited opportunity is related to increasing the amount of R&D, product development and technology when feasible. Spreading and utilising the existing knowledge within the value network would further increase the critical market intelligence within the industry. Opportunities also lie in increasing understanding of the diverse range of customers and potential customers (needs, habits, culture, etc.), in providing help for partnership building, and in establishing international connections (e.g. international boards and visits) – these are important especially when entering new global markets in developing countries. Realisation of some of these opportunities may require an increased awareness that the present performance level is not up to global best practice. This awareness is normally created through exposure to best practice during visit to best practice companies hence enabling them to form a picture of what is both possible and required.

Threats arise, for example, from the limited amount of support for and recognition of SMEs, from the high costs (see above), from the limited knowledge of and preparedness to enter the Asian markets, and from a challenging regulatory environment. Threats are also related to the food companies' and raw material suppliers' vulnerability to natural and environmental threats

[2] Deloitte, 2015, Energy Markets and the Implications of Renewables – South Australian Case Study. Deloitte Access Economics;
ESAA, 2015. On a high: SA renewables and wholesale prices, https://www.esaa.com.au/members/on_a_high_south_australian_renewables_and_wholesale_prices_1;
ACIL Allen Consulting, 2015. NEM OUTLOOK Reference Case Market Projections

such as drought and other weather related challenges, including climate change. The highly competitive environment as relates to Asia (although good in principle in driving improved performance) can be challenging for smaller food firms. There is increasing competition from countries like New Zealand, Israel and South Africa. This is further complicated by the complexity and inconsistency of the regulatory regimes and behavioural customs in some of the target markets. Similarly, some Australian regulatory actions appear as threats and cause debate; e.g. regimes such as Wine Equalisation Tax (WET) have changed the industry dynamics, but similarly abolishing WET would result in reduced profitability. Furthermore, there is also increasing completion on Australian markets from countries such as New Zealand, Israel and South America.

Table 1. SWOT analysis of the luxury and functional food value chains.

SWOT ANALYSIS **Current state of the South Australian Functional and Luxury Food Industry**		
INTERNAL	**STRENGTHS** • Many unique businesses, niche market players and 'gap fillers' with novelty value • Long traditions and quite strong business culture with a variety of different companies and high-quality products • Experienced businesses and some pioneering operations and initiatives: learning from more experienced businesses, interest in mentoring possibilities (ecosystem thinking and benefits) • Good relationships and level of trust among businesses and sustainable relationships with suppliers, customers, regulators etc. • Some collaboration • Diversity in regional climates, attributes and cultures • Innovative culture and tradition • Healthy independent retail sector • AFM (Advanced Food Manufacturing) grants and DSD's (Department of State Development) grants supporting innovation, SA innovation vouchers, micro finance fund grants • Demonstrated collaborative mechanisms and cooperation builders such as Food SA, SAWIA and other industry organisations	**WEAKNESS** • Conservative and traditional attitudes and quite slow development, with a few exceptions • Cautious product development • Small amount of genuine luxury and functional products – value chains generally quite short • Size of the local customer base is generally too small for high value luxury and functional products: resulting in a limited interest in product development and innovation in the luxury and functional fields • Limited interest and capabilities to export • Difficulties in finding right partners for export • Limited funds for new machinery, facilities and R&D • Limited collaboration in exports • Distance to other markets • Threats to water supply/security • Rising input costs associated with business operations • Scale and complexity of distribution systems • An ongoing need for infrastructure in regional areas
EXTERNAL	**OPPORTUNITIES** • Collaboration possibilities in exports • Recognition and full utilisation of the specialities and resources of the region • Improving the readiness to enter Asian markets • Increasing the amount of R&D, product development and technology – when feasible • Spreading and utilising the existing knowledge within the value network; increasing the market intelligence • Increasing health consciousness • Increasing the understanding of diverse range of customers and potential customers (needs, habits, culture, etc.) • Providing help in partnership building, and in establishing international connections (e.g. international boards, visits) • Simplifying and standardising regulation and certifications • Increasing demand for safe and nutritional food production systems • Increasing diversity of food markets • Ensuring a competitive trade and service provider network • Food service industry is growing globally • Enhancing the food, wine and tourism experience	**THREATS** • Not enough funding and recognition for SMEs • Limited knowledge and preparedness to enter the Asian markets • Too much bureaucracy and tax burden • Vulnerability to natural and environmental threats (water, drought, energy etc.); impacts of climate change and variability • Highly competitive environment with a wide range of risks, regulation, and difficult requirements (Asian markets) • Complex and inconsistent certification system that needs standardisation • Exposure to commodity and currency volatility • Future labour shortages and low rates of skilled labour retention • High costs of business operations • Access to capital for future expansion • Challenges of the Australian packaging industry; worries of the interviewed companies related to local availability for differentiated and luxury packaging • Highly competitive environment with a wide range of risks, regulation, and requirements (Asian markets)

4.2 Technology assessment

The technology assessment was near future-oriented, that is, it looked at useful new and emerging technologies and innovations that could shape the food industry and its development now and into the near-future. The interviews conducted in April 2015 revealed that some South Australian companies were interested in increasing the amount of research and development (R&D) undertaken by them, product development and the use of technology to achieve this, as well as utilising outside R&D knowledge.

The technologies identified as relevant to the South Australian food industry were as follows:

1) *Digitalisation of the food industry:*

Digitalisation does not refer to a single technology but to a myriad of different solutions with different readiness levels. It covers e-trade and e-commerce solutions, such as online-stores, mobile payment, customer engagement platforms, crowdsourcing and also the Internet of Things (IoT). IoT refers to the ability to connect remote or mobile equipment to networks through advanced wireless connectivity and low-cost sensors. IoT is closely linked with intelligent packaging solutions and it can be applied to the food chain management as well as quality control, traceability and production efficiency.

2) *Food processing technologies:*

Since the current sophistication level in the food processing equipment is relatively low in South Australia, technologies with fairly high technology-readiness levels (TRLs that already commercially available such as levels 8-9) are the most relevant ones. These include cold pasteurisation techniques, such as High Pressure Processing[3] and Pulsed Electric Field, which both have versatile application areas in the food industry.

3) *Biotechnology for food*:

Biotechnical applications utilise either living microbes or microbial components (enzymes, metabolites) in food processing. Biotechnology is a wide domain with technologies in all TRLs, and new technologies are being developed continuously. For the South Australian food industry the most relevant is the use of commercially available food grade enzymes and microbes in food processing.

4) *Functional ingredients production technologies*:

Functional ingredients serve to introduce and improve quality attributes of food products providing health benefits for the consumers. They serve as the basis for formulation of many types of functional foods. Manufacturing ingredients that already have health claims or R&D of new functional ingredients are technology domains that can provide opportunities for South Australia in the long term (5 to 10 years).

5) *3D printing and food*:

3D printing of foods is a fast developing technology; equipment improvements (regarding the ease of use and speed of production) have been considerable during the past few years. Some relevant application areas are tailor-made shapes of confectionery and biscuits, and some speciality foods (e.g. easy to swallow foods).

6) *Active, intelligent and sustainable food packaging*:

[3] The present technology has considerably improved compared to what existed some years ago; hence previous negative experience with using this technology should not impact the decision of whether to use this technology today.

Active, sustainable and intelligent packaging solutions were identified as key enabling packaging technologies for the food industry. When targeting Asian markets, the luxury food and wine brand protection needs to be strengthened. Anti-counterfeit and traceability packaging solutions (e.g. packaging containing visible or embedded safety elements), should be used to protect the brand and enhance the brand experience (e.g. RFD and auto ID technologies).

4.3 Innovation in the food industry

It is worth reflecting what is meant by innovation in the food industry[4]. It normally takes 3-5 years for innovations to be realised in the food industry, due to the complexity relating to scale-up and the associated costs. The normal way of achieving a faster time-to-market by food companies is to aim for rapid implementation of international best practices. There is also a shift across the international food industry from closed, in-house innovation systems towards a semi-open innovation system which requires a large number of international relevant relationships. Innovation in the food industry is not only new product and process development but also, with frequently higher short-term emphasis, the achievement of higher margins, better quality, higher productivity and process excellence in existing operations. In addition to the scientific and technical knowledge required, innovation in the food industry also requires substantial consumer and customer insight. As a consequence, most smaller food companies operate with innovation on TRL levels 8-9, whereas large multi-national food corporations focus on margin productivity, new product development and new technology deployment on technology readiness levels 4-9. In domains where smaller food companies have access to competent support from innovation centres and universities able to assist them on technology readiness levels 6-9, these smaller companies extend their innovation activities down to TRL 6. This means that the priorities for such small food companies when it comes to innovation are:

1. Cost reduction and making improvements including transfer of principles from other industries, e.g. overall equipment utilisation, defect rate levels and minimisation of waste through LEAN approaches[5], as well as scale-up of production, automation and sometimes transitioning from batch to continuous processing. This includes focus areas such as cost-reduction through recipe changes without sensory and or other quality impacts.

2. Product improvements and product revisions.

3. Line extension, line optimisation and new technology adoption.

4. Adoption of new (to the company) technologies and development of new to market, frequently game-changing product offerings.

4.4 Market analysis

A market analysis was carried out to gain greater understanding of the current market opportunities in Asia and Australia for functional and luxury foods.

4.4.1 Functional Foods

Two main categories of companies active in the functional food ecosystem are suppliers of functional ingredients and food manufacturers which supply end-products to customers. Food

[4] Interview with G. Roos 2015
[5] http://www.manavue.ca/si_mve_a/Lean_Approach.html

manufacturers purchase functional ingredients from ingredient suppliers for incorporation in functional foods. To date, there is limited vertical integration between these particular types of companies. Opportunities for South Australian companies therefore lie in the supply of functional ingredients to food and beverage manufacturers, or in the manufacture and supply of functional food end-products themselves. The competitive landscape is crowded in functional foods, where there are generally specific competitors, often global multi-national companies, operating in each country, and some competitors who operate across multiple countries. Some examples of companies that have a strong / dominant position in particular products include: probiotics in Korea - Yakult Korea; probiotics in India - Yakult India; probiotics in Japan - Yakult Japan; prebiotics in China - Fenchem China; probiotics in India - Tata Chemicals (psyllium husk); prebiotics in Southeast Asia (SEA) - Orafti and omega-3 in SEA - DSM Nutrition. The opportunities for South Australian companies in end-products are more likely in emerging market niches, such as in gluten or lactose-free foods.

For ingredients, the market analysis focused on markets for the ingredients in *functional food applications*. Most of these ingredients also have markets outside functional foods, for example in dietary supplements, cosmetics or animal feed. Often these other markets are larger than the market in functional foods. The market value (at retail prices) of finished end-products is significantly higher than the market value just of functional ingredients, due to the significant value-add in the supply chain.

Across the Asia Pacific region (comprising the eight countries in the scope of this report), the total functional food market is valued at US$5.1 billion in 2014, and is forecast to grow at a compound annual growth rate (CAGR) of 7.5% from 2014 to 2020[6]. The size of the functional food market by product type identified to be relevant for South Australia across Asia Pacific is illustrated below (Table 2). The market sizes quoted for ingredients are an estimate of sales of each product only in functional foods. Usage of these products in other applications is excluded from the market size estimates.

Table 2. Functional Food Market in Asia Pacific by Product Category, 2014.

Product	Market Size (US$ millions)	CAGR 2014 – 2020
Functional Ingredients		
PUFA	329.5	6.6%
Proteins and Peptides	2185.0	6.2%
Vitamin D	70.2	4.1%
Probiotics	713.5	9.7%
Prebiotics	518.6	8.4%
Aloe Vera	39.2	10.0%
Phytosterol	286.0	6.4%
Carotenoids	146.0	7.1%
Polyphenols	537.2	6.4%
Functional Food End-Products		
Gluten Free Food	175.4	8.8%
Lactose Free Food	165.0	8.7%

[6] There is very limited published statistical information on markets for functional foods and functional ingredients. Information that exists is largely from proprietary sources (e.g. published market research reports from industry analysts that are only available for purchase), and often use different definitions and categorisations of functional foods. For example, some reports include market sizes at end-product (retail) prices, whilst other data is based on the market for functional ingredients only. However, sales of functional ingredients are a business-to-business sale (B2B) between an ingredient supplier and a food manufacturer, and prices are generally confidential. Hence, the sales value of ingredients is usually at best an estimate. Given the absence of available data, in calculating market sizes for functional foods, estimates were made based on interviews with industry participants, individual country industry associations, existing Frost & Sullivan reports (both as seen on the Frost.com website as well as based on existing information from consulting projects), industry publications and expert interviews. Hence, there is substantial uncertainty around these numbers which is common in most market research.

Source: Frost & Sullivan
No figures are available for the category "other free-from foods".

The largest markets in Asia Pacific are for proteins and peptides, probiotics, polyphenols and prebiotics. The strongest growth opportunities are in aloe vera, probiotics, gluten-free food and prebiotics.

Across the countries in Asia Pacific, China, Japan and Australia are by far the largest and most developed functional food markets. However, all markets are forecast to see growth in demand for functional foods in excess of gross domestic product (GDP) growth over the next few years, except for Indonesia, where consumer purchasing power will largely remain too low for functional food products.

Table 3. Market Size and Forecast Growth for Functional Foods, by Country

	Functional Food Market Size (US$ millions)	Forecast Growth Rate 2014 – 2020	Annual Functional Food Market Growth (US$ millions)
Australia	1,067	8.4%	90
China & HK	2,082	7.9%	164
India	142	9.8%	14
Indonesia	145	3.9%	6
Japan	1540	3.8%	59
Korea	105	9.0%	9
Malaysia & Singapore	85	9.6%	8

Source: Frost & Sullivan

4.4.2 Luxury Foods

Luxury foods are defined as those possessing three characteristics – limited availability / rarity, high price and symbolism. The largest opportunities for luxury foods are therefore in countries where there are significant numbers of high net worth individuals (HNWIs), a relatively high degree of social stratification as well as an acceptance of it and where symbolism in food consumption is important.

Asia Pacific is the fastest growing global market for luxury foods, stimulated by factors such as rapid economic growth and significant wealth disparities, which have stimulated the development of a rapidly growing number of HNWIs.[7] In Asia Pacific in 2014 there was an estimated 4.5 million HNWIs, more than in North America or Europe.[8] About 75% of Asia Pacific HNWIs are located in Japan and China (including Hong Kong). Conversely, markets such as Indonesia and India are much smaller although they have growth prospects (India and Indonesia combined only have approximately the same number of HNWIs as Australia).

A notable trend in luxury food consumption has been the westernisation of tastes in luxury food, with foods from Europe in particular gaining significant share of consumption in Asia. European producers have generally been successful in developing and promoting the heritage and narrative of their brands, in addition to the strict classification systems that have often limited availability, contributing to a perceived exclusivity of their products. Luxury foods in Asia Pacific therefore include both traditionally Asian foods, such as abalone and matsutake mushroom, and western foods, generally processed, such as wine, brandy and chocolates.

Within individual countries, opportunities for luxury foods mainly exist in the largest cities, where there are significant numbers of HNWIs and where most fine dining establishments and luxury hotels are located. The luxury food market is dominated by the food service segment rather than the retail segment, although opportunities in retail are growing. For South

[7] HNWIs are individuals with investable assets of US$1 million or more
[8] Cap Gemini, World Wealth Report, 2015

Australian producers, gaining access to distribution channels that serve food service in selected countries is therefore critical.

A range of luxury foods were identified in each market. These luxury foods were screened to short-list those that are, or could be, produced in South Australia. In total, 12 food items were identified as meeting the characteristics of being perceived as luxury, and currently being produced (or potentially able to be produced) in South Australia (Table 4). With the exception of tuna and red wine, South Australia's current share of Asia Pacific demand is negligible. Hence, South Australia has an opportunity to substantially grow its sales of luxury foods through increased penetration of the Asia Pacific market.

Table 4. Luxury Food Markets.

Product	Asia Pacific Demand	Australian Production	South Australian Production	South Australian Share
Abalone	110,000 t	5,200 t	1,100 t	1%
Bluefin Tuna	30,000 t	8,000 t	7,900 t	26%
Brandy	49 million bottles	~100,000 bottles	13,000 bottles	<1%
Caviar	100 t	0	0	0%
Chocolates	~$12 billion	n/a	n/a	<1%
Distilled Spirits	$93 billion	~$500 million	n/a	<1%
Matsutake Mushrooms	3,500 t	0	0	0%
Olive Oil	300,000 t	20,000 t	2,000 t	0.7%
Red Wine	~3.5 billion bottles	~1.0 billion bottles	~500 million bottles	14%
Rock Lobster	150,000 t	10,500 t	1,500 t	1%
Truffles	100 t	7 t	<0.5 t	<0.5%
Wagyu Beef	>$3 billion	A$261 million	n/a	n/a

Source: Frost & Sullivan estimates. Note: data for chocolates, distilled spirits, olive oil and red wine is for all products, not specifically luxury only, as data only for luxury products is not available.

4.4.3 Macroeconomic and demographic overview of luxury and functional foods

Singapore is likely to remain the most accessible and easiest country to do business with across the countries studied (Table 5). This is due to the lowest risk level identified when the ease of doing business, corruption, existence of FTAs with Australia, economic freedom, political stability and local food regulation were assessed. For more information see the Market Analysis.

Table 5. Asia Pacific market opportunity evaluation for functional and luxury foods. GREEN indicates low risk (scale 1-5); YELLOW medium risk (scale 6-7); and RED high risk (scale: 8).

Countries	Ease of Doing Business, 2014 ranking	Corruption Perception Index, 2014 ranking	FTAs with Australia, 2014	Economic Freedom Index, 2014 ranking	Political Stability Risk, 2014 Percentile ranking	Food Regulation, 2014 ranking
Indonesia	7	8	X	6	6	7
Malaysia	4	5	✓	5	5	5
Australia	3	2	NA	2	2	2
Singapore	1	1	✓	1	1	3
Japan	5	3	✓	3	3	1
South Korea	2	4	✓	4	4	4
China	6	7	✓	7	7	8
India	8	6	X	8	8	6

Ease of Doing Business: Encompasses factors such as ease of starting business, registering property and contract enforcement. Rank 1 indicates the country with the highest ease of doing business

Corruption Perception Index: Higher score implies more corruption.

FTAs with Australia: Ease of trade, liberalisation of conditions of investment, foundation for further bilateral or multilateral cooperation

Economic Freedom Index: Incorporates government spending, regulatory freedom for businesses, property rights; Higher core corresponds to greater freedom.

Political Stability Risk: Reflects perceptions of sudden and unexpected changes to government policy); 0 (lowest) to 10 (highest)

Food Regulation: Rules enforced by a country to ensure food safety and security.

4.5 Summary of key opportunities and challenges

The key opportunities for the South Australian food industry – to add value to the luxury and functional food value chains - were identified based on the value chain analysis and related SWOT analysis (Table 1), market analysis of functional and luxury foods, and technology assessment.

To fully tap the potential, several challenges need to be tackled in South Australia. The main problems and challenges for South Australia are related to:

- the low level of differentiation
- the size of the local market
- the complexity of food standards and labels
- low availability across the complete range of packaging solutions from local packaging providers or representatives from international packaging providers
- the availability of a quality workforce
- the lack of knowledge of what to do (many business owners are craftsmen with know-how in their current production area only)
- lack of consumer insight as relates to target markets/segments
- lack of collaboration tradition

- overcoming the cultural hesitation towards luxury products for export markets

In addition, companies would benefit from market intelligence and stronger international networks that are critical in exporting. Similarly more support and knowledge sharing is needed in order to utilise the latest know-how related to food technology and innovation.

The identified opportunities for South Australia have been divided into 1) primary opportunities, and 2) enabling opportunities (see Table 6). The primary opportunities are directly related to food, ingredients, origin, image and experience that functional and luxury foods from South Australia could create. The primary opportunities focus on recognition and utilization of the specialities and resources of the region and development of products by matching South Australian capabilities with needs in the target markets. The enabling opportunities are seen as opportunities that support the value adding actions and the food industry development, and strengthen the capabilities of the South Australian food companies.

Table 6. Primary and enabling opportunities in the luxury and functional food value chains.

PRIMARY OPPORTUNITIES				
LUXURY FOOD • Chocolate • Red wine • Spirit • Truffles • Southern Bluefin Tuna • Caviar • Abalone • Oysters • Lobster • Wagyu Beef	**FUNCTIONAL FOOD** • Dairy based ingredients • Probiotics • Aloe Vera Extract • Caretenoids • Polyphenols and flavinoids • Indigeneous plant extracts	**FOOD INNOVATION AND TECHNOLOGY** • Digitalization • Education • Packaging technologies	**FOOD EXPERIENCE AND BRANDING** • Safety and sustainability • Food culture • Social media and customer contact • Inspiring stories • Luxury and functional packaging and gift packs • Airport sales	**CULINARY TOURISM** • Luxury food and wine • Health and wellbeing

ENABLING OPPORTUNITIES			
MARKET UNDERSTANDING • Business services • Export support • Market intelligence • Product adaptation • Demographic marketing	**COLLABORATION** • Partnership building • Joint export efforts • Ecosystem thinking	**ENTREPRENEURIAL ATTITUDE** • Mentoring • Risk taking • New types of funding	**E-COMMERCE** • Platforms development • Collaboration

5. Future pathways

The future pathways aim at focusing on specific growth opportunities for the local industry through adding value. The most interesting pathways should be the ones where a shared opportunity beyond a single business can be identified. Pathways target a vision of how to exploit identified business opportunities, and pathway steps show the necessary actions to achieve that vision are shown.

Future pathways for South Australian food sector are presented in Figure 3. Pathways 1-3 focus on functional foods, while Pathways 5 and 6 target the luxury food and wine and culinary tourism. Pathway 4 targets packaging development and is closely linked with Pathways 2 and 5. A detailed description of pathway steps can be found in Appendix 1.

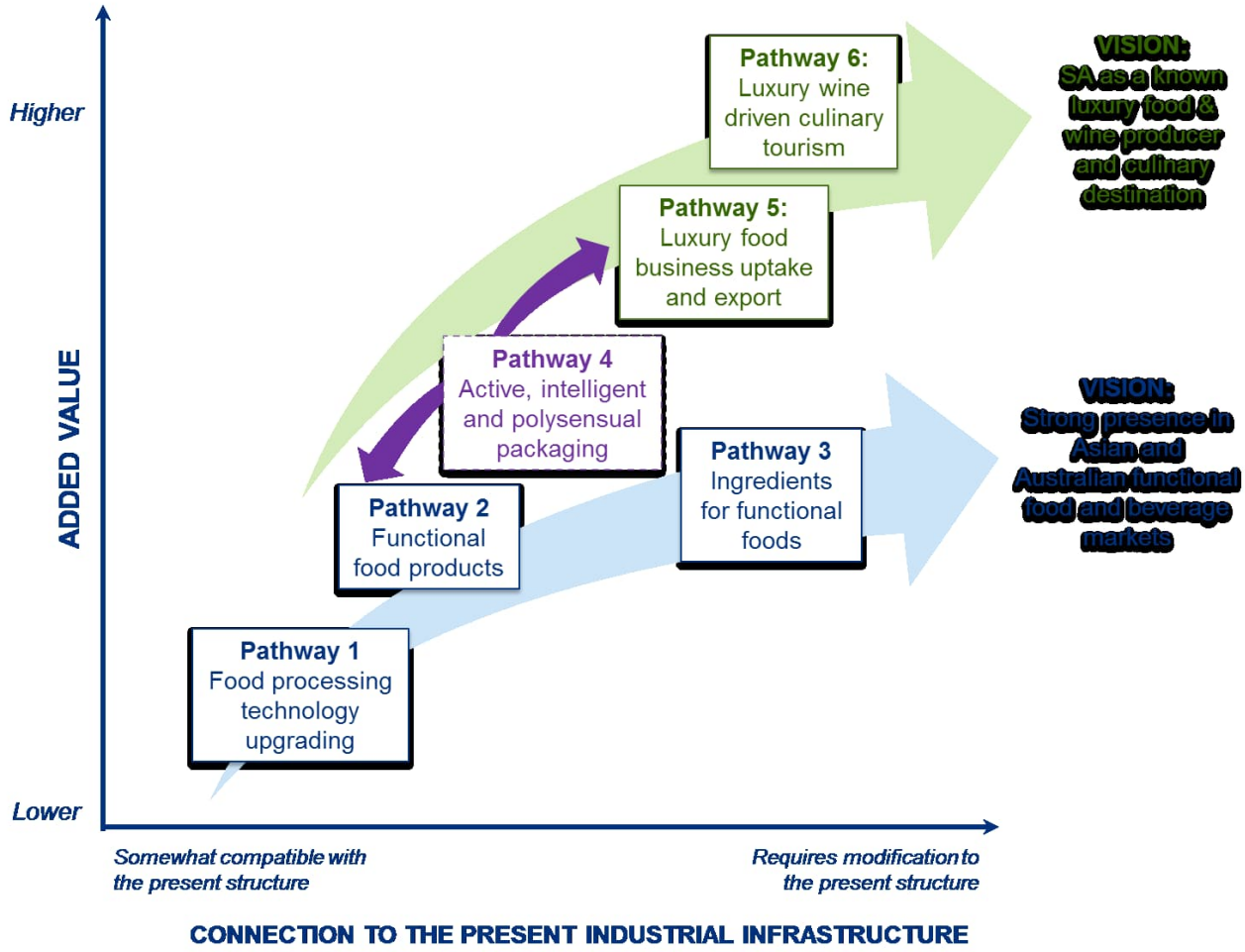

Figure 3. Future pathways.

Pathway 1. Food processing technology upgrading

Adoption of new processing technologies has the potential to increase productivity of the business and improve quality and safety of the products and provide longer shelf-life. The technological capability within South Australian food industry is generally considered low in international comparison. Partly this is due to the small average size of the firms. Up-to-date food processing equipment is a prerequisite for the future success in food business. With the right technology the quality of the product can be improved (and standardised) and often production volumes can be increased.

Most of the food technology suppliers are global players, and local industry is limited. Some key global suppliers have representation in Australia (but not in South Australia), but most of their activities are related to marketing and sales. There are some food processing equipment retailers in South Australia.

To upgrade food technology in South Australia requires demonstrating the benefits of technology adoption to food businesses. As many businesses currently view technology uptake as a cost rather than an investment with potentially high return (ROI), there is a need for awareness building activities for demonstrating these benefits. This includes identifying potential technologies for any individual firm and helping in assessing the required size of the investment and the expected payback time for various production parameters (volumes etc.).

The easiest option for technology upgrading is the adoption of commercially available food processing technologies to improve quality of products and productivity of the business. Much more effort is needed to attract technology manufacturers to establish presence in South Australia by building up a significant demand base for advanced food technology.

The competence base needs to be improved to trigger food technology development activities in South Australia by building up a demand base of a group of sophisticated customers and a world-class ecosystem of supporting activities. As any locally operating food company alone (due to its relatively small size) is not likely to attract global suppliers to establish development activities in South Australia, there is a need to concentrate innovation activities under one roof to reach sufficient scale. A food innovation centre with applied research capability (TRL 8-9) and innovation programs (TRL 6-9) of significant scale could serve as a hub for aggregating and leveraging fragmented technology and product development efforts (Figure 4). As such, it would also serve as an attraction point for collaboration with global technology suppliers. The centre could be set up in three stages, as suggested in Figure 4.

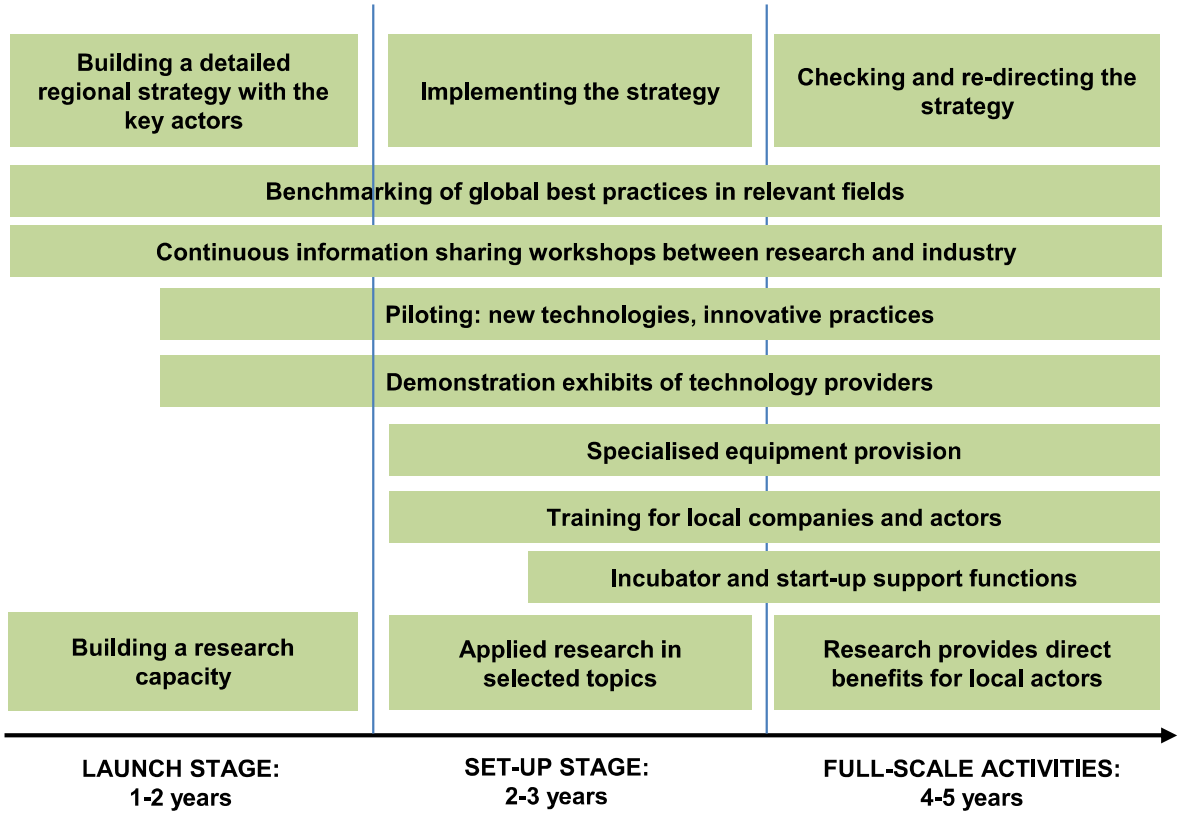

Figure 4. Functions of a centre of food innovation and research: a stylised overview.

Pathway 2. Functional food products

Functional foods can be divided in two main categories: foods where a health promoting ingredient (e.g. fibre, probiotic, vitamin, omega-3, plant stanol, etc.) has been added and foods where a harmful component has been removed. The latter products are especially important for people with food allergies or malabsorptions (e.g. lactose intolerant people and people with coeliac disease). There are also two main groups of consumers of functional foods: those who are healthy and who want to stay healthy and those who have a risk of disease (e.g. high blood pressure or cholesterol). The latter group is more willing to consumer more “high-tech” or “medicinal” food products than the first one (see Literature Review).

Australia is in a good position to produce functional foods to Asian markets since its clean environment is appreciated in many Asian countries that struggle with worse environmental conditions. Since the current production of functional foods is limited in South Australia, the easiest step to start would be to add known functional ingredients (with health benefits) into current food products. However, as the functional food markets are currently largely dominated by global food and beverage manufacturers, entering this area necessitates identifying market niches and performing focused efforts. Asian countries vary greatly in their preferences in functional foods as well in the maturity of markets (see Market Analysis – Functional Foods). The opportunities for South Australia likely lie in the sports nutrition (protein and peptide supplements), gut health (prebiotics, fibres) and free-from products (mainly gluten- and lactose-free). Depending on the functional ingredient, its addition may necessitate changes in food processes and processing equipment. The food process and food matrix must be compatible with the functional ingredient (i.e. retain the activity of the component). These issues will set the limits for the potential combinations of functional ingredients and food. If major changes in the recipe or processing are necessary due to the addition of a functional ingredient, food pilot facilities to test recipes and processes in small scale should be used. It may also be advisable to use some R&D services. Currently this kind of capability does not exist in South Australia (not found in universities and no local suppliers).

Pathway 3. Ingredients for functional foods

At the moment there is no/little production of functional ingredients in South Australia. However, South Australian universities have research in the primary production area that could be utilised to initiate this production (a good example is high lutein wheat). Often the production of a new ingredient is started in a small start-up company which involves the people that were also performing the research. At a later stage the production and marketing stages can be outsourced to another company; the “original” company will keep the intellectual property rights (IPR) and is responsible for further R&D of the ingredient.

South Australia produces high amounts of food industry side streams that could be utilised in the production of functional ingredients (fruit, vegetable, cereal and milk processing side streams). There are also other natural resources, like seaweed[9], that could be utilised in the ingredient production. It has to be kept in mind that it does not make sense to produce functional ingredients from raw materials that can be easily consumed as such (whole fruit and vegetables, herbs etc.).

Few food companies (typically only the big players) produce the functional ingredients that they use themselves. To set up an ingredient production facility usually requires highly specialised equipment and skills, coupled with strong understanding of market requirements and existing competition (local/global). To produce a *novel* functional ingredient means that there is no existing market and therefore risks are high. Also, with new ingredients there is typically no or low know-how related to the production, which means that starting of the production may be slow. However, if successful and if the company owns the IPR, also the benefits can be high.

Since the market for functional ingredients is quite developed and global, there needs to be a good reason to start their production in South Australia. Two scenarios are possible here:

1) Side-stream option: Adding value into a currently poorly utilised side stream that is produced in high enough amounts. If the raw material is perishable, there should be constant availability of the raw material to make the process economically feasible. Another option is to invest in large-scale drying technologies, which enable to produce

[9] For example, Tasmanian company Marinova manufactures a functional ingredient known as fuciodan from seaweed. This is used in nutraceutical products in Asia.

powders from more seasonal type of products, such as the side streams of fruits and vegetables.

2) A “high-tech” alternative is to tap onto the research performed at the universities and start a small company that initiates the commercialisation activities of an IP protected ingredient. These kinds of start-ups are usually small and the actual production is typically later sold to a larger company with expertise in this area.

Pathway 4. Active, intelligent and polysensual packaging

In today’s South Australia the packaging suppliers and consequently also food producers are rather limited to supplying only the conventional and standard packaging solutions. With only a few expectations, currently available packaging solutions are unable to create premium consumer experience or interact with consumers and fail to communicate the quality, exclusivity and sophistication of the product. Therefore there is a need for increasing the quality of both packaging design, and diversifying packaging material and solution supply.

Pathway 4 aims at increasing the understanding of opportunities created by adaptation of more sophisticated packaging solutions among South Australian food value chain actors (i.e. packaging suppliers and food producers). Intelligent packaging, such as anti-counterfeit and traceability solutions, can be used to protect the luxury food and wine brands and products, especially in markets where counterfeiting and tampering is a real problem.

The pathway is closely linked with Pathways 2 (Functional food products) and 5 (Luxury foods business strategy uptake and export promotion), and it highlights the role of improved packaging as a tool to create a stronger brand association and improve food chain management for both luxury and functional foods.

Pathway 5. Luxury foods business strategy uptake and export promotion

There is need to develop a luxury food product offering which both responds to identified luxury food and wine demand in Asia and which proactively creates offerings for unarticulated luxury food and wine demand in Asia. South Australian food exports to Asia could be spearheaded by seafood production such as Southern Rock Lobster and Greenlip and Black Lip Abalone, or Southern Bluefin Tuna, followed by other food product offerings e.g. cheese and wine. We could demonstrate the uninterrupted export cool chain to SA exporters as well as Asian importers which will reinforce the transhipment advantages and the reliability of the key transit points.

Marketing activities need to be initiated to enter and establish channels to key markets and to create market awareness. The specific emphasis in this export program should be to adopt best available marketing approaches for the specific needs or the luxury food market, identification of appropriate distribution channels, identification of luxury preferences among targeted consumers and identification of existing brand characteristics leading to brand development.

This study suggests building a cluster of luxury food producers which are supported by a sophisticated export promotion ecosystem, including packaging, design, cultural insight etc. to substantially scale up trading in the food and wine luxury category.

Pathway 6. Luxury wine driven culinary tourism

There is an opportunity for South Australian businesses to attract high net worth individuals (HNWIs) with luxury wine driven culinary tourism. Potential clients include people with a variety of interests towards premium experiences on wine and food, such as:

- Wine connoisseurs and wine collectors who are looking for authentic wine and food experiences at wine estates or in their vicinity.
- Asian HNWIs seeking to experience Australian and Western food in the authentic environment.
- Celebrities, business executives, political leaders or other influential people seeking privacy and willing to pay for exclusive leisure service with top class food and wine.
- Increasing number of Chinese upper middle class seeking to be educated on the wine industry.
- People keen on being educated on wine and food appreciation through wine master classes for example.
- Honeymoon travellers seeking a unique, once-in-a-lifetime experience.

While South Australian wine regions and other key places provide the locations for wine driven culinary tourism, it is essential to recognise that from the point of view of a foreign visitor, state and regional borders are not relevant. It is thus essential to develop South Australia service offering as part of the larger portfolio of other interesting destinations across Australia. This pathway requires substantial further development which is justified by the opportunity identified.

Key requirements for developing a competitive luxury tourism offering include a comprehensive offering of complementary services, such as luxury accommodation, premium dining and wine experiences, facilities for recreation and sports, shopping and cultural entertainment. In countries with established culinary tourism (e.g. France, Italy) the Michelin Guide 3* rating is an absolute must. Thus creating an objective, independent and reliable restaurant guide which would rank on an annual basis the eating places around the state should be considered.

None of the companies can provide the set of services alone, and thus collaboration is a key requirement. Clustering between local service providers in a complementary manner is needed. For example, the Barossa Valley has been able to profile itself as a destination with a comprehensive service offering based on local collaboration between service providers.

6. Conclusions and key findings

General conclusions from the study are as follows:

- Most food companies in South Australia are small in size with limited capabilities and willingness to change their ways of working, processes and product portfolios.
- Currently foods produced in South Australia are main-stream, and knowledge about functional foods is limited. The awareness of the existing potential in the functional food area is largely missing among the South Australian food industry.
- There is large potential in the luxury foods area above and beyond the advanced wine industry.
- Food packaging is primarily functional and low cost; it needs to be enhanced to meet the requirements by international standards and consumer expectations in both functional and luxury food markets.
- The Asian functional and luxury food markets analyzed in this study are forecast to grow significantly, providing opportunities for the South Australian food industry to take its share. However, market entry and differentiation in these highly competed markets have many challenges.
- There are few companies in the current value chain that are innovative, ambitious and future oriented as well as export focused; these should be used as inspiring examples for the others.
- There are various opportunities available in adopting and upgrading the current food processing technologies to improve product quality, yield and capacity to upscale for larger volumes as well as reducing costs. Technologies available cover all aspects of the food value chain, not only production; for example e-commerce, supply chain management, traceability, safety, anti-counterfeiting and customer engagement.
- Due to the fairly stagnant nature of the current South Australian food industry, a change in mindset is needed to initiate the necessary change towards more added value food production systems. This change in mindset is not likely to emerge quickly without visible success stories, encouragement and incentives from both government and key industry stakeholders.
- Innovation services easily accessible for small companies are currently missing in South Australia.
- Successful penetration of Asian markets requires innovative products, excellent quality (acknowledged, not only perceived), and differentiation (e.g. through branding). Since South Australia is lagging behind global competitors, fast growing Asian markets should be targeted as a priority. However, since markets vary for any given product and country, a case by case analysis of the market potential is needed.

6.1 Policy Recommendations

Given that the authors and advisory bodies for this report have limited understanding of the complete landscape relating to governance as well as existing and planned policies for the food industry domain in Australia and South Australia, the following recommendations are made grounded in this limited knowledge and must be seen as indicative only.

Pathway 1. Food processing technology upgrading

Actual decisions about investment in food processing technology will be made by individual firms. Due to the low level of awareness of available options, low acceptance of risk, limited capability (due to their small average size), a case can be made for the government intervention to support industry upgrading their food processing technology.

- *Policy recommendation 1* – Consider the establishment of a food technology adoption and upgrading program. This program should aim at increasing the uptake of state-of-the-art food processing technologies through a portfolio of activities including awareness raising, technology scans, identifying potential supplier, and invitations for global vendors to demonstrate their technology in South Australia, as well as financial and technical feasibility studies preceding technology uptake.

- *Policy recommendation 2* – In association with the technology adoption and upgrading program, mentoring and coaching services should be set up. These services would link experienced business managers with SMEs whose process upgrading is restricted by limited in-house management capabilities.

Pathway 2. Functional food products

To support this pathway the role of policy makers should be to establish favourable framework conditions to encourage businesses to explore opportunities in the functional foods market.

- *Policy recommendation 3* – Since an addition of a functional ingredient often implies changes in the recipe or processing of a food product, there is a need for food pilot facilities. Since these kinds of facilities are currently missing in South Australia and they are not likely to emerge purely as a market driven activity (due to high level of investment required), investigation should be made into the potential models for setting up such piloting capabilities. These could be part of a more comprehensive concept for a food innovation centre (see below).

- *Policy recommendation 4* – Investigate the opportunities for public procurement as a driver and source of demand for functional food products for example public health care, aged care facilities and schools. Such purchasing would create a demand driven opportunity for functional food producers.

Pathway 3. Ingredients for functional foods

- *Policy recommendation 5* – The relevant scientific competencies in functional food ingredients found in South Australian universities do not currently find channels to market due to limited piloting and upscaling capabilities. The South Australian Government through its relevant departments and agencies should consider setting up facilities for applied research and piloting together with building up relevant applied science expertise. This type of capability is not likely to develop within universities due to its strongly applied and commercial nature (TRL4-6). At the same time, purely market driven services (TRL 6-9) are not very likely to appear on the market either, due to high initial investment required and uncertain yield.

- *Policy recommendation 6* – The inward investment promotion organisation could seek to identify potential functional food ingredients from wine production (and other food and beverage production) side-streams and attract ingredient manufacturers to establish operations in South Australia. This action point is conditional on introduction of functional food products on the marketplace by food producers i.e. progress of the Pathway 2.

Pathway 4. Active, intelligent and polysensual packaging

- *Policy recommendation 7* –Establishing a strategic development program to build local capabilities in specification and design capabilities for active, intelligent and polysensual packaging solutions is desirable. This recommendation would generate demanding and competent customers for packaging solutions.

- *Policy recommendation 8* – Building on the previous recommendation, there should be a complementary initiative to attract global packaging solution providers to increase their presence in South Australia. By pooling demand from multiple food producers and indicating willingness to adopt state-of-art packaging solutions, South Australia could become a more interesting market for global packaging suppliers. As the local packaging volume will not suffice to attract the global providers to South Australia, it can only be accomplished by pooling the fragmented demand in a larger pool and increasing the level of sophistication in requirements. Hence attracting a capable international packaging provider with offerings in this domain to establish a design, sales and support office in South Australia.

Pathway 5. Luxury foods business strategy uptake and export promotion

- *Policy recommendation 9* – More awareness raising activities should be established to increase understanding of available opportunities and identify best practices from overseas.

- *Policy recommendation 10* – Marketing activities need to be initiated to enter and establish channels to key markets. An export support program would lower the risk for SMEs to uptake a luxury food business strategy with orientation to export markets. Best available marketing approaches for the specific needs or the luxury food market need to be adopted. This kind of insight is not easily available on the marketplace. One way forward could be through the establishment of a luxury product cluster including existing non-food luxury producers.

- *Policy recommendation 11* – The export support activities for luxury food products should create a promotion concept to be piloted in one selected Asian target market. If the concept proves successful and receives positive assessment from both the market and the food businesses, it should then be replicated on other markets with the appropriate local adaptations.

- *Policy recommendation 12* – The government could explore possibilities to establish identifiable product labelling for country of origin Australia. We understand this to be a complex and ongoing issue relating to both the state and federal levels.

Pathway 6. Luxury wine driven culinary tourism

- *Policy recommendation 13* – The need exists for industry collaboration towards assembling a comprehensive service offering for luxury culinary tourism. As no single

firm in the hospitality sector is likely to be capable of producing the necessary set of services to cater for all luxury tourist expectations, there is a need to build regional collaboration networks. Together with industry associations and key businesses, the South Australian Government can support collaboration and networking. This is a significant opportunity in a complex domain. It will require the development of a specific and comprehensive policy together with key stakeholders. Without this policy it is unlikely that these opportunities will be realised.

- *Policy recommendation 14* – The South Australian Government through its departments and agencies could consider supporting even stronger specialised profiling of regions with capability to develop luxury wine driven culinary tourism. For instance: wine regions / Barossa, McLaren Vale, Adelaide Hills; premium seafood capital / Port Lincoln; beef / Mt. Gambier etc.

General policy recommendations

In the previous section, policy recommendations specific to all six pathways were presented. Some recommendations have considerable similarities across the pathways. In case all the pathways are not pursued concurrently separate recommendations were regarded as necessary.

The largest gap identified in the (South) Australian food industry ecosystem is the lack of applied research and food process piloting capacity necessary to support food innovation (see above).

Another related need cutting across various pathways is the need for capability for new technology adoption involving training, benchmarking, demonstration, technology transfer and other activities supporting particularly SME's with limited own resources.

A third important issue related to all the six pathways is the need to improve collaboration between businesses. There is a need for all stakeholders to work together facilitating networking between themselves to achieve a higher level of synergy in developing new products and services. In addition, partnerships and alliances are needed to build more comprehensive offerings, create local demand for new products, and build avenues for export markets.

As mentioned in Section 5 a detailed description of pathway steps and recommendations for the industry can be found in Appendix 1. Figure 5 presents an overview of recommended actions for each pathway.

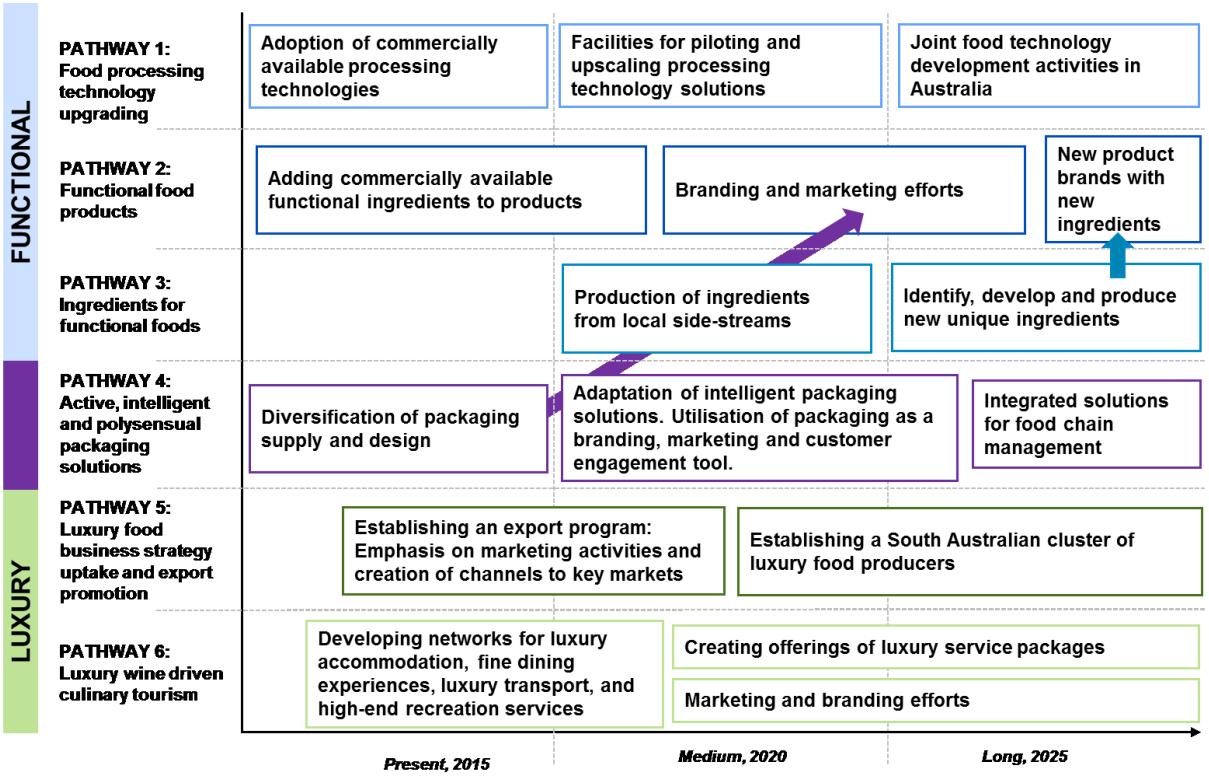

Figure 5. Recommended pathway steps.

7. Appendix

The following organisations were interviewed for this project, particularly for input to the Luxury Food Market Analysis.

Organisation	Country
Australian Southern Bluefin Tuna Industry Association (ASBTIA)	Australia
Aquaculture Stewardship Council	Australia
Australian Truffle Growers Association	Australia
Australian Olive Oil Council	Australia
Grand Hyatt Hotel Shanghai	China
Sofitel Wanda Beijing	China
Retail and Food, Ekuinas (Malaysian Sovereign Investment Fund)	China
www.theyumlist.blogspot.com.au	Singapore
P.T.Sarinah	Indonesia
Supermarket Bintang	Indonesia
Senayan City Food Hall	Indonesia
Dijon Food Specialties	Indonesia
Keraton Hotel	Indonesia
Raffles Jakarta	Indonesia
Yamanashi Prefecture Oku Noboru Senkai production	Japan
Starzen Meat Processor Co., Ltd. Akune Plant (wagyu beef)	Japan
JA Yubari Shop	Japan
Ajisaikan	Japan
Miyazaki Prefectural Fisheries Experiment Station	Japan
Korea Abalone Industry Organization	Korea
Seoul Galleria Department Store	Korea

Organisation	Country
Shinsegae luxury department store	Korea
Lotte luxury department store	Korea
Nara Cellar Corporation	Korea
Hilton Seoul	Korea
Shilla Hotel	Korea
Hyundai Department Store	Korea
CJ Corporation	Korea
Retail and Food, Ekuinas (Malaysian Sovereign Investment Fund)	Malaysia
www.theyumlist.blogspot.com.au	Singapore