The Australian ginger industry

Overview of market trends and opportunities

Australian Ginger Growers Association Inc.

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Project manager

Jason Keating, manager, Food and Fibre Futures project, Department of Employment, Economic Development and Innovation

Authors

Henry E Camacho, senior trade and investment officer, Department of Employment, Economic Development and Innovation

Adriano Brescia, trade and investment officer, Department of Employment, Economic Development and Innovation

Contents

Tables and figures v

Preface vii

Executive summary ix

1.0 Introduction 1

1.1 Objectives 1

1.2 Methodology 1

1.2.1 Secondary sources 1

1.2.2 Primary sources 1

1.3 Limitations 1

2.0 Global situation analysis 2

2.1 Global trends in harvesting and production 2

2.2 Global leaders in ginger production 3

2.3 Global leaders in ginger harvest 4

2.4 Leading producers by yield 5

2.5 Australia's global position 6

2.6 Global trade in ginger 6

2.6.1 Volume of imports of fresh ginger by country 6

2.6.2 Volume of exports of fresh ginger by country 7

2.7 Global consumption trends 8

3.0 Commercial ginger production in Australia 9

3.1 Background 9

3.2 Industry value 10

3.3 Industry bodies 10

3.3.1 Australian Ginger Growers Association Inc. 10

3.3.2 Horticulture Australia Limited 11

3.3.3 Growcom 11

3.4 Production requirements and issues 11

3.4.1 Climate 11

3.4.2 Seed and planting 11

3.4.3 Land, water and irrigation 12

3.4.4 Fertilisers 12
3.4.5 Pests and diseases 12
3.4.6 Managing pests and diseases 13
3.4.7 Crop rotation 13
3.4.8 Harvesting 13
3.4.9 Post harvest 15
3.4.10 Labour 15
3.5 Ginger production for the processing sector 16
3.5.1 The quota arrangement—views of ginger growers 16
3.6 Ginger production for the fresh market 17
3.6.1 Grading 17
3.6.2 Transport 17
3.6.3 Supply and demand 18
3.6.4 Packaging and marketing 18
3.7 Production trends in Australia 18
3.7.1 Trends in ginger cultivation 18
3.7.2 Trends in ginger production 19
3.8 Views of ginger growers 20
3.8.1 Factors influencing domestic ginger cultivation 21
3.8.2 Key issues affecting production capacity 22
3.8.3 Expansion of the ginger industry 23
4.0 Australian ginger processing sector 24
4.1 Australian ginger processors 24
4.1.1 Buderim Ginger Limited 24
4.1.2 Bundaberg Brewed Drinks Pty Ltd 26
4.1.3 Other food and beverage processors in Australia using ginger as a vital ingredient 27
4.2 Exports of fresh and processed ginger 28
4.3 Australian exports of ginger by destination 28
5.0 Australian fresh ginger sector 31
5.1 Key characteristics in purchasing fresh ginger 31
5.2 Domestic trends in fresh ginger consumption 31
5.3 Factors impacting on price 31

5.3.1 Seasonality 31
5.3.2 Competition 31
5.3.3 Quality 32
5.4 Retail consumers 32
5.5 Market focus 32
5.6 Wholesaler selling methods 32
5.7 Marketing and promotion 32
5.8 Views of wholesalers 32
5.8.1 Factors influencing future demand for fresh ginger 33
5.9 Volume of ginger sold at the Brisbane Markets 33
5.10 Price structure 34
5.10.1 Wholesale ginger prices in Brisbane 34
5.10.2 Wholesale ginger prices in Sydney 34
5.10.3 Wholesale ginger prices in Melbourne 35
6.0 Global competition analysis 36
6.1 The impact of foreign competition on Australia's ginger industry 36
6.2 Imports of foreign ginger into Australia 36
6.2.1 Imports of foreign ginger into Australia—views of ginger growers 37
6.3 Export opportunities for Australian fresh ginger 37
7.0 Market opportunities and challenges 38
7.1 Key opportunities for the ginger industry 38
7.2 Key challenges for the ginger industry 38
8.0 Appendix 1—Product varieties 40
8.1 Characteristics and components of ginger 40
8.2 Forms of ginger 40
8.2.1 Fresh ginger 40
8.2.2 Dried ginger 40
8.2.3 Ginger oils 40
8.2.4 Crystallised ginger 40
8.2.5 Pickled ginger 40
8.2.6 Ground ginger 41
8.2.7 Preserved ginger 41

8.3 Key varieties of ginger 41
8.4 Breeding new varieties of ginger 41
9.0 Appendix 2—Questionnaires 43
9.1 Grower's questionnaire 43
9.2 Processor's questionnaire 49
9.3 Wholesaler's questionnaire 52

Tables and Figures

Tables

Table 1: Main ginger production regions in Australia (2006–2007) 9

Table 2: Harvesting periods for processing and fresh market sectors 14

Table 3: Fresh ginger grading categories 17

Table 4: Opportunities for the fresh market and processing sectors 39

Table 5: Challenges for the fresh market and processing sectors 39

Table 6: Common varieties of ginger in Australia 41

Figures

Figure 1: World ginger production (1999–2007) 2

Figure 2: World area harvested (1999–2007) 2

Figure 3: Ginger production by country (1999–2007) 3

Figure 4: Global leaders in ginger production by percentage (2006–2007) 4

Figure 5: Ginger harvesting trends (1999–2007) 4

Figure 6: Global leaders in ginger harvest by percentage (2006–2007) 5

Figure 7: Leading producers by yield (1999–2007) 6

Figure 8: Volume of ginger imports by country (1999–2005) 7

Figure 9: Volume of ginger exports by country (1999–2005) 8

Figure 10: Global consumption trends for spices, including ginger (1999–2003) 8

Figure 11: Main ginger production regions in Australia (tonnes per percentage) 10

Figure 12: Land cultivated with ginger by area (2004–2008) 19

Figure 13: Fresh ginger production by volume (2004–2008) 19

Figure 14: Processed ginger production by volume (2004–2008) 20

Figure 15: Australian exports of ginger by volume (1988–2008) 28

Figure 16: Australian exports of fresh ginger by destination (2007–2008) 29

Figure 17: Australian exports of ginger preserved by sugar (2007–2008) 29

Figure 18: Australian exports of ginger in syrup (2007–2008) 30

Figure 19: Volume of ginger sold at the Brisbane Markets (2005–2008) 33

Figure 20: Wholesale ginger prices in Brisbane (2005–2008) 34

Figure 21: Wholesale ginger prices in Sydney (2005–2008) 34

Figure 22: Wholesale ginger prices in Melbourne (2005–2008) 35

Preface

This report provides an analysis of the Australian ginger industry. It was largely made possible due to the generous support of the Australian Ginger Growers Association who offered us a formal letter of introduction to their members.

Growers and processors alike allowed our team to ask them many confidential questions about their businesses and aspirations for the future. We thank them sincerely for their time and appreciate their candid and thoughtful replies about not only their businesses but about the industry as a whole.

This report is available to the Australian ginger industry and identifies not only constraints to future growth but provides recommendations for their resolution. We hope the Australian ginger industry continues to grow and prosper in the future.

Executive summary

This report presents the findings of market research conducted into the Australian ginger industry and its position in the global environment. The purpose of this market research is to assist the Australian ginger industry to identify key issues impacting on the production, processing, marketing and export of Australian ginger. We expect the Australian ginger industry to use the findings of this research to better understand the current opportunities and challenges facing the industry, and the impact they may have in the future.

An extensive industry survey was conducted with 16 ginger growers and one industry consultant located in the Sunshine Coast and Wide Bay–Burnett regions. The survey also involved two Australian processors (Buderim Ginger Limited and Bundaberg Brewed Drinks Pty Ltd) and five wholesalers located at the Brisbane Markets at Rocklea.

Accordingly, the overall objectives of the market research study were to:

- determine global and domestic ginger production trends
- identify key players in the supply chain and their contribution to the industry
- identify issues influencing production and processing of ginger in Australia
- highlight market opportunities and challenges for fresh and processed Australian ginger.

Ginger is cultivated in many tropical and subtropical regions of the world. China and India lead the world in fresh ginger production with a global share of over 50%, followed by Indonesia, Nepal and Nigeria. During the last 10 years, global ginger production has been increasing, with production estimated at 1 387 445 tonnes in 2007.

In comparison to leading ginger producing nations, Australia is a relatively small producer. During the last five years, total ginger production in Australia has been increasing, with the industry yielding an average of 8000 tonnes. Of this, 55% of production is supplied to the Australian processing sector and 45% is supplied to the domestic fresh market. Australia's contribution represents less than 1% of global production.

Queensland Primary Industries and Fisheries (QPIF) estimates the current farm-gate value of the Australian ginger industry at approximately A$15.6 million. Ginger is also used as a vital ingredient in a wide range of semi-processed products for the food manufacturing sector and processed products for the retail sector. The value of these products, in which Australian ginger is a key ingredient, is estimated at over A$80 million.

Ginger production in Australia is predominately located throughout Queensland in the Sunshine Coast and Wide Bay–Burnett regions. The Sunshine Coast region produces approximately 6075 tonnes of ginger annually. The Wide Bay–Burnett is the second largest growing region, with production estimated at 1837 tonnes per year.

Ginger is a labour-intensive industry. There are currently 49 growers in Queensland, of which QPIF estimates 30 are full-time growers. Based on research, it is estimated that the industry employs approximately 200 full-time farmhands. Additionally, the industry employs approximately 385 casual staff during peak harvesting periods.

Ginger growing is also a capital-intensive industry. A high capital outlay is incurred in irrigation, specialised planting and harvesting equipment, and planting materials. Maximum yields are obtained in quality coastal soils using clean seed and high inputs of quality water (4 megalitres per acre), fertiliser and organic matter.

Producing ginger for the processing sector is or has been an integral part of almost every ginger grower's business in Australia. The most common variety used for processing is 'Queensland' ginger. Most growers supply conventionally grown ginger, while smaller amounts of organic produce are also supplied to Buderim Ginger Limited for use in value-added organic ginger products.

Buderim Ginger is the largest ginger processor in Australia, taking over 95% (4200 tonnes) of the ginger produced for processing. All growers supplying ginger for the processing sector will provide most of their harvest to Buderim Ginger and smaller volumes to other processors.

Other food and beverage processors in Australia using ginger as a vital ingredient include Bundaberg Brewed Drinks Pty Ltd, Gourmet Garden Limited, Veg Master and Sunshine Tropical Limited among others. Combined, these companies employ over 560 staff. Approximately 30% of staff employed by these companies are involved directly with the ginger component of the business.

Depending on usage, ginger is harvested at different times. Ginger for processing into confectionary ginger products is generally harvested after 5 to 6 months, while ginger for fresh consumption is generally harvested after 6 to 18 months.

Australia's fresh markets take over 40% of the ginger produced domestically. The most common variety of ginger grown for the fresh market in Australia is the 'Canton' variety as it attracts a higher price than other varieties. Small amounts of the 'Japanese' variety are also grown by several growers. Ginger grown for the fresh markets is consigned to metropolitan wholesale markets in Sydney, Melbourne, Brisbane, Adelaide, Hobart, Darwin, Perth and Newcastle. There are also a number of growers that produce organic ginger and supply to the fresh organic produce segment.

The fresh market for ginger fluctuates according to supply and demand. There may be potential to increase consumption of fresh ginger through promotion in domestic market. Growers indicated that during the 2006–2007 season the average price received from wholesalers purchasing fresh ginger was between $2.50 and $4.00 per kilogram, but prices have spiked as high as $12.00 and dropped as low as $1.50 due to fluctuations in supply capacity. Key factors impacting on ginger prices throughout the production season include seasonality, competition and product quality.

The Australian ginger processing sector takes 55% of the ginger produced in Australia. Ginger is a vital ingredient in a wide range of semi-processed products for the food manufacturing sector, and processed products for the retail sector. The current value of products in which ginger is a key ingredient is estimated at over A$80 million. Currently the Australian processing market offers immediate growth potential for growers. In recent years some processing companies have experienced problems securing a sufficient supply of raw ginger to meet current demand or to further expand their operations.

Australia exports ginger in raw and semi-processed form. In 2008, Australian exports of raw ginger were valued at approximately A$725 000, while exports of semi-processed ginger were valued at A$11.8 million. Key export destinations include the United States, New Zealand, the United Kingdom and Japan. Opportunities may exist to re-open the japanese export market by addressing current market restrictions, as well as boosting exports to existing markets. Japan is the leading importer of ginger across the globe, with in excess of 90 000 tonnes of ginger being imported each year since 1999.

Research conducted by QPIF identified a number of key issues limiting expansion and production of ginger, including the following:

- Pests and disease—These are the biggest concerns that affect most ginger growers in Australia. Managing these threats adds a significant cost to production. Growers expressed concern regarding the impact of pathogens on yields in recent years. Similarly, growers expressed concern regarding the effect that pathogen threats will have on the industry in the future.

- Water availability—Ginger requires significant amounts of water throughout the growing season (4 megalitres per acre) and growers are heavily reliant upon consistent rainfall in order to maintain water reserves for irrigation. In recent years, long periods of drought in some regions have impacted heavily on water reserves.

- Availability of labour—Growers expressed difficulty in attracting casual and permanent staff, especially during the harvesting season. Attracting good-quality labour with an interest in agriculture is also a common issue for growers.

- Availability of good-quality seed—There is no regulated certified seed scheme currently in place. The Australian Ginger Growers Association (AGGA) has a documented seed scheme but it is not legislated or controlled. The AGGA code of conduct aims to maintain a high-quality seed source.

- Availability of suitable land—Growers indicated the need to identify new areas to grow ginger (outside the Sunshine Coast area) in order to maintain or increase supply to processing and fresh market sectors.

- Rising production costs—Cost of inputs such as fertilisers, fuel and wages have increased significantly in recent years, while ginger prices have remained almost unchanged. Rising production costs have impacted more heavily upon the profitability of smaller and medium-sized farms.

- Demand for ginger—Demand for ginger from the processing sector has remained stagnant in recent years.

- Low prices—Current prices received for ginger in the processing sector are too low.

- Age of the growers—The majority of growers surveyed are nearing retirement age and do not want additional commitments. Furthermore, some growers do not have a succession plan in place or family members interested in continuing business operations. Additionally, poor production yields in recent years caused by disease problems and bad weather has placed significant pressure on growers. Some growers have indicated that a continuation of these conditions would force them to leave the industry.

- Foreign competition—There are concerns regarding the importation of ginger from foreign competitors and the effect this may have on the Australian ginger industry.

1.0 Introduction

1.1 Objectives

This research study aimed to:

- determine global and domestic ginger production trends
- identify key players in the supply chain and their contribution to the industry
- identify key issues impacting on production and processing of ginger in Australia
- highlight market opportunities and challenges for fresh and processed Australian ginger.

1.2 Methodology

Information from this report was collected from both secondary and primary sources.

1.2.1 Secondary sources

Preliminary desktop research was conducted to identify global trends in harvesting and production, and to obtain background information regarding ginger production and processing in Australia. The findings provided the basis for developing in-depth interview questionnaires for ginger growers, processors and wholesalers based in Queensland. Information sources included the Australian Bureau of Statistics (ABS), the Food and Agriculture Organization Statistics Division (FAOSTAT), Market Information Services and the Australian Quarantine Inspection Service.

1.2.2 Primary sources

Surveys were conducted with 16 ginger growers and one industry consultant located in the Sunshine Coast and Wide Bay–Burnett regions.

Ten of the selected growers were interviewed face to face at their properties during November 2008. Growers interviewed were selected based on advice from the Australian Ginger Growers Association (AGGA) and Queensland Primary Industries and Fisheries (QPIF) staff.

The other six participants responded to a mail-out questionnaire that was distributed among registered members of the AGGA between October and December 2008. It is estimated that the combined production of the interviewed growers accounts for approximately 70% of ginger production in Australia. The interviews involved growers that produce ginger for the processing sector and fresh market, as well as seed growers.

Face-to-face interviews were also conducted with Queensland's largest ginger processor, Buderim Ginger Limited, and beverage processor, Bundaberg Brewed Drinks Pty Ltd, in November 2008. During the interviews, information such as demand levels, price structures, price specifications, product positioning and marketing was gathered.

Furthermore, five face-to-face interviews were conducted with selected ginger wholesalers located at the Brisbane Markets. Wholesalers were selected based on their turnover of product and their current involvement in domestic and international ginger trade.

1.3 Limitations

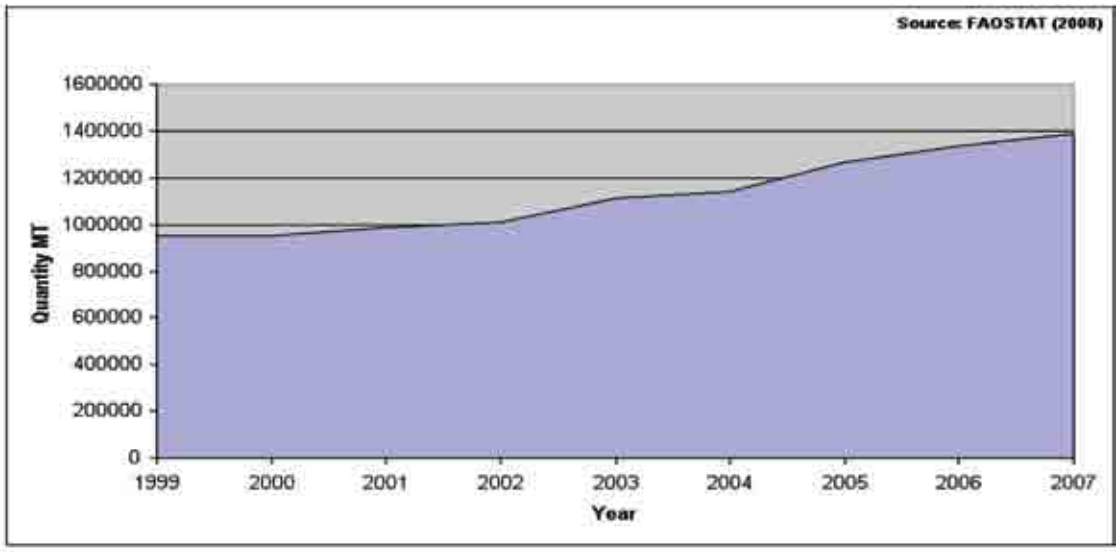
Information presented in this report should be use as a guide only. The information provided is based upon the accuracy of data supplied from interviewees. Furthermore, information provided by interviewees only represents a portion of Australia's ginger production, processing and wholesaler sectors, as only selected interviews were conducted. Finally, during the face-to-face interviews some respondents did not answer all questions, so there are variable response rates for the survey questions.

2.0 Global situation analysis

2.1 Global trends in harvesting and production

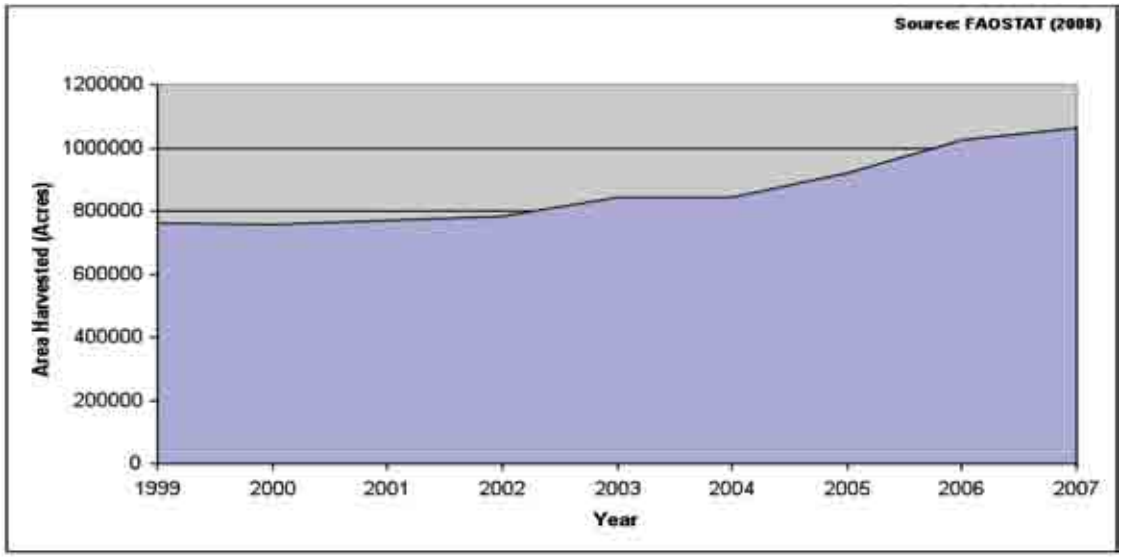
Ginger is native to southern China but is also cultivated in many tropical and subtropical regions of the world. According to the Food and Agriculture Organization (FAO), global ginger harvesting and production has increased since 1999—a trend which is predicted to continue in the future. As illustrated in Figure 1, overall production of ginger around the world increased from 952 222 tonnes in 1999 to 1 387 445 tonnes in 2007.

Figure 1: World ginger production (1999–2007)



Similarly, harvesting areas of ginger across the world have also increased in recent years. The world harvest area totalled 762 318 acres in 1999 and has increased annually to 1 060 818 acres in 2007 (refer to Figure 2).

Figure 2: World area harvested (1999–2007)

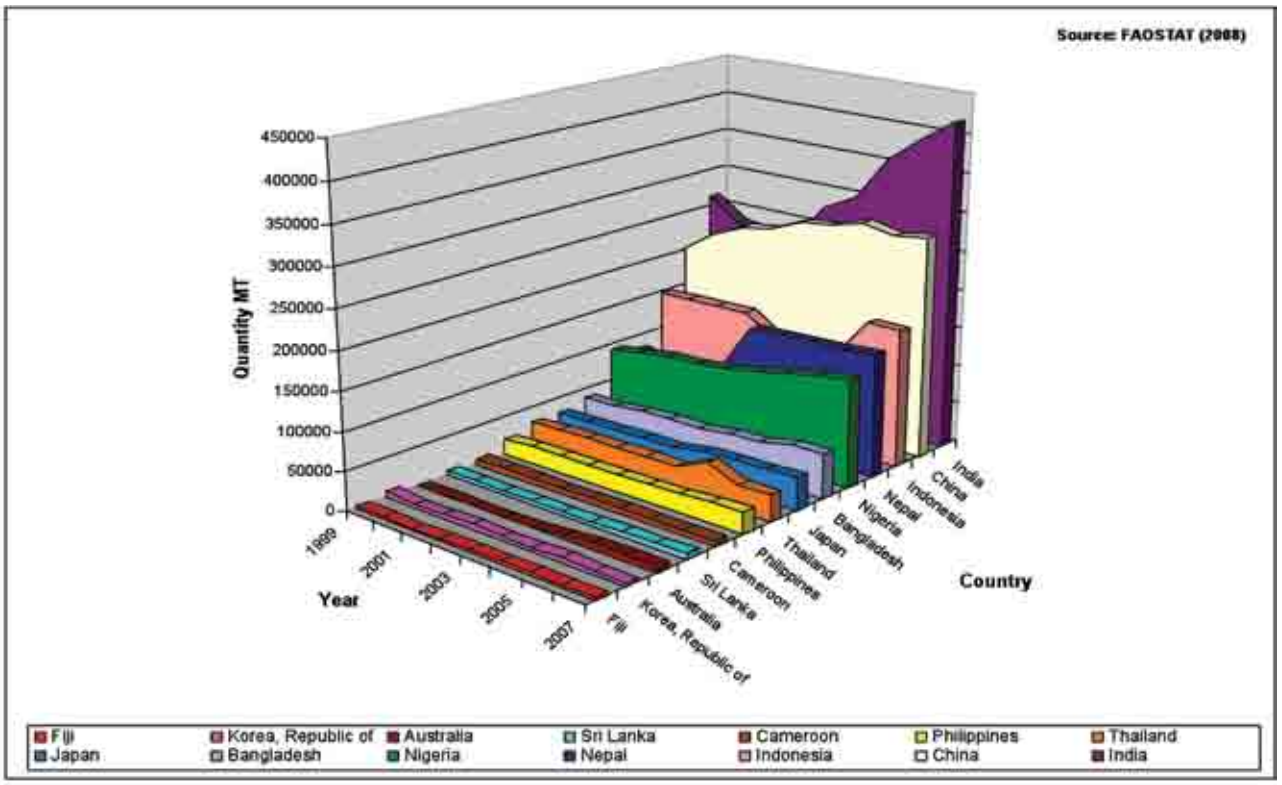


Based on FAO statistics, global yield of ginger in 2007 totalled 0.76 tonnes per acre. QPIF and AGGA suggest that the data provided by the FAO in Figures 1 and 2 is significantly deflated and does not accurately represent global yield estimates for ginger. It is estimated that the average yield for Australian producer's range between 15 and 20 tonnes per acre.

2.2 Global leaders in ginger production

In recent years China and India have continued to lead the world in fresh ginger production with a combined global share of over 50%, followed by Indonesia, Nepal and Nigeria (refer to Figure 4). Other major producers of ginger include Bangladesh, Japan, Thailand, Philippines, Cameroon, Sri Lanka, Korea and Fiji**.** Figure 3 illustrates the trends in ginger production among leading ginger producing nations in recent years. QPIF and AGGA suggest that Australia's production is significantly larger than other global players such Fiji, Korea, Sri Lanka and Cameroon.

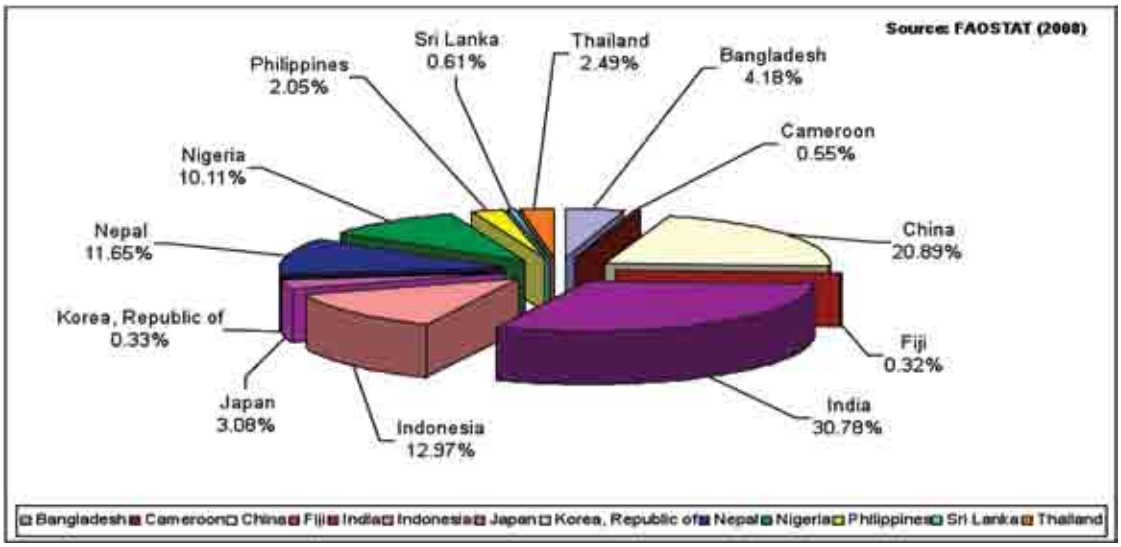
Figure 3: Ginger production by country (1999–2007)



Note: Based on 2007 ABS statistics, Australia would rank 12th on this graph, with approximately 8000 tonnes of ginger produced annually (no data available for Australian ginger production from the period 1999–2004).

According to the FAO, the amount of Chinese ginger produced has increased gradually each year from 1999 to 2005. Total ginger production in China was 201 128 tonnes in 1999, compared to 286 698 tonnes in 2005. In 2006–2007 however, China's production decreased slightly, the direct result of an exceptional rainy season in China. Overall ginger production in India also increased from 263 000 tonnes in 1999 to 420 000 tonnes in 2007. Similarly, production in Nigeria, Nepal, Bangladesh, Fiji and Thailand has also increased significantly since 2001. Figure 4 illustrates the percentage of ginger produced by the world's 13 largest producers.

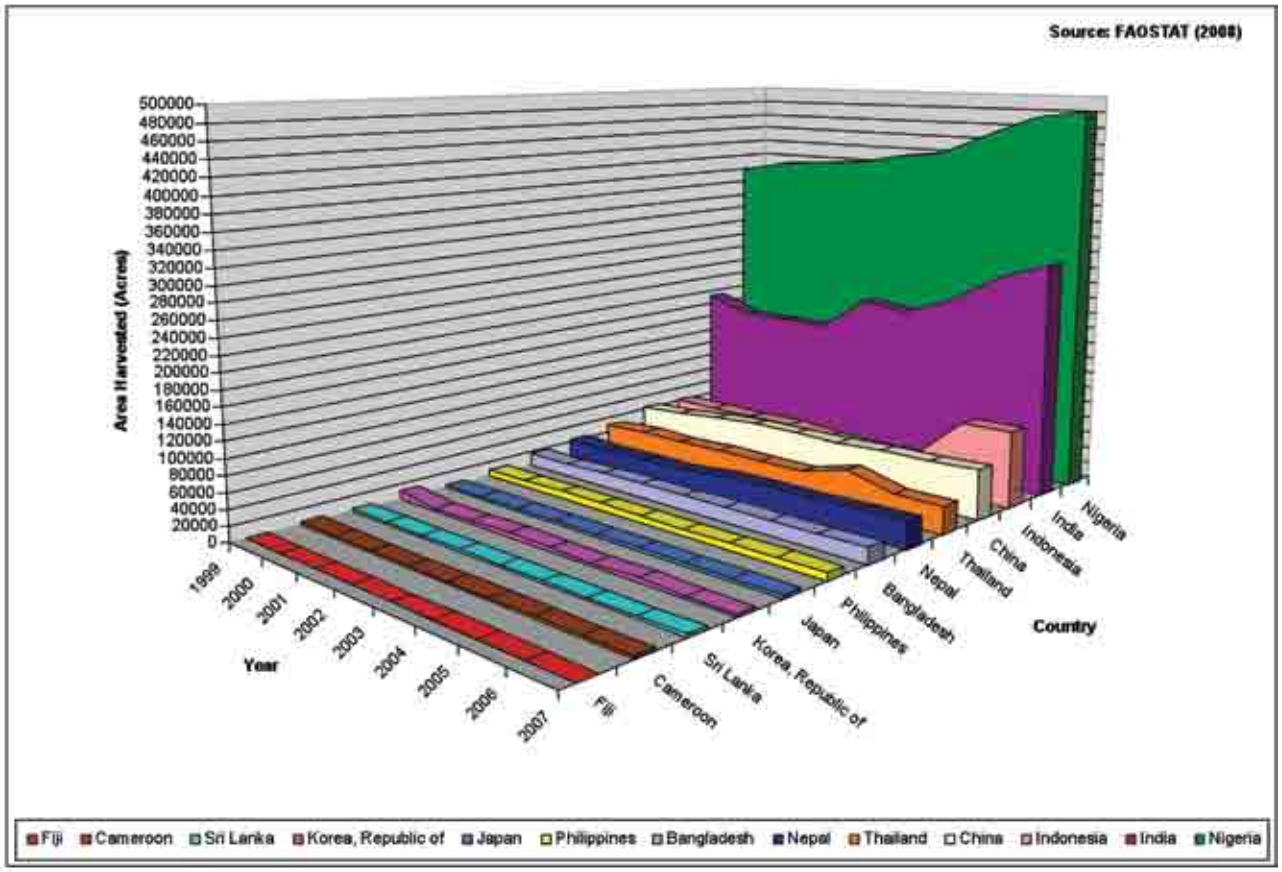
Figure 4: Global leaders in ginger production by percentage (2006–2007)



2.3 Global leaders in ginger harvest

Since 1999, harvesting areas in India, Nigeria and Indonesia have enlarged significantly, while areas across China have remained stable. Although the ginger cultivation area in China is not as large as some other nations, China's productivity is greater. Figure 5 illustrates the trends in ginger harvest areas among leading ginger producing nations in recent years.

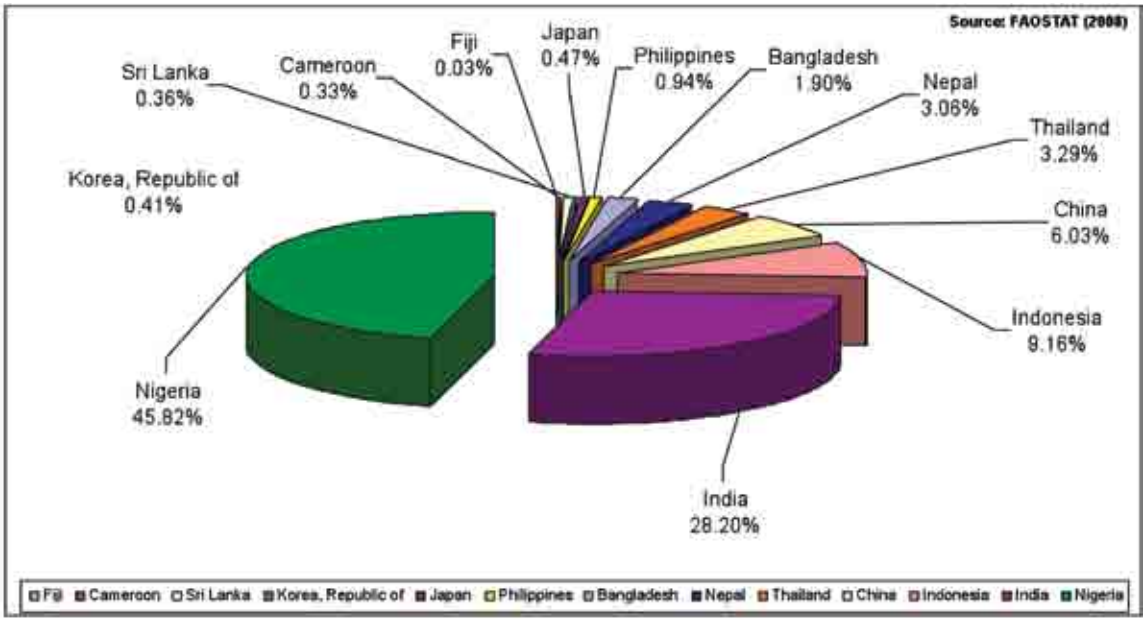
Figure 5: Ginger harvesting trends (1999–2007)



Note: QPIF suggests that the data quoted for land area of ginger planted and harvested in Nigeria is inflated.

Figure 6 below illustrates the percentage of land under the cultivation of ginger by the world's 13 largest producers. Nigeria, India and Indonesia and China represent 90% of the world's land under ginger cultivation.

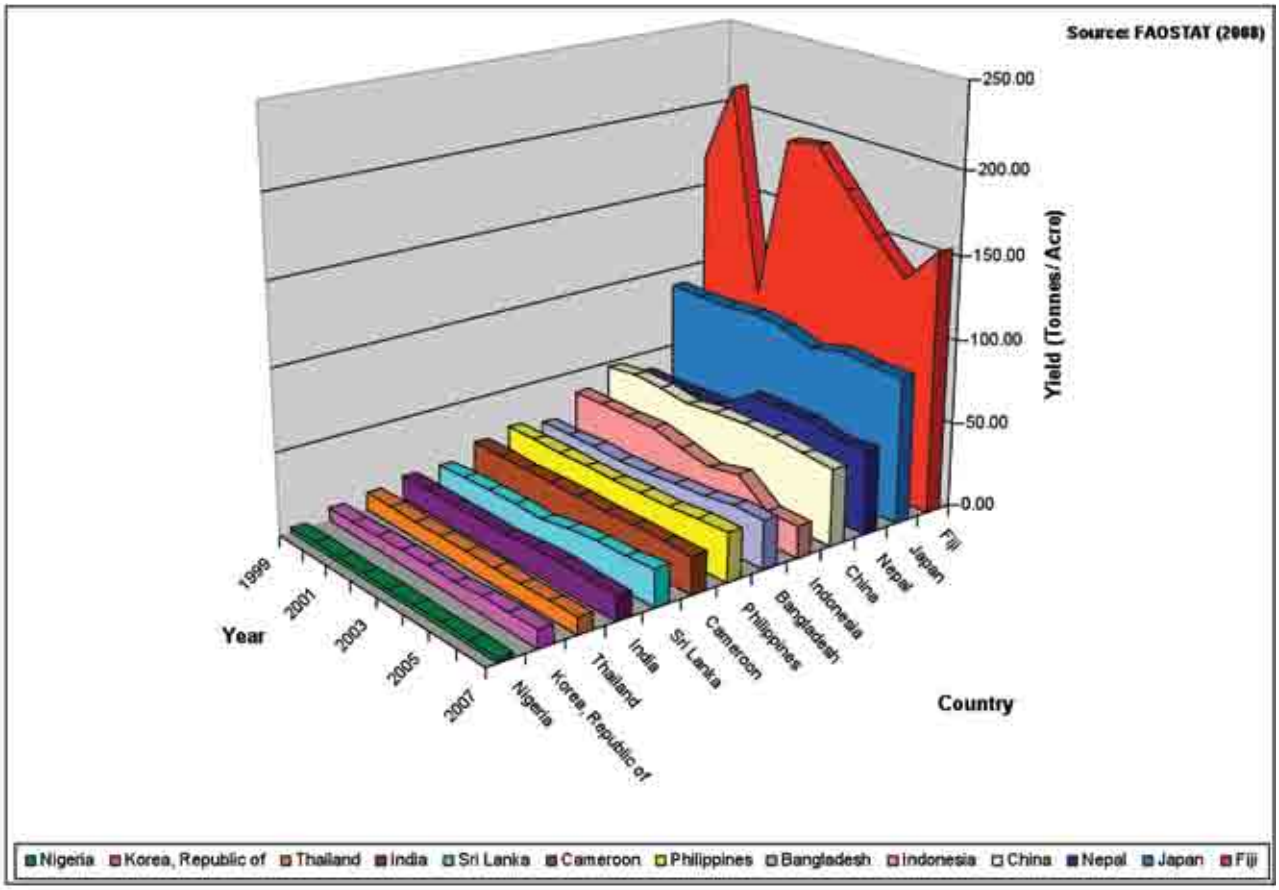
Figure 6: Global leaders in ginger harvest by percentage (2006–2007)



2.4 Leading producers by yield

According to the FAO, Fiji, Japan, Nepal and China have the highest yield of production per acre of land cultivated. Since 1999, these nations have produced in excess of 45 tonnes per acre. Figure 7 illustrates the trends in yield among the 13 leading ginger producing nations. QPIF and AGGA suggest that data provided by the FAO in Figure 7 is highly questionable, and ginger yields of leading producer nations are heavily inflated. According to AGGA, Australia would currently out-yield most leading producers.

Figure 7: Leading producers by yield (1999–2007)



Note: QPIF suggests that the data quoted by FAO for Fiji's ginger yields is inflated.

2.5 Australia's global position

In comparison to leading ginger producing nations, Australia is a relatively small producer on the global scale. Total ginger production in Australia has averaged 8000 tonnes in recent years, with 55% of production supplied to the Australian processing sector and 45% supplied to the domestic fresh market. In 2006–2007, global ginger production exceeded 1 000 000 tonnes—Australia's contribution represents less than 1% of global production. QPIF estimates the current farm-gate value of the Australian ginger industry at approximately A$15.6 million (Ginger grower interviews 2008).

2.6 Global trade in ginger

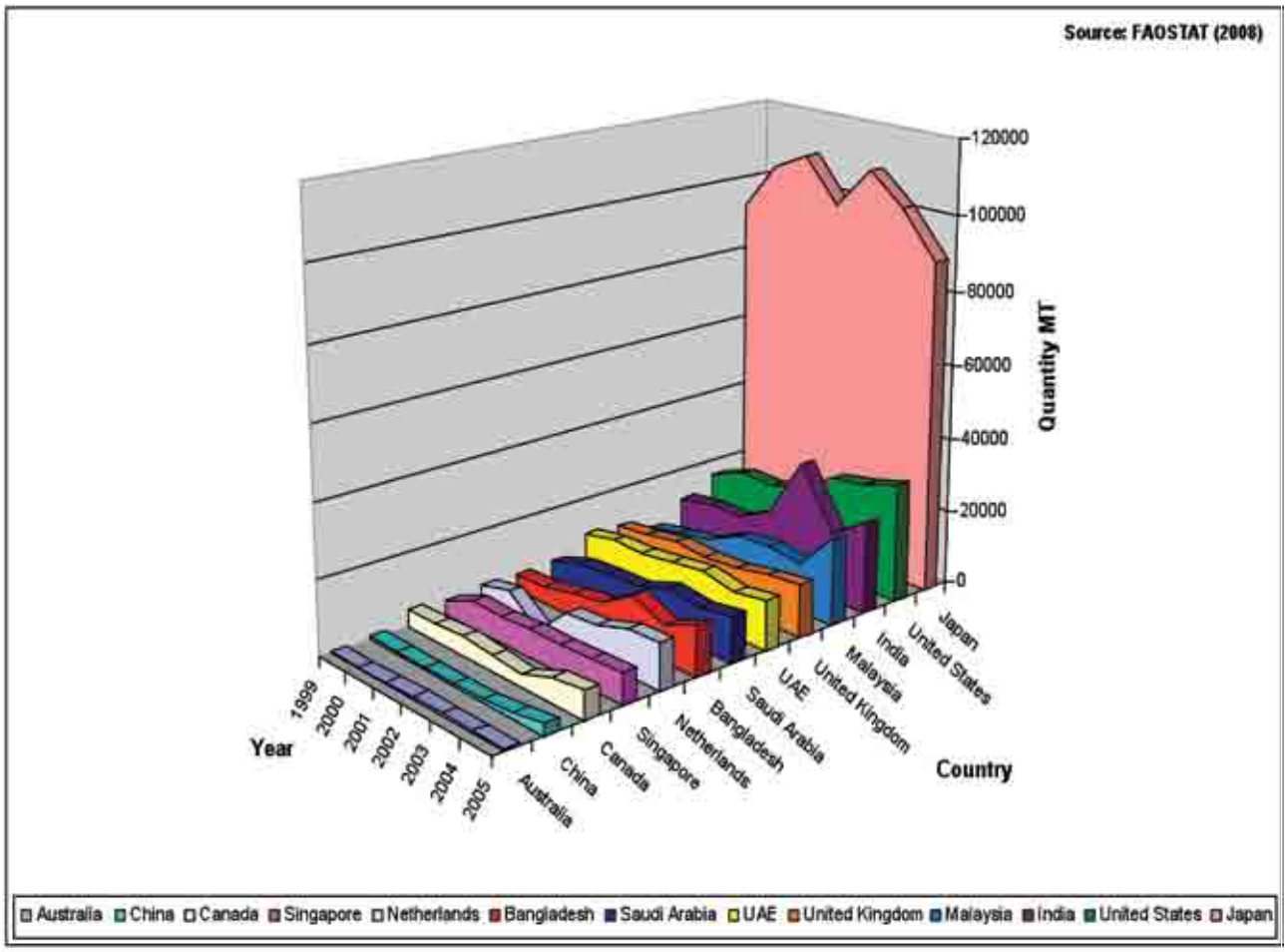
Ginger is traded globally in a variety of forms. Processed ginger—including dried ginger, confectionary ginger and ginger extracts such as oils and resins—is the most commonly traded, largely for its flavouring and medicinal properties. Australia, China, Fiji and Thailand are the major processors and exporters of confectionery ginger and ginger extracts. The United Kingdom, the United States and Saudi Arabia are the three major importing countries of ginger in this form.

Note: Data for global imports and exports of processed ginger is currently not available.

2.6.1 Volume of imports of fresh ginger by country

Japan is the leading importer of ginger across the globe, with in excess of 90 000 tonnes of ginger being imported each year since 1999. Other key importers include the United States and Malaysia, with both nations importing in excess of 20 000 tonnes of ginger since 2005. Although China and India are two of the main ginger producers in the world, they are also among some of the major importers as a result of high domestic consumption. Figure 8 illustrates recent trends in ginger imports by key importing nations (FAOSTAT 2008).

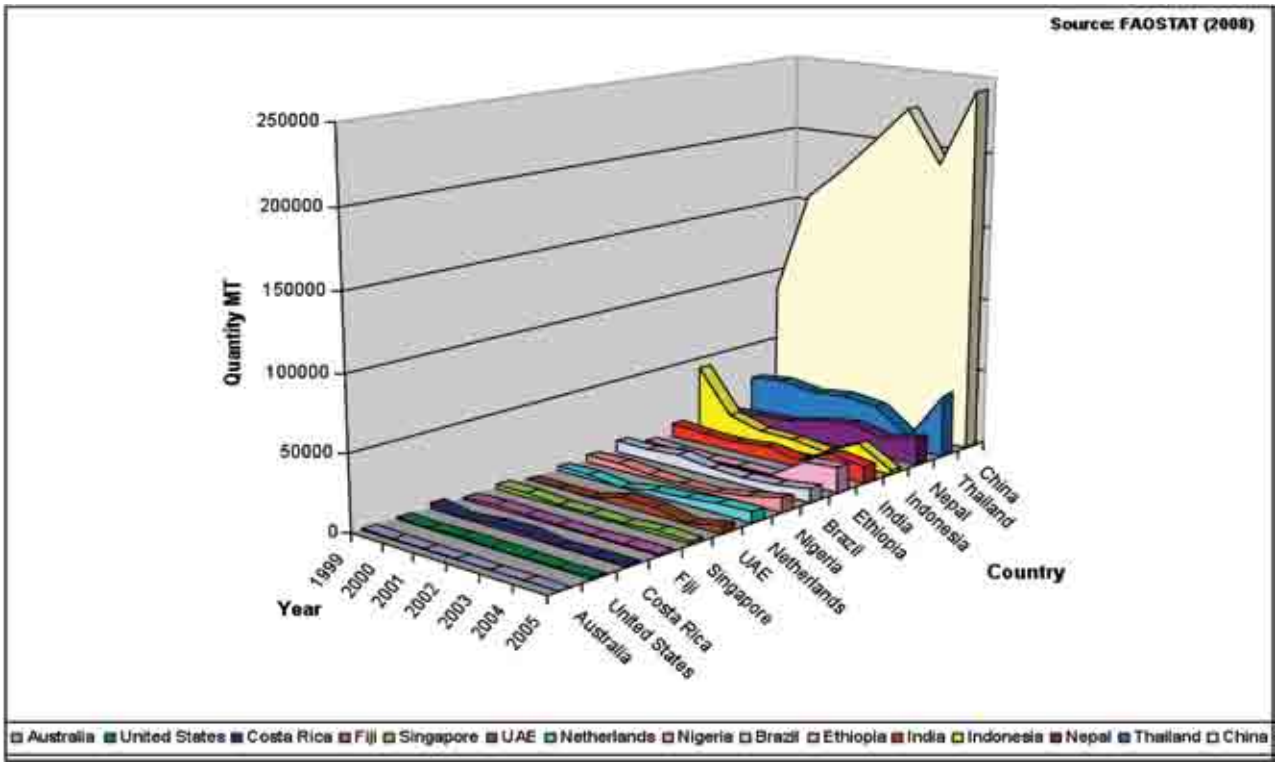
Figure 8: Volume of ginger imports by country (1999–2005)



2.6.2 Volume of exports of fresh ginger by country

China is the leading exporter of ginger across the globe, with in excess of 100 000 tonnes of ginger exported each year since 2000. Exports of ginger from China have increased significantly in recent years, with over 240 000 tonnes of ginger exported in 2005. Exports from Thailand, Nepal, Ethiopia and Brazil have also increased in recent years. Figure 9 illustrates recent trends in ginger exports by key exporting nations (FAOSTAT 2008).

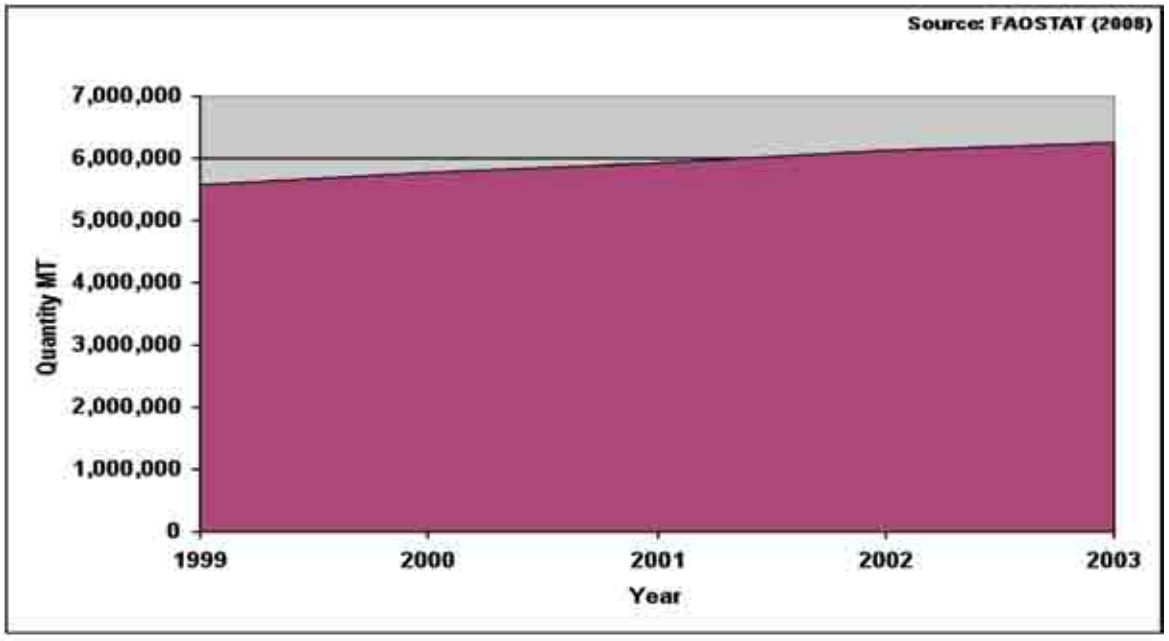
Figure 9: Volume of ginger exports by country (1999–2005)



2.7 Global consumption trends

Global food consumption trends are currently driven by several factors, including health consciousness, population growth, changing demographics and busy lifestyles. Combined, these factors are fuelling growth in global consumption of fruit and vegetable cooking ingredients and spices, including ginger (refer to Figure 10).

Figure 10: Global consumption trends for spices, including ginger (1999–2003)



Note: A spice is any pungent, aromatic plant substance (dried seed, fruit, root, bark, leaf or vegetative substance) used as a food additive for the purpose of flavour, colour, or as a preservative that kills harmful bacteria or prevents its growth.

3.0 Commercial ginger production in Australia

3.1 Background

Ginger was first grown commercially in Australia at Buderim in south-east Queensland during the early 1900s, and was sold mainly to the domestic fresh market. At that time, all processed ginger was imported from China; however, imports of processed product were disrupted during World War II and consequently the first processing facility was built at Buderim in 1941.

Ginger production in Australia is predominately located throughout Queensland in the Sunshine Coast and Wide Bay–Burnett regions. Ginger production in the Sunshine Coast is concentrated within 50 kilometres of Yandina, and in the hinterland areas of Caboolture, Nambour and Gympie. The Sunshine Coast region produces over 75% of Australia's total ginger production—the region has 35 growers cultivating over 420 acres of land. Annual production of ginger in this region is estimated at 6075 tonnes per year (ABS 2008).

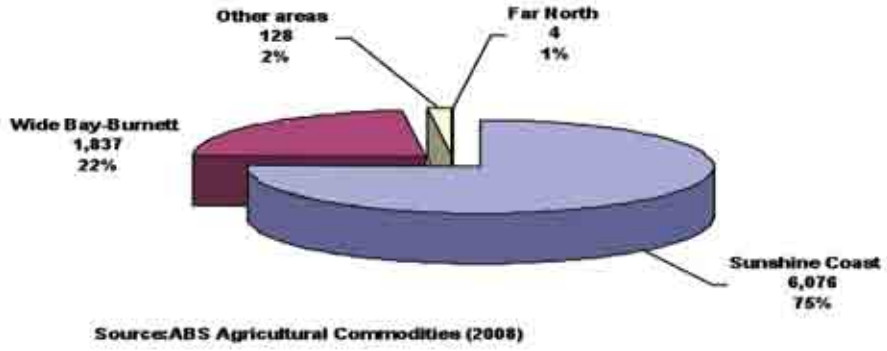
The Wide Bay–Burnett is the second largest growing region, holding eight growers that cultivate over 135 acres of ginger per year. Ginger production from this region is estimated at 1837 tonnes per year. Smaller areas of production also exist in North Queensland, particularly throughout the Atherton Tablelands and areas south of Cairns (ABS 2008). Table 1 and Figure 11 illustrate the breakdown of growers and their production across Queensland.

Table 1: Main ginger production regions in Australia (2006–2007)

Region	No. of growers	Acres	Production (tonnes)
Sunshine Coast	35	420.17	6076
Wide Bay–Burnett	8	135.94	1837
Other areas	4	51.90	128
Far North Queensland	2	4.94	3
Total	**49**	**612.95**	**8044**

Source: ABS Agricultural Commodities (2008)

Figure 11: Main ginger production regions in Australia (tonnes per percentage)



3.2 Industry value

The current farm-gate value of the Australian ginger industry is estimated at A$15.6 million. This figure represents the value of both the fresh market and processing sectors in Australia. Total ginger production in Australia has averaged 8000 tonnes in recent years, with 55% of production supplied to the Australian processing sector and 45% supplied to the domestic fresh market.

The fresh market component is estimated to range between 3500 and 4000 tonnes at an average price of $3.00 per kilogram. Hence, the farm-gate value of ginger produced for the fresh market sector in Australia is currently estimated at A$10.6 million. The processing sector takes the remaining 4000 to 4500 tonnes at a set price of $1.12 per kilogram. Hence, the farm-gate value of ginger produced for the processing sector is currently estimated at A$5 million.

Ginger is a vital ingredient in a wide range of semi-processed products for the food manufacturing sector and processed products for the retail sector. The value of these products, in which Australian ginger is a key ingredient, is estimated at over A$80 million. The value of sales of semi-processed and processed ginger products in the domestic market is over A$50 million. Exports of Australian semi-processed and processed ginger products are currently valued at A$30 million.

3.3 Industry bodies

The AGGA is the major ginger industry organisation in Australia. Horticulture Australia Limited (HAL) and Growcom are two horticultural organisations identified as potential industry partners.

3.3.1 Australian Ginger Growers Association Inc.

The Australian Ginger Growers Association (AGGA) was established to support Australian ginger growers. The AGGA presently has 36 associate members. Of these members 11 growers own quota and supply Buderim Ginger Limted, 4 growers lease quota and also supply Buderim Ginger, and the 21 remaining members are not currently producing ginger or are currently only supplying the fresh market. The AGGA also consists of representatives from Buderim Ginger, including the organisation's chief executive officer. Approximately 20 growers are not registered as part of the association.

3.3.2 Horticulture Australia Limited

Horticulture Australia Limited (HAL) is a national research, development and marketing organisation that works in partnership with the horticulture sector to invest in programs that provide benefit to Australian horticulture industries. HAL invests almost A$80 million annually in projects in partnership with the horticulture sector. During the year HAL runs more than 1200 research, development and marketing projects, covering a diverse range of topics including market access, market research, export marketing, domestic marketing, supply chain management, quality assurance, food safety, skills development, industry communication, biotechnology, biosecurity, breeding, plant health, pesticide regulation, agronomy, crop regulation, physiology, irrigation and sustainable practices.

3.3.3 Growcom

Growcom is a commercially focused Queensland organisation that provides a portfolio of relevant services to help members, clients and partners achieve greater success. Growcom promotes innovative, responsible farming and business practices in order to facilitate growth in the Queensland horticulture industry.

3.4 Production requirements and issues

Ginger growing is a capital- and labour-intensive industry. A high capital outlay is incurred in irrigation, specialised planting and harvesting equipment, and planting materials. Maximum yields are obtained in well-drained, sloping, friable coastal soils using high inputs of high-quality water, fertiliser and organic matter.

3.4.1 Climate

Ginger is a tropical crop and therefore grows particularly well in the wet tropics and subtropics. It also grows well in areas that experience a dry season, provided there is irrigation. Areas that are too windy or too exposed may cause issues for growers as crops perform best in more sheltered areas. For this reason, the majority of Queensland's ginger farms are located along coastal areas such as the Sunshine Coast that experience high temperatures and humidity, and high rainfall during summer.

3.4.2 Seed and planting

Planting occurs from August through to mid October, with the optimum period being from mid to late September. Planting is a mechanised operation using modified potato planters.

Propagation of ginger takes place from rhyzome cuttings. High-quality seed is vital to the production of a successful yield and therefore careful selection of planting material is required—special care is taken in selecting material free of pest and disease such as Fusarium and nematode. There is currently no certified seed scheme in place. Growers stressed the need for the implementation of a certified ginger seed scheme in order to ensure the supply of consistent quality ginger seed to growers.

Currently growers use a combination of their own seed and seed purchased from seed growers for planting. It is a common practice for growers to use 60% or more of their own seed and source the remaining from other ginger growers or specialised seed growers.

3.4.3 Land, water and irrigation

The land required for the cultivation of ginger is well-drained loam. Ginger requires well-textured and well-drained friable coastal soils to maximise rhizome size and yields, and to make harvesting easier. This is particularly important as the industry moves to mechanisation.

Ginger is a subtropical crop requiring large amounts of good-quality water to maintain rapid growth. On average, a ginger crop requires approximately 4 megalitres per acre of water and growers have large dams for on farm storage of water.

Poor-quality water, such as water that is high in salt levels, will burn the plants through dehydration and consequently limit growth. Ginger plants also require large amounts of water as they are highly susceptible to sunburn damage. Regular irrigation is essential following planting to prevent sunburn of newly developed shoots and to prevent water stress in the crop (wilting will reduce the final yield).

The Sunshine Coast region (which contains an abundance of mineral rich, red earth soils) is considered an ideal location for ginger production in subtropical Australia. Availability of land and water is one of the biggest issues concerning existing ginger growers. Urban development around the Sunshine Coast area has impacted on the availability of reasonably priced land suitable to grow ginger.

Growers interviewed expressed concern for the future production of ginger on the Sunshine Coast, sharing the common view that ginger production will not be sustainable in the region in the future (10+ years). Growers indicated the need to identify new areas to grow ginger in order to maintain or increase supply to processing and fresh market sectors.

3.4.4 Fertilisers

Large amounts of fertiliser inputs throughout the production cycle are required to ensure high yields. It is common practice for growers to use a range of fertilisers—including poultry manure, sawdust, urea, phosphate and potassium nitrate—twice in the season (before planting and once the field has germinated) to boost nutrient levels in the soil and accelerate plant growth.

3.4.5 Pests and diseases

Pests and diseases pose the largest production concern to most ginger growers and are a constant threat to yields. All growers anticipate some losses every season due to disease. Most growers believe that 10% losses in a patch are acceptable, but at times some patches can experience over 80% losses.

The most common disease threat is Fusarium yellow rot. Fusarium is a fungal disease that affects seed material causing the seed to rot after planting. Symptoms of the disease include a stunted and dry or yellow appearance of the plant's leaves and rotting of the rhyzome.

Other common pathogens include root-knot nematode and Pythium. Both damage the root and the rhizome and lead to crop loses. Pythium is common in warmer, wetter areas of the world such as Fiji, India and China, and in recent years it has been a notable issue for ginger growers. Less common diseases also include bacterial soft rot (caused by *Erwinia*), armillaria and big bud.

Fusarium and root-knot nematode can be spread through infected planting material. Once they are introduced into a patch they are almost impossible to eradicate. Losses at the time of early harvest are minimal, but the risks become increasingly high as the crop matures and remains in the ground.

The major pests of ginger are cutworm, heliothis and symphilids, which affect the ginger directly after planting. African black beetle is a less common pest, which generally affects the plant during early growth.

3.4.6 Managing pests and diseases

Traditional ginger growers use chemicals throughout the production cycle to combat pests and diseases. Metham is the common fumigation chemical currently used as ethylene dibromide (EDB) is no longer registered due to its impact on soil and the environment. The loss of this fumigation chemical has heavily impacted on the ability of some growers to effectively control pests and diseases. The use of hot water treatment is the current best practice to control nematode in seed material.

QPIF is currently using leading biotechnology research to overcome problems with diseases and pests introduced via planting material. Current solutions involve the application of tissue culture for the development of clean planting material. Experiments are being trialled by the QPIF Maroochy Research Station using soil amendments to control Pyithium rhizome rot, and experiments are also being conducted on farms to control Fusarium yellow rot and root-knot nematode. The Australian Centre for Agricultural Research is currently funding research into the control of these soil-borne pathogens.

3.4.7 Crop rotation

Ginger production results in the heavy build up of pests and diseases in soils, severely impacting on land. Crop rotation is a technique employed by most ginger growers to allow the soil to recover from the impacts of a continuous production cycle and break pest and disease cycles. After the harvest period, ginger growers often plant cover crops in the winter to break the ginger production cycle. Common cover crops grown include oats, barley, sorghum, corn, brassica and pasture grasses as they are best suited to the climate of the Sunshine coast region.

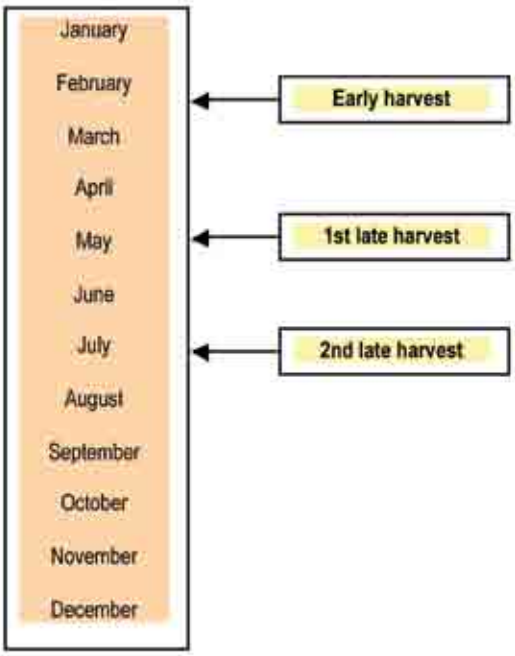
Growers producing ginger for the factory or who harvest within six months of planting are more likely to grow winter crops in between their ginger crops, giving the soil an opportunity to recover. Growers that produce ginger all year round for the fresh market often practice long crop rotation periods. Depending on the property size and availability of land, growers will often practice crop rotation for periods ranging from one to four years.

3.4.8 Harvesting

Depending on usage (processing or fresh market), ginger is harvested at different times. Ginger for processing into confectionary ginger products is generally harvested after 5 to 6 months, while ginger for fresh consumption is generally harvested after 10 to 18 months. Ginger is harvested either by using mechanical pullers and diggers or by using manual labour where rhizomes are pulled and collected by hand.

Depending on the size of the operation and time of harvesting, the harvesting method may change between different growers. Most large and medium-size growers adopt a mechanised approach to lift and collect rhizomes. Some medium- and small-size growers may lift the rhizomes mechanically and collect them by hand, while some may conduct the whole harvesting process manually. Table 2 illustrates the key harvesting period for ginger in Queensland.

Table 2: Harvesting periods for processing and fresh market sectors

<table>
<tr><th>Processing</th><th>Fresh</th></tr>
<tr><td>Early harvest ginger (February to March)
Early harvest requires immature ginger to be harvested six months after planting so that the rhyzomes are ‘fibre-free’ and of ‘choice-grade’. The target yield for early harvest ginger is 20 tonnes per acre.
Planting of early harvest ginger commences in August and the crop remains in the ground for a 5 to 6 month period. Early harvest ginger is generally harvested in late February or early March.
Early harvest ginger is immature and therefore has low fibre content (35–45% fibre content). Because the ginger is young, it does not have the tonnage of mature ginger.
Early harvest ginger is soft and tender and therefore is used primarily for processing into confectionary products.</td><td rowspan="2">Fresh market ginger is usually harvested at maturity to maximise the yield of rhizome, and can be harvested from 6 to 18 months after planting.
Planting of late harvest ginger commences in August and ginger remains in the ground for a 10 to 18 month period depending on the individual grower. 

Note: Fresh market ginger is harvested all year round</td></tr>
<tr><td>Late harvest ginger (May to July)
The first late harvest occurs in May when approximately 80% of the yield is harvested. Ginger harvested during this period usually presents well, is not all fibrous and is less affected by Fusarium and nematode.
The second late harvest occurs in July when the remaining 20% of the yield is harvested. Ginger harvested during this period does not present as well, is more fibrous and is generally more severely affected by pests and diseases.
Late harvest ginger is mature and therefore highly fibrous. Because the ginger is older it has higher tonnage, built up by starch reserves in the rhyzomes of the plant. Late harvest ginger is more affected by pest and disease issues from holding ginger in the ground for a longer period.</td></tr>
</table>

3.4.9 Post harvest

The post-harvest process for ginger varies according to end use—processing or the fresh market.

Processing

Following harvest, raw ginger for processing is loaded into 500 kilogram bins and freighted to the processor either by using the grower's own transport or contractors. The ginger may be sent either washed or unwashed depending upon the post-harvest processes employed by the grower. Once the ginger is delivered to the processor, it is washed and sorted for contaminants before being weighed and stored in brine for preservation. Brine is a sodium metabisulphite solution that prevents rhizomes from growing and preserves the ginger against bacteria so it can used for processing at a later date. Ginger may be stored in brine for over 12 months before being processed. In Australia, the majority of the ginger produced for the processing sector is supplied to the Buderim Ginger factory.

The fresh market

Post-harvest practices for fresh ginger follow a similar process. Following fresh ginger harvesting, ginger is washed and air dried. The ginger is then cut and graded according to size, shape and colour, and packed into boxes by grade. Ginger offcuts from the grading process are typically supplied to juice manufacturers or disposed of. Alternatively, some growers mulch offcuts for use as a fertiliser.

3.4.10 Labour

Ginger is a labour-intensive industry. There are currently 49 growers in Queensland, of which QPIF estimates 30 are full-time growers. Based on research, it is estimated that the industry employs approximately 200 full-time farmhands. Additionally, the industry employs approximately 385 casual staff during peak harvesting periods.

Mechanisation practices have been adopted by large and medium-sized farms, mainly at the planting and harvesting stages. Smaller farms still conduct most of their production activities using manual labour.

Growers supplying ginger to the processing sector may employ two separate harvesting practices. Some growers pull the ginger mechanically using mechanical pullers and collect their yield manually. Alternatively, other growers conduct the entire harvesting process (pulling and collecting yield) using manual labour only. In both instances there is a high need for labour during the period of harvest (February to March). Growers hire casual staff during this period—in most cases they are either backpackers or local seasonal workers.

Notably, growers have expressed concern regarding the difficulty in sourcing labour during peak harvesting periods. In recent years, the number of people interested in working during the early harvest season has decreased. Growers have also experienced difficulty in attracting good-quality workers that are willing to undertake labour-intensive agricultural work.

Growers supplying the fresh market also require labour during the selection, grading and packing stages. These activities are normally carried out by locals that are hired on a permanent basis. Large ginger farms that harvest weekly (throughout the entire year) have the capacity to retain a pool of workers on a permanent basis. However, medium- and small-sized farms (that do not harvest on a continuous basis) experience difficulty in retaining staff. Growers such as these indicated that they regularly invest time and effort into staff retention, and sourcing and training new employees.

3.5 Ginger production for the processing sector

Producing ginger for the processing sector is or has been an integral part of almost every ginger grower's business in Australia. Most growers started in the industry producing ginger for processing and later moved into growing ginger for the fresh market. The most common variety used for processing is 'Queensland' ginger. Most growers supply conventionally grown ginger, while smaller amounts of organic produce are also supplied to Buderim Ginger Limited for use in value-added organic ginger products.

Buderim Ginger is the largest ginger processor in Australia, taking over 95% (4200 tonnes) of the ginger produced for processing. All growers supplying ginger for the processing sector will provide most of their harvest to Buderim Ginger and smaller volumes to other processors. Other ginger processors in Australia include Bundaberg Brewed Drinks Pty Ltd, Gourmet Garden Limited, Veg Master and Sunshine Tropical Limited among others. Combined, these companies employ over 560 staff. Approximately 30% of staff employed by these companies are directly involved with the ginger component of the business. A more detail description of Australian processors is provided in section 4.0.

Of the 16 growers surveyed, 10 currently have quota arrangements with Buderim and they hold quota volumes that can range from 20 to 80 tonnes for small producers, 100 to 200 tonnes for medium-size producers and over 500 tonnes for large producers. During 2008 most growers met their quota requirement to Buderim Ginger, with some growers supplying additional quota (up to 115% of their required quota).

In some cases, growers also supply quota on behalf of other growers with whom they have leasing agreements. All interviewed growers currently supplying ginger to Buderim Ginger expect to be able to meet their stipulated quota requirements for 2009.

Buderim Ginger was identified by growers as a key player in the ginger industry in Australia. Growers indicated that production of ginger for Buderim Ginger is the main focus of production for most ginger growers in Australia, and refer to the company as the 'back bone' of the industry. They also noted the importance for the industry of having Australia's largest ginger processor close to the main ginger growing regions.

3.5.1 The quota arrangement—views of ginger growers

As part of the interviews, ginger growers were asked to provide their views regarding the quota system currently in place between Buderim Ginger and local growers. The views and concerns of growers are listed below.

In general, ginger growers are satisfied with the current quota arrangement in place. They noted the following benefits, which include:

- ensuring a guaranteed market for their crop
- allowing for certainty with planning production
- providing a fair system for all growers
- allowing growers to develop good relations with the factory
- assisting producers to stay in the industry
- ensuring Buderim Ginger has a secure supply.

Some of the key concerns raised by growers in relation to the quota system include that:

- the current payment for ginger is low—price of inputs at the grower level have increased significantly during the last five years, while the prices paid by the factory have increased only marginally
- the dollar value of quota has decreased over the years
- some growers see the quota as a barrier for entry into the industry.

3.6 Ginger production for the fresh market

Australia's fresh markets take over 40% of the ginger produced domestically. Most growers involved in the production of ginger for the fresh market are also involved in the production of ginger for the processing sector.

The most common variety of ginger grown for the fresh market in Australia is the 'Canton' variety as it attracts a higher price than other varieties. Small amounts of the 'Japanese' variety are also grown by several growers. On some occasions, growers may supply additional amounts of the 'Queensland' variety, which is mainly grown for the processing sector.

Ginger grown for the fresh market is sold to wholesalers throughout Australia such as Sydney, Melbourne, Brisbane, Adelaide, Hobart, Darwin, Perth and Newcastle. There are also a number of growers that produce organic ginger and supply to the fresh organic produce segment.

3.6.1 Grading

Following field harvesting, the ginger is washed, air dried, cut and graded. There is currently no industry-recognised specifications for ginger grading in Australia. Grading is therefore based on individual grower's own grading systems, which in most cases classify ginger under three different grades. For this reason, two different growers can have the same grading system (using three categories); however, the type of product present in each category may be of different specifications. For example, up to 90% of product for a grower graded as large may be only 50% of product for another grower. Table 3 below details the most common grading categories used by Queensland growers.

Table 3: Fresh ginger grading categories

Category	Attributes
Large, normal or special	Large size, high in quality
Regular, medium or chunky	Medium size
Small	Small and irregular sizes, includes ginger offcuts

Note: Individual growers refer to categories using the names listed above.

Graded ginger is packed into 10 kilogram cartons for the wholesale market. Most growers will have their own branded cartons with different designs and colours for each grade. Each of the different categories will attract different prices, with large-sized ginger demanding a premium price over the other categories. Some growers use only two grading categories, which are more commonly referred to as large and small.

3.6.2 Transport

Fresh ginger is transported using contractors. The packaged ginger is collected directly from growers' properties and transported to wholesalers located in different cities across Australia. Frequency of collection varies depending on the production capacity of growers. Large growers often have two or more pick-ups per week, while small growers generally only pack for one pick-up per week or every few weeks.

The two main transport companies used by growers are Lindsay Brothers Australia and Turners Transport Company. The current cost of transport from the Sunshine Coast is approximately $2.00 per 10 kilogram carton to Sydney, $3.00 per 10 kilogram carton to Melbourne and $1.50 per 10 kilogram carton to Brisbane. In addition to transport costs, growers are also required to pay a fuel levy of $25.00 per collection and fees associated with the newly introduced driver fatigue laws. As of December 2008, driver fatigue costs were $20.00 per collection.

3.6.3 Supply and demand

Supply of Australian-grown ginger to the fresh market is conducted on a continuous basis all year around. Most growers harvest the same amount every week of the year in order to provide a continuous supply to the fresh markets. Depending on the size of their farm, growers may supply between 2 and 30 tonnes per week.

The ability of growers to supply ginger continuously throughout the season ensures that they achieve a healthy average price for their produce. Most growers have good relationships with wholesalers at the fresh markets and regular contact is made to obtain information regarding current market prices.

Small growers producing limited amounts of ginger are not able to supply continuously throughout the year. Typically, they can supply for two to three months of the year. These growers follow the price of ginger closely during the year in order to sell when they are able to achieve a high price.

3.6.4 Packaging and marketing

Growers supplying ginger to the fresh market use their own printed cardboard cartons to promote their brand/logo and to provide information about the grower and certifications the grower may have. Growers also use different colours or designs to differentiate between grades of ginger.

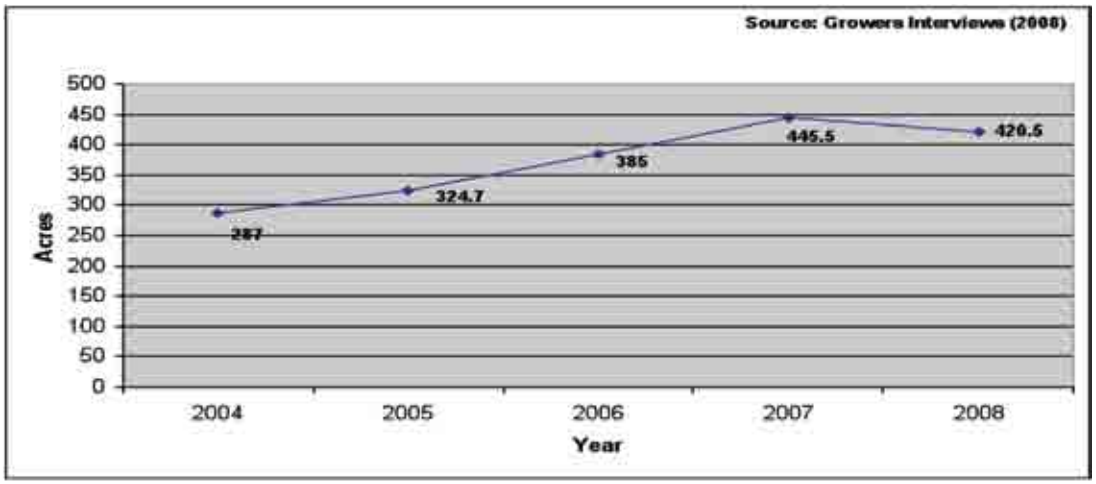
Labelling cartons is currently the only way growers market their products to retailers—there is no other form of marketing conducted by growers in the fresh market sector. Growers indicated that clients often recognise branding and images on cartons and associate this packaging with product quality, building brand awareness and recognition with wholesalers and their clients. Smaller growers, who do not have continuity of production, generally pack their ginger in generic cartons without branding or marketing.

3.7 Production trends in Australia

3.7.1 Trends in ginger cultivation

According to industry findings, the trend in total land area used for the cultivation of ginger has increased steadily each year from 2004 to 2007, with 2008 being the exception. Total land dedicated to the cultivation of ginger increased from 287 acres in 2004 to 445 acres in 2007. In 2008, land area dedicated to ginger production was slightly lower at 420 acres (refer to Figure 12).

Figure 12: Land cultivated with ginger by area (2004–2008)



Note: The information provided above represents the trends in ginger cultivation for the 16 ginger growers surveyed.

The reduction in total land area cultivated in 2008 was directly influenced by poor weather conditions and the impact of disease on crops. Pythium has been an issue for several larger growers during the 2008 season, infecting planting material and damaging the quality of crops. In addition, extreme weather conditions (the dry season in 2006–2007 and wet season in 2007–2008) discouraged several growers from cultivating large areas of ginger.

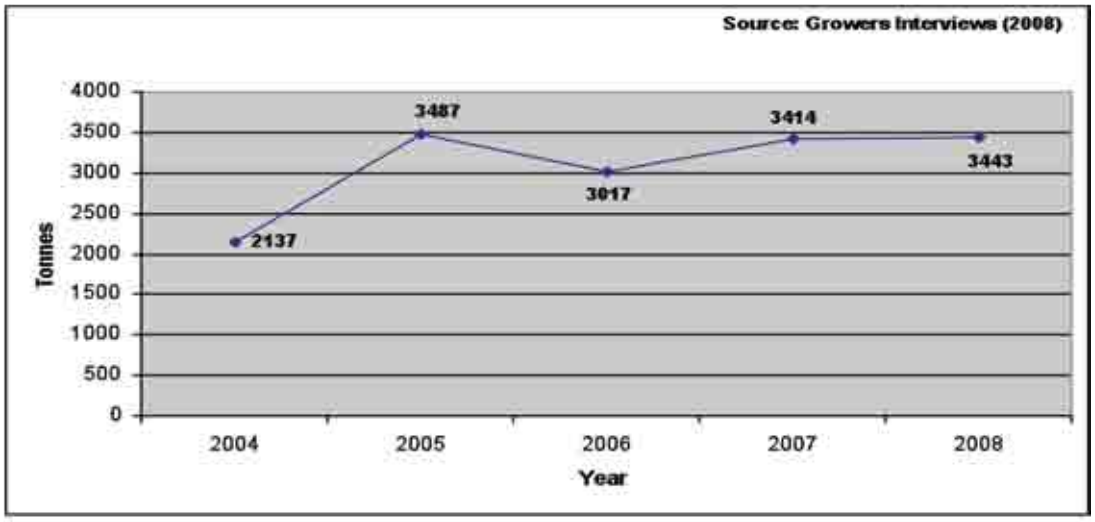
3.7.2 Trends in ginger production

Note: The information below is based on data provided from surveys conducted with the 16 selected ginger growers throughout Queensland.

Trends in fresh ginger production

Figure 13 highlights the five-year trend (2004–2008) in ginger production for the fresh market. Ginger production for the fresh market increased significantly from 2137 tonnes in 2004 to a peak of 3487 tonnes in 2005. With the exception of 2006, which saw a decline in production compared to the previous year, production has increased slightly each year from 2006 to 2008. Poor rainfall in 2006 affected yields resulting in production volumes to decrease in comparison to the previous year.

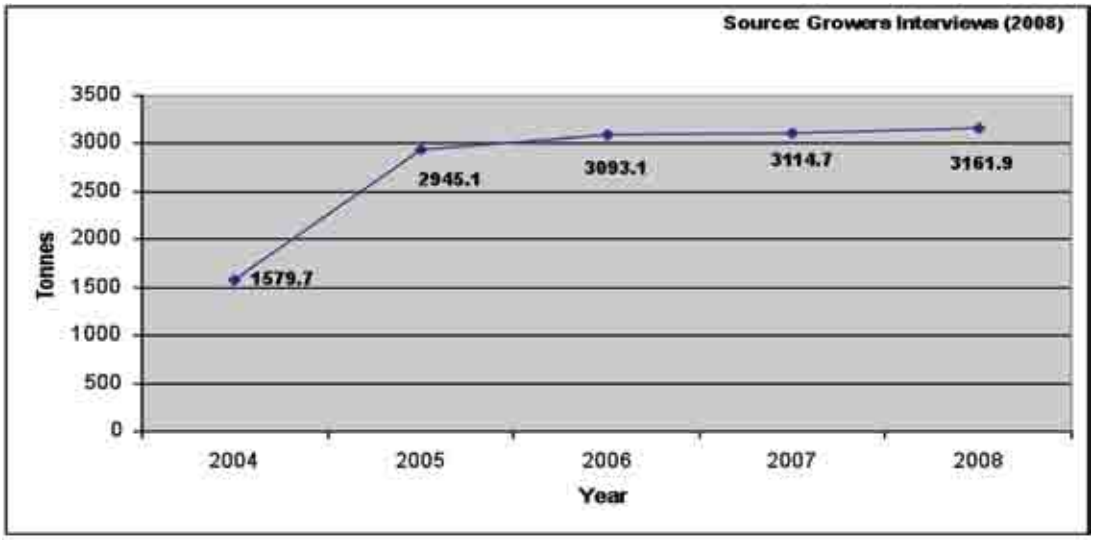
Figure 13: Fresh ginger production by volume (2004–2008)



Trends in ginger production for processing

Figure 14 illustrates the five-year trend (2004–2008) in ginger production for the processing sector. Ginger production for the processing sector almost doubled from 1579 tonnes in 2004 to 2945 tonnes in 2005. Ginger production prior to 2005 was largely affected by the impact of the drought, which resulted in less ginger being planted during this period. Between 2005 and 2008, production increased slightly each year, with an increase of 216 tonnes over the four-year period.

Figure 14: Processed ginger production by volume (2004–2008)



Total ginger production (fresh and processed) increased from 3700 tonnes in 2004 to 6600 tonnes in 2008. Total production in 2006 was slightly lower (322 tonnes) than the previous year, largely because of a lack of rainfall throughout the year. Ginger requires large amounts of good-quality water to achieve yield and, as a result, minimal rainfall throughout 2006–2007 impacted negatively on the industry.

3.8 Views of ginger growers

This section details the views and concerns of surveyed ginger growers. As part of QPIF's industry research, growers were asked to express their opinions regarding cultivation, production capacity and the expansion of the ginger industry in Australia.

3.8.1 Factors influencing domestic ginger cultivation

Sixteen growers were surveyed to provide their view in regard to expanding their production in the coming years. From the growers surveyed:

- 10 indicated that they did not intend to expand production beyond their current capacity
- four indicated the intention to expand their operations
- two indicated the desire to expand operations depending on demand and the opportunities to develop new markets.

The 10 growers that do not intend to expand production indicated reasons, which included:

- the high cost of good-quality land to grow ginger—the Sunshine Coast region has experienced a significant increase in the cost of land during the last decade due to increased urbanisation. In recent years, areas available for agriculture have decreased significantly and cost of land has been increasing. As a result, growers are experiencing difficulty in finding affordable land suitable for the production of ginger
- the lack of water available for irrigation
- the high cost of machinery and farm equipment to expand production
- the current prices received for ginger in the processing sector are too low
- limited availability of labour—in recent years some growers have experienced difficulty in sourcing and retaining labour during peak harvesting periods
- the age of the growers—the majority of growers surveyed are nearing retirement age and do not want additional commitments. Furthermore, some growers do not have a succession plan in place or family members interested in continuing business operations. Additionally, poor production yields in recent years caused by disease problems and bad weather has placed significant pressure on growers, some of which have indicated that a continuation of these conditions would force them to leave the industry
- concerns regarding the importation of ginger from foreign competitors and the effect that this may have on the Australian ginger industry.

The six growers that intend to expand indicated reasons, which included that:

- the industry has growth potential as current demand for ginger exceeds supply—with population growth, it is expected that domestic consumption of ginger will also continue to grow
- growing ginger under contract (quota arrangement) offers growers market and income security
- they wanted to increase production capacity in order to retain a permanent workforce
- there was strong interest expressed by family members in continuing to grow ginger
- they wanted to increase production capacity to a point where mechanisation is cost effective.

3.8.2 Key issues affecting production capacity

The following issues were identified by growers as being key issues affecting the current and future production capacity of the Australian ginger industry:

- Pests and diseases—These are the biggest concerns that affect most ginger growers in Australia. Managing these threats adds a significant cost to production. Growers have expressed concern regarding the impact of pathogens on yields in recent years. Similarly, growers have expressed concern regarding the effect that pathogen threats will have on the industry in the future.
- Water availability—Ginger requires significant amounts of water throughout the growing season and growers are heavily reliant upon consistent rainfall in order to maintain water reserves for irrigation. In recent years, long periods of drought in some regions have impacted heavily on water reserves.
- Availability of labour—Growers have expressed difficulty in attracting casual and permanent staff, especially during the harvesting season. Attracting good-quality labour with an interest in agriculture is also a common issue for growers.
- Availability of good-quality seed—There is currently no certified seed scheme in place.
- Availability of suitable land—Growers indicated the need to identify new areas to grow ginger (outside the Sunshine Coast area) in order to maintain or increase supply to processing and fresh market sectors.
- Rising production costs—Cost of inputs such as fertilisers, fuel and wages have increased significantly in recent years, while ginger prices have remained almost unchanged. Rising production costs have impacted more heavily upon the profitability of smaller and medium-sized farms.
- Environmental pressures—There is a growing appreciation of urban encroachment pressure on land and appropriate land use. A greater number of complaints from local councils have been received from neighbours bordering farms.
- Demand for ginger—Demand for ginger from the processing sector has remained stagnant in recent years.

In addition to those issues outlined above, the following key issues are also expected to impact heavily upon the future of Australian ginger growers:

- Foreign competition—There is concern regarding the potential commercial impact of imported ginger from nations that are able to produce ginger at a lower cost. Additionally, there is the potential scientific impact of imported ginger from nations that are hosts to new and existing diseases.
- Threat of new entrants—Growers expressed concern regarding the number of new domestic producers entering the industry and the effect that oversupply will have on ginger prices in the fresh market.
- Growers leaving the industry—Numerous factors (including ageing growers, poor production conditions and low financial gains) have led to an increase in the number of growers leaving the industry in recent years. If this trend continues, domestic production is likely to decrease, forcing processors to rely on imported ginger to meet their production requirements. Similarly, this could also occur in the fresh market.
- Fresh market opportunities—Growth potential in the fresh market offers opportunities to further increase production.

3.8.3 Expansion of the ginger industry

Growers provided their views regarding the current and future situation of the ginger industry. From those growers surveyed, two key views were identified:

- The majority of growers had the perception that production of ginger in Australia during the last five years has been steady or expanding (but a very slow rate).
- Two growers indicated that ginger production has been declining in Australia.

Ginger growers indicated the following reasons for industry growth:

- An increasing demand for fresh ginger in the domestic market—Growth in fresh ginger is believed to have been driven by an increasing awareness of Asian cuisine and by general population growth. Growers have also experienced an increase in demand from wholesalers to supply extra volumes of ginger to the fresh market in the last five years.
- A strong potential to further increase ginger demand by better promoting its uses and key health qualities—Growers also have the view that there is a significant potential to increase demand for ginger if marketing programs are developed to increase demand at the consumer level. Currently, ginger is an under-utilised product and its health benefits are not fully recognised.
- A steady demand for processed ginger over the last five years—Demand for early harvest ginger, used to produce confectionary products, has been static. However, some minor growth has been experienced in the demand for first late harvest and puree ginger, used to produce dry ginger and purees. Future increases in demand will depend heavily on demand from key industry processors.

Ginger growers indicated reasons for decline in industry growth, including:

- a lack of affordable land to grow ginger
- decreasing levels of production per hectare
- a number of medium- and small-sized growers have been leaving the industry during recent years.

4.0 Australian ginger processing sector

4.1 Australian ginger processors

The following section provides information on the ginger processing sector in Australia. QPIF conducted face-to-face interviews with two of Australia's largest ginger processors that operate processing facilities in Queensland—Budermin Ginger Limited and Bundaberg Brewed Drink Pty Ltd

4.1.1 Buderim Ginger Limited

Background

Buderim Ginger Limited is an Australian-owned company situated on Queensland's Sunshine Coast. The factory was originally established as a cooperative of ginger growers from Buderim and adjacent districts in 1941. In 1989, Buderim Ginger became a publically listed company.

Products manufactured

Buderim Ginger is the world's largest processor and marketer of sugar-based ginger products. The company's core ginger products are packaged into a range of bulk volumes for food service and industrial customers, and include drained ginger, syruped ginger, dusted ginger, crystallised ginger, fresh ginger puree, pickled ginger and dried ginger. Raw ginger is also processed and packaged into a range of retail-ready marmalades, jams, toppings, sauces, cooking ingredients, beverages, confectionary items and therapeutic products.

Sourcing raw ginger for processing

Buderim Ginger uses the 'Queensland' variety in the processing of their product range. This variety is preferred for processing because of its mild flavour profile and smaller size, which is better suited to processing practices and the equipment used in factory processing. Key advantages of 'Queensland' ginger include consistency of flavour and the ability of the ginger to preserve well. When placed in brine (sodium metabisulphite) for preservation, 'Queensland' ginger does not deteriorate and can be held in storage for over 12 months, unlike other varieties. Medium-sized 'Queensland' ginger that is disease-free and not highly fibrous are the ideal characteristics of raw ginger for processing.

Buderim Ginger purchases approximately 4500–5000 tonnes of raw ginger from domestic ginger growers for processing annually. This includes 3000 tonnes of early harvest, 1000 tonnes of first late harvest and 500–1000 tonnes of second late harvest in a typical year. An additional 50–500 tonnes of semi-processed ginger (pre-cut and in brine) is imported either from Fiji or China depending on local supply.

In periods when supply of domestic ginger is short, the factory purchases larger volumes from Fiji or China. In recent years, supply from Australian ginger growers has consistently been short. This is largely a result of minimal rainfall and the impact of disease, which has resulted in poor yields. There have also been a number of growers leaving the industry in recent years and, although consolidation of those growers supply to larger growers has occurred, it has not completely replaced lost volume.

Fiji is the preferred source for acquiring imported ginger. Fijian ginger is consistently better in quality than Chinese ginger and can be purchased efficiently through Buderim Ginger's subsidiary in Fiji. There are numerous disadvantages associated with Chinese imported ginger, including inconsistencies in flavour profile (either very hot or very mild) and perceived issues with product integrity (pesticides and chemical residues).

Processing capacity

Buderim Ginger has the capacity to process over 6000 tonnes of raw ginger per annum; however, current storage capacity restricts processing capability to just over 3000 tonnes per year for early harvest ginger.

The quota arrangement

A quota arrangement is in place between Buderim Ginger and ginger growers. The quota arrangement refers to a tonnage system whereby the grower has access to a market to supply a set volume that is agreed upon by both parties. Growers that supply Buderim Ginger receive a guaranteed price for the tonnage that they produce, providing it is accepted by the factory.

There are currently 20 registered quota holders in Queensland with a quota capacity totalling 3176 tonnes, of which approximately 15 growers are currently supplying quota to Buderim Ginger. The number of quota holders has decreased since 2000, when 25 registered growers owned and supplied quota.

From 2002 to 2007, the set price for quota equalled $1.10 per kilogram. In 2008, the set price increased by two cents to $1.12 per kilogram. Further increases have been negotiated and the set price will continue to increase by two cents each year until 2010.

Each year Buderim Ginger conducts forecasts for raw ginger requirements and informs quota holders of the percentage of quota they are required to supply to the factory in the following season. All ginger growers who supply the factory have entered into long-term contracts with the company. This gives the company a secure source of ginger and the growers a guaranteed market for their ginger quota. The company holds some base quota, which is available to lease to potential growers in order to encourage new entrants on a small initial scale.

In recent years a growing number of smaller and medium-sized growers have significantly decreased or completely ceased production. Where smaller growers have left the industry, larger growers have expanded their production operations—purchasing quota from those holders leaving the industry. Five growers currently lease quota from registered quota holders that are not fulfilling their quota requirement. These growers each have their own individual arrangements in place for leasing quota.

Buderim Ginger has suffered from a lack of local raw ginger supply in recent years, as many local producers have been unable to satisfy the quota requirements of the factory. As the number of quota holders supplying ginger to the factory has declined since 2000, the factory has requested growers supply volumes that exceed their quota allocation. Despite this, Buderim continues to experience problems with securing a sufficient supply of raw ginger from domestic producers.

Buderim Ginger indicated the need to identify new areas to grow ginger in order to maintain a sustainable supply of raw ginger in the future. The Bundaberg and Atherton regions have been identified as possible locations where ginger production could be successful. A number of growers from the Bundaberg area have and will continue to supply ginger; however, volumes at this time remain relatively low. There is no active ginger production taking place at Atherton. Further research and supply experience in ginger production in these regions is required.

Domestic and international markets

Buderim Ginger has a strong export focus, with 60% of product manufactured being exported into foreign markets. Key export markets include the United Kingdom, Germany, Holland, Canada, the United States, New Zealand and South Korea. Products supplied to these markets are mostly ingredient-based for use by confectioners, bakers and other food manufacturers. The remaining 40% share is dedicated to the domestic market where product is distributed to retail supermarkets (Coles and Woolworths) and the food service and industrial sectors (Darrel Lea and Cotties).

Through product development and effective marketing and product positioning, Buderim Ginger predict a steady growth in demand for their product range in the future. While there is limited opportunity in further developing the domestic market for sugar-preserved ginger products as it is already mature, the company has indicated that there is a strong opportunity for accelerated growth in exports of ginger purees and ingredients, particularly by profiling and promoting their products to potential buyers at international trade events.

In export markets, Buderim Ginger's product range is differentiated by flavour, consistency and the clean and green image of Australian-grown ginger. Buderim Ginger has established a strong reputation in overseas markets through brand recognition, with many customers using Buderim Ginger's brand, and therefore have a competitive branding advantage over other ginger products. Price competitiveness is the main factor limiting demand, due to alternative suppliers being mainly from low–labour cost countries such as China and Thailand.

In recent years, Buderim Ginger has placed a strong focus on product improvement and development. A range of pharmaceutical and nutraceutical products are currently under development, with extensive research being conducted into the health benefits of ginger and its use in combating various medical conditions. Buderim Ginger also indicated the desire to work with new varieties of ginger and further exploit opportunities with existing varieties such as Buderim Gold.

4.1.2 Bundaberg Brewed Drinks Pty Ltd

Background

Bundaberg Brewed Drinks Pty Ltd, established in Bundaberg in 1960, is an Australian, family-owned, boutique brewery that has built its success and reputation on providing high-quality, distinctive brewed beverages to domestic and international markets.

Products manufactured

The company produces and exports Bundaberg Ginger Beer. In addition to ginger beer, Bundaberg Brewed Drinks manufactures lemon lime and bitters, fruit flavoured ales, sarsaparilla and cordials in various packaging. Bundaberg Brewed Drinks' production includes traditional brewing processes, but the final product is non-alcoholic.

Sourcing raw ginger for processing

Bundaberg Brewed Drinks uses 'Queensland' ginger for manufacturing ginger beverages. Australian-grown ginger, characterised by its distinct flavour profile and high quality, is the preferred source of raw material for the beverage manufacturer. All raw ginger is purchased from Buderim Ginger Limited in its semi-processed form.

Production capacity

Bundaberg Brewed Drinks currently has the capacity to further expand production, and is interested in establishing the Bundaberg region as a second ginger growing area and supporting the growth of the ginger industry.

Domestic and international markets

Bundaberg Brewed Drinks is well established in the domestic market, with major supermarket chains and wholesalers distributing their product range to end users. However, with limited growth potential in the domestic market, the company remains focused upon accelerating growth in new and existing export markets.

Bundaberg Ginger Beer is a market leader in both Australia and New Zealand, and is now gaining recognition in a wide range of other countries across the globe including the United Kingdom, Europe, Singapore and Hong Kong. The company has continued to boast impressive export growth in recent years with an increase in export sales of 41% from 2004 to 2007.

Bundaberg Brewed Drinks has strategically prioritised marketing to sustain the domestic market and expand export markets. By implementing an integrated global marketing strategy, it is proactively seeking distribution partners with established supply chain networks to represent the Bundaberg brand. Key marketing tools used to develop markets include advertising through a range of media (television, radio, billboards, buses, taste testing and complimentary give-aways).

4.1.3 Other food and beverage processors in Australia using ginger as a vital ingredient

A number of companies were identified as consumers of raw ginger through market research and from interviews conducted with selected ginger growers.

Gourmet Garden Limited

Gourmet Garden Limited was established in 1999, and specialises in the manufacture of a wide range of fresh refrigerated herbs and spices packaged into various sized sachets and tubes. Products include packaged ginger, basil, chives, coriander, dill, chilli, mint, oregano, parsley, rosemary and lemon grass, as well as a variety of mixed flavour packs.

Gourmet Garden's products are sold in Australia through leading supermarket retailers such as Woolworths, Coles and BI-LO. The company is also currently exporting to the United States, Canada, the United Kingdom, Europe, New Zealand and Asia, with further expansion into international markets currently being planned.

The company began sourcing raw ginger as an ingredient for their products in 1999, initially taking 50 tonnes. Consumption has been continuously increasing over the past decade largely due to an increase in demand for their products in some markets. In 2009, the company purchased 150 tonnes of raw ginger from domestic growers and expect that their ginger requirement will continue to increase into the future as demand for their products continues to grow.

Sunshine Tropical Limited

Sunshine Tropical Limited is a Queensland-based company located on the Sunshine Coast. The company specialises in the manufacture of high-quality jams, sauces, relishes and chutneys specifically designed for the top end of the hospitality sector in Australia.

The company also supplies quality frozen fruit for the food service and catering sectors. Sunshine Tropical produce a range of premium products that use ginger as an ingredient including Apricot and Ginger Jam, Fig and Ginger Jam, Mango and Ginger Chutney, Mango and Ginger Jam, and Melon and Ginger Jam.

The Ginger People Pty Ltd

The Ginger People Pty Ltd is an Australian-owned company situated in Caboolture, Queensland. This company has created a unique range of premium ginger ingredients and retail products including crystallised ginger, candied ginger in syrup, ginger juices and purees, and unique ginger-flavoured confections. The majority of ginger used in the manufacture of their products is imported from overseas suppliers.

Veg Master Limited

Veg Master Limited is a small food processing company based in Sydney. The company supplies a range of vegetable products, including ginger in bulk volumes to restaurant and hospitality sectors in Sydney. Veg Master purchases 600 kilograms of raw ginger per week. This represents approximately 30 tonnes per year.

4.2 Exports of fresh and processed ginger

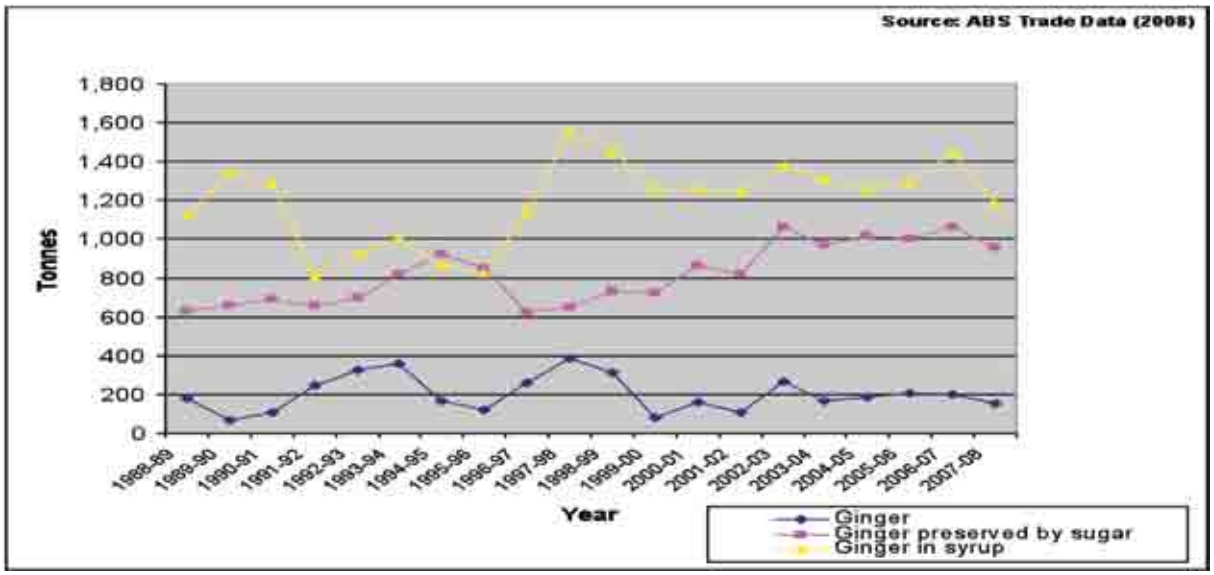
According to the Australian Bureau of Statistics (ABS), volumes of Australian exports of fresh and semi-processed ginger have fluctuated over recent decades. Figure 15 illustrates the trends in exports of raw ginger, ginger preserved in sugar and ginger in syrup from 1988 to 2008.

During this period, raw ginger exports peaked to a maximum of 384 tonnes and decreased to a minimum of 66 tonnes. Over the last five years, exports of raw ginger have remained consistent, with volumes averaging 180 tonnes per annum. Volumes increased slightly each year between 2003 and 2006, peaking at 205 tonnes. Between 2006 and 2008, volumes decreased slightly each year, reaching a low of 155 tonnes in 2008. Australian exports of raw ginger were valued at approximately A$725 000 in 2008.

There has been a significant increase in the volume of exports of ginger preserved by sugar over the last 20 years, with exports increasing from 628 tonnes in 1988 to 1062 tonnes in 2007. During the last five years, exports of ginger preserved in sugar have remained constant, averaging approximately 1000 tonnes each year. Australian exports of ginger preserved in sugar were valued at A$7 million in 2008, indicating exporters received $7.30 per kilogram of semi-processed ginger.

Exports of ginger in syrup fluctuated significantly between 1988 and 1998, with the volume of exports ranging from 800 tonnes to 1557 tonnes. Since 1999, exports have remained consistent, approximately 1250 tonnes per year. Slight increases were seen in 2003 (1381 tonnes) and 2006 (1448 tonnes). Australian exports of ginger in syrup were valued at A$4.8 million in 2008, indicating exporters received $4.10 per kilogram of ginger in this form.

Figure 15: Australian exports of ginger by volume (1988–2008)



4.3 Australian exports of ginger by destination

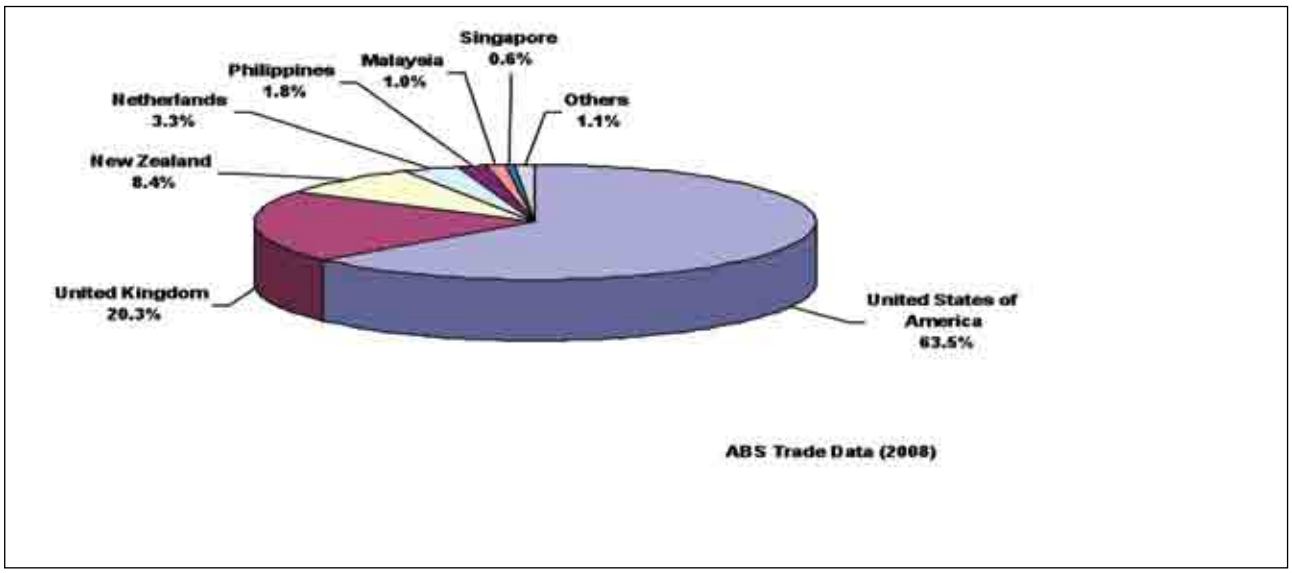
Over the past two decades, Australia has exported fresh ginger to 40 countries. Between 1988 and 2006, Australia's key export destinations included Japan, New Zealand, the United Kingdom, Canada, Singapore, the United States, the Netherlands, China and Russia (ABS Trade Data 2008).

Prior to 2000, Japan was a key export destination for Australia, particularly in the periods from 1993 to 1996 and 1997 to 1999. During these two periods, Australian exports of fresh ginger where at their highest, with exports to Japan exceeding 100 tonnes per year. In early 2000, following changes in export protocols for the Japanese market, exports of fresh ginger to Japan ceased (ABS Trade Data 2008).

According to ABS statistics, the United States is currently Australia's largest export market for fresh ginger, representing 63% of exports in 2007–2008. Other key export markets include the United Kingdom (20%), New Zealand (8%) and the Netherlands (3%). The Philippines, Malaysia and Singapore are also smaller export markets for Australian fresh ginger.

The AGGA suggests that data provided by the ABS refers to exports of semi-processed ginger as there is currently no significant volume of fresh ginger exports. There is no clear definition for determining fresh versus processed product. Figure 16 below, illustrates Australia's key export destinations of fresh ginger in 2007–2008.

Figure 16: Australian exports of fresh ginger by destination (2007–2008)



Major export destinations of Australian ginger preserved by sugar and in syrup currently include the United States, Germany, the United Kingdom, Canada and the Netherlands. Figures 17 and 18 illustrate key export destinations of Australian semi-processed ginger in 2007–2008.

Figure 17: Australian exports of ginger preserved by sugar (2007–2008)

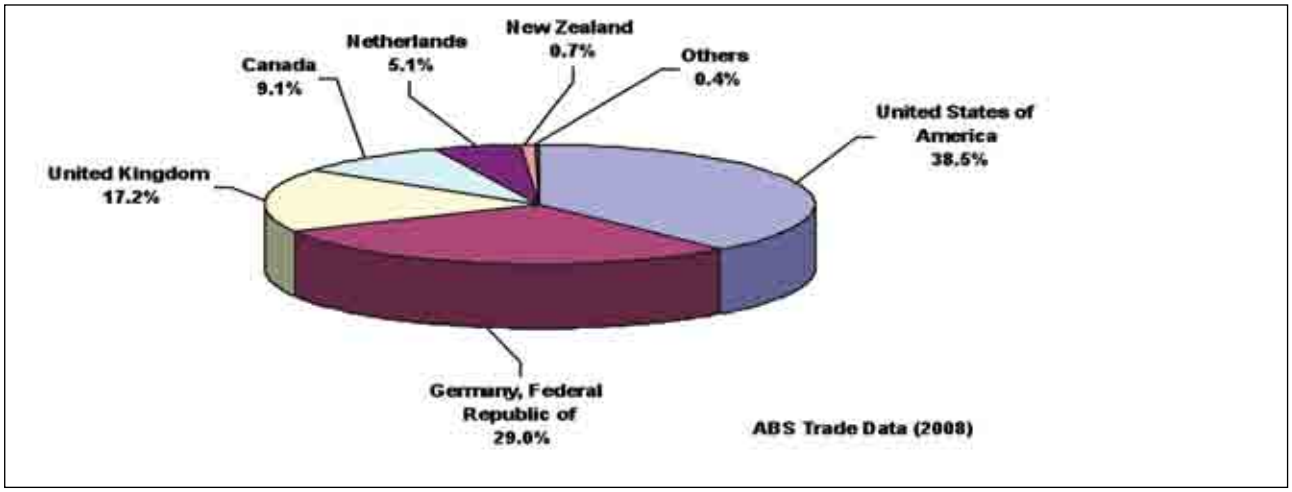
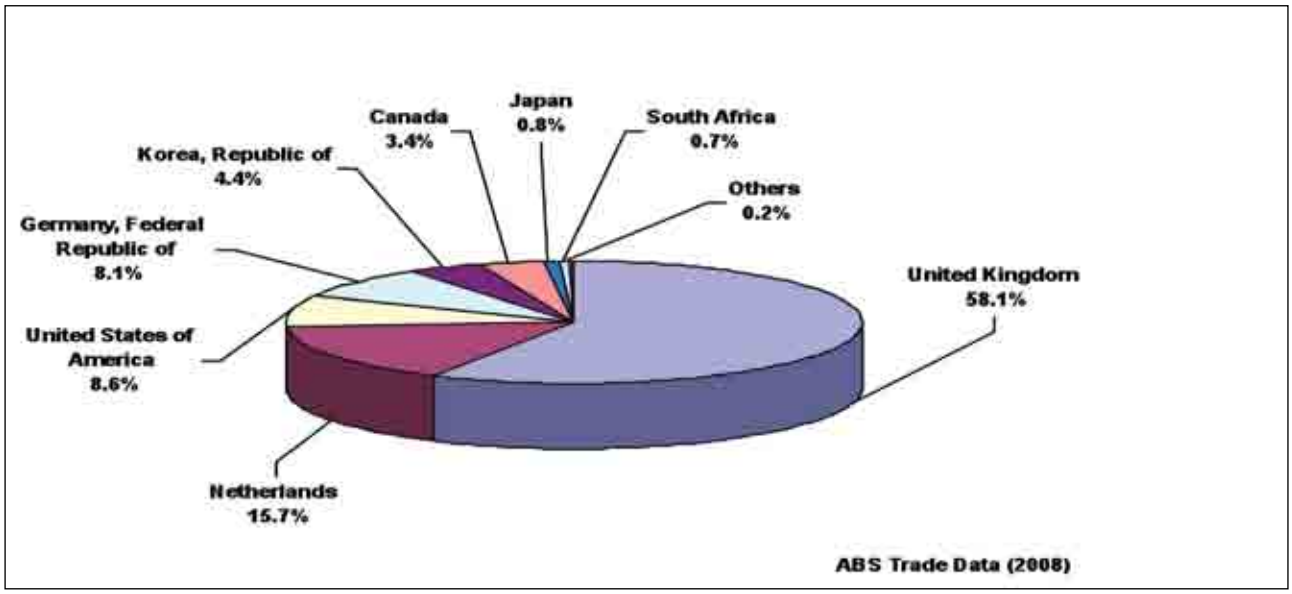


Figure 18: Australian exports of ginger in syrup (2007–2008)



5.0 Australian fresh ginger sector

Note: The information provided in this section was gathered from interviews conducted with Brisbane's five major ginger wholesalers located at the Brisbane Markets at Rocklea. Additionally, information was sourced from Market Information Services.

All fresh market ginger is currently consigned to Australian metropolitan wholesale markets. Growers negotiate directly with their own agents located in capital cities throughout Australia. The fresh market for ginger fluctuates according to supply and demand, and in the current market there seems to be growth potential.

5.1 Key characteristics in purchasing fresh ginger

Wholesalers purchase ginger in a variety of sizes, ranging from large to small, to satisfy the requirements of their client base. 'Canton' (Jumbo) ginger is the most popular variety used in the fresh market. Ideal characteristics desired by wholesalers include large uniform-sized rhizomes, clean skin and gold skin colour.

Key suppliers of fresh ginger to the Brisbane Markets include Templeton Farms, Davison Farms, Dellit Farms, Oakland Farms and Gill Logging. Most wholesalers have established long-term relationships with individual growers and choose to source supply only from those trusted growers.

Wholesalers indicated three key limitations to sourcing ginger. They include:

- inconsistency of supply throughout the year
- inconsistency of product quality throughout the year
- limited annual output.

5.2 Domestic trends in fresh ginger consumption

Over the past five years, the fresh market for ginger has experienced steady growth as demand for fresh ginger has increased. However in recent times, the market has been more volatile as demand for fresh ginger dips and spikes at different periods throughout the year. In the 2006–2007 season, growers indicated that the average price received from the sale of fresh ginger to wholesale agents was between $2.50 and $4.00 per kilogram; however, prices have spiked as high as $10.00 and dropped as low as $1.50 due to fluctuations in supply capacity.

5.3 Factors impacting on price

The following issues were identified by wholesalers as being key factors impacting on the price of fresh ginger throughout a typical season.

5.3.1 Seasonality

Seasonality is the biggest factor driving changes in the price of ginger throughout the year. The December–January period is when ginger is at its highest price point. At this time, supply decreases as old season ginger production ends and price may range considerably. The March–November period is when ginger is at its lowest price point. New season ginger commences at this time and the price remains relatively consistent.

5.3.2 Competition

Competition is another key issue that has a strong bearing on price. The spread of competition may have an influence on the volume of ginger supplied to wholesalers and in turn may also affect the price of product at the market. Although the current supply of ginger to the domestic fresh market is consistent in

a typical year, an oversupply of ginger to the fresh market in the future could cause price to drop while an undersupply could cause price to rise.

5.3.3 Quality

Quality is also an important factor influencing price, and the quality of product supplied to the fresh market will vary at different times of the year. Quality is generally at its poorest when old season ginger ends. At this time, ginger has poor quality skin and a limited shelf life. To increase the shelf life of ginger during this period, product is stored in refrigerated stands at a temperature of 14 degrees Celsius.

5.4 Retail consumers

Interviews with five major wholesalers in Brisbane revealed that independent retailers and leading supermarket chains are their main ginger customers. Wholesalers indicated that 80% of sales in Brisbane are made to independent fruit stores. A smaller percentage of sales (20%) are also made to supermarket chains (Coles, Woolworths, IGA, ALDI and BI-LO), interstate wholesalers and independent consumers. QPIF suggests that key supermarket chains source the majority of their ginger from wholesalers in Sydney and Melbourne.

5.5 Market focus

The primary market focus of Brisbane wholesalers is currently the domestic market. While the majority of wholesalers had no current experience with exporting, two wholesalers had exported to New Zealand in the past. Success in this market was limited and both companies were ultimately unable to compete on price—they were driven out by foreign competitors.

5.6 Wholesaler selling methods

Of the five ginger wholesalers interviewed, four wholesalers act as merchants whereby product is purchased from the grower for an agreed price and re-sold to customers. In this case, price is usually negotiated before the product is acquired from the grower. Only one wholesaler acts as an agent, whereby product is supplied by the grower and a commission is charged by the agent for selling the product.

5.7 Marketing and promotion

Very little is done by wholesalers to promote and market ginger to customers. All wholesalers indicated that individual packaging and branding by growers on ginger cartons is the key tool used to promote ginger. Many customers recognise branding and imaging on boxes and affiliate this packaging with quality. Wholesalers rely heavily on sales from their established client base and regularly inform their clients of product quality and price.

5.8 Views of wholesalers

This section details the views and concerns of surveyed wholesalers. As part of QPIF's industry research, wholesalers were asked to provide their view regarding the future demand for fresh ginger.

5.8.1 Factors influencing future demand for fresh ginger

Of the five wholesalers interviewed:

- four wholesalers held a common view that demand for fresh ginger has been growing minimally over the past five years with potential for increased growth in the future
- one wholesaler held the view that the demand for fresh ginger has remained steady with minimal change.

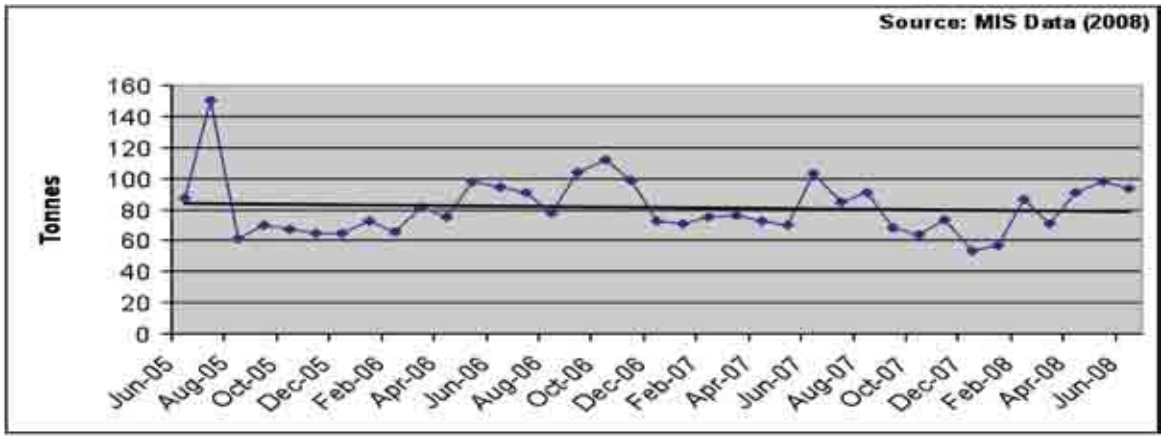
Wholesalers expressed the need to address the following issues in order to increase demand for fresh ginger:

- Lack of marketing and promotion—Wholesalers indicated a need for the ginger industry to focus on conducting marketing and promotional activities in order to drive sales to end users. Because promotion in the ginger industry is currently limited, the key driver is price.
- Consistency of product quality—Wholesalers indicated variations in product quality at different periods throughout the season and significant variations in the quality of ginger produced by individual growers.
- Storage and handling—Wholesalers indicated the need for correct training of supermarket staff regarding the appropriate storage and handling of ginger.
- Packaging and labelling—Wholesalers indicated the need for packaging according to client needs. Re-packaging is currently a key issue for some wholesalers as there are a number of clients that prefer 5 kilogram trays as opposed to standard 10 kilogram cartons.

5.9 Volume of ginger sold at the Brisbane Markets

The information below is based on data provided by Marketing Information Services and illustrates the monthly trend in volumes of ginger sold at the Brisbane Markets between June 2005 and June 2008.

Figure 19: Volume of ginger sold at the Brisbane Markets (2005–2008)



As illustrated in Figure 19, the trend in ginger volumes sold at the wholesale markets in Brisbane has decreased slightly each year from 2005 to 2008. Between July 2007 and June 2008, 931 tonnes of fresh ginger was sold. This volume was slightly lower compared to volumes sold in the previous two years, which totalled 965 tonnes (2005–2006) and 1022 tonnes (2006–2007).

Peak supply of fresh ginger generally takes place between the months of July and September, while periods of low supply occur between late November and January. An average of 80 tonnes of fresh ginger has been sold monthly over the three-year period ending June 2008.

5.10 Price structure

The graphs below illustrate the wholesale prices of 'new season' and 'old season' ginger between July 2005 and June 2008 for the Brisbane, Sydney and Melbourne wholesale markets.

5.10.1 Wholesale ginger prices in Brisbane

Figure 20: Wholesale ginger prices in Brisbane (2005–2008)

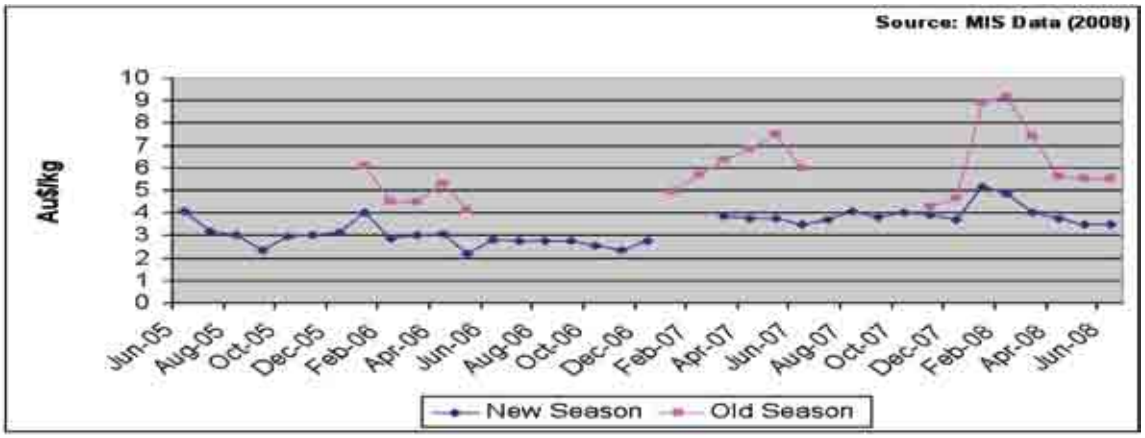


Figure 20 illustrates the fluctuation in price of new season and old season ginger sold at Brisbane's wholesale markets between July 2005 and June 2008. In 2007–2008, prices for new season ginger ranged between $3.80 per kilogram and $5.00 per kilogram. In turn, prices for old season ginger ranged between $4.30 per kilogram and $9.20 per kilogram.

The graph indicates that ginger was sold at its highest price point between the months of December and February, while prices in other months remained consistently low. During the three-year period spanning July 2005 to June 2008, average prices for new season ginger increased from $2.80 per kilogram to $4.00 per kilogram, while prices for old season increased from $4.60 per kilogram to $6.80 per kilogram.

5.10.2 Wholesale ginger prices in Sydney

Figure 21: Wholesale ginger prices in Sydney (2005–2008)

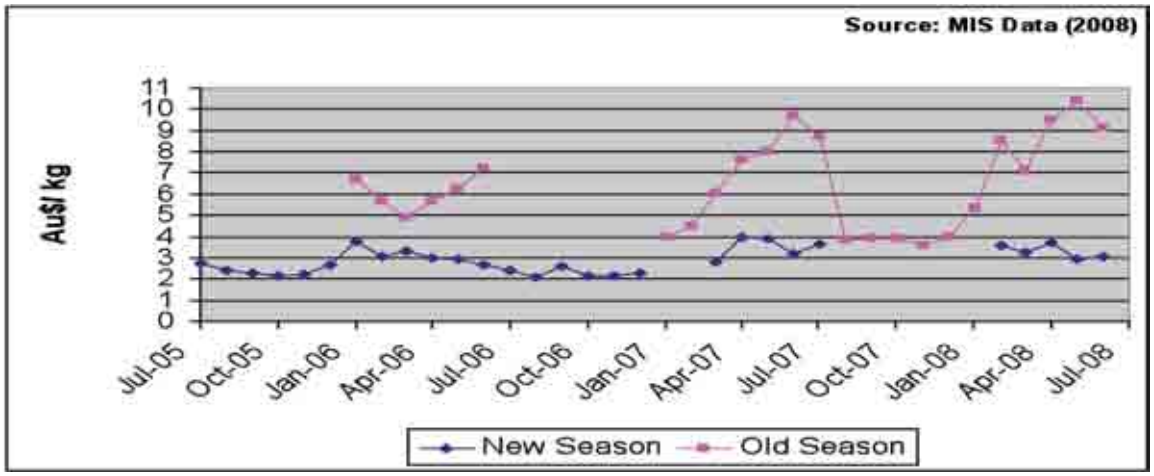


Figure 21 illustrates the fluctuation in price of new season and old season ginger sold at Sydney's wholesale markets between July 2005 and June 2008. In 2007–2008, prices for new season ginger ranged between $2.90 per kilogram and $3.70 per kilogram. In contrast, prices for old season ginger ranged between $3.50 per kilogram and $10.40 per kilogram.

The graph indicates that ginger was sold at its highest price point between the months of April and June, while prices were at their lowest between the months of July and December. This differs from price trends

in Brisbane where prices are traditionally at their highest in the months of January and February. During the three years spanning July 2005 to June 2008, average prices for new season ginger increased from $2.50 per kilogram to $3.50 per kilogram, while prices for old season ginger increased from $5.00 per kilogram to $7.20 per kilogram.

5.10.3 Wholesale ginger prices in Melbourne

Figure 22: Wholesale ginger prices in Melbourne (2005–2008)

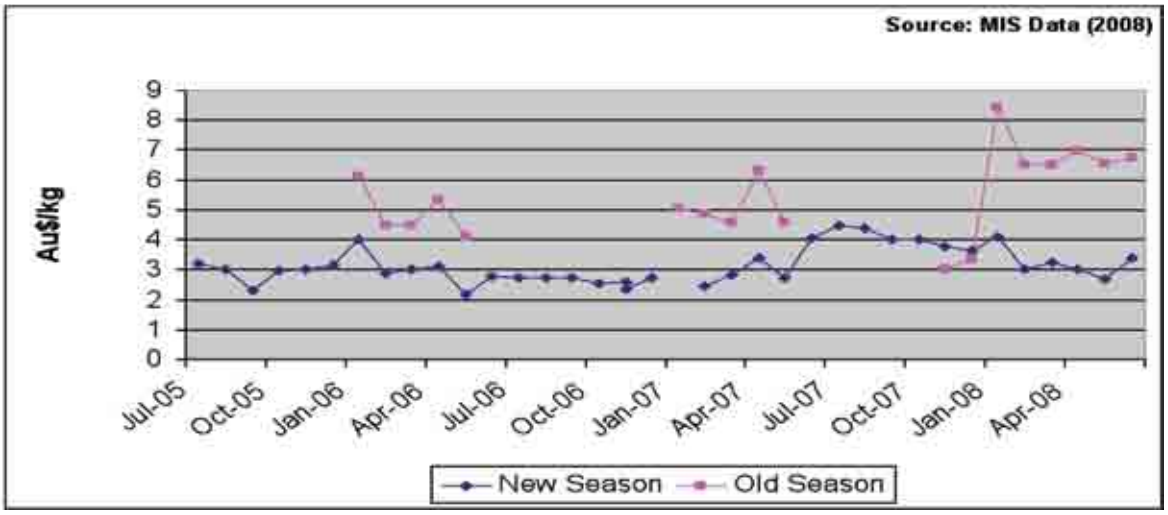


Figure 22 illustrates the fluctuation in price of new season and old season ginger sold at Melbourne's wholesale markets between July 2005 and June 2008. In 2007–2008, prices for new season ginger ranged between $2.70 per kilogram and $4.50 per kilogram. In contrast, prices for old season ginger ranged between $3.00 per kilogram and $8.45 per kilogram.

The graph indicates that ginger was sold at its highest price point between the months of January and April, while prices in other months remained consistently low. During the three-year period spanning July 2005 to June 2008, average prices for new season ginger have increased from $2.80 per kilogram to $3.60 per kilogram, while prices for old season have increased from $4.20 per kilogram to $6.20 per kilogram. Direct comparisons between price trends in Brisbane and Melbourne over the three-year period (2005–2008) illustrate very similar patterns in average ginger prices.

6.0 Global competition analysis

6.1 The impact of foreign competition on Australia's ginger industry

In 2002, the Fijian Government lodged an official application with the Australian Government to gain market access for fresh ginger. Negotiations have since followed and recently officials from Biosecurity Australia visited Fiji on a fact-finding mission to verify the full process of preparing fresh ginger before it is exported. Further negotiations between governments are required in order for Fiji to gain market access.

Queensland growers and processors have expressed strong concerns regarding the importation of fresh ginger from Fiji. Both growers and processors alike believe the importation of fresh ginger poses a key risk for the industry due to threats of introducing more virulent strains of existing diseases such as bacterial wilt or new diseases such as Radopholus nematode. This was evidenced on the Sunshine Coast during the 1960s when seed was imported from Thailand and introduced an outbreak of bacterial wilt to the region. As a consequence, certain areas on the Sunshine Coast are no longer farmable.

Notable increases in ginger production, especially from neighbouring nations such as Fiji, could also have a strong impact on Australia's ginger industry in coming years. Figures provided by the Agriculture Ministry of Fiji revealed that production of mature ginger has increased by 31.9% from 2333 tonnes produced in 2006 to 3077 tonnes produced in 2007, largely due to an increase in ginger farmers. Similarly exports last year increased by 2.2% from 1202 tonnes exported in 2006 to 1228 tonnes exported in 2007.

The two main varieties of ginger grown and exported from Fiji are the premium quality red and white 'Canton' varieties, predominately used for fresh market consumption. With Australia being targeted as a key export market for mature ginger from Fiji, the market for fresh ginger in Australia could be heavily impacted by exports from foreign competitors supplying raw ginger at a lower price than domestic produce.

Despite recent production growth, Buderim Ginger Limited's subsidiary in Fiji is predicting a decline in Fiji's ginger production during the 2008–2009 seasons, largely due to the low availability of planting material and disease issues. Production in this current season is estimated to range between 500 and 1000 tonnes. As a result, the limited production capability of Fijian growers will restrict their ability to export in the coming seasons.

6.2 Imports of foreign ginger into Australia

In recent years, Australian ginger processors have imported over 400 tonnes annually of Chinese and Fijian ginger in semi-processed form, due to the inability of domestic growers to meet demand for the Buderim Ginger factory. In 2008, 6% of processed ginger was imported from China. In comparison to Australian ginger, imported ginger has two key disadvantages—inconsistencies in flavour profile and high amounts of chemical residues.

6.2.1 Imports of foreign ginger into Australia—views of ginger growers

Ginger growers were also asked to provide their views in relation to the need for processors to import ginger. Their views are outlined below:

- Most growers understand the need for processors to import ginger from overseas as Australian growers are not able to meet current demands.
- Some growers see imports as a threat, impacting heavily on the industry—the affect of imports on local industry will depend on volumes imported.
- Ginger imported from overseas does not have the same flavour qualities as Australian-produced ginger.
- There are a number of quality issues that the processor may have to face with overseas imports.

6.3 Export opportunities for Australian fresh ginger

In the past, Australian ginger growers have exported fresh ginger directly to New Zealand and Japan; however, currently there are no growers exporting directly to overseas markets. Direct exports of fresh ginger to New Zealand decreased in 2006 when growers were unable to compete on price with Thai ginger, also being exported into this market.

Direct exports to Japan were also affected because of changes made to export protocols by the Japanese Government. In particular, some chemicals used in the production of ginger in Australia were banned by the Japanese Government closing this market for Australian growers in 1997.

Japan is currently the leading importer of ginger across the globe with approximately 90 000 tonnes of fresh ginger being imported in 2005. Until recently, China was the major exporter of fresh ginger into this market; however, China voluntarily stopped exports to Japan in 2008 with regular rejection of its ginger exports due to the presence of pesticides and toxins.

With China failing to meet Japanese quality standards, possible opportunities exist to export Australian fresh ginger at a premium price to the high-value Japanese market by exploiting Australia's clean, green image for premium quality ginger; however, a review of the current export protocols is required—matching those chemicals currently used in Australia with chemicals accepted by Japan.

Opportunities may also exist to further expand exports of fresh ginger to Australia's leading export markets—the United States, New Zealand and the United Kingdom. Export opportunities also exist for Australian-processed ginger. They are mentioned in section 4.0.

7.0 Market opportunities and challenges

Through industry research, QPIF has identified a number of key issues impacting on the production, processing, marketing and export of Australian ginger. These issues pose both opportunities for future industry growth and challenges impeding the growth of industry.

7.1 Key opportunities for the ginger industry

Key opportunities include the following:

- Ginger is a high-value crop. Improvements in farm management practices and pest and disease management could significantly improve productivity and profitability of growers. Knowledge transfer between growers themselves and between growers and researchers could also result in productivity improvements by growers and lead to greater profitability.
- Demand for fresh product has increased steadily with its increasing use in Asian food and this market is likely to continue to grow. Promotion of the health qualities of fresh ginger is another avenue for increasing demand for fresh product.
- Export demand for fresh product has not been fully analysed or quantified and this may present an opportunity for the industry to explore, especially in high-value markets such as Japan. As with fresh ginger, the export market for processed ginger has not been analysed or quantified and this could be explored by the industry.
- Queensland processed ginger is a premium-quality product that is in high demand. The processed ginger industry is strengthened by the accessibility of Buderim Ginger Limited, the major processor, which has strong links with Queensland growers supplying raw material.
- Increased supply of product from new cultivars with properties such as higher gingerols and shogaols, and of organic product may provide new opportunities for growers to consider.

7.2 Key challenges for the ginger industry

Key challenges include the following:

- Growers are ageing and leaving the industry, and are not being replaced. Urban encroachment is restricting land supply in the key growing areas, start-up costs for new growers are high, input costs are increasing and labour supply is unreliable.
- There is the threat of new diseases resulting from climate change or new cultural practices affecting the industry. The industry also lacks an accreditation scheme for seed growers.
- The processing industry is relying on a small number of suppliers, some of whom are increasingly supplying the fresh market as well as the processors. As a result, processors are sourcing cheaper product from Fiji and China.

Tables 4 and 5 highlight the key opportunities and challenges impacting both the fresh market and processing sectors in Australia.

Table 4: Opportunities for the fresh market and processing sectors

Fresh market		Processing
Opportunities	• Profitable gains to be made in farm management practices • Profitable returns to be made as ginger is a high-value crop • Improvements in pest and disease management/reduction in crop loss • Improvements in knowledge transfer among growers • Export demand not fully explored or quantified	• High demand for product • Very good communication lines with growers • Accessible processor (Buderim) • Premium-quality product • Export demand not explored or quantified • New cultivars—increase supply capacity, altered properties (high gingerols and shogaols)

Table 5: Challenges for the fresh market and processing sectors

Fresh market		Processing
Challenges	• Age of growers—uncertainty about the future as growers are ageing • Labour costs are increasing and labour supply is inconsistent • Imports—cheaper product sourced from overseas (Fiji and China) • Disease outbreak—threat of new diseases as a result of climate change or new cultural practices • Bad seed—no accreditation scheme for seed growers • Increased input costs such as fuel and fertiliser • High start-up costs for new growers (production and quota for processed ginger) • Land supply • Urban encroachment/conflicts	• Fall-out with growers because of value of quota price drop • Supply issues: 1. New and existing growers are supplying more product to fresh market 2. Existing growers that exit are not being replaced • Reliance on a small number of suppliers • Cheaper products are sourced from overseas markets such as Fiji and China—reducing input costs

8.0 Appendix 1—Product varieties

8.1 Characteristics and components of ginger

Ginger is a perennial rhyzomatic plant that grows up to a height of about 1 metre. The plant has a thick tuberous rhizome and a reddish erected stem. Ginger is comprised of key components including amino acids, shoagoals, gingerols, fibre, essential oils and minerals, and is therefore used commonly as an ingredient in a variety of products for its flavouring and medicinal value.

8.2 Forms of ginger

Ginger is available in a variety of forms including fresh, dried, pickled, preserved, crystallised (or candied) and powdered or ground. Ginger is most commonly processed into a dried form.

8.2.1 Fresh ginger

Fresh ginger comes in young and mature forms. Young ginger has mild flavour and has a pale, thin skin that does not require peeling. The skin of mature ginger on the other hand is tough, which requires peeling to get to the fibrous flesh. It is either chopped or grated before use.

8.2.2 Dried ginger

Dried ginger is available in both whole fingers and slices. Dried roots are sold either with the root skin left on or with the skin peeled off. To prepare dried skinless ginger, the roots are boiled in water, killing the rhizomes. Peeling, scraping or slicing is also done to remove the skin. Before use it is soaked in recipe liquid. Dried ginger may be further processed to produce oil.

8.2.3 Ginger oils

Ginger oil is extracted by steam distillation from the root of the plant. It is used for its antiseptic, aphrodisiac, laxative, stimulant and tonic properties and is often blended with other essential oils to produce many different mixtures for many different ailments. Ginger oil has a spicy and peppery aroma.

8.2.4 Crystallised ginger

Ginger is cooked in sugar syrup, then air dried and coated in sugar to obtain candied ginger.

8.2.5 Pickled ginger

The root of the ginger is sliced paper-thin and pickled in a sweet vinegar solution. This pickle often accompanies sushi and is served to refresh the palate between courses. It is coloured pink or red.

8.2.6 Ground ginger

Ground or powdered ginger is the buff-coloured, ground spice made from dried rhizome. It is used in various recipes.

8.2.7 Preserved ginger

Preserved ginger or stem ginger is made from fresh young rhizome, peeled and sliced, then cooked in a heavy sugar–salt mixture. The ginger pieces and syrup are canned together. They are soft and pulpy, but extremely hot and spicy. It is used both in confection and desserts.

8.3 Key varieties of ginger

There are many varieties of ginger. The most sought-after varieties have a light-brown skin, with creamy yellow to light-green flesh. The most common varieties are listed in Table 6 below.

Table 6: Common varieties of ginger in Australia

Queensland	Canton/Jumbo	Imports
• Mainly used for processing into confectionary, ingredient and pharmaceutical/ therapeutic products • High flavour profile with a strong citrus flavour and aroma • Rough in appearance • Mild in taste • Small to medium in size • Lesser shelf life due to smaller size • High in gingerols, active ingredient in anti-nausea, anti-inflammatory and anti-bacterial products	• Mainly used for fresh market consumption—cooking and therapeutic uses • Smooth in texture • Large in size • Hot in taste • Lesser flavour content • Longer shelf life due to larger size • High in gingerols, active ingredient in anti-nausea, anti-inflammatory and anti-bacterial products •	• Used commonly in Asia as an ingredient in product and cuisine • Used for its functional value, health benefits and therapeutic use • Used mainly in Australia as an additive when domestic supply is short • Lesser flavour content • Common imported varieties include Japanese, Fijian and Chinese ginger • High in gingerols, active ingredient in anti-nausea, anti-inflammatory and anti-bacterial products

8.4 Breeding new varieties of ginger

A new variety of ginger that has a significantly larger underground root than the current 'Queensland' variety has been bred at the QPIF Maroochy Research Station. Chief Horticulturalist, Dr Mike Smith, has led the nine-year QPIF project to develop the new variety known as 'Buderim Gold'.

Over this period, scientists have selected existing ginger varieties with the most promising characteristics and multiplied these key types in the laboratory and in field trials. This Tetraploid ginger variety was created as a result and is so called because it has four sets of chromosomes compared to its parent, the 'Queensland' variety, which has two sets.

The new variety is characterised by its large size and has similar flavour characteristics to the existing high-quality 'Queensland' ginger, which will enable industry to continue to promote the unique flavour that they have based their reputation on in Australia and overseas.

According to industry, the variety has no marketability for the fresh market. The variety does not present as a visually appealing product due to the 'rough', 'woolly' and 'bark-like' appearance of the skin. For this reason, its use is likely to be limited to the processing sector.

Whilst the larger rhyzome means increased profitability for processors by minimising wastage and processing of lower valued cuts, recent factory trials have revealed that the size of the 'Buderim Gold' variety is in fact too large for the equipment used to cut and process the ginger effectively. This variety will continue to be evaluated and multiplied by selected ginger growers and further evaluated in factory processing trials.

The AGGA has expressed a strong interest in further research and development into disease-resistant varieties and less fibrous varieties.

9.0 Appendix 2—Questionnaires

9.1 Grower's questionnaire

The Ginger Industry—Grower's Questionnaire

Date of interview: _____

Interviewer: _____

General details:

Company/ Farm name: _____

Location: _____

Person interviewed (position): _____

Contact details: _____

Company structure: _____

Age of the grower: ☐ 20- 30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ 61+

Property size: _____

Length of time involved in ginger industry: _____

Previous agricultural experience: _____

_____

_____

_____

Production and Harvesting Related:

1. What percent (%) of your land is dedicated to the cultivation of ginger? _____

_____

2. How many acres of land have you cultivated in each of these years? _____

_____

Year	2008	2007	2006	2005	2004
Number of acres cultivated:					

3. How much ginger have you produced over the last five years?

Year	2008	2007	2006	2005	2004
Fresh ginger					
For Processing					

4. How much seed do you plant annually? _____

_____

5. i) Do you produce your own seed or purchase seed for planting? _____

_____

	Seed use (%)	Volume (tones)
Own seed		
Purchased seed		

ii) If you purchase seed, from where? _____

_____

6. i) What variety(s) of ginger do you grow on your farm?

   a. Canton ☐

   b. Queensland ☐

   c. Other ☐ Specify _____

   ii) How much of each variety do you cultivate?

Variety	(%) Planted	Annual production (tones)
Canton / Jumbo		
Queensland		
Other (name)		

7. What are your main production issues? _____

_____

_____

8. i) Do you practice crop rotation?

   a. Yes ☐

   b. No ☐

ii) If yes, what are the benefits? _____

_____

iii) What crops do you use in this practice? _____

_____

_____

9. What type of harvesting practice do you employ on your farm? _____

_____

_____

10. What post harvest processes / practices do you employ? _____

_____

_____

11. i) What are your thoughts regarding the future of ginger production in Queensland? _____

_____

ii) Are you planning to expand operations? Why? _____

_____

iii) Do you think the industry in terms of total ginger production is expanding? Explain. _____

_____

_____

_____

iv) Are there any significant impediments for you to increasing production?
(i.e.: harvesting, disease, natural disasters & market issues) _____

_____

_____

_____

v) Are you currently producing ginger as part of a consortium with other producers?

(i.e.: share farming or group branding) Explain.

_____

_____

_____

Market Related:

Processing market:

i) Who do you currently supply? _____

_____

_____

ii) What volume(s)? _____

2. i) Do you have a quota agreement with Buderim?

a. Yes ☐ If yes, what is the quota? _____

b. No ☐ _____

ii) Are you satisfied with the current quota arrangement in place with Buderim? Explain. _____

_____

_____

iii) How much did you supply of your allocated quota in 2007? _____

_____

_____

iv) If it was lower, why? _____

_____

_____

3. How do you transport ginger to buyers? _____

Using own transport ☐

Using a contractor ☐

Other ☐ Specify _____

4. i) What are your current expectations about meeting your quota / demand for next year?

_____

_____

5. ii) If you do not expect to meet your quota / supply, what are the likely reasons for this?

_____

_____

6. What are your thoughts regarding the demand for processed ginger? _____

_____

7. As a local ginger grower, are you concerned if local processors need to import raw ginger to meet their production requirements? Why? _____

_____

8. How strategic is it to your ginger growing business, having a local ginger processor rely on your operations? Explain. _____

_____

Fresh market:

1. Who do you supply fresh ginger to? _____

_____

2. What percent of your fresh production goes to each of the following segments?

Market Segments	% Fresh production
Direct to consumers via farm gate / farmers markets	
Direct to retailers	
Direct to wholesalers	

3. Does your wholesaler act as an agent or as a merchant? Explain _____

_____

4. i) Do you grade and pack your own ginger?

   a. Yes ☐

   b. No ☐

ii) If yes, explain your grading systems? _____

_____

iii) If no, explain how your ginger is supplied to the fresh market? _____

_____

5. How do transport / distribute your product to buyer(s) / agent(s)? _____

_____

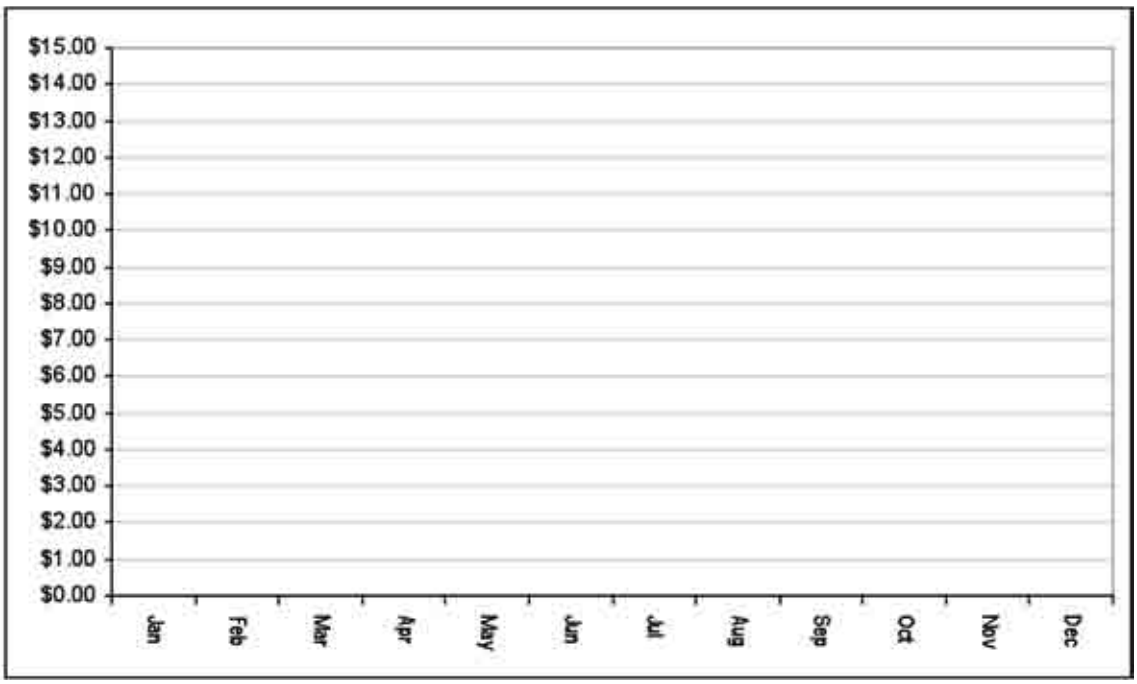
6. What do you do with ginger off cuts and low grade produce? _____

_____

7. i) Explain the pricing structure that you have in place for your ginger? _____

_____

   ii) Map the price fluctuation over a common year?



iii) In terms of harvesting during the season, how do you respond to varying market prices?

_____

iv) In terms of supplying during the season, how do you respond to varying market prices?

_____

_____

8. What are the key issues impacting on the supply capability of your ginger to the fresh market including wholesalers & retailers? (i.e. weather, labor, price, certifications)

9. How is your ginger promoted / branded in the market? _____

10. What are your thoughts regarding the future demand for fresh ginger? _____

11. i) Are you part of a consortium with other growers? (i.e.: sharing packing equipment, using the same brand)

   a. Yes ☐

   b. No ☐

ii) If yes, explain your relationship _____

Where do you see future market opportunities? _____

Other notes / comments: _____

9.2 Processor's questionnaire

The Ginger Industry—Processor's Questionnaire

Date of interview: _____

Interviewer: _____

General details:

Company/ Farm name: _____

Location: _____

Person interviewed (position): _____

Contact details: _____

Company structure: _____

Background: _____

Products manufactured: _____

Processing Related:

1. What variety(s) of ginger do you use for processing?
   a. Canton ☐
   b. Queensland ☐
   c. Other ☐ Specify _____
2. What ginger variety is preferred for processing? Why? _____

_____

3. In what form do you purchase ginger? _____

_____

_____

4. What key characteristics do you look for when purchasing ginger for processing? _____

_____

_____

5. i) Do you import ginger?
   a. Yes ☐ Specify which markets? _____
   b. No ☐

ii) What volume(s) do you import? _____

iii) At what price? _____

6. Do you have quality issues or any other issues with imported ginger? Explain. _____
7. How much raw / processed ginger do you purchase annually? _____

Ginger	Volume (tones)
Raw Ginger	
Processed Ginger	

8. How much ginger do you process annually? _____

How do you manage supply / undersupply of ginger? _____

_____

_____

10. i) Do you have a pricing arrangement in place with your suppliers?

    a. Yes ☐ If yes, what is the arrangement? _____

    b. No ☐ _____

11. What production processes do you employ in the factory? (ingredient to final product)

_____

_____

12. How many local ginger growers supply to you? _____

13. In what form is ginger received from growers?

    a. Raw ☐

    b. Peeled ☐

    c. Washed ☐

    d. In brine ☐

    e. Other ☐ Specify _____

14. What product(s) do you produce using ginger?

    a. Beverage ☐

    b. Confectionary ☐

    c. Ingredient ☐

Functional foods ☐

Other ☐ Specify _____

15. How is your product(s) transported / distributed to your customers?

Using own transport ☐

Using a contractor ☐

Other ☐ Specify _____

16. Who are your key customers? _____

_____

17. How is your product marketed / promoted to your customers? _____

_____

18. What is the point of difference / competitive advantage of using Australian grown ginger?

_____

_____

19. What are your thoughts regarding the future demand for processed ginger products?

_____

_____

20. What are the market segments that are likely to experience growth?

a. Beverage ☐

b. Confectionary ☐

c. Ingredient ☐

d. Functional foods ☐

e. Other ☐ Specify _____

Buderim Ginger Limited

1. What is the quota system? _____

_____

2. How does the quota system work? _____

_____

3. How many growers quota? _____

4. How many growers lease quota? _____

5. i) What are your thoughts regarding the current quota agreement? _____

_____

ii) Are there impediments with the current quota system? Explain _____

iii) Are there any changes you would like made to the current quota system? _____

_____

9.3 Wholesaler's questionnaire

The Ginger Industry—Wholesaler's Questionnaire

Date of interview: _____

Interviewer: _____

General details:

Company/ Farm name: _____

Location: _____

Person interviewed (position): _____

Contact details: _____

Company structure: _____

Background: _____

Products distributed: _____

Raw ginger demand

1. How much raw ginger did you handle last year? _____

_____

2. i) Over the last 5 years, what is the trend in the volume of ginger purchased by this company? (i.e. growth or decline) _____

_____

_____

ii) What volume of ginger was purchased in each of these years?

Year	2008	2007	2006	2005	2004
Raw ginger (tons)					

i) Who are your key suppliers of ginger? _____

_____

ii) What volume of ginger do they supply your company annually? _____

How much fresh ginger do you supply to the following market segments?

Market Segments	Volume (tones)
Direct to consumers	
Direct to independent retailers	
Direct to supermarket chains (Coles, Woolworths, IGA, ALDI)	

Are there any impediments to sourcing ginger? Explain _____

_____

Grade, Volumes and Price Structure

1. What key characteristics do you look for when purchasing fresh ginger? _____

_____

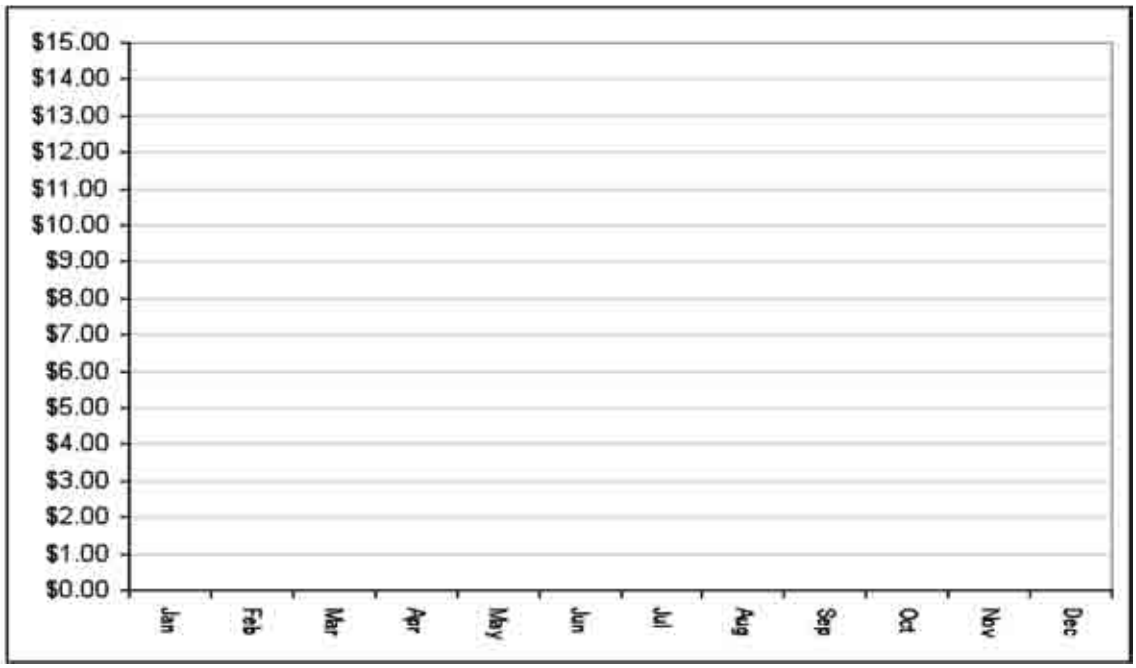
_____

2. What key factors impact on the price of ginger throughout the year? (i.e. seasonality, competition)

_____

_____

3. i) Map the ginger price cycle over the production season



ii) When is ginger at its highest price point? _____

iii) When is ginger at its lowest price point? _____

4. Do you sell as an agent or a merchant?

   a. Agent ☐ If agent, what (%) commission do you charge? _____

   b. Merchant ☐

5. Who are your main buyers?

   a. Independent consumers ☐

   b. Independent retailers ☐ Specify _____

   c. Supermarket chains ☐ Specify _____

6. How do you transport and distribute ginger to your customers? _____

_____

_____

7. How do you promote and market ginger to your customers? _____

_____

_____

8. What is your primary market focus?

Domestic markets ☐ Specify _____

International markets ☐ Specify _____

9. i) Have you had any previous experience in exporting?

a. Yes ☐ Specify which markets? _____

b. No ☐

ii) If yes, can you explain your exporting experiences? (i.e.: successful or unsuccessful) _____

_____

10. What are your thoughts regarding the future demand for fresh ginger? _____

_____

_____

PR09–4626