

AUSTRALIAN FOOD, BEVERAGE AND
PHARMACEUTICAL PRODUCT
MANUFACTURING INDUSTRY
SECTOR

IRC Work Plan 2016-2019

THE FOOD, BEVERAGE AND PHARMACEUTICAL PRODUCT MANUFACTURING INDUSTRY REFERENCE COMMITTEE WORK PLAN 2016-2019

Purpose

This workforce development and skills needs analysis represents the latest industry intelligence and resulting work plan of the Food, Beverage and Pharmaceutical Product Manufacturing Industry Reference Committee (IRC). It was developed through research of national and industry data sources and ongoing input from IRC members and key stakeholders. The report is designed to provide industry intelligence to support the Australian Industry and Skills Council's (AISC) four-year rolling National Schedule of training product development and review work.

The industry intelligence component covers the following topics:

Sector Overview

An analysis of the depth and breadth of the industry and identification of the macro environmental forces that currently challenge and / or provide opportunities for the industry.

Employment

Review of employment projections by the Department of Employment and an outline of the current workforce profile and supply for the industry.

Skills Outlook

Provides insights into the key trends that could potentially drive changes in workplace design and identification of key priority skills and skilled labour shortages for the industry.

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Executive Summary

This report provides an overview of workforce development and skills needs for the Australian food, beverage and pharmaceutical industry sector. The report was commissioned to support the Australian Industry and Skills Committee (AISC) in developing the four-year rolling National Schedule of training product development and review work. The report is structured, as per the AISC template, in four main sections as follows: sector overview, employment, skills outlook, and training product review plan. Methods of analysis include research of published national and industry data sources and input from Industry Reference Committee (IRC) members and key stakeholders.

The report draws attention to the fact that food supply and exponential population growth provides this industry with the potential for growth and new business opportunities. The opportunities are also shaped by a number of current government policies, market trends characterised by a growing focus on healthier and 'grab and go' food options, a growing export trade, and availability and ongoing development of advanced technologies.

Further, the report reveals that the industry sector's workforce, consistent with many other industry sectors, is reaching the retirement age in higher numbers, creating significant challenges for employers in respect to their ability to attract people to the industry and develop their skills through on the job learning and formal training.

Importantly, employers will increasingly seek high level skills to support more demanding job functions in most workplaces. This occurs because businesses respond to opportunities with new value creation strategies, capital structure strategies, product development, and investments in world-leading technologies, among many other innovations.

Examples of changing job functions for operational employees include: management, quality inspection, generation of information/reporting, process improvements, and technical maintenance. Similarly, higher level skills will be required of specialist managers to support strategic developments and targets. Such examples include strategic leadership and change management skills, marketing executive skills, developing investment project skills, global supply chain and logistics skills and other high level skills.

Summary of key points in each section

Sector overview

- The food, beverage and pharmaceutical product manufacturing industry can be described as having five sectors: food processing and manufacturing, beverage manufacturing, pharmaceutical manufacturing, nutraceutical manufacturing, and wholesaling / retailing of the above. The industry can also be described in more detail through a range of sub-sectors.
- The industry includes 10,566 manufacturing businesses and 26,145 wholesalers and retailers, who collectively employ approximately 750,000 people.
- In general, the sectors are characterised by a large number of small and medium-size producers producing for local or niche markets and a smaller number of large producers which often are multinational companies and operate globally.
- Total sales turnover of the manufacturing sectors increased by 4.1 per cent (or \$4,286 million) to \$109.2 billion between 2012-13 and 2013-14.
- The industry is represented by about 55 peak organisations at a national and state level, including industry and industry sub-sectors associations, industry services bodies such as R&D corporations, professional associations, employee associations and regulatory bodies.

- Key regulations for the industry include or are related to: Food Standards Australia New Zealand, industry / customer standards, Australian Consumer Law, Australian Packaging Covenant, sugar industry regulations, excise compliance, export licence, advertising and packaging regulations, environmental protection measures, pharmaceuticals regulations including international regulations such as the FDA in the USA for exports, complementary medicines regulations, wine industry regulations and alcoholic product retail regulations.
- There are some regulated occupations¹, which are specific to the industry sectors.
- Key macro forces which currently challenge and provide opportunities for the industry sectors include:
 - Global food security significance and higher food demand in expanding markets, such as Asia Pacific region, reflected also in a number of Government policies aimed at facilitating the sector's growth
 - The 2015 PBS Access and Sustainability Package, which is expected to create added pressure on the pharmaceutical industry. The policy may also provide opportunities for working with regulatory bodies and streamline its conditions further.
 - Climate change and its effects on the upstream sectors, which creates both challenges and opportunities for many food processing sectors to increase collaboration with the supply chains. These partnerships will aim to support decisions and development of more resilient crop varieties and large scale farming systems.
 - Export growth of food, beverage and pharmaceutical products and clear customer trends, which provide opportunities for businesses to achieve greater adaptation of products to more diversified markets; and develop targeted marketing of different product qualities to market segments where there is the greatest potential for value adding.
 - Existing and ongoing development of enabling technologies, which allows for more efficient and sustainable food, beverage and pharmaceutical processing, integrated packaging, enhancement of the nutritional value of products and reduction of waste and water use.

Employment

- Employment growth is anticipated for all industry sectors in the coming years, except for the sugar and confectionery manufacturing sector and the fruit and vegetable processing sector.
- About 19 per cent of the industry workforce is likely to retire over the next five years.
- A significant number of the workforce occupies roles specific to factory process workers such as food/beverage process workers, packers, product assemblers and product quality controllers, and food trade workers such as bakers and pastry cooks. A significant workforce is also employed to undertake more general roles such as specialist managers (i.e. business administration managers, marketing and sales managers, production managers, supply and distribution managers), clerical and administrative work and sales.

¹ Regulated occupations have legal (or industry) requirements or restrictions to perform the work. Regulated occupations require a license from, or registration by, a professional association or occupational licensing authority.

Skills outlook

Current skill needs priority in the industry include:

DRIVER	SKILLS OUTLOOK	TRAINING PACKAGE PROJECT
<p>Industry changes driven by technology potentially reducing production costs and creating a competitive industry both domestically and internationally.</p>	<p>Higher and value-added skills, which will be required from both operational and specialist management employees and are driven by higher efficiency targets, innovation and automation/digitisation of some work activities in most workplaces and jobs.</p>	<p>Develop qualification/s for equipping owners and senior managers with strategic management skills to respond to the dynamic and changing operating environment with increased competition and opportunities to reach global markets.</p> <p>Develop/update qualifications and units covering skills for cultural competency and awareness of Asian market preferences for products, presentation and transportation.</p> <p>Develop/update qualifications and units covering skills for lean and agile manufacturing processes.</p> <p>Develop/update qualifications and units covering skills for risk management across all occupations.</p>
<p>Evolving skills across the industry driven by emerging technology and processes requiring a higher skill levels at the operational level.</p>	<p>At the operational level, skills demand includes a range of skills in the following areas: Science Technology Engineering and Mathematics (STEM), compliance, and leadership.</p>	<p>Review of the retail baking qualifications, skill sets and units of competency.</p> <p>Review of qualifications and units of competency for Food Science to address changing industry needs.</p>
<p>Export growth of food, beverage and pharmaceutical products and clear customer trends, which provide opportunities for businesses to achieve greater adaptation of products to more diversified markets.</p>	<p>Higher level supply chain and logistics skills required to support lean, fast, reliable, transparent and collaborative relationships with key suppliers and customers and with other companies, including competition and research organisations.</p>	<p>Develop qualification/s for global supply chain management and logistics including rapid expansion of fast moving goods channels and online retailing.</p> <p>Develop/update qualifications and units covering skills for cultural competency and awareness of Asian market preferences for products, presentation and transportation.</p>

Changing markets and demand requiring a higher level response to customers to support growth.	Higher level skills in relation to customer service – i.e. specific product and brand knowledge, working with data and data analysis, negotiation, digital marketing and digital commercialisation approaches.	Develop/update qualifications and units covering skills for cultural competency and awareness of Asian market preferences for products, presentation and transportation.
Targeted marketing of different product attributes to market segments where there is the greatest potential for value adding.	Brand development and marketing strategies to support business growth.	Review units across food processing, pharmaceuticals manufacturing, flour milling, food science and technology and other qualifications as required to support brand development and marketing strategy development.
Response to the changing customer interface to include electronic media and online sales.	Social media engagement and online retailing	Review units across food processing, pharmaceuticals manufacturing, flour milling, food science and technology and other qualifications as required to support Social media engagement and online retailing. Develop qualification/s for global supply chain management and logistics including rapid expansion of fast moving goods channels and online retailing.
Technological developments and general changes to wine operations	A range of specialist skills and general skills for wine making in a contemporary workforce	Review wine making qualifications and units of competency to ensure they reflect current practices and skill needs of a contemporary workforce. Develop/update qualifications and units covering skills for developing and managing seamless HACCP plans and systems.
Existing and ongoing development of enabling technologies. Access and Sustainability Packaging in the pharmaceutical industry.	Automated production processes especially in high technology sectors such as food and pharmaceutical manufacturing	Full review of pharmaceutical qualifications and units with potential development of new units and skill sets.

<p>Efficiencies in product packaging required for entry into new and expansion of existing domestic and international markets particularly pharmaceuticals.</p>	<p>Alternative packaging materials</p>	<p>Review and update units for advanced, automated and alternative packaging materials across food processing, food science and technology and pharmaceuticals.</p>
<p>Existing and ongoing development of enabling technologies and processes, allowing for efficiencies, sustainability, integrated packaging, product enhancements and environmentally sustainable practices.</p>	<p>Food, beverage and pharmaceutical processing innovation and product development including artisan bakery and fermented food production, pharmaceuticals, wine, food fermentation and general foods.</p>	<p>Review job roles and qualifications at Certificate III to Diploma for food processing and product development. Develop new innovation and product development units.</p> <p>Develop/update qualifications and units covering skills for investigating nutritional characteristics of raw materials before, during and after processing.</p> <p>Develop/update qualifications and units covering skills for waste management and conversion.</p> <p>Develop/update qualifications and units covering skills for developing and managing seamless HACCP plans and systems.</p>

A. ADMINISTRATIVE INFORMATION

Name of Applicable Industry Reference Committee (IRC)	Food, Beverage and Pharmaceutical Industry Reference Committee
Name of Applicable Skills Service Organisation (SSO)	Skills Impact Ltd

B. SECTOR OVERVIEW

Sector Description

The food, beverage and pharmaceutical product manufacturing industry sector integrates all businesses that operate in the following sub-sectors:

Food processing and manufacturing

- Dairy product manufacturing
- Bakery product manufacturing
- Grain processing, cereal and pasta manufacturing
- Fruit and vegetable processing
- Sugar manufacturing
- Confectionery manufacturing
- Snack food manufacturing
- Functional food and beverage manufacturing.

Beverage manufacturing

- Wine and spirit manufacturing
- Beer manufacturing
- Soft drinks manufacturing.

Livestock and pet feed manufacturing

Pharmaceutical and nutraceutical product manufacturing

- Human pharmaceuticals and medicinal product manufacturing
- Complementary medicine manufacturing
- Veterinary pharmaceuticals and medicinal product manufacturing.

Wholesaling of the above

In 2014, the sector included 10,566 manufacturing businesses and 26,145 wholesalers and retailers employing 750,000 people^{2,3}.

The manufacturing of food, beverage and pharmaceuticals contribution to the Australian economy includes⁴:

- Total sales turnover, which increased by 4.1 per cent (or \$4,286 million) to \$109.2 billion between 2012-13 and 2013-14.
- Industry value added (IVA), which increased by 3 per cent (or \$841 million) to \$29.2 billion over the same period.

² ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

³ ABS, Australian Industry, 2013-14, Cat No 8155.0.

⁴ ABS, Australian Industry, 2013-14, Cat No 8155.0.

- Employment, which decreased by 1.7 per cent (or 4,303 people) to 254,253 people at June 2014.

Relevant Training Package Qualifications

The Training Package for the food, beverage and pharmaceutical product manufacturing sector is *FDF10 Food Processing Training Package*. FDF10 comprises 26 qualifications, 24 skill sets and 474 units of competency.

FDF10 FOOD PROCESSING TRAINING PACKAGE QUALIFICATIONS

Qualification Level: Certificate I

Certificate I in Food Processing
 Certificate I in Pharmaceutical Manufacturing
 Certificate I in Sugar Milling Industry Operations

Qualification Level: Certificate II

Certificate II in Food Processing (Sales)
 Certificate II in Pharmaceutical Manufacturing
 Certificate II in Wine Industry Operations
 Certificate II in Retail Baking Assistance
 Certificate II in Food Processing
 Certificate II in Sugar Milling Industry Operations

Qualification Level: Certificate III

Certificate III in Food Processing
 Certificate III in Pharmaceutical Manufacturing
 Certificate III in Plant Baking
 Certificate III in Wine Industry Operations
 Certificate III in Retail Baking (Cake and Pastry)
 Certificate III in Retail Baking (Bread)
 Certificate III in Retail Baking (Combined)
 Certificate III in Food Processing (Sales)
 Certificate III in Sugar Milling Industry Operations

Qualification Level: Certificate IV

Certificate IV in Food Processing
 Certificate IV in Pharmaceutical Manufacturing
 Certificate IV in Food Science and Technology
 Certificate IV in Advanced Baking
 Certificate IV in Flour Milling

Qualification Level: Diploma

Diploma of Food Processing
 Diploma of Pharmaceutical Manufacturing
 Diploma of Food Science and Technology
 Diploma in Food & Wine Management

Sector Analysis

Sub-sector description and analysis of businesses involved

FOOD PROCESSING AND MANUFACTURING

SUB-SECTOR NAME	DAIRY PRODUCT MANUFACTURING
SCOPE OF WORK	<p>The sector consists of businesses that process milk and cream, to make milk and cream products with varying levels of fat content, and manufacture dairy products such as cheese, butter, yoghurt, condensed milk, ice cream, milk powder.</p>
PRODUCERS	<p>In 2014 there were 474 businesses in the sector, with the majority small and medium-size operators⁵, however dairy processing in the sector is dominated by a small number of large, diversified dairy companies with global operations and multiple production sites across Australia. Smaller producers specialise in niche products or cater for smaller local or foreign markets.</p> <p>Major producers⁶</p> <ul style="list-style-type: none"> • Devondale Murray Goulburn Co-operative Co Limited (MGC) (Australian dairy farmers cooperative) • Lion Pty Ltd (subsidiary of Japanese Kirin Holdings Company Limited) • Parmalat Australia Pty Ltd (subsidiary of Parmalat Belgium SA) • Fonterra Australia Pty Ltd (subsidiary of New Zealand cooperative of dairy farmers) • Bega Cheese Co-operative Limited (Australian-owned and publicly listed manufacturer) • Warrnambool Cheese and Butter (subsidiary of Canadian dairy company Saputo) • Tatura Milk Industries Limited (subsidiary of Bega Cheese) • Peters Food Group Limited • Unilever Australia (Holdings) Proprietary Limited (subsidiary of UK Unilever plc) • Bulla Dairy Foods (Australian-owned company) • Bon Appetit Australia Pty Ltd • Norco Co-operative Limited • Sara Lee Group (Australia) Pty Ltd (subsidiary of Canadian's frozen food company McCain) • Weis Frozen Foods
GEOGRAPHICAL LOCATION	<p>While all Australian states have dairy product processing operations, Victoria contributes the largest share, followed by New South Wales, in national dairy product output. The processing establishments are generally located near dairy farms or areas with high concentration of dairy farming activities and water availability.</p>

⁵ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

⁶ Enterprises listed according to their relative market share or significance in the sector

AUTOMATION AND DIGITISATION

The level of automation varies depending on the type and scale of production. New process engineering practices and technologies are being integrated in diary operations to develop new product attributes and ingredients and improve existing processes. Computerised systems are used to streamline administrative and managerial operations and contribute to improved marketing and distribution system.

SUB-SECTOR NAME	BAKERY PRODUCT MANUFACTURING
SCOPE OF WORK	The sector includes businesses involved in the production of all range of bread products and bread dough; cakes, pastries and other similar bakery products such as artisan breads; and biscuits. Bakery producers operate from either factory-based premises or non-factory based locations such as retail bakeries, supermarket in-store bakeries or home.
PRODUCERS	<p>The sector is characterised by a large number of small and medium-size producers, with many producing from non-factory based premises for local or niche markets. In 2014 there were a total of 5,928 businesses in the sector⁷. There is a small number of large producers, yet they dominate the national bread and biscuits product output through the large number of sites operated across Australia. Often, these companies are multinational, and operate globally.</p> <p>Smaller producers, including those operating as franchisees, account for a larger number of business with smaller, individual and specialised output. Many specialise in niche areas as a means to differentiate themselves in the market eg: artisan baking.</p> <p>Major producers⁸</p> <ul style="list-style-type: none">• Goodman Fielder Limited (subsidiary of Singapore's Wilmar International and Hong Kong's First Pacific)• George Weston Foods Ltd (GWF) (subsidiary of Australia's Food Investments Pty Limited)• Patties Foods Limited (Australian-owned company)• George Weston Foods (GWF) (a wholly owned subsidiary of Associated British Foods plc (ABF))• Sara Lee Australia (subsidiary of Canadian frozen food company McCain)• Arnott's Biscuits Holdings Pty Limited (subsidiary of the US-based Campbell Soup Co. Inc.)• Green's Foods Holdings Pty Limited (Australian-owned company)
GEOGRAPHICAL LOCATION	Bread and bakery production occurs across all Australian states.

⁷ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

⁸ Enterprises listed according to their relative market share or significance in the sector

AUTOMATION AND DIGITISATION	The level of automation and integration of digital technology varies depending on the scale of production. In large operations, bread production is a fully mechanised process, with machines undertaking jobs from dough mixing to moulding and baking, as well as slicing and wrapping. Larger companies are also using computer-based systems and software to achieve better inventory and production planning, improved marketing and distribution systems.
SUB-SECTOR NAME	GRAIN PROCESSING, CEREAL AND PASTA MANUFACTURING
SCOPE OF WORK	The sector includes businesses that process grains, vegetables or plants into a range of flour and meal products (primary processing activity) and businesses that manufacture prepared cereal foods, fresh and dried pasta, and prepared baking mixes.
PRODUCERS	<p>In 2014 there were 86 grain processors in the sector, including three large businesses and smaller operators largely catering for niche and specialty products. Cereal and pasta manufacturing includes 244 businesses, both large multinational companies and small local manufacturers and resellers⁹. Smaller operators are usually specialist breakfast cereal and baking mix companies concentrating on a specific range of products.</p> <p>Major producers¹⁰</p> <p>Grain processing</p> <ul style="list-style-type: none"> • Manildra Milling Pty Ltd (Australian family-owned business) • Food Investments Pty Limited (subsidiary of the UK-based Associated British Foods plc.) • Allied Mills Australia Pty Ltd (subsidiary of Australia's GrainCorp Limited) <p>Cereal and pasta manufacturing</p> <ul style="list-style-type: none"> • Kellogg Australia (subsidiary of the US-based Kellogg Company) • Australian Health & Nutrition Association Limited (AHNAL) (Australian-owned company). Sanitarium Health & Wellbeing is the trading name of AHNAL and New Zealand Health Association Ltd, both wholly owned by the Seventh-day Adventist Church. • General Mills Australia (subsidiary of the US-based General Mills) • Nestle Australia Ltd (subsidiary of the Swiss Nestle SA company) • Clearlight Investments Pty Limited (Australian-owned private company)
GEOGRAPHICAL LOCATION	Flour and grain product manufacturers are located in both metropolitan areas and country areas. Metropolitan manufacturers are located close to downstream markets, such as wholesalers and food manufacturing industries. In country areas, manufacturers are located in wheat-growing areas to be close to key inputs. Likewise, large cereal and pasta producers tend to have operations near key inputs to reduce transport costs. Although

⁹ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

¹⁰ Enterprises listed according to their relative market share or significance in the sector

	sector producers are spread across Australia, New South Wales and Victoria have the largest share.
AUTOMATION AND DIGITISATION	The sector is characterised by the introduction of further automation of traditional processes and re-engineering or equipment design to increase efficiency and operating capacity. Other major developments relate to computerisation of processes and stocks, and improved packaging processes through adoption of automated equipment. Value adding through the development of new products is a key driver of innovation in the sector.

SUB-SECTOR NAME	FRUIT AND VEGETABLE PROCESSING
SCOPE OF WORK	The sector represents businesses that process, bottle, can, preserve, quick freeze and quick dry fruit and vegetables, including dehydrated vegetable products, sauces, pickles and mixed meat and vegetable products.
PROCESSORS	<p>The sector is comprised of 524 businesses, with the majority of them being small and medium-size operators including farmer cooperatives¹¹. The sector is also characterised by a high level of vertical integration, particularly in the fruit processing segment. Where vertical integration is limited, processors enter into supply contracts with growers, which gives them a level of control on management functions related to quantity and quality of supply. Processors with large-scale operations in the sector are generally multinational companies.</p> <p>Major processors¹²</p> <ul style="list-style-type: none"> • Simplot Australia (Holdings) Pty Limited (subsidiary of US-based J.R. Simplot Company) • SPC Ardmona (SPC) (subsidiary of Coca-Cola Amatil) • McCain Foods (Aust) Pty Ltd (subsidiary of Canadian McCain Corporation) • Heinz Wattie's Pty Limited (subsidiary of US-based Heinz) • One Harvest Pty Ltd (Australian, family-owned business based in Queensland)
GEOGRAPHICAL LOCATION	Production facilities are located in all Australian states, generally in areas with high concentration of fruits and vegetable growers. New South Wales, Victoria and Queensland have the largest share of fruit and vegetable processors.
AUTOMATION AND DIGITISATION	The sector, particularly larger processors, integrates automated processes and digital systems that provide efficient control of inventory and management of production processes, improved marketing and distribution systems.

¹¹ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

¹² Enterprises listed according to their relative market share or significance in the sector

SUB-SECTOR NAME	SUGAR MANUFACTURING
SCOPE OF WORK	<p>The industry's major product is raw crystal sugar, which is sold to refineries both domestically and abroad. Approximately 95% of Australian sugar produced comes from Queensland with the balance from Northern New South Wales.</p> <p>The Australian sugarcane industry is one of Australia's largest rural industries with sugarcane being Queensland's largest agricultural crop. Up to 35 million tonnes of sugarcane is crushed annually. This can produce up to 4.5 million tonnes of raw sugar, 1 million tonnes of molasses and 10 million tonnes of bagasse annually. Approximately 85% of the raw sugar is exported, generating up to \$2.0 billion in export earnings.</p> <p>Sugar mills are self-sufficient in energy, burning the sugar processing by-product bagasse, (which is a renewable fuel) to generate electricity and steam for factory operations. In addition, more than half of the electricity generated (around 500 GWh in 2014) is exported to the electricity network supporting electricity infrastructure and reducing greenhouse gas emissions from power generation. The use of renewable bagasse for the production of 'green' energy reduces the nation's greenhouse gas emissions by over 1.5 million tonnes annually.</p>
PRODUCERS	<p>Sugar manufacturing sector is characterised by a small number of operators who are a combination of publicly owned entities, private companies, and co-operatives. Large producers include Australian-owned companies and also global operators with a high level of vertical integration. Chocolate and confectionery sector is represented by three large, globally-operated producers and 326 small and medium-size businesses. Small producers have a significant role in small local and foreign markets and niche markets.</p> <p>Major producers</p> <p>Sugar manufacturing</p> <ul style="list-style-type: none"> • Wilmar Sugar Australia Limited and its subsidiaries • Mackay Sugar Limited (unlisted public company) • MP Australia Holdings Pty Ltd (trading as MSF Sugar, subsidiary of Thai-based Mitr Phol Sugar Corp) • Finasucre Investments (Australia) Pty Limited (subsidiary of the Belgian sugar giant Societe Financiere des Sucres) • Tully Sugar Limited is a wholly owned subsidiary of Chinese agribusiness company COFCO • Isis Central Mill was registered in 1894 as a company by a group of Cane Growers. • SUNSHINE Sugar was formed in June 2015 when the growers of NSW Sugar Milling Co-operative Ltd merged the refining and milling operation. • Sugar Australia is the leading supplier of quality refined sugar products. We service the industrial and consumer sugar market, and market the CSR Sugar brand.

GEOGRAPHICAL LOCATION

Sugar processing facilities are located mainly along Australia’s eastern coastline, from Mossman in far north Queensland to Grafton in northern New South Wales. There are approximately 4400 cane farming entities growing sugar cane on a total of 380,000 hectares annually, supplying 24 mills, owned by 8 separate milling companies. Sugar Refinery facilities operate from Port Melbourne in Victoria to Mackay in Queensland. Chocolate and confectionery producers are located in most Australian states, with the majority in metropolitan areas in New South Wales and Victoria.

AUTOMATION AND DIGITISATION

Sugar manufacturing is characterised by extensive capital equipment, this capital equipment undergoes in excess of a \$300 million renewal program every year. Limited new technology has been adopted in the sector, however this has improved in recent times with the introduction of foreign ownership and injections of new capital. Chocolate and confectionery producers involve a high level of production automation and computer-controlled equipment for precise calibration and tolerances. Digital systems for improved supply chain arrangements, and better marketing and distribution systems are also a driver of improvements in the sector.

SUB-SECTOR NAME

CONFECTIONERY MANUFACTURING

SCOPE OF WORK

The sector consists of companies that manufacture confectionery, chocolate or cocoa products, with or without sugar.

PRODUCERS

Chocolate and confectionery sector is represented by three large, globally-operated producers and 326 small and medium-size businesses.¹³ Small producers have a significant role in small local and foreign markets and niche markets.

Major producers¹⁴

- Mondelez Australia Holdings Pty Ltd (subsidiary of the US-based Mondelez International Inc)
- Nestle Australia Ltd (subsidiary of Switzerland-based Nestle SA)
- Mars Australia Pty Ltd (subsidiary of US-based Mars Inc.)
- Ferrero Australia Pty Ltd (subsidiary of Luxembourg-based Ferrero International SA)

GEOGRAPHICAL LOCATION

Chocolate and confectionery producers are located in most Australian states, with the majority in metropolitan areas in New South Wales and Victoria.

¹³ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

¹⁴ Enterprises listed according to their relative market share or significance in the sector

AUTOMATION AND DIGITISATION

Chocolate and confectionary producers involve a high level of production automation and computer-controlled equipment for precise calibration and tolerances. Digital systems for improved supply chain arrangements, and better marketing and distribution systems are also a driver of improvements in the sector.

SUB-SECTOR NAME	SNACK FOOD MANUFACTURING
SCOPE OF WORK	The sector includes companies that manufacture dried fruit and nut bars, muesli bars, protein bars, mix nuts, potatoes/corn chips, extruded snacks, popcorn, pretzels and other sweet and savoury snack products. The primary distribution channels are supermarkets, milk bars and convenience stores.
PRODUCERS	<p>The snack food sector is represented by large multinationals that specialise in snack food production, such as Frito-Lay, or that dedicate a small segment of their business to snack foods, like Nestle Australia; major grocery supermarkets through their own private labels; and small-scale producers that specialise in niche, lower volume products, with many entering the market in recent years.</p> <p>Major producers¹⁵</p> <ul style="list-style-type: none">• Frito-Lay Australia Holdings Pty Limited (subsidiary of US-based Frito-Lay Inc)• Smith's Snackfoods Company (subsidiary of the multinational corporation PepsiCo)• Snack Brands Limited (privately owned Australian snack food company)• Woolworths Ltd (private labels)• Aldi Stores Supermarkets Pty Ltd (private labels)• Wesfarmers Ltd (private labels)• Manassen Foods Australia Pty Ltd• Sakata Rice Snacks Australia Pty Ltd• Stuart Alexander & Co Pty Ltd• San Remo Macaroni Co Pty Ltd• Rice Growers Ltd• Menora Foods Pty Ltd• Nestle Australia Ltd
GEOGRAPHICAL LOCATION	The majority of snack food establishments are located in metropolitan areas of Queensland, Victoria and New South Wales.

¹⁵ Enterprises listed according to their relative market share or significance in the sector

AUTOMATION AND DIGITISATION

Many snack food producers benefit from the introduction of automated, computer-controlled equipment, which provides increased efficiency and, in many cases, improved product quality.

SUB-SECTOR NAME	FUNCTIONAL FOOD AND BEVERAGE MANUFACTURING
SCOPE OF WORK	<p>The sector encompasses companies that manufacture foods and drinks, including fermented foods, fortified, enriched or enhanced with vitamins and nutraceutical components such as probiotics (microorganisms that provide digestive benefits), omega-3 (fish oil) extracts, and nutrients found in plants (such as soy beans, blueberries or grapes), algae/seaweeds.</p> <p>Examples of functional foods and drinks include fruit juice, bread and pasta fortified with vitamins and minerals, fermented cheeses, fermented fruit and vegetables, Kombucha, margarine containing plant sterols, yoghurt with specific bacterial strains, health drinks, sports drinks and energy drinks.</p>
PRODUCERS	<p>Food and beverage companies are the primary producers of functional food. Nutraceutical/ingredient extraction may be conducted in-house, or it may be outsourced to specialised suppliers dedicated to food ingredient technology research and product development.</p>
AUTOMATION AND DIGITISATION	<p>Nutraceutical extraction involves specialised, sophisticated technologies. Research and development is often significant.</p>

BEVERAGE MANUFACTURING

SUB-SECTOR NAME	WINE AND SPIRIT MANUFACTURING
SCOPE OF WORK	<p>The sector includes businesses that process grapes into wine, fortified wine and wine-based alcoholic beverages. These products are sold in bulk, bottles or casks in domestic and export markets. In 2015 the Australian wine industry exported 789 million litres of wine generating \$2.11 billion for the Australian economy¹⁶. Domestically, wine sales totalled \$2.78 in 2014-2015¹⁷</p> <p>The sector also includes businesses that produce spirit beverages from grapes (including recovered material from wine production), sugarcane or sugar beet products (including cane juices, molasses, and sugar), grain, and ferments (yeast and yeast cultures). Spirit products include food grade ethanol, brandy, vodka, gin, whisky and liqueurs.</p> <p>A further stream is the recovery of wine industry waste materials including marc (the solid remains of wine grapes after pressing of the grapes) and transforming the waste into value added products such as grape alcohol, chemical additives for wine, tannins, grape juice and various agricultural and</p>

¹⁶ Wine Australia 2015, *Wine Export Approval Report*, Moving Annual Total (MAT) to December 2014

¹⁷ Wine Australia 2016, *State of Australia Wine*, March 2016

horticultural products including stock feed, mulch, soil conditioner and organic fertilizer.

PROCESSORS

The sector comprises 1,925 wine businesses, including a few large producers, several medium-size businesses and many small family-owned businesses.

The sector includes also more than 58 spirit producers¹⁸. The majority are non-employing or small producers that make boutique spirits, with many promoting themselves as tourism destinations.

Major processors¹⁹

Wine processors

- Accolade Wines Holdings Australia Pty Limited (private equity ownership, Australian Wine producer, largest winery in the southern hemisphere)
- Casella Wines Pty Limited (Australia's largest family owned winery, also distributor of a craft beer)
- Treasury Wine Estates Limited (TWE) (Australian-owned producer and distributor of wine with global operations)
- Pernod Ricard Pacific Holding Pty Ltd (subsidiary of France-based spirits and wine giant Pernod Ricard SA, Australian winemaker, distributor of a range of well-known spirit brands)
- Australian Vintage Limited (AVL)
- Kingston Estate Wines
- De Bortoli Wines

Spirit producers

- Carlton & United Breweries CUB (subsidiary of SAB Miller)
- Bacardi Lion (joint venture of Bacardi and Lion)
- Diageo Australia (foreign-owned public company, distributor of beer, spirits and a small portfolio of premium Champagne)
- Beam Global Australia (subsidiary of the US-based Beam Inc)
- Vok Beverages (independently owned and operated Australian alcoholic beverage company)
- Brown-Forman Australia (subsidiary of the US-based Brown-Forman spirit company)
- Suntory Australia (subsidiary of Japan-based Suntory Liquors Limited)
- Campari Australia (subsidiary of Italy-based Gruppo Campari)
- Asahi Holdings (Australia) Pty Ltd (previously Independent Distillers, producer and distributor of a range of RTD products, spirits and craft beers)
- ONEBEV (independently owned Australian alcoholic beverage company)
- Coca-Cola Amatil Limited (CCA) (subsidiary of Beam Inc., distributor of a range of spirit, cider and RTD products)
- Lion Pty Ltd is (subsidiary of Japanese Kirin Brewing Company, producer and distributor of a range of wine, cider and beer products)

¹⁸ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

¹⁹ Enterprises listed according to their relative market share or significance in the sector

GEOGRAPHICAL LOCATION	<p>Wine production facilities are located at or near vineyards in all Australian States with concentrations in regions like the Barossa Valley, McLaren Vale, Clare Valley, Riverland, Coonawarra, Eden Valley and Adelaide Hills in South Australia or Sunraysia, Yarra Valley, Mornington Peninsula, Heathcote, Western District, Rutherglen and Beechworth in Victoria.</p> <p>In New South Wales, winery regions include the Hunter Valley, Great Dividing Range, Orange, Forbes, and Griffith.</p> <p>In Western Australia, the regions include the Margaret River, Frankland River, Mount Barker and Swan Valley.</p> <p>There are a number of spirit manufacturing establishments in New South Wales, Queensland and Victoria. Tasmania has some world recognised whiskey distilleries, whilst Queensland and South Australia have some of the oldest and largest.</p>
AUTOMATION AND DIGITISATION	<p>The sector, particularly larger processors, integrate automated processes and digital systems that provide better quality control, greater product consistency, efficient control of inventory, management of production processes, improved marketing and distribution systems.</p> <p>Smaller boutique producers often have a rich heritage and produce unique wine which reflect the characters of wines of their region. These producers whilst innovative and dedicated are generally not in a financial position to automate but are often very active in the digital / social media space.</p>
SUB-SECTOR NAME	BEER MANUFACTURING
SCOPE OF WORK	<p>Businesses in this sector manufacture keg, bottled and canned beer in a range of varieties such as ale, lager and stout. Businesses in this sector also produce cider including apple cider, pear cider and a range of other non-traditional cider flavours.</p>
PRODUCERS	<p>The sector includes 224 producers, the majority of which are small, privately-owned brewers producing premium beers.²⁰ There are a few large, multinational companies that dominate the market. Besides a few large-scale operations of major players such as Lion and CUB, there are about 100 small cider producers in Australia, serving niche markets.</p> <p>Major producers and distributors²¹</p> <ul style="list-style-type: none"> • Lion Pty Ltd (subsidiary of the Japanese Kirin Brewery Company Limited) • Carlton & United Breweries CUB (subsidiary of SABMiller, the world's second-largest brewer) • Coopers Brewery Limited • Australian Beer Company (ABCo) (joint venture of the Coca-Cola Amatil and Casella)

²⁰ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

²¹ Enterprises listed according to their relative market share or significance in the sector

	<ul style="list-style-type: none"> • Gage Roads Brewing Co Ltd (Woolworths has 25% stake in the company) • Asahi Holdings (Australia) Pty Ltd
GEOGRAPHICAL LOCATION	Although the majority of industry establishments are concentrated in Victoria, New South Wales and Western Australia operations can also be found in Queensland and South Australia and a smaller number in Tasmania.
AUTOMATION AND DIGITISATION	Computerisation is playing a major role in ensuring consistency in beverage products by monitoring ingredient flow and ensuring that these ingredients are mixed in correct quantities and at specified temperatures.

SUB-SECTOR NAME	SOFT DRINKS MANUFACTURING
SCOPE OF WORK	The sector includes businesses that produce canned or bottled soft drinks, (carbonated and non-carbonated), cordial, juice, syrup, sport drinks and energy drinks.
PRODUCERS	<p>The sector is dominated by a few large, multinational companies but also contains 360 smaller, regionally-based operators.²² Many of these operators produce private-label products and service niche market segments.</p> <p>Major producers and distributors²³</p> <ul style="list-style-type: none"> • Coca-Cola Amatil (Australia) Limited (CCA) (subsidiary of US-based Coca-Cola Amatil Limited) • Asahi Holdings (Australia) Pty (subsidiary of the Japanese-based company) • Tru Blu Beverages (Australian-owned private company)
GEOGRAPHICAL LOCATION	Soft drink manufacturers have facilities all over Australia, with key sites in Sydney, Melbourne, Adelaide and Perth.
AUTOMATION AND DIGITISATION	Soft drink manufacturing is characterised by extensive capital equipment, with limited new technology being adopted in the sector. Digital systems for improved supply chain arrangements, and better marketing and distribution systems are also adopted in the sector.

LIVESTOCK AND PET FEED MANUFACTURING

SUB-SECTOR NAME	LIVESTOCK AND PET FEED MANUFACTURING
SCOPE OF WORK	The sector includes businesses involved in the manufacture of stockfeed for animals and birds (including cereal meal, grain offal or crushed grain for use as fodder) and canned food for pets. Products are transported in bulk form to distribution centres across the country.

²² ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

²³ Enterprises listed according to their relative market share or significance in the sector

PRODUCERS	<p>In 2014 there were 305 businesses in the sector²⁴, with the majority being small operators. However, the stockfeed products marketed is dominated by a small number of large and medium producers. The level of vertical integration within the sector is relatively minor. Also, some of the major companies listed below are stockfeed or pet food divisions of global food and beverage corporations.</p> <p>Major producers²⁵</p> <ul style="list-style-type: none"> • Ridley Corporation Limited (Australian-owned public company) • Mars Australia Pty Ltd (subsidiary of US-based Mars Incorporated) • Riverina (Australia) Pty Ltd (subsidiary of Japan-based Mitsubishi Corporation) • Ingham Holdings (subsidiary of US-based private equity firm TPG) • Nestle Australia Ltd (subsidiary of Switzerland-based Nestle SA) • Ricegrowers Limited (Australian-owned public company)
GEOGRAPHICAL LOCATION	<p>The majority of feedstock and canned pet food production facilities are located across New South Wales, Queensland and Victoria, generally in rural or country areas and close to key inputs such as grain mills, cattle farms or meat processing plants. A few facilities are also located in Western Australia and South Australia.</p>
AUTOMATION AND DIGITISATION	<p>The sector integrates high levels of automation and involves almost continuous operations. Processes and stock inventory and distribution are supported by computerised systems. Packaging also involves a variety of packaging equipment including collators, conveyors, spiral chutes, carton drops and automated case packers.</p>

PHARMACEUTICAL AND NUTRACEUTICAL PRODUCT MANUFACTURING

SUB-SECTOR NAME	HUMAN PHARMACEUTICAL PRODUCT MANUFACTURING
SCOPE OF WORK	<p>The sector comprises of businesses that manufacture medicinal and pharmaceutical products for human use, including medicines, chemical or diagnostic testing agents, blood serums and biotech products.</p> <p>Recent developments include booming export markets, (mainly China), in the vitamins and food supplements categories, which has been a driver for improved company growth and opportunities.</p> <p>The sector includes organisations across a breadth of specialisations and manufacturing processes with some being extremely specialised whilst others not quite so. The more complex the tasks within the production process, the less reliance there is on generic, transferable production skills such as good manufacturing practice (GMP) and more reliance on internal training on organisational specific equipment. For example, organisations producing highly sterile products would have extremely specialised</p>

²⁴ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

²⁵ Enterprises listed according to their relative market share or significance in the sector

	<p>processes in their production and focus on developing staff in one specific part of the process rather than developing generic skills across the entire process. These skills will be less transferrable across the industry. An organisation that produces product in a less sterile environment may be more reliant on industry transferable skills with a focus on skill development not specific to their organisation.</p> <p>There is a need for basic GMP skills across a continuum in line with complexity of the production process and a focus on general employability skills to assist in determining a candidate's aptitude for the industry.</p>
PRODUCERS	<p>The sector includes 323 producers²⁶, including the following major producers, often multinational, pharmaceutical manufacturing companies that dominate the market²⁷.</p> <ul style="list-style-type: none"> • Pfizer Australia Holdings Pty Limited (subsidiary of the US-based company Pfizer Inc.) • AstraZeneca PTY Limited (subsidiary of the British-Swedish AstraZeneca plc) • GlaxoSmithKline Holdings Pty Ltd (GSK Australia) (subsidiary of the British GlaxoSmithKline plc (GSK)) • Aspen Pharmacare Australia Pty Ltd subsidiary of the South Africa-based company Aspen Pharmacare Holdings Ltd) • CSL Limited (Australian-based, public company) • Alphapharm (subsidiary of the foreign-owned company Mylan) • Sanofi-Aventis Australia Pty Limited (subsidiary of the French Sanofi-Aventis company)
GEOGRAPHICAL LOCATION	<p>New South Wales and Victoria account for two thirds of the business enterprises in this sector. Several businesses are also located in Queensland, Western Australia and South Australia and a small number in Tasmania.</p>
AUTOMATION AND DIGITISATION	<p>The operations used in the sector range from simple processes of mixing ingredients and packaging to complex procedures involving the latest capital-intensive technology. The sector is evolving in line with various technological advancements. As the job task becomes more complex there is a greater focus on organisational specific training and less on accredited training, especially with automation within the industry.</p>
SUB-SECTOR NAME	COMPLEMENTARY MEDICINE MANUFACTURING
SCOPE OF WORK	<p>The sector comprises of businesses that manufacture vitamins, mineral and dietary supplements, herbal and homoeopathic medicines.</p> <p>Dietary supplements are products in form of liquid, capsule, powder or pill which concentrate nutraceutical components derived from natural sources such as herbals, non-herbals and others.</p>

²⁶ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

²⁷ Enterprises listed according to their relative market share or significance in the sector

PRODUCERS	The sector includes few highly specialised companies that produce their own branded dietary supplement products, such as Blackmores Limited and Swisse Wellness Pty Ltd, and a number of small contract manufacturing businesses that produce a range of vitamins and supplements for pharmaceutical companies and consumers.
GEOGRAPHICAL LOCATION	Industry activity is concentrated in New South Wales, Victoria and Queensland to take advantage of the infrastructure provided and market size.
AUTOMATION AND DIGITISATION	The equipment for extracting nutraceutical components can be specialised and based on sophisticated technologies. Other operations in the sector range from simple processes of mixing ingredients and packaging to complex procedures involving advanced technology. The sector is evolving in line with various technological advancements. As the job task becomes more complex there is a greater focus on organisational specific training and less on accredited training, especially with automation within the industry.

SUB-SECTOR NAME	VETERINARY PHARMACEUTICAL MANUFACTURING
SCOPE OF WORK	This sector manufactures drugs, medicines, medicinal chemicals, vaccines, serums and other pharmaceutical products for veterinary use.
PRODUCERS	<p>The sector includes 56 producers.²⁸ There are a few large, multinational companies that dominate the market, several medium businesses, and a larger number of small, family-owned producers.</p> <p>Major producers²⁹</p> <ul style="list-style-type: none"> • Zoetis (a global producer, spin off from Pfizer) • Virbac Australia Pty Limited (subsidiary of France-based Virbac) • Intervet Australia (MSD Animal Health Australia) (part of the US-based pharmaceutical giant Merck & Co Inc) • Jurox Pty Ltd (family-owned and Australia-based company) • Bayer Australia Ltd (subsidiary of German-based Bayer company) • Bioproperties Pty Ltd (Australia-owned company)
GEOGRAPHICAL LOCATION	The majority of industry establishments are concentrated in New South Wales but there are also production facilities in Victoria and Queensland.
AUTOMATION AND DIGITISATION	<p>Veterinary pharmaceutical manufacturing generally involves complex processes using capital-intensive technology and equipment.</p> <p>The sector is evolving in line with various technological advancements. As the job task becomes more complex there is a greater focus on</p>

²⁸ ABS, Counts of Australian Businesses, including entries and exits, June 2014, Cat No 816502

²⁹ Enterprises listed according to their relative market share or significance in the sector

organisational specific training and less on accredited training, especially with automation within the industry.

WHOLESALE AND RETAILING OF FOOD, BEVERAGE AND PHARMACEUTICAL PRODUCE

SUB-SECTOR NAME	WHOLESALE AND RETAILING
SCOPE OF WORK	<p>This sector operates via two channels:</p> <ul style="list-style-type: none"> ▪ Retail and trade merchants ▪ Wholesalers, manufacturers, importers and exporters <p>Wholesalers, manufacturers, importers and exporters sell, import and/or export large volumes of food, beverage and pharmaceutical produce, and distribute them through the retail sector or directly to the specialist industries.</p>
PLAYERS	<p>The sector is highly fragmented comprising of many geographically focused wholesalers and a large number of retail points. Large supermarkets and large retailers deal directly with manufacturers, reducing the need for an industry wholesaler.</p>
GEOGRAPHICAL LOCATION	<p>Food, beverage and pharmaceutical merchants operate throughout Australia.</p>
AUTOMATION AND DIGITISATION	<p>Manufacturers and merchants are increasingly reviewing the best ways of providing products, information and services to the customers; are adapting to new ways of collaborative logistics (computerised inventory control systems, tracking and reporting technologies) and digital communication.</p>

Relevant stakeholders

The food, beverage and pharmaceutical industry sector is represented by about 55 peak organisations at a national and state level. These organisations include over 35 industry and industry sub-sectors associations, about 10 industry services bodies including R&D, and a small number of professional associations, employee associations and regulatory bodies. There are also over 80 local wine region associations focused on the promotion of wine from their particular defined wine regions.

Table 1: Relative number of industry peak bodies

CATEGORY	NUMBER
Industry Associations	7
Industry Sub-Sector Associations	28
Industry Services Bodies	6
Industry R&D Services Bodies	4
Employee Associations	3
Regulatory Bodies	4
Industry Standards Body	1
Professional Association	2
Total	55

Table 2: Peak industry sector organisations

CATEGORIES	GEOGRAPHICAL REPRESENTATION
INDUSTRY SECTOR ASSOCIATIONS	
Ai Group	NATIONAL
Australian Food and Grocery Council (AFGC)	NATIONAL
Food Technology Association of Australia	NATIONAL
Foodservice Industry Association	NATIONAL
Food and Beverage Importers Association	NATIONAL
Foodservice Suppliers Association Australia (FSAA)	NATIONAL
Food Industries Association of Queensland (FIAQ)	QLD
INDUSTRY SUB-SECTOR ASSOCIATIONS	
DAIRY	
Australian Dairy Products Federation (ADPF)	NATIONAL
Dairy Australia	NATIONAL
Dairy Industry Association of Australia Inc (DIAA)	NATIONAL
Dairy Food Safety Victoria	VIC
BAKERY	
National Baking Industry Association (NBIA)	NATIONAL
Baking Association of Australia	NATIONAL
SUGAR	
Australian Sugar Industry Alliance	NATIONAL
Australian Sugar Milling Council	NATIONAL
SOFT DRINKS	

Australian Beverages Council	NATIONAL
BEER	
Brewers Association of Australia and New Zealand	NATIONAL
WINE	
Wine Grape Growers Australia	NATIONAL
Winemakers' Federation of Australia	NATIONAL
NSW Wine Industry Association	NSW
Queensland Wine Industry Association	QLD
South Australian Wine Industry Association	SA
Wine Grape Council of South Australia	SA
Wine Victoria	VIC
Wines of WA	WA
SPIRITS	
Distilled Spirits Industry Council of Australia (DSICA)	NATIONAL
Australian Distillers Association	NATIONAL
PHARMACEUTICAL	
Medicine Australia (MA)	NATIONAL
Generic and Biosimilar Medicines Association (GBMA)	NATIONAL
Complementary Medicines Australia	NATIONAL
Australian Self-Medication Industry Association	NATIONAL
AusBiotech	NATIONAL
The Pharmacy Guild of Australia	NATIONAL
INDUSTRY R & D SERVICES BODIES	
Dairy Innovation Australia Limited (DIAL)	NATIONAL
Sugar Research Australia (SRA)	NATIONAL
Sugar Research Institute	NATIONAL
Grape and Wine Research and Development Corporation	NATIONAL
EMPLOYEE REPRESENTATIVE ORGANISATIONS	
Australian Manufacturing Workers' Union	NATIONAL
Breweries and Bottleyards Employees' Industrial Union of Workers of Western Australia	WA
National Union of Workers	NATIONAL
INDUSTRY SERVICES BODIES	
Nutrition Australia	NATIONAL
The Allergen Bureau	NATIONAL
The Australian Institute of Food Science Technology	NATIONAL
Medical Technology and Pharmaceuticals Growth Centre (MTPConnect)	NATIONAL
Wine Grapes Marketing Board	NATIONAL
Queensland Sugar Limited	QLD
Sugar Terminals Limited	QLD
INDUSTRY STANDARDS BODIES	
Food Standards Australia New Zealand	NATIONAL
PROFESSIONAL ASSOCIATION	
Australian Society of Sugar Cane Technologists	NATIONAL
Australian Society of Viticulture and Oenology	NATIONAL

REGULATORY BODIES

Australian Grape and Wine Authority (Wine Australia)	NATIONAL
Pharmaceutical Benefits Advisory Committee (PBAC)	NATIONAL
Therapeutic Goods Administration	NATIONAL
VineHealth Australia	SA

Industry and occupational regulations and standards

Industry regulations and standards

Australian food, beverage and pharmaceutical industry operates under high level of regulation.

Food Standards Australia New Zealand

All food and beverage manufacturing operations are subject to national food standards and food safety assurance systems enforced by Food Standards Australia New Zealand (FSANZ). The Food Standards Code represents the uniform law governing Australian food and beverage production.

The Code describes appropriate labelling requirements, provides specific definitions of products, details the composition of products and permitted ingredients and outlines approved processing methods.

All genetically modified (GM) foods intended for sale in Australia and New Zealand must also undergo a safety assessment by FSANZ. FSANZ will not approve a GM food unless it is safe to eat.

Likewise, businesses manufacturing functional foods and drink must comply with all requirements under the *FSANZ Food Standards Code* that are relevant to content formulation and nutrition, health and related claims made on labels or in advertisements.

The industry is likely to be affected by further regulation changes related to country of origin labelling laws due to the Hepatitis outbreaks in February 2015. Under the proposed changes, manufacturers will need to explicitly state where ingredients have come from.

Food safety practices are also enforced by local councils and environmental health offices. These systems are applicable to local producers.

Other food standard requirements include those such as *Woolworths Quality Assurance Standard* those of other similar organisations, international food safety standards including *BRC Global Standards for Food Safety* and *IFS International Food Safety Standard*.

Producers Licence

A producer of liquor who wants to sell their liquor is required to hold a producer's license or equivalent licence under the respective State/Territory liquor licensing legislation.

Wine industry regulations

The wine industry has standalone regulations in relation to geographical terms, labels and exports under the *Australian Grape and Wine Authority Act 2013* and *Australian Grape and Wine Authority Regulations 1981*.

Industry / customer standards

The food and beverage manufacturing sector is also subject to many customer food standard requirements including *Woolworths Quality Assurance Standard*, and international food safety standards including *BRC Global Standard for Food Safety* and *IFS International Food Safety Standard*.

Australian Consumer Law

All nutrition content and health claims of functional food and drinks must be factually correct and substantiated through scientific research papers or clinical trials to avoid misleading consumers in breach of the Australian Consumer Law.

Australian Packaging Covenant

Businesses signatory to the *Australian Packaging Covenant*, an agreement between government, industry and community groups, are obliged to find and fund solutions to address packaging sustainability issues.

Sugar industry regulations

In the past, the Queensland government played a central role in forming industry policy and regulations in the sugar industry in relation to controlling price, sugar cane plantation areas, and compulsory sale of all sugar to Queensland Sugar Limited (QSL) and mills licence permits. In recent years this sector has become more open and transparent. Early in 2014, QSL was removed as the only option for sugar milling companies to market their own sugar. As a result, most major sugar companies decided to break ties with QSL from 2017, creating their own marketing and export channels. In response to cane grower concerns regarding changes to sugar marketing arrangements in Australia, the Federal Government established a Taskforce which released a report in 2015, recommending the creation and implementation of a mandatory Code of Conduct for the Australian sugar industry. Subsequently, the *Sugar Industry (Real Choice in Marketing) Amendment Act 2015* as passed in the Queensland Parliament to provide Queensland cane growers with the right to choose who sells and prices grower economic interest sugar, and permitted arbitration if required.³⁰

Excise compliance

The alcoholic beverage sector is subject to excise regulations which require producers to measure and sample alcohol content of the product they produce to calculate the excise payable. A licence from the Australian Taxation Office is required to distil alcoholic spirits in Australia. This licence imposes several obligations to ensure spirit products are kept secure, accounted and excise duty paid when due. Australian Taxation Office requires significant and adequate records for all excisable products to show these obligations have been met.

Export licence

Wine producers and exporters have to obtain an export licence from the Australian Grape and Wine Authority (AGWA). The regulation of wine exports is primarily to ensure the quality of Australian products marketed overseas. AGWA also oversees labelling requirements for wine producers to ensure labels include the variety of grapes used and regional zones of production.

Advertising and packaging regulations

Alcohol beverage advertising and packaging also needs to be consistent with other applicable laws and codes, for example:

- *Alcohol Beverages Advertising Code*
- Federal competition and consumer legislation and state fair trading legislation
- *Australian Association of National Advertisers (AANA) Code of Ethics*
- *Commercial Television Industry Code of Practice*
- *Commercial Radio Code of Practice*
- *Outdoor Media Association Code of Ethics*.

³⁰ QSL, 2016, [Developments in the Queensland export sugar industry](http://www.qsl.com.au/developments-queensland-export-sugar-industry/fast-facts). [www] <http://www.qsl.com.au/developments-queensland-export-sugar-industry/fast-facts>

Environmental protection measures

Food and beverage manufacturers must adhere to national and state environment protection measures as do all businesses however there are particular challenges in relation to the discharge of waste into waterways and chemical emissions in the air caused by fermentation reactions in production.

Pharmaceuticals regulations

Regulation of pharmaceuticals in Australia is overseen by the Federal Government in relation to the quality, safety, listing and pricing, patent protection, clinical trials, and efficacy of therapeutic goods supplied in Australia through:

- Therapeutic Goods Administration (TGA)
- Australian Register of Therapeutic Goods (ARTG)
- Advisory Committee on Prescription Medicines
- Good Manufacturing Practice (GMP)
- Advisory Committee on the Safety of Medicines
- Pharmaceutical Benefits Scheme (PBS)
- Pharmaceutical Benefits Advisory Committee (PBAC)
- IP Australia.
- Federal Drugs Administration (FDA) USA
- European Medicines Agency (EU)

The advertising of therapeutic goods, including complementary medicines, is subject to the advertising requirements of the Therapeutic Goods Act, which adopts the *Therapeutic Goods Advertising Code* (TGAC) and the supporting Regulations, the *Trade Practices Act 1975* and other relevant laws.

The state governments play an important role in the control of pharmaceutical product distribution through their scheduling systems. The industry is also subject to self-regulation by Medicine Australia through an internationally recognised code of conduct.

Companies who export or have multi-national operations are also subjected to regulations of various countries and unions such as the FAD in the USA and EMA in the European Union along with other sovereign agencies depending on location of exports or operations.

Complementary medicines regulations

Complementary medicines are regulated under the *Therapeutic Goods Act 1989*. In addition, the *Australian Regulatory Guidelines for Complementary Medicines* (ARGCM) provides detail on the regulation of complementary medicines and assist sponsors to meet their legislative obligations. Business will also need to consider whether their product needs to be listed or registered with the Therapeutic Goods Administration (TGA).

Therapeutic Goods Administration inspects manufacturers on an ongoing basis for compliance with good manufacturing practice; and undertakes monitoring of safety, quality and efficacy of listed, registered and included therapeutic goods once they are on the market.

Therapeutic goods available on, and sold through, international websites are not regulated by the TGA.

Alcoholic product retail regulations

The retail sale of alcohol products is heavily regulated, requiring retailers and hospitality venues to obtain licences, to sell alcohol within the hours stipulated under the licences and to develop and implement management plans to identify and control risks associated with the sale of alcohol.

Regulated occupations in the industry

Regulated occupations have legal (or industry) requirements or restrictions to perform the work. Regulated occupations require a license from, or registration by, a professional association or occupational licensing authority.

There are some occupations specific to this industry sector that require licensing and/or registration before employment. The industry also employs a wide range of trade licenced occupations including electricians, plumbers and forklift operators.

Challenges and opportunities in the sector

Australian food, beverage and pharmaceutical industry sector operates in a dynamic environment shaped by a range of policy frameworks including international trade policies and biofuel policies, environmental challenges, and market factors such as food production, trade and food prices. Challenges and industry's opportunities for growth that relate to these factors are discussed below.

GOVERNMENT POLICIES

Food manufacturing, along with the agriculture sector, is at the forefront of government policy agenda in Australia, prioritising it as a growth sector. Opportunities in the sector are provided by global food security significance and higher food demand in expanding markets, such as Asia Pacific region. The Australian government facilitates the sector's growth through a range of initiatives including the following among others:

- The Food and Agribusiness Industry Growth Centre
- CSIRO Food and Nutrition Flagship program
- Agricultural Competitiveness White Paper
- MTP Connect

Further global trade liberalisation through new Free Trade Agreements will enable increased 'tariff free' access to a diverse range of overseas markets.

State governments have also a focus on the agriculture and food sectors as critical contributors to local growth and export, leading to policies for state-based industry strategies and action plans.

The challenge for individual companies is to unlock commercial benefits from these government programs and agreements by becoming export ready, culturally literate and market savvy.

The food manufacturing sector can contribute alongside the forestry sector to the huge opportunity that Australia has, to use renewable fuels in its energy sector. The sectors will benefit from clear government policies that support hybrid systems based on production residues to deliver useful heat or electricity or gas for transportation and industrial heat, and subsidies to promote growth.

For the pharmaceutical sector, the 2015 PBS Access and Sustainability Package is expected to create added pressure on the already strained industry and may lead to downsizing for many companies. However, significant savings are expected to be delivered as an outcome of this package and existing reforms. This will be dependent on greater collaboration between regulatory bodies and pharmaceutical stakeholders to achieve a more streamlined regulatory approach. The benefits of this package are seen to be improved access to new drugs and reduced costs for patients.³¹

CLIMATE IMPACTS ON AGRICULTURAL CROP AND FOOD SUPPLY

The future of Australian food production, for many food categories, is reliant on the agricultural crop health and productivity in the conditions where arable land and water resources become increasingly difficult constraints to crop production, and frequency and severity of climate variations will possibly increase due to the effects of climate change.

There are opportunities for many food processing sectors to increase collaboration with breeders, horticultural and animal farms, and with research teams, in order to support decisions and develop more resilient crop varieties and large scale farming systems for increased productivity, efficiency, and optimisation of available resource utilisation.

MARKET AND TRADE

Australia is well located to take advantage of the opportunities provided by higher food consumption in Asia Pacific in the future. However, there will be a need for a change to food production to fully capture these opportunities. At the industry level, this will require greater adaptation of our products to more diversified markets and targeted marketing of different product qualities to market segments where there is the greatest potential for value adding.

The global food trends include³²:

- Demand for transparency in food labelling and clear definitions for 'natural' and 'nutritious' food
- Increasing demand for new flavours, more unusual fresh and nutritionally enhanced 'superfoods' as the interest in nutrition converges with the popularity of reality television cooking shows, and with growing incomes in developing nations, where well off individuals are prepared to pay a premium for quality food and ingredients created in clean environments
- Growing focus on healthier food options within Australia and Asia's middle-class, particularly on products that have reduced sugar, salt, fat, and are allergen free. People become increasingly health-conscious and interested in functional foods and complementary medicines as a way of managing aging health concerns such as weight and high cholesterol. This also includes the growing market for fermented foods and drinks
- Growing attitudes towards alternative ingredients such as macro-algae (seaweed), micro-algae (spirulina and chlorella) and insects as a form of protein, omega oil, and mineral sources available in functional foods and complementary medicines.
- Growing importance of provenance and transparency for the Millennial generation (15-35 years) who are tech-savvy, experience-driven and less brand loyal than older consumers
- Declining importance of formal meal times as a result of non-traditional work patterns and changing family structures. As a result, quick healthy 'grab and go' foods are a burgeoning market
- Repositioning and value-adding of traditional frozen foods (seafood and vegetables) to emphasise their superior nutritional content
- Greater importance of minimising, reusing and recycling production waste
- Growing focus on preventing overconsumption – both in food, alcohol and packaging.

³² Agrifood Skills Australia, Environmental Scan 2015

In addition, growing healthy demand from Asian consumers continues to generate substantial sales for the Australian vitamins and dietary supplements. The sales are also supported by the strong brand equity of the Australian leading players. Likewise, the market for intrinsically healthy foods and functional foods experiences remarkable growth and consumer interest.

Key points on the industry's international trade

Australia is a net exporter of processed food and beverage. Exports of processed food and beverages, excluding meat and seafood sectors, increased by 3 per cent to \$11.4 billion in 2014-15, particularly due to a growth in beverage exports. Imports increased by 9 per cent to \$10.3 billion.³³ Imported products with the highest aggregate value at a national level was processed fruit and vegetable, and soft drinks.

Australian wine exports grew at the strongest rate in more than a decade in 2015, partly due to the depreciation of Australian currency and subsequent boost to global competitiveness. The value of Australian wine exports increased by 7.8 per cent while the volume increased by 4.9 per cent³⁴. Despite the strong export growth, the average value of Australian wine exports per litre increased by only 3 per cent from AU\$2.60 to AU\$2.67. This is consistent with the industry commentary that overseas markets remain fiercely competitive and the Australian dollar depreciation has not been a windfall for local producers as they try to build overseas sales.³⁵

Conversely, Australia has a high dependence on imported medicinal and pharmaceutical products, particularly active ingredients. Imports increased by 4 per cent to \$10.3 billion in 2014-15. Exports have dropped progressively during the last few years and with a further 15 per cent in the last year, dropping to 2.4 billion.³⁶ Industry's export potential is affected by reductions in local manufacturing, competition from generic products, declining R&D and escalating costs. Ongoing reforms to Australia's Pharmaceutical Benefits Scheme (PBS) is affecting local participants, as the ongoing implementation of mandatory price disclosure cuts is pushing prices down. There is, however, evidence that the pharmaceutical sector is moving to more competitive production processes including automation and robotics as means of defining a competitive advantage in production and supporting competition against international companies in both the domestic and export markets.

Many food and beverage manufacturing companies are engaged in exporting products directly from Australia or through an agent. A few are currently involved in other international relationships, such as importing goods or services or being involved in an international supply chain or outsourced part of their process. Many see opportunities and plan to expand overseas in the coming years. The most significant challenges for the food and beverage manufacturing sector in doing business overseas includes³⁷:

- A lack of information on local regulations in overseas markets
- Licences, permits and product standards in overseas countries
- Tariffs, quotas and imports duties in overseas countries
- Customs costs and/or delays
- A lack of information on local culture, language and business practices
- The value of the Australia dollar
- Transport/freight costs from Australia to overseas markets.

³³ ABARES, Agricultural commodity statistics 2015

³⁴ Wine Export Approval Report, September 2015, released by Wine Australia.

³⁵ 34th Annual Edition, the Australian and New Zealand Wine Industry Directory 2016, Winetitles Media

³⁶ ABS International Trade in Goods and Services, Australia, Dec 2015 Cat No 5368

³⁷ Australia's International Business Survey, 2014, Industry Report. Food Manufacturing

Additional challenges include:

- Compliance and auditing costs related to international food safety standards and labelling requirements
- Increased manufacturing competitiveness through production efficiency improvements e.g. LEAN, automation.

RESEARCH, INNOVATION AND APPLIED TECHNOLOGY

Technology is considered the greatest driver of future growth. Businesses in food, beverage and pharmaceutical sector are adopting cloud technologies for strategic, 'transformation' purposes, to increase transparency and improve business models; use data and analytics to improve decision making related to consumer insight, brand and product management and pricing; focus on product innovations (including healthier or functional foods), increased customer acquisition and alternative sales and distribution channels.

In many sectors, especially pharmaceuticals, the introduction of automated processes through robotics is seen as a means of creating a competitive advantage as productivity and output increase and employment costs decrease. This also allows for a more effective application of JIT production principles and minimised stock holdings.

Breakthroughs continue in the R&D centres of both ingredient suppliers and equipment manufacturers. For food researchers, the objectives are to support the efficient and sustainable conversion of agricultural food materials into value-added ingredients and products. Emerging food processing technologies include innovative approaches to³⁸:

- Component separation using chromatography
- Pasteurisation using pulsed electric field
- Sterilisation using cool plasma and high pressure processing
- Homogenisation and fortification using micro-fluidisation.

The opportunities for sourcing healthy foods, nutritional components and functional food development are extensive in Australia. Further research on materials unique to Australia such as those included below will be able to provide scientific evidence of health benefits, confirm usable food ingredients, and offer further opportunities in a competitive environment:³⁹

- Bovine cartilage powder
- Whey protein powder
- Freeze dried young barley grass or other fruit/vegetable powders
- Fish and shark liver oil (EPA)
- Herbs and spices derived from native plants that have proven health benefits.

There is also a substantial drive to enhance food packaging. Developments include barrier packaging, anti-microbial packaging, active packaging and smart packaging.

Challenges exist around the adoption/implementation of new technologies by food manufacturing firms, the commercialisation of food science and technology for food products, and consumer

³⁸ Department of Industry, Innovation, Science, Research and Tertiary Education, 2011, The Potential Role of Enabling Technologies in the Future of the Australian Food Industry. [www]

http://www.industry.gov.au/industry/IndustrySectors/nanotechnology/Publications/Documents/WorkshopReport_Food.pdf#page13

³⁹ Australian Trade Commission, 2016, Health and functional foods to Japan. [www]

<http://www.austrade.gov.au/Australian/Export/Export-markets/Countries/Japan/Industries/Food-and-beverage-health-and-functional-foods>

acceptance of 'designed' foods. Consumers indicate a desire to have their views taken into account sufficiently early in the product development process. They also demand to be well informed with sufficient information to be able to make safe and informed choices. However, there are examples of technologies such as high-pressure pasteurisation that have persevered through some initial resistance and are starting to have an impact on both the product development and plant operation sides of the food and beverage industry.

C. EMPLOYMENT

Employment Outlook

The Department of Employment projects⁴⁰ that total employment in the food, beverage and pharmaceutical industry sector will grow by 4 per cent over the five years to November 2019 (Table 3).

At the industry sub-sector level, a positive employment growth is anticipated in all sub-sectors, except the sugar and confectionery manufacturing sector and the fruit and vegetable processing sector where employment will drop by 4.8 percent and 3.6 percent, respectively, in the coming years. A significant increase in employment is expected in the beverage manufacturing sector (10 per cent) and bakery product manufacturing (6 per cent). While some sub-sectors within these sectors may anticipate high or some employment growth, others - such as the wine industry - allegedly do not plan for increased employment.

Table 3: Department of Employment Industry Projections – five years to November 2019⁴¹

INDUSTRY SECTOR	EMPLOYMENT LEVEL	EMPLOYMENT PROJECTIONS		
	Nov 2014 ('000)	Nov 2019 ('000)	Growth ('000)	(%)
Food manufacturing	142.5	147.0	4.5	3.1
Food Product Manufacturing, nfd	32.3	33.3	0.9	2.9
Dairy Product Manufacturing	12.4	12.6	0.2	1.6
Fruit and Vegetable Processing	4.9	4.7	-0.2	-3.6
Grain Mill and Cereal Product Manufacturing	5.6	5.8	0.2	3.9
Bakery Product Manufacturing	60.5	64.1	3.6	6.0
Sugar and Confectionery Manufacturing	13.1	12.5	-0.6	-4.8
Other Food Product Manufacturing	13.8	14.1	0.3	2.3
Beverage manufacturing	27.1	29.8	2.7	10.0
Pharmaceutical and medicinal product manufacturing	23.0	24.1	1.1	4.8
Total	192.65	200.96	8.31	4

Description of Workforce Supply

The food, beverage and pharmaceutical manufacturing industry sector is a significant employer of people in regional and remote areas. ABS statistics indicate that the industry workforce in all sectors is aging and reaching retirement age in higher numbers, presenting businesses with the

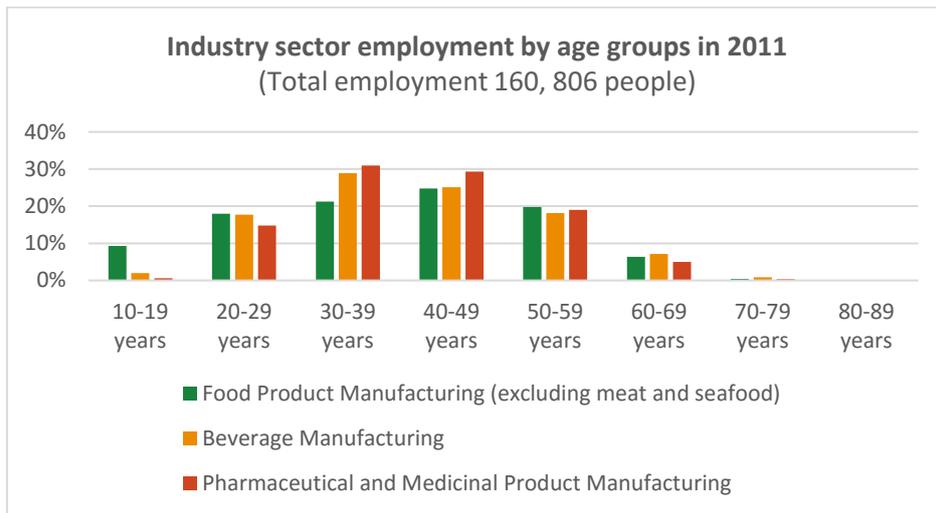
⁴⁰ Department's projections are based on based on the forecasts and projections set out in the Mid-Year Economic and Fiscal Outlook (MYEFO)

⁴¹ Department of Employment, Industry Employment Projections, 2015 Report. Release date: March 2015.

<http://lmip.gov.au/default.aspx?LMIP/EmploymentProjections>

challenge of an oncoming wave of retirement – i.e. skill shortages in the industry (Figure 1). Based on ABS data, about 26 per cent of the industry sector workforce (42, 399 people) was aged 50 years and over in 2011. About 5 to 8 per cent of this group (the people over 60s) is expected to have retired from the workforce by 2015 and an additional 19 per cent (the people over 50s) is likely to retire over the next five years. The coming workforce retirement is likely to bring significant job vacancies across the sector and will mean significant efforts from employers to replenish these skills, particularly given challenges with attracting young people to the industry.

Figure 1: Industry sector employment by age groups in 2011⁴²



Current employing occupations in the food, beverage and pharmaceutical industry sector include professions that are configured in Figure 2 to Figure 4 below.

⁴² 2011 Census of Population and Housing

Figure 2: Occupations and their relative number in the food product manufacturing sector⁴³

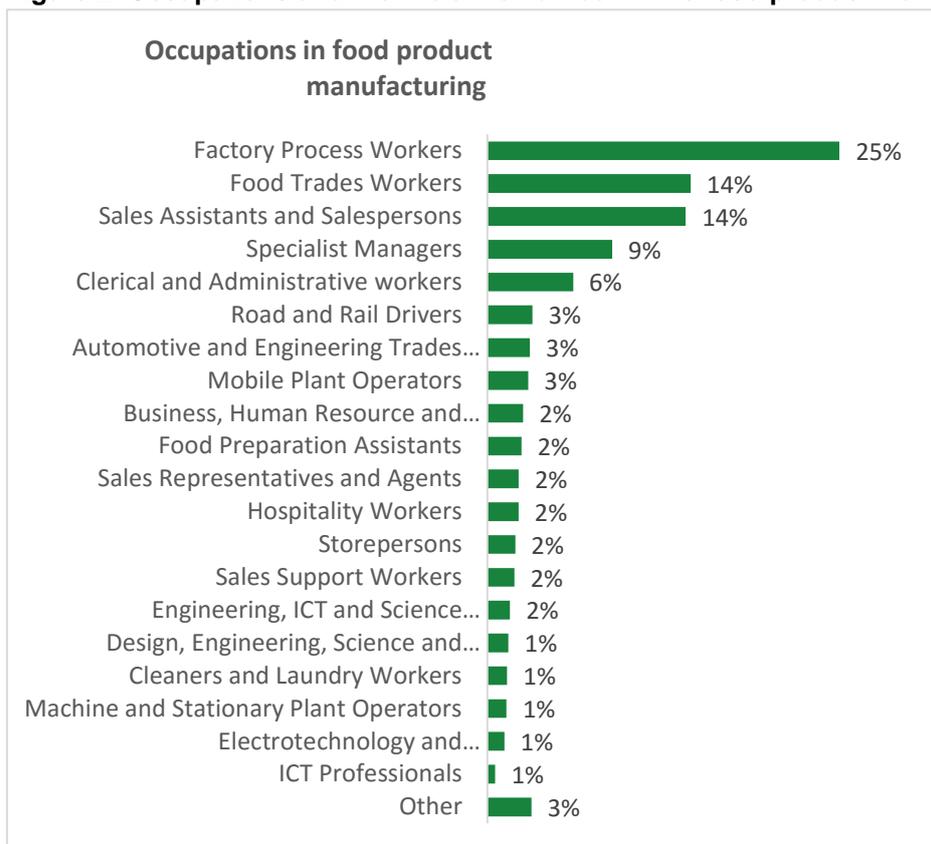


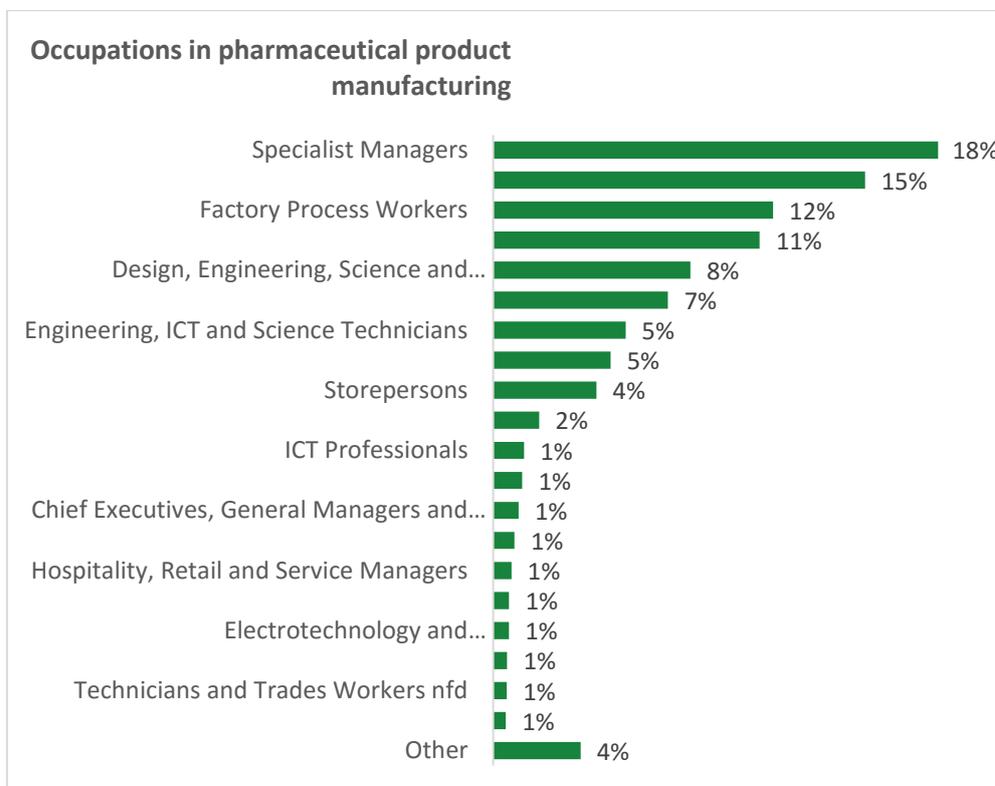
Figure 3: Occupations and their relative number in the beverage product manufacturing sector⁴⁴



⁴³ 2011 Census of Population and Housing

⁴⁴ 2011 Census of Population and Housing

Figure 4: Occupations and their relative number in the pharmaceutical product manufacturing sector⁴⁵



As shown, a significant number of the workforce occupies roles that are specific to the industry sub-sectors including factory process workers such as food/beverage process workers, packers, product assemblers and product quality controllers, and food trade workers such as bakers and pastry cooks. Also, a significant workforce is employed to undertake more general roles such as specialist managers (i.e. business administration managers, marketing and sales managers, production managers, supply and distribution managers), clerical and administrative work and sales. The sector employs also a large number of people for a range of other jobs such as automotive and engineering trade workers and drivers. Professionals such as chemists, food and wine scientists, life scientists, medical laboratory scientists and industrial, mechanical and production engineers are predominant occupations in the industry as well.

For most technical skills and specific knowledge required in the industry sectors, learning occurs mainly 'on the job' through workforce development activities provided by employers. This occurs because gaining industry specific qualifications before employment commences remains a limited choice amongst the young people and other potential new entrants. Thus, external supply of skilled workers is consistently low in the industry. In these conditions, the responsibility for attracting/engaging young people and existing workers with the sectors, and in specialist training, resides solely with employers.

To secure skilled employees, or recruit for positions with a general character (i.e. administrative workers, managers, drivers or engineering trade workers), the employers need to compete in the labour market with other employers and industry sectors on the available workforce.

⁴⁵ 2011 Census of Population and Housing

D. SKILLS OUTLOOK

Future changes in workplace and job design are generally driven by innovations at the business and industry level, introduction of new policies and legislations, technology and business challenges.

At the business level, innovations may involve introduction of new or improved technologies and processes, new or improved ways to deliver services, and new work organisation, including new job demands and job control (i.e. more complex and diversified tasks involving greater autonomy). Work organisation involves also a better interaction between internal and external stakeholders through integration of supportive technologies.

Small, medium and large organisations will experience differing skill needs. In acknowledging this, it is important to consider the impact of skill sets in addressing the varying needs as not all skill gaps require a full qualification.

Trends in Workplace Design and/or Job Design⁴⁶

At a higher level value-added skills will be driven by higher efficiency targets, innovation and automation/digitisation of some work activities in most workplaces and jobs. In addition, higher level supply chain and logistics skills will be required and skills to adapt and respond to climate change challenges, changing government policies, industry code of practices and WHS procedures.

In the presence of automation and digitisation, operational employees will be required to spend much less time on operating machinery or processing paperwork and more time on higher value added job functions. Higher level skills will be required of operational employees to support extended job functions and strategic targets. These skills include Science Technology Engineering and Mathematics (STEM) skills, compliance skills, and leadership skills. Specialist managers will require higher level skills to support strategic developments and targets.

Key development trends and business challenges likely to change jobs and drive capacity building in the food, beverage and pharmaceutical products manufacturing sub-sectors include the examples outlined below.

FOOD & BEVERAGE

Value added foods

Value creation strategies to increase exposure to value-added foods, such as 'ready-to-consume' produce in the key growth categories, and to reduce exposure to the volatility of the food commodity price cycle.

Restructure of capital

New capital structure strategies to achieve new funding sources and establish a stable capital base that supports plans to drive growth and deliver higher farm gate prices and returns.

Product development and marketing

New product development and packaging innovation to maximise opportunities in new markets, supply channels and food and beverage categories. New process and technological developments in food and beverage product making based on chemistry and microbiology discoveries.

⁴⁶ This section is based on feedback from IRC meetings, desktop research and broader stakeholder consultation via the website

Emerging skills in cultural competency and awareness of Asian market preferences for products, presentation, marketing and transportation will be required. Skills at the customer interface/sale will require significant improvement in relation to customer service, specific product and brand knowledge, data management and analysis, negotiation, digital marketing and digital commercialisation approaches and a better use of digital technologies such as web sites, social networks and mobile/apps technologies. Retail baking has a need for the development of skills in niche areas such as artisan bakery as a means to differentiate and respond to a growing market demand for specialised products. A review of the existing retail baking qualifications and units will be required with the potential modification of existing or development of new qualifications and unit of competencies especially for the supermarket and artisan baking areas.

A high level of need for food safety auditors exists and there needs to be an inclusion of this in the review of the food science and technology qualifications and units of competency. This is also reflected in niche markets and café markets as this becomes a growing market.

Responding to buyer behaviour

Strategies to better connect with and serve domestic and international customers, including stronger online presence promoting key projects in the food and beverage segments that the producers bring into the market. Skills will emerge in global supply chain management and logistics including full traceability, enhanced inventory management and warehouse management, brand development, social media engagement and online retailing.

Emerging skill needs include microbiological sampling and testing, advanced packaging - raw material reduction, downsizing, alternative packaging materials and the automation of processes, food innovation and product development, investigation of nutritional characteristics of raw materials before, during and after processing, organic food / beverage manufacturing, processing, raw material provenance and origin control and algae/seaweed usage.

Fermented food and drink products are also growth areas responding to consumer demand for healthier food and drink options. What has been a small cottage industry is now a growing sector with the need for skills development in production. The development of units and qualifications to cater for this sector will need to be considered.

Using technology to drive business processes

Investments that integrate world-leading technology and quality standards in operations to improve efficiency; strategic initiatives that integrate and simplify business processes and systems across the business; new plant or production line investments to increase capacity for production of foods with growing demand nationally and internationally such as nutritional products. Higher, value-added skills driven by higher efficiency targets, innovation and automation/digitisation of some work activities in most workplaces and jobs.

In the presence of automation and digitisation, operational employees will be required to spend much less time on operating machinery or processing paperwork and more time on higher value added job functions such as management, quality assurance, information management and reporting, process improvements, technical maintenance and customer interaction and communication. Skills in lean and agile manufacturing processes will also be required. Emerging skills needs will also include developing and managing seamless HACCP plans and systems and waste management and conversion

Workplace Health and Safety

Workplace health and safety remains a focus across the sector. Risk management skills and knowledge across all occupations will be needed.

PHARMACEUTICALS

New product developments

Developments in new life saving and life improving drugs that will continue to provide significant benefits in the areas of cardiovascular disease, malignancies (solid and liquid) and infectious diseases.

A focus on innovation, particularly on developing biosimilars and in areas with high unmet clinical demand. As innovation increases so does the need to develop alternative production methods which leads to a greater specialisation in production and a focus on skills in specific, specialised areas of production. The more specialised the production process, the more likely it that a person will be trained in a part of the process rather than across the process. Automation and robotics are seen as a means of reducing costs and increasing productivity in order to create a sustainable competitive advantage when competing against low cost countries.

Compliance and transparency

Further investment in compliance to meet the global trend towards transparency reporting, additional government requirements regarding the registration of medicines, recent scandals regarding bribery and corruption increasing the internal and external regulatory focus on payments, and increased scrutiny of relationships with third parties. These trends will require higher level skills to support extended job functions including Science Technology Engineering and Mathematics (STEM) skills, compliance skills, and leadership skills in language literacy and numeracy and digital skills, analytical thinking, technology and process-oriented, lean and agile manufacturing process, application of relevant science knowledge, engineering (maintain / improve / design / build), supply chain and logistics, WHS compliance, Government policy compliance skills, food safety compliance, operations management, and risk management.

Skills will need to adapt and respond to climate change challenges, changing government policies, industry code of practices and WHS procedures

Sales and marketing of pharmaceuticals

Growth strategies including expansion in new therapeutic areas, increases in sales and marketing capacities (integrating research and market access functions as well as building up market access and external affairs capabilities), the introduction of new products in portfolio pipelines and New Chemical Entities (NCEs), and restructuring to increase efficiencies and manage costs will require skills in communication (particularly at the customer interface). Skills at the customer interface/sale will require significant improvement in relation to customer service, specific product and brand knowledge, working with data and data analysis, negotiation, digital marketing and digital commercialisation approaches.

Collaboration and partnerships

A high priority on strategic alliances and joint ventures will drive the need for higher level skills for specialist managers to support strategic developments and targets including strategic leadership for alliances and joint ventures and alternative funding strategies, marketing (brand development, social media engagement and online retailing), corporate risk management, business management, planning and implementing investment projects, global supply chain and logistics (including cultural competency and awareness of Asian market preferences for products, presentation and transportation).

Higher level supply chain and logistics skills are required to support lean, fast, reliable, transparent and collaborative relationships with key suppliers and customers during planning or product development, with internal and cross-functional staff through sales and operation planning and with

other companies, including competition and research organisations, on areas including new product development, product components and shared logistics infrastructures.⁴⁷

Patient focus

A better focus on patient outcomes, that is, to deliver a solution rather than simply a treatment.

Key priority skills in the sector workforce

The food, beverage and pharmaceutical products manufacturing industry sectors have nominated key priority skill needs for the workforce / industry sectors in current practices and skill needs for wine making in a contemporary workforce, automated and alternative packaging materials, brand development, social media engagement and online retailing and food processing innovation and product development.

Generic workforce skills ranked in order of importance for Food, Beverage and Pharmaceuticals	
(Most important skill =1 least important skill = 12)	
1	LLN (Foundation skills of literacy and numeracy)
2	Learning agility / Information Literacy / intellectual autonomy and self-management
3	Design mindset / Thinking critically / System thinking / Solving problems
4	Customer Service/ Marketing
5	Managerial / leadership
6	Financial Understanding
7	Technology
8	STEM (Science Technology Engineering Mathematics)
9	Communication/ Virtual collaboration / Social intelligence
10	Entrepreneurial
11	Environmental and sustainability
12	Data analysis

⁴⁷ AT Kearney & Australian Food and Grocery Council, 2015 Supply Chain Strategy and Capability Assessment

E. TRAINING PRODUCT REVIEW PLAN 2016-19

The IRC Training Product Review Plan 2016-19 for the Australian Food, Beverage and Pharmaceutical Product Manufacturing industry sector is provided in Appendix A.

Explanation

Time critical issues and interdependencies

The AISC has commissioned three projects which will commence in the second half of 2016.

Retail baking

Retail baking was approved for review by the Food, Beverages and Pharmaceuticals Industry Reference Committee. The proposed five qualifications and 33 units of competency resulted in wide and varied responses from stakeholders, with no majority support received for the draft materials. Therefore, retail baking modifications will be a priority project. More work will be required with stakeholders to reach a common stakeholder viewpoint leading to the development of a business case to progress to full review.

In addition, the Retail Baking industry has identified the need to develop a new qualification for artisan baking and potentially a new qualification for Supermarket Baking.

Food Science and Technology

Preliminary industry feedback on the food science and technology components of the FDF Training Package identified issues which warrant a full review. The industry was not in a position to provide the subject matter expertise within the timeframes available for this work.

Sugar milling

Sugar milling qualifications appear in both the *SUG02 Sugar Milling* and *FDF10 Food Processing Training Packages*, together with new qualifications proposed for the new *FDF Food Processing Training Package*. Work is required to investigate whether sugar milling qualifications in *SUG02 Sugar Milling* be brought into *FDF Food Processing Training Package*. This work would include a map of job roles to determine the appropriate qualifications required by the sector.

Pharmaceutical Manufacturing

The existing pharmaceutical qualifications and unit of competencies are underutilised and require a full review. At present, limited delivery is restricted to the Certificate III in Pharmaceutical Manufacturing with a view of industry that the current qualifications do not cover industry needs. A greater focus on employability skills and Good Manufacturing Processes (GMP) is required for entry level along with programs for upskilling such as leadership. There may be a greater need of skill sets over full qualifications; this will need to be tested as part of the broader review.

Training products scheduled for review more than once in four years

Where units of competency appear more than once in the Work Plan it is normally to address one of the following:

- To ensure that where any changes are made to the unit it can still be used in other qualifications
- To address separate and different issues or development work on a unit.

Where possible, holistic reviews of units will occur, combining specific stakeholder issues or suggestions with a broader review of the unit.

All qualifications, skill sets and units of competency will be checked over the duration of this Work Plan to ensure currency with industry needs.

F. IRC SIGNOFF

This Work Plan was agreed as the result of a properly constituted IRC decision.

Signed for and on behalf of the **Food, Beverage and Pharmaceutical IRC** by its appointed Chair

Bronwyn Graham

(Name of Chair)



Signature of Chair

Date:28/9/16

ATTACHMENT A

IRC Training Product Review Plan 2016-19 – Food, Beverage and Pharmaceuticals Industry Sector

Contact details: Skills Impact Ltd., 559A Queensberry Street, North Melbourne VIC 3051

Date submitted to Department of Education and Training: 29 September 2016

Note: Except for retail baking, qualifications and units in this Work Plan are based on the 2016 Case for Endorsement for *FDF Food Processing Training Package Release 1.0*. At the time of writing, this Training Package is pending AISC approval.

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
2016						
2016	Food Processing	FDF	Retail baking Review packaging of 5 qualifications and the development of new qualification/s to address changing industry needs: Certificate II in Retail Baking Assistance (cake and pastry) Certificate III in Retail Baking (Cake and Pastry) Certificate III in Retail Baking (Combined) Certificate III in Retail Baking (Bread) Certificate IV in Advanced Baking	FDF20510 FDF30510 FDF30710 FDF30610 FDF40811	Review qualifications and units of competency to meet industry requirements, including the possible development of new qualification/s and units to reflect changing industry needs and comply with Standard 6 of <i>Standards for Training Packages, 2012</i> . Review 33 UOCs Finish products Form and fill pastry products Prepare fillings Produce meringue-based products Provide production assistance for bread products Provide assistance in cake, pastry and biscuit production Produce pastry	FDFRB1001 FDFRB2001 FDFRB2002 FDFRB2003 FDFRB2004 FDFRB2005 FDFRB3001

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Produce bread dough Produce sponge, cake and biscuits Decorate cakes and biscuits Bake bread Bake sponges, cakes and biscuits Bake pastry products Store, handle and use frozen dough Retard dough Process dough Diagnose and respond to product and process faults (bread) Diagnose and respond to product and process faults (pastry, cake and biscuits) Produce artisan breads Produce sweet yeast products Produce and decorate gateaux and tortes Plan and schedule production for retail bakery Participate in product development Apply marketing principles to retail bakery Control bakery operations to meet quality and production requirements Apply baking science to work practices Produce sourdough products Apply advanced finishing techniques for specialty cakes and desserts Explore and apply baking techniques to develop new products	FDFRB3002 FDFRB3003 FDFRB3004 FDFRB3005 FDFRB3006 FDFRB3007 FDFRB3008 FDFRB3009 FDFRB3010 FDFRB3011 FDFRB3012 FDFRB3013 FDFRB3014 FDFRB3015 FDFRB3016 FDFRB3017 FDFRB4001 FDFRB4002 FDFRB4003 FDFRB4004 FDFRB4005 FDFRB4006

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Evaluate and assess bakery product Set up sustainable baking operations Coordinate material supply for baking processes Prepare plated sweets and desserts	FDFRB4007 FDFRB4008 FDFRB4009 FDFRB4010
2016	Food processing	FDF	Sugar milling Map job roles to determine whether proposed new FDF qualifications sufficiently cover SUG02 and FDF11 qualifications: Sugar Milling Support Sugar Milling Industry Operations Certificate I in Sugar Milling Certificate II in Sugar Milling	FDF21016 FDF31016 SUG10102 SUG20102	Modify qualifications and units of competency to align to the Australian Qualifications Framework. Review performance evidence, knowledge evidence and assessment conditions to comply with Standard 6 of <i>Standards for Training Packages, 2012</i> .	
2016	Food Processing	FDF	Food science and technology Review packaging of 2 qualifications, including review for food producers not conducting their own microbiological testing: Certificate IV in Food Science and Technology	FDF40316	Review qualifications and units of competency to meet industry requirements and comply with Standard 6 of <i>Standards for Training Packages, 2012</i> . Review 76 UOCs Assess compliance with food safety programs	FDFAU4001

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
			FDF50315 Diploma of Food Science and Technology	FDF50316	Communicate and negotiate to conduct food safety audits Conduct food safety audits Identify, evaluate and control food safety hazards Carry out sampling and interpret tests for cheese production Produce acid-coagulated soft cheese Produce a range of rennet-coagulated cheeses Produce acid and heat coagulated cheese Implement the food safety program and procedures Monitor the implementation of quality and food safety programs Supervise and maintain a food safety plan Supervise and verify supporting programs for food safety Apply food processing technologies Monitor the development and implementation of a food QA system Apply digital technology in food processing Perform microbiological procedures in the food industry Document processes and procedures for a food product Apply food preservation technologies	FDFAU4002 FDFAU4003 FDFAU4004 FDFCH4001 FDFCH4002 FDFCH4003 FDFCH4004 FDFFS2001 FDFFS3001 FDFFS4001 FDFFS4002 FDFFS4001 FDFFS4002 FDFFS4001 FDFFS4002 FDFFS4003 FDFFS4004 FDFFS4005 FDFFS4006

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Establish operational requirements for a food processing enterprise	FDFST4007
					Preserve food in cans or sealed containers	FDFST4008
					Label foods according to legislative requirements	FDFST4009
					Apply sensory analysis in food processing	FDFST4010
					Apply the principles of nutrition to food processing	FDFST4011
					Apply water management principles to the food industry	FDFST4012
					Monitor manufacturing of market milk and related products	FDFST4020
					Carry out sampling and testing of milk at receipt	FDFST4021
					Review standards and procedures for the preparation of milk for processing	FDFST4022
					Review standards and procedures for the processing of chocolate and sugar-panned products	FDFST4030
					Review standards and procedures for the processing of aerated confectioneries	FDFST4031
					Review standards and procedures for the production of gums and jellies	FDFST4032
					Review standards and procedures for the production of chocolate products	FDFST4033
					Review standards and procedures for the processing of chocolate	FDFST4034

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Review standards and procedures for the processing of high and low boil confectionery	FDFST4035
					Review standards and procedures for the processing of confectionery products	FDFST4036
					Review product safety and quality processes for chilled or frozen poultry product manufacturing	FDFST4040
					Review product safety and quality standards and procedures for cooked poultry product manufacturing	FDFST4041
					Review product safety and quality procedures for egg based product manufacturing	FDFST4042
					Review product safety and quality procedures for processing of fruit, vegetables & other produce	FDFST4050
					Review product safety and quality procedures for fish and seafood products	FDFST4051
					Review production system for manufacturing and processing of edible fats and oils	FDFST4052
					Review processes for manufacturing, packaging and testing of beverage products	FDFST4053
					Review product safety procedures for manufacturing of cereal products	FDFST4054
					Maintain work health and safety processes	FDFWHS4002
					Apply principles of statistical process control	FDFOP2015
					Operate a process control interface	FDFOP2030
					Use numerical applications in the workplace	FDFOP2061
					Establish process capability	FDFPPL4005

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Manage controlled atmosphere storage Control food contamination and spoilage Apply basic process engineering principles to food processing Describe and analyse data using mathematical principles Apply principles of food packaging Identify the physical and chemical properties of materials, food and related products Participate in product recalls Audit bivalve mollusc growing and harvesting processes Audit a cook chill process Audit a heat treatment process Audit manufacturing of ready-to-eat meat products Develop a HACCP-based food safety plan Monitor refrigeration and air conditioning systems in food processing Identify and implement required process control for a food processing operation Construct a process control chart for a food processing operation Specify and monitor the nutritional value of processed food Identify the biochemical properties of food	FDFTEC4002 FDFTEC4003 FDFTEC4004 FDFTEC4007 FDFTEC4008 FDFTEC4009 FDFTEC4011 FDFAU4005 FDFAU4006 FDFAU4007 FDFAU4008 FDFFS5001 FDFST5001 FDFST5002 FDFST5003 FDFST5004 FDFST5005

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Apply food microbiological techniques and analysis Evaluate sampling plans in relation to food industry standards Develop a new food product Implement and review the production of milk fat products Implement and review the production of fermented dairy products and dairy desserts Implement and review the production of concentrated and dried dairy products Implement and review the production of ice creams and frozen dairy products Implement and review the production of milk and related products by the membrane system Develop, manage and maintain quality systems for food processing Apply an understanding of food additives Manage and evaluate new product trials Manage utilities and energy for a production process	FDFST5006 FDFST5007 FDFST5008 FDFST5023 FDFST5024 FDFST5025 FDFST5026 FDFST5027 FDFST5030 FDFTEC4005 FDFTEC5001 FDFTEC5002
2017						
2017	Wine Making	FDF	Certificate II in Wine Industry Operations Certificate III in Wine Industry Operations	FDF20411 FDF30411	Review wine making qualifications and units of competency to ensure they reflect current practices and skill needs of a contemporary workforce.	

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Conduct winery and/or site tours Promote wine tourism information Perform cellar door stock control procedures Sell cellar door products and services Conduct a standard product tasting Evaluate vines (advanced) Conduct a specialised product tasting Coordinate winery hospitality activities Perform oak handling activities Perform fermentation operations Operate the ion exchange process Perform single column lees stripping (continuous still brandy) operations Operate the pressing process Operate clarification by separation (centrifugation) process* Prepare and monitor wine cultures * Perform dual column distillation (continuous still brandy) operations* Perform first distillation (pot still brandy) operations* Operate the fine filtration process Perform heat exchange operations Handle spirits Operate the pressure leaf filtration process Operate the rotary vacuum filtration process* Perform must draining operations*	FDFCD2001A FDFCD2002A FDFCD2004A FDFCD2005A FDFCD2006A FDFCD3001A FDFCD3002A FDFCD3003A FDFCEL2001A FDFCEL2002A FDFCEL2003A FDFCEL2004A FDFCEL2005A FDFCEL2006A FDFCEL2007A FDFCEL2008A FDFCEL2009A FDFCEL2010A FDFCEL2011A FDFCEL2012A FDFCEL2013A FDFCEL2014A FDFCEL2015A

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Operate the crushing process*	FDFCEL2016A
					Prepare and make additions and finings	FDFCEL2017A
					Carry out inert gas handling operations	FDFCEL2018A
					Carry out transfer operations	FDFCEL2019A
					Prepare and wax tanks	FDFCEL2020A
					Perform second distillation (pot still brandy) operations	FDFCEL3001A
					Operate the continuous clarification by separation (floatation) process	FDFCEL3002A
					Operate the concentration process	FDFCEL3003A
					Perform de-aromatising, de-alcoholising or de-sulphuring operations	FDFCEL3004A
					Perform rectification (continuous stills) operations	FDFCEL3005A
					Operate the bottle sealing process	FDFBP2004A
					Operate traditional sparkling wine processes	FDFBP2006A
					Operate the tirage and transfer process	FDFBP2007A
					Perform packaging equipment changeover	FDFBP2008A
					Evaluate wines (standard)	FDFCD2003A
					Perform cellar door stock control procedure*	FDFCD2004A
					Carry out potting operations	FDFWGG2001A
					Hand prune vines	FDFWGG2003A
					Operate interrelated processes in a production system	FDFOP3003A
					Perform cellar door stock control procedure*	FDFCD2004A
					Clean and sanitise equipment	FDFOP2004A
					Apply sampling procedures	FDFOP2003A

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Handle spirits Operate the rotary vacuum filtration process Bench graft vines Carry out potting operations Hand prune vines Undertake irrigation systems maintenance activities Maintain callusing environment Obtain and process rootlings Tend containerised nursery plants Train vines Operate specialised canopy management equipment* Field graft vines Install irrigation components Deliver injection requirements Identify and treat nursery plant disorders Operate the irrigation system Support mechanical harvesting operations Install and maintain vine trellis Recognise disorders and identify pests and diseases Operate vineyard equipment Perform vertebrate pest control activities Carry out hot water treatment Operate nursery cold storage facilities Take and process vine cuttings	FDFCEL2012A FDFCEL2014A FDFWGG2001A FDFWGG2002A FDFWGG2003A FDFWGG2004A FDFWGG2005A FDFWGG2006A FDFWGG2007A FDFWGG2008A FDFWGG2009A FDFWGG2010A FDFWGG2011A FDFWGG2013A FDFWGG2012A FDFWGG2014A FDFWGG2015A FDFWGG2016A FDFWGG2017A FDFWGG2018A FDFWGG2019A FDFWGG2020A FDFWGG2021A FDFWGG2022A

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
					Carry out basic canopy maintenance Pick grapes by hand Plant vines by hand Apply chemicals and biological agents Coordinate canopy management activities Coordinate crop management activities Coordinate nursery activities Coordinate field nursery activities Coordinate hand pruning activities Implement irrigation schedule Operate mechanical harvester Monitor and maintain nursery plant Implement soil management program Perform shed nursery activities Monitor and control vine disorders and damage Operate spreading and seeding equipment	FDFWGG2023A FDFWGG2024A FDFWGG2025A FDFWGG3001A FDFWGG3002A FDFWGG3003A FDFWGG3004A FDFWGG3005A FDFWGG3006A FDFWGG3007A FDFWGG3008A FDFWGG3009A FDFWGG3010A FDFWGG3011A FDFWGG3012A FDFWGG3013A
2017	Food Processing	FDF	Advanced, automated and alternative packaging materials Review packaging for qualifications: Certificate II in Food Processing Certificate II in Food Processing (Sales)	FDF20216 FDF20916 FDF40116	Review and update units for advanced, automated and alternative packaging materials: Operate a case packing process Fill and close product in cans Operate a form, fill and seal process Operate a fill and seal process Operate a high speed wrapping process Operate a packaging process Operate a cooling, slicing and wrapping process	FDFOP2018 FDFOP2019 FDFOP2020 FDFOP2021 FDFOP2022 FDFOP2023 FDFOP2024

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
			Certificate IV in Food Processing Diploma of Food Science and Technology	FDF50316	Implement and review manufacturing, packaging and testing of beverage products Operate a beer filling process Operate a beer packaging process Set up a production or packaging line for operation Operate interrelated processes in a production system Operate interrelated processes in a packaging system Apply principles of food packaging	FDFST4053A FDFOP2072 FDFOP2073 FDFOP3002 FDFOP3003 FDFOP3004 FDFTEC4008
			Brand development, social media engagement and online retailing Review work roles and qualifications: Certificate IV in Food Processing Certificate IV in Pharmaceutical Manufacturing Certificate IV in Food Science and Technology Certificate IV in Flour Milling Diploma of Food Processing	FDF40116 FDF40216 FDF40316 FDF41016 FDF50116 FDF50216	Units to be identified during review of job roles	TBA

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
			Diploma of Pharmaceutical Manufacturing Diploma of Food Science and Technology	FDF50316		
			<p>Food processing innovation & product development Review job roles and qualifications: Certificate III in Food Processing Certificate IV in Food Processing Certificate IV in Food Science and Technology Diploma of Food Processing Diploma of Food Science and Technology</p> <p>Food Fermentation Clarification of industry need and the potential development of qualifications and/or skills sets meet this need. This will incorporate existing units and the development of new units to close gaps.</p>	<p>FDF30116 FDF40116 FDF40316 FDF50116 FDF50316 TBA</p>	<p>Review current unit of competency and develop 4 x UOCs for supporting, managing and leading food processing innovation</p> <p>Develop a new food product New unit: support food process and product innovation New unit: manage the implementation of food process and product innovations New unit: initiate and lead a food processing industry innovation New unit: lead food processing industry innovative thinking and practice</p> <p>Use of existing units (to be determined as part of the development process) and the development of new units</p>	<p>FDFST5008 TBA TBA TBA TBA TBA</p>

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
2017	Pharmaceutical Manufacturing	FDF	Full review of the pharmaceutical qualifications and units with potential development of new units and skill sets.	TBA	Review the current qualifications and units of competency to determine suitability to address current industry needs and identify potentially new units of competency and skills sets to better address these needs.	
2018						
			Supply chain management Develop qualification/s for global supply chain management and logistics including rapid expansion of fast moving consumer goods (FMCG) channels and online retailing	TBA	To be identified during business case review for global chain logistics across all sectors	
			Business management Develop qualification/s for equipping owners and senior managers with strategic management skills to respond to the dynamic and changing operating environment with increased competition and opportunities to reach global markets.	TBA	To be identified during business case review	
			Asian markets Develop/update qualifications and units covering skills for cultural competency and	TBA	To be identified during business case review	

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
			awareness of Asian market preferences for products, presentation and transportation			
			Raw materials Develop/update qualifications and units covering skills for investigating nutritional characteristics of raw materials before, during and after processing	TBA	To be identified during business case review	
			Hazard analysis and critical control points Develop/update qualifications and units covering skills for developing and managing seamless HACCP plans and systems	TBA	To be identified during business case review	
			Competitive systems and practices Develop/update qualifications and units covering skills for lean and agile manufacturing processes	TBA	To be identified during business case review	
			Risk management Develop/update qualifications and units covering skills for risk	TBA	To be identified during business case review	

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
			management across all occupations			
			Waste management and conversion Develop/update qualifications and units covering skills for waste management and conversion	TBA	To be identified during business case review	

4 year rolling unit reviews (excludes units reviewed as part of above projects)

2016					Overall unit reviews	
	Food Processing	FDF			<p>Review 25% of remaining units:</p> <p>Sector: Baking</p> <p>Operate a cooling and slicing process</p> <p>Operate a pastry forming and filling process</p> <p>Manufacture rye crisp breads</p> <p>Manufacture wafer products</p> <p>Operate a doughnut making process</p> <p>Operate a griddle production process</p> <p>Operate a pastry production process</p> <p>Sector: Bottling</p> <p>Operate the bottle supply process</p> <p>Operate the carton erection process</p> <p>Operate the carton packing process</p> <p>Operate the bottle sealing process</p> <p>Operate the electronic coding process</p> <p>Operate traditional sparkling wine processes</p> <p>Operate the tirage and transfer process</p> <p>Operate the bottle capsuling process</p> <p>Operate manual bottling and packaging processes</p> <p>Operate the palletising process</p> <p>Perform basic packaging tests and inspections</p> <p>Operate the bottle filling process</p> <p>Operate the labelling process</p> <p>Operate the softpack filling process</p> <p>Perform packaging equipment changeover</p> <p>Sector: Beverages</p> <p>Operate a deaeration, mixing and carbonation process</p> <p>Manufacture coffee (roast and ground)</p> <p>Operate an ice manufacturing process</p>	<p>FDFBK2001</p> <p>FDFBK2002</p> <p>FDFBK2003</p> <p>FDFBK2004</p> <p>FDFBK2005</p> <p>FDFBK2006</p> <p>FDFBK2007</p> <p>FDFBP2001</p> <p>FDFBP2002</p> <p>FDFBP2003</p> <p>FDFBP2004</p> <p>FDFBP2005</p> <p>FDFBP2006</p> <p>FDFBP2007</p> <p>FDFBP2009</p> <p>FDFBP2010</p> <p>FDFBP2011</p> <p>FDFBP2012</p> <p>FDFBP3001</p> <p>FDFBP3002</p> <p>FDFBP3003</p> <p>FDFBP3004</p> <p>FDFBV2001</p> <p>FDFBV2002</p> <p>FDFBV2003</p>

				<p>Sector: Cellar door</p> <p>Conduct winery and or site tours</p> <p>Promote wine tourism information</p> <p>Evaluate wines (standard)</p> <p>Perform cellar door stock control procedure</p> <p>Sell cellar door products and services</p> <p>Conduct a standard product tasting</p> <p>Evaluate wines (advanced)</p> <p>Conduct a specialised product tasting</p> <p>Coordinate winery hospitality activities</p> <p>Sector: Cellar operations</p> <p>Perform oak handling activities</p> <p>Perform fermentation operations</p> <p>Operate the ion exchange process</p> <p>Operate the pressing process</p> <p>Prepare and monitor wine cultures</p> <p>Perform heat exchange operations</p> <p>Operate the pressure leaf filtration process</p> <p>Operate the rotary vacuum filtration process</p> <p>Perform must draining operations</p> <p>Operate the crushing process</p> <p>Prepare and make additions and finings</p> <p>Carry out inert gas handling operations</p> <p>Carry out transfer operations</p> <p>Prepare and wax tanks</p> <p>Perform second distillation (pot still brandy) operations</p> <p>Operate the continuous clarification by separation (flotation) process</p> <p>Operate the concentration process</p> <p>Perform de-aromatising, de-alcoholising or de-sulphuring operations</p> <p>Perform rectification (continuous still) operations</p> <p>Perform single column lees stripping (continuous still brandy) operations</p> <p>Operate clarification by separation (centrifugation) process</p>	<p>FDFCD2001</p> <p>FDFCD2002</p> <p>FDFCD2003</p> <p>FDFCD2004</p> <p>FDFCD2005</p> <p>FDFCD2006</p> <p>FDFCD3001</p> <p>FDFCD3002</p> <p>FDFCD3003</p> <p>FDFCEL2001</p> <p>FDFCEL2002</p> <p>FDFCEL2003</p> <p>FDFCEL2005</p> <p>FDFCEL2007</p> <p>FDFCEL2011</p> <p>FDFCEL2013</p> <p>FDFCEL2014</p> <p>FDFCEL2015</p> <p>FDFCEL2016</p> <p>FDFCEL2017</p> <p>FDFCEL2018</p> <p>FDFCEL2019</p> <p>FDFCEL2020</p> <p>FDFCEL3001</p> <p>FDFCEL3002</p> <p>FDFCEL3003</p> <p>FDFCEL3004</p> <p>FDFCEL3005</p> <p>FDFCEL3006</p> <p>FDFCEL3007</p>
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				<p>Perform dual column distillation (continuous still brandy) operations</p> <p>Perform first distillation (pot still brandy) operations</p> <p>Operate the fine filtration process</p> <p>Handle spirits</p> <p>Sector: Cheese</p> <p>Coordinate cheese making operations</p> <p>Carry out processes for a range of artisan cheeses</p> <p>Sector: Confectionery</p> <p>Examine raw ingredients used in confectionery</p> <p>Operate a boiled confectionery process</p> <p>Operate a chocolate conching process</p> <p>Operate a chocolate depositing or moulding process</p> <p>Operate a confectionery depositing process</p> <p>Operate a granulation and compression process</p> <p>Operate a panning process</p> <p>Operate a chocolate refining process</p> <p>Operate a starch moulding process</p> <p>Sector: Dairy processing</p> <p>Operate a butter churning process</p> <p>Operate a butter oil process</p> <p>Operate a curd production and cutting process</p> <p>Operate a cooling and hardening process</p> <p>Operate a cheese pressing and moulding process</p> <p>Operate a fermentation process</p> <p>Sector: Food safety</p> <p>Follow work procedures to maintain food safety</p> <p>Sector: Fruit and vegetables</p> <p>Apply hydro-cooling processes to fresh produce</p> <p>Conduct chemical wash for fresh produce</p> <p>Program fresh produce grading equipment</p>	<p>FDFCEL3008</p> <p>FDFCEL3009</p> <p>FDFCEL3010</p> <p>FDFCEL3011</p> <p>FDFCH3001</p> <p>FDFCH3002</p> <p>FDFCON2001</p> <p>FDFCON2002</p> <p>FDFCON2003</p> <p>FDFCON2004</p> <p>FDFCON2005</p> <p>FDFCON2006</p> <p>FDFCON2007</p> <p>FDFCON2008</p> <p>FDFCON2009</p> <p>FDFDP2001</p> <p>FDFDP2002</p> <p>FDFDP2003</p> <p>FDFDP2004</p> <p>FDFDP2005</p> <p>FDFDP2006</p> <p>FDFFS1001</p> <p>FDFFFV2001</p> <p>FDFFFV3001</p> <p>FDFFFV3002</p>
2017					

				<p>Review 25% of remaining units:</p> <p>Sector: Grocery products and supplies</p> <p>Operate a bleaching process</p> <p>Operate a completing process</p> <p>Operate a deodorising process</p> <p>Operate a flake preparation process</p> <p>Operate a fractionation process</p> <p>Operate a hydrogenation process</p> <p>Operate an interesterification process</p> <p>Operate a neutralisation process</p> <p>Operate a soap splitting process</p> <p>Operate a winterisation process</p> <p>Operate a creamed honey manufacture process</p> <p>Sector: Grain processing</p> <p>Operate a liquid, mash or block stockfeed process</p> <p>Understand mill operations and technologies</p> <p>Operate a grain conditioning process</p> <p>Operate a grain cleaning process</p> <p>Operate a purification process</p> <p>Operate a scalping and grading process</p> <p>Operate a scratch and sizing process</p> <p>Operate a break roll process</p> <p>Operate a pelleting process</p> <p>Handle grain in a storage area</p> <p>Receive grain for malting</p> <p>Prepare malted grain</p> <p>Blend and dispatch malt</p> <p>Work with micronutrients or additions in stockfeed manufacturing processes</p> <p>Demonstrate knowledge of animal nutrition principles</p> <p>Lead flour milling shift operations</p> <p>Control mill processes and performance</p> <p>Control power and automation for milling processes</p>	<p>FDGGPS2001</p> <p>FDGGPS2002</p> <p>FDGGPS2003</p> <p>FDGGPS2004</p> <p>FDGGPS2005</p> <p>FDGGPS2006</p> <p>FDGGPS2007</p> <p>FDGGPS2008</p> <p>FDGGPS2009</p> <p>FDGGPS2010</p> <p>FDGGPS2011</p> <p>FDGGR2001</p> <p>FDGGR2002</p> <p>FDGGR2003</p> <p>FDGGR2004</p> <p>FDGGR2005</p> <p>FDGGR2006</p> <p>FDGGR2007</p> <p>FDGGR2008</p> <p>FDGGR2009</p> <p>FDGGR2010</p> <p>FDGGR2011</p> <p>FDGGR2012</p> <p>FDGGR2013</p> <p>FDGGR3001</p> <p>FDGGR3002</p> <p>FDGGR3003</p> <p>FDGGR3004</p> <p>FDGGR4001</p>
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				<p>Supervise testing processes for wheat and flour</p> <p>Manage mill logistics and support services</p> <p>Supervise dust control procedures in a grain processing enterprise</p> <p>Sector: Laboratory (wine industry)</p> <p>Perform basic analytical tests</p> <p>Perform basic microbiological tests</p> <p>Prepare laboratory solutions and stains</p> <p>Prepare and pour culture media</p> <p>Record laboratory data</p> <p>Use basic laboratory equipment</p> <p>Maintain aseptic environment</p> <p>Use computer technology for laboratory applications</p> <p>Perform non-routine or specialised tests</p> <p>Perform routine troubleshooting procedures</p> <p>Check and maintain readiness of wine testing equipment</p> <p>Perform instrumental tests or procedures on wine samples</p> <p>Standardise laboratory solutions</p> <p>Analyse laboratory data</p> <p>Perform packaging quality control procedures</p> <p>Prepare product or show samples</p> <p>Sector: Plant baking</p> <p>Operate a dough mixing process</p> <p>Operate a final prove and baking process</p> <p>Operate a dough make up process</p> <p>Sector: Pharmaceutical manufacturing</p> <p>Follow work procedures to maintain Good Manufacturing Practice</p> <p>Apply Good Manufacturing Practice procedures</p> <p>Operate a concentration process</p> <p>Operate an extraction process</p> <p>Operate a separation process using chromatography</p> <p>Operate an aseptic fill and seal process</p> <p>Operate an aseptic form, fill and seal process</p>	<p>FDfGR4002</p> <p>FDfGR4003</p> <p>FDfGR4004</p> <p>FDfLAB2001</p> <p>FDfLAB2002</p> <p>FDfLAB2004</p> <p>FDfLAB2005</p> <p>FDfLAB2006</p> <p>FDfLAB2011</p> <p>FDfLAB2012</p> <p>FDfLAB3001</p> <p>FDfLAB3002</p> <p>FDfLAB3003</p> <p>FDfLAB3004</p> <p>FDfLAB3005</p> <p>FDfLAB3006</p> <p>FDfLAB3007</p> <p>FDfLAB3008</p> <p>FDfLAB3009</p> <p>FDfPB3001</p> <p>FDfPB3002</p> <p>FDfPB3003</p> <p>FDfPH1001</p> <p>FDfPH2001</p> <p>FDfPH2002</p> <p>FDfPH2003</p> <p>FDfPH2004</p> <p>FDfPH2005</p> <p>FDfPH2006</p>
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				Coordinate a label store Operate a compressing process Dispense pharmaceutical raw materials Operate an encapsulation process Operate a granulation process Operate a liquid manufacturing process Operate a tablet coating process Operate a terminal sterilisation process Monitor and maintain Good Manufacturing Practice procedures Prepare and review workplace documentation to support Good Manufacturing Practice Facilitate and monitor Good Manufacturing Practice Facilitate contamination control Participate in change control procedures Participate in validation processes Respond to non-conformance Sector: Poultry Operate a dicing, stripping or mincing process Operate an evisceration process Grade carcass Harvest edible offal Operate a marinade injecting process Operate a washing and chilling process Operate the bird receival and hanging process Operate a stunning, killing and defeathering process Work in an egg grading floor Operate egg grading and packing floor equipment Operate a chickway system Debone and fillet product (manually)	FDFPH2007 FDFPH2008 FDFPH2009 FDFPH2010 FDFPH2011 FDFPH2012 FDFPH2013 FDFPH2014 FDFPH3001 FDFPH4001 FDFPH4002 FDFPH4003 FDFPH4004 FDFPH4005 FDFPH4006 FDFPO2001 FDFPO2002 FDFPO2003 FDFPO2004 FDFPO2005 FDFPO2006 FDFPO2007 FDFPO2008 FDFPO2009 FDFPO2010 FDFPO3001 FDFPO3002
2018					
				Review 25% of remaining units:	

				<p>Sector: Operations</p> <p>Pack or unpack product manually</p> <p>Operate automated washing equipment</p> <p>Carry out manual handling tasks</p> <p>Prepare basic mixes</p> <p>Operate basic equipment</p> <p>Monitor process operation</p> <p>Participate effectively in a workplace environment</p> <p>Take and record basic measurements</p> <p>Follow work procedures to maintain quality</p> <p>Communicate workplace information</p> <p>Work effectively in the food processing industry</p> <p>Inspect and sort materials and product</p> <p>Clean equipment in place</p> <p>Clean and sanitise equipment</p> <p>Work in a socially diverse environment</p> <p>Operate a bulk dry goods transfer process</p> <p>Work in a freezer storage area</p> <p>Operate a bulk liquid transfer process</p> <p>Load and unload tankers</p> <p>Work with temperature controlled stock</p> <p>Conduct routine maintenance</p> <p>Maintain food safety when loading, unloading and transporting food</p> <p>Apply sampling procedures</p> <p>Participate in sensory analyses</p> <p>Work in a food handling area for non-food handlers</p> <p>Operate a blending, sieving and bagging process</p> <p>Manufacture extruded and toasted products</p> <p>Operate a forming or shaping process</p> <p>Dispense non-bulk ingredients</p> <p>Operate a mixing or blending process</p> <p>Operate a baking process</p>	<p>FDFO1001</p> <p>FDFO1002</p> <p>FDFO1003</p> <p>FDFO1004</p> <p>FDFO1005</p> <p>FDFO1006</p> <p>FDFO1007</p> <p>FDFO1008</p> <p>FDFO1009</p> <p>FDFO1010</p> <p>FDFO2001</p> <p>FDFO2002</p> <p>FDFO2003</p> <p>FDFO2004</p> <p>FDFO2005</p> <p>FDFO2006</p> <p>FDFO2007</p> <p>FDFO2008</p> <p>FDFO2009</p> <p>FDFO2010</p> <p>FDFO2011</p> <p>FDFO2012</p> <p>FDFO2013</p> <p>FDFO2014</p> <p>FDFO2016</p> <p>FDFO2017</p> <p>FDFO2025</p> <p>FDFO2026</p> <p>FDFO2027</p> <p>FDFO2028</p> <p>FDFO2029</p>
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				Operate a coating application process	FDFOF2031
				Work in a clean room environment	FDFOF2032
				Operate a depositing process	FDFOF2033
				Operate an evaporation process	FDFOF2034
				Operate an enrobing process	FDFOF2035
				Operate an extrusion process	FDFOF2036
				Operate a filtration process	FDFOF2037
				Operate a grinding process	FDFOF2038
				Operate a frying process	FDFOF2039
				Operate a heat treatment process	FDFOF2040
				Operate a mixing or blending and cooking process	FDFOF2041
				Operate a drying process	FDFOF2042
				Operate an homogenising process	FDFOF2043
				Operate a retort process	FDFOF2044
				Operate pumping equipment	FDFOF2045
				Operate a production process	FDFOF2046
				Operate a portion saw	FDFOF2047
				Pre-process raw materials	FDFOF2048
				Operate a reduction process	FDFOF2049
				Operate a separation process	FDFOF2050
				Operate a spreads production process	FDFOF2051
				Operate a chocolate tempering process	FDFOF2052
				Operate a washing and drying process	FDFOF2053
				Operate a water purification process	FDFOF2054
				Freeze dough	FDFOF2055
				Operate a freezing process	FDFOF2056
				Operate a membrane process	FDFOF2057
				Operate a holding and storage process	FDFOF2058
				Operate a continuous freezing process	FDFOF2059
				Operate an automated cutting process	FDFOF2060
				Apply work procedures to maintain integrity of product	FDFOF2062
				Apply quality systems and procedures	FDFOF2063

				Provide and apply workplace information Work in confined spaces in the food and beverage industries Operate a wort production process Operate a brewery fermentation process Operate a beer maturation process Operate a beer filtration process Operate a bright beer tank process Identify key stages and beer production equipment in a brewery Prepare and monitor beer yeast propagation process Control contaminants and allergens in the workplace Prepare food products using basic cooking methods Identify cultural, religious and dietary requirements for food products Sector: People Participate in work teams and groups Participate in improvement processes Report on workplace performance Support and mentor individuals and groups Lead work teams and groups Participate in an audit process Establish compliance requirements for work area Manage people in the work area Plan and co-ordinate maintenance Schedule and manage production Optimise a work process Manage a work area within budget Manage supplier agreements and contracts Manage internal audits Design and maintain programs to support legal compliance	FDFOP2064 FDFOP2065 FDFOP2066 FDFOP2067 FDFOP2068 FDFOP2069 FDFOP2070 FDFOP2071 FDFOP2074 FDFOP3001 FDFOP3005 FDFOP3006 FDFPPL2001 FDFPPL3001 FDFPPL3002 FDFPPL3003 FDFPPL3004 FDFPPL3005 FDFPPL3006 FDFPPL4001 FDFPPL4002 FDFPPL4003 FDFPPL4004 FDFPPL4006 FDFPPL4007 FDFPPL4008 FDFPPL5001
2019					
				Review 25% of remaining units: Sector: Sugar	

				Install pre-ballast	FDFSUG101
				Undertake shunting operations	FDFSUG102
				Move cane bins in a marshalling yard	FDFSUG103
				Check a cane sample for extraneous matter	FDFSUG104
				Manually clean and maintain housekeeping standards	FDFSUG105
				Lay sleepers for cane rail systems	FDFSUG201
				Lay rails for cane rail systems	FDFSUG202
				Lay skeleton track for cane rail system	FDFSUG203
				Operate tamping equipment	FDFSUG204
				Construct turnouts	FDFSUG205
				Drive a cane locomotive	FDFSUG206
				Conduct cane weighbridge operations	FDFSUG207
				Operate a tipping station	FDFSUG208
				Operate an extraction station	FDFSUG209
				Operate a juice clarification process	FDFSUG210
				Operate a mud filtration process	FDFSUG211
				Chemically clean equipment	FDFSUG212
				Operate a pans station	FDFSUG213
				Operate a low grade fugal station	FDFSUG214
				Operate a high grade fugal station	FDFSUG215
				Operate a crystalliser station process	FDFSUG216
				Operate a boiler - basic	FDFSUG218
				Operate a bagasse fuel supply system	FDFSUG219
				Operate a coal fuel supply system	FDFSUG220
				Operate an ash separation system	FDFSUG221
				Operate a waste water treatment system	FDFSUG222
				Operate a cooling water system	FDFSUG223
				Perform standard tests on cane samples	FDFSUG224
				Collect and prepare samples	FDFSUG225
				Perform general drilling operations	FDFSUG226
				Perform general lathe operations	FDFSUG227
				Perform general milling operations	FDFSUG228

				Perform general planing and shaping operations Undertake forming, bending and shaping Undertake simple fabrication Drive a master-slave locomotive Control cane traffic movements Adjust cane delivery schedules to meet daily milling requirements Operate a boiler - intermediate Operate a boiler - advanced Monitor a sugar mill powerhouse Perform factory control tests Analyse and convey workplace information Operate a sugar system Sector: Technical Participate in a HACCP team Implement the pest prevention program Apply raw materials, ingredient and process knowledge to production problems Determine handling processes for perishable food items Apply an understanding of legal requirements of food production Manage water treatment processes Sector: Wine Grape Growing Bench graft vines Carry out potting operations Hand prune vines Maintain callusing environment Obtain and process rootlings Tend containerised nursery plants Train vines Field graft vines Identify and treat nursery plant disorders Support mechanical harvesting operations Install and maintain vine trellis Recognise disorders and identify pests and diseases	FDFSUG229 FDFSUG230 FDFSUG231 FDFSUG301 FDFSUG302 FDFSUG303 FDFSUG304 FDFSUG305 FDFSUG306 FDFSUG307 FDFSUG308 FDFSUG309 FDFTEC3001 FDFTEC3002 FDFTEC3003 FDFTEC4001 FDFTEC4006 FDFTEC4010 FDFWGG2001 FDFWGG2002 FDFWGG2003 FDFWGG2005 FDFWGG2006 FDFWGG2007 FDFWGG2008 FDFWGG2010 FDFWGG2012 FDFWGG2015 FDFWGG2016 FDFWGG2017
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				<p>Operate vineyard equipment</p> <p>Carry out hot water treatment</p> <p>Operate nursery cold storage facilities</p> <p>Take and process vine cuttings</p> <p>Carry out basic canopy maintenance</p> <p>Pick grapes by hand</p> <p>Plant vines by hand</p> <p>Coordinate canopy management activities</p> <p>Coordinate crop harvesting activities</p> <p>Coordinate nursery activities</p> <p>Perform field nursery activities</p> <p>Coordinate hand pruning activities</p> <p>Operate a mechanical harvester</p> <p>Monitor and maintain nursery plants</p> <p>Implement a soil management program</p> <p>Perform shed nursery activities</p> <p>Monitor and control vine disorders and damage</p> <p>Operate spreading and seeding equipment</p> <p>Operate specialised canopy management equipment</p> <p>Sector: Work health and safety</p> <p>Work safely</p> <p>Participate in work health and safety processes</p> <p>Contribute to work health and safety processes</p> <p>Identify, assess and control work health and safety risk in own work</p> <p>Manage work health and safety processes</p> <p>Sector: Wine</p> <p>Identify key operations in wine production</p> <p>Identify viticulture processes</p> <p>Perform effectively in a wine industry workplace</p> <p>Identify and control risks in own work</p>	<p>FDFWGG2018</p> <p>FDFWGG2020</p> <p>FDFWGG2021</p> <p>FDFWGG2022</p> <p>FDFWGG2023</p> <p>FDFWGG2024</p> <p>FDFWGG2025</p> <p>FDFWGG3002</p> <p>FDFWGG3003</p> <p>FDFWGG3004</p> <p>FDFWGG3005</p> <p>FDFWGG3006</p> <p>FDFWGG3008</p> <p>FDFWGG3009</p> <p>FDFWGG3010</p> <p>FDFWGG3011</p> <p>FDFWGG3012</p> <p>FDFWGG3013</p> <p>FDFWGG3014</p> <p>FDFWHS1001</p> <p>FDFWHS2001</p> <p>FDFWHS3001</p> <p>FDFWHS4001</p> <p>FDFWHS5001</p> <p>FDFWIN1001</p> <p>FDFWIN1002</p> <p>FDFWIN2001</p> <p>FDFWIN2002</p>
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