RELATIVE COMPETITIVENESS OF THE SOUTH AFRICAN OILSEED INDUSTRY

by

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"When it can't be done, do it. If you don't do it, it doesn't exist (Paul Arden).
"There are no short cuts to any place worth going" (Beverly Sills),

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ABSTRACT

Agribusinesses in South Africa are influenced by a number of factors including increased globalization of markets, trade liberalization, advances in information technology and consumer preferences. These factors have a continuous effect on the competitiveness of the South African oilseed industry. An analysis of the sector in this regard is therefore very appropriate.

An overview of the oilseed industry locally and globally is provided, followed by measurements of the comparative and competitive advantages of the South African and Argentine oilseed industries. Three indexes are used to calculate the comparative and competitive advantages namely the Net Export Index (NXI), the Revealed Comparative Advantage (RCA) and the Relative Revealed Comparative Trade Advantage (RTA) index. According to the results South African groundnuts and sunflower seed have a competitive advantage in their primary form. Oilseeds to which value has been added have, in most cases, a competitive disadvantage, exactly the opposite to Argentina's oilseed products.

The finding that South Africa is only competitive in the primary oilseed market, lead to the secondary oilseed industry. In the analysis it was found that the South African oilseed industry is price driven. Since price plays a large role in the competitiveness of the industry, imports of cheaper bottled refined oils are considered to pose a major threat.

A new strategy is required to make the South African oilseed industry more competitive. Supply chain management can be viewed as an important way of improving competitive advantage and shortening the lead time.

Quality food production can be viewed as a means of bypassing the competitive margin-based "race to the bottom". As South Africa has a competitive disadvantage for most of the value added oilseeds, this area must be emphasised. Issues surrounding food quality and safety are becoming increasingly prevalent, mainly because of the rise of incomes and educational levels among consumers in most advanced industrial countries. Health issues are of great importance to the local as well as global market, and the production of a healthier vegetable oil has become a necessity for this industry.

Innovations in sunflower oil will lead to great improvements in the competitiveness of the oilseed industry. Sunflower oil with unique and healthier attributes must be supplied. Constant research and innovation must be practiced to keep up with the changing environment.

After gaining consumer trust, effective marketing and distribution services must be applied, customer research, the right positioning of products, the creation of a unique image, packaging and the promotion of the product as a safer, healthier, high quality, proudly South African product, will lead to a more competitive oilseed industry.

The factors discussed in this section can only succeed with the assistance of the government. Policy must be instituted to avoid the dumping of cheaper crude vegetable oils and bottled cooking oils in South Africa.

Mededingendheid van die Suid-Afrikaanse oliesade bedryf

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UITTREKSEL

Agri-besighede in Suid-Afrika word deur ‘n aantal faktore beïnvloed, waaronder toenemende globalisering van die mark, liberalisering van handel, vordering ten opsigte van inligting en tegnologie en verbruikersvoorkeure. Hierdie faktore het ‘n toenemende effek op die mededingendheid van die Suid-Afrikaanse oliesade bedryf. ‘n Analise van die sektor in die verband is dus toepaslik.

‘n Oorsig van die internasionale en plaaslike oliesade bedryf, word verskaf: Dit word gevolg deur ‘n meting van die vergelykende en mededingendheidsvoordeel van die Suid-Afrikaanse en Argentynse oliesade industriee. Drie indekse word gebruik om die vergelykende en mededigende voordele te bereken, naamlik die netto uitvoere indeks, die blootgestelde vergelykende voodele indeks en die relatiewe blootgestelde vergelykende handelsvoordeel indeks. Die resultate dui daarop dat grondboon- en sonneblomsaadprodukte in hulle primêre vorm ‘n mededingendheidsvoordeel het. Oliesade wat verwerk word toon in meeste van die gevalle nie mededingend nie. Die Argentynse oliesade industrie ervaar presies die teenoorgestelde.

Daar is bevind dat Suid-Afrika slegs mededingend is in die primêre oliesade mark. Die sekondêre oliesade bedryf is verder ontleed. In die is gevind dat die industrie prysgedrewe is. Omdat prys ‘n groot rol speel in die mededingendheid van die industrie, word die invoer van ru-olie, verfynde olies en gebottelde olies as ‘n groot bedreiging beskou.

‘n Nuwe strategie is nodig om die Suid-Afrikaanse oliesade industrie meer mededingend te maak. Beter bestuur van die aanbodketting kan ‘n belangrike manier wees om die mededingendheidsprobleem aan te spreek, en om die leweringstyd te verkort.

Kwaliteit voedselproduksie kan ‘n manier wees om mededingendheid wat op prys marges gebaseer is, te omseil. Omdat Suid-Afrika nie mededingend is ten opsigte van die meeste waardetoegevoegde oliesade nie, moet hierdie aspek beklemtoon word. Voedselkwaliteit en -veiligheid word al meer belangrik namate verbruikers se inkomste en opvoeding toeneem. Gesondheidsfaktore is baie belangrik, in sowel die plaaslike as die internasionale mark, en die produksie van ‘n gesonder olie is van kardinale belang.

Innovasie ten opsigte van sonneblomolie kan aanleiding gee tot 'n aansienlike verbetering ten opsigte van mededingendheid in die oliesade bedryf. Sonneblomolies met unieke en gesonder eienskappe moet gebruik verskaf word. Voortdurende vernuwing ten opsigte van tegnologie en inligting is noodsaaklik om in beheer te bly van 'n veranderende omgewing.

Na verbruikersvertroue verkry is moet goeie bemarkings- en verspeidingsdienste toegepas word, verbruikersnavorsing onderneem word, produkte reg geposisioneer word en produkte met ‘n unieke voorkoms en verpakking ontwikkel word. Hierdeur kan produkte as ‘n veiliger, gesonder en trots-Suid-Afrikaanse produk wat van hoë kwaliteit verseker bemark word. Hierdie strategieë sal die Suid-Afrikaanse oliesade bedryf meer mededingend maak.

Die bogenoemde kan slegs slaag met die regering se hulp. Beleid teen die storting van plant ru-olies, verfynde olies en gebottelde kookolies in Suid-Afrika moet ingestel en toegepas word.

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CHAPTER 1

INTRODUCTION

1.1 Background

According to Van Schalkwyk, Taljaard and Van Schalkwyk (2003) oilseeds constitute one of the most important field crops in the world. This is according to them not only applicable in regard to the contribution it makes to the gross value of production of agricultural commodities, but also in terms of its value in the value-adding system of other commodities. Although oilseeds are an important commodity to South Africa, the competitiveness of this industry remains of concern. According to Esterhuizen and Van Rooyen (2001) agribusinesses are experiencing increasing pressure because of globalization, making it all the more important for agricultural industries to have a relative competitive advantage.

In this study the competitiveness of the South African oilseed industry is investigated. There are a number of factors that have an effect on competitiveness namely; trade liberalization, partnerships for proper supply chain management, information and knowledge. These factors and others are evaluated as they pertain to the South African system.

1.2 Problem statement and motivation

The objective of this study is to measure the relative competitiveness of the South African oilseed industry. The increasing emphasis of trade liberisation in primary and processed products has increased, and the concept of competitiveness has changed radically in the South African context. The changes in the South African trading regime, as well as changes in forces that affect global markets for

agricultural products, force producers and processors to position themselves as capable competitors in the global free market environment. This is even more important in the light of the fact that South Africa's foreign competitors have high levels of government subsidies and protection measures, putting South African producers and processors at a definite disadvantage.

The existence of partnerships and strategic positioning are crucial for proper supply chain management, an important factor in the relative competitiveness of an industry. Although these concepts may seem simple to achieve, international experience has shown that various factors could influence the successful establishment of partnerships. This would mean lower costs and improved efficiency regarding responses to consumer requirements. Strategic positioning involves developing an adaptive strategy for value creation in response to acute changes in the industry's competitive environment. In this regard it is important to note that industries that are able to adapt successfully in dynamic environments understand their capabilities as bundles of competencies and not as products or functions. In other words, bundles of competencies is all that remains if one was to remove the products, i.e. the human capital in the industry, the shared knowledge, the corporate history, communication networks and traditions, organizational structures and collective learning. Hence, a key component of core competencies is information and knowledge. The importance of tacit knowledge should, furthermore, not be underestimated, since much of the knowledge needed for successful decision making comprises unique experiences generated over time and through interactions that can not be replicated by formal rules.

The importance of the above becomes clearer when one considers the issue of focussing on productivity gaps or focussing on opportunity gaps, as it affects the relative competitiveness of the industry The former entails focussing on present routines, processes, products and markets. Decisions involve improving productivity of known systems and routines. This type of strategy is important for success when markets are static, mature or fully competitive. However, the question should be what happens when markets are dynamic and firms enter a

period of structural change, or when markets become less competitive. Consequently products or production-based strategies are lost because the markets are lost, globalization and structural change seriously challenge the traditional business model of being the world's low cost producer of commodities (with a comparative advantage), and decreasing commodity prices outpace producers' ability to increase productivity. Hence, a shift away from the productivity gap is needed, which entails a focus on the other half of the value creation equation, namely the opportunity gap. This entails that the industry needs to assess itself regarding its core competencies and the use of tacit knowledge. The result of such a shift is (i) improved information flows, (ii) minimal investment in hard physical assets through partnerships, (iii) using financing for market development and supply chain relationship development, (iv) better understanding of dynamics of the market, retailer policies and management, and (v) that relationship development and management becomes a strategic initiative.

An international survey by Zuurbier (1999) indicates that vertical integration of supply chains and networks is expected to determine the structure of the food and agribusiness industry in the next decade, and this will affect the relative competitiveness of industries. The most important driving forces are expected to be technology, consumer behaviour and multinational companies.

Supply chains are thus viewed as one of the most important concepts in the future of the food and agricultural industries' relative competitiveness. The real measure of supply chain success is how well activities are coordinated to create value for consumers while, at the same time, increasing the profitability of every link in the supply chain, from seed to end user (Wysocki, 2000). Measuring the relative competitiveness and the comparative advantage of an industry will also give a good indication of the success in the supply chain.

Many methods exist for the evaluation of comparative advantage and relative competencies in certain agricultural industries. According to Esterhuizen and Van Rooyen (1999) a variety of methods have been developed and used by

researchers to measure competitiveness. They identified two methods from an ISMEA (1999) study to determine the competitiveness of European Union food chains in a global environment, namely the Porter approach and the competitiveness indicators as originally developed by Balassa (1989), as quoted by Esterhuizen and Van Rooyen (1999). The Relative Revealed comparative Trade advantage (RTA) index is used in this study to determine the competitiveness of the South African oilseed industry.

1.3 Objectives

The primary objective of this study is to investigate the relative competitiveness of the South African oilseed industry in an effort to improve efficiency, so that opportunities that exist can be exploited. In order to reach the primary objective several secondary objectives need to be met, namely:

- Obtain an overview of the current production and trade situation of oilseeds globally and in South Africa;
- Gather descriptive statistics of the South African secondary oilseed industry;
- Analyze the comparative and relative competitive advantage of the oilseed industry in South Africa
- Make recommendations in terms of how the relative competitiveness of the South African oilseed industry can be improved.

1.4 Methodology

The comparative advantage and relative competitiveness of the South African oilseed industry were measured by applying three indexes i.e. the: Revealed comparative advantage (RCA), Net Export Index (NXI) and the Relative Revealed Comparative Trade advantage (RTA) index.

The methodological approach closely resembles that of a cluster study. This entails, amongst other methods, the use of questionnaires (see Appendix A) to

obtain information from South African oilseed crushers and refiners who are members of the South African Oil Processors Association. Industry institutions have been evaluated in such a way that their efficiency, as well as the strong points, weak points, opportunities and threats are revealed.

1.5 Data used

In accordance with the objectives above it was necessary to administer a questionnaire to gather information for descriptive statistics of the South African oilseed industry. This information, together with information from the Food Pricing Monitoring Committee (2003) was used for this study.

To analyze comparative advantage and relative competitiveness in the South African oilseed industry, information from the FAO (2004) was applied to the RCA, NX and the RTA index.

1.6 Chapter outline

The rest of the study is divided into the following chapters:

Chapter 2 comprises of a literature review, describing the factors affecting the competitiveness of an industry. The challenges faced by agribusinesses, as well as the key concepts to meet these challenges are also discussed in this chapter.

Chapter 3 provides an overview of the international and local oilseed industry.

In Chapter 4 the comparative advantage and the relative competitive performance of the South African oilseed industry is analyzed.

Chapter 5 provides descriptive statistics of the South African oilseed industry gathered through the questionnaires and by the Food Pricing Monitoring Committee.

Chapter 6 concludes with a summary and recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In today's ultra-competitive world, an optimized supply chain is perhaps the only sustainable advantage for most businesses or industries (Strategicsystems, 2004). Porter (1990) stated that productivity of a nation is the most important factor for competitiveness, but that is not all that is needed to make a nation internationally competitive. According to Dunne (2001) there is no doubt that the competitive environment in which agribusinesses firms operate has changed. Handfield and Nichols (1998) also stated that we have entered a new era in understanding the dynamics of competitive advantage and the role played by procurement. Dunne (2001) quoted Johnson (1998) who said: "someone moved the cheese", and according to Porter (1990) a need for a new paradigm for competitiveness has to be developed to handle this changes occurring. Dunne (2001) identified supply chain management as an important way that can be used to "find new cheese".

The chapter starts with a discussion of competitiveness as seen by Porter (1990). Dunne (2001) identified supply chain management as an important way to help improve the competitiveness of an industry. Supply chains and their functions are therefore discussed in detail. The challenges faced by agribusinesses as well as the key concepts necessary to overcome these challenges are discussed in the last section before the chapter is concluded.

2.2 What is competitiveness at national level

A nations' goal is according to Porter (1990) to be more productive, but countries can't only compete on comparative advantage. The fact that a country has good

production factors doesn't make it competitive anymore, and this is mainly because of technology. Technology let industries operate in a more sophisticated way, and create new alternatives.

The standard theory of comparative advantage has diminished in relevance, especially in sophisticated industries. Nations can't afford to only compete on price and commodity markets anymore, regardless how good their factors of production are. According to Porter (1990) competitiveness at national level depends on:

- Product quality and features (determine prices).
- Efficiency with which products are produced.
- Capacity to compete in sophisticated industries.
- The upgrading of the competitive position.
- Move from competing on price and quality to higher margin levels.
- Productivity leads to high wages, low inflation.

Competitiveness is not a low currency, economic growth, trade surplus and jobs, but productivity and the mix of trade (imports of low valued goods and exports of high valued goods).

According to Porter (1990) the need for a new paradigm has to be developed for competitiveness because of the changing environment. The nation must be viewed as a platform for a global strategy, not the place where all firms' activity take place, but only a home base where all the activities start. Competitive advantage results from rapid innovation and improvement, not static advantages. Innovation includes both technology and methods, and sustainable competitive advantage requires the relentless broadening and upgrading of markets over time. Porter (1999) stated that early movers often become international leaders.

The determinants of a nations' competitive advantage are illustrated in Figure 2.1.

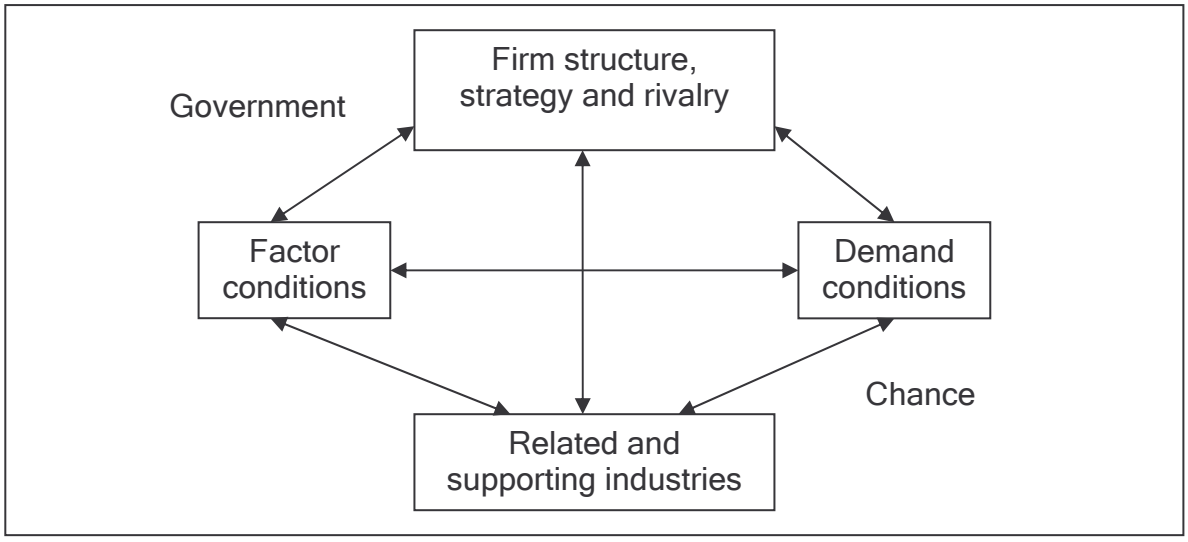

Figure 2.1: Determinants of national competitive advantage (Porter diamond)

Source: Porter (1990)

According to Porter (1990), **factor conditions** refers to inputs used as factors of production. These factors include labour, land, natural resources, capital and infrastructure. The fact that a country has good non-key factors such as unskilled labour and raw materials do not generate sustained competitive advantage as it can be obtained by any company. However, specialized key factors including skilled labour, capital and infrastructure, are more difficult to duplicate, and this leads to a competitive advantage. These key factors of production are according to Porter (1990) created, not inherited.

Demand conditions are an important factor to help and produce competitiveness. A sophisticated domestic market pressures a company or nation to sell superior products. The fact that the market demands high quality and close proximity enables the companies to better understand the needs and desires of the customers. If the nations' discriminating values spread to other countries, then the local firm will be competitive in the global market.

Porter (1990) stated that a set of strong **related and supporting industries** is important to the competitiveness of firms. These industries include suppliers and related industries. According to Porter (1990) the phenomenon of competitors (upstream and/or downstream industries) located in the same area is known as

clustering or agglomeration. Porter (1990) also indicated a number of advantages to be located close to rivals:

- Potential technology knowledge spillovers;
- An association of a region on the part of consumers with a product and high quality and therefore some market power, or
- An association of a region on the part of applicable labour force.

There are also some disadvantages identified by Porter (1990) to be located close to rivals:

- Potential poaching of your employees by rival companies, and
- Obvious increase in competition possibly decreasing mark-ups.

Firm **strategies** in the domestic capital market affect the competitiveness of firms. According to Porter (1990) countries with a short run outlook will tend to be more competitive in industries where investment is short-term, and countries with a long run outlook will tend to be more competitive in industries where investment is long term. Individuals base their career decisions on opportunities and prestige. Porter (1990) stated that a country will be competitive in an industry whose key personnel hold positions that are considered prestigious.

Porter (1990) illustrates firm **structure** with management styles which vary among industries. Some countries may be oriented toward a particular style of management. If the management style suite the country this country will tend to be more competitive in industries.

Local **rivalry** spurs innovation, which is needed for sustainable competition. International competition is not as intense and motivational. Porter (1990) stated that with international competition there are enough differences between companies and their environments to provide handy excuses to managers who were outperformed by their competitors.

Porter (1990) emphasizes the role of chance in the model, and random events can either benefit or harm a firm's competitive position. These events can be anything like major technological breakthrough or inventions, acts or war and destruction, or dramatic shifts in exchange rates.

According to Figure 2.1, government also plays an important role. Porter (1990) argues like everybody else that there are some things that governments do that they shouldn't, and other things that they do not do but should. He says, "Government's proper role is as a catalyst and challenger, it is to encourage – or even push companies to raise their aspirations and move to higher levels of competitive performance…" Porter (1990) stated that all four determinants illustrated in Figure 2.1 can be influenced through a variety of governmental actions such as:

- Subsidies to firms, either directly (money) or indirectly (through infrastructure)
- Tax codes applicable to corporation, business or property ownership;
- Educational policies that affect the skill level of workers;
- They should focus on specialized factor creation
- They should enforce tough standards

2.3 Supply chain

Much research has been conducted on supply chains, and it has been defined in many ways. Christopher (1992) defines a supply chain as a network of organizations linked through upstream and downstream processes and activities to produce value in the form of products and services. Darroch (2001) defines a supply chain as activities associated with the flow and transformation of goods from the raw material stage (extraction), through to the end-user, including associated information flows (Handfield & Nichols, 1999).

Figure 2.2 illustrates Porter's Value chain, and according to him a firm's ability to create superior value for its customers – its competitive advantage, is determined by how successful it is in melding its support and operational activities.

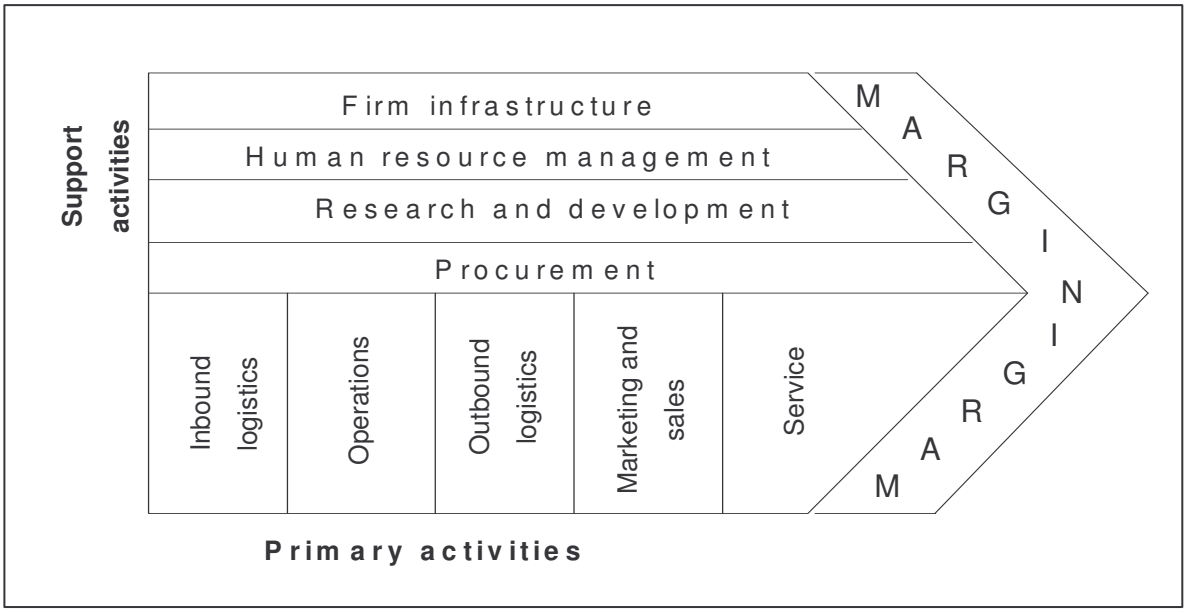

Figure 2.2: Porter's Value Chain

Source: Porter 1980

As stated by IFC (2003) the generic oilseed supply chain comprises commercial entities. These entities include farmers, processors of crude and refined vegetable oils, wholesalers, retailers and chemical and food service companies. All of these entities reflect important stages of vegetable oil production, and the interaction between these entities is illustrated in Figure 2.3 (IFC, 2003; Darroch 2001).

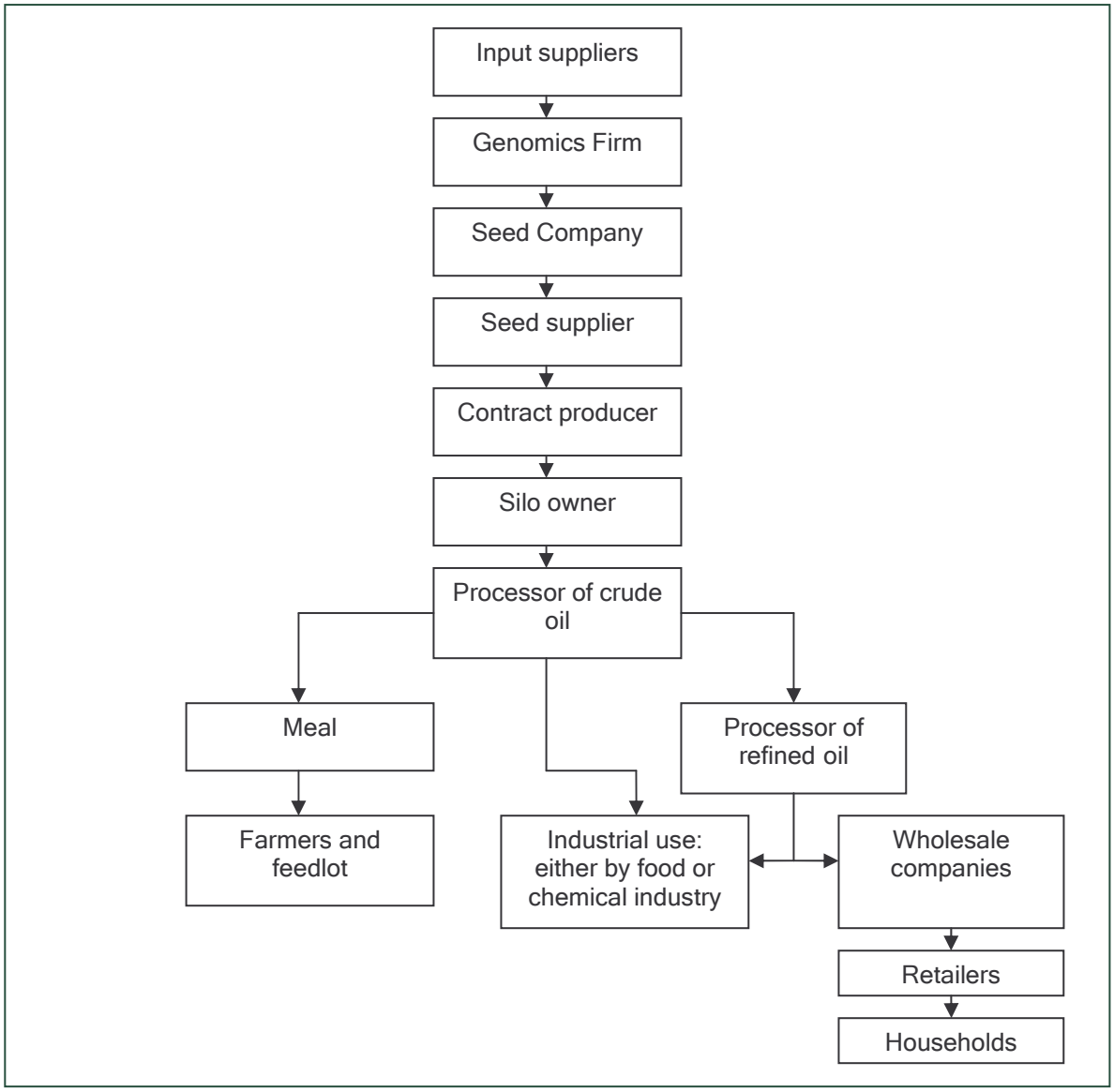

Figure 2.3: Supply chain of oilseeds
Source: IFC (2003) and Darroch (2001)

According to Darroch (2001) materials and information flow both up and down a supply chain. The main elements of a supply chain vary by industry and over time. The makeup of a supply chain can also change over time as firms consolidate, strive to increase operational efficiency, or respond to demand for new products and services by other firms and consumers.

Darroch (2001) reported that a firms' supply chain is embedded in the industry supply chain, implying that players have upstream suppliers and downstream

customers or allies. A player's ability to compete in end-user markets, therefore, may depend not only on that player's own supply chain, but also on how suppliers and downstream players operate their supply chains. Darroch (2001), also states that current supply chains need to "do things right" and focus on reducing costs, inventory levels, and cycle and lead times, improve customer service and develop new products and services. Working across multiple enterprises or companies (inter-enterprise) to find means of shortening the time of delivery of goods and services from the producer to the consumer (see Figure 2.3), is needed to make the supply chain more economically competitive.

2.4 Challenges faced by industries

KPMG (2005) states that, as the pace of a business accelerates, the impact of increased global competition, new technologies, changing regulations and consumer pressures presents food and drink manufacturers with a stream of challenges which consist of obtaining cost efficiencies in supply chains and overheads to maintain cost margins; investment and improvement in new product development. KPMG (2005) identified other challenges faced by industries:

- Extending **information technology** beyond the supply chain to increase competitive advantages;
- Shifting balance of **power to retailers**, who drive price reductions and make increasing demands for promotional support and higher levels of service;
- Increased **competition for smaller companies** in an environment where scale can help ease many competitive, legislative and reputation pressures;
- Maintaining **consumer loyalty** by achieving returns from ever-increasing promotional budgets and consumer demands for quality, choice and convenience;
- Preserving reputations as investors and **consumer demand** for non-financial information increases;

- **Growing concern about health** among consumers and increasing regulations, such as the European Union's proposed law on Genetically Modified Food (GMO) labelling.

According to Darroch (2001) business and academic discussions about current agribusiness issues in South Africa are increasingly focussed on ways to improve the performance and competitiveness of current food and fibre supply chains, and on exploiting opportunities using new supply chains.

Darroch (2001) identified three key challenges faced by agribusiness supply chains in South Africa beyond the year 2000:

- The need to manage the drivers of change;
- To build core competencies to form and manage supply chains, and
- To overcome barriers to successful supply chain management.

The challenges identified by KPMG (2005) above makes it clear that these challenges fit into the need to manage the drivers of change, which was identified as a challenge by Darroch (2001). All three of the challenges identified by Darroch (2001) are discussed in the following section.

2.4.1 Drivers of change in the agribusiness sectors

According to Thomson and Strickland, (1998) drivers of change in an industry are the major underlying causes of a changing industry and competitive conditions. Boehlje et al. (1995) claim that the changes have a dramatic impact on the management of an agribusiness firm because they effect the competitive environment of the firm and influence the way in which the management of the firm will reorganize its internal resources to meet their challenges. The drivers of change identified by Darroch (2001) are as follows:

- Increasing globalization

- Changing client needs
- Changing social concerns and lifestyles
- Increasing urbanization
- A growing population and growing unemployment
- Technological change
- Changes in government policy

PWC (2005), identified challenges faced by food and beverage companies:

- Challenges from the industry
- Challenges from consumers
- Challenges from governments

With reference to the challenges identified by Darroch (2001) and PWC (2005) it is clear that these challenges are relatively similar and are discussed in more detail below.

2.4.1.1 Challenges from the industry

a) Changing client needs

According to PWC (2005) companies at the retail end of a chain are establishing new and stringent product identification standards that suppliers must meet if they are to continue selling their products. Darroch (2001) says that smaller farms and agribusinesses can effectively service niche local and export markets, like organic products and premium fruit and vegetables, to satisfying new client needs.

Producer-driven and buyer-driven chains consist of many players, including producers, branded manufacturers, retailers, designers, distributors and traders. What differentiates a producer-driven chain from a buyer-driven chain is the location of relative power within a given chain. According to Gereffy (2001)

manufacturers play a central role in coordinating production networks in a producer-driven chain while, in a buyer-driven chain, large retailers, marketers and branded manufacturers play the pivotal roles in setting up decentralized production networks.

According to the Global Supply Chain of the vegetable industry (2000) there is a strong perception that producer-driven chains dominate in industries with vertical structures, while buyer-driven chains characterize industries with horizontal structures. However, this is not the case in the vegetable oil industry as a whole. Despite this industrys' vertical structure and lack of a decentralized production network, the relative power within the vegetable oil chain is located in the retailers. Food processors do however receive profits three points higher than the rest of the manufacturing sectors (Connor & Schiek, 1997). This can be due to the vertical structure of the industry.

b) Technological change

According to Van Rooyen, Esterhuizen and Doyer (2000) technology is viewed as one of the major factors determining the competitiveness of an industry. Broderick (2005) states that technology can be used to overcome the challenges faced by smaller players in the food and drink sector. In a recent analysis conducted by Van Rooyen *et al.* (2000), 79% of South African agribusinesses interviewed (sample = 40) indicated that the level, cost and access to technology influenced their competitiveness status.

Technology facilitates the functioning of a business or company in terms of:

- Delivery (technology enables sales orders for goods that are out of stock to be taken and purchase orders being placed for these products automatically, without the need for any manual intervention);
- Labelling (technological advances enables information from control sheets to be transferred automatically);

- Technological aids reduces time spent on and cost of order collection, input and administration;
- A wider choice and range of products can be offered to consumers;
- The Internet can help suppliers to source new products, or enable quicker new product development for manufacturers.

According to Broderick (2005) technology must support three key stages in order for the supply chain to work efficiently:

- There must be effective and accurate capture and transfer of lot/batch information at each point of receipt and despatch of produce;
- A clear audit trail must exist through the production process, in order for control and traceability to be maintained;
- The recording and transfer of lot/batch information for processed goods must be supported between the manufacturers' systems, through the supply chain, to the customers' systems.

2.4.1.2 Challenges from government

a) Increasing globalization

According to Dunne (2001) there has been a drive to liberalize world trade through the reduction of tariff and non-tariff barriers that individual countries have imposed to protect their domestic industries. The principal instrument in the fight for trade liberalization has been the General Agreement on Tariffs and Trade (GATT).

Darroch (2001) stated that lower trade barriers and the ability of well-resourced multinational firms to transfer technology, marketing and management know-how from country to country at relatively low cost have led to increased global competition.

b) Changes in government policy

Van Rooyen (2000) states that agricultural production, trade policy and practice in South Africa have changed dramatically over the past decade and, according to Darroch (2001), changes in policy can lead to major changes in industry structures and business strategies.

The deregulation of marketing of agricultural products in South Africa since 1996 has, according to Darroch (2001), created a much wider range of marketing alternatives for a number of commodities. The new Marketing of Agricultural Products Act, No 47 of 1996 provides a set of rules that differs greatly from earlier legislation and the former interventionist approach applicable to agribusiness. According to Van Rooyen *et al.* (2000), these changes require that farm producers and agribusinesses have to position themselves as business-driven competitors in a less controlled global trading environment.

2.4.1.3 Challenges from consumers

a) Changing social concerns and lifestyles

Consumer well-being and health is an important external factor influencing the global oilseed market. According to Hughes (2004) consumers are more knowledgeable as a result of higher training, education and better access to information (radio, television, programmes, etc.), and this refines the consumers' perspective on diet and health.

The world's population is ageing, and consequently the search is on for an elixir. Society in general has become more health conscious, mainly because of the rising personal cost of healthcare and the importance of the "looking good" concept as propounded by the media.

Other consumer considerations that have been brought about by information, are concerns about food safety and the impact of food production on the environment. Natural, organic and vegetarian foods have become important issues in today's market.

According to Hughes (2004) the trends discussed above confirm that the world's population is becoming better educated and informed, household numbers are increasing as the household sizes decreases and increasing numbers of women participate in the labour force, resulting in dual-income households. These factors lead to a demand for more convenient food. The increasing pace of life leads food manufacturers to offer "ready meal" solutions. These meal solutions can be categorized as ready-to-cook (e.g. raw ingredients), ready-to-prepare (e.g. pasta and sauces), ready-to-heat (e.g. ready meals) and ready-to-eat (e.g. takeaways).

Food has become more than a mere necessity. It has become a luxury, a matter of pleasure and status. The environment, animal welfare and fair trade have become issues. Information on the culinary preferences of different ethnic groups has increased because of media exposure (TV chefs) and travel, and consequently restaurants flourish.

b) Increasing urbanization

According to Rand Organization (2000), accelerated population growth in developing countries and slower growth in developed countries, combined with widening economic disparities between developing and developed countries, are increasing the pressures of migration from the less-developed to the developed world. Figure 2.5 indicate that on a smaller scale, increasing numbers of people in developing countries are relocating to urban areas (Hughes, 2004) (Figure 2.5). The main reason for this is their search for more and better education and employment opportunities.

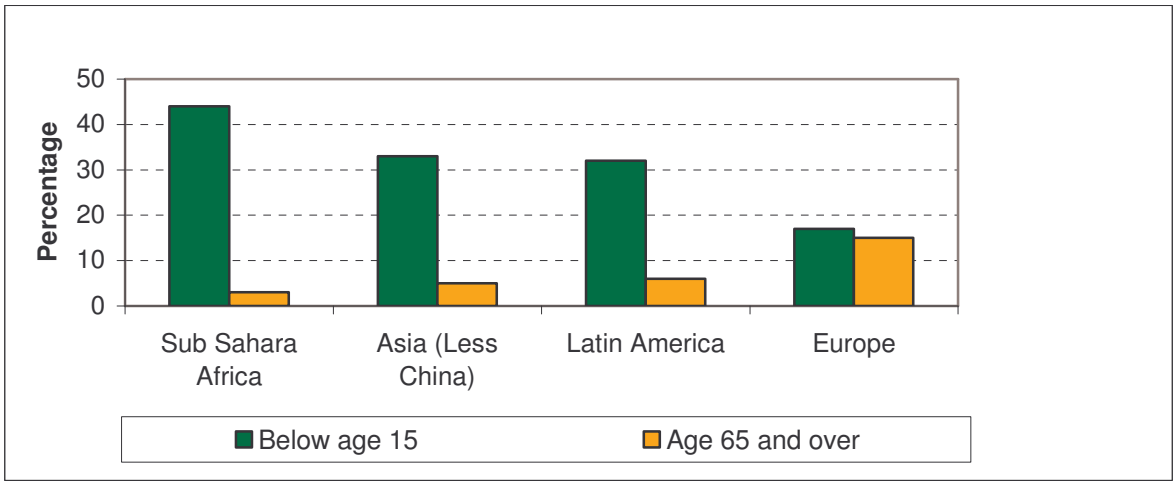

Figure 2.4: Percentage of population ages in four different continents (2003)
Source: PRB (2004)

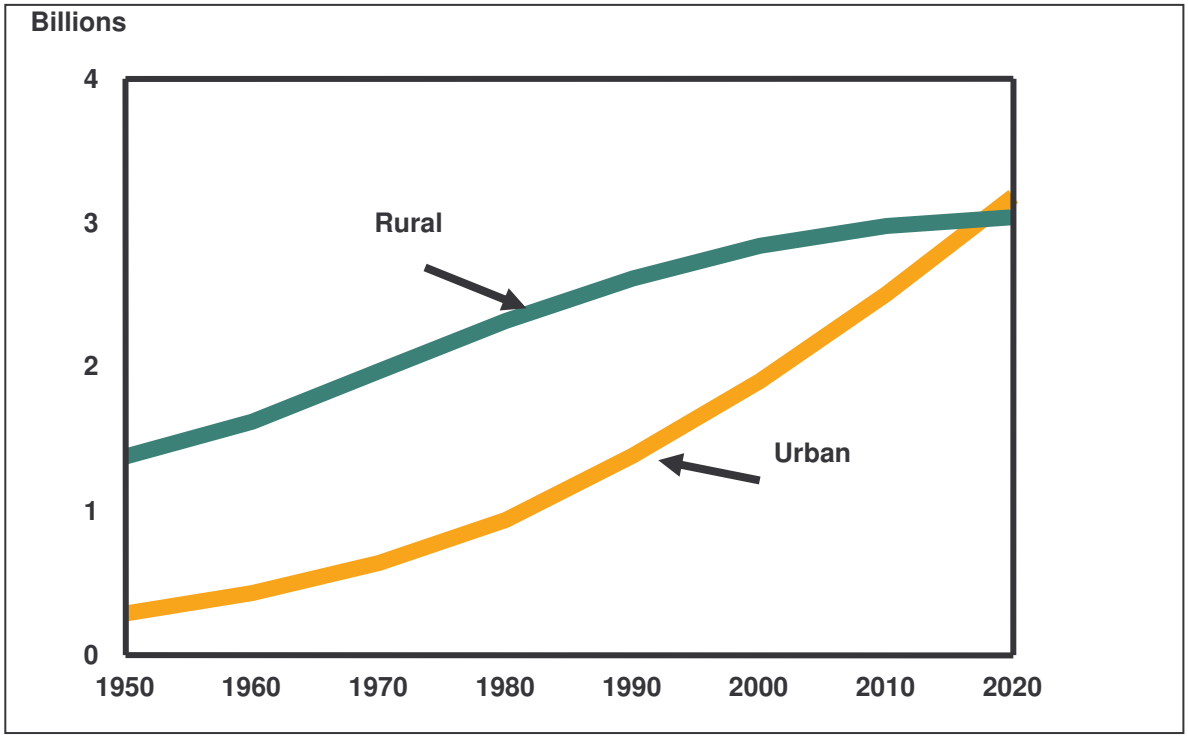

Figure 2.5 Movement of people from rural to urban areas (1950-2220)
Source: Hughes (2004)

c) A growing population and unemployment

According to KLM (2003) the prediction in 1960, that the world's population of 6 billion people would increase to 12 billion in the 1990s, has been revised. A

population of 9 billion is predicted for 2050, and a decline of 500 million is expected in 2075.

Furthermore, KLM (2003) identifies a number of interconnected sets of reasons for fertility rates in many countries declining, including:

- The availability of contraception, which has allowed women to achieve higher levels of education, enhanced opportunities for employment, and greater individual financial independence;
- The trend toward urbanization, which makes it more difficult for a family to support more than one or two children; and
- Governmental initiatives to limit family size in countries like China and Iran.

The dynamics of global population growth differ dramatically for major regions of the world (Rand Organisation, 2000). The difference in the population growth in developed and developing countries are illustrated in Figure 2.6. From this it is clear that the growth of the developing countries was almost six times higher in 2000 than the developed countries' growth, and this gap is still widening.

As indicated by PRB (2004), developing countries in Africa and Asia will account for about 90% of the increase in world population projected by 2050, while the population of most developed countries will decrease. This is mainly due to the young age structure of developing countries compared with those of developed countries (Figure 2.4).

The size and number of households are declining (Hughes 2004). Household income is therefore increasing, but the gap between rich and poor is widening.

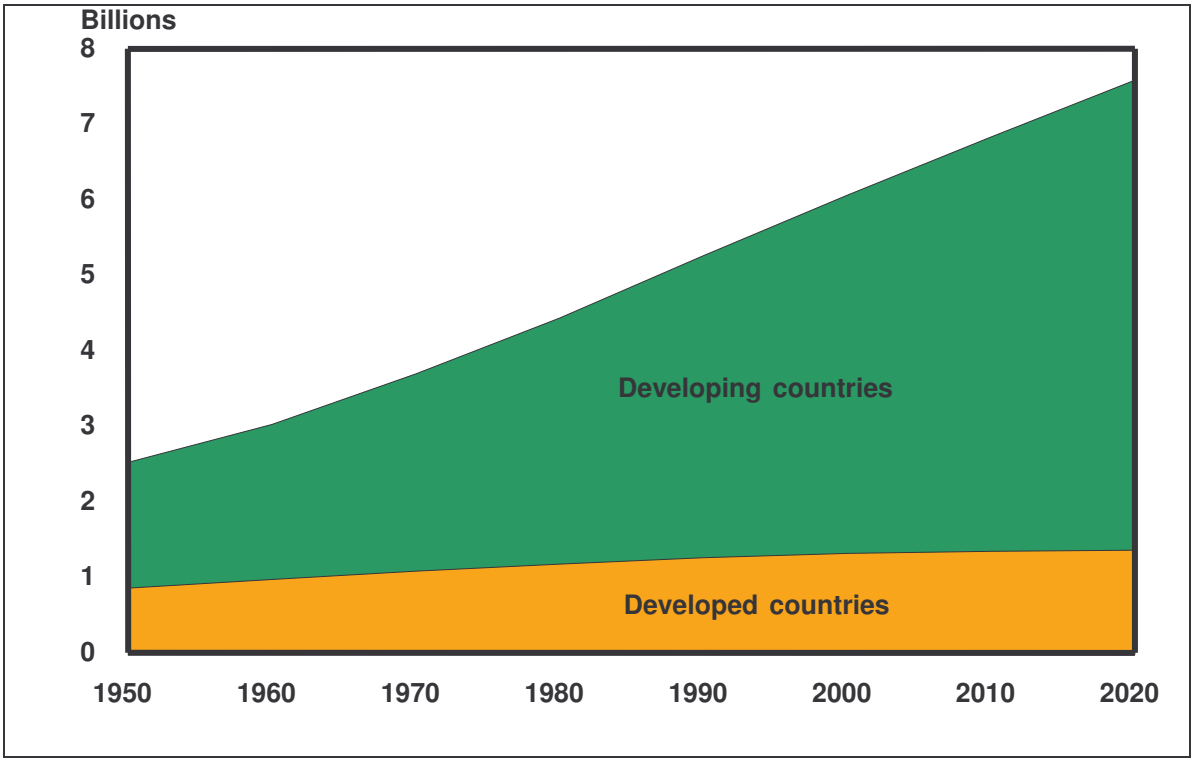

Figure 2.6: World populations, 1950-2020
Source: UN (2002)

2.4.2 Core Competencies

According to Darroch (2001) by building core competencies to more tightly align current supply chains and to form and operate tightly aligned new supply chains will help the managers of supply chains to respond to increasing global competition, to exploit new export and local market opportunities, to benefit from technology changes, and to better manage the expected impacts of regulatory and government policy changes.

Core competencies are the foundation from which competitive advantage can be built in the market. A core competence is therefore a collection of competencies that are widespread in the corporation (Prahalad and Hamel, 1990).

Figure 2.7 indicates how the value and difficulty of competencies increases from the different levels of a company.

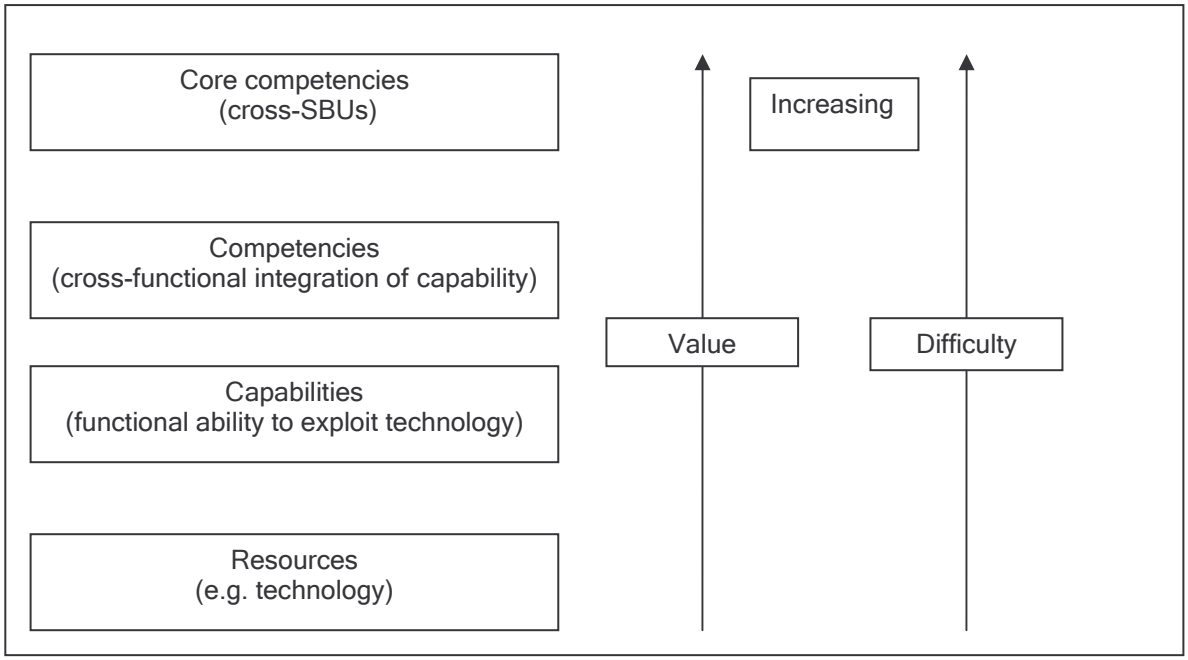

Figure 2.7: Hierarchy of competencies

Source: Prahalad and Hamel, 1990

According to Torkkeli *et al*. (2002) core competencies hold together a portfolio of seemingly unrelated businesses, and can thus be used as a base for diversification strategies. QuickMBA (1999) compared it to glue that bonds the business units together into a coherent portfolio. The success of diversification is linked with the ability to exploit or strengthen competitive advantage (Torkkeli et al, 2002).

According to Prahalad and Hamel (1990) core competencies have three traits: firstly they provide potential access to a wide variety of markets, secondly they make a significant contribution to perceived customer benefits and finally they are difficult for competitors to imitate (Prahalad and Hamel, 1990).

Just by looking at the traits of core competencies, it can be seen that they are vital for formulating a company's strategy. Without core competencies, competitive advantage is not sustainable and strategic intent is not attainable. In short, core competencies are corporations' fundamental strengths, i.e. things that companies do very well. Once these core competencies are identified, the executives can

examine possible opportunities for achieving new markets or making new products by appropriate new technology (Torkkeli et al, 2002).

According to Coombs (1996), there are three other factors that are potential inputs to core competencies. The first and the most important of these is the organizational structure. The second extra input is dynamic scale economies, which refer to the fact that core competencies have to be continually exercised in order for them not to atrophy. The third potential input is market knowledge (Torkkeli et al, 2002).

According to Prahalad and Hamel (1990), core competencies lead to the development of core products. Core products are not directly sold to end users, but used to build a large number of end-user products (QuickMBA, 1999). Figure 2.8 illustrates this concept in more detail.

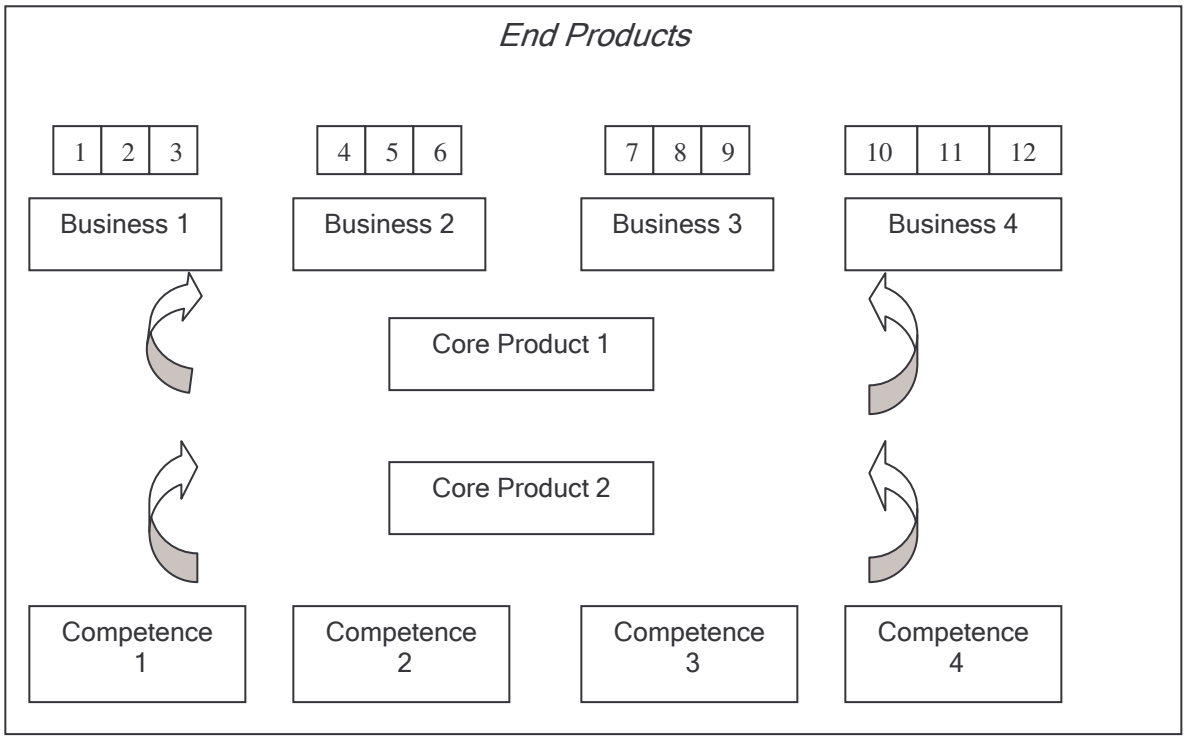

Figure 2.8: Core Competencies to End Products
Source: QuickMBA website, 1999

Agribusinesses must build an amount of core competencies to successfully operate, as already stated in the previous paragraphs. Darroch (2001) identified a number of core competencies important to the South African agri-businesses, and these specific competencies include:

- Focus on product and process development;
- Flexibility to meet changing customer demands;
- Fast response to end-user demands;
- Ability to customize goods and services to meet end-user demands;
- Ability to keep new products identity-preserved (separate) from commodity grade products;
- Continuous focus on cost control and improving operating efficiency;
- Risk management (e.g. using production contracts);
- Ability to improve logistics management (flow of materials into and out of the firm) and transport/distribution systems;
- Focus on holistic systems that integrate the whole supply chain;
- Emphasis on product and service quality and quality assurance (e.g food safety) along the supply chain;
- Emphasis on generating appropriate information for decision-making (e.g. product monitoring) and on information sharing;
- Skills in negotiation and joint-decision making;
- Relationship building and management, including developing cooperative/collaborative attitudes and perspectives;
- Capacity to trust chain partners, and to be trust-worthy.

From the number of core competencies identified by Darroch (2001), Van Rooyen *et al.* (2000) identified that a recent international survey by Zuurbier, (1999) indicated that vertical integrated supply chains and networks and trust relationships is expected to determine the structure of the food and agribusiness industry in the next decade. The most important driving forces is expected to be technology, consumer behaviour and multi national companies.

According to Darroch (2001) a lack of one or more of these core competencies creates constraints that South African agribusiness firms need to overcome in order to successfully run supply chains and manage the impacts of the key drivers of change.

2.4.3 Overcoming barriers to successful supply chain management

According to Darroch (2001) typical barriers to the successful formation and management of supply chains that must be overcome were based on the author's experience, Boehlje et al (1998), Van Duren and Saparling (1999) and O' Keefe (1998). A number of barriers were identified by these authors, but the four that stood out throughout, include:

- Lack of willingness to work together with other players
- Lack of potential added value to justify the costs of being a player in the chain
- Lack of communication and information flow across the players in the chain
- Lack of capacity to implement a supply chain and supply chain management concepts, due to inadequate organization structure, a lack of resources (including knowledge of new enabling technologies), support systems (e.g. information systems), and incentives to participate; a business culture that does not focus on a win-win situation for the players; lack of leadership and poor coordination of supply chain linkages

After evaluating which aspects of the above three key challenges – drivers, core competencies and key barriers – have the biggest impact on their supply chains, agribusiness managers must take appropriate action (Darroch, 2001). Key factors must be applied to supply chains to assist them to be more competitive.

2.5 Key concepts necessary to be competitive

In order to become more competitive certain key concepts must be applied. These concepts are vertical coordination, the development of quality, information and communication and lastly, supply chain management.

2.5.1 Vertical coordination

As defined by Webref (2004), vertical coordination is the process ensuring that each successive stage in the production, processing and marketing of a product is appropriately managed and interrelated to the next, so that decisions about what to produce, and how much, are communicated as efficiently as possible from the consumer to the producer. Mighell and Jones (1963) define it broadly as the use of various methods to manage vertical stages in a marketing channel.

Producers are independent by nature and are often reluctant to band together to promote their products better. This makes vertical coordination difficult (Hobbs and Young, 2001). Regulations, product characteristics, technology and the cost of conducting business are pushing producers toward more efficient ways of operation to maintain margins and to improve profitability (Hine and Umberger, 2002).

Vertical coordination can help producers to maintain their margins and improve profitability. According to Hobbs and Young (2001), vertical coordination may encompass different forms, including:

- mergers with another firm;
- joint ventures on a particular project for a certain duration;
- acquisition or purchase of another firm, or
- full integration, from the farm gate to the retail shelf.

The concept described in this section is particularly important in the food industry because of its complexity and the large number of firms that participate in one or more stages (Webref, 2004).

Vertical coordination can be divided into three basic types;

- Open production
- Contract production
- Vertical integration

Open production applies when a firm purchases a commodity from a producer at a market price determined at the time of purchase, but this kind of coordination is decreasing. Contract production applies when a firm commits to purchase a commodity from a producer at a price formula established in advance of the purchase (CBOT and the Agricultural Product Division (APD) on the Johannesburg stock exchange commonly referred to as Safex contracts). Vertical integration occurs when a single firm controls the flow of a commodity across two or more stages of a food production (Mighell and Jones, 1963), and because of its importance to this study is discussed in more detail below.

Vertical coordination changed from open production to contract production and vertical integration. Changes in vertical coordination and increased concentration in the food sector can enable a small number of firms to affect prices or other terms of trade. New information will be needed to monitor the food industry concentration accurately. Environmental issues are also important, but are not discussed in this study. Because of the changes mentioned in this paragraph, new technological and policy solutions are of great importance (Martinez, 1996).

Vertical integration, one of the basic types of vertical coordination, can be defined as the extent to which a firm is actively engaged in different stages of the product transformation process (Zagra, 1993).

In order to achieve efficiency and reduce uncertainties related to suppliers, companies undertake several production activities by themselves. Another reason for applying vertical integration is to reduce market-related uncertainties by controlling distribution channels that could be used to facilitate new product introductions (Spaulding and Woods, 2003). Self-reliance and self-efficiency are the results of vertical integration (Spaulding and Woods, 2003). Early introduction of new products is enhanced and risk of failure reduced by using vertical integration (Spaulding and Woods, 2003).

A US case showed that closely integrated value chains lead to many improvements in agriculture food-value chains. This case showed that integration can lower costs by improving productivity, improve and ensure quality throughout the chain, control risk associated with markets and food safety, and enhance responsiveness to demand (CAST, 2001).

As observed by Dobashi and Fallon (1999) there are three levels of integration in the poultry industry:

- *Non-integrated firms*

  These firms tend to act as individual business units. Non-integrated industries are likely to be found in developing countries. A small subsistence farm producing poultry merely for the needs of the farm household would be an example of a non-integrated firm.

- *Semi-integrated firms*

  This involves the processor taking over some parts of the production process to control the quality and quantity of output. In the broiler industry, a firm rearing the poultry may also be involved in the production of parent stock or in running the hatchery operation.

- *Integrated-large corporate entities*

  These entities control all levels of the value chain, from feed milling to delivery at the retail level.

There are differences across countries in the way integration arrangements operate, but typically integration displaces the decision making authority from the farmer to the downstream producer or processor, turning farmers into quasi-employees (Reardon & Barett 2000).

According to Berlin (2001) transaction cost and increasing competition are the two main reasons for the emergence of vertical integration, and these two factors are discussed in the following paragraphs.

The more unpredictable the operating environment of the industry, the greater transaction costs is likely to be. A change in the exchange rate will require a response by a producing firm using imported inputs. Adapting to the exchange rate change will have implications for other firms being dealt with. Efficiency losses may result from firms bargaining about who should bear the burden of the change in the industry's environment, rather than using the resources for more productive activities (FAO, 2004).

Transaction costs can arise if a product is not standardized. In most industries, a variety of features give rise to differences in quality. The producer wanting to guarantee access to his/her inputs can, for example, deal with this by backwardly integrating with a firm supplying the specific inputs. The case for this action will be strengthened if the costs of integrating are lower than the transaction costs incurred by not integrating. In countries where the legal system is well developed, producers can rely on the legal system rather than integrating with their input suppliers to ensure the quality of their inputs (FAO, 2004).

The gap in market power is widening between buying entities and food suppliers, and the bargaining power has shifted to buyers (McCluskey & O'Rourke, 2000). The above scenario increases the risk of replacing one supplier much easier with another if not satisfied. Quality, price and service are important factors for suppliers. Small suppliers have difficulty to match the prices of larger suppliers. Furthermore the capital needed to upgrade facilities and technology to new demands of the system, such as those relating to food safety, and competing in branded advertising will be more troublesome to small than to large suppliers.

2.5.2 Developing quality in food supply chains

According to Marsden (1998) quality food production can be viewed as a means of bypassing the competitive margin-based "race to the bottom", by the agro-food sector targeting specific quality and premium price markets. A "race to the bottom" is said to occur when competition between nations (over investment capital, for example) leads to the rapid dismantling of regulatory standards (Word iQ, 2004).

According to Banks and Bristow (1999) trade liberalization through the WTO and the slow reform of the Common Agricultural Policy (CAP) in the European Union (EU) is increasingly positioning farmers and the food industry within a global marketplace. Within this competitive environment, they suggest solutions for the problem of securing the future viability of peripheral regions. These solutions appear to look away from the uncertainty of internationally prescribed forms of institutional support, and towards market-based solutions grounded in the provision of speciality and quality of products.

At present, issues surrounding food quality are becoming increasingly prevalent for two main reasons. Firstly, steadily rising incomes in most advanced industrial countries has lead to the availability of more high quality food and a bigger variety of food. This increase in demand for better quality was recognized by retailers, and through exercising their "due-diligence" obligations, they have been able to displace quality concerns down through the supply chain to processors and

farmers (Flynn, Marsden & Ward, 1994). Secondly, food safety and health concerns sensitise consumers regarding the ways by means of which food is produced and processed (House of Commons Agriculture Select Committee, 1998). These food safety and health concerns exerted pressure on all role players in the supply chain, forcing them to continually improve standards of production, processing and marketing (Banks and Bristow, 1999).

In the context of concern for quality, the provenance of food becomes important, for it is often assumed that 'locally produced' food is of a higher quality (i.e. it is "safer") than "global" food (Nygard and Storstad, 1998). Such assumptions can be orchestrated if a local area or region produces a series of recognizable foodstuffs, encoded in trusted brands. However, while some areas are noted for their distinctive foods and application of marks of local quality and provenance, other areas lack the most basic consumer association with quality. This reflects both the predominance of conventional notions, productivity supply chain linkages in certain regions, and the challenges of changing entrenched production practices and development (Wilkinson, 1997).

According to Banks and Bristow (1999) parts of Wales was threatened by low value-added commodity supply chains. In order to explore opportunities of and constraints on quality food development, Banks and Bristow chose to contrast mainstream and premium (organic) models of supply chains. Their study found that there were a number of positive influences encouraging the wider adoption of production and processing quality in commodity-based agro-food supply chains. The rise to dominance of corporate retailers has ensured that quality concerns are being encouraged throughout the supply chain, as a minimum requirement for market entry and not merely as a token response to consumer concerns. In addition, this concern for quality is being enforced increasingly by new regulatory mechanisms for total quality assurance and traceability of food products from "farm gate to plate".

For economic sustainability, quality agricultural production must be backed by the assertion of product differentiation (Banks and Bristow, 1999).

2.5.3 Information and communication technology

Information and communication technology are critical factors in supply chain coordination and integration. Electronic communication links can improve coordination between firms due to the decreased costs of communicating and processing information. This so-called communication effect enables firms to take advantage of electronic coordination in two different ways. By using electronic links to reduce the costs of searching for appropriate goods and services, firms can achieve an electronic brokerage effect. Furthermore, by using electronic links to reduce the cost of tightly integrating a particular buyer and seller, firms can achieve an electronic integration effect. Firms can benefit from applying both types of electronic coordination mechanisms to improve supply chain coordination and integration by the development of electronic markets and electronic hierarchies (Van de Velde, 2002:7).

The benefits companies gain by sourcing through an electronic market, created when information systems serve as intermediaries between buyers and sellers by using information technology (IT), include:

- Reduced transaction costs, due to lower costs of searching, information sharing and monitoring, and increased standardization.
- Improved pricing, due to increased market competition and economies of scale available to producers as a result of aggregating demand.
- Improved decision making, due to increased visibility of real supply and demand.
- Increased supplier innovation, again due to increased competition.

While electronic markets provide certain advantages to both buyers and sellers, companies, as they focus on higher-quality products, increased customer

satisfaction and business re-engineering, also experience opportunities presented by electronic inter-organizational value chains for improving their competitiveness in vertical markets (Wingand and Benjamin, 1995). Thus the need for closer coordination of supply chain activity increases as buyers and sellers are motivated to move away from open competitive markets toward greater inter-organizational integration (Van de Velde, 2002).

If a firm does not adopt IT, costly disadvantages could result, because information that provides competitive advantage serves as a strategic resource (Sonka, Hofing & Shangnon, 1988). The differences in consumer demand for functional and innovative products call for different supply chain management approaches, including how to use IT in chain operations (Salin, 1998). For example, a supply chain manager for a product could reduce cost of the operations along the chain. Production, transportation or inventory management are the same essential functions that are well-suited for management by IT systems aimed at cost-reduction. For an innovative product, the chain manager should focus less on costs and more on delivering the attributes that consumers desire (Salin, 1998).

According to Salin (1998) agri-food supply chain managers must concern themselves with the control of food quality and safety, and with the potential for weather-related supply variability. Food safety issues go hand-in hand with supply chain choice, and proper monitoring and response to food safety problems require the ability to trace back small lots from retail to processor or even to the farm. The traceability of these products can be managed by good IT systems (Salin, 1998).

Raw material costs are not easy to control, and perhaps not even predictable. Firms might respond by focusing attention on improving distribution, where costs can be controlled to a greater extent; or firms can form alliances with suppliers who can deliver goods even during times of relative shortage. Supply unpredictability also causes managers to focus on improving their understanding of commodity markets using a variety of information sources from outside their firms, including government-provided information (Salin, 1998).

Seasonality of agricultural production, particularly for crops, can affect supply chain approaches. No amount of IT investment could eliminate a business' need for extensive storage or products that are highly seasonal (Salin, 1998).

Continuous information exchange helps to cement relationships, as firms in close partnerships open their books to each other. Information sharing enables firms to identify which partners perform the required functions at the lowest cost; then efficiencies along the entire chain can be enhanced by moving activities to the least-cost partner (Salin, 1998).

The changes in economic concentration along the supply chain complicate management, because many options for partnering are possible. It is physically difficult to maintain close relationships with many suppliers or many retailers. Processors tend to offer electronic links to their largest retail customers. Good IT systems in agri-food can generate information that will bring competitive advantages to the entire supply chain, to the extent that information is shared. Information sharing along the chain helps to lock in selected partners. A food retailer can use its advantage to pressure suppliers, or alternatively, they can work towards improving performance of the entire farm-to-retail chain. IT is a valuable tool for creating a supply chain that is capable of rapid response, but it has its limits (Salin, 1998).

According to Fearne and Dedman (2000), it is not what one knows that gives one a competitive advantage, but how information is interpreted and used strategically to drive innovation and efficiency.

2.5.4 Supply chain management

As stated by Balsmeier and Voisin (1996), supply chain management is a strategy that integrates various organizations' objectives in order to increase the efficiency of the entire supply chain. Koch (2002) defines it as a combination of art and

science that goes into improving the way a company finds the raw components it needs to make a product or service, manufactures that product or service and delivers it to customers.

According to Braithwaite (2002) the value of supply chain management always starts with customers. Customers demand shorter times to market for new products, lower stock, obsolescence and cash commitments and lower unit costs of purchasing and manufacturing. At the same time, and with no compromise, they want increasing variety and choice, wider distribution and increased customer and market responsiveness: the best of all worlds. This wish list is universal to all manufacturing industries; it is only the emphasis that varies according to a specific marketplace.

By using supply chain management as a strategic variable, firms can be freed from trying to balance the relationship between profitable growth and customer satisfaction (Spaulding and Woods, 2003). Coordination of efforts through supply chain management will enable firms to meet customer wants cheaper, faster and better, thereby achieving the desired financial performance (Spaulding and Woods, 2003). When all functional areas work together, companies can increase revenues, control cost and achieve customer satisfaction (Spaulding and Woods 2003).

Supply (chain) management is often trivialized as the strategy of focusing on core competencies, reducing the number of suppliers, and developing strong partnerships built on shared information and trust with the surviving suppliers. This oversimplification neglects what supply chain management is really about, namely, choosing, developing and nurturing the appropriate type of relationship with each supplier (Van de Velde, 2002).

At product of service level, an organization basically has only one of two strategic supply chain management objectives:

- Product cost reduction, and
- Customer value improvement

Product cost reduction can be realized by lower production costs, improved conformity to quality, material or location substitution, and lower transaction costs, such as inspection costs, vendor search, evaluation and monitoring, and general communication with suppliers. It is also argued that only the last mechanism, the reduction of transaction costs, could yield a sustainable competitive advantage, as the first three are easy to imitate (Stuart and McCutcheon, 2000).

The second strategic objective, improving customer value, is strongly connected to technology. Indeed, having and securing proprietary access to technological innovations is a product-market combination critical for being able to add customer value, reduce costs, and ultimately improve one's competitive position (Van de Velde, 2002).

Since the core of any business strategy is the customer value proposition, it should therefore also be the core of any supply chain management strategy. Organizations have three tasks, which can be performed in different ways or combinations, as identified by Treacy and Wiersema (1995):

- operational excellence,
- customer intimacy, and
- product leadership

It is relevant and useful to analyze a number of supply chain management aspects and vertical linkages, stipulated in the paragraphs above, with the perspective of a broader agricultural industry. Such an industry perspective is made essential by increasing globalization of markets and a greater need for high performance of vertically linked supply chains in order for a national or regional industry to be competitive in the dynamic markets of the modern world (Ricks.*et al*, 1999).

According to Ricks et al (2000) effective supply chain management involves:

- efficient linking and coordination of several vertical levels,
- partnering between industry suppliers and customers,
- the need to plan strategically to develop successful supply chain management aspects, and
- setting goals for improved customer satisfaction, improved performance, and improved competitiveness of the vertically linked system

Accomplishing effective supply chain management to serve modern customer needs is especially difficult in an industry consisting of many small firms, most of which produce similar commodities. These firms also have a limited ability to undertake tasks such as market research on changing customer needs or research and development to adapt products to meet changing customer needs and preferences. Therefore, some aspects of such an industrys' supply chain management can be facilitated by certain types of broad-based industry organization (Ricks, 2000).

Ricks' study (2000) about US agricultural industries indicated that for the industries to be competitive in the modern economic setting, which includes increasingly globalized markets, the entire vertical supply-marketing chain must achieve high performance in serving the needs of its customers effectively. Effective vertical linkages of firms within the supply-marketing chain, including vertical partnerships and alliance relationships, are becoming increasingly important for achieving the required modern competitiveness. In addition to these perspectives on the relevant firms, an industry perspective on supply chain management and related strategies can also be important for the competitiveness of agricultural industries (Ricks, 2000).

Aspects such as industry export expansion programs, generic market research, commodity nutritional research and generic market development can be facilitated from the perspective of a commodity industry. For these aspects certain kinds of

broad-based industry organizations, such as trade associations for effective supply-marketing chain management are needed (Ricks, 2000)

The objectives of supply chain management have been to improve the coordination and performance of production and marketing systems (Ricks *et al* 1999). Supply chain management generally represents vertical coordination and logistics in a supply system. Porter's value chain and value system framework captures the essence of organizing activities within and between firms in order to transmit value (Porter, 1985).

The main benefit of supply chain management is that, when all of the channel members - including suppliers, manufacturers, distributors and customers - behave as if they are part of the same company, they can enhance performance significantly across the board (Capacino, 1996).

2.6 Conclusion

The many challenges facing agribusinesses are discussed in this chapter. These challenges, if not properly managed can have a negative influence on the competitiveness of these industries.

The key differentiators or factors discussed in this chapter must be applied to gain competitive advantage in an increasing globalised market (Market Research, 2002). This includes vertical coordination (of which vertical integration is a component), quality development, information technology, identification of the core competencies and supply chain management. All of these factors can lead to greater efficiency, productivity and relative competitiveness.

In future supply chains will compete with each other, and if only certain actions of the supply chain are performed efficiently, the full potential for value-adding will not be realized (Worley, 1996). An uncompetitive supply chain will therefore jeopardise farm level profitability and *vice versa*.

Van Rooyen *et al.* (2000) identified supply chain interaction as one of the most important phenomena to affect the food and agricultural industry in the future. Value, as stated by Van Rooyen *et al.* (2000), will be added or lost if the supply chain is not functioning in an effective and efficient manner, and this is why it is necessary to take note of the determinant of national competitive advantage.

CHAPTER 3

OVERVIEW OF THE INTERNATIONAL AND LOCAL OILSEED INDUSTRY

3.1 Introduction

According to the Food Pricing Monitoring Committee (2003) as well as Van Schalkwyk *et al.* (2003) oilseeds, or more specifically sunflower seed, is one of the most important field crops in the world. Van Schalkwyk *et al.* (2003) based their statement on more than oilseeds' contribution to the gross value of total agricultural production – their conclusion also considers its value in the value adding chain.

As reported in Agriculture and Agri-Food Canada (2004) the international oilseed sector is projected to grow significantly over the medium term, continuing its nine-fold expansion since 1964. This worldwide growth is fuelled by an increasing demand for vegetable oils and protein meals, resulting from rising family incomes, larger populations and food safety concerns, which create the need to replace animal meal in livestock rations.

As already discussed in Chapter 2 very little of oilseed crop is consumed in its primary form globally. According to Van Shalkwyk *et al*. (2003) processing oilseed provides inputs to various other sectors of the economy, including agricultural inputs in the form of animal feedstuffs and industrial inputs for the manufacturing of a variety of products.

In this chapter South African and world oilseed production trends are discussed. As price is an important factor in the oilseed industry, price trends of different oilseeds in different stages of the supply chain are also discussed, not only for

South Africa but also globally. Firstly, the production of the major oilseeds is discussed.

3.2 Global and local production of the major oilseeds

In this section both global and local oilseed production is discussed. The South African share and performance regarding oilseed production are compared to the international situation.

3.2.1 Global oilseed production

FAO (2004) identifies the worlds' major oilseeds as sunflower seed, peanuts, cottonseed, rapeseed and soybean. Figure 3.1 clearly shows that soybeans are the main oilseed produced globally. The three main producers of this commodity are the US, Brazil and Argentina. According to FAO (2004) the sizable increase in the production of rapeseed, groundnut and sunflower seed will lead to a rise in the aggregate oilseed output. These three crops currently account for about 40% of world oilseed production. According to Figure 3.1 total oilseed production has experienced a rising trend from 2000/01 to 2004/05, and each of the oilseed types have experienced this positive trend.

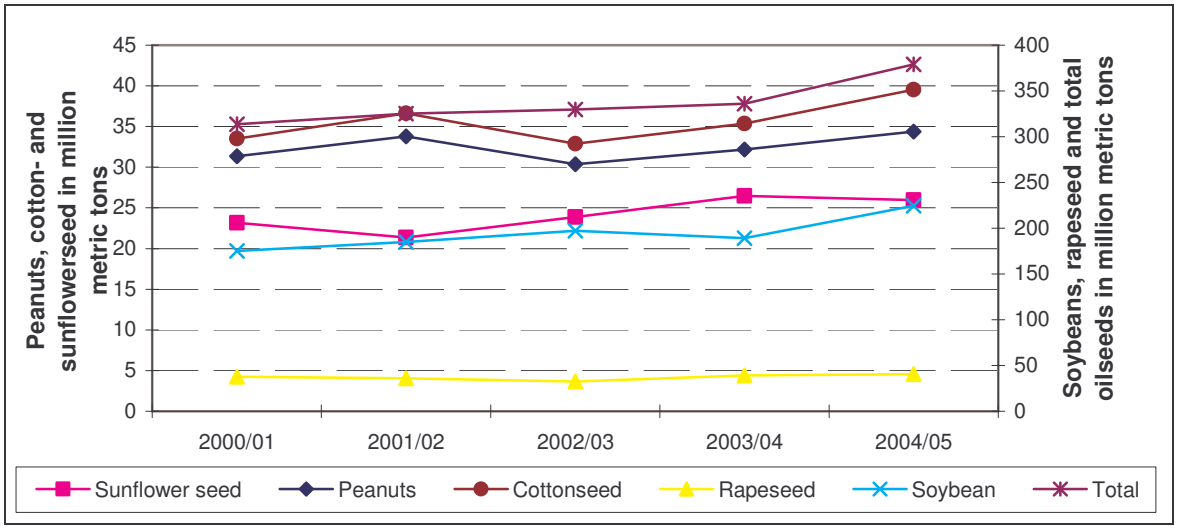

Figure 3.1: Global production of the major oilseeds in million metric tons
Source: USDA (2004)

3.2.2 South African oilseed production

In the 2003/04 season, South Africa produced 2.5% of the world's sunflower, 0.29% of the world's groundnut and only 0.1% of the world's soybeans. Figure 3.2 show that South Africa produces more sunflower seed than soybeans and groundnuts. Sunflower seed and soybeans experienced a rising trend from 1970/71 to 2003/04, whereas groundnut production experienced a downward trend over the same period.

Sunflower production in South Africa has flourished at the expense of other pertinacious seeds (AFMA, 2001). This increase in sunflower seed production is, according to AFMA (2001), due to its suitability as a cash crop and the fact that oilseed crushers prefer sunflower seeds as a result of its high oil content. The Free State and the North West provinces produced 88% of South Africa's sunflower seed in 2002/03.

Figure 3.2 indicates further also the volatility of sunflower production and hence areas planted: The variability can be explained by the precariousness of the weather. It is clear that 1998/99 and 2001/02 were record production seasons, while the global sunflower production experienced a low production season in 2001/02. In 2002/03 all the South African oilseeds shown in Figure 3.2 experienced a decrease in production as well as in area planted (Figure 3.3).

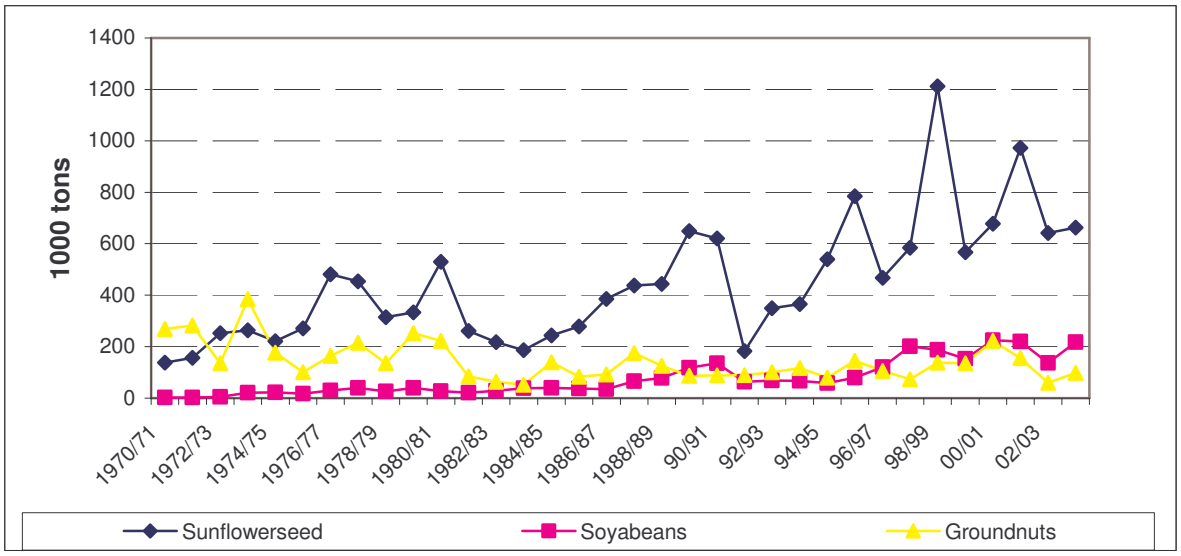

Figure 3.2: South African production of oilseeds (1 000 tons)
Source: NDA (2004)

Groundnuts are very sensitive to adverse climatic conditions, and this probably contributes to the low correlation between the area planted (Figure 3.2) and production (Figure 3.3). According to Figure 3.2 groundnut production decreased significantly from 2000/01 to 2003/04. Production variability has a significant impact on the amount of groundnuts exported which, according to Van Schalkwyk *et al.* (2003), will in turn influence the return earned by farmers, and the industrys' ability to generate foreign exchange.

From Figure 3.3 it is clear that the area planted with groundnuts declined during the period 1991/92 to 1997/98, but picked up again from 1997/98 to 2000/01. When the Oilseed Marketing Board was abolished in 1997; the real price of groundnuts increased by 61%, leading to a greater area planted and increased production volumes (see Figure 3.2). After 2000/01 the area planted again showed a decreasing trend. These decreasing production trends can be attributed to the fact that farmers make their planting decisions on the basis of the previous years' prices.

Birch (1999) stated that local production of soybeans is grossly inadequate for the countrys' requirements. He estimated that production would have to be more than

double present production if local requirements or processing capacity, either as oilseed meal or full fat soy, is to be met.

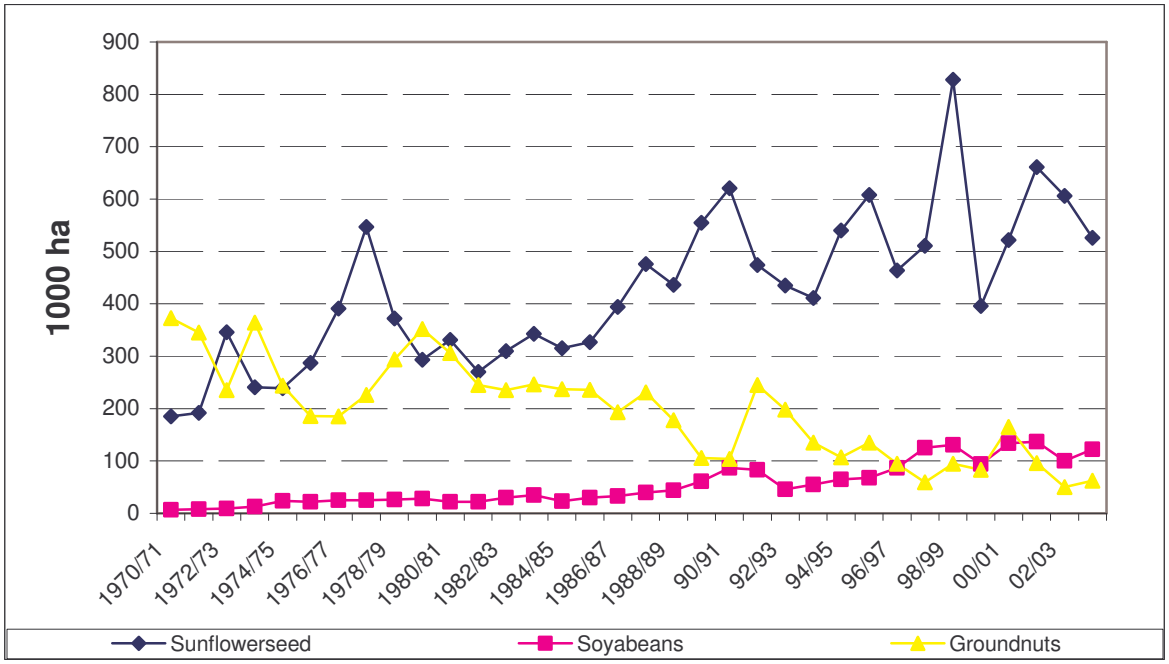

Figure 3.3: Area planted in South Africa with the major oilseeds
Source: NDA (2004)

Sunflower seed, soybeans and groundnuts are the three main oilseeds produced in South Africa, but other oilseeds are also produced. According to Whitehouse (2003), South Africa has only recently started producing canola commercially. Whitehouse (2003) states that the area planted to canola has increased substantially in a relatively short time, from 17 000 ha planted in the 1998/99 production season to 25 000 ha planted in the 1999/2000 season (Figure 3.4). Production also increased from 21 000 tons in 1998/99 to 23 000 tons in 1999/2000. Canola production is expected to continue to increase in South Africa, as it can be stimulated by promoting canola oil as cooking oil – in the past canola oil had primarily been used for industrial purposes. According to the ARC-PPRI (2002), canola is rapidly becoming one of the most important sources of vegetable oil and protein in the world. Canola oil can be used as cooking and salad oil as well as for margarine.

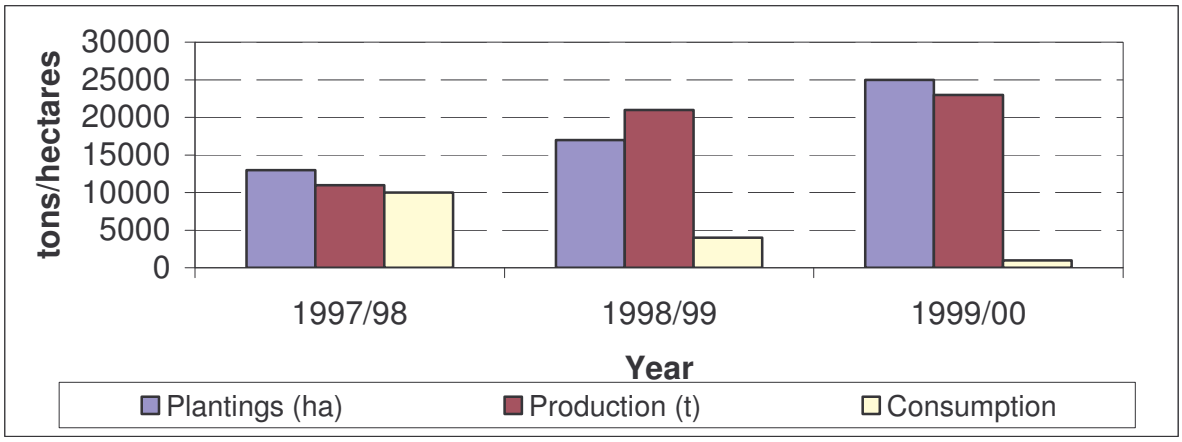

Figure 3.4: Canola plantings, production and consumption
Source: Whitehouse (2003) and Index Mundi (2004)

South Africa harvested 65 000 ha of cottonseed and produced 57 000 Metric tons (Mt) in 2004 (Index Mundi, 2004). According to Index Mundi (2004) total consumption of cottonseed was 102 000 Mt for 2004, the same as supply.

South Africa does not produce palm oil and is therefore dependent on imports.

3.3 Global and South African oilseed crushing

Oilseed crushing is generally considered a sector that is very capital intensive; it goes hand in hand with transport economics, commodity trading, hedging, technical excellence and large economies of scale. This sector is under pressure to be competitive in order to survive. In this section the global as well as the South African oilseed crushing situations are discussed.

3.3.1 Global oilseed crushing

According to Figure 3.5 the quantity of most oilseeds crushed increased over the last three years. Crushing of soybeans increased significantly by 15.31 million metric tons in this period, and was the oilseed of which the biggest volume was crushed. The total volume of oilseeds crushed increased every year from 2001/02 to 2004/05, with a very large increase in amount crushed from 2003/04 to 2004/05,

when about 20.97 million metric tons were processed. According to Figure 3.5, soybeans are experiencing an increasing trend.

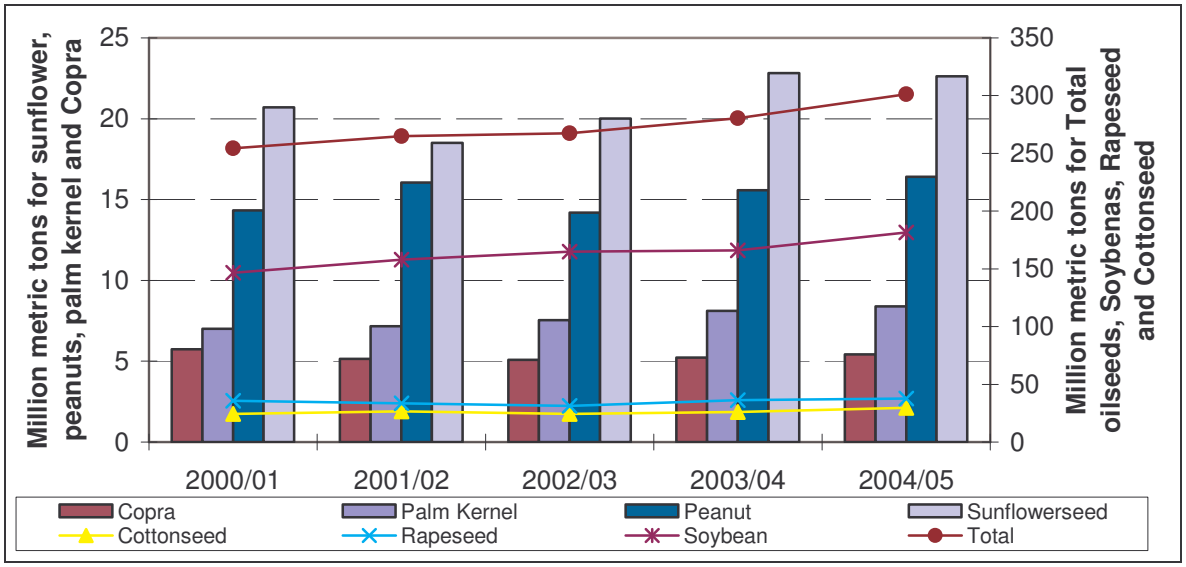

Figure 3.5: Global crushing of the major oilseeds (2000/01-2004/05)
Source: USDA (2004)

3.3.2 South African oilseed crushing

The Food Pricing Monitoring Committee (2003) states that approximately 95% of all sunflower seed produced in South Africa is destined for the processing industry, more specifically for the production of sunflower oil. According to Whitehouse (2003), the domestic demand for plant oils in South Africa is estimated at 720 000 tons per year. Approximately 42-49% of these plant oils are produced locally in South Africa, and the rest is imported. South African production of sunflower oils increased from 295 056 tons in the year 2000, to 478 711 tons in 2002, an increase of 183 655 tons. Maize germ and other self-produced oil decreased in production from 38 194 tons in the year 2000 to 36 249 tons in 2002.

Table 3.1: South Africa's production of vegetable and animal oils and fats in tons

	2000	2001	2002
Primary products			
Self-produced sunflower oil	295 056	364 175	478 711
Maize germ and other self-produced oil	38 194	39 568	36 249
Oil-seed cake and meal	477 587	434 823	462 951
Primary products used for further processing			
Sunflower seed oil, other self-produced oil and refined oils used for the production of hydrogenated fats	299 479	346 746	412 263
Margarine	156 405	169 885	221 920
Blended table, salad and cooking oils	294 363	292 933	325 245
Other vegetable fats	60 858	37 359	25 204

Source: Whitehouse (2003), from the National Department of Agriculture (2004)

Whitehouse (2003) states that sunflower seed oil accounts for 82% of all edible oils produced in South Africa, and this is substantiated by Figure 3.6. Figure 3.6 indicates that the amounts of soybeans and groundnuts crushed are very low compared to sunflower seed. This local production of sunflower seed oil meets local demand; when shortages in supply occur, sunflower seed is supplemented by unrefined oil imports (mainly from Argentina). These oils are refined and packaged by local oil expressers.

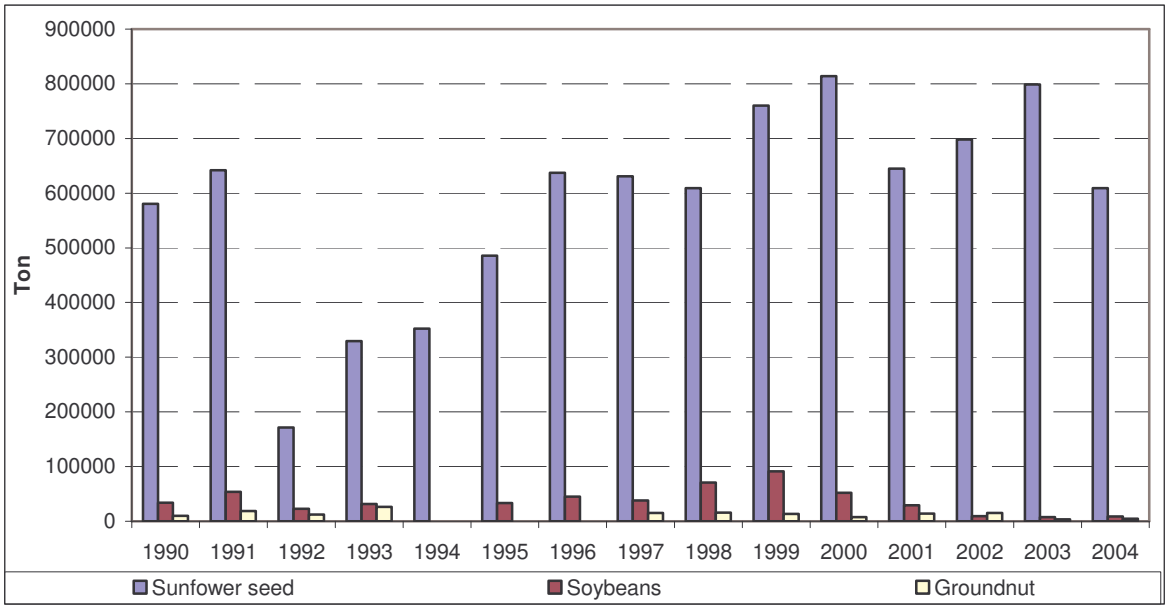

Figure 3.6: South African oilseeds to expressers
Source: NDA (2005) (2003 and 2004 are preliminary figures)

The oil content of Soybeans is only 18%, compared to between 40 and 45% in the case of sunflower seed. The soybean meal fraction after oil extraction is 80% compared to 42% from sunflower extraction. The oilcake obtained from soybeans is preferred to the oilcake of sunflower because of its higher protein content and nutritional value for animals. Large quantities of soybean meal are imported to meet domestic demand for animal consumption. Soybean crushing experienced a decreasing trend from 1999 to 2003. Soybeans are used mainly for animal consumption, 80% relative to the 20% used for human consumption.

The limited market for soybean oil, and considerable competition from South American and Argentine soybean meal makes it difficult for a soybean crusher to survive sustainably in South Africa. Argentine soybean meal is extremely cost competitive due to the low crushing margins. Van Schalkwyk *et al.* (2003) provided reasons why soybean production has not fulfilled this potential for the local market:

- The South African soybean industry is a price taker on the world market. Past policies protected the local industry. Relative to world markets, local soybean input costs are high, resulting in a comparative cost disadvantage for South African producers, even when taking the cost of transport into account.
- Soybean profitability does not compare favourably with alternative commodities.
- Farmers are of the opinion that soybean production requires much greater managerial skills than maize production. Consequently they will only consider switching from maize to soybean production if there is a relatively large difference in profitability.

The largest proportion of groundnuts is consumed in their primary form by humans (26%), whether shelled or not.

3.4 International and local prices of oilseeds and vegetable oils

The international and local production of oilseeds is discussed in this chapter. As vegetable oils can be considered a commodity market, price has a considerable effect on the production, consumption and trade of oilseeds and its products. In this section the price trends of the different oilseeds and their products are discussed.

3.4.1 International prices of oilseeds and its value-added products

The prices of soybeans and sunflower seed vary substantially from one season to the next, as is the case for all other field crops. This is mainly because field crop production is highly dependent on climatic factors, especially rainfall.

Figure 3.7 represents the prices of sunflower seed, soybeans and peanuts and their oils. All the commodity prices were contextualized using the US farm price and for the oils, US tank prices for crude oil. Peanut or groundnut prices decreased from 2000/01 to 2003/04. Sunflower seed and soybean prices both increased in the period 200/01 to 2003/04. Vegetable oil prices are considerably higher than commodity prices and the gap increases as more value is added to the commodity. From Figure 3.7 it is clear that peanut oil (groundnut oil) prices increased at a very steep rate in the period 2001/02 to 2003/04. Both sunflower oil and soybean oil prices experienced an upward trend in the period 2000/01 to 2003/04.

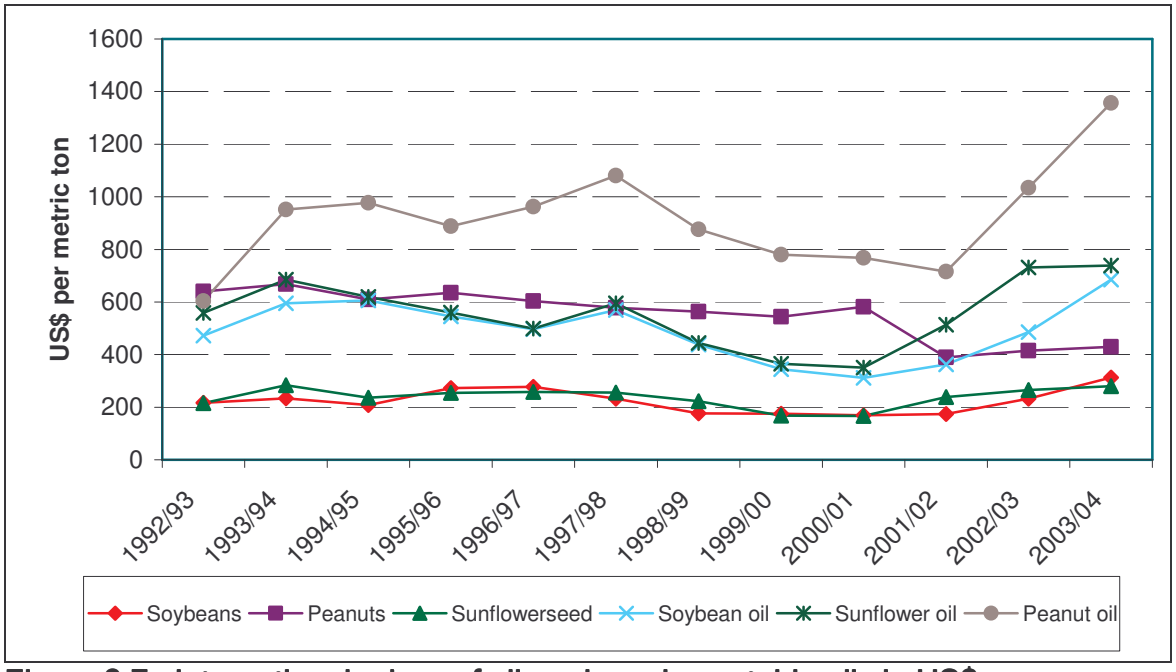

Figure 3.7: International prices of oilseeds and vegetable oils in US$
Source: USDA (2004)

Groundnut oil is the vegetable oil with the highest price. Sunflower oil and soybean oil prices were relatively similar for the period in Figure 3.7, but only until 2000/01, when sunflower oil prices rose much higher than soybean oil prices.

The amounts of value added to the different oilseed commodities during crushing and extracting are indicated in Figure 3.8. According to this figure the value added to oilseeds, from commodity to oil, started to increase in 2000/01 and is still experiencing a positive trend.

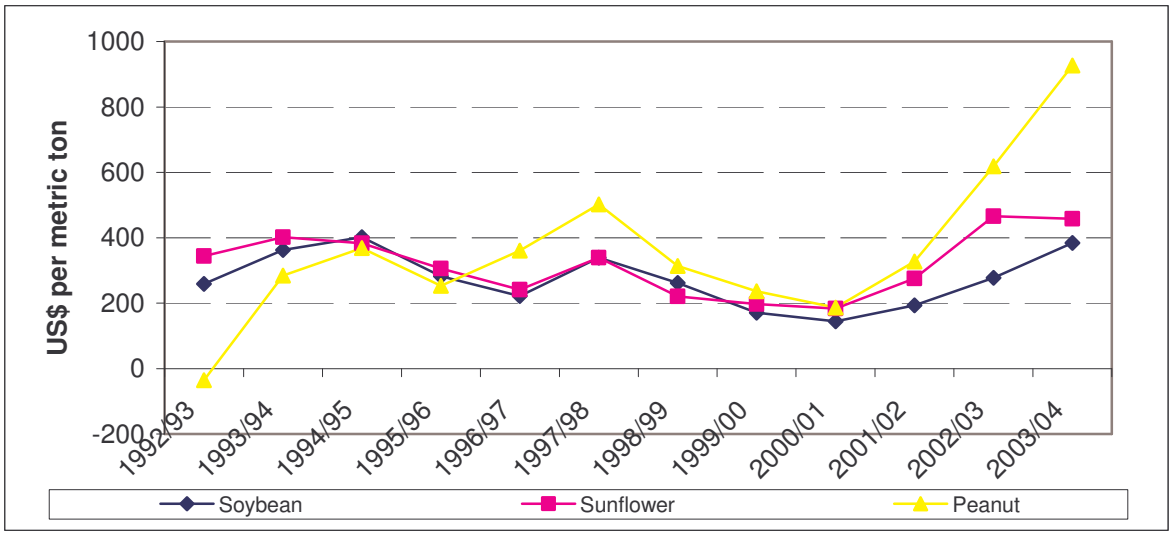

Figure 3.8: Value added to oilseeds (from commodity to oil)
Source: Own calculations from USDA (2004)

3.4.2 Local prices and added value

International prices as discussed above have a large impact on local prices. Soybean prices have been the most stable of all the other oilseeds listed in Figure 3.9. Groundnut prices are very variable, varying from being the oilseed with the highest price to the oilseed with the lowest price. Sunflower prices experienced a decreasing trend from 1997/98 to 1999/2000, but increased from 1999/2000 to 2000/01.

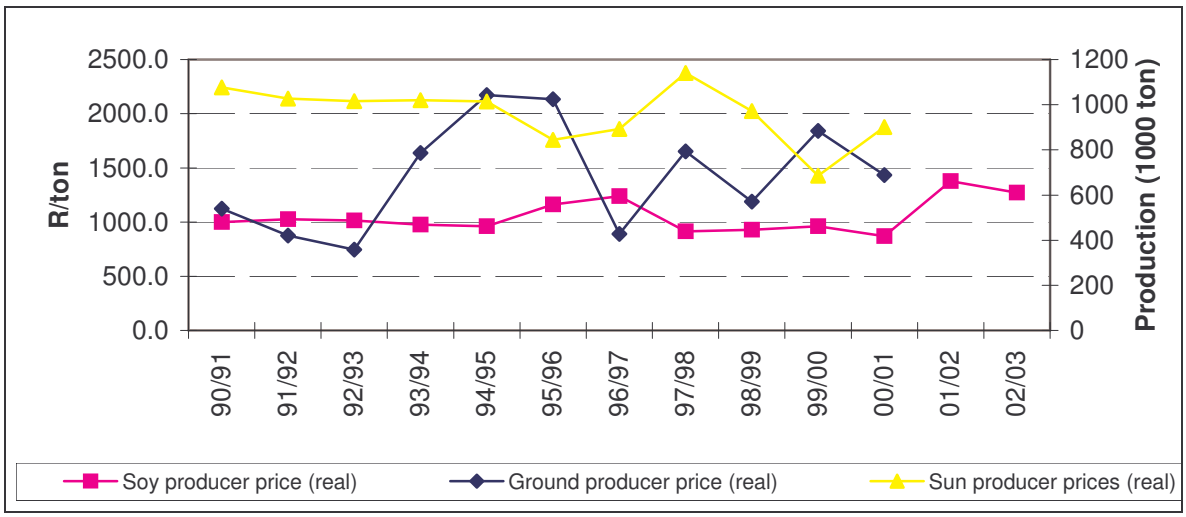

Figure 3.9: Real producer prices and production of oilseeds (1990/91 to 2002/03)
Source: NDA (2004)

Since 1995/96 nominal prices have showed steady increases. Real prices, on the other hand, followed nominal prices relatively closely. In contrast to soybeans and sunflower seed, real groundnut prices are currently slightly higher than in the early 1990s. The fact that groundnuts have higher prices than soybean and sunflower seed is expected to influence the rate at which groundnuts will be crushed in the future.

3.5 Global and local trade trends

In this section the total amount of oils and seeds traded globally as well as nationally is discussed

3.5.1 Global trade trends

According to Agriculture and agri-food Canada (2004) the world trade in oilseeds and oilseed products increased by almost 900% from 9 Mt in 1964 to a projected 80 Mt for 2003/04. During the 1970s and 1980s, most international trade consisted of exports from the US into the EU, where oilseeds were crushed and consumed locally or shipped to third world countries. During the 1990s, most of the growth in world trade involved the expansion of soybean production in North and South America to supply Asian demand in the Pacific region. As already mentioned the trade in vegetable oils and protein meals has increased sharply, and exceeds world trade in wheat and corn, in terms of volume.

Total global exports of oilseeds, vegetable oils and protein meals

Figure 3.10 depicts the total export of oilseeds, vegetable oils and protein meals. It can be seen that the amount of vegetable oils and protein meals had increased over the period 2000/01 to the figures predicted for 2004/05. The increase in trade of these two products is mainly due to the strong income and population growth in

developing countries, leading to an increased demand for vegetable oils for human consumption, and protein meals used in livestock feed production.

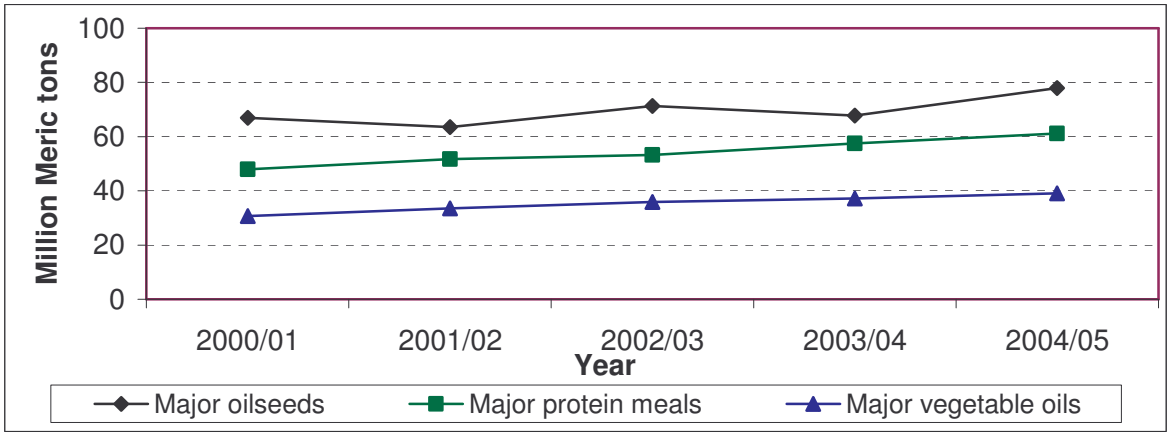

Figure 3.10: Global exports of the major oilseeds, vegetable oils and protein meals
Source: FAS (2004)

Global trade of the major oilseeds

The global export of oilseeds is indicated in Figure 3.11. In this figure other oilseeds include palm kernel, copra and cottonseed. As seen in Figure 3.11, soybeans and rapeseed are the two main oilseeds exported, with sunflower seed in the third place

Soybean exports reached a peak in the production season of 2002/03; in this specific year all the other oilseed exports declined. Sunflower seed exports increased significantly from 2.69% in the 2002/03 production year, to 4.25% of the total oilseed exports in 2003/04.

Soybeans constitute 85% of the total volume of the major oilseeds exported. The US' soybean exports were 27% of the total world soybean export in 2003/04, and are predicted to reach 43% of the total world soybean exports in 2004/05. Brazil exported 22% of the soybeans exported in the world in 2003/04, and is predicted to export more than 35% in 2004/05.

FAS (2004) shows that China dominates the world soybean imports; it is expected to continue this trend as it demands nearly 37% of world soybean imports, despite a substantial increase in production.

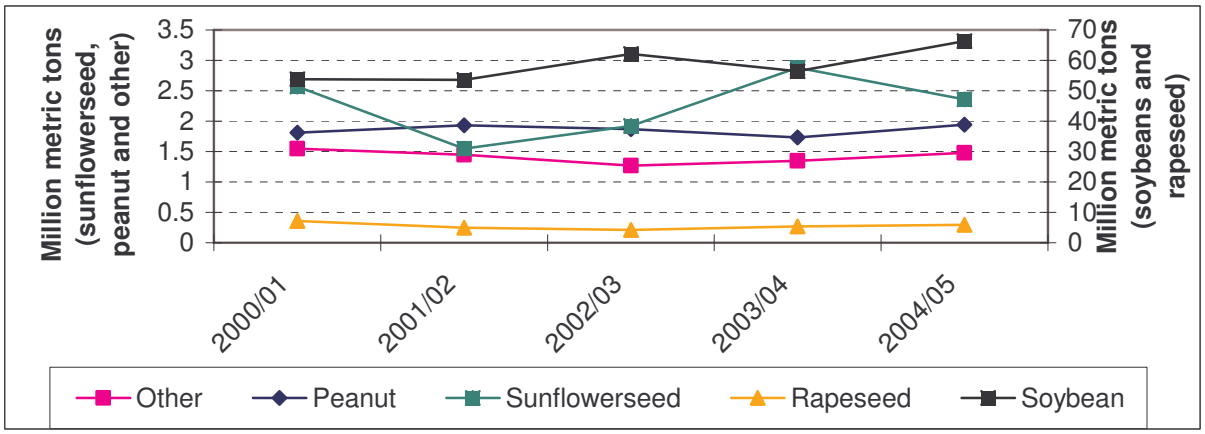

Figure 3.11: Total global exports of the major oilseeds
Source: FAS (2004)

Global trade of the major vegetable oils

According to Agriculture and agri-food Canada (2004), world trade in vegetable oils increased by 180% between 1964 and 2004. Vegetable oils traded went from 2 Mt in 1964 to 37 Mt in 2003/04. Global trade in vegetable oils expanded by over 25% since the 1999/2000 crop year, this was largely led by the expanded trade in palm oil. Palm oil is the second largest oil produced, it is expected to make up over half of the oil traded worldwide in 2003/2004. By contrast, soybean oil makes up one quarter of total world vegetable oil trade. For 2003/04, world trade in vegetable oils is forecast at a figure slightly over 37 Mt (20 Mt palm oil, 10 Mt soy oil and only 1 Mt canola/rapeseed oil).

According to the International Trade Forum (2000) over two thirds of vegetable oils produced are consumed in the regions produced; however any excess oils are exported around the world. In the export market the top three world exporters usually account for around 60% of total world exports.

Palm oil is the major vegetable oil exported. Figure 3.12 illustrates a positive growing trend in exports for all the major vegetable oils from 2000/01 to 2004/05. This growing trends shows that this is a growing industry.

Malaysia is the main exporter of palm oil, and it is predicted to export 57% of the total palm oil exported in 2004/05. Soybean oil is the vegetable oil of which the second largest amount is exported.

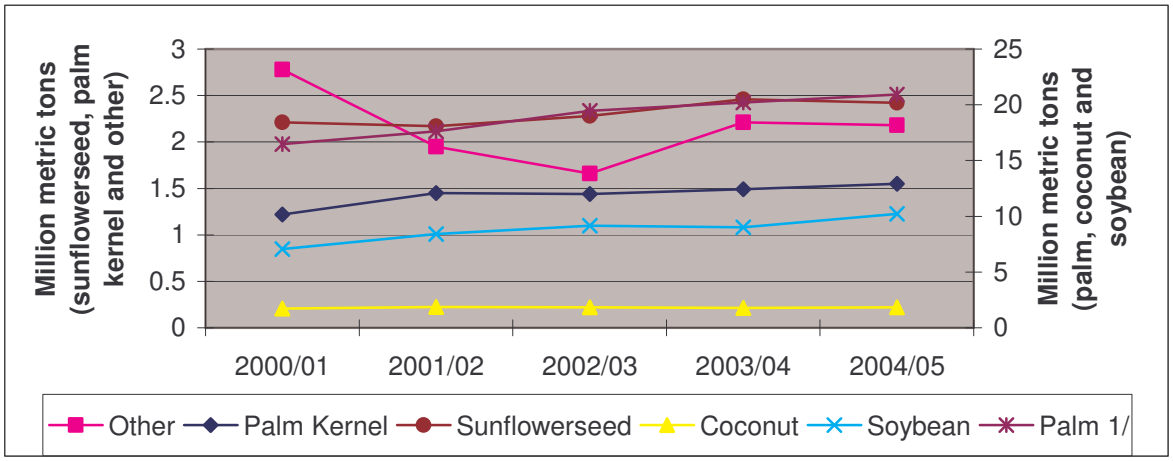

Figure 3.12: Global exports of the main vegetable oils
1/ Palm oil trade excludes trans-shipments through Singapore
Other oilseeds include peanut oil, cottonseed oil and rapeseed oil.
Source: USDA (2004)

The United States remains the largest soybean oil producer and exporter in the world. As discussed in the previous section, soybean is the largest oil produced and accounts for 25% of the global production of oils and fats. According to Othman *et al.* (1998), the world palm oil market enjoyed a high growth rate from the late sixties up to the late nineties. Countries such as Indonesia, the Philippines and Malaysia took advantage of this and are very competitive in the vegetable oil export market. Palm oil is the oil of which the second largest amount is exported, 21.36 million tonnes were exported in 2003, representing 48% of the global trade, Malaysia accounts for 27% of the global export market in oils and fats.

Global Import trends

The import market for vegetable oils is much more dispersed that the export market. World imports are much more widely distributed among countries. According to USDA (2004), the top three importers account for only 36% of all world imports during 2004. The three top vegetable oil importers for 2003/04 were China, India and Pakistan. China's total vegetable oil imports consist of more than 52% palm oil and 36% soybean oil. India's main vegetable oil import is also palm oil, and more than 78% of its total oil comprises this oil.

According to Agriculture and agri-food Canada (2004) China's policy of expanding domestic crushing capacity instead of importing vegetable oils and protein meals, will influence the nature of world trade and increase the demand for oilseeds at a faster rate than would have been the case.

Agriculture and agri-food Canada (2004) states that the import demand from some parts of Asia is expected to decline, as the Pacific regions are expected to switch from importing feedstuffs to importing meat and other livestock products.

3.5.2 South African oilseed trade trends

According to Agriculture and agri-food Canada (2003), South African agricultural production almost doubled in the past 30 years, although production varies from year to year due to erratic weather conditions. South Africa is self-sufficient regarding primary foods, with the exception of wheat, oilseeds and rice. South Africa will continue to import these foods to meet its needs in the short term.

Table 3.2: World trade and consumption of sunflower - and soybean oil

'000 metric tons	2000/01	2001/02	2002/03	2003/04
Imports				
Sunflower oil	**109**	**4**	**30**	**36**
Soybean oil	**85**	**132**	**119**	**134**
Total	**194**	**136**	**149**	**170**
Consumption				
Sunflower oil	**351**	**269**	**310**	**320**
Soybean oil	**49**	**130**	**115**	**130**
Total	**400**	**399**	**425**	**450**

Source: USDA (2004)

From Table 3.2 it is clear that soybean oil is gaining in popularity while sunflower oil is losing popularity. During the 2000/01 production season 31% of the sunflower oil consumed was imported, and during the 2003/04 production season more than 11% of the sunflower oil consumed was imported. More soybean oil is however imported than consumed.

According to FAS (2003), the import switch is mainly price driven, while most of the local table oils sold is denatured blends.

The amounts of crude and refined oils that are imported into South Africa are given in Figure 3.13. From this figure it is interesting to note that the amount of refined oils imported increased in US Dollars since 2001, while the amount of crude oil imported decreased in US Dollars during the same period. This can indicate that ever more imported refined oils are consumed, to the detriment of South African crude oil refiners.

According to Tips (2004), sunflower seed, olive oil, palm and soybean oil are the refined oils with the biggest import share for South Africa. Linseed, cottonseed, sunflower seed and soybean crude oils are the crude oils mainly imported by South Africa.

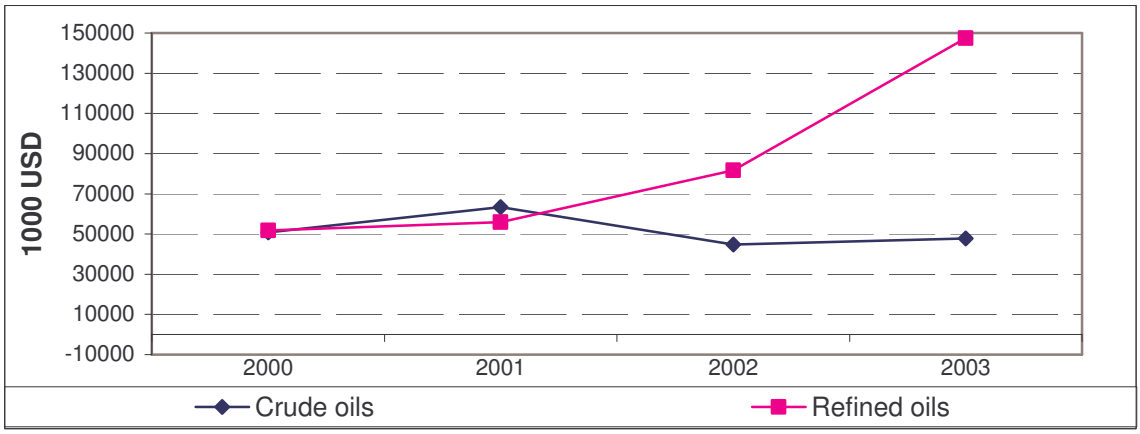

Figure 3.13: South African imports of crude and refined oils
Source: Tips (2004) and own calculations

Refined palm oil is the main edible oil imported by South Africa, the total amount imported by South Africa in 2003 was valued at $98 015 000. Crude palm oil imported was valued at $9 000 in the same year. Whitehouse (2003) states that South Africa does not grow any oil palm and as such does not have the raw material available to produce palm oil. The crude palm oil is mainly imported from Malaysia and refined locally. Imports of this refined palm oil decreased in US Dollar value by more than 20% from 2002 to 2003, after an increase by almost 50% from the year 2000 to 2003.

Soybean crude oil and refined oil, as the second and third highest value imports of edible oils, are mostly imported from Argentina and Brazil. In 2003 almost 70% of the crude oil originated from Argentina, while over 80% of the refined soybean oil came from Brazil.

According to Tips (2004) sunflower seed oil is also major edible oil imported by South Africa. Sunflower crude and refined oils are mainly imported by Argentina. All the crude oil imported by South Africa comes from Argentina, and about 99% of the refined sunflower oil is imported from Argentina (USD value).

Table 3.3 gives information about the import tariffs for the different oilseeds, which are relatively high, according to the refiners, as the tariff on soy and sunflower oil are as high as 10%.

Table 3.3: Import tariffs of oilseeds and their products

Tariff number	Product	General rate for South Africa	EU	SADC
12.01	**Soybeans**	**8%**	**Free**	**Free**
12.02	**Peanuts**	**10%**	**Free**	**Free**
12.06	**Sunflower-seed**	**9.4%**	**7.5**	**Free**
15.07	**Soy oil (crude)**	**10%**	**Free**	**Free**
15.12	**Sunflower oil (crude)**	**10%**	**free**	**Free**
23.04	**Soybean meal**	**6.6%**	**3.3%**	**Free**

Source: USDA (2003)

3.5 Conclusion

This chapter provides an overview of the international and South African oilseed industry, with special reference to sunflower, soybeans and groundnuts. Global oilseed production and oilseed crushing are both showing a positive trend. The increasing commodity production and crushing activity, together with increasing exports and prices of the major global oilseeds are an indication of a growing industry, from primary to secondary production.

As discussed in this chapter soybeans are the most produced and crushed oilseed globally whereas sunflower seed is the main produced and crushed oilseed in South Africa. Soybeans are also the most globally traded oilseed, but palm oil and sunflower oil are the two major vegetable oils exported globally. Although South Africa's main oilseed produced is sunflower seed, more sunflower oil is imported by South Africa than other vegetable oils. The large amount of crude and refined oils imported by South Africa is indicative of a problem. Imports of refined oils show a tremendous increase, and crude oils a decrease. The reason for this is the lower price of imports, and this can be to the detriment of South African oilseed processors. The next chapter (Chapter 4) measures the relative competitiveness in the South African oilseed industry's supply chain.

CHAPTER 4

COMPARATIVE ADVANTAGE AND COMPETITIVE PERFORMANCE IN THE SOUTH AFRICAN OILSEED INDUSTRY

4.1 Introduction

According to Esterhuizen and Van Rooyen (2001) agribusinesses are experiencing increasing pressure as globalization blurs the boundaries between countries that have traditionally protected their industries from competitive pressure. According to Zereyesus (2003) current trends relating to the globalization of markets, trade liberalization, advances in information technology, consumer preferences and improved logistics are exerting pressure on industries worldwide to become more competitive. Competitiveness will largely be influenced by the performance of supply chains.

Esterhuizen and Van Rooyen (1999) state that producers and agribusinesses now have to position themselves as business driven competitors in a less controlled, free market global trading environment. South African agribusinesses are, according to Esterhuizen and Van Rooyen (2001), involved in an exhausting race of "catch up" with competitors. Having a comparative advantage and being competitive in an industry have become very important factors for most South African supply chains.

Before any conclusions on the comparative advantage and international competitiveness of the South African oilseed industry can be reached, it is necessary to compile a number of indexes. The Revealed Comparative Advantage (RCA), Net Export index and the Relative Revealed Comparative Trade Advantage (RTA) indexes are provided in this chapter. The RTA is also calculated for

Argentina, one of the world's biggest oilseed producers and South Africa's biggest competitor. The meaning of the terms comparative and competitive advantage is discussed in the next section.

4.2 Comparative and competitive advantage

According to Mosoma (2004) the concepts of comparative advantage and competitiveness are two important foundations for understanding the importance of international trade in agriculture and illuminating the underlying factors responsible for current trade patterns.

The OECD (2004) states that **competitiveness** is a dynamic concept that is strongly influenced by the macroeconomic and regulatory environment with producers and processors in a continuous "treadmill" in the market place. According to Worley (1996) competitive advantage explains existing trading patterns as they operate in the real world, including all the barriers to free trade i.e. policy effects, product quality differences and industry marketing skills which are ignored by comparative advantage. According to Ortmann (2000), Fafchamps, De Janvry and Sadoulet (1995) competitiveness is as "the ability of a firm or a country to produce a commodity at an average variable cost below its price". Porter (1998) argues that competitiveness of locations "arise(s) from the productivity with which firms in a location can use inputs to produce valuable goods and services". Spies (1999, quoted by Ortmann, 2000), concurs by defining that "competitiveness implies superior performance in productivity growth – especially in multi-factor productivity, which is best reflected in the effective rate of technological innovation in an economy".

One of the biggest constraints involved in measuring competitiveness is the lack of reliable data on production costs at farm level, as few producers have good information about their cost structures. Competitiveness at the production level is also strongly influenced by the prices farmers receive from their final output (OECD, 2004). According to the OECD (2004), production can be competitive over

a wide range of farm sizes once the minimum farm size and technology level has been reached. On the other hand, economies of scale appear to be of much greater importance in the processing sector.

The relatively low productivity and low quality of many products, caused mainly by the dual structure of agriculture (small number of commercial farmers and large number of subsistence farmers) have hampered the attainment of a competitive supply chain (OECD, 2004).

Comparative advantage explains how trade could benefit nations by more efficient use of the world's resource base (land, labour and capital inputs) when that trade is totally unrestricted, i.e. a free market environment or at least "equal playing field" exists. Ortmann (2000) stated that competitiveness is related to the economic concept of comparative advantage.

This concepts of comparative advantage and competitiveness are summarized by Warr (1994), and according to him comparative advantage refers to the ability of one nation to produce a commodity at a lower opportunity cost than another nation, while competitive advantage indicates whether a firm could compete successfully in the trade of the commodity in the international market, given existing policies and economic structure. According to Khemani (1997) comparative advantage can form the basis for building competitive advantage.

4.3 Indexes used to measure comparative and competitive advantage

Muchavele (2000) identified Net Social Profitability (NSP), Domestic Resource Cost (DRC), Resource Cost Ratio (RCR) and the Revealed Comparative Advantage (RCA), developed by Balassa (1989), as measurements of economic efficiency. According to Galetto (2003) the Net Export Index (NX) can be seen as an alternative measure to the one proposed by Balassa (1989).

The indexes used to analyze the comparative advantages and international competitiveness of the oilseed industry was used by Galetto (2003) to measure the competitive performance of the western hemisphere's dairy industry. These indexes include the Revealed Comparative Advantage (RCA) index, the Net Export Index (NX) and the Relative Revealed Comparative Trade Advantage (RTA), all developed by Balassa (1989). The Revealed Comparative Advantage (RCA), developed by Balassa (1989), was improved by Vollarath (1991) and will be discussed later in this chapter; it is denoted as RCA# (Batha and Jooste, 2004).

According to Esterhuizen and Van Rooyen (1999) many methods have been developed and used by researchers to measure competitiveness. They identified two methods from an ISMEA study (1999). These methods are used mainly to determine competitiveness, and are the Porter approach (1990) and the competitiveness indicators as originally developed by Balassa (1989). The Relative Revealed Comparative Trade Advantage (RTA) index, as already identified in the previous paragraph, will be used in this study to determine the competitiveness of the South African oilseed industry.

4.3.1 RCA and RCA#

In this study two RCA measures are discussed. One is the original RCA index formulated by Balassa (1965). The other is an improved version constructed by Vollarath (1991), and is denoted as RCA#.

According to Galetto (2003) the RCA index is one of the most popular measures of competitive performance. The RCA of a particular good (for a specific country), is the share of the international market of that good divided by its share in the international market for all goods. Batha and Jooste (2004) points out that Balassa's RCA index faces measurement problems and distortions in governmental policies, causing immeasurable damage to the “true” pattern of comparative advantage. This index can still be used, according to Batha and Jooste (2004), since the impact of changes in trade policies can be deduced from

movements of RCA, even though it fails to distinguish between a region's factor endowments. The formula is expressed mathematically as:

$$RCA_i = \left[\frac{\left(X_{ij} \Big/ \sum_i X_{ij} \right)}{\sum_j X_{ij} \Big/ \sum_j \sum_i X_{ij}} \right]$$

Vollarath's RCA# is, according to Batha and Jooste (2004), considered to be a more appropriate measure of comparative advantage, because a group of countries is expected to have a much greater impact at the world level than an individual economy. RCA# considers the significance of a country's exports in a given sector and at the world level and purges any double counting problem in the world trade. The formula is expressed mathematically as:

$$RCA\#_i = \frac{\left\{ \frac{X_{ij}}{\left(\sum_i X_{ij} \right) - X_{ij}} \right\}}{\left\{ \frac{\left((\sum_j X_{ij}) - X_{ij} \right)}{\left((\sum_j \sum_i X_{ij}) - (\sum_j X_{ij}) \right) - \left((\sum_i X_{ij}) - X_{ij} \right)} \right\}}$$

Where:

X_{ij} : Exports of sector "*i*" of country "*j*"

$\sum_i X_{ij}$: Total exports of country "*j*"

$\sum_j X_{ij}$: World exports of sector "*i*"

$\sum_j \sum_i X_{ij}$: Total "world" exports.

An index of 1.1 for a particular industry (commodity) in a particular country means that its share of the world market is 10% higher than its share of total exports, and thus this country has a revealed comparative advantage in the industry (commodity). RCAs lower than 1 indicates that the country has a comparative disadvantage.

Edwards and Schoer (2001) as well as Batha and Jooste (2004) state that there is no significant difference between the calculated RCA and RCA#. Therefore only the calculated RCA# was used and it will be discussed later in this chapter.

4.3.2 Net Export Index (NX)

The RCA has been criticized since it only takes exports into account, ignoring imports. According to Vollarath (1991) net trade effects should be taken into account. Balassa proposed an alternative measure namely the Net Export Index (NX_i), where net exports are exports minus imports. The net exports are divided by the total value of trade (exports plus imports) of the commodity in question. An index with an upper limit of 100 indicates that there are no imports, and a lower limit of -100 indicates that there are no exports. The index is mathematically formulated as:

$NX_i = [(X_i - M_i) / (X_i + M_i)] \times 100$

X_i = Exports
M_i = Imports

According to Galetto (2003) this index has one problem, and that is that it does not take the overall level of trade in a specific commodity into account. In other words a country which is relatively self-sufficient, with a small exportable surplus and no

imports, would have an index of 100 and therefore appear to be very competitive even though it hardly trades at all.

For this reason Galetto (2003) states that both RCA and NX_i should be used together in analyzing the comparative advantage of a specific industry or commodity.

4.3.3 Relative revealed comparative trade advantage (RTA)

This index has been used by Galetto and Cappellini (2003) to measure the competitive performance in the western hemisphere's dairy industry, Esterhuizen and van Rooyen also used this index to measure the competitiveness of South African agribusinesses in the food commodity chain, as well as in the agro-food and fibre industry. According to Esterhuizen and Van Rooyen (2001) the difficulty of measuring competitive advantage led Balassa (1989) to investigate trade patterns directly, without reference to underlying resources, productivity, subsidies or prices. Balassa (1989) then argues that "revealed" competitive advantage could be indicated by the trade performance of individual commodities and countries in the sense that the commodity pattern of trade reflects relative market costs as well as differences in non-price competitive factors, such as government policies.

The RTA index describes a country's share of the world market in one commodity relative to its share of all traded goods, this index reflects both imports and exports and it is mathematically formulated as follows:

$$RTA_{ij} = RXA_{ij} - RMP_{ij} \quad (1)$$

$$RXA_{ij} = (X_{ij}/\sum_{l,\, l\neq j} X_{il})/(\sum_{k,\, k\neq j} X_{kj}/\sum_{k,\, k\neq i}\sum_{l,\, l\neq j} X_{kl}) \quad (2)$$

$$RMP_{ij} = (M_{ij}/\sum_{l,\, l\neq j} M_{il})/(\sum_{k,\, k\neq\neq} M_{kj}/\sum_{k,\, k\neq i}\sum_{l,\, l\neq j} M_{kl}) \quad (3)$$

In the equations above, X(M) refer to exports (imports), with the subscripts *i* and *k* denoting the product categories, while *j* and *l* denote the country categories. The numerator is equal to a country's export (import) of a specific product category relative to the exports (imports) of this product from all countries but the considered country. The denominator reveals the exports (imports) of all products but the considered commodity from the respective country as a percentage of all other countries' exports (imports) of all other products.

4.4 Measuring the comparative advantage of the South African oilseed industry

In this section the results of applying RCA# and NX index to the oilseed industry are discussed. Data including the total world exports, as well as exports of the different oilseed products in the supply chain by South Africa and the world (FAO, 2005) were used.

The "revealed comparative advantage" of Vollarath (1991) and the "net export index" are used together for the purpose of assessing the comparative advantage of the South African oilseed industry.

4.4.1 Revealed Comparative Advantage (RCA) and Net Export Index (NXI) of the groundnut supply chain

The RCA# index for groundnuts at its different stages is depicted in Figure 4.1. For the whole period represented in Figure 4.1 South African groundnut oilcake and prepared groundnuts had comparative disadvantages, with their values remaining below 1.

Groundnuts in their shells started from a revealed comparative disadvantage in the period 1990 to 1993, but achieved a revealed comparative advantage, with a value of 27.15, in 2002. Shelled groundnuts and groundnut oil both have values bigger than 1 for most of the period in Figure 4.1, indicating on a revealed comparative advantage. Groundnut oil only experienced a revealed comparative disadvantage

for two of the 14 years, but shelled groundnuts enjoyed a revealed comparative advantage for the whole period. According to Galetto (2003) a RCA# index value higher than 10 for a specific product for a country shows a strong comparative advantage for this specific product. Of all the different products in the groundnut supply chain, only groundnuts in their shells exhibit a strong revealed comparative advantage which is still escalating. In 2003 only groundnuts in shell and groundnut shelled showed a revealed comparative advantage. Shelled groundnuts and have index values for the period in Figure 4.1 that is mostly between 2 and 8, indicating a marginal comparative advantage.

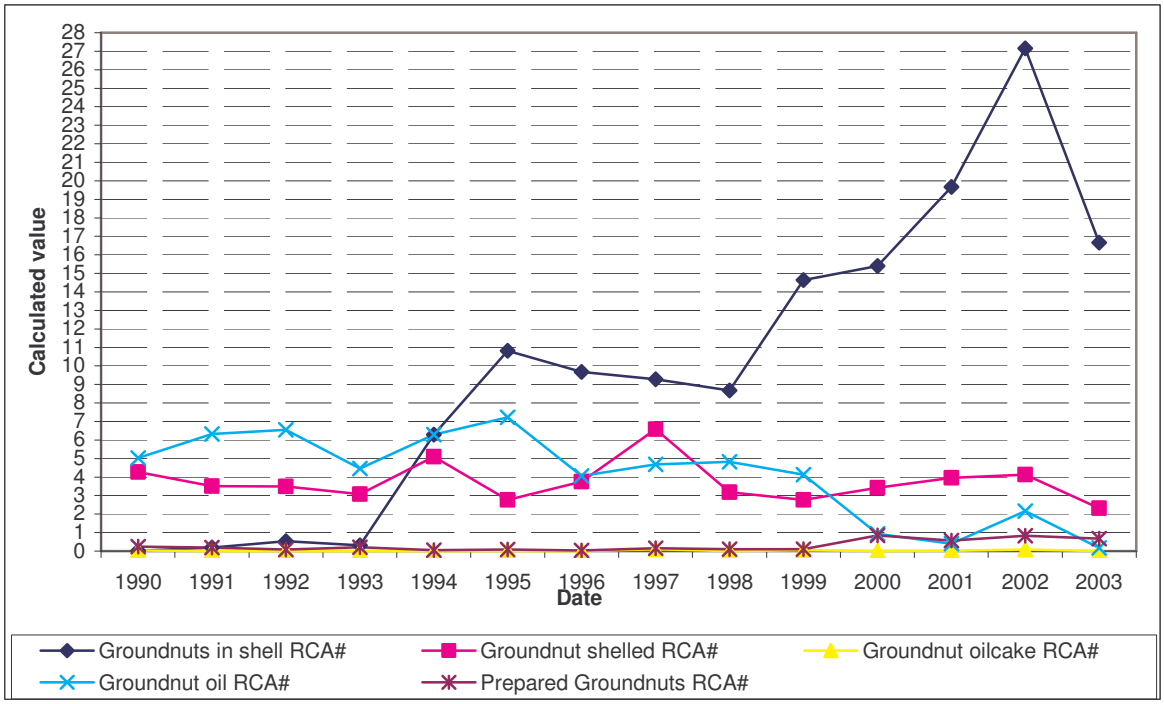

Figure 4.1: RCA# index of the groundnut industry

In Figure 4.2 the NX index (NXI) for groundnuts and the different products in its supply chain are given. As discussed earlier in this chapter, an upper limit of 100 is an indication of no imports and a lower limit of -100 indicates that there are no exports.

Groundnuts in shells show a negative net export, an indication that South Africa was a net importer of groundnuts in shells from 1990 to 1993. This industry grew at

a very rapid pace, from a net importer to a net exporter, from a value of almost -80 in 1990 to a NXI value of 94.61 in 1994. Since 1994 South Africa showed a positive net export of values varying from 80 to almost a 100, and a very strong growing comparative advantage.

Shelled groundnuts show a positive net export for South Africa for the whole period in Figure 4.2, except for 1991, 1995 and 2003, when South Africa was a net importer. As already discussed, shelled groundnuts have a relative comparative advantage for the whole period covered by the graph.

The South African NX index for groundnut oil indicates a strong net export for the whole period in Figure 4.2. In this figure it is also clear that groundnut oils experienced a comparative disadvantage in 2000, 2001, 2003. The NX index for the prepared groundnuts varied from net exports to net imports from 1990 to 1996. From 1997 onwards South Africa was a net exporter of prepared groundnuts but, as discussed, this product experienced a comparative disadvantage for the whole period.

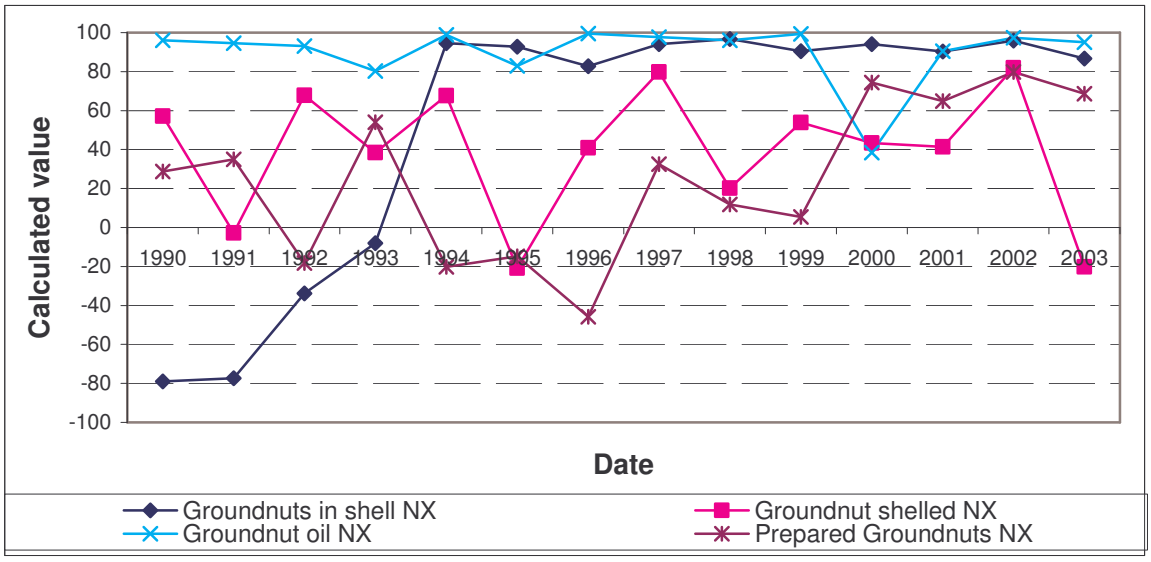

Figure 4.2: NX index for the groundnut industry

4.4.2 Revealed comparative advantage in the soybean supply chain

Soybeans and all its products have, according to Figure 4.3, which shows the RCA#, a revealed comparative disadvantage. Figure 4.4 indicates that the whole soybean supply chain is a net importer of products, except in 1991, when South Africa was a net exporter of soybean oilcake and it moved closer to a comparative advantage, with a value of more than 0.5. In 1998 soybeans and in 2000 soy sauce both were net exported products in South Africa.

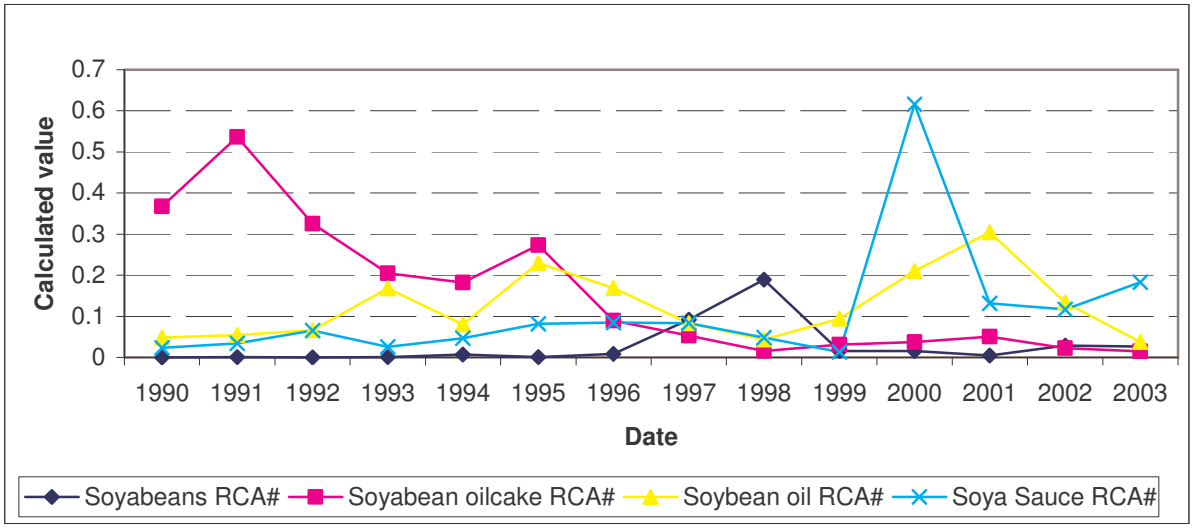

Figure4.3: RCA# index values of the products in the soybean supply chain

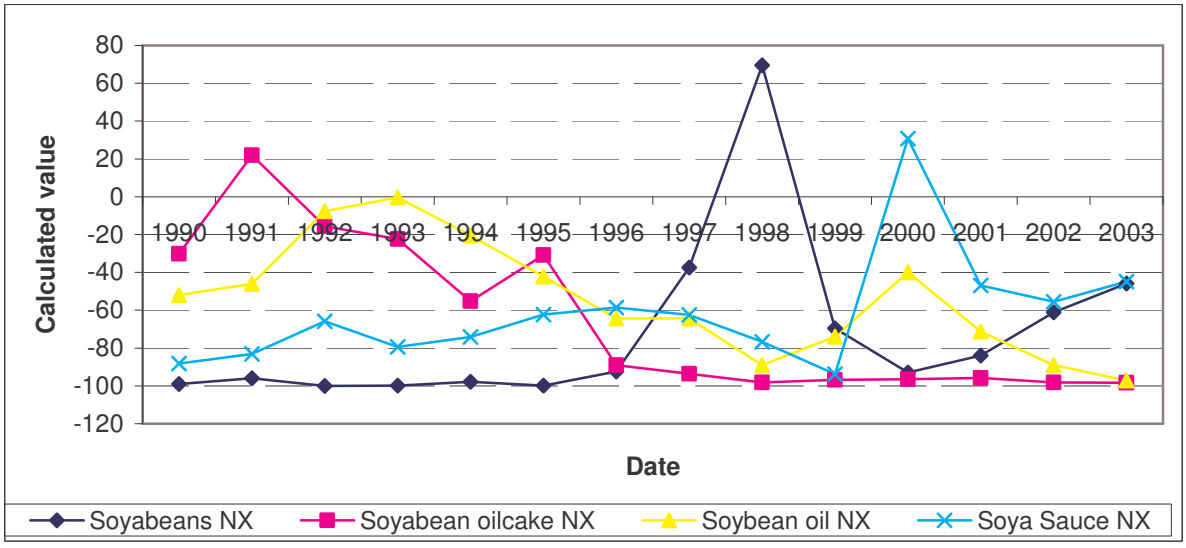

Figure 4.4: NX index values for the different products in the soybean supply chain

4.4.3 Comparative advantage in the sunflower seed supply chain

Figure 4.5 indicates the RCA# index values for the different sunflower seed products in its supply chain. According to this figure sunflower oil experienced a revealed comparative advantage for almost the whole period depicted in Figure 4.5, but did experience a comparative disadvantage in 1990, 1994, 1995 and in 2003. Margarine had a revealed comparative advantage from 1990 to 1993, but after 1993 it experienced a revealed comparative disadvantage, as did sunflower oilcake and sunflower seed for most of the time period in Figure 4.5, with values less than one.

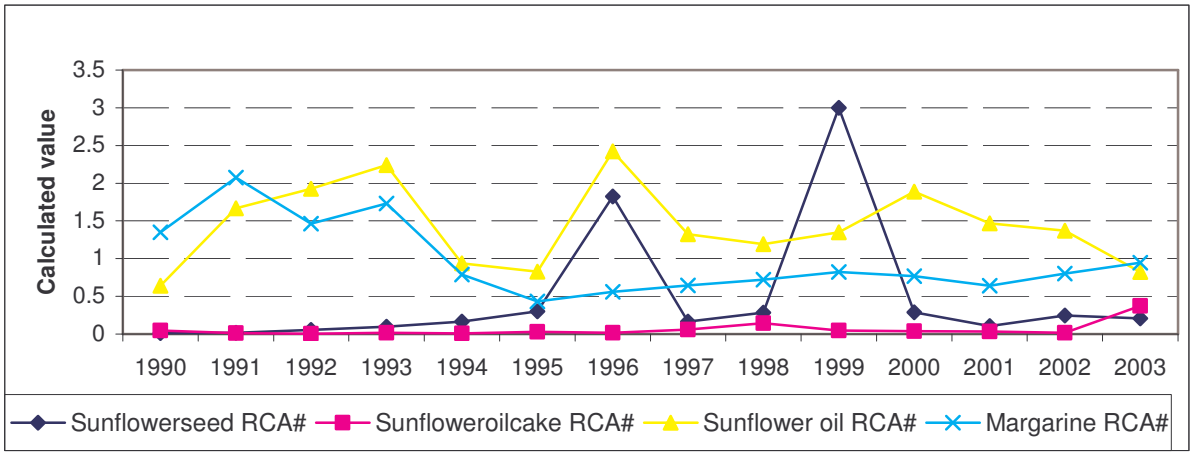

Figure 4.5: RCA# index values for different sunflower products in the supply chain

From Figure 4.6 it is clear that the sunflower seed products in the supply chain are mostly imported. Sunflower seed was a net exported product in 1996, 1999, 2000 and 2002. Sunflower oil, sunflower oilcake and margarine had a negative value, indicating that they were net importers for most of the period, except for 2002 when South Africa were a net exporter of sunflower oil, 2003, a net exporter of sunflower oilcake and in 1990, 1991 and 1993 a net exporter of margarine. As the values in Figure 4.5 increased, the comparative advantage shown in Figure 4.4 increased correspondingly.

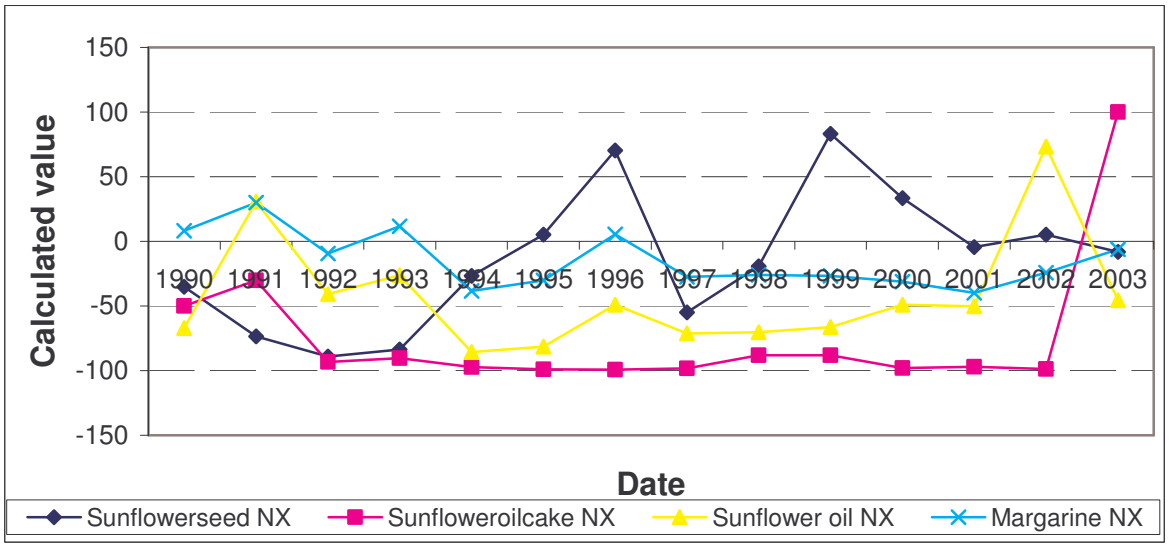

Figure 4.6: NX index values for the different sunflower products in the supply chain

4.5 Measuring the competitive performance of the South African oilseed industry using RTA

Balassa's Revealed Comparative Advantage (RCA) method applied in the previous section compares a country's share of the world market in one commodity with its share of all traded goods. In this section trends in the global competitiveness of the South African oilseed industry for the different supply chains are calculated by using the Relatively Revealed Comparative Trade Advantage (RTA) index. This specific index is used to accommodate both imports and exports. In Table 4.1 the RTA index values are calculated for the different oilseed chains in South Africa for the last 5 years. The values for the period 1999 to 2002 were calculated by Esterhuizen (2005), and the RTA index values for 2003 are own calculations. According to Galetto and Cappellini (2003) positive results show international competitive advantages and vice versa.

Table 4.1: Competitive advantage of oilseed chains in South Africa based on the RTA index

Chain	Product	RTA 1999	RTA 2000	RTA 2001	RTA 2002	RTA 2003
Soybeans chain	Soybeans	(0.06)	(0.37)	(0.05)	(0.08)	(0.03)*
	Oil of soybeans	(0.47)	(0.24)	(1.41)	(2.16)	(2.32)*
	Cake of soybeans	(1.72)	(1.91)	(2.14)	(2.14)	(1.50)*
	Soy sauce	(0.29)	(0.20)	(0.17)	(0.24)	(0.18)*
Groundnuts chain	Groundnuts in shell	15.11	15.03	18.70	27.31	15.73*
	Groundnuts shelled	2.04	2.13	2.53	3.76	(0.53)*
	Oil of groundnuts	4.40	0.56	0.38	2.13	0.18*
	Cake of groundnuts	0.06*	-	0.02	0.09	-
	Prepared groundnuts	0.00	0.71	0.42	0.71	0.52*
Sunflower chain	Sunflower seed	2.71	0.14	(0.01)	0.03	(0.01)*
	Oil of sunflower	(4.76)	(3.90)	(3.08)	1.15	(1.06*)
	Cake of sunflower	(0.54)	(3.32)	(1.64)	(2.06)	0.37*
	Margarine	(0.88)*	(0.77)*	(0.93)*	(0.70)*	(0.14)*

Source: Esterhuizen and Van Rooyen (2001)
Esterhuizen (2005)
FAO website (2005)
*own calculations

Note: RTA > 0 = Competitive advantage; RTA < 0 = Competitive disadvantage

From Figure 4.7 it is clear that groundnut oilcake and prepared groundnuts mostly exhibit positive values, although the values are very low, this is an indication of relative competitive advantage. The international competitive advantage of groundnut oil is declining, while shelled groundnuts experienced an international competitive disadvantage in 2003, after a relatively constant international competitive advantage from 1998 to 2002. Groundnuts in shells experienced a relatively steep increase in international competitiveness from 1998 to 2002, but this decreased in relative terms in 2003.

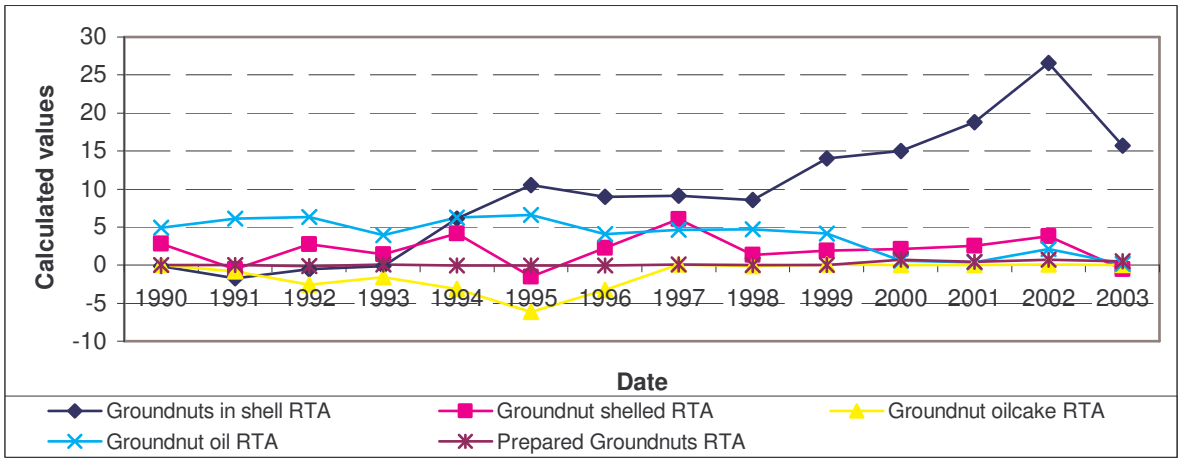

Figure 4.7: RTA index for the different groundnut products in the supply chain

Figure 4.8 shows the international competitiveness of the soybean supply chain in South Africa. The RTA values for the different products in the supply chain are mostly negative; indicating that all the relevant products experience a relative competitive disadvantage, except for soybeans and soy sauce in 1998 and 2000 respectively, when the products experienced relative competitive advantages. The RTA value for soybeans experienced a steep increase in 2003, where soybean oil showed a steep decrease in its relative competitive advantage from 2000-2003. The profit margin for crushing soybeans in South Africa is too high, and sunflower seed is used by crushers mainly because of this reason.

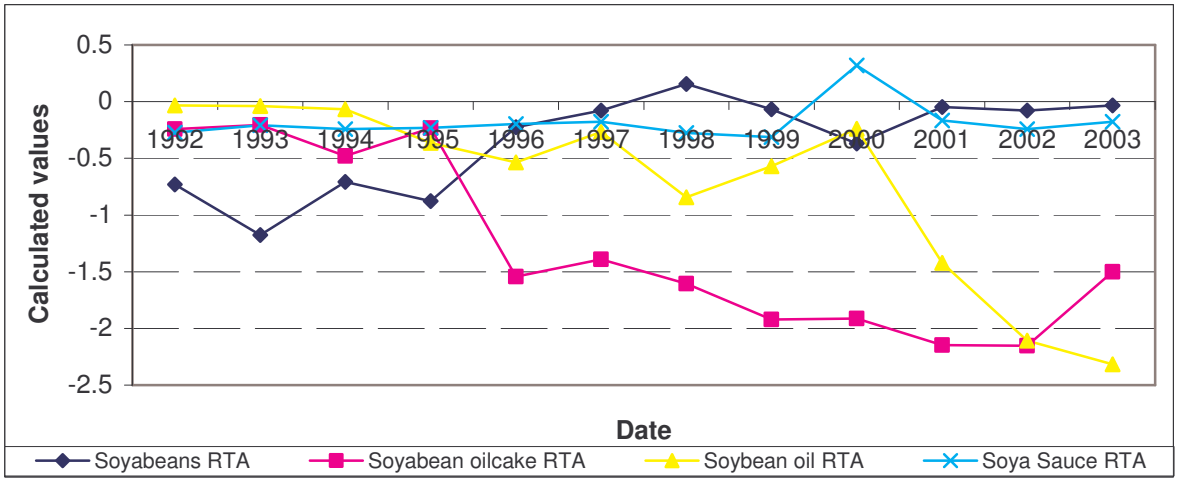

Figure 4.8: RTA index values for different soybean products in the supply chain

According to Figure 4.9 most of the products in the sunflower seed supply chain experienced international competitive disadvantages in the past. Sunflower seed experienced an international competitive advantage in 1996, 1999 and 2000, while sunflower oil only had an international competitive advantage in 2002; for the rest of the period and products an international competitive disadvantage was experienced.

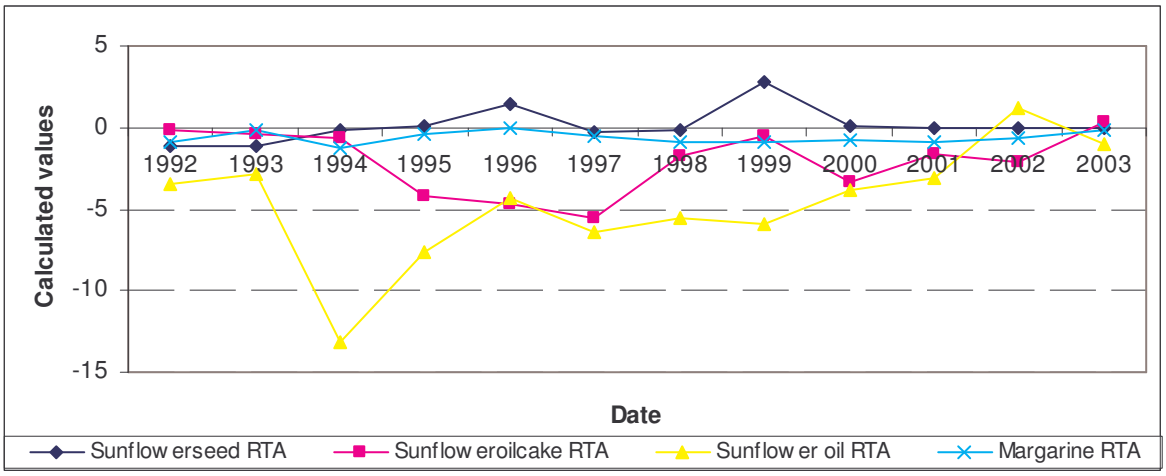

Figure 4.9: RTA index values for the different sunflower seed products in the supply chain

According to Esterhuizen and Van Rooyen (2001) there is a decrease in international competitiveness when moving from the primary to the processed products in the selected agro industry supply chains they studied, and this applies to the oilseed supply chain as well. This means that beneficiation or "value adding" opportunities in South African agribusinesses, where farm production is relatively or marginally international competitive, are limited.

4.6 Competitiveness of Argentina's oilseed supply chain

Argentina is one of the biggest oilseed producers in the world and South Africa's biggest competitor in the southern hemisphere, as Argentina shares the same counter-seasonal advantage. Considering the RTA index for Argentina (Table 4.2), and comparing it to the RTA index for South Africa in Table 4.1, it is clear that Argentina has a more internationally competitive soybean supply chain than South

Africa. South Africa is experiencing an international competitive disadvantage for the whole soybean supply chain, whereas Argentina has a relatively strong international competitive advantage, except for soy sauce, because of its low crushing margin.

South Africa's groundnut supply chain has a relatively better international competitive advantage for groundnuts in shell (primary form) than Argentina. For the groundnut products to which value is added, Argentina has a much better international competitive advantage than South Africa. South African imports of shelled groundnuts from Argentina increased tremendously, from zero imports in 2002 to 1 797 thousand USD in 2003.

The South African sunflower seed supply chain vacillated between an international competitive disadvantage and a low competitive advantage. Argentina, on the other hand, has a strong international competitive advantage for sunflower seed as well as all its value added products.

Table 4.2: Competitive advantage of Argentina's oilseed chain (RTA index)

Chain	Product	RTA 1999	RTA 2000	RTA 2001	RTA 2002	RTA 2003
Soybean chain	**Soybeans**	**15.92**	**21.09**	**29.59**	**26.17**	**31.38**
	Oil of soybeans	**115.31**	**131.67**	**124.57**	**132.93**	**163.75**
	Cake of soybeans	**103.93**	**112.71**	**97.66**	**111.66**	**124.33**
	Soy sauce	**(0.14)**	**(0.20)**	**(0.31)**	**(0.15)**	**(0.26)**
Groundnut chain	**Groundnuts in shell**	**0**	**(0.02)**	**0**	**0.03**	**0.01**
	Groundnuts shelled	**63.77**	**57.93**	**47.36**	**28.15**	**26.68**
	Oil of groundnuts	**96.40**	**57.71**	**37.40**	**71.28**	**39.69**
	Cake of groundnuts	**147.38**	**34.2774**	**17.82**	**29.66**	**15.91**
	Prepared groundnuts	**18.06**	**25.31**	**38.58**	**36.03**	**44.13**
Sunflower chain	**Sunflower seed**	**55.46**	**14.41**	**8.21**	**33.14**	**13.64**
	Oil of sunflower	**181.63**	**113.80**	**91.24**	**107.05**	**87.86**
	Cake of sunflower	**251.54**	**230.32**	**160.50**	**151.08**	**104.37**
	Margarine	**5.83**	**7.07**	**5.72**	**7.19**	**7.93**

Source: FAO website (2005) and own calculations

4.7 Trends in the South African and Argentine oilseed supply chain

In Table 4.3 the RTA index for the South African as well as the Argentinean oilseed industry is summarized, indicating the trends of the different supply chains. According to this table, soybeans in the soybean supply chain have a competitive advantage in Argentina, with a positive trend. South African soybeans, on the other hand, were relatively stable and still exhibit an international competitive disadvantage. The soybean oils and cakes exhibit an international competitive disadvantage and a downward trend in South Africa, while Argentina has an internationally competitive advantage and a positive trend. Both South Africa and Argentina have international competitive disadvantages with a negative trend for soy sauce.

In the groundnut supply chain, South Africa has an international competitive advantage for groundnuts in the shell while Argentina has an international competitive disadvantage for the same product. Argentina has an international competitive advantage for shelled groundnuts but South Africa has an international competitive disadvantage. South Africa has an internationally competitive disadvantage for groundnut oil, groundnut oilcake and prepared groundnuts, while Argentina has an international competitive advantage for all these products in the groundnut supply chain.

South Africa has an international competitive disadvantage for all the sunflower products in the sunflower supply chain, and all except margarine are on a negative trend. Argentina is internationally competitive in the whole sunflower supply chain.

Table 4.3: Competitive advantage of the oilseed industry based on the RTA index

Chain	Product	South African RTA 2003	Trend 1999-2003	Argentina RTA 2003	Trend 1999-2003
Soybean	Soybeans	**(0.03)**	=	**31.38**	**+**
chain	Oil of soy beans	**(2.32)**	-	**163.75**	**+**
	Cake of soy beans	**(1.50)**	-	**124.33**	**+**
	Soy sauce	**(0.18)**	-	**(0.26)**	**-**
Groundnut	Groundnuts in shell	**15.73**	+	**0.01**	**=**
chain	Groundnuts shelled	**(0.53)**	-	**26.68**	**-**
	Oil of groundnuts	**0.18**	-	**39.69**	**-**
	Cake of groundnuts	**0**	-	**15.91**	**-**
	Prepared groundnuts	**0.52**	+	**44.13**	**+**
Sunflower	Sunflower seed	**(0.01)**	-	**13.64**	**-**
chain	Oil of sunflower	**(0.06)**	-	**87.86**	**-**
	Cake of sunflower	**0.37**	-	**104.37**	**-**
	Margarine	**(0.14)**	+	**7.93**	**+**

4.8 Conclusion

Results of the analysis of the South African oilseed industry indicates that oilseeds in their primary form have a better internationally revealed comparative advantage, while value added oilseed products are burdened with a revealed comparative disadvantage. Jooste and Van Schalkwyk (2001) studied the comparative advantage of the primary oilseed industry in South Africa, but used the Resource Cost Ratio (RCR). They state that oilseeds in high yielding areas and under irrigation have a comparative advantage in their primary form, but in low yielding areas dryland groundnuts in North Eastern KwaZulu-Natal and dryland soy beans in Eastern Mpumalanga have comparative disadvantages.

Groundnuts and its value added products are the products in the South African oilseed supply chain with the highest international revealed comparative advantages and net exports, with sunflower seed and its products the second highest.

According to the relative trade advantage (RTA) analysis, oilseeds in their primary state have the highest international competitive advantage. This chapter made it clear that comparative as well as international competitive advantage in value added oilseed products is lacking.

The comparative and competitive advantage of the oilseed supply chain was calculated by means of trade data. Various factors must be considered before it can be said that the supply chain of the specific oilseeds has a competitive advantage/disadvantage from a local point of view. This analysis only indicates the comparativeness and competitiveness to world trade.

Argentina is one of South Africa's biggest competitors regarding oilseeds, mainly because the two countries enjoy the same counter seasonal advantage. The analysis found exactly contrasting results for South Africa and Argentina for competitive advantages for the different oilseeds. South Africa has a better relative competitive advantage for oilseeds in their primary form, where Argentina has a bigger relative competitive advantage for value added oilseed products. Argentina known as one of South Africa's biggest competitors in the oilseed industry, can rather be seen as an opportunity for a partnership. Why is South Africa only competitive in oilseeds in their primary form? In Chapter 5 a study of the secondary industry was conducted to find out what exactly is hurting South Africa's competitive advantage for value added oilseeds.

CHAPTER 5

THE SECONDARY OILSEED INDUSTRY IN SOUTH AFRICA

5.1 Introduction

In this chapter the secondary oilseed industry of South Africa are discussed. This is because of the results in Chapter 4, indicating that South African oilseeds only has a competitive advantage in their primary form. Information was gathered from the secondary industry which includes oilseed crushers and refiners, to give a better indication of what exactly are going on in this part of the oilseed supply chain. Eleven members (77%) of the Oil Processors' Association and one non-member completed questionnaires (see Appendix A) and their feedback provided a background for the secondary oilseed industry. The questionnaires were either distributed by means of mail, e-mail or completed during personal interviews.

The results discussed in this chapter are mainly based on the information obtained from the questionnaires, specifically the following information:

- Raw material used (type, supplier, imports, transport and storage);
- Competitive criteria;
- Processing (methods used, cost, amount and value added at different stages);
- End products (packaging, labeling and brand names);
- Marketing cost;
- Customers (demand for oilseeds, transport, exports);
- Integration, and
- Information systems used.

A very important part in this chapter is the SWOT analysis also obtained from the questionnaires.

It is important to note that there were a total of twelve respondents. The number of respondents varies for almost every section, because not all of the questions were answered by all of the respondents, and only the questions that were correctly and fully answered could be used.

5.2 Processors and members

The largest crushing plants and all the oil refineries that are members of the South African Oil Processors' Association are shown in Table 5.1. As already indicated, only 77.8% of the largest crushing plants in Table 5.1 responded to the questionnaires, and 84.6% of the South African oil processing Association members responded to the questionnaires that were distributed.

According to the feedback, Elangeni Oil and Cake Mills, Capital Oil Mills and Sealake Industries shown as crushing companies in Table 5.1 do not use their crushing capacity at present. These enterprises have 105 000 tons of unused crushing capacity. The Food Pricing Monitoring Committee (2003) indicated that only 62% of the total crushing capacity in South Africa is utilized. The eight largest sunflower seed crushers have a capacity of 1 075 000 tons, of which less than 666 500 tons are utilized.

The surplus crushing capacity available allows the industry to expand at any given time. According to the Food Pricing Monitoring Committee (2003) this phenomenon makes the crushing industry highly competitive since the utilization of crushing capacity is readily available to anyone in the business. The fact that excess processing capacity exists in South Africa exerts increasing pressure on the ability of large and small processors to reach and maintain optimum levels of economies of scale.

As discussed in Chapter 3, about 88% of South Africa's sunflower seed is produced in the Free State and the North West provinces. Table 5.2 indicates the location of the crushers, emphasizing the importance of transport.

Table 5.1: Largest crushing plants in South Africa

Processor	Location	Crushing capacity (tons)
***Nola industries**	**Randburg & Boksburg**	**400 000**
***Epic**	**Southdale**	**200 000**
***Epco**	**Lichtenburg**	**170 000**
Willowton Oil Mills	**Isando**	**100 000**
Senwesko	**Viljoenskroon**	**100 000**
***Capital oil Mills**	**Pietermaritzburg**	**50 000**
***Elangeni Oil and Cake Mills**	**Isithebe**	**30 000**
***Sealake Industries**	**Pietermaritzburg**	**25 000**
***Nedan Oil Mills**	**Parklands**	**110 000**
Total		1 185 000

Source: Food Pricing Monitoring Committee (2003)
* Questionnaire respondents all sunflower seed crushers, except Nedan, which is a soybean crusher

Table 5.2 gives a list of oil refineries that are currently members of the South African Oil Processors' Association (SAOPA). Comparing Table 5.1 and 5.2 it is clear that almost all crushers have refining capacity, but a minimum number of refiners have crushing capacity.

According to Table 5.2 eight of the thirteen refineries are located relatively close to Durban harbour, via which crude oil can be imported.

Table 5.2: South African Oil Refineries (n=11)

Refiners	Location
*Capital Oil Mills	Pietermaritzburg
*Elangeni Oil and Cake Mills	Isithebe
*Epic Foods	Southdale
*Epko Oil Seed Crushing	Lichtenburg
*Nedan Oil Mills	Rivonia
*Nola Industries	Randfontein
*Sealake Industries	Pietermaritzburg
*Sun Oil Refineries	Isipingo Beach
*Sunola Oil Mills	Port Shepstone
*UBR	Durban
Continental Oil Mills	Randfontein
Hentiq 1320	Cumberwood
Willowton Oil Mills	Isando

Source: The South African Oil Processors Association (2003)
* Questionnaire respondents

Felda Bridge Africa, a palm oil refiner and non-member of SAOPA, also responded to the questionnaire.

Of the 11 respondents, only 2 operate under full capacity including Felda Bridge Africa. Table 5.3 presents the available and used capacities for all oilseeds which are mainly sunflower seed. Of the 11 processors who responded, 55% experienced a change in capacity over the last five years. This capacity change was mainly due to the change in price, demand and imports.

Table 5.3: Available and used capacity

Processor	Available capacity t/annum	Capacity used r/annum
Felda Bridge Africa	7 500	7 500
Epco oil Seed Crushing	180 000	130 000
Epco oil Refinery	51 600	45 000
Nedan Oil	11 000	34 000
Epic Foods	110 000	60 000
Nola	60 000	59 500
Elangeni	80 000	40 000
Capital products	24000	24000
Sun Oil	43200	21600
Sealake	90000	60000
Sunola Oil Mills	40000	28000

5.3 Raw materials

In this section the type and suppliers of the raw materials used by processors, key criteria used to choose a supplier, transport, storage cost and lead time of the raw materials are discussed.

5.3.1 Type of raw materials used

According to Figure 5.1 over 90% of the refiners use crude sunflower oil as a raw product. Crude soybean oil is the second most frequently used oil.

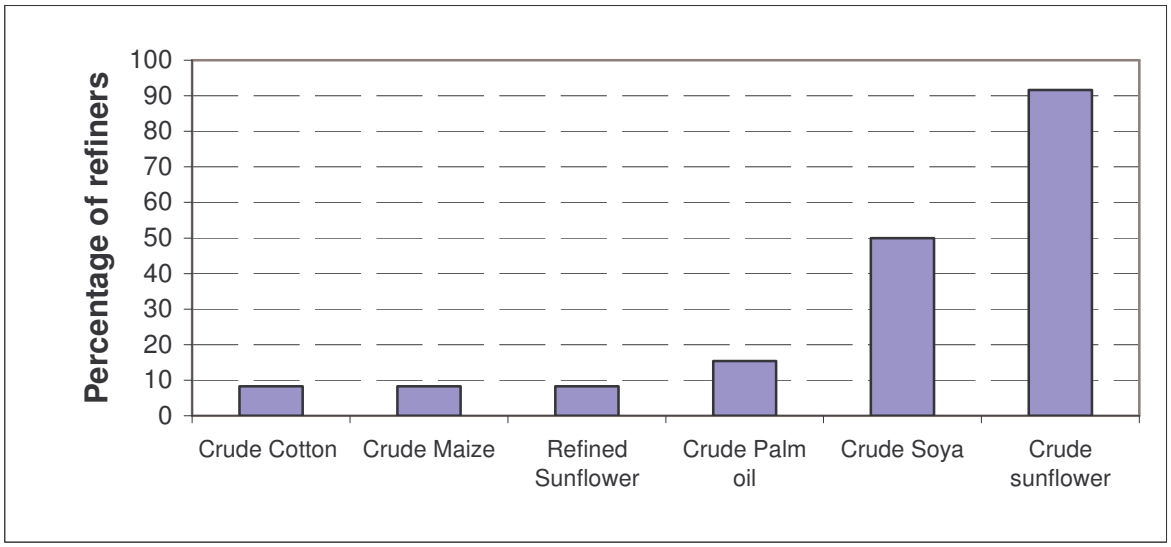

Figure 5.1: Percentage usage of different crude edible oils by processors (n=12)

5.3.2 Locally supplied and imported raw materials

According to Figure 5.2, 41.67% of the 12 respondents rely on both local suppliers, including co-ops, farmers and local crushers, and imports of crude oil, to supply them with their raw materials, 33% of the 12 respondents rely only on local suppliers, and 25% on imports only. About 66.67% of the processors depend on imports.

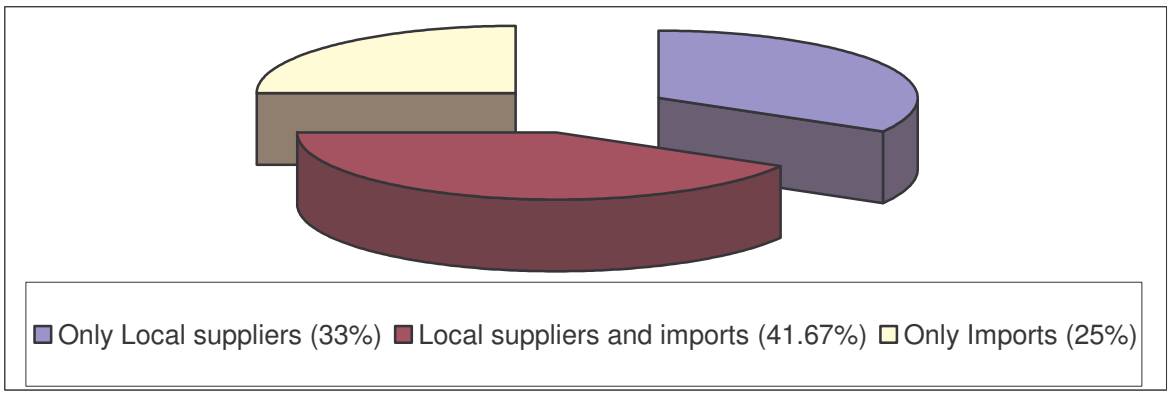

Figure 5.2: Suppliers of raw materials to processors (n=12)

Fifty percent of the processors importing crude sunflower oil import between 50 and 30% of their raw material (crude sunflower oil). Of the processors 17% import

between 50 and 80 percent crude sunflower oil and 33% import all their crude sunflower oil. The main reasons provided by the respondents are lower prices and the seasonal supply of the commodity.

Eighty percent of the processors using soybean crude oil import between 90 and 100% of this crude oil. The reasons why they import soybean crude oil are the same as the reasons for importing sunflower oil. The processors using palm oil have to import all the palm oil because, as discussed in Chapter 3, palm oil is not produced in South Africa, though it is processed locally.

5.3.3 Key criteria when selecting a raw material supplier

In Figure 5.3 the key criteria for the selection of raw material suppliers are prioritized. It is clear that cost and product quality are the two major criteria, as indicated by all the processors. Service is also of great importance, and over 80% of the processors identified it as a high priority when selecting a supplier.

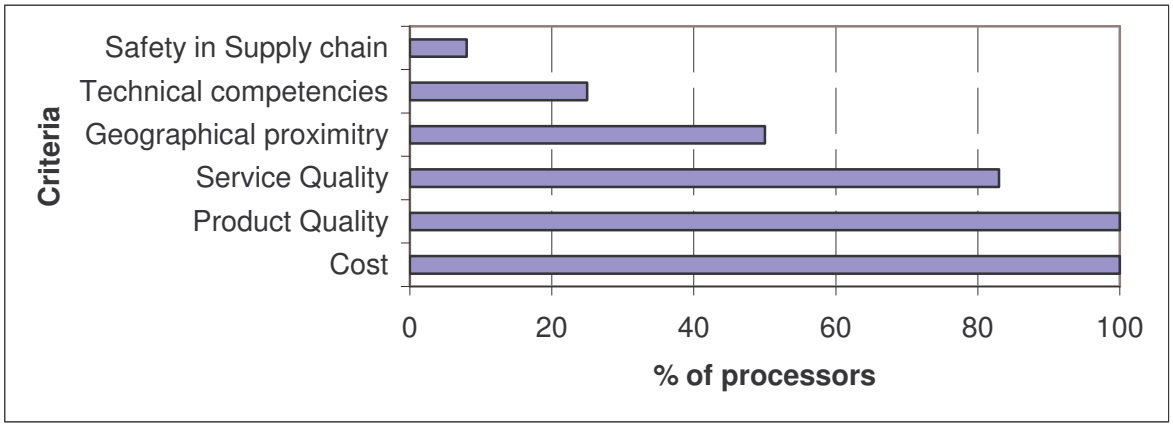

Figure 5.3: Key criteria when selecting suppliers (n=12)

5.3.4 Transport of raw materials

According to Figure 5.4, 41.67% of the twelve processors only make use of contracting, and only 16.67% of them depend totally on their own transport. Almost 25% of the processors make use of contracting together with other transport,

including own vehicles and deliveries by suppliers. From this it is clear that processors consider it more profitable to make use of contractors.

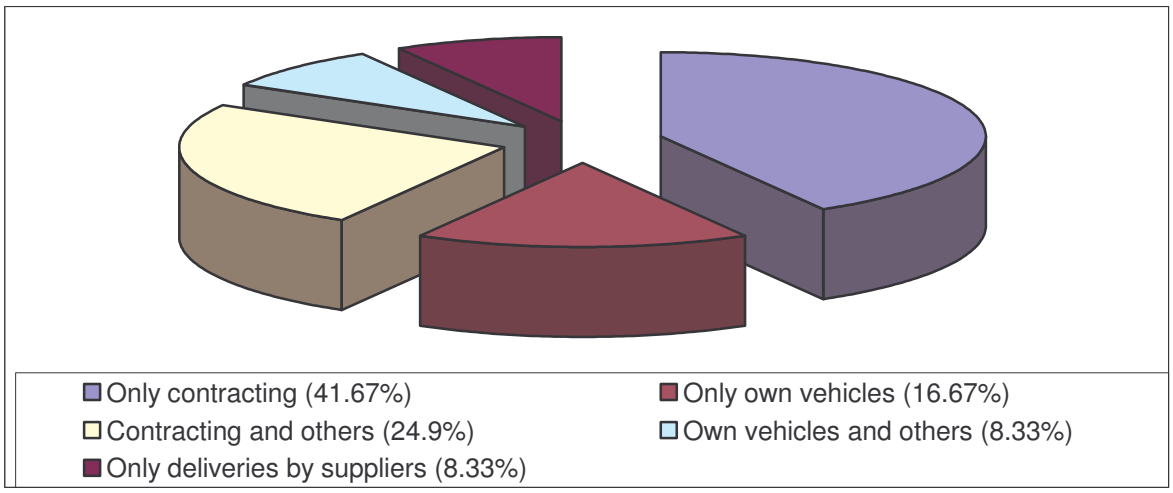

Figure 5.4: Transport of raw materials (n=12)

In Figure 5.5 it can be seen that most of the processors receive raw materials from less than 100 km from their sites; this is mainly because most of the processing sites are located close to Durban harbour, via which crude oil are imported. Some processors obtain their raw materials from as far as 8 000 km from their sites (palm oil from Malaysia). Transport costs can vary from R5.40 to R8 per kilometer, depending on the type of transport used.

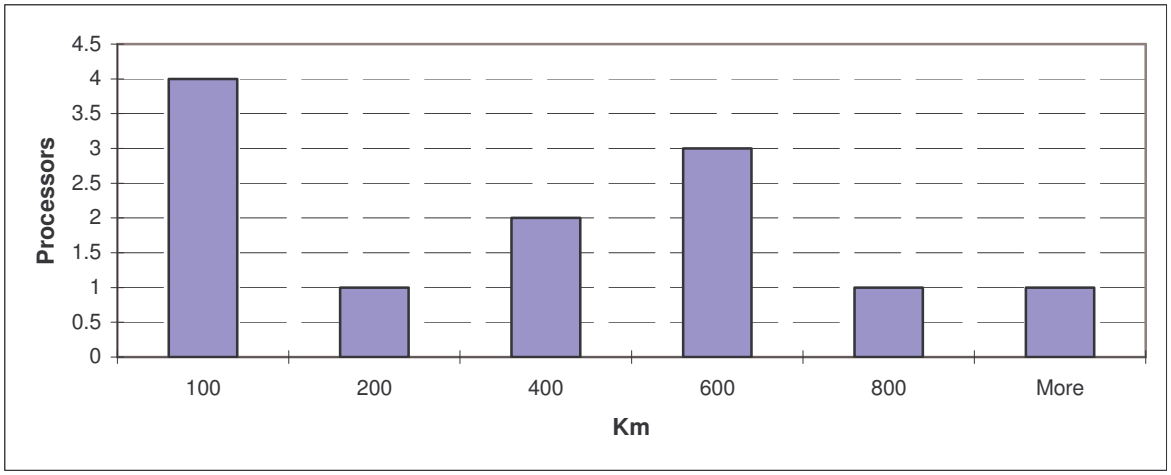

Figure 5.5: Distance of raw materials from processors (n=12)

5.3.5 Storage cost and lead time

All twelve of the respondents have sufficient storage for their raw materials. The lead time of the raw materials is depicted in Figure 5.6, and shows that most of the processors wait for more than 60 days for an order. Imported raw materials take, on average 2-3 weeks longer than locally produced raw materials to be delivered.

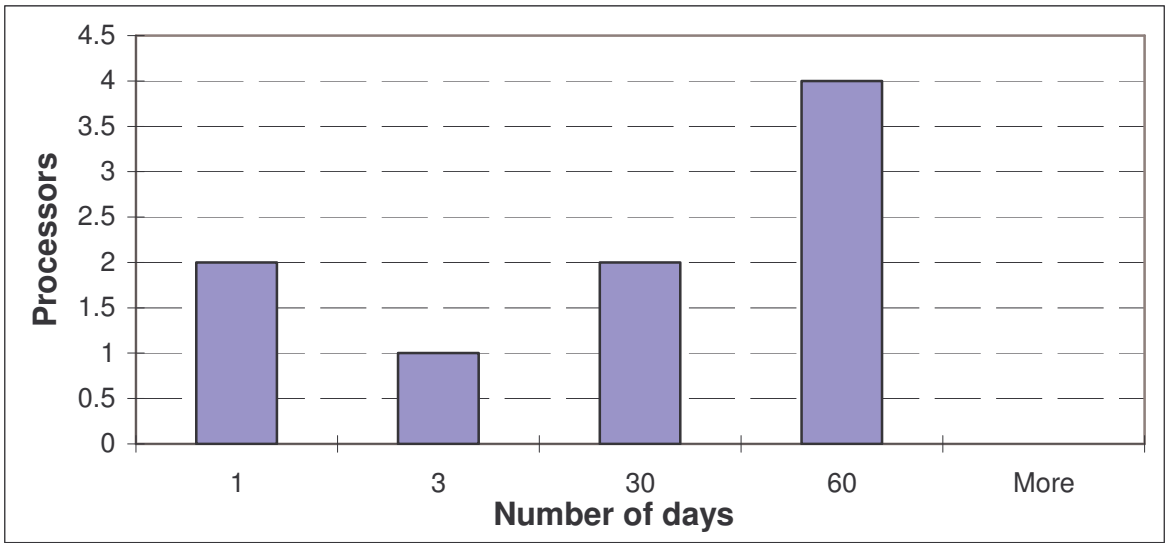

Figure 5.6: Lead time of local raw materials to the processors (n=12)

5.4 Competition

Increasing pressure is being exerted on the ability of large and small processors to reach and maintain optimum levels of economies of scale. The fact that excess capcity exist makes this even more difficult. Oilseed processing, according to the Food Pricing Monitoring Committee (2003), is highly capital intensive, and requires specialized knowledge and state-of-the-art technology. The fact that large amounts of crude oil are imported into South Africa makes it very difficult for large and small local oilseed crushers to survive.

The respondents identified a number of areas in which they compete against each other. From Figure 5.7 it is clear that the industry is price driven. Quality follows price as the second most important factor on which competition is based.

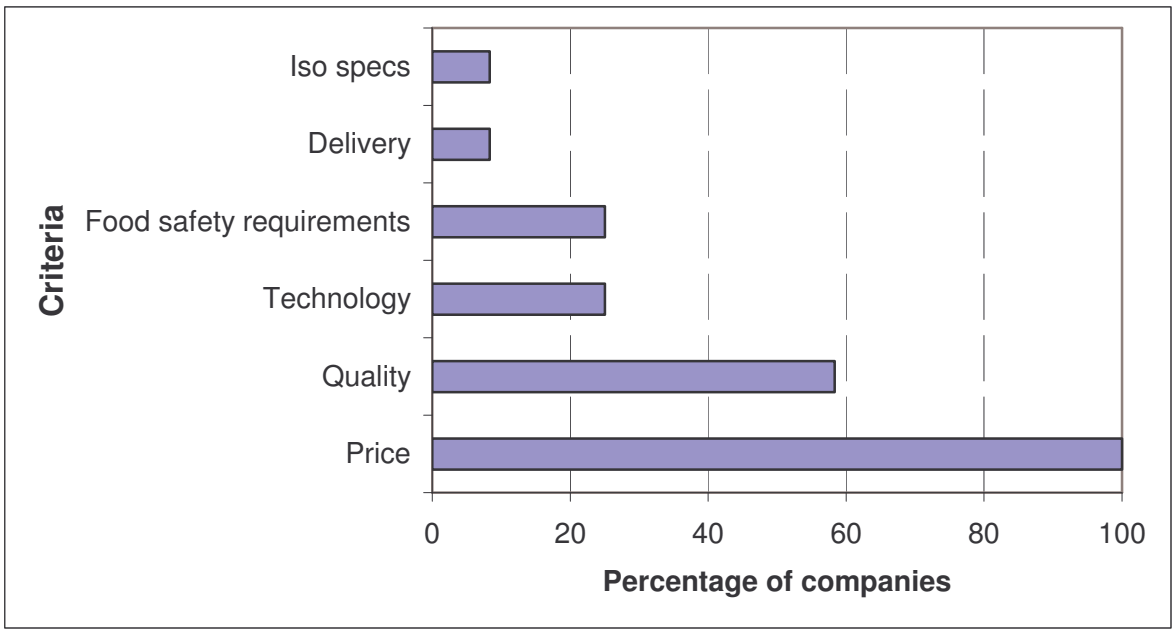

Figure 5.7: Fields in which oilseed processors compete (n=12)

5.5 Processing methods and costs

Figure 5.8 show that almost 63% of oilseed crushers use the continuous solvent extraction processing method. Of the oilseed refiners, 55% use chemical and non-chemical methods.

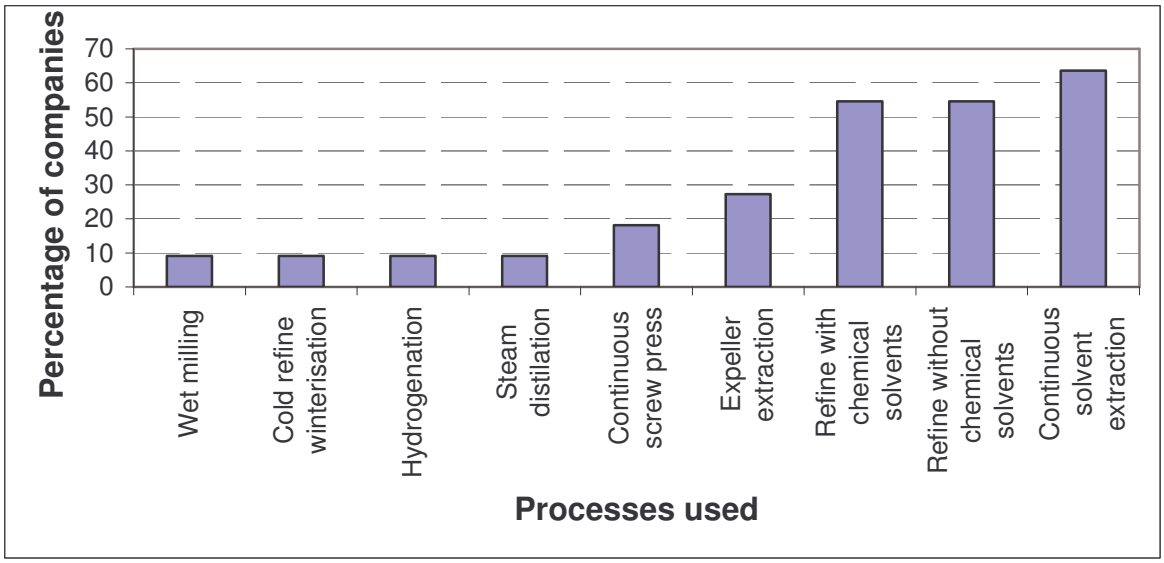

Figure 5.8: Processing methods used by processors (n=11)

Table 5.4 represents the total processing cost of the nine respondents who replied to this specific question in the questionnaire. According to this figure more than 40% of the processors' costs are between R400 and R600 per ton. More than 20% of the processors experience a total processing cost between R400 and R600 per ton.

Table 5.4: Total processing cost (R/ton) (n=9)

Processing cost (R/ton)	Frequency
≤200	**1**
200-400	**4**
400-600	**2**
600-800	**0**
800-1 000	**1**
≥1 000	**1**

To lower the processing cost and to remain competitive in the market, processors must stay at the forefront of technological innovations in oilseed processing. According to the Food Pricing Monitoring Committee (2003) this complicates the ability of the industry to maintain or reach economies of scale. The frequency that

the processors improve their practices are shown in Figure 5.9, and according to this 36.36% of the processors improve their practices often, 36.36% more than often, 9.09% very often, 9.09% not very often and 9.09% relatively often.

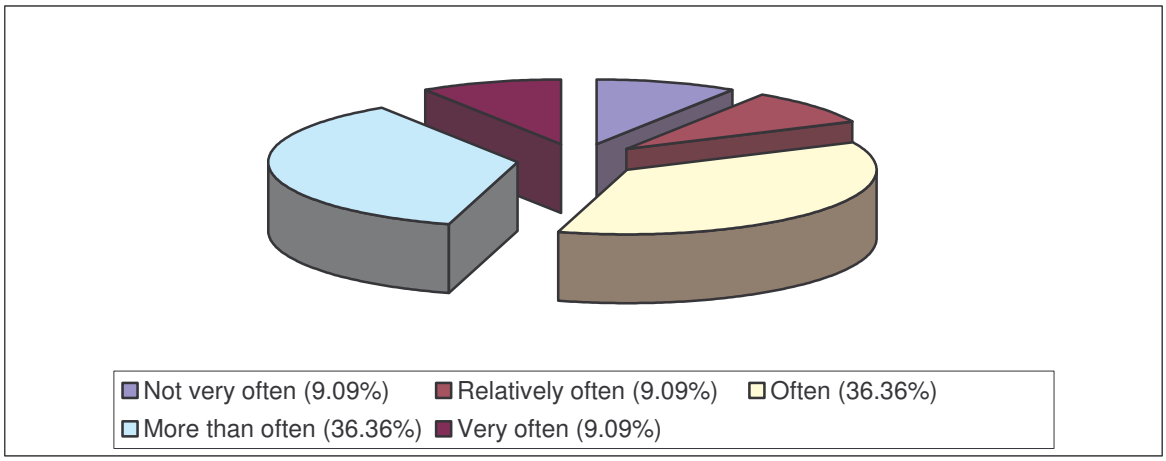

Figure 5.9: Improvement of practices to lower production cost (n=11)

Almost 43% of the processors improve their practices relatively often or very often. Upgrading equipment for better capacity utilization was given as reason for improvements made over the last five years by almost 30% of the processors. Packaging equipment and better production and process control were identified by the other processors as areas in which they improved.

The following weak links were identified in the processing chains of the processors:

- Steam distillation
- Dewaxing
- Winterization
- Logistical problems (rail to road)
- Machinery
- Chilling

5.6 Value adding to oilseeds

Table 5.5 represents the prices of sunflower seed, oilcake and crude oil from six respondents. According to the information provided, the average value added to sunflower seed is in the order of R3 370 per ton. In the case of soybeans, the value added amounts to R4 150 per ton.

Table 5.5: Value adding in the crushing process (n=6)

Processors	Price of seed R/ton	Price of oilcake and crude oil (R/ton)	Value added R/ton
1	**2 200**	**6 250**	**4 050**
2	**1 950**	**6 050**	**4 100**
3	**2 017**	**5 710**	**3 693**
4	**2 200**	**5 900**	**3 700**
5	**2 100**	**6 100**	**4 000**
6	**2 150**	**6 200**	**4 050**
Average	1 802	5 173	3 370

Prices of crude and refined oils were obtained from eight processors and are depicted in Table 5.6. According to this table the average value added is R691 per ton during refining (i.e. from crude sunflower oil to refined sunflower oil). The refining process of soybean oil adds R450 per ton to the value of the product.

Table 5.6: Value added during the refining process (n=8)

Processor	Price of crude oil R/ton	Price of Refined oil R/ton	Value added R/ton
1	**4 750**	**5 620**	**870**
2	**4 750**	**5 200**	**450**
3	**4 585**	**5 100**	**515**
4	**4 585**	**5 024**	**439**
5	**4 600**	**5 600**	**1000**
6	**5 000**	**5 800**	**800**
7	**4 800**	**5 400**	**600**
8	**5 000**	**5 850**	**850**
Average	4 759	5 449	691

Table 5.7 shows that the refining process adds an average value of R773 per ton to edible sunflower oil in the retail market. From the refining activity to the retail level a value of R750 per ton were added.

Table 5.7: Value added from the refined oil to retail (n=8)

Processors	Price of refined oil R/ton	Retail price R/ton	Value added R/ton
1	**5 620**	**5 620**	**0**
2	**5 200**	**5 500**	**300**
3	**5 100**	**6 000**	**900**
4	**5 024**	**7 405**	**2 381**
5	**5 600**	**6 000**	**400**
6	**5 800**	**7 100**	**1 300**
7	**5 400**	**6 000**	**600**
8	**5 850**	**6 150**	**300**
Average	5 449	6 222	773

By summarizing the value added to both sunflower seed and soybeans, the crushing activity adds the most value to oilseeds, then the process from refined oils to the retail market, and lastly the refiners processing crude oil to refined oils.

5.7 End products

Of the eleven respondents, 45% produce crude oil and all produce oilcake. All of the processors produce refined oil. Figure 5.10 indicates that most of the processors (45%) produce between 2 000 and 6 000 tons/month.

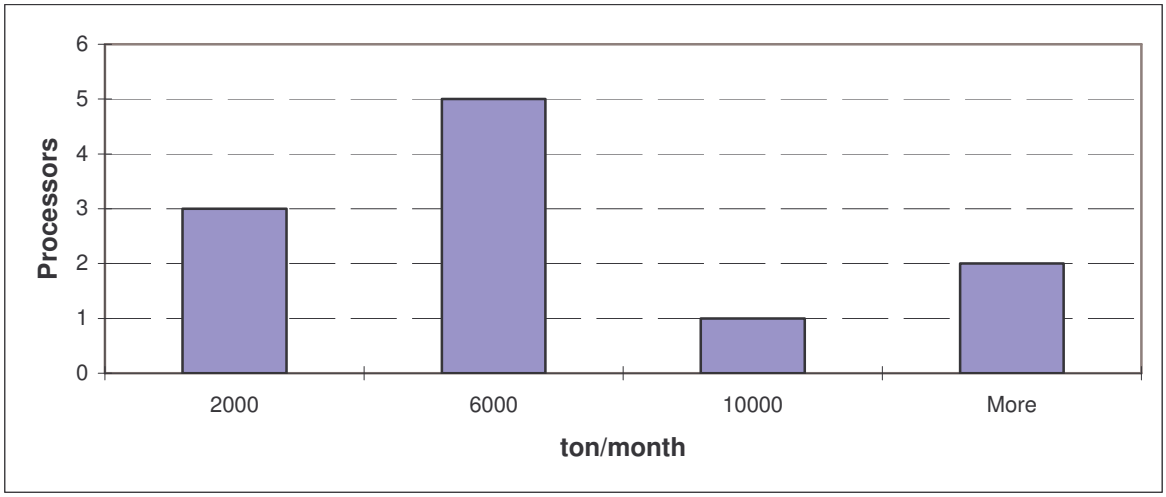

Figure 5.10: Amount of refined oil produced (ton/month) (n=11)

5.7.1 Packaging and labeling

Over 90% of companies do their own packaging and labeling. The costs involved in packaging and labeling varies from 41 cents per liter to R1.51 per liter. According to Figure 5.11, 33% of nine respondents' packaging and labeling costs range between 60 cents and R1 per liter.

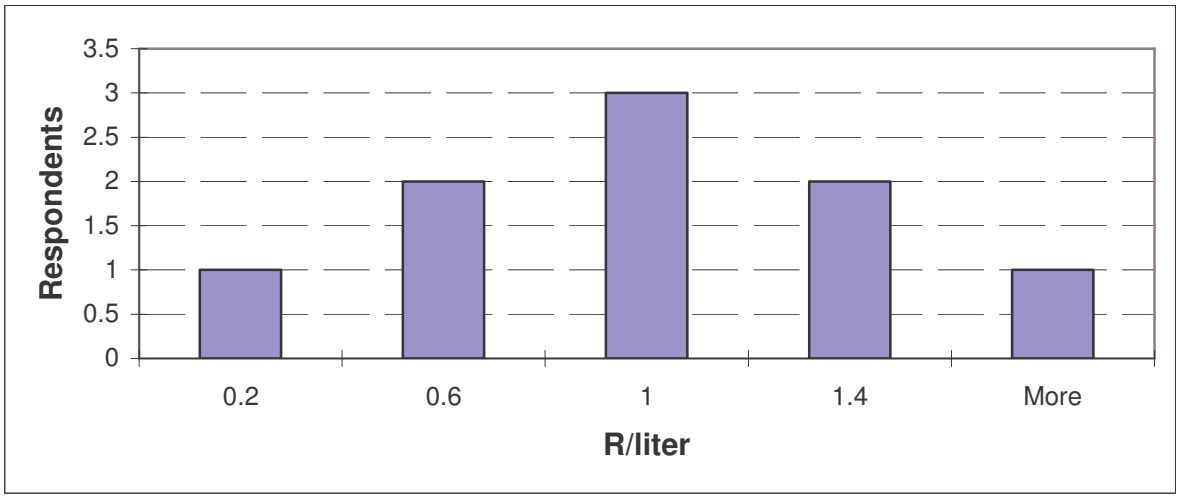

Figure 5.11: Packaging and labeling costs of processors (n=10)

5.7.2 Brand names

According to Figure 5.12, 33% of the 12 processors operate under two brand names and 25% operate under four brand names. The fact that the industry is price driven results in little loyalty and this reduces the value of brand names.

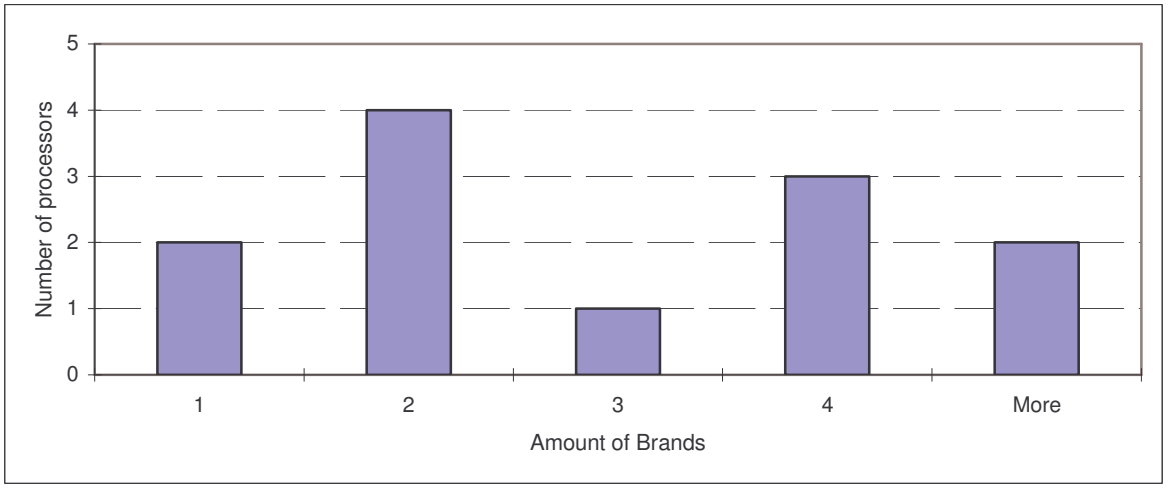

Figure 5.12: Number of brand names per processor (n=12)

5.8 Marketing

In this section the marketing cost, customers of the end products, price and quality pressure, demand, exports and transport of the end products (edible oils) produced are discussed.

5.8.1 Marketing cost

The marketing cost of oilseeds varies from 5 cents to R120 per ton. According to Figure 5.13 about 27% of the respondents spend less than R10 per ton on the marketing of their products and 27% spend between R40 and R70. One of the processors stated “oil is a commodity where price plays a bigger role”.

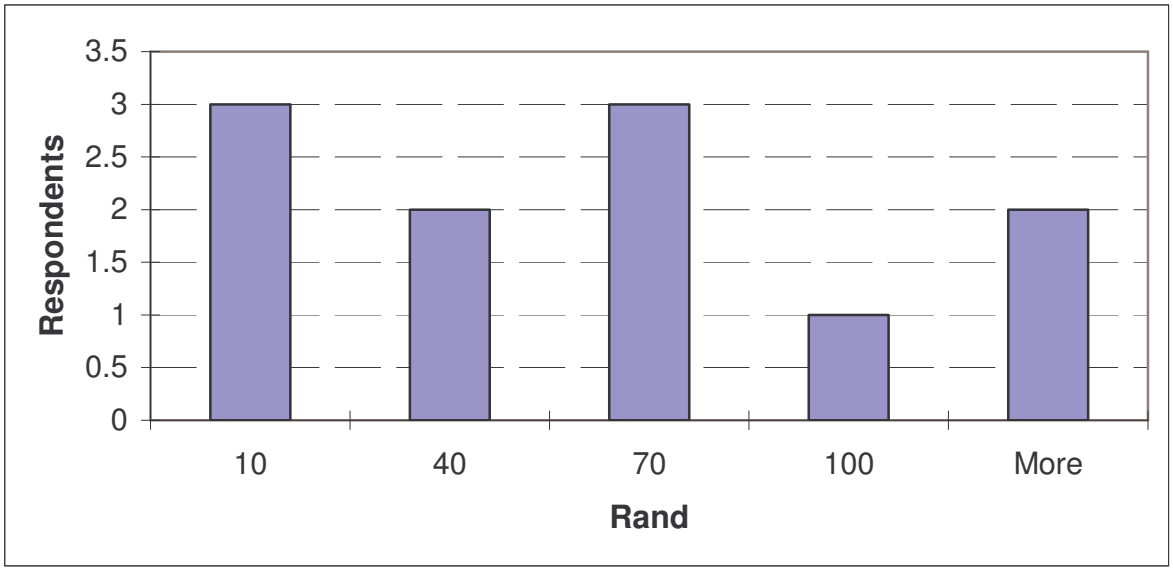

Figure 5.13: Marketing cost in Rand per ton (n=11)

5.8.2 Customers

Figure 5.14 indicates the different customer groups to whom the processors supply their products. Of the respondents 25% supply their products to retailers and wholesalers.

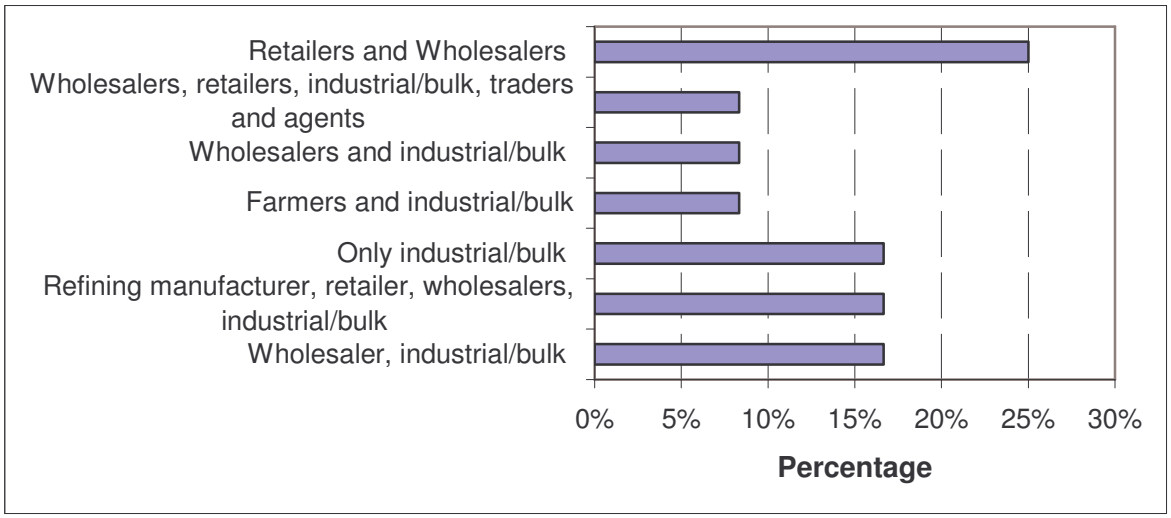

Figure 5.14: Point of sale of the products of the processors (n=12)

About 75% of the processors supply to wholesalers and 50% to retailers. Almost 75% of the processors provide their products for industrial use.

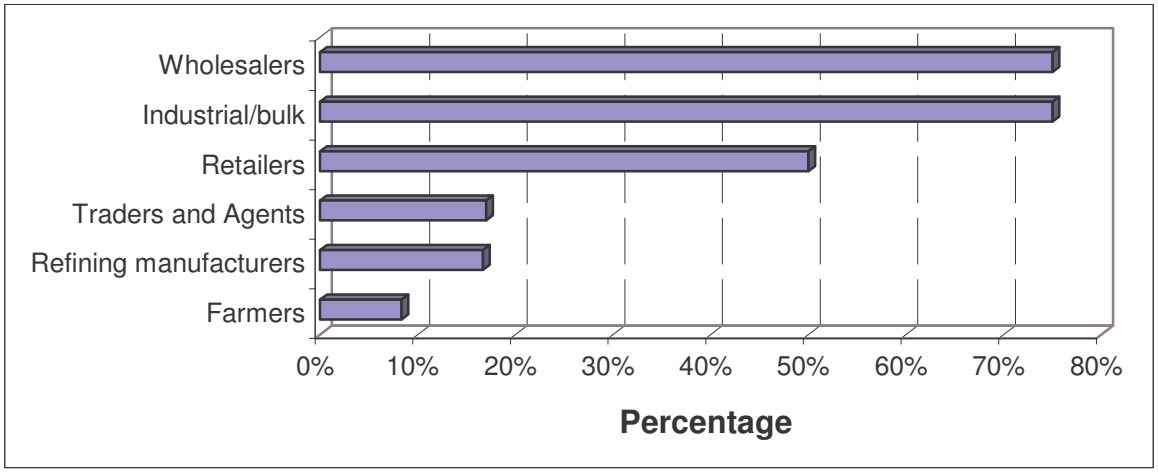

Figure 5.15: Customers of oil processors (n=12)

5.8.3 Price and quality pressure

Price and quality pressure were identified by all of the processors as the most important pressures to which they are subject. Eighty percent of the eleven processors consider price as the biggest factor in the market; if the price of their

product is too high, customers will find a less expensive product. There is little loyalty in the market, and no compromise for quality in the industry.

5.8.4 Product demand

Of the processors 45% regard the demand for their product as relatively high, the other percentages as indicated in Figure 5.16 are equally distributed among high and medium demand; there is no processor who perceives his product to be in the low or relatively low demand category.

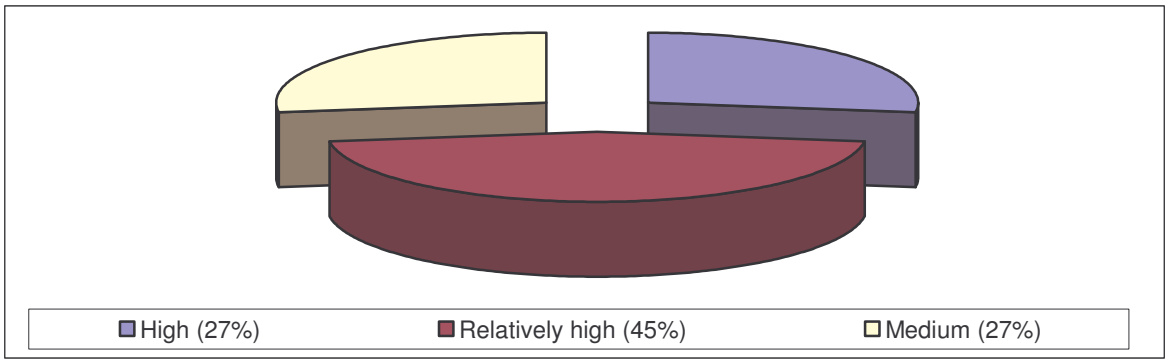

Figure 5.16: Demand for products (n=11)

As already discussed, the demand for edible oils is considered to be medium to high, and 80% of the respondents depicted a change in their customers. Of the respondents who experienced a change in customers 37.5% experience a reduction in numbers mainly because of price competition. The other 62.5% of respondents experienced an increase in customers because of better price and quality, new outlets opening, more aggressive sales/marketing and resulting sales opportunities in other provinces.

Of the twelve respondents 92% indicated that they have good access to the market for their products.

5.8.5 Exports of end products

Of the eleven respondents 45% export their products to mainly African countries such as Botswana, Namibia, Nigeria, Zambia, and Mozambique.

5.8.6 Transport of end products

The distance of the crushing or refining plant to the market influences the processors' ability to achieve economies of scale. According to the Food Pricing Monitoring Committee (2003) a number of small processors have the disadvantage of being located far from markets, in contrast to the larger ones who built their factories closer to the markets of Gauteng and KwaZulu-Natal, or those that are situated near harbours specifically to be closer to their raw material suppliers (imported crude oils). The relative difference in transport costs of transporting the primary commodity to the processing plant and transporting the processed product to the market affects the smaller processors in particular (Food Pricing Monitoring Committee, 2003).

Figure 5.17 indicates how processors transport their end products. The transport was divided into groups, as indicated in the figure. According to Figure 5.17, most of the processors make use of own vehicles together with contractors, and own vehicles together with contractors and customers picking it up themselves.

If the transport is considered separately, 91% of the eleven respondents make use of contractors, 64% make use of their own vehicles and 46% of the respondents' customers collect the end product directly from the processors. Most of the processors are situated in KwaZulu-Natal, Gauteng and the North West, and supply their products throughout South Africa. Because of the distance to the Western Cape, processors in KwaZulu-Natal do not sell their products there.

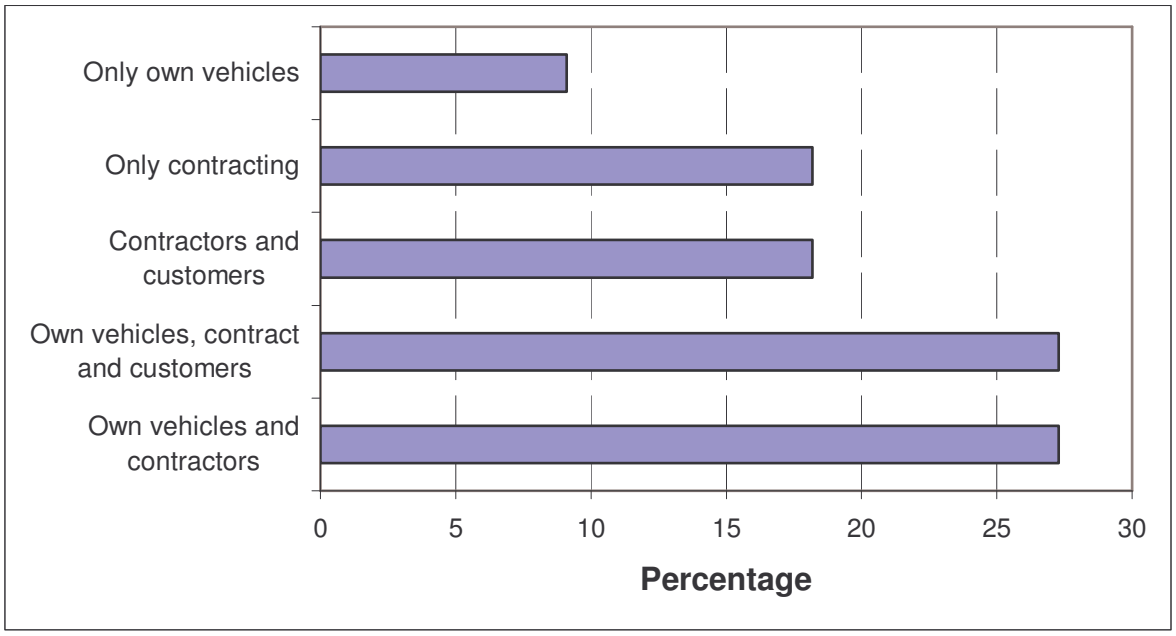

Figure 5.17: Transport of end products (n=11)

Only 36% of the eleven respondents experience problems with transport, of which the following are examples:

- Availability of vehicles during peak seasons
- The cost of diesel
- The cost of toll roads
- Late deliveries and
- Unscheduled trucks

5.9 Integration

Only 36% of the 11 respondents are integrated with their suppliers. These processors reported that they are integrated in either of the following ways:

- a joint venture on a particular project for a certain duration of time,
- integrated ownership, or
- production contracts with suppliers.

Only four of the 11 respondents are integrated with other processors, three of them are refiners that are integrated with crushing companies and one a crushing company with a refiner.

There is little integration between processors and their clients. Only two of the 11 respondents are integrated with their clients. In this case a fixed price marketing contract has been closed for a certain duration of time. According to the respondents, the main reason for integration is for better certainty of supply of raw materials, and to improve production.

5.10 Information systems used

Only eight of the ten processors who responded use some kind of information system in their business. Of the eight using information systems, 63% use Internet banking. Most of them have access to the Internet for communication, price information of the commodities (SAFEX) and other agricultural information (SAGIS). Almost 38% of the eight processors using information systems have access to other information systems than the above mentioned to communicate with customers, all of this is conducted through an Intranet system.

5.11 SWOT analysis

In the questionnaire a SWOT analysis was conducted for each processor. They were asked to identify all the strong points, weak points, opportunities and threats of the industry. Ten processors responded to this specific analysis and the results obtained are summarized below.

Strong points of the industry

- This industry is an essential food industry for the country, there are few alternatives for this product.
- Crushers are in close proximity to their raw material sources.

- The availability of raw materials can be considered as a strong point, and if there is a local shortage, there is always sufficient imported crude oil available.
- Production is considered to be very efficient as the technology of the crushers and refiners are of high quality.
- The processing plants are considered fast and can operate at a low cost, especially the crushing plants near the coast.
- There are few role-players in the industry.
- ISO 9001-2000, a standard of quality recognized and respected throughout the world, is applied.
- The palm oil refiner considered palm oil to be a product that is gaining market share.

Weak points of the industry

- The industry is a commodity market, and therefore mostly price driven, which leads to low margins and little brand loyalty.
- Oversupply of processing capacity at refining sites. A large percentage of the crushing facilities are underutilized.
- Few economies of scale.
- Strength of retailers and wholesalers who control the pricing chain.
- South Africa is a net importer of oil, supplying capacity for dumping of oil at subsidized prices.
- Levies on imported products complicate exports.
- Insufficient local sunflower seed is available and there is a 10% duty on imported oil.
- Dependency on fluctuations of the exchange rate.
- Transportation problems (high cost)
- The palm oil refiner identified the supply and pricing as a weak point

Opportunities in the industry

- Strategic business units.
- Rise in standards of living increases oil usage.
- Export opportunities to more African countries are becoming available.
- Producer/manufacturer joint ventures exist.
- Value is added to products, using oil as a base.
- End users can be educated regarding sunflower oil.
- The palm oil refiner mentioned the local supply of palm oil, palm oils replacing animal products to a greater extent and the use of hard fractions to replace hydrogenated soft oils.

Threats to the industry

- Dumping of cheaper bottled cooking oils in no need of further processing.
- Subsidies being paid to overseas producers.
- Blending of low quality oils.
- The strong rand/dollar exchange rate.
- Variable weather conditions.
- Insufficient local supply of sunflower seed, and decreasing year by year.
- Lower quality of local seeds
- The palm oil refiner mentioned the effect of legislation on palm oil as well as the cost of production

5.12 Breakeven level and annual turnover

According to Figure 5.18 about 38% of the eight respondents have a breakeven level of more than R200 million per annum. In Figure 5.19 it can be seen that 38% of the eight respondents have an average annual turnover of R100 million per annum, which is lower than the other 63% companies' breakeven levels. This is an indication of the existence of big processors and small processors, and this can

make production difficult for smaller manufacturers, as they have to compete with the large manufacturers who have economies of scale and probably access to better technology.

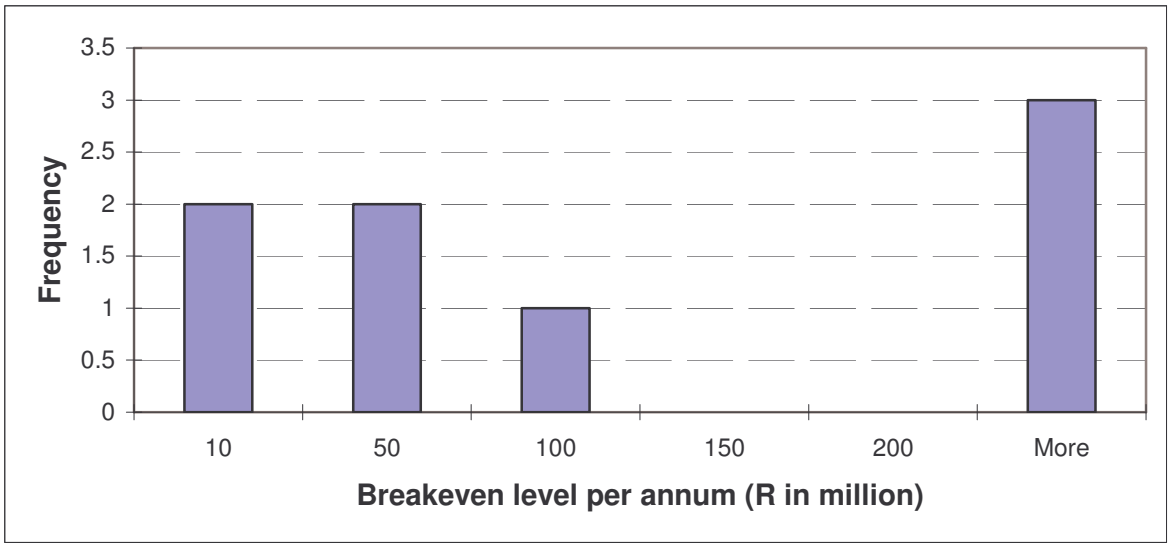

Figure 5.18: Breakeven level per annum (R in million) (n=8)

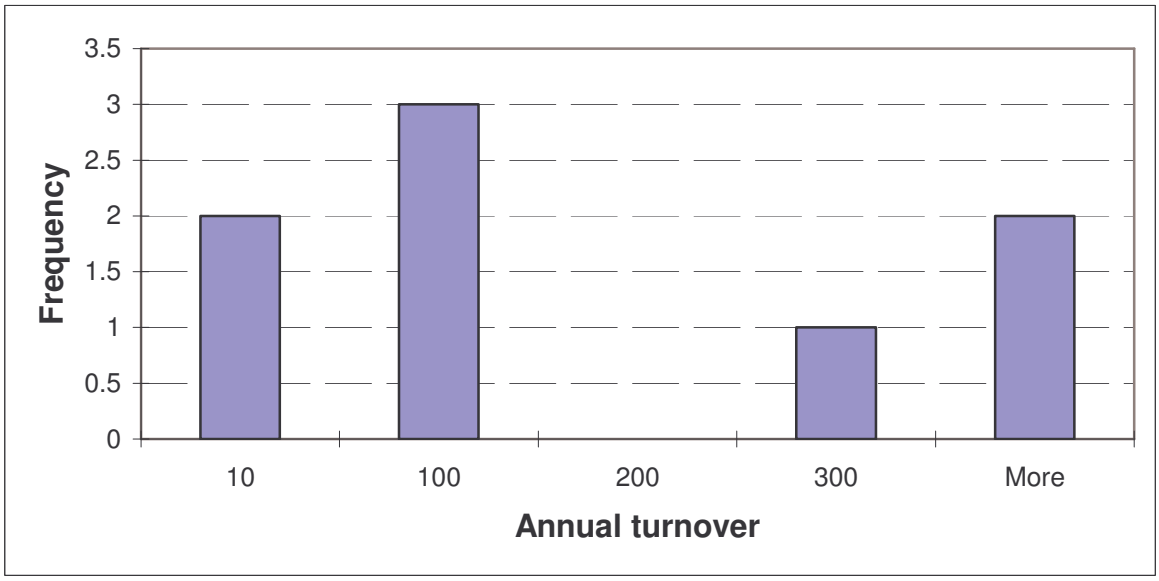

Figure 5.19: Average annual turnover (R in million) (n=10)

About 50% of the respondents reported a change in their annual turnover, and the reasons being:

- Volume increase
- Acquisition of refinery
- Change in ownership
- New market opportunities opened up, leading to growth

5.13 Conclusion

This chapter presented information on the secondary oilseed industry of South Africa Members of the South African Oilseed Processors' Association were identified, and it was determined that their crushing capacity is underutilized at this stage. Mainly sunflower seed which originates from local suppliers is crushed, this crushing activity is the major value adding activity in the supply chain.

Most of the oilseed crushers are situated near Durban harbour, and a large part of their crude oil is imported from Argentina. The local raw materials are transported by road, and small processors experience this as a problem.

The industry is price driven, and competes mainly on price and quality, although quality cannot be compromised when supplying mainly to wholesalers, retailers and for industrial use. Because the industry is price driven the marketing cost of edible oils is not a major factor, as the demand for edible oils is relatively high to high.

There is little vertical integration amongst the processors, and the breakeven level and annual turnover shows a relatively big gap between small and big processors. Most of the processors have access to the Internet and some use an Intranet system for better management and communication.

According to the SWOT analysis imported bottled vegetable oils was seen as a major threat, together with the volatile exchange rate. The fact that there is no brand loyalty in this market is a major weak point. The fact that there are no alternatives for edible oils makes it an essential product, and the rise in living standards increases the demand for edible oils. With the right consumer education, strategic business units and greater export opportunities to African countries are a few of the opportunities that exist for this industry. According to this chapter there are factors mentioned by the secondary industry that influence competitiveness of value added oilseeds in South Africa. Although all the constraints to the industry, influencing competitiveness, were mentioned, the possible solutions are discussed in Chapter 6.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

According to figures, international and local oilseed production is growing. Despite this growth the analysis in this study shows that when it comes to the processing of oilseeds the South African industry is not competitive. Because of this problem the secondary industry was analysed further. Factors like the importation of crude and refined oils, surplus or unused capacity, and the fact that the industry only competes on price were identified as the factors contributing most to the situation. The literature review pointed at a number of key factors that will have a positive effect on the competitiveness of the industry if applied.

The following section summarizes the most important findings of the study. Some conclusions are drawn from this after which recommendations are made. The chapter concludes with some suggestions for further research.

6.2 Summary

6.2.1 Literature Review

South African agribusinesses are facing a number of challenges that affects competitiveness. Agribusinesses are faced with challenges from the industry, government and consumers. Medium and small processors are experiencing pressure from larger processors, as the oilseed industry is currently competing almost just on price. Oilseed processors do not receive subsidies like in many other countries. This results amongst others in the importation of cheaper oilseed

products into South Africa. The ever changing environment makes it important for the industry to innovate constantly. Higher education and urbanization increases the demand for healthier and safer food. This puts pressure on food processors.

The Porter diamond model includes all the necessary determinants for a nation to be competitive. These determinants include:

- Firm strategies, structures and rivalry;
- Factor conditions;
- Demand conditions, and
- Related and supporting industries.

Emphasis must be put on each of the above mentioned determinants to improve the competitiveness of the South African oilseed industry. The competitiveness of the oilseed industry can be improved by applying core competencies and key concepts including:

- Vertical coordination
- Quality development in food supply chains
- Better information and communication technology, and
- Supply chain management.

6.2.2 International and local situation of the oilseed industry

Increasing global production, crushing, exports and prices indicate that the oilseed industry is indeed growing.

Soybeans are globally the most produced and crushed oilseed while sunflower seed is the main produced and crushed oilseed in South Africa. Soybeans are also the most globally traded oilseed, but palm oil and sunflower oil are the two major vegetable oils exported globally. Although South Africa's main oilseed produced is sunflower seed, sunflower oil is the vegetable oil most imported compared to other oils. The large amount of crude and refined oils imported by South Africa is problematic: This problem has increased as there has been a tremendous

increase in the amount of refined oils imported, and a decrease in the amount of crude oils imported. The reason for the higher imports is the lower price of imported oils. Oilseed processors identified this phenomenon as a major threat to the future of the industry.

6.2.3 Comparative advantage and international competitiveness of the South African oilseed industry

The results of the analysis of the South African oilseed industry indicate that sunflower seed and groundnuts in their primary form have better internationally revealed comparative advantages; while value added oilseed products for these two oilseeds struggle with a low revealed comparative disadvantage. Soybeans experience a comparative disadvantage for all its products in the supply chain. Jooste et al. (2001) studied the comparative advantage in the primary oilseed industry in South Africa by using the Resource Cost Ratio (RCR). They state that oilseeds in high yielding areas and under irrigation have a comparative advantage in their primary form, but in low yielding areas, dryland groundnuts in North Eastern KwaZulu Natal and dryland soybeans in Eastern Mpumalanga experienced a comparative disadvantage in 2001.

Groundnuts and its value added products have the oilseed supply chain with the highest international revealed comparative advantage and net exports, with sunflower seed and its products the second highest.

According to the relative trade advantage (RTA) analysis oilseeds in their primary state have the biggest international competitive advantage. It is clear that there is a lack of comparative as well as competitive advantage on the value added level.

Argentina is one of South Africa's major competitors in the oilseed market, mainly because of the fact that this country enjoys the same seasonal advantage regarding access to developed country markets. Argentina has a relatively high competitive advantage in value added oilseeds, whilst South Africa mostly has a

competitive disadvantage. South Africa on the other hand has a competitive advantage in sunflower seed and groundnuts in the primary form, where Argentina has a competitive disadvantage for groundnuts in the primary form. Argentina has a much higher competitive advantage in value added oilseed products than oilseeds in their primary form, exactly opposite from the South African situation. An analysis of the South African secondary industry was done to give a better indication of why value added oilseed products experiences a competitive disadvantage. The results of the analysis forms part of the conclusions of the study and are discussed in the next section.

6.3 Conclusion

The South African oilseed industry is struggling with a competitive disadvantage in terms of its value added oilseed products. Because of this the secondary oilseed industry was further analysed.

Porter (1990) stated that non-key production factors do not generate sustainable competitive advantage. South Africa has enough unskilled labour, but some of the processors complained about the lack of local oilseed supply. It is the key factors (skilled labour, capital and infrastructure) that are a major determinant of competitive advantage. Crushing capacity is presently underutilised, of which mainly sunflower seed is crushed. Most of these oilseed crushers are situated near Durban harbour, and a large part of their crude oil is imported from Argentina. Because of the cheap crude oil imports, most crushing facilities are unused or under utilised as already mentioned.

According to the Food Price and Monitoring Committee (2003) oilseed processing is highly capital intensive, and requires specialised knowledge and state-of-the-art technology. The fact that large amounts of crude oil are imported into South Africa makes it very difficult for large and small local oilseed crushers to survive. Of the oilseed crushers and refiners, 54.54% of the eleven respondents improve their practices not very often to often, and only 45.46% improve their practices more

than often to very often. This is an indication that there are still improvements to be made in research and technology. The secondary oilseed industry has to move their focus from price competition to other aspects which will increase consumer loyalty.

The South African oilseed market consists of a relatively unsophisticated consumer market. This situation compels oilseed processors to continue to compete on price. Consumers have to be educated in terms of what they buy.

None of the processors regarded the demand for their product to be low. Of the eleven, 62.5% stated that they experienced an increase in customers mainly because of lower prices and more aggressive sales/marketing. Again the emphasis is placed on the importance of price in the industry. Looking at the large amount of popular articles on the safeness of oilseed products which appeared in the last couple of months, it is clear that consumers have other needs except low prices.

All over the world consumers are concerned about the effect vegetable oils have on their health. This will have a negative affect on demand if the needs of the consumers are not addressed. Even though South Africa does have laws to protect consumers from harmful or dishonest food products there is a lack of enforcement (Hanekom, 2004). Tselentis (2004), legal and regulatory manager of the Consumer Goods Council (CGC), stated that the "mystery oil shopper" exercise had revealed some startling misperceptions which include:

- Soya oil labeled as sunflower oil;
- Olive oil blend on sale, and the
- Misuse of the Heart Foundation logo.

The revealed misrepresentations make it very difficult for the consumers, and retailers must take responsibility for the quality of the oil that they're selling. Integration between processors and retailers are thus of great importance, as currently only 18% of the 11 respondents are integrated with their customers.

Almost half of the respondents export their products to mainly developing African countries. In future this market can be retained if competition in this market is not also based on price only.

Porter (1990) stated that a set of strong related and supporting industries is important to the competitiveness of firms. These industries include suppliers and related industries. Of the oilseed processors surveyed only 33% rely only on local suppliers. The key criteria mentioned by the processors when selecting a raw material supplier are cost and quality. The lead time of processors ordering raw materials is about 60 days, but when raw material is ordered from local suppliers it takes only about 3 weeks. Only 36% of the eleven respondents are integrated with their suppliers.

Other related industries including research facilities, railway networks, co-operatives, suppliers, etc. will also have to be improved in order to increase the competitiveness of the oilseed industry.

Most of the oilseed processors' mission statements put emphasis on brand building by selling high quality products that offers superior value for money. The analysis has however proven that the industry continues to compete on price. Because of this, small processors find it very difficult to compete with the bigger manufacturers. Competing on quality, and focusing on niche markets will give small processors opportunities in the market. Increased competition in the market is an important factor in the local market to stimulate innovation, which can lead to international competitiveness in the end.

6.4 Recommendations

A new firm strategy is needed to make the South African oilseed industry more competitive. As indicated in the literature review, supply chain management can be viewed as an important way that can be used to improve competitive

advantage, and shorten the lead time. According to Worley (1996) if only certain actions of the supply chain are performed efficiently, the full potential for value-adding will not be realized. Vertical integration can help and reduce uncertainties related to suppliers, as well as market-related uncertainties by controlling distribution channels that could be used to facilitate new product introductions.

Quality food production can be viewed as a means of bypassing the competitive margin-based "race to the bottom". As South Africa has a competitive disadvantage for most of the value added oilseeds, emphasis must be put on this area.

Issues surrounding food quality and safety are becoming increasingly prevalent because of the rising incomes and education levels of consumers in most advanced industrial countries. Health issues are of great importance in the local as well as global market and the production of a healthier vegetable oil has become a necessity in this industry. According to Slover (1971) oil with a higher vitamin E (tocols) level is less resistant to rancidity, as it is a powerfull antioxidant. Slover (1971) also stated that tocotrienols are believed to be a much more potent antioxidant than tocophenols, and at this stage sunfloweroil, groundnut oil and soybean oils only contain tocotrienols, emphisising the need for better varieties.

According to Boland (2004) sunflower oil is healthier than most other food oils on the market, and as this is the oilseed mainly produced in South Africa, innovation in this commodity will lead to great improvement in the competitiveness of the oilseed industry. Boland identified three types or classifications of sunflower oil, which has unique and healthier attributes. These sunflower oils include;

- Linoleic (C18:2) sunflower oil containing essential fatty acids that are polyunsaturated
- High oleic sunflower oil with monounsaturated fat levels of 80% or higher and a lower IS value indicating on a more stale oil/fat.
- NuSun is a midoleic sunflower oil with a lower monounsaturated fat level than high oleic sunflower oil, but a lower saturated fat level than linoleic oil.

A bigger variety of oils for the health-conscious consumers must be developed. Willowton Oils and Cake Mills, one of South Africa's biggest oil processors presents an example of what can be done. They developed an ultra-premium frying oil named Sunflo Platinum Oil, ensuring consumers superior quality, maximum levels of anti foaming agent, maximum levels of anti-oxidants and cholesterol free. Better research, innovation and technology can bring more products like Sunflo Platinum Oil. This will guide the industry to move away from competing on price only.

Applying a good marketing and distribution service locally as well as globally will have a positive effect on the competitiveness of the industry. By knowing what the customer wants and by identifying new marketing opportunities the industry will increase its competitiveness. This again puts emphasis on research and availability of information. Other factors that have to be considered in this industry is the positioning of products, a unique image and packaging and the promotion of the product as a safer, healthier, high quality and proudly South African product.

But before all of the above mentioned strategies are applied, consumer trust must be developed. All the confusion of the misuse of the heart foundation logo, soya oil labeled as sunflower oil, and the olive oil blend making use of the SABS "performance" mark when there isn't such endorsement must be eliminated. Better enforcement is needed to apply the laws to protect consumers from harmful or dishonest food products.

In Figure 6.1 it is clear that another alternative other than law enforcement and media should be found. The consumer can be used for this purpose. Even though law enforcement was present, coloured sunflower oil was sold as olive oil and blended sunflower oil was sold as pure sunflower oil. This is harmful for the industry. By ensuring the consumers that the produced vegetable oils are tested, safe and of good quality a logo from a trusted institution (for example the UFS logo) can be applied on the product, empowering consumers to make informed choices.

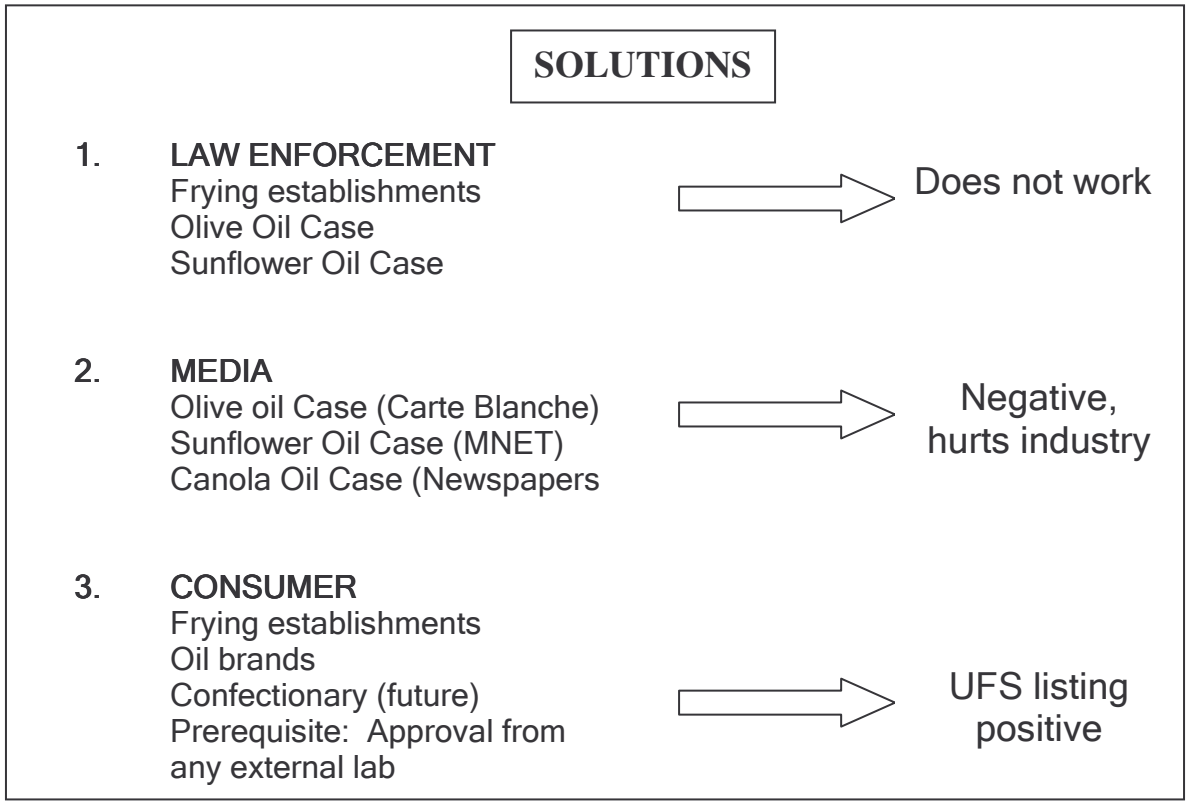

Figure 6.1: Solutions to generate consumer trust

Source: The South African Fryer Oil Initiative (SAFOI), 2004

All the factors discussed in this section can not be achieved without the help of the government. Policy issues must be put in place to avoid the dumping of cheaper crude vegetable oils as well as bottled cooking oils in South Africa.

6.5 Recommendations for further research

During this study a need for further research were identified, and they are the following:

a) A full analysis of the South African oilseed supply chain

In this study the whole supply chain from the farmer to the consumer must be analyzed. This will give an indication of where all the weak links in the

oilseed supply chain lies. Recommendations of how the weak linkages in the supply chain can be overcome must be made.

b) Demand conditions in the South African oilseed industry

This study will be an analysis of the demand conditions of the South African oilseed industry, as it is an important determinant factor for relative competitiveness. In this study the consumer needs must be analyzed. What do consumers want in oilseed products, and what can the processors do in fulfilling their needs. The possibility of niche markets must be studied.

c) Supporting industries in the South African oilseed industry

In this study the limitations of supporting industries in the South African oilseed industry must be identified. Recommendations must be made in order to overcome this problem.

d) The South African oilcake market

A study concerning the market for oilcake in South Africa must be done, as well as the opportunities that exist in this market.

e) Technology in the oilseed industry

As indicated in this study, technology is an important factor in the competitiveness of industries. Research must be done on the technology currently used in the South African oilseed industries, and the technology used by other major oilseed producers. The difference in the profit margins of the South African crushing and refining industries against those of Argentina, as it is more competitive in value added oilseeds. What can be done to make South African oilseed industries more competitive in the value

added oilseed industry, and to make South Africa one of the worlds' technology leaders in the oilseed industry.

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APPENDIX A

QUESTIONNAIRE

Dear Sir/Madam

1.1.1. Project: Descriptive Statistics for the secondary oilseed industry in South Africa

We are busy investigating the relative competitiveness of the oilseed industry in South Africa. An overview of the industry is of great importance to give a better idea of what is currently the situation. More specifically the costs to obtain the raw material, the manufacturing costs as well as the distribution costs to the consumer. The analysis will be done for all the different products produced by all the crushers and refiners of oilseeds in South Africa. Other factors like the identification of core competencies and tacit knowledge that exist in this industry must also be investigated. The functioning of the whole oilseed industry will be studied, with the goal to improve the operation for better global competitiveness.

The primary objective of this project is to investigate the supply chain of the oilseed industry in an effort to improve efficiency so that opportunities that exist can be exploited. In order to reach the primary objective several secondary objectives need to be met, namely:

- Investigate the institutional framework of the oilseed industry;
- Determine core competencies in the oilseed industry at different stages of production and processing;
- Draw an inventory of tacit knowledge in the oilseed industry; and
- Identify opportunity gaps and make recommendations in this regard.

Included is a questionnaire to help us with the collection of the data we need to conduct this study. We humbly ask you to complete it as accurately as possible. **We would sincerely appreciate it if you can fax/e-mail it back to us**. Individual company data will be kept ***strictly confidential*** and will only be used to calculate averages.

If there are any uncertainties please do not hesitate to contact us.

Regards

Miss. Jani Hallatt
FOR Prof. Herman van Schalkw

General information

Complete the following company details.

Company name _____

Address: P.O. Box _____

Town _____

Code _____

Complete the following contact details.

Contact person: _____
Position in company: _____
Job title: _____
Tel: _____
e-mail: _____

Indicate your position in the supply chain?

Facility	Mark here
Crusher/processor	
Refiner	

Other (identify):

A. Raw Material information

Specific raw materials

A.1 What raw materials do you process (please indicate the amount).

Oilseed	**Mark here**	**Amount of raw material (Average ton/month)**
Sunflower seed		
Groundnut		
Soybeans		
Other:		

Suppliers of raw materials

A.2 Who are the main suppliers of your raw materials, and what product do they supply?

Suppliers	Mark here	Number of suppliers	Specific raw material supplied	Mark here
Farmers	☐	☐	**Sunflower** **Groundnuts** **Soybeans**	
			Other, specify:	
Co-op	☐	☐	**Sunflower**	
			Groundnuts	
			Soybeans	
			Other, specify:	
Other, specify:				

A.3 Do you import raw material?

☐ Yes ☐ No

If Yes, indicate why?

Reasons for importing raw materials	Mark here
Lower Price	
Better Quality	
Seasonality problems of locally produced raw material	

Other, specify:

A.4 What percentage of your raw materials are imported?

Raw materials	Amount of imported raw materials (tons/month)
Sunflower	
Groundnuts	
Soybeans	

Others:

Prices of Raw materials

A.5 How are the prices of your locally produced raw materials determined?

A.6 How are prices of imported raw materials determined?

A.7 Please indicate your key criteria when selecting suppliers. Please tick all the applicable criteria.

Criteria	Mark here
Cost	
Quality of product	
Quality of service	
Geographical proximity	
Technical competencies	

Others, specify:

Transport of Raw materials

A.8 How are your raw material transported, and what is the distance and cost of this transport?

Way of raw material transport	Mark here	Cost /km	Distance from supplier to processing plant (km)
Own vehicles			
Contracting			
Transport cost included in contract with supplier			

Other, specify:

Storage cost of raw materials

A.9 Do you have sufficient storage facilities?

☐ Yes ☐ No

If No, does this influence your processing?

Possible effect of insufficient storage	Mark here
Higher transaction cost	
Longer delivery time needed	

Other influences:

A.10 What is your average storage cost for your raw materials?

R/ton/year:
Total cost/year:

A.11 What is the lead time (associated with an order)?

B. Processing information

Plant Capacity

B.1 Is your plant operating under full capacity?

☐ Yes ☐ No

B.2 Please provide the available capacity of your plant, as well as the capacity you are currently using?

Product	Available Capacity (tons/annum)	apacity used (tons/annum)
Sunflower seed		
Groundnuts		
Soybeans		

Other, specify:

Total Capacity for all oilseeds

B.3 Have your capacity or the amount of raw material processed changed over the last five years?

☐ Yes ☐ No

If yes, give a reason (ex. new equipment, change in supply, change in demand,

competition, change in price…)?

B.4 Are you in competition with larger competitors?

☐ Yes ☐ No

B.5 In what way are you in competition?

Based on:	Mark here
Price	
Quality	
Technology	
Food safety requirements	

Other, specify:

Processing methods used

B.6 What kind of processing method(s) do you use?

Process Type	Mark here
Continuous Solvent extraction	
Batch solvent extraction	
Expeller extraction	
Extrusion	
Continuous Screw Press	
Wet Milling	
Cold press process	
Refine with chemical solvents (hexane)	
Refine without chemical solvents (hexane)	

Other (identify):

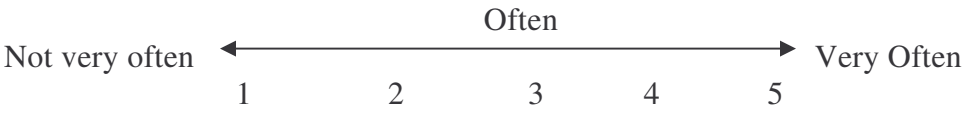
B.7 Processing Cost

Processing methods	Costs (R/ton)
Raw material preparation (washing & de-hulling)	
Extraction costs associated with basic procurement, handling, extraction, and disposal	
Handling costs associated with segregation at the oilseed crusher	
Grading and testing cost associated with segregation at the oilseed crusher	
Refining cost	
Handling costs associated with segregation at the oilseed refiner	
Storage of produced products	

Other processing costs:

Total processing cost (R/ton)

B.8 How often do you improve practices to lower costs?



B.9 What kind of practices have being improved over the last 5 years?

B.10 Where in your processing operation lays your weakest link?

C. Prices of vegetable oils at different stages of processing

C.1 Indicate the price of the different products applicable to your company?

Products	Price of oilseeds (R/ton)	Price of oilcake (R/ton)	Price of crude oil (R/ton)	Price of refined oils (R/ton)	Retail price (R/ton)
Sunflower					
Groundnuts					
Soybeans					
Other, specify:					

D. End Products

Total amount produced

D.1 Specify the amount of end products produced.

Products	Average amount per month
Crude oil (litres)	
Refined oil (litres)	
Oilcake (kg)	
Other, specify:	

E. Packaging and Labelling

Brand

E.1 Under what brand name(s) do you sell your product?

Brand
1)
2)
3)
4)
5)

E.2 Do you package and Label your products yourself?

Package: ☐ Yes ☐ No

Label: ☐ Yes ☐ No

E.3 If any of your answers were Yes in question E.2, indicate what the cost of packaging and/or labelling is (R/litre or R/kg for oilcake)?

Products	Packaging cost for vegetable oils (R/litre) and oilcake (R/kg)
Crude oils (R/ℓ)	
Refined oils(R/ℓ)	
Oilcake (R/kg)	

Other:

Products	Labelling cost for vegetable oils (R/litre) and oilcake (R/kg)
Crude oils(R/ℓ)	
Refined oils(R/ℓ)	
Oilcake (R/kg)	

Other:

F. Marketing

F.1 What is your total marketing cost (R/ton)?

F.2 Who are your main customers, and what products do they buy?

_

Market	Mark here	Number of customers	Products
Farmers **Refining manufacturers** **Small retailers**			
Wholesalers			
Industrial/bulk			

Other, specify:

F.3 Do you experience any kind of price or quality pressure from your buyers?

☐ Yes ☐ No

If Yes, describe what influence it has on your quality and quantity of product supplied?

F.4 How do you regard the demand for your product?

High ⟵ ⟶ Low

1 2 3 4 5

F.5 Did the number of companies you supply to change over the last 5 years, how, and why?

F.6 Do you have good market access for your product?

☐ Yes ☐ No

If no, give a reason why?

Local market

F.7 What is the destination of your end products in the local market?

Product	Destination	Amount sold in tons/annum
Crude sunflower oil		
Refined sunflower oil		
Sunflower oilcake		
Crude groundnut oil		
Refined groundnut oil		
Groundnut oilcake		
Crude soybean oil		
Refined soybean oil		
Soybean oilcake		

Other:

International market

F.8 Do you export your product?

☐ Yes ☐ No

If Yes, complete the following table indicating to where you export your product and what

amount you are exporting?

Product	Destination	Amount sold in tons/annum
Crude sunflower oil		
Refined sunflower oil		
Sunflower oilcake		
Crude groundnut oil		
Refined groundnut oil		
Groundnut oilcake		
Crude soybean oil		
Refined soybean oil		
Soybean oilcake		

Other:

F.9 If you export, what factors complicate the matter?

F.10 If you export your products, are there any specific quality requirements?

F.11 What, according to you is the most important factors your customers look at,
before they buy your product?

Important factors to customers	Mark here
Price	
Quality	
Service	

Other, specify:

G. Transport cost of end product

G.1 Explain how your end products are transported to your customers?

Transport of your end products	Mark here	Cost /km	Distance from processing plant to customer (km)
Make use of own vehicles, delivering to the customer			
Making use of contractors			
Customers come and fetch it themselves			

Other, specify:

G.2 What discount do you give to your customer when they come to collect the products themselves?

G.3 How far is the market from your processing site?

Product	Distance from market (km)
Crude sunflower oils	
Crude groundnut oil	
Crude soybean oil	
Refined sunflower oil	
Refined groundnut oil	
Refined soybean oil	
Sunflower oilcake	
Groundnut oilcake	
Soybean oilcake	

Other, specify:

G.4 Do you have any transport problems?

☐ Yes ☐ No

If Yes, name the problems?

H. Integration

Vertical Integration with suppliers

H.1 Are you in any way integrated with your suppliers?

☐ Yes ☐ No

If yes, please indicate what kind of integration you have?

Type of vertical integration	Mark here
Merger with another firm	
Joint venture on a particular project for certain duration	
Acquisition or purchase of another firm	
Full integration from the farm gate to the retail shelf	
Production contract	
Integrated ownership	

Other, specify:

Integration with other processors

H.2 Are you in any way integrated with any other company associated with processing activities?

☐ Yes ☐ No

If yes, with who are you integrated?

Company integrated with	Mark here
Crushing company	
Refining company	
Packaging company	
Labelling company	
Transportation company	

Other, specify:

H.3 If your answer were Yes in H.2, explain what kind of integration you have with the companies involved in processing?

Type of integration	Mark those applicable
Merger with another firm	
Joint venture on a particular project for certain duration	
Acquisition or purchase of another firm	
Full integration from the farm gate to the retail shelf	
Integrated ownership	
Production contract	
Marketing contract	

Other, specify:

Integration with customers

H.4 Do you have any marketing contracts with your customers?

☐ Yes ☐ No

H.5 If you are integrated with your customers, please indicate how you are integrated with them?

H.6 If you are integrated with a roleplayer in the supply chain, please indicate what the reason for integration is?

Reason for vertical integration	Mark here
Lower transaction cost	
Certainty of supply of raw materials	
Improve production	

Other, specify:

I. Information systems

I.1 Are you using any kind of information system (ex. Electronic Data Interchange (EDI) or a web based communication system)?

☐ Yes ☐ No

If Yes, indicate what kind of information system you are using, and what you are using it for (inventory control, stock replenishment, pricing, invoicing, or automatic deposits)?

Information system	Purpose of your information system

J. SWOT analysis of the industry

J.1 Name all the Strengths, Weaknesses, Opportunities and Threats of your industry?

Strong points of the industry **1)** **2)** **3)**
Weak points of the industry **1)** **2)** **3)**
Opportunities that exist in the industry **1)** **2)** **3)**
Threats to the oilseed industry **1)** **2)** **3)**

K. Annual turnover

K.1 What is your breakeven level (R/annum)?

K.2 What is your average annual turnover?

K.3 Did your annual turnover undergo a drastic change over the last couple of years?

☐ Yes ☐ No

If Yes, why?

Thank you

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