A LONGITUDINAL STUDY OF CUSTOMERS' PERCEPTIONS OF THEIR CONFIDENCE IN, AND SATISFACTION WITH, THE SOUTH AFRICAN SUGAR ASSOCIATION CANE TESTING SERVICE DIVISION

by

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ABSTRACT

Customer satisfaction is a critical component of a business' competitive strategy. The Cane Testing Service (CTS) division of the South African Sugar Association is operating in a deregulated market environment and thus has to ensure that customers are always satisfied with the quality of service received from CTS.

This study aimed to establish the change in customer satisfaction levels between 1998 and 2003. The study set out to determine customer satisfaction levels with specific customer groupings of combined millers and growers, millers-only and growers-only of all fourteen Mill Group Boards. The study investigated customer satisfaction levels for each of the sixteen service characteristics for the fourteen Mill Group Boards. Regular measurement of customer satisfaction allows CTS to continuously improve the levels of customer satisfaction and thereby minimise the threat to CTS of competitors entering the sugar industry laboratory services market. Customer satisfaction levels were determined by conducting a longitudinal, quantitative survey on one hundred and sixty-eight miller and grower members of all Mill Group Boards using the CTS developed questionnaire, containing CTS and customer verified service attributes.

The 2003 study shows a statistically significant improvement in customer satisfaction levels with CTS service delivery across all customer groupings in comparison with the 1998 customer satisfaction levels. The specific Mill Group Board analyses shows an improvement in customer satisfaction levels for twelve of the fourteen boards. Specific strategies are to be developed for those boards and service attributes that did not show an improvement. It is recommended that CTS customer surveys be conducted every three years and the Balanced Scorecard management tool be used to monitor the effectiveness of customer improvement strategy implementation. It is proposed that future research consider benchmarking CTS service delivery against other similar service providers and that focus groups be employed to obtain feedback from key customers.

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CHAPTER 1 - INTRODUCTION

1.1 INTRODUCTION

The sugar industry in South Africa is a major industry and is especially important in providing employment in the predominantly rural areas of KwaZulu-Natal, Mpumalanga and the Eastern Cape. The South African Sugar Association (SASA) provides a range of specialist support services to the sugar industry to ensure its profitability, competitiveness and sustainability. The Cane Testing Service (CTS), the laboratory division of SASA, provides an analytical laboratory service to fourteen individual Mill Group Boards (MGBs), which comprises of local millers and local growers. This service facilitates miller-to-grower payment and grower-to-grower distribution of revenues which amount to over R3 billion annually (South African Sugar Association, 2002).

Following the amendment of Clause 55(b) of the Sugar Industry Agreement in 1994 (South Africa 1994:16380), the MGBs are free to choose whichever service provider to conduct the cane testing function that determines the total sucrose entering the mill and the individual sucrose content of sugar cane consignments. It is in the interest of CTS to maintain sound, long-term relationships with each MGB and it is, therefore, important to measure the level of customer satisfaction at regular intervals. Having conducted a CTS customer satisfaction survey in 1998, which identified areas of slight dissatisfaction, areas of reasonable satisfaction and areas of satisfaction, the current study aims to survey the present levels of customer satisfaction with a view to identifying the extent and nature of changes in customer

perceptions from 1998 to 2003. This survey will provide an objective basis for future review of customer enhancement activities and development of future business strategies.

1.2 BACKGROUND TO STUDY

CTS plays an integral role in the effective functioning of the South African sugar industry. CTS is the arbiter of cane quality. With the deregulation of the sugar industry and the devolution of responsibility to the MGBs, the miller and growers of individual MGBs financed cane testing locally. With no other organisation available to perform this service at the time of deregulation, all MGBs contracted CTS to perform the testing of cane. These contracts were to run in perpetuity but included a one-year's notice period by either party. As a result of the pivotal function that CTS plays, it is required to have a sound, long-term relationship with millers and growers at fourteen mills in the industry.

While CTS managers receive feedback in an informal fashion on a regular basis, a customer satisfaction study offers an opportunity to record areas where significant progress has been made and assists in the focusing of energies for future strategies within CTS as a whole. The customer satisfaction survey conducted on MGBs in 1998, surveyed miller and grower perceptions of CTS which allowed strategies to be developed that addressed negative perceptions through overall service improvement and improved communication.

1.3 MOTIVATION FOR THE STUDY

Although it is important and valuable to track and understand the satisfaction and loyalty of customers as a group, it is equally critical to understand the attitudes and behaviour of individual customers. Depending on their unique behavioural attributes, intensity of satisfaction or dissatisfaction and their ability to act on their satisfaction or dissatisfaction, customers behave in four basic ways: as loyalists, as defectors, as mercenaries or as hostages. Turning as many customers as possible into the most valuable type of loyalist and eliminating the most dangerous type of defector or hostage, is every organisation's ultimate objective (Jones and Sasser, 1995).

The CTS, until a few years ago, was operating in a monopolistic environment where customers had no other option but to use their services, and customers were thus hostages. Many organisations operating in this environment see little reason to respond to the plight of hostages and their customers experience the worst an organisation has to offer and must accept it (Jones and Sasser, 1995). These customers cannot go anywhere else and there is thus no incentive for the organisation to correct problems.

When the source of a monopoly's hold on customers disappears, whether the cause is deregulation, the emergence of an alternative technology or the arrival of new competitors, the market can become highly competitive in a short period of time (Jones and Sasser, 1995). The CTS is now operating in a deregulated environment and has to develop a successful strategy to manage customer satisfaction. By surveying CTS customers' level of satisfaction and plotting the results, managers can be helped to understand just how satisfied

or dissatisfied customers are with both their dealings with the organisation in general, and with various elements of the organisation's service in particular. The fact that such indices are quantitative makes them a useful tool for comparing results over different time periods, locations and business units (Naumann and Giel, 1995).

With the removal of entry restrictions into the provision of analytical laboratory service to the sugar industry, CTS has to ensure that customers are satisfied with the service they receive from CTS and will remain loyal to CTS. This can only be achieved by surveying customer satisfaction levels on the relevant service criteria. A customer satisfaction survey was conducted by CTS in 1998 and strategies were subsequently developed to address areas with which customers were dissatisfied. Surveying present levels of customer satisfaction will enable CTS to identify the extent and nature of changes in customer perceptions from 1998 to 2003. It will also enable CTS to assess the effectiveness of strategies implemented after the 1998 survey and will provide a basis from which future customer perception enhancement activities can be identified. It will also provide an objective basis for a future review on the extent to which these enhancement activities have been achieved and provides a platform from which future business change strategies can be developed.

1.4 OBJECTIVES OF THE STUDY

- **Overall objective**: To identify the perceived levels of satisfaction with CTS's service and to identify changes since the previous study.

- **Sub-objective 1**: To establish the MGB members' perceptions of CTS in general and compare this to perceptions held in 1998.

  Hypothesis 1: There has been an improvement in MGB members' perceptions of CTS in general when compared to 1998.

- **Sub-objective 2**: To determine millers' level of satisfaction with current services provided.

  Hypothesis 2: The millers are satisfied with current services provided by CTS.

- **Sub-objective 3**: To determine growers' level of satisfaction with current services provided.

  Hypothesis 3: The growers are satisfied with current services provided by CTS.

- **Sub-objective 4**: To identify perceived strengths and weaknesses of CTS with the intention of addressing and improving both actual and perceived weaknesses.

1.5 DELIMITATIONS OF STUDY

This study will be conducted on the fourteen MGBs within the South African sugar industry where CTS operates. Therefore, no other sugar industry bodies or individuals will be researched.

1.6 LIMITATIONS OF STUDY

Data collection is by means of a self-completed questionnaire and there is thus no control over the response rate.

1.7 ASSUMPTIONS OF STUDY

This study will assume that different racial groups within the MGBs will have the same assumptions and this study will not measure racial differences.

1.8 METHODOLOGY

Customer satisfaction measurement serves two roles: providing information and enabling communication with customers (Pizam and Ellis, 1999). Vavra (1997) states that the primary reason for taking the time to measure customer satisfaction is to collect information, either regarding what customers indicate needs to be done differently or to assess how well an organisation is currently meeting its customer needs. A secondary, but no less important, function of customer satisfaction measurement in service organisations, is the demonstration of interest in communicating with customers by surveying them.

The reasons for measuring customer satisfaction may vary from organisation to organisation, but Naumann and Giel (1995) have suggested the following five objectives that are most common:

- To get close to the customer: understand what attributes are the most important to customers, identify attributes that affect the customer's decision making, the relative importance of the attributes and to get a performance evaluation of how well the organisation is delivering each attribute.

- Measure continuous improvement: the attributes significant to the customer are linked directly to value-added processes in the organisation and are put into a form consistent with the internal measurements used to evaluate the process.
- To achieve customer-driven improvement: not all customers are an equally valuable source of innovation. This requires creation of a comprehensive database that not only tracks sales, but sources of innovations.
- To measure the competitive strengths and weaknesses: determine customer perceptions of competitive choices. This is achieved by surveying possible future customers as well as current and past customers.
- To link customer satisfaction measurement to internal systems.

A longitudinal study was conducted into the present levels of customer satisfaction in CTS with a view to identifying the extent and nature of changes in customer perceptions between 1998 to 2003. The survey took the form of a self-administered questionnaire and all members of the fourteen MGBs were included in the study. Sixteen service characteristics were measured using a seven point Likert scale. The data analysis was quantitative and the findings were conclusive. Whilst the questionnaire was subjected to face validation, content and construct validity was also discussed. This study was conducted on CTS MGB customers only.

1.8.1 Research Design

The research was classified as conclusive research since the information needed was clearly defined and the research process was formal and structured (Cooper and Schindler, 2001). A census was taken of all MGB members and the data analysis was quantitative. The findings were conclusive and could be used as input in future decision making. The research design applied was descriptive as it described market characteristics and identified perceptions. The study was a longitudinal study since it was a repeat of the study carried out in 1998 and was used to track changes in customer perceptions of satisfaction.

1.8.2 Target Population

A census was taken of the fourteen MGBs and included all members of each MGB since the population was relatively small and this would confer high accuracy and sampling precision.

1.8.3 Data Collection

The method selected for the current study was the communication approach, specifically a self-administered questionnaire that involved questioning or surveying individuals and recording their responses for analysis (Cooper and Schindler, 2001).

A Likert scale was used in this study and consisted of a statement expressing either a favourable or unfavourable attitude towards the object of interest. The respondent was asked to agree or disagree with each statement and responses were given a numerical score

to reflect their degree of attitudinal favourableness. The scores were totalled to measure the respondent's attitude. Each characteristic measured in the survey was scored on a seven point rating scale, indicating the extent of the respondents' agreement or disagreement with the statements presented.

The questionnaire used in this study was the same as that used in the survey of 1998 as the attributes being measured were still a key component of the relationship between CTS and MGBs.

1.9 STRUCTURE OF THE STUDY

Chapter 1 provides an introduction to the study. The rationale for the study is presented together with its objectives. The structure of the dissertation is also clarified in this chapter.

Chapter 2 is an overview of the industry and market in which CTS operates. The sugar industry macro-environment and market structure are described. The South African Sugar Association and its marketing approach are briefly discussed.

Chapter 3 offers a review of the related literature on service quality and customer satisfaction. The concept of service quality is defined and the SERVQUAL measurement instrument is critically assessed. This chapter further defines customer satisfaction and includes the concepts of customer expectations and customer perceptions. The concept of customer loyalty is also briefly reviewed.

Chapter 4 presents the design of the research undertaken and includes the service attribute selection and importance ranking by pilot testing. This chapter discusses the sampling method used, the questionnaire design, the data collection procedure, the selection of the method of statistical analysis and the limitations of the study.

Chapter 5 presents the research findings and the interpretation of these results.

Chapter 6 presents the overall conclusions reached from the research, as well as recommendations for the CTS business and for further research.

Having introduced the study in Chapter 1, the next chapter provides an overview of the South African sugar industry.

CHAPTER 2 - INDUSTRY OVERVIEW

2.1 BACKGROUND

CTS plays an integral role in the effective functioning of the South African sugar industry (South African Sugar Association, 2002). This chapter discusses both SASA and CTS within the sugar industry environment, and describes the sugar industry environment and market structure, together with the milling companies that operate in the industry. As a specialist service provider to the South African sugar industry SASA, and its marketing approach in relation to its environment, is also described. Finally, CTS, and the market in which operates in, is discussed.

2.2 THE SOUTH AFRICAN SUGAR INDUSTRY AND ITS MACRO-ENVIRONMENT

The South African sugar industry is one of the world's leading cost competitive producers of high quality sugar. It is a diverse industry combining the agricultural activities of sugarcane cultivation with the industrial factory production of raw and refined sugar, syrups, specialised sugars and a range of by-products. Based on revenue generated through sugar sales, the South African sugar industry is responsible for income totalling over R6 billion per annum, of which over R3 billion is distributed by CTS between millers and growers. Based on actual sales and selling prices in 2002, it is estimated that the South African sugar industry contributed R2.38 billion to the country's foreign exchange earnings (South African Sugar Association, 2002).

The sugar industry makes an important contribution to direct employment in cane production and processing, and provides indirect employment for numerous support industries in the three provinces where sugarcane is grown, namely KwaZulu-Natal, Mpumalanga and the Eastern Cape. Employment within the sugar industry provides approximately 85 000 jobs. Direct and indirect employment is estimated at 350 000 jobs. There are approximately 1 million people dependent on the sugar industry. In addition, there are 53 000 registered cane growers (South African Sugar Association, 2002). It can be seen that the sugar industry makes a significant contribution to employment rates within South Africa.

The South African sugar industry functions as a proceeds-sharing partnership between growers and millers. This structure is common amongst sugar industries around the world as a result of the nature of the crop and the processing requirements (Ardington, 2001). Given the nature of the industry, government intervention is necessary to regulate the relationship between millers and growers. For this reason, the Sugar Act 9 of 1978, Section 4(1)(c) (South Africa. Sugar Act 9 of 1978), which contains supporting legislation in the form of the Sugar Industry Agreement (South Africa 2000:21139) was established.

The basis of payment between millers and growers is termed the recoverable value (RV) formula and Clause 134 (b) of the Sugar Industry Agreement (South Africa 2000:21139) allows a laboratory service provider to enter into contracts with each of the MGBs to undertake sampling and analysis to determine the recoverable value of cane delivered by growers to the mills. The MGBs are the local mill area bodies charged with determining which service provider can perform the cane testing function. The selected laboratory

service provider offers a specialist service under contract to individual MGBs to determine the quality of individual grower's cane deliveries to the mill for cane payment purposes. This service provider will also provide a technical audit of the distribution between millers and growers, thereby ensuring a fair and equitable division of proceeds.

2.3 MARKET STRUCTURE

Armstrong and Kotler (2000) define a market as consisting of all the actual and potential buyers and sellers of a particular product, and define a market structure as the competitive environment in which the buyers and sellers of the product operate. The structure of the market strongly affects the process by which price and output are determined in the real world. Although markets can be very different, economically they are classified under four types of market structure. These can vary from the situation where thousands of firms compete (perfect competition), to the situation where there is no competition (monopoly). Monopolistic competition refers to the case where there are many sellers of a differentiated product whilst oligopoly is the case where there are few sellers of a homogeneous or differentiated product (Parkin and King, 1995). The South African sugar industry operates in an oligopolistic market structure for retail sales of refined sugar and in an oligopsonistic market structure for the relationship between millers and growers in the purchase and sale of sugar cane.

2.3.1 The South African Sugar Industry and its Market Structure

The South African sugar industry is one of the world's leading cost-competitive producers of high quality refined sugar (a homogeneous product). The industry is a proceeds-sharing partnership between millers and growers and has been established since 1935 (South African Sugar Association, 2002). The milling sector is concentrated around fifteen mills: seven mills are owned by Illovo Sugar Limited, five by Tongaat-Hulett Sugar Limited, two by Transvaal Sugar Limited and one co-operative mill owned by growers.

2.3.2 Oligopoly: Meaning and Sources

Oligopoly is the case where there are few sellers of a homogeneous product. Therefore, the retail market of the sugar industry can be described as a pure oligopoly as the product (refined sugar) is homogeneous. As there are only a few firms selling a homogeneous product in an oligopolistic market, the action of each firm affects the other firms in the industry and vice versa.

The sources of oligopoly are the following:

- Economies of scale may operate over a sufficiently large range of outputs to leave few firms supplying the entire market.
- Huge capital investments are required to enter an oligopolistic industry and this acts as a natural barrier to entry.
- Few firms may own a patent for the exclusive right to produce a commodity or to use a particular production process.

- Established firms may have a loyal following of customers based on product quality and service that new firms would find difficult to match.
- Few firms may control the entire supply of a raw material required in the production of the product (Salvatore, 2001).

Two decades ago there were over twenty sugar mills and currently there are only fifteen mills supplying the entire retail sugar market (Ardington, 2001). It is estimated that, currently, it would cost over R1 billion to erect a large sugar mill (Simmonds, 2001). The fifteen sugar mills have approximately 53 000 sugar cane growers contracted to supply their harvest of sugar cane (raw material) to the sugar mills closest to them. The market relationship between the 53 000 sugar cane growers and the four sugar milling companies is described as an oligopsonistic relationship where a small number of large buyers (milling companies) control a large proportion of the sugar cane market (American Marketing Association, 2003). This is due to the geography and location of sugar mills, which restricts growers' choice in terms of to which mill they deliver their sugar cane (Trikam, 2001). This oligopsonistic relationship and the limited number of sugar milling companies operating in the industry, are classified as sources of oligopoly but also represent the barriers to other firms entering the market in the long term.

Limit pricing, whereby existing firms charge a price low enough to discourage entry into the industry, may provide a further barrier to entry. This does not apply to the South African sugar industry since the price of sugar locally is a dollar-based reference price of US$330 per ton, which has been legislated to protect the local sugar industry from the highly subsidised sugar producers of the northern hemisphere (South Africa Sugar

Association, 2002). South Africa is a low cost sugar producer and does not receive government subsidies, but the world sugar market is distorted because of the high subsidies protecting the European Union and United States sugar markets. The current world price of sugar, which is a dump market because of the overproduction by the inefficient, subsidised producers of the European Union and United States, is approximately US$175 per ton. Therefore, the local sugar industry does not discourage entry due to limit pricing but entry is restricted due to tariffs, which make imported sugar more expensive than locally produced sugar.

2.3.3 Oligopoly and Market Concentration

The degree to which an industry is dominated by a few large firms is measured by concentration ratios (Salvatore, 2001). These give the percentage of total industry sales of the four, eight or twelve largest firms in the industry. The South African sugar industry is oligopolistic with the four-firm concentration ratio being 100% (South African Sugar Association, 2002).

The sugar industry is a major industry in South Africa and is characterised by an oligopolistic market structure and a proceeds-sharing partnership between millers and growers. The sugar industry requires various specialist services that are best served by having one organisation provide this range of services. The South African Sugar Association was therefore established by millers and growers to provide a range of specialist services to the sugar industry. The following section discusses the South African Sugar

Association and introduces the Cane Testing Services division, which is the division researched in this study.

2.4 THE SOUTH AFRICAN SUGAR ASSOCIATION (SASA)

The South African Sugar Association administers the partnership on behalf of its two members, the South African Cane Growers Association (Cane Growers) and the South African Sugar Millers Association Limited (SASMAL) (South African Sugar Association, 2002). SASA's main function is to provide a range of specialist services that enhance the profitability, global competitiveness and sustainability of the South African sugar industry. Notable for the diversity of the services it provides this major industry, SASA divisions contribute at various points across the industry value chain (South African Sugar Association, 2002). These centralised cost effective services are divided into those that provide support to the industry core functions of cane growing and milling (development finance, agricultural research and extension, cane testing and industrial training), and those that provide support to the industry partnership (industry partnership administration, export sales and shipping of raw sugar, generic advertising, external liaison and communication) (South African Sugar Association, 2002).

2.4.1 Marketing Philosophy

Armstrong and Kotler (2000) describe a market as the set of actual and potential buyers of a product. These buyers share a particular need or want that can be satisfied through exchanges and relationships. Marketing activities should be carried out under a well-

thought out philosophy of efficient, effective and socially responsible marketing (Kotler, 2000). There are five marketing approaches that SASA could consider:

- Production concept: emphasises producing and distributing products in sufficient quantities to meet enormous demand (Van der Walt et al., 1996).
- Product concept: the focus is on making superior products and improving them over time (Kotler, 2000).
- Selling Concept: mass production resulted in supply meeting or exceeding demand, and companies needed to find new customers and persuade resistant customers to buy (Van der Walt et al., 1996).
- Marketing concept: the marketing manager must integrate and direct the company resources towards satisfying the customers needs (Armstrong and Kotler, 2000).
- Societal marketing concept: holds that the organisation should determine the needs, wants and interests of target markets. It should then deliver superior value to customers in a way that maintains or improves the consumer's and the society's well-being (Armstrong and Kotler, 2000).

2.4.2 The Marketing Philosophy of SASA

The marketing philosophy of SASA, when considering the above alternatives can be categorised as the selling concept. The local sugar industry produces in excess of the local market demand and, therefore, has to find new customers in the export market (South African Sugar Association, 2002). Since the local sugar retail industry operates as an oligopoly (cartel arrangement) there is little local competition and no mechanism exists to define and satisfy consumer wants and needs and communication with consumers is

unilateral. It is apparent that the key to success in the rapidly changing marketing environment is to stay abreast of major environmental changes and for SASA to modify strategies and programmes.

The microenvironment consists of the forces close to the company that affect its ability to serve its customers: the company, suppliers, marketing channel firms, customer markets, competitors and public (Grant, 1998). These combine to form the company value delivery system. Prior to implementing an amended marketing strategy, SASA must analyse the marketing environment and undertake corporate and strategic planning.

2.4.3 SASA and its Marketing Environment

The decline of marketing in the previous decade was attributed to its extreme functional autonomy (Doyle, 1995). Marketing managers must work closely with other company departments such as finance, research and development, purchasing, manufacturing and accounting. Marketing management assists production management on design, qualitative and quantitative aspects of the product as well as the packaging. The price, distribution strategy, promotion strategy and method of communication with consumers are also determined by marketing management (Kotler, 2000). According to McKenna (1991), non-marketing specialists must focus on being market driven. This integrated marketing approach however, often fails due to inadequate training of all employees (Kotler, 2000).

The concept of integrated marketing is especially challenging for SASA, as there are a diverse range of specialist divisions involved at all levels of the industry. According to

Milner-Smyth (2002), the sugar industry has recently implemented a strong customer focus following the introduction of comprehensive training programmes and greater exposure to customer requirements for all employees. These included visits to customer premises, customer open days and customer satisfaction surveys. In addition, SASA has also appointed an External Affairs Director to interact at a high level with customers and other industry stakeholders, and thus pass on the information gathered to all divisions within SASA (Supersad, 2001). Also important in the creation of a marketing culture, is the implementation of customer surveys by SASA.

The appropriate marketing philosophy for SASA to adopt would be a societal marketing approach. The societal marketing concept advocates that SASA will need to build social and ethical considerations into their marketing practices and become customer-oriented and market driven in all that they do and to take steps to eliminate adverse consumer sentiment. According to Trikam (2001) SASA's appointment of an External Affairs Director is an indication of its recognition to change its marketing philosophy and to liaise with all relevant stakeholders.

Whilst the appointment ensures local customer satisfaction, there exist export opportunities that could be realised. Globalisation requires rapid communication and SASA has put measures in place to take advantage of the opportunities that arise. The less restrictive role of government has led to difficulties in predicting change in the market, but SASA has realised that close interaction with all stakeholders has to benefit the environmental scanning process.

By recognising and acting on the marketing environmental factors that have an impact on SASA, the industry will be well positioned to prosper both locally and internationally.

2.5 CANE TESTING SERVICE (CTS)

The Cane Testing Service (CTS) is one of the specialist service providers within SASA and has the core function of determining the quality of individual grower sugar cane deliveries to sugar mills for cane payment purposes. The CTS currently operates laboratories at fourteen of the fifteen sugar mills in South Africa (South African Sugar Association, 2002).

The Cane Testing Service provides a laboratory service to the South African sugar industry under the auspices of the Sugar Industry Agreement (South Africa 2000:21139). Clause 134 (a) requires the CTS to provide a technical audit function ensuring that the total mass of recoverable value is determined according to official procedures. CTS consists of two hundred and seventy eight operational and eleven middle management employees spread across fourteen different operational sites. There are three senior managers and a General Manager heads this division of SASA.

2.5.1 CTS Vision

The vision of CTS's is:

"To be recognised by the sugar industry as being the preferred provider of laboratory services" (Cane Testing Service, 2002: 1).

Being the laboratory service provider of choice will ensure that CTS customers are completely satisfied and loyal and will enable CTS to expand its business into other laboratory markets and to provide a cost effective service through the exploitation of economies of scale.

2.5.2 CTS Market Description

The customer profile for the sugar industry laboratory services constitutes the 53 000 individual sugar cane growers and the four sugar milling companies within the South African sugar industry. The millers and growers operate a proceeds-sharing partnership and are grouped into fourteen individual MGBs across the South African sugar belt. The size of the sugar crop for the 2002 season was 23 million tons of sugar cane which produced 2.75 million tons of sugar (South African Sugar Association, 2002). The cost of the laboratory service for cane payment to the industry amounted to R34 million. This cost was recovered via a levy on each ton of sugar cane delivered to the sugar mills. For the 2002 season the average levy amounted to R1.48 per ton of sugar cane (Singh, 2003).

The sugar industry market structure is described as being so stable that it is accepted that it would continue to exist without any changes (Ardington, 2001). However, recent reviews of the Sugar Act 9 of 1978 by the Department of Trade and Industry, have placed pressure on the industry to increase competitiveness within the industry. Indeed, the deregulation in 1994, which led to CTS having to enter into contractual arrangements with individual MGBs, was intended to increase competition within the laboratory services environment (Trikam, 2001).

A change in an established market structure can offer exceptional opportunities and these opportunities are often more obvious to outsiders (Jones and Sasser, 1995). Until a few years ago, CTS was operating in what was effectively a monopolistic environment where customers had no option but to use the services of CTS and were thus hostages (Trikam, 2001). As described by Jones and Sasser (1995), when the source of a monopoly's hold on customers suddenly disappears, either through deregulation or the emergence of an alternative technology, or the arrival of new competitors, the market can become highly competitive in a short period of time.

The CTS is now operating in a deregulated environment and, therefore, has to develop a successful strategy to manage customer satisfaction. If competitors make use of innovation to exploit opportunities resulting from the change, they can very quickly play a decisive role in a large industry without taking a drastic risk. CTS does have a competitive advantage due to its long association with the industry and its jealously guarded impartiality and integrity that is crucial when a laboratory is functioning as a cane payment service provider. However, CTS still has to ensure that its customers are completely satisfied and that CTS is not caught unawares by external influences.

2.6 CONCLUSION

Operating in an industry that is facing various challenges, CTS has to develop sound, long-term business relationships with millers and growers at the fourteen mills in the industry. Whereas previously CTS operated in a protected monopoly, deregulation means that the customers are no longer hostage and are free to choose their service providers. Whilst CTS

management does receive feedback in an informal manner on a regular basis, a customer satisfaction study offers an opportunity to identify areas where CTS it is not performing to the satisfaction of customers and areas it is satisfying customer requirements. To ensure customer satisfaction, customer loyalty and the sustainability of the business, CTS has to identify key service criteria and measure how effectively it is delivering this service to customers.

The following chapter presents a review of the literature gathered on the various topics related to the study and includes an examination of concepts regarding service quality, customer expectations, customer perceptions, customer satisfaction and customer loyalty.

CHAPTER 3 - SERVICE QUALITY AND CUSTOMER SATISFACTION

3.1 INTRODUCTION

The increased significance of the services sector to the global economy has led to a heightened concern by practitioners, as well as consumers, regarding the quality of services being offered (Sung et al., 1997). This increased significance is reflected in the way customers now critically assess the standard of service provided by competing service firms (Antonacopoulou and Kandampully, 2000). Within the current marketplace, some of the greatest challenges facing organisations include the intensifying global competition, the continuous increase in customer expectations and customers' subsequent demands as the quality of service improves (Wong and Sohal, 2003a).

In an attempt to address these challenges, organisations need to adopt proactive strategies which will assist in building and sustaining a competitive edge (Kandampully, 1998). Specifically, the delivery of service quality is increasingly being seen as central to service providers' efforts to position themselves effectively in the marketplace. As a result, the concept of quality and its relationship with the service industries has become a major focus area for organisations within this sector (Lovelock, Patterson and Walter, 1998). Leading service organisations strive to maintain a superior quality of service in an effort to gain and maintain customer loyalty.

A service organisation's long-term success in a market is, therefore, determined by its ability to expand and maintain a large and loyal customer base (Zeithaml, Berry and

Parasuraman, 1996). Zeithhaml (2000) has further shown that leveraging service quality contributes to both the retention and expansion of the existing customer base.

The CTS, as a service organisation, is facing the challenge of an increase in customer expectations and the subsequent demand in the quality of service received (South African Sugar Association, 2002). As described in Chapter 2, having operated in a protected, monopolistic market prior to 1994, CTS is being critically assessed by customers who are now free to take their business to other service providers. Even though there is currently relatively little competition in the market in which CTS operates, providing customers with outstanding service quality may be the only reliable way of achieving sustained customer satisfaction and loyalty.

With service quality regarded as a causal antecedent of customer satisfaction (Taylor and Baker, 1994), it is an important aspect for service organisations hoping to achieve continuous customer satisfaction and loyalty to consider. This chapter will, therefore, focus on the definition and characteristics of service and the definition of service quality. The measurement of service quality is discussed and the popular measurement instrument of service quality, SERVQUAL, is critically assessed. The review of the SERVQUAL instrument and the application of certain aspects of it to the current study are further discussed. This chapter will also review appropriate literature on customer satisfaction and customer loyalty.

3.2 SERVICE QUALITY

3.2.1 Definition of Service

The level of satisfaction among customers is a good indicator of the level of quality of the service that customers receive. Therefore, understanding service quality is a crucial step in achieving customer satisfaction.

Kotler (2000) defines a service as any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may, or may not, be tied to a physical product. The following categories of services mix are described and are used to classify CTS's offering.

3.2.2 Categories of Service Mix

A company's offering to the marketplace often includes some services. The service component can be a minor or a major part of the total offering. Five categories of offerings can be distinguished (Kotler, 2000):

- Pure tangible good: the offering consists primarily of a tangible good. No services accompany the product.
- Tangible good with accompanying services: the offering consists of a tangible good accompanied by one or more services.
- Hybrid: the offering consists of equal parts of goods and services.

- Major service with accompanying minor goods and services: the offering consists of a major service along with additional services or supporting goods.
- Pure service: the offering consists primarily of a service.

The CTS's offering consists of providing a service to its customers with no accompanying goods provided, therefore, the service can be classified as being a pure service.

3.2.3 Characteristics of Services

Services have four major characteristics (Kotler, 2000):

- Intangibility: services are intangible and unlike physical products cannot be seen, tasted, felt, heard or smelt before they are purchased. Buyers will, therefore, look for signs or evidence of the service quality and will draw inferences about quality from the location, staff, communication material, symbols and price they see.
- Inseparability: services are typically produced and consumed simultaneously and are, therefore, not manufactured, put into inventory, distributed and consumed later.
- Variability: services are deemed highly variable because they depend on who provides them, and when and where they are provided.
- Perishability: services cannot be stored.

The analytical results that CTS provides are intangible, inseparable, variable and perishable as per the above definition. Customer satisfaction will depend on the level of service quality provided by CTS. The relevant literature pertaining to service quality will be reviewed in the following section.

3.2.4 Definition of Service Quality

Parasuraman, Zeithaml and Berry (1988) define service quality as the degree of discrepancy between customers' normative expectations for the service and their perceptions of the service performance. Zeithaml (1988) adds that customers of services observe and evaluate the production process as they experience the service they receive.

Earlier work by Gronroos (1978) proposed that service quality comprises three dimensions. The first dimension is the technical outcome of quality, which is the actual outcome of the service encounter. Most often, customers can measure the service outcome in an objective manner. The second dimension is the functional quality of the service encounter, which is the element of quality concerned with the interaction between the provider and the recipient of a service. Customers often perceive this in a subjective manner. The third dimension is corporate image, which is concerned with customers' perceptions of the service organisation. Image depends on technical and functional quality, price, external communications, physical location, appearance of the site and the competence and behaviour of the service firm's employees.

Later work by Gronroos (1984) defined service quality as a perceived judgement resulting from an evaluation process where customers compare their expectations with the service they perceive to have received. The author further declared that the quality of service is dependent on two variables: expected service and perceived service and that any previous experience with a service could influence the expectations of a consumer, whereas the perceived service is the result of a consumer's perception of the service itself.

Berry, Zeithaml and Parasuraman (1985) argue that consumers evaluate the level of service quality they receive based on three types of attributes, namely: search, experience and credence attributes.

- Search attributes such as physical facilities, appearance of personnel and the supplier's image can be considered before consuming the service.
- Experience attributes are assessed on the basis of the actual service experience, for example, responding quickly to a request or performing a service at the agreed standard.
- Credence attributes such as security of an investment cannot be determined even after repeated use of a service.

The most significant contribution of the research described above was to separate service quality into attributes of process and outcome quality. Parasuraman, Zeithaml and Berry (1988) have suggested a more detailed classification of service quality which includes five dimensions: reliability, responsiveness, assurance, empathy and tangibles. The work of these authors was concentrated on the belief that service quality is measurable in the eyes of the customer. They take the view that service is deemed to be of high quality when customers' expectations are confirmed by the subsequent service delivery. A good operational example of a standardised framework for understanding service quality is the SERVQUAL instrument developed by Parasuraman, Zeithaml and Berry (1988).

3.2.5 Measurement of Service Quality

There are a number of measurement tools and techniques for assessing service quality and consumer satisfaction levels, some more complex than others. The leading researchers in the area of service quality measurement studies have been Parasuraman, Zeithaml and Berry (1985) with the development of the above mentioned SERVQUAL procedure. These authors were of the opinion that service quality could be measured, but only by the customer themselves and put forward the concept that service is of high quality when its delivery meets or surpasses the customers' expectations. Service quality fails to be achieved when expectations are not met and hence a service gap materialises. Parasuraman, Zeithaml and Berry (1985) state that it is only by explicitly assessing expectations as well as perceptions that service quality gaps in terms of services provided can be determined.

The SERVQUAL instrument will be discussed, with the intention of identifying service quality dimensions which are a useful reference for the current CTS study.

3.2.6 The SERVQUAL Instrument

The SERVQUAL instrument is a reasonable illustration of the programmatic development of a universal list of service quality dimensions. Its authors sought to determine common dimensions of service delivery and discovered the following ten general dimensions:

- Tangibles: physical facilities, appearance of personnel, tolls or equipment, physical representation of service (such as plastic credit card).
- Credibility: trustworthiness, believability and honesty.

- Competence: possession of required skills and knowledge.
- Access: approachability and ease of contact.
- Reliability: performing the service at designated time, dependability of performance, accuracy of billing and correct record keeping.
- Responsiveness: timeliness of service.
- Courtesy: politeness, respect, consideration and friendliness of contact personnel.
- Communication: keeping customers informed in language they can understand and listening to customers' comments.
- Empathy: making an effort to understand the customer.
- Security: freedom from danger, risk or doubt.

Each of the above ten dimensions of service quality relates not only to the service consumed but also to the customers' confidence in those providing the service. The above dimensions were further refined until the instrument was composed of five higher-order dimensions which subsumed the previous ten (Parasuraman, Zeithaml and Berry, 1985). The five service dimensions of the SERVQUAL instrument are:

- Reliability: the ability to perform the promised service dependably and accurately.
- Responsiveness: the willingness to help customers and provide prompt service.
- Assurance: the competence of the system and its credibility in providing a courteous and secure service.
- Empathy: the approachability, ease of access and effort taken to understand customers' needs.
- Tangibles: the appearance of physical facilities, equipment, personnel and communication materials.

The SERVQUAL instrument consists of twenty-two statements used to assess service quality across the five dimensions, with each statement used twice: once to measure expectations and once to measure perceptions. Respondents are asked to rate their level of agreement or disagreement with the given statements on a seven point Likert scale. These statements represent the determinants or dimensions of service quality. One of the purposes of the SERVQUAL instrument is to ascertain the level of service quality based on the five key dimensions and identify where gaps in service exist and to what extent. These gaps are listed below and are defined in the Service-Quality Model of Parasuraman, Zeithaml and Berry (1985).

- Gap 1 (the positioning gap) pertains to managers' perception of customers' expectations and the relative importance customers attach to the quality dimensions.
- Gap 2 (the specification gap) is concerned with the difference between what management believes the customer wants and what the customers expect the business to provide.
- Gap 3 (the delivery gap) is concerned with the difference between the service provided by the employee of the business and the specifications set by management.
- Gap 4 (the communications gap) exists when the promises communicated by the business to the customer do not match the customers' expectations of the external promises.
- Gap 5 (the perception gap) is the difference between the customers' internal perception and expectation of the services.

The lower the mean score, the larger the gap in service quality, and conversely the higher the mean score, the smaller the gap. Gaps 1 to 4 are within the control of an organisation and need to be analysed to determine the cause and to implement changes to reduce or eliminate Gap 5. Parasuraman, Zeithaml and Berry (1985) argue that with minor modifications, SERVQUAL can be adapted to any service organisation. Information on levels of customer expectations can help managers to understand what customers actually expect of a particular service. Similarly, information on service quality gaps can help managers identify where performance improvement can best be targeted. Equally, if gap scores in some areas do turn out to be positive, this allows managers to review whether they may be oversupplying this particular feature of service and whether there is potential for redeployment of resources into features which are underperforming

3.2.7 Critical Assessment of SERVQUAL

The critical assessment of SERVQUAL is intended to show the advantages and utility of the instrument and its contribution to developing the CTS questionnaire. This section also reviews SERVQUAL's shortcomings and provides reasons for the decision not to use the instrument in the CTS study.

Since its formulation, the twenty-two-item SERVQUAL instrument has been used in a variety of service industries and countries, and represents one of the most widely used operationalisations of service quality (Lewis, 1995). It has provided researchers with a means of measuring the performance-expectations gap (Gap 5). According to Lewis SERVQUAL has good reliability and validity which can be used to understand service

expectations and perceptions of customers and, hence, service quality gaps. Despite general agreement that SERVQUAL is a good predictor of service quality in its wholeness, it has been subjected to severe criticism as well (Sureshchander, Rajendran and Anantharaman, 2002).

Principal criticisms of its psychometric soundness and utility are its reliance on two scales measuring perceptions and expectations when one scale (that of perceptions or a simple performance measurement, which is what the CTS instrument is designed to measure) would be shorter, simpler and more easily understandable and ultimately more effective (Newman, 2001). The use of expectations is questioned by Babakus and Mangold (1992) and Cronin and Taylor (1992) who conclude that the disconfirmation approach (difference between customer perceptions and expectations) in measuring service quality has little theoretical or empirical support.

Similarly, Teas (1993) questions the interpretation and operationalisation of expectations and Avkiran (1999) notes a tendency to set expectations higher than perceptions, thus making a gap between perceptions and expectations inevitable. On practical grounds, the use of two scales and the negatively worded question items, are both time consuming and too complex for most respondents (Avkiran, 1999). The reliability and validity of SERVQUAL's difference score formulation has been questioned by Babakus and Boller (1992) and Brown, Churchill and Peter (1993), and SERVQUAL's dimensionality has not proved universal (Newman, 2001).

Buttle (1996) and Genestre and Herbig (1996) argue that SERVQUAL measures only process of delivery rather than the outcomes of service, whilst Gilmore and Carson (1992) observe that SERVQUAL is narrowly focused on service or product dimensions to the neglect of the rest of the marketing mix. Robinson (1999) concluded that it is questionable whether SERVQUAL is a reliable measure of service quality and whether it is measuring service quality at all. This criticism followed careful scrutiny of the twenty-two items used to measure service quality. Items used deal largely with the element of human interaction/intervention in service delivery and the rest pertain to tangible facets of service (such as employee appearance, appearance of equipment and décor). Smith, A.M. (1995) argues that because SERVQUAL uses a complicated questionnaire to measure perceived service quality, it is used by scholars more frequently than business practitioners.

Modifications to the twenty-two items has resulted in alternative service quality measures such as Cronin and Taylor's (1992) SERVPERF measure, which has the claimed advantage of a single scale, designed to measure service quality performance using a seven point semantic differential scale. The BANKSERV measure (Avkiran, 1999) is a single measure of service quality designed to allow customers to reflect on their perceptions and expectations in a single statement.

The SERVQUAL instrument, therefore, appears to have overlooked some important factors of service quality, namely the core service, standardisation of service delivery (the non-human element) and the social responsibility of the service organisation (Sureshchander, Rajendran and Anantharaman, 2002). Another criticism was the generic nature of the instrument and it was suggested that the survey instrument needed to be customised for use

in the specific industry to which it was applied by including additional related questions (Brown, Churchill and Peter, 1993). Examples of these include SERVPERF (Cronin and Taylor, 1992) and BANKSERV (Avkiran, 1999).

Despite many difficulties and weaknesses associated with the use of SERVQUAL, it nevertheless continues to be one of the most widely recognised methods of measuring service quality and has contributed significantly to the understanding of service quality in a time of increased significance of the services sector to the global economy.

3.2.8 SERVQUAL and the Current CTS Study

The review of the SERVQUAL instrument was beneficial in terms of identifying the key dimensions of service quality. The identification and review of the important quality attributes is valuable and the comprehensive list of service quality dimensions provided by SERVQUAL has been used to group the CTS service quality attributes into five broader categories. Whilst the CTS study does not attempt to identify gaps in service quality but rather to identify levels of customer satisfaction with service quality criteria and to compare these with the previous customer survey, the SERVQUAL instrument provides useful information in determining the appropriate service quality criteria for the CTS study.

The decision not to use the SERVQUAL instrument was primarily because of the complicated questionnaire and its unsuitability for CTS customers. Additional practical considerations included the finding by Smith (2003) that respondents did not understand how to complete the questionnaire and that the SERVQUAL questionnaire was too long. It

was further concluded that the questionnaire had to be modified considerably to suit the survey, which is in agreement with the conclusion of Brown, Churchill and Peter (1993) who criticised SERVQUAL as being too generic.

Bachelet (1995: 80) importantly also asks "how can respondents correctly answer a question on how they perceive the performance of a product or service if they have not experienced a number of brands or products?". This is especially relevant in the case of the current CTS study, as even though the market has been deregulated, CTS still operates from a dominant, monopolistic market situation. Thus, the CTS customers have no other service provider with which to compare CTS. The first question of each pair of questions in SERVQUAL have been designed to elicit a response of customer's expectation of an excellent (ideal) service provider for the service attribute. The second question relates to the customer's perception of the same attribute at the service provider being studied. The CTS customers would not have experienced service from another service provider. Therefore, instead of measuring the difference in the gap between expectation and perception, the approach taken in this study is to measure customer satisfaction on selected service quality attributes. The levels of satisfaction among CTS customers are a good indicator of the level of quality of the service that CTS customers are receiving.

Having identified the important quality attributes for CTS, the purpose of this study was to survey customer satisfaction levels of the various quality attributes. This study used a CTS developed, customer mail survey method to measure customer satisfaction rather than the SERVQUAL instrument for the reasons discussed above. The development of the CTS questionnaire will be discussed further in Chapter 4.

As this is a longitudinal study, after confirming the reliability and validity of the CTS questionnaire used in the 1998 customer survey, as well as confirming the attribute selection in conjunction with the SERVQUAL review, it was decided that there was no need to change the survey instrument. The review of SERVQUAL did provide useful input confirming the dimensions used and suitability of the survey instrument that was to be implemented in this study.

Other methods of measuring service quality (such as customer interviews, internal audits and customer value workshops) were also considered, but were considered unsuitable for this study, primarily due to time and other resource constraints.

3.2.9 Conclusion: Service Quality

Service quality is regarded as a difficult concept to quantify. However, in the pursuit of strategies to improve the quality of service and to achieve customer satisfaction and loyalty, the measurement of service quality is essential. It must be noted that service quality is the antecedent to customer satisfaction and customer loyalty and must, therefore, be accorded the importance it deserves. It is important that CTS evaluate the quality of its service to ensure continuous improvement in customer satisfaction and customer loyalty. This will allow management to allocate appropriate resources to areas that are underperforming. The improvement in perceived quality of CTS services will lead to improved customer satisfaction levels.

Having identified and confirmed the appropriateness of the service quality criteria for the CTS study, the next section reviews the relevant literature on the definitions of customer satisfaction and customer loyalty. The definition of customer satisfaction deemed most suitable for the current study is also discussed.

3.3 CUSTOMER SATISFACTION

3.3.1 Introduction

Service quality and customer satisfaction are the two core concepts that are the crux of marketing theory and practice (Spreng and Mackoy, 1996). In today's world of intense competition, the key to sustainable competitive advantage lies in delivering high quality service that will, in turn, result in satisfied customers (Shemwell, Yavas and Bilgin, 1998). Increasing customer satisfaction and customer loyalty leads to improved profits, positive word-of-mouth and lower marketing expenditure (Heskett, Sasser and Schlesinger, 1997).

Ensuring customer satisfaction is one of the most important tasks facing business today. Gerson (1993) views customer satisfaction as whenever a customer's needs, real or perceived, are met or exceeded. Spreng, MacKenzie and Olshavsky (1996) describe satisfaction to incorporate both the needs and the desires of the customer, and that failure to include customer desires has caused logical inconsistencies in satisfaction research. Further research by Gabbott and Hogg (1999) suggests that it is not always necessary to be either satisfied or dissatisfied; the customer may, in fact, be totally neutral to aspects of the service.

Customer loyalty, as demonstrated by repeat business, has been shown to be a key determinant of the success of many service companies (Reichheld and Sasser, 1990). While a high level of customer satisfaction does not necessarily guarantee customer loyalty, dissatisfaction will cause customers to take their business elsewhere. In other words, customers who are dissatisfied with the level of service they have received will be less likely to return in future, or if they do return, they will most likely do so with less frequency than they did in the past. Conversely, customers who are extremely satisfied with their service experience with a given firm, will most likely continue to return to that firm at the same frequency or even more frequently (Reichheld and Sasser, 1990).

The customer's experience with the service firm is also likely to be multiplied through interactions with other prospective customers via word-of-mouth. When customers are satisfied with the service they receive they influence the expectations of other customers (or potential customers) with whom they interact. When they are dissatisfied with the service, customers are even more likely to influence the expectations of others (Davis and Heineke, 1998).

There has been some debate as to whether service quality is a cause of satisfaction (Cronin and Taylor, 1992; Parasuraman, Zeithamel and Berry, 1985) or a consequence of satisfaction (Bolton and Drew, 1991). This study does not address the debate itself, but adopts the view that service quality is antecedent to customer satisfaction and customer loyalty. Section 3.2.4 defined the service quality concept and the following section defines customer satisfaction and includes the concepts of customer expectations and customer perceptions. The literature on customer loyalty is also reviewed since achieving growth in

customer loyalty by increased customer satisfaction and through improved service quality is the ultimate goal of CTS.

3.3.2 Defining Customer Satisfaction

Kotler (2000) defines satisfaction as feelings of pleasure or disappointment resulting from comparing a product's perceived performance in relation to the customer's expectations. This definition makes it clear that satisfaction is a function of perceived performance and expectations. If the performance falls short of expectations, the customer is dissatisfied, and if performance matches the expectations, the customer is satisfied. If the performance exceeds expectations, the customer is highly satisfied (Kotler, 2000). Many companies, including CTS, aim for high satisfaction since customers who are merely satisfied still find it easy to switch service providers when a better offer presents itself. Those customers who are highly satisfied are much less ready to switch, and the result is high customer loyalty.

Davis and Heineke (1998) define customer satisfaction in service operations by approaching it in two general ways:

- Satisfaction as a function of disconfirmation; and
- Satisfaction as a function of perception.

3.3.2.1 Customer Satisfaction as a Function of Disconfirmation

The research of Anderson (1973), Swan, Trawick and Carrol (1981) and Parasuraman, Zeithaml and Berry (1994) has attempted to define satisfaction in terms of disconfirmation,

that is, the difference between customer perceptions and expectations. The formula depicting this is:

Satisfaction = f(Perception – Expectation)

The literature on customer expectations is reviewed next and customer perceptions will be addressed in the section thereafter. The definition that is most suited to the current study will also be determined.

Customers' expectations provide a baseline for the assessment of levels of customer satisfaction. As customers evaluate the levels of performance of a service, they typically compare that performance to what they had expected (Zeithaml et al., 1993). Disconfirmation models contend that service quality can be conceptualised as the difference between what a customer expects to receive and their perceptions of actual delivery. Customers hold that product or service performance exceeding some standard based on expectations leads to satisfaction, while performance falling below this standard results in dissatisfaction (Oliver, 1997). According to Mowen (1995) this expectancy disconfirmation approach helps to explain customer perceptions of service quality, as well as customer satisfaction judgements.

Davis and Heineke (1998) propose that customer expectations of service are set in two basic ways:

- Prior to the customer's first encounter with the service firm, via advertising and customer word of mouth; and
- After a previous encounter (or encounters) with the firm, that is, from personal experience.

Early work in this area proposed that there are two dimensions to the expectation construct: the level of service desired by the customer and the level of service predicted by the customer (Anderson, 1973; Swan, Trawick and Carrol, 1981):

- High customer satisfaction results when performance is greater than, or equal to, the customer's desired service level.
- Customer satisfaction occurs when the performance is less than the customer's desired service level but greater than or equal to the predicted service level, i.e. the service performs as well as or better than predicted, but below the desired service level.
- Customer dissatisfaction occurs when performance is less than both the customer's desired and predicted levels of service, i.e. the service performs worse than the customer desired or expected.

Olson and Dover (1976) describe expectations as pre-purchase beliefs about a service. Miller (1977) proposed four different types of expectation: ideal, expected, deserved and minimum tolerable. The ideal is the wished for level of performance, expected is an objective calculation of the probability of performance, whilst deserved is the customer's subjective opinion of their investment. Minimum tolerable is obviously the bottom level of acceptable performance. Parasuraman, Berry and Zeithaml (1991) suggest that expectations have two levels: desired and adequate. The desired level is the service the customer hopes to receive and adequate is based on a prediction of what the service will be. Boulding (1993) suggests that ideal expectations are unrelated to what is reasonable/feasible and/or what the provider tells the customer to expect. They represent enduring wants and needs that are unaffected by marketing and as such are more constant over time. In contrast, expectations of what should happen, namely normative expectations are more likely to be

influenced by service providers and are dynamic concepts changing over time (Boulding, 1993).

Needs, whether unmet and discovered, implicit, or explicit, are modified by perceptions which, in turn, modify expectations (Horovitz, 2000). Perceptions modify an objective evaluation of how a service may answer a need. They introduce a subjective element into the judgement. Thus, the customer will not see whatever a company says or does in exactly the same way as the service provider does. Expectations on the other hand, have more to do with the level of service customers perceive to be due to them, given their needs and perceptions of the offer. Expectations are formed not only by what happened on previous occasions, but also by experiences in analogous situations (Palmer and O'Neill, 2003).

Boulding, Kalra and Staelin (1999) have investigated the effects of prior expectations on customers' cumulative perceptions of service quality and have suggested a progressive effect of perceptions feeding into expectations, with the effect that previous performance is assessed against rising expectations. This confirms the work of Mazursky and Geva (1989) who contend that satisfaction reduces over time. This aspect has particular reference to the current study, where CTS has been providing a service for a significant period of time. With the rising of customer expectations, it could be suggested that customer satisfaction may decline over time.

The study of Spreng and Olhavsky (1993) demonstrated that there was a significant relationship between the extent to which performance is congruent with desires, but did not find the disconfirmation of expectations to be significant. The work of Goode and Moutinho (1995) and Teas (1994) argues that the multiple definitions of expectations and the resulting

difficulties with measurement operationalisation undermine the value of models incorporating expectations. However, the current study is longitudinal and thus the influence of time and rising expectations having the effect of downgrading perceptions of previous service quality, bears particular reference.

3.3.2.2 Customer Satisfaction as a Function of Perception

An alternative approach put forward by Cronin and Taylor (1994) and Teas (1993) is that satisfaction depends primarily on the customer's perception of service rather than on the discrepancy between perception and expectation. The formula depicting this is:

Satisfaction = f(Perception)

The above formula does not include expectation and there is thus no difference being measured between customer perceptions and expectations. The construct of the current CTS study takes the approach of customer satisfaction being a function of perception since the survey instrument has been designed to measure customer satisfaction for specific service criteria. The SERVQUAL instrument measures the disconfirmation or the difference between perception and expectation. As stated in Section 3.2.8, the SERVQUAL instrument was found to be unsuitable for this study because measurement of this difference introduces greater difficulty in assessment.

Perception has proven to be a difficult concept to define and measure (Woodruff, 1997; Holbrook, 1994). McDougall and Levesque (2000) broadly define perception or perceived value as the results or benefits customers receive in relation to total costs (which include the

price paid plus other costs associated with the purchase). Holbrook (1994) states that what constitutes value appears to be highly personal, idiosyncratic and may vary widely from one customer to another. van der Wagen (1994) adds that individual customers have many different perceptions, which are influenced by education, upbringing, experience, and other factors. Research by Zeithaml (1988) suggests that customers who perceive that they received value for money are more satisfied than customers who do not perceive they received value for money. For the current study perceived value, or the customer perception, will be defined as the customers' overall assessment of what is received relative to the service quality that is provided by CTS.

Perception refers to the customers' perception of actual performance, implying that perception and objective actual performance are not one and the same (Palmer and O'Neill, 2003). Parasuraman, Zeithaml and Berry (1994) argue that while perception alone may be a better predictor of satisfaction, it offers less understanding of the underlying phenomena than the disconfirmation model.

A contemporary view of the role of perceptions in customer behaviour put forward by Sheth, Mittal and Newman (1999) who contend that perception is not merely a matter of objectively absorbing the stimuli present in the environment, but rather a combination of three factors that help shape customer perceptions:

- Stimulus characteristics: people perceive a stimulus differently according to its sensory characteristics and information content, and stimuli that differ from others around them are more likely to be noticed (Solomon, 1999).
- Context: in perceiving a stimulus with a given set of characteristics, customers will also be influenced by the context of the stimulus (Biswas and Blair, 1991).

- Situational variables in which the information is received, including social, cultural and/or personal characteristics: perceptions are greatly influenced by personal customer characteristics, the most obvious of which is prior experience with a particular product or service offering (Sheth, Mittal and Newman, 1999).

Palmer and O'Neill (2003) add that prior experience and knowledge have a bearing on how a customer feels about a particular product/service offering, which feeds expectations of the relevant exchange process. In turn, expectations influence perceptions, in that customers often eventually see what they expect to see (Oliver, 1980).

The work of Horovitz (2000) showed that customer needs are complex and may be classified into two categories: implicit needs which usually relate to the features of the product or service, and explicit needs which are concerned with benefits of the product or service. The author further states that in time, customers' needs turn into customers' perceptions. Anything that influences those perceptions will have a positive or negative impact on the customers' willingness to trust a service organisation. These influences are termed filters and include physical, psychological and image filters. Descriptions of these filters follow.

- Physical filters

Whether physical or psychological, there will be elements in the offer that alter the customer's perception. Each time an appeal to the five senses is made to reinforce the offer, the positive perception of its quality and capacity to fulfil needs is strengthened. The physical clues can lead a customer in another direction if the service provider is mistaken.

Thus, words, colours, material, sounds, support, smell and texture all contribute to modify perception of quality (level and variability).

- Psychological filters

Beyond physical filters, there are psychological filters that also modify the customer's perception. These include memory, knowledge, beliefs and values. Perceptions are genuinely felt and only by reminding customers (counteracting lack of memory), educating them (counteracting lack of knowledge) and changing their beliefs and values can their perceptions be changed.

- Image

The third factor that affects perceptions is the organisation's or product's own image. Image is built around a character, a personality and values, signified by the brand and dispersed through communication. How the organisation positions itself naturally influences customers and controlling the image as much as possible by communication can assist in improving perceptions over time.

3.3.3 Managing Customer Perceptions and Expectations

Horovitz (2003) states that all of the above items are linked and the best organisations manage the whole chain by:

- Identifying which needs are implicit i.e. those whose absence will cause dissatisfaction.
- Identifying how needs are modified in perception.
- Determining how expectations are formed.

Managing customer perceptions and expectations is especially important in the service sector, which sells two things: the service itself, and the ability to serve, which the customer has to believe can be delivered (Kotler, 2000).

The work of Smith, I. (1995) proposes that there are three aspects to managing customer satisfaction, namely, the legal perspective, the customer perspective and the manager's perspective.

- The legal perspective

From the legal perspective, managing customer satisfaction means meeting specific standards of product or service: price, delivery, safety and quality. There are also codes of practice and other self-regulating controls, which may apply to specific businesses. Customer satisfaction from a legal perspective is ensured when customers are not misled or left dissatisfied or with inferior or faulty goods or services and the service provider has conformed with the codes of good practice and other requirements which apply to the business's particular activities.

- The customer perspective

The heart of customer satisfaction is meeting or exceeding customers' expectations. Managing customer satisfaction is a continuous process that does not begin or end with a purchase; it covers the entire ownership experience from selecting a product, to purchase, through aftercare to repeat purchase. There are three clear stages: pre-sales, sales and after-sales, and all three stages will contribute to customer satisfaction.

- The manager's perspective

The manager's perspective of handling customer satisfaction must start from the realisation that what the manager provides extends well beyond the core product or service. Managing customer satisfaction begins with an understanding of the elements that come together to determine satisfaction levels.

3.3.4 Customer Satisfaction and Internal Business Processes

Customer satisfaction is linked to both business performance in terms of market share and profitability, and internally driven critical processes (Naumann and Giel, 1995). This implies that a focus on improving customer satisfaction levels allows an organisation to continuously improve those internal business processes that drive customer satisfaction, which, in turn drives market share and market share drives financial performance. Internal business process improvement initiatives that focus on customer satisfaction have to form part of the routine business performance measurement system. One such measurement tool, the Balanced Scorecard (Kaplan and Norton, 1992), is described as a business performance measurement system that covers four perspectives, namely, financial, learning and growth, internal business process and customers. The Balanced Scorecard is intended to support the management of strategy implementation and organisations, in reviewing operations, would be able to monitor non-financial and financial performance measures. This tool would be of benefit to CTS in monitoring the ongoing implementation of customer satisfaction improvement strategies.

3.3.5 Conclusion: Customer Satisfaction

The above section of this chapter has reviewed two critical aspects in defining customer satisfaction, namely customer expectations and customer perception. Some authors define customer satisfaction as the difference between customer perceptions and expectations, whilst others define satisfaction primarily in terms of the customer's perception of service. The current CTS study follows the latter view and this has rendered the design of the questionnaire simpler and of greater practical use. Other aspects of customer satisfaction, which were in the context of managing perceptions and expectations, were also briefly reviewed. Customer satisfaction improvement strategies and its forming part of the internal business process, was discussed and the Balanced Scorecard management tool was introduced and will be discussed further in Section 6.3.

As stated previously, high customer satisfaction results in high customer loyalty. Having reviewed the literature on customer satisfaction, the literature on customer loyalty is reviewed in the following section.

3.4 CUSTOMER LOYALTY

3.4.1 Introduction

Even in markets with relatively little competition, providing customers with outstanding value may be the only way to achieve sustained customer satisfaction and loyalty. Research shows that perceived service quality has an impact on customer satisfaction, which, in turn,

leads to later behaviours (loyalty) towards the service organisation (Andreassen and Lindestad, 1998). Therefore, service quality appears to be a causal antecedent of customer satisfaction, which mediates the relationship between service quality judgments and behavioural intentions (Taylor and Baker, 1994). In a further study conducted in five different service industries, a positive relationship was found between perceived service quality and customer loyalty (de Ruyter, Wetzels and Bloemer, 1998). The study of Wong, Dean and White (1999) also found a positive relationship between the dimensions of service quality and customer loyalty.

3.4.2 Definition of Customer Loyalty

Simply stated, customer loyalty is a purchase behaviour, unlike customer satisfaction, which is an attitude (Griffin, 1996). Customer loyalty has been generally described as occurring when customers:

- Repeatedly purchase goods or service over time, and
- Hold favourable attitudes towards goods or service, or towards the company supplying the goods or service (Wong and Sohal, 2003b).

Oliver (1997) proposes that customer loyalty can be viewed as developing in four phases. In the first cognitive loyalty phase, the information base available to the customer compellingly points to one brand over another. In this phase, the level of attachment a customer feels for the organisation's offerings is low. The second phase of loyalty is based on affect. Affective loyalty, as an attitude, is more difficult to dislodge than cognitive loyalty, since the loyalty is encoded in the customer's mind as affect and not solely as

cognition. The third loyalty phase, conative loyalty, is a state containing deeply held commitment to buy. Action loyalty is the last loyalty phase where intention accompanied by motivation leads to a state of readiness to act and a desire to overcome obstacles to achieve action (Oliver, 1997).

According to Wong and Sohal (2003a) customer loyalty appears to consist of three separate dimensions, namely, the behavioural, attitudinal and cognitive dimensions. From the study of Jacoby and Chestnut (as cited by Wong and Sohal, 2003a: 294) the behavioural dimension of loyalty has been interpreted as a form of customer behaviour (for example repeat purchasing behaviour) directed towards a particular service; the proportion of purchases devoted to a given brand (Cunningham, 1956) and the probability of repeat purchases (Ehrenburg, 1965).

Criticism from Dick and Basu (1994) suggest that a major problem with behavioural loyalty is that it does not provide a comprehensive understanding of the factors underlying repeat purchase. Further criticism by Day (1969) is that behavioural measures of loyalty lack a conceptual basis and have a narrow and outcome-focused view of what is a dynamic process.

The attitudinal dimension of loyalty is described in the study of Jacoby and Chestnut (as cited by Wong and Sohal, 2003a: 295) as a psychological commitment to a brand. Jarvis and Wilcox (1976) suggest that the attitudinal dimension includes consumer's preferences or intentions. As a result of the above considerations, Dick and Basu (1994) encourage the use of composite measures of loyalty, as the restriction of loyalty to either behaviour or attitude

seems incomplete. They, therefore, propose that loyalty is determined by a combination of repeat purchase levels (repeat patronage behaviour) and relative attitude (level of attachment). It would seem that composite measures of behavioural and attitudinal loyalty tend to capture the essence of loyalty more effectively (Wong and Sohal, 2003a).

Jones and Sasser (1995) state that there are two types of loyalty: true long-term loyalty and false loyalty. A variety of factors can generate false loyalty or make customers seem deeply loyal when they are not. These include government regulations that limit competition, high switching costs, propriety technology that limits alternatives and strong loyalty-promotion programmes. Jones and Sasser (1995) made a startling discovery about customers in such markets: whenever such customers have choices and feel free to make a choice, they act like customers in markets with intense competition and will only remain loyal if they are completely satisfied. This is the threat faced by CTS.

Different satisfaction levels reflect different issues and, therefore, require different actions (Naumann and Giel, 1995). The level of satisfaction among targeted customers is a good indicator of the level of quality of the product or services they are receiving (Pizam and Ellis, 1999). The way to raise the level of customer satisfaction from neutral to satisfied, or from satisfied to completely satisfied, is not just a matter of doing a better job of delivering the same value or experience that the organisation is currently delivering (Jones and Sasser, 1995). There are four elements that affect customer satisfaction: the basic elements of the product or service; basic support services; recovery process for counteracting bad experiences and extraordinary services that so excel in meeting customers' personal preferences that they make the product or service seem customised (Kotler, 2000).

3.5 CONCLUSION: CUSTOMER LOYALTY

It is essential to understand what proportion of customers' seeming loyalty is true loyalty based on the organisation's delivery of superior value, and what is artificial loyalty. Measuring customer satisfaction is one of the surest ways to obtain this information. If there is a likelihood that the level of competition in a market is going to increase, it is obviously better to seek to increase customer satisfaction before the change occurs rather than after. With the CTS emerging from a protected market environment, it is crucial to measure the level of customer loyalty by measuring the level of customer satisfaction. This study is, therefore, an important intervention in a strategic planning process that ensures CTS continued success in increasing customer satisfaction and customer loyalty.

Chapter 3 reviewed the relevant literature on service quality, customer satisfaction and customer loyalty. The approach taken for the current CTS study is to determine levels of customer satisfaction for selected service quality criteria. The research methodology adopted, including the design of the survey instrument, is discussed in the next chapter.

CHAPTER 4 - RESEARCH METHODOLOGY

4.1 INTRODUCTION

A CTS customer satisfaction survey provides CTS with the necessary data to develop and implement customer enhancement strategies that will lead to improvements in customer satisfaction with CTS service delivery. It is, therefore, important that the data generated from the customer survey is reliable and accurate. To develop a good customer satisfaction measurement programme, all pieces of a research design must be in place. A research design is a description of the entire customer satisfaction measurement programme, whilst clarifying the research objectives allows an organisation to adopt a clear direction for the customer satisfaction survey (Naumann and Giel, 1995).

The research objectives formulated for the current study were clear, concise and relevant to the business needs and strategic planning for CTS and are presented below together with the hypotheses.

- **Overall objective**: To identify the perceived levels of satisfaction with the service provided by CTS and to identify any changes since the previous study.
- **Sub-objective 1**: To establish the MGB members' perceptions of CTS in general and compare these to perceptions held in 1998.

  Hypothesis 1: There has been an improvement in MGB members' perceptions of CTS in general when compared to 1998.

- **Sub-objective 2**: To determine the millers' level of satisfaction with current services provided.

  Hypothesis 2: The millers are satisfied with current services provided by CTS.

- **Sub-objective 3**: To determine the growers' level of satisfaction with current services provided.

  Hypothesis 3: The growers are satisfied with current services provided by CTS.

- **Sub-objective 4**: To identify perceived strengths and weaknesses of CTS with the intention of addressing and improving both actual and perceived weaknesses.

Clearly defined objectives lead to a cleaner, less ambiguous research design. A good initial test for the clarity of objectives was to identify the research hypotheses necessary to achieve the objectives, as ambiguous objectives invariably lead to difficulty in developing hypotheses (Naumann and Giel, 1995).

This chapter builds on the introduction to the methodology presented in Section 1.8 and focuses on aspects that influenced research design for the current study. The chapter covers this study's research objectives and addresses aspects such as the design of the research, target population, data collection, data analysis, reliability, validity, the limitations of the study and assumptions used in the study.

4.2 RESEARCH DESIGN

The research undertaken was classified as conclusive research since the information needed was clearly defined and the research process was formal and structured (Cooper and Schindler, 2001). It has also provided information for the evaluation of alternative courses of actions. A census was taken of all MGB members and the data analysis was quantitative. The findings are conclusive and will be used as input in future decision making at CTS. The research design applied was also descriptive in that it attempted to describe market characteristics and determine perceptions. The study was a longitudinal study since it was a repeat of the study carried out in 1998 and tracked changes in customer perception and confidence. The design detail is expanded on in the next section of this chapter.

4.2.1 Attribute Selection

To measure customer satisfaction, the dimensions or attributes of the service that customers are using in their overall satisfaction assessment need to be anticipated (Pizam and Ellis, 1999). Naumann and Giel (1995) state that the accurate identification of attributes important to the customer is the foundation upon which all subsequent portions of the customer satisfaction measurement programme must be built.

Both internal and external sources were utilised to generate the attribute list in this study. The internally generated attribute list came from the pool of CTS managers who have considerable experience, are in regular customer contact and have a good understanding of customer needs and expectations. However, attributes that management may wish to

measure may be unimportant or irrelevant to the customers' needs. Indeed, previous research by Parasuraman, Berry and Zeithaml (1993) showed that various service dimensions and their underlying attributes are not uniformly important to customers. Therefore, an external source in the form of customer pilot testing was chosen to confirm the list of internally generated attributes.

The pilot testing was conducted on the fourteen chairmen of the MGBs who were the key people involved in managing the relationship between CTS and the MGBs. These selected customers confirmed the list of CTS service attributes and also evaluated the importance of each dimension that was used in the measurement. A balance was achieved between the information needs of management and the needs and issues of the customers. A similar approach was taken for the 1998 study and there were no changes to the attributes that were measured. There were sixteen attributes that were identified (see Appendix A) and measured through thirty-six statements posed in three sections (see Appendix B). These thirty-six statements represented the determinants of CTS customer satisfaction.

The sixteen CTS attributes were grouped into the five broader categories as described by Parasuraman, Berry and Zeithaml (1993) and are shown in Table 4.1. Using the definition of the service quality dimensions as described by Parasuraman, Berry and Zeithaml (1993) enabled the classification of the CTS service attributes into the appropriate service dimension category.

Table 4.1: Grouping of CTS Service Attributes into Service Dimensions.

Service Dimensions	CTS Service Attributes
Reliability	General satisfaction, employee ability, testing accuracy satisfaction, testing frequency satisfaction, world-class.
Assurance	Impartiality and integrity, cost-effectiveness, provision of information, technical competence/effectiveness.
Tangibles	Suitability of technology, housekeeping.
Empathy	Customer satisfaction, monthly reports, handling queries.
Responsiveness	Recent improvement, continuous improvement.

Source: Parasuraman, Berry and Zeithaml (1993: 4.3.5)

The pilot testing on the fourteen chairmen of the MGBs included the service dimension importance ranking and this is presented in Table 4.2 together with a comparison to the findings of the Parasuraman, Berry and Zeithaml (1993) study. The pilot study (see Appendix C) then established the relative importance of the five CTS service dimensions and then compared this with the results achieved by Parasuraman, Berry and Zeithaml (1993).

The results of the pilot study confirmed via an external source that the service attributes selected by the internal source (CTS management) were still valid and that using the same service attributes that were used in the 1998 study was justified. The pilot study also confirmed that the service attributes that management wished to measure were still relevant and important to the customers' needs. This was in contrast to the finding of previous

research by Parasuraman, Berry and Zeithaml (1993) which showed that various service dimensions and their underlying attributes are not uniformly important to customers.

Table 4.2: Pilot Study Showing Service Dimension Importance Ranking by the Fourteen MGB Chairmen and Comparison with Earlier Study.

Parasuraman, Berry and Zeithaml (1993) Study		**Current CTS Study**	
Service Dimension	**Rank**	**Service Dimension**	**Rank**
Reliability	32	Reliability	26
Responsiveness	22	Assurance	26
Assurance	19	Responsiveness	19
Empathy	16	Empathy	16
Tangibles	11	Tangibles	13
Total	100	Total	100

In considering the service dimension importance ranking by the fourteen MGB chairmen, the current study used a frequency distribution to facilitate comparisons. The results of the service dimension importance ranking aspect of the pilot study showed similar results to those obtained by Parasuraman, Berry and Zeithaml (1993). In comparing the two studies, as shown in Table 4.2, four of the five dimensions varied in perceived importance (rating score) with empathy receiving the same rating score by both studies. The findings in this study also differed slightly from those of Parasuraman, Berry and Zeithaml (1993), in that reliability and assurance were rated equally important. The order in which the MGB chairmen ranked the importance of the service dimensions showed that assurance was ranked above responsiveness whilst for the Parasuraman, Berry and Zeithaml (1993) study,

responsiveness was ranked above assurance. Both studies had reliability ranked as most important and tangibles as the lowest ranked in terms of importance.

The pilot study on the fourteen MGB chairmen, therefore, justified using the same service quality attributes for the current study and also gave an indication of the relative importance of the five service dimensions measured.

4.2.2 Target Population

The idea of sampling is that by selecting some of the elements in a population, conclusions about the entire population may be drawn. A census, which is a count of all the elements in a population, is feasible when the population is small and necessary when the elements are quite different (Cooper and Schindler, 2001).

CTS operates under contract to fourteen MGBs. Each miller and grower member of each of the MGBs was included as respondents for this study. The members of the MGBs offer a fair representation of the characteristics of all millers and growers of the South African sugar industry population. They are also democratically elected to the office of the MGB with a Chairman and Vice-Chairman being nominated and elected each year. A census was taken of the fourteen MGBs as the population was relatively small and this conferred a high accuracy and sampling precision on the study. The population consisted of one hundred and sixty-eight (census of all fourteen MGBs whose miller and grower members totalled one hundred and sixty-eight) and the geographical locations covered Mpumalanga, KwaZulu-Natal Midlands, Zululand, North and South Coasts.

4.2.3 Data Collection

Research designs can be classified by the approach used to gather primary data (Cooper and Schindler, 2001). There are two approaches: observation and communication. The method selected for the current study was the communication approach, specifically a self-administered questionnaire that involved questioning or surveying people and recording their responses for analysis.

4.2.3.1 Mail Survey

The mail survey, specifically the self-administered questionnaire (see Appendix B), was chosen as the method of survey for this study. The advantage of the mail survey was its low cost per targeted respondent. The questionnaires were distributed efficiently to a relatively large number of respondents. A disadvantage of the mail survey is that response rates tended to be low. However, the approach taken by CTS to overcome this, was to send reminders to respondents after four, six and eight weeks. The impact of this approach is discussed later in this section.

The predominant factors influencing the costs of a customer satisfaction measurement programme are sample size, number of attributes being evaluated, geographic dispersion of the sample and the frequency of administration (Naumann and Giel, 1995). With the questionnaires distributed numbering one hundred and sixty-eight, the service attributes covered numbering sixteen, and with fourteen different geographical locations (in Mpumalanga, KwaZulu-Natal Midlands, Zululand, North and South Coasts) being targeted

in the survey, the mail survey approach chosen was the most cost effective when compared to the alternatives of telephonic and personal interviews. Due to the stability of the sugar industry, specifically in terms of MGB members, the frequency of once every three to five years for administering a customer satisfaction survey was deemed suitable. This frequency of data gathering depends on the objectives the survey was trying to attain, how often data should be gathered to attain those objectives and how much the organisation is willing to spend.

The staffing requirements for a mail survey are minimal and the entire programme, including administration of the survey, data analysis and presentation of results, was completed by the author. Mail surveys take three to four months to complete due to questionnaire development and printing, mailing time and completion delays. The questionnaire that was used in this study was the same as that used in the survey of 1998 as the service attributes being measured were still found to be important and relevant by both internal and external sources (see Appendices A and B).

Questionnaires were distributed from July 2003 and returns were received by the end of October 2003. Reminders were sent to all participants four weeks and again six weeks after the original mailing, thanking respondents for returns and reminding others to complete and mail the questionnaire. The reminder after six weeks included a new questionnaire along with a letter telling non-respondents that the questionnaire was not yet received and repeated the appeal of the first letter. A final reminder was sent eight weeks after the original mailing. Return envelopes were included and use was made of the sugar industry internal mailing system to simplify questionnaire return.

A covering letter accompanied the questionnaire and covered aspects such as the rationale for the study, the initial appeal for assistance, the benefits that accrued to respondents, the request for specific action and finally to express gratitude to the respondent for cooperation (see Appendix D). The letter was from the General Manager of CTS (the author of this study) so that the importance of the research was reinforced. Concise instructions were contained at the beginning of the survey questionnaire (see Appendix B).

The above initiatives aimed at achieving a high response rate for the CTS customer survey were successful as reflected in the final response rate of 68% for the 2003 customer survey of all MGBs (see Table 4.3.). The response rate showed a steady improvement from 10% after the first mailing, 25% after the four-week reminder, 49% after the six-week reminder and 68% after the eight-week (final) reminder. As noted later in Section 5.2, the overall response rate increased from 44% for the 1998 CTS customer survey to 68% for the 2003 CTS customer survey. Reasons that contributed to this significant increase in customer response rate are discussed next.

One of the key reasons for the improved response rate can be attributed to the closer working relationship between CTS and MGBs as evidenced by the regular attendance of CTS managers at the monthly MGB meetings across the industry. This allowed CTS managers to remind millers and growers present at the MGB meetings verbally to respond to the survey. In addition, written reminders were sent to all participants at four and six week intervals following the original mailing. A final reminder was sent eight weeks after the original mailing to those MGB members who had not yet responded. No reminders were sent to MGB members during the 1998 CTS customer survey.

Table 4.3: Improvement in CTS Customer Survey Response Rates After Reminders.

MGB	MGB Response Rates (%) After the Various Mailing Reminders			
	First mailing	Four-week reminder	Six-week reminder	Eight-week reminder
Malelane	0	15	39	54
Komati	0	0	28	39
Pongola	0	9	18	55
Umfolozi	15	31	46	62
Felixton	14	36	43	64
Entumeni	23	39	62	69
Amatikulu	14	14	71	86
Darnall	0	43	71	100
Gledhow	28	44	61	72
Noodsberg	0	0	43	86
Maidstone	0	17	58	92
Eston	8	39	62	77
Sezela	15	31	46	77
Umzimkulu	0	22	56	67
Total	10	25	49	68

The CTS questionnaire distributed to respondents in the 2003 study was accompanied by a covering letter that explained the rationale for the study, which was not the case in the 1998 survey. Naumann and Giel (1995) state that the purpose of the cover letter is to induce the respondent to complete the questionnaire and the above authors' recommended best

practices were included in the content of the CTS cover letter. The cover letter content included aspects such as stating the plea for help, what benefits will accrue to the respondent (to ultimately provide a better CTS service), expressed gratitude to the respondent for cooperation, offered assistance in addressing any queries and finally the signature on the covering letter was that of the General Manager of CTS, which reinforced the importance of the survey.

The use of return envelopes and the use of the sugar industry internal mailing system also simplified questionnaire return and further contributed to the improved response rate. The better miller response rate when compared to the grower response rate for both surveys, can be attributed to the closer proximity of the miller customers to CTS operations and easier access to the internal CTS mailing facility. This facilitated easier questionnaire returns and also enabled CTS managers to remind miller customers on a more regular, informal basis. The use of the same 1998 CTS questionnaire in the 2003 survey was a further contributory factor to the improved 2003 response rate as most MGB members would have completed the questionnaire in 1998 and would have been reasonably familiar with the process.

The response rate of 68% achieved by the 2003 CTS customer survey compared favourably with other reported customer survey response rates. Caruana (2002) reported a customer survey response rate of 20.5% for posted questionnaires, which was deemed an acceptable response rate for the type of survey conducted. Sureshchander, Rajendran and Anantharaman (2002) reported a customer response rate of 60% and attributed the high response rate to following a personal-contact approach and periodic follow-ups by telephone and personal visits. McDougall and Levesque (2000) reported a 76.3% customer response

rate, achieved by the use of incentives. The use of incentives, as described by Barsky and Huxley (1992), had an impact on the response rates, with rates of 100%, 29% and 7% being achieved for generous, moderate and no incentives respectively. Further research by Soderlund (1998) reported a response rate of 65% and Danaher and Haddrell (1996) achieved a 17.1% response rate which they described as a low response rate by most survey standards, but which compared favourably with other similar hotel studies with no incentives offered. From the literature surveyed it would appear as though response rates of between 7% and 100% are achieved, depending on the type of study and whether incentives are used or not.

The CTS customer survey did not use any incentives for questionnaire completion and return but nevertheless achieved a high response rate. The improved response rate from the 1998 survey conferred greater reliability in the data obtained from the 2003 survey. It also suggested an improved interest by MGB members in general with the relationship between CTS and MGBs and this can only benefit the ongoing objective of improving the levels of customer satisfaction with CTS's service offering to the MGBs.

4.2.3.2 Scales

There are two broad types of scales used in customer satisfaction surveys: single and multi-item scales (Danaher and Haddrell, 1996). Simple, single-item scales, generally having two to nine points are used to reflect very satisfied' to very dissatisfied' responses, with the main advantage being that they were simple to use. Danaher and Haddrell (1996) identified two flaws with single-item scales in that they cannot provide information on components

and cannot assess various dimensions separately. It was also difficult to assess reliability with a single-item measure.

With multi-item scales respondents are not simply asked to give an overall evaluation of their satisfaction with the service, but are also asked to rate the key components of the service process. The current study used a single-item scale having seven points, as it was important that the survey be as simple as possible. Asking all respondents to identify key components of the service process, would have increased the difficulty level and potentially have reduced the response rate. In any event, key components of the service process were identified through attribute selection and confirmation by internal sources and by external sources through the pilot-testing phase.

A Likert scale was used and consisted of a statement that expressed either a favourable or unfavourable attitude toward the object of interest. The questionnaire is presented in Appendix B. The respondent was asked to agree or disagree with each statement and each response was given a numerical score to reflect its degree of attitudinal favourableness. The scores were totalled to measure the respondent's attitude. Each attribute measured in the survey was scored on a seven point rating scale, indicating the extent of the respondents' agreement with the statements presented. A number of questions were used to elicit levels of satisfaction on each attribute and the results of these were combined for one rating on each attribute. The scoring of negatively phrased statements was reversed to ensure accurate analysis. Based on a one to seven scale, the scores obtained on each attribute can be interpreted as follows:

- Seven: Excellent - the perception of this attribute was extremely positive, respondents were highly satisfied with this aspect.
- Six: Good - the perception of this attribute was good; respondents were satisfied with this aspect.
- Five: Adequate - the perception of this attribute was fair; respondents were barely satisfied with this aspect.
- Four: Neither good nor bad - the perception of this attribute was that it was rarely satisfactory, but could not be described as poor.
- Three to one: Poor to very poor - the perception held about this attribute was unsatisfactory to highly unsatisfactory.

The seven point Likert scale provided an opportunity for greater sensitivity of measurement. For the purposes of the interpretation of the findings of this survey, any score below five was considered as an area of concern. Such areas will be the focus of future strategic planning in respect of both service delivery and the management of customer perceptions in CTS.

4.2.4 Data Analysis

Data analysis was essential in order to determine the attributes driving customer satisfaction. The results were presented as averages determined for:

- Total miller and grower responses per attribute.
- Total miller responses per attribute.
- Total grower responses per attribute.

- Total miller and grower responses per CTS centre, per attribute.
- Miller responses per CTS centre, per attribute.
- Grower responses per CTS centre, per attribute.

The above were compared with the study of 1998 to see if the differences were significant using the Mann-Whitney U test for overall miller and grower comparisons and for miller-only and grower-only specific comparisons. The non-parametric Mann-Whitney U test, used to test differences of the ranks, is the appropriate statistical test to use for two independent samples and ordinal data (Copper and Schindler, 2001). The SPSS v9 computer package was used to conduct the analysis. The statistical methods employed in this study were verified by a statistician.

4.2.5 Reliability

The reliability of a customer satisfaction measurement programme is the extent to which research results would be stable or consistent if the same techniques were used repeatedly. Sampling, questionnaire design, question wording, scaling and measurement all present potential reliability problems (Bless and Higson-Smith, 1995). The above considerations were not changed from the survey of 1998, thus allowing for a comparison with the previous findings, as well as the reliability of the techniques employed.

The techniques used to measure reliability such as test-retest reliability, equivalent forms reliability and split-half reliability were deemed unsuitable for this study. A more detailed method for estimating the internal consistency of an instrument is the item analysis

described by Bless and Higson-Smith (1995). This technique determines how well the responses to each item correspond with the responses to the other items and to the test as a whole. Item analysis was not used to estimate the internal consistency of the CTS survey instrument, but the sixteen attributes that were measured through the thirty-six questions posed over three parts had some questions expressed negatively and some positively. The reliability of the CTS customer satisfaction measurement programme was established primarily through the pilot testing conducted on MGB chairmen.

4.2.6 Validity

Validity is concerned with whether a customer satisfaction measurement programme, or a particular item, really measured what it was supposed to measure. The four most important types of validity are content validity, criterion-related validity, construct validity and face validity.

4.2.6.1 Content Validity

For the current study, as was the case for the 1998 study, CTS management agreed the service attributes to be measured as listed in Appendix A. The attributes were selected as key areas of performance which were highly valued by the millers and growers and contributed significantly towards their levels of satisfaction or dissatisfaction with CTS. This was confirmed by an external source through the pilot test conducted on the fourteen MGB chairmen. The attributes were also areas where CTS was continuously striving towards maximising their performance. The content validity of the questionnaire was

further achieved by the fact that the questions were developed by an expert in the field of customer satisfaction surveys in the sugar industry, Milner-Smyth (2002), a Research Psychologist and the Human Resources Executive for SASA and the author of numerous customer survey reports for the organisation.

4.2.6.2 Construct Validity

The questionnaire was designed to measure the customers' satisfaction levels with CTS. The most important variables that determine the levels of satisfaction were identified and are listed in Appendix A. A number of questions were used to elicit satisfaction levels on each attribute and the results of these were combined to produce one rating on each attribute. Respondents were required to respond to statements that were expressed both positively and negatively. The scoring of negatively phrased statements was reversed to ensure accurate analysis. The attributes were identified according to logical deduction due to the nature of the service CTS provides to the industry i.e. a non-profit laboratory service provider to the sugar industry and were confirmed by external sources.

4.2.6.3 Face Validation

The questionnaire was developed with the needs of the subjects, the MGB members', in mind. The attributes and the language used in the instrument were uncomplicated and the terminology was regularly referred to in industry communications. Further face validation was done by evaluating the questionnaire in a pilot test using the fourteen MGB chairmen. The overall questionnaire was evaluated in the pilot test from the perspective of the

respondent by assessing the cover letter, instructions, scaling and the logical consistency and flow of the instrument.

Criterion-related validation, especially predictive validation, was not deemed to be applicable in this study.

4.3 CONCLUSION

This section presents conclusions on the development of the questionnaire and the response rate achieved for the study.

The critical aspect of the questionnaire development was the selection of appropriate service characteristics that CTS proposed to measure. The use of both CTS management (internal sources) and MGB chairmen via the pilot test (external sources) to generate and verify the service characteristics list, resulted in a service attribute list that was important to both CTS and its customers. The review of the SERVQUAL measurement tool provided further guidance in confirming the service characteristics and establishing service dimension importance rankings. It was concluded that CTS had successfully identified the key service criteria and had developed an effective measurement tool that determined how effectively it delivered its service to customers.

The response rate of 68% for the 2003 CTS customer survey was a significant improvement over the 1998 survey. It was concluded that the use of an effective cover letter together with regular reminders and informal follow-ups with respondents contributed to the

significant improvement in customer response rate. The successful confirmation of the service criteria used in the 1998 study and its subsequent use in the 2003 study was also considered a contributory factor to the high response rate to the 2003 survey.

The current CTS study was a longitudinal study and it was, therefore, important that the questionnaire and the service quality attributes being measured were still deemed to be relevant and important. Having established confidence in the survey instrument and the overall research methodology used in the study, the following chapter presents the research findings and the interpretation of these results.

CHAPTER 5 - RESEARCH FINDINGS

5.1 INTRODUCTION

The overall objective of the research undertaken in this study was to identify the perceived levels of satisfaction with CTS's service and to identify changes since the 1998 study. The findings addressed the research hypothesis that there had been an improvement in MGB members' perceptions of CTS in general when compared to perceptions held in 1998. In addition, the findings also addressed the millers' and growers' levels of satisfaction with the current services provided by CTS. This was achieved by determining the perceptions of MGB members' to specific service criteria that formed part of the service provided by CTS to the MGBs.

The analysed data were reflected as a comparison between the 1998 survey and the 2003 survey and are presented in the following format:

- Total miller and grower responses per attribute.
- Total miller responses per attribute.
- Total grower responses per attribute.
- Total miller and grower responses per CTS centre, per attribute.
- Miller responses per CTS centre, per attribute.
- Grower responses per CTS centre, per attribute.

The 2003 MGB members' response rate to the self-administered questionnaire was first compared to the response rate of the survey conducted in 1998.

5.2 CTS MGB SURVEY RESPONSE RATE

In 1998, a total of one hundred and eighty-one survey questionnaires were distributed to all members of the fourteen MGBs. In 2003, a total of one hundred and sixty-eight questionnaires were distributed to all MGB members. The response rates for the 1998 and 2003 surveys are presented in the Table 5.1.

The analysis of the results in Table 5.1 indicated that there was a significant improvement in the survey response rates between the 1998 and the 2003 surveys. The overall response rate increased from 44% in 1998 to 68% in 2003, with the millers' response rate increasing from 52% to 83% and growers' response rate increasing from 39% to 61%. Twelve of the fourteen centres showed an overall increase in response rate from 1998 to 2003. Millers' showed an increase in response rate at ten of the centres from 1998 to 2003 and growers' an increase at eleven of the centres. In both surveys, millers had a better overall response rate than growers. The reasons for the improved response rate together with comparisons to other studies were discussed in Section 4.2.3.1.

The results obtained from the survey were averaged and the data presented in sections 5.3 to 5.5.

Table 5.1: CTS Customer Survey Response Rate for 1998 and 2003 Surveys.

MGB	Millers' Response %		Growers' Response %		Total Response %	
	1998	2003	1998	2003	1998	2003
Malelane	100	40	100	63	100	54
Komati	45	100	18	21	32	39
Pongola	66	50	71	57	70	55
Umfolozi	50	100	30	44	35	62
Felixton	37	75	22	60	29	64
Entumeni	66	60	44	75	50	69
Amatikulu	50	100	33	80	37	86
Darnall	33	100	80	100	62	100
Gledhow	37	100	33	58	35	72
Noodsberg	20	100	55	75	43	86
Maidstone	100	100	33	88	62	92
Eston	50	100	20	73	31	77
Sezela	50	100	57	67	54	77
Umzimkulu	50	75	22	60	31	67
Total	52	83	39	61	44	68

5.3 RESEARCH RESULTS

The findings addressed the research hypothesis that there had been an improvement in MGB members' perceptions of CTS in general when compared to 1998. Further, the findings also addressed the hypothesis that both millers and growers were satisfied with the current

CTS services. The findings also identified perceived strengths and weaknesses in CTS's service.

The analysed data is presented in tabular format (see Tables 5.2, 5.3, 5.4, 5.6, 5.7 and 5.8) and the computed significance probability (p) value for each comparison is shown. Where the p-value is less than or equal to the level of statistical significance at the 5% level ($\alpha \leq 0.05$), the null hypothesis (Ho), namely, that there is a significant difference in the particular service characteristic between the 1998 survey and the 2003 survey, is not rejected. Each of the sixteen service criteria is presented separately in the following format:

- Comparing perceptions of customer satisfaction with CTS service characteristics for combined millers and growers of all MGBs between the 1998 and 2003 surveys.
- Comparing perceptions of customer satisfaction with CTS service characteristics for growers-only of all MGBs between the 1998 and 2003 surveys.
- Comparing perceptions of customer satisfaction with CTS service characteristics for millers-only of all MGBs between the 1998 and 2003 surveys.
- Comparing perceptions of customer satisfaction with CTS service characteristics for combined miller and grower responses per MGB between the 1998 and 2003 surveys.
- Comparing perceptions of customer satisfaction with CTS service characteristics for miller responses per MGB between the 1998 and 2003 surveys.
- Comparing perceptions of customer satisfaction with CTS service characteristics for grower responses per MGB between the 1998 and 2003 surveys.

The data presented in Section 5.4 focuses on addressing responses for each service characteristic with combined miller and grower responses of all MGBs. This meant that

responses for millers and growers were collated from all MGBs and that the data was not MGB specific but rather reflected the overall MGB response. Specific MGB responses are presented in the section thereafter.

5.4 COMPARING CTS CUSTOMER SATISFACTION LEVELS OF ALL MGBs

This section presents the results for all MGBs of the three customer groupings that were researched, namely, combined millers and growers, growers-only and millers-only.

5.4.1 Comparing CTS Customer Satisfaction Levels for Combined Millers and Growers between the 1998 and 2003 Surveys

Table 5.2 shows that in the 1998 survey there was a total of eighty miller and grower respondents (44% response rate) and the 2003 survey had a total of one hundred and fifteen miller and grower respondents (68% response rate). The characteristics were ranked according to decreasing perceptions of satisfaction as per the 1998 survey with a rank of seven being highly satisfied, and one being highly dissatisfied. From Table 5.2 it can be seen that in 1998, the impartiality and integrity service characteristic had the highest mean value of 5.5050 and continuous improvement was the lowest ranked service characteristic with a mean value of 3.6375.

Table 5.2: Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Impartiality and Integrity	1998	80	5.5050	0.90790	4042.5	-1.444	0.149
	2003	115	5.6904	0.78729			
General Satisfaction	1998	80	5.4375	1.13454	4232.5	-1.033	0.302
	2003	115	5.5304	1.14188			
Handling Queries	1998	80	5.3688	1.11305	4210.0	-1.012	0.312
	2003	115	5.3261	0.77103			
Testing Accuracy Satisfaction	1998	80	5.2250	1.15260	4336.0	-0.699	0.485
	2003	115	5.3609	1.00775			
Testing Frequency Satisfaction	1998	80	5.1750	1.31952	3209.0	-3.924	0.000
	2003	115	5.8435	0.89434			
Cost-Effectiveness	1998	80	5.0050	1.01731	4146.5	-1.173	0.241
	2003	115	4.7791	1.06405			
World-Class	1998	80	4.6875	1.20751	4113.0	-1.298	0.194
	2003	115	4.8870	1.20500			
Customer Satisfaction	1998	80	4.6458	1.03299	3221.5	-3.582	0.000
	2003	115	5.1855	0.78384			
Employee Ability	1998	80	4.5833	1.09532	3652.5	-2.458	0.014
	2003	115	4.9681	1.00387			
Housekeeping	1998	80	4.5125	1.46688	4477.5	-0.323	0.747
	2003	115	4.4957	1.33360			
Recent Improvement	1998	80	4.3000	1.10694	4188.5	-1.099	0.272
	2003	115	4.4870	1.25212			
Technical Competence/Effectiveness	1998	80	3.9500	1.14627	1992.0	-6.965	0.000
	2003	115	5.1652	0.93593			
Monthly Reports	1998	80	3.7625	1.19327	2003.0	-6.864	0.000
	2003	115	5.0783	1.18579			
Provision of Information	1998	80	3.7550	0.96468	1035.5	-9.224	0.000
	2003	115	5.1478	0.54231			
Suitability of Technology	1998	80	3.7125	1.16046	1663.0	-7.783	0.000
	2003	115	5.2087	0.98672			
Continuous Improvement	1998	80	3.6375	0.94459	1396.5	-8.520	0.000
	2003	115	5.0957	0.94566			
Overall	1998	80	4.5789	0.56923	2158.0	-6.300	0.000
	2003	115	5.1406	0.51406			

The combined overall mean score for all service characteristics for both millers and growers showed a significant difference with $p = 0.000 < \alpha = 0.05$. The null hypothesis (*Ho*) is

therefore not rejected. There was a significant increase in the perceived levels of satisfaction with CTS's service from a mean of 4.5789 in 1998 to 5.1406 in 2003 by both miller and grower members of all MGBs. The nature of the difference regarding which specific service characteristics contributed to this overall significant increase in customer satisfaction, is shown in Table 5.2.

Of the eight service characteristics that did not show a significant difference ($p > 0.05$) between the 1998 and 2003 surveys, five of these characteristics namely, general satisfaction, impartiality and integrity, recent improvement, testing accuracy satisfaction, and world-class reflected an increase, though not significant, in customer satisfaction. Three of these characteristics, namely, handling queries, cost effectiveness and housekeeping reflected a decrease, though not significant, in customer satisfaction.

5.4.2 Comparing CTS Customer Satisfaction Levels for Total Growers between the 1998 and 2003 Surveys

Tables 5.1 and 5.3 show that in the 1998 survey there were a total of forty-three grower respondents (39% response rate). The 2003 survey had a total of seventy grower respondents reflecting a 61% response rate. The characteristics were ranked according to decreasing perceptions of satisfaction as per the 1998 survey with a rank of seven being highly satisfied, and one being highly dissatisfied. From Table 5.3 it can be seen that in 1998, the impartiality and integrity service characteristic had the highest mean value of 5.5256 and suitability of technology was the lowest ranked service characteristic with a mean value of 3.6279.

The combined overall mean score for all service characteristics for growers showed a significant difference with $p = 0.000 < = 0.05$. The null hypothesis (*Ho*) is therefore not rejected. There was a significant increase in the perceived levels of satisfaction from a mean of 4.5747 in 1998 to 5.1913 in 2003 by grower members of all MGBs with CTS's service to MGBs. The nature of the difference with regard to which specific service characteristics contributed to this overall significant increase in customer satisfaction is shown in Table 5.3 and described thereafter.

Comparing results of the 1998 and 2003 customer surveys showed that eight of the sixteen service characteristics had p values $< \alpha = 0.05$. The null hypothesis (*Ho*) is therefore not rejected for these service characteristics. There was thus a significant difference in these eight service characteristics between the 1998 survey and the 2003 survey. The eight service characteristics that showed a significant increase in customer perception of satisfaction are listed below in the respective service dimension categories:

- Reliability: employee ability, testing frequency satisfaction.
- Assurance: provision of information, technical competence/effectiveness.
- Responsiveness: continuous improvement.
- Empathy: customer satisfaction, monthly reports.
- Tangibles: suitability of technology.

Each of the five service dimensions reflected an improvement in customer satisfaction for at least one of the service characteristics.

Table 5.3: Comparison of CTS Customer Satisfaction Levels for Total Growers between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Impartiality and Integrity	1998	43	5.5256	1.03097	1346.0	-0.410	0.682
	2003	70	5.6543	0.77715			
General Satisfaction	1998	43	5.3256	1.24825	1317.0	-1.203	0.229
	2003	70	5.5286	1.25942			
Handling Queries	1998	43	5.3081	1.29311	1335.5	-1.008	0.313
	2003	70	5.3071	0.72753			
Cost-Effectiveness	1998	43	5.2140	1.01830	1226.0	-1.657	0.098
	2003	70	4.8771	1.07907			
Testing Accuracy Satisfaction	1998	43	5.1047	1.28433	1395.0	-0.668	0.504
	2003	70	5.3000	1.06458			
Testing Frequency Satisfaction	1998	43	5.0465	1.49529	1009.0	-3.161	0.002
	2003	70	5.9143	0.92850			
World-Class	1998	43	4.8605	1.35544	1441.5	-0.388	0.698
	2003	70	4.9571	1.27899			
Customer Satisfaction	1998	43	4.6279	1.09160	1078.5	-2.540	0.011
	2003	70	5.1714	0.77552			
Employee Ability	1998	43	4.5504	1.17937	1148.5	-2.122	0.034
	2003	70	5.0143	1.06539			
Housekeeping	1998	43	4.4419	1.45246	1381.0	-0.755	0.451
	2003	70	4.7286	1.28448			
Recent Improvement	1998	43	4.3023	1.30082	1344.0	-0.977	0.328
	2003	70	4.5286	1.41136			
Technical Competence/Effectiveness	1998	43	4.0000	1.23443	693.0	-4.953	0.000
	2003	70	5.2286	0.96566			
Provision of Information	1998	43	3.8651	1.02327	391.5	-6.616	0.000
	2003	70	5.2086	0.52024			
Continuous Improvement	1998	43	3.6279	0.90035	429.5	-6.548	0.000
	2003	70	5.1286	0.97685			
Monthly Reports	1998	43	3.7674	1.23128	633.5	-5.276	0.000
	2003	70	5.1857	1.27737			
Suitability of Technology	1998	43	3.6279	1.21544	487.5	-6.156	0.000
	2003	70	5.3286	1.03169			
Overall	1998	43	4.5747	0.62115	709.0	-4.707	0.000
	2003	70	5.1913	0.59847			

Of the eight service characteristics that did not show a significant difference ($p > 0.05$) between the 1998 and 2003 surveys, six of these, namely, general satisfaction, impartiality

and integrity, recent improvement, testing accuracy satisfaction, world-class and housekeeping reflected an increase in customer satisfaction, though not significant. Two of these characteristics, namely, cost effectiveness and handling queries reflected a decrease, though not significant, in customer satisfaction.

5.4.3 Comparing CTS Customer Satisfaction Levels for Total Millers between the 1998 and 2003 Surveys

Tables 5.1 and 5.4 show that in the 1998 survey there were a total of thirty-seven miller respondents (52% response rate) and the 2003 survey had a total of forty-five miller respondents (83% response rate). The characteristics were ranked according to decreasing perceptions of satisfaction with a rank of seven being highly satisfied, and one being highly dissatisfied. From Table 5.4 it can be seen that in 1998, the general satisfaction service characteristic had the highest mean value of 5.5676 and provision of information was the lowest ranked service characteristic with a mean value of 3.6270.

The combined overall mean score for all service characteristics for millers showed a significant difference with $p = 0.000 < \alpha = 0.05$. The null hypothesis (*Ho*) is therefore not rejected. There was a significant increase in the perceived levels of satisfaction from a mean of 4.5838 in 1998 to 5.0616 in 2003 by miller members of all MGBs with CTS's service to MGBs. The nature of the difference with regard to which specific service characteristics contributed to this overall significant increase in customer satisfaction is shown in Table 5.4 and described thereafter.

Table 5.4: Comparison of CTS Customer Satisfaction Levels for Total Millers between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
General Satisfaction	1998	37	5.5676	0.98715	821.5	-0.113	0.910
	2003	45	5.5333	0.94388			
Impartiality and Integrity	1998	37	5.4811	0.75345	630.5	-1.892	0.059
	2003	45	5.7467	0.80837			
Handling Queries	1998	37	5.4392	0.87083	797.5	-0.329	0.743
	2003	45	5.3556	0.84189			
Testing Accuracy Satisfaction	1998	37	5.3649	0.97645	773.5	-0.564	0.573
	2003	45	5.4556	0.91591			
Testing Frequency Satisfaction	1998	37	5.3243	1.08151	634.5	-2.073	0.038
	2003	45	5.7333	0.83666			
Cost-Effectiveness	1998	37	4.7622	0.97392	798.5	-0.318	0.750
	2003	45	4.6267	1.03362			
Customer Satisfaction	1998	37	4.6667	0.97500	554.0	-2.624	0.009
	2003	45	5.2074	0.80494			
Employee Ability	1998	37	4.6216	1.00358	707.0	-1.178	0.239
	2003	45	4.8963	0.90683			
Housekeeping	1998	37	4.5946	1.49925	678.0	-1.476	0.140
	2003	45	4.1333	1.34164			
World-Class	1998	37	4.4865	0.98943	689.5	-1.412	0.158
	2003	45	4.7778	1.08479			
Recent Improvement	1998	37	4.2973	0.84541	800.0	-0.323	0.747
	2003	45	4.4222	0.96505			
Technical Competence/Effectiveness	1998	37	3.8919	1.04838	335.5	-4.849	0.000
	2003	45	5.0667	0.88933			
Suitability of Technology	1998	37	3.8108	1.10146	344.5	-4.714	0.000
	2003	45	5.0222	0.89160			
Monthly Reports	1998	37	3.7568	1.16441	377.0	-4.365	0.000
	2003	45	4.9111	1.01852			
Continuous Improvement	1998	37	3.6486	1.00599	272.5	-5.394	0.000
	2003	45	5.0444	0.90342			
Provision of Information	1998	37	3.6270	0.88840	154.5	-6.340	0.000
	2003	45	5.0533	0.56793			
Overall	1998	37	4.5838	0.51075	390.5	-4.119	0.000
	2003	45	5.0616	0.45136			

Comparing results of the 1998 and 2003 customer surveys showed that seven of the sixteen service characteristics had p values $< \alpha = 0.05$. The null hypothesis (Ho) is therefore not

rejected for these service characteristics. There was a significant difference in the seven service characteristics between the 1998 survey and the 2003 survey. The seven service characteristics that showed a significant increase in customer perception of satisfaction are listed below in the respective service dimension categories:

- Reliability: testing frequency satisfaction.
- Assurance: provision of information, technical competence/effectiveness.
- Responsiveness: continuous improvement.
- Empathy: customer satisfaction, monthly reports.
- Tangibles: suitability of technology.

Each of the five service dimensions reflected an improvement in customer satisfaction for at least one of the service characteristics.

Of the nine service characteristics that did not show a significant difference ($p > 0.05$) between the 1998 and 2003 surveys, five of these characteristics, namely, impartiality and integrity, employee ability, recent improvement, testing accuracy satisfaction and world-class reflected an increase, though not significant, in customer satisfaction. Four of these characteristics, namely, general satisfaction, cost effectiveness, housekeeping and handling queries reflected a decrease, though not significant, in customer satisfaction.

5.4.4 Conclusion for all MGBs

Presenting the data in the format that showed the comparison between the 1998 and 2003 levels of customer satisfaction of the combined millers and growers, of growers and finally of millers specifically for all MGBs, allowed useful conclusions to be drawn about the

change in perceptions that MGBs had in general about CTS. The results showed that for the combined millers and growers, total millers and total growers groupings, there were significant increases in customer satisfaction levels with CTS service delivery. The combined miller and grower and total grower-only groupings reflected a significant increase in eight service characteristics, whilst the total miller-only grouping showed a significant increase in seven of the service characteristics.

The next section presents the data on a MGB-specific basis for the comparisons between the 1998 and 2003 surveys. The data on perceptions of customer satisfaction with CTS service characteristics for the combined millers and growers responses for each MGB, grower responses only and finally miller responses only for each MGB is presented.

5.5 Comparing CTS Customer Satisfaction Levels for Specific MGBs between the 1998 and 2003 Surveys

In order to implement and monitor new strategies at each of the MGBs effectively, it was important that the analysis of customer survey responses be detailed for individual MGBs as well. This section presents customer survey responses for each CTS service characteristic for total miller and grower responses for each of the fourteen MGBs. The miller-only and grower-only responses for each CTS service characteristic are also shown individually for each MGB. The data is presented in a summarised, tabular format with the detailed data shown in Appendices E1 to E14 for combined miller and grower responses, and Appendices F1 to F14 for miller-only and grower-only responses. Table 5.5 defines the symbols used

for summarised MGB-specific data shown in Table 5.6 (for combined miller and grower), Table 5.7 (for growers-only) and Table 5.8 (for millers-only).

Table 5.5: Description of Symbols Used in Tables 5.6, 5.7 and 5.8.

Symbol	Description
↑↑	The *p* value is $\leq \alpha = 0.05$ and the null hypothesis (*Ho*) is therefore not rejected for this service characteristic. There was a significant increase for this service characteristic between the 1998 survey and the 2003 survey for the specific MGB.
↑	The *p* value is $> \alpha = 0.05$ and the null hypothesis (*Ho*) is therefore rejected for this service characteristic. There was a non-significant increase for this service characteristic between the 1998 survey and the 2003 survey for the specific MGB.
↓↓	The *p* value is $\leq \alpha = 0.05$ and the null hypothesis (*Ho*) is therefore not rejected for this service characteristic. There was a significant decrease for this service characteristic between the 1998 survey and the 2003 survey for the specific MGB.
↓	The *p* value is $> \alpha = 0.05$ and the null hypothesis (*Ho*) is therefore rejected for this service characteristic. There was a non-significant decrease for this service characteristic between the 1998 survey and the 2003 survey for the specific MGB.
→	The *p* value $= 1.00$ and the null hypothesis (*Ho*) is therefore rejected for this service characteristic. There was no difference for this service characteristic between the 1998 survey and the 2003 survey for the specific MGB.

5.5.1 Comparing CTS Customer Satisfaction Levels for Combined Miller and Grower Responses per MGB between the 1998 and 2003 Surveys

Table 5.2 in Section 5.4.1 showed that the combined overall mean score for all service characteristics for both millers and growers reflected a significant difference with $p = 0.000 < \alpha = 0.05$. There was thus a significant increase in the perceived levels of satisfaction with CTS's service from 1998 to 2003 by both miller and grower members of all MGBs. The nature of the difference with regard to which specific MGBs contributed to the overall significant increase in customer satisfaction is now described.

Table 5.6 presents the analysed data in a summarised, tabular format for the total miller and grower perceptions for each of the sixteen CTS service characteristics for each MGB. The research findings showed that eight of the fourteen MGBs (total miller and grower responses) had a significant increase in the overall levels of satisfaction with CTS's service and four MGBs (total miller and grower responses) reflected an increase, though not significant, in customer satisfaction. One MGB showed a significant decrease in the overall level of satisfaction with CTS's service and one MGB reflected a decrease, though not significant, in customer satisfaction.

The maximum MGB responses equals two hundred and twenty-four (fourteen MGBs multiplied by sixteen service characteristics) and of this, 65 (or 29%) showed a significant increase, 98 (or 44%) showed a non-significant increase, 11 (or 5%) showed a significant decrease and 50 (or 22%) showed a non-significant decrease in customer satisfaction.

Table 5.6: Summary of Comparisons of CTS Customer Satisfaction Levels by Total Growers and Millers per MGB between the 1998 and 2003 Surveys.

Characteristic *	AK	DL	EN	ES	FX	GH	KM	ML	MS	NB	PG	SZ	UF	UK
General Satisfaction	↑↑	↓	↓	↓	↑↑	↑↑	↑	↓	↑	↑↑	↓↓	↑	↑	↑
Impartiality and Integrity	↑	↓	↓	↓	↑	↑	↑	↓↓	↑↑	↑	↓	↑	↑	↑
Employee Ability	↑	↓	↑	↑	↑	↑	↑	↓	↑	↑↑	↓	↑	↑↑	↓
Cost-Effectiveness	↑	↓↓	↓	↑	↑	↑	↓	↓	↑	↓	↓	↓	↓	↓
Customer Satisfaction	↑	↓↓	↑	↑	↑↑	↑↑	↑	↓	↑	↑	↑	↑	↑↑	↑
Recent Improvement	↑	↓	↓	↑	↑	↑	↓	↓	↑	↑↑	↓	↑	↑	↑
Continuous Improvement	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑
Testing Accuracy Satisfaction	↑↑	↓	↓	↓↓	↑	↑	↑	↓	↑	↑↑	↓↓	↑	↑	↑
Testing Frequency Satisfaction	↑↑	↓	↓	↓	↑	↑	↑	↑	↑↑	↑↑	↓↓	↑↑	↑↑	↓
Provision of Information	↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑	↑	↑↑	↑	↑↑
Technical Competence/ Effectiveness	↑↑	↑↑	↑	↑↑	↑↑	↑↑	↑	↑↑	↑↑	↑↑	↓	↑	↑↑	↑
Suitability of Technology	↑	↑	↑↑	↑	↑	↑	↑↑	↑↑	↑↑	↑↑	↑	↑	↑	↑
World-Class	↑↑	↓	↓	↑	↑	↑	↑	↓	↑	↑	↓	↑	↑	↑
Housekeeping	↑↑	↓	↑	↓	↑	↑↑	↓	↓	↑	↑	↓↓	↓	↓	↓
Monthly Reports	↑↑	↑↑	↑↑	↑	↓	↑↑	↑	↑↑	↑↑	↑	↑	↑↑	↑	↑
Handling Queries	↑↑	↓	↓	↓	↑	↑↑	↑	↓↓	↓↓	↑	↓↓	↑	↑	↓
Overall	↑↑	↓	↑	↑	↑↑	↑↑	↑↑	↑	↑↑	↑↑	↓↓	↑↑	↑↑	↑
No. of Significant Increase	9	4	4	3	5	8	3	4	7	8	0	4	5	1
No. of Non-Significant Increase	7	1	4	7	10	8	10	2	8	7	5	10	9	10
No. of Significant Decrease	0	2	0	1	0	0	0	2	1	0	5	0	0	0
No. of Non-Significant Decrease	0	9	8	5	1	0	3	8	0	1	6	2	2	5

* See Appendix G (List of Abbreviations) for full MGB name.

5.5.2 Comparing CTS Customer Satisfaction Levels for Growers-Only per MGB between the 1998 and 2003 Surveys

Table 5.3 in Section 5.4.2 showed that the combined overall mean score for all service characteristics for growers-only reflected a significant difference with $p = 0.000 < \alpha = 0.05$. There was, thus, a significant increase in the perceived levels of satisfaction from 1998 to 2003 by grower members of all MGBs with CTS's service to MGBs. The nature of the difference with regard to which specific MGBs contributed to the overall significant increase in customer satisfaction is now described.

Table 5.7 presents the analysed data in a summarised, tabular format for the total grower perceptions for each of the sixteen CTS service characteristics for each MGB. The research findings showed that four of the fourteen MGBs (grower-only responses) had a significant increase in the overall levels of satisfaction with CTS's service, and seven MGBs (grower-only responses) reflected an increase, though not significant, in customer satisfaction. One MGB showed a significant decrease in the overall level of satisfaction with CTS's service, and two MGBs reflected a decrease, though not significant, in customer satisfaction.

The maximum MGB responses equals two hundred and twenty-four and of this, 30 (or 13%) showed a significant increase, 127 (or 57%) showed a non-significant increase, 6 (or 3%) showed a significant decrease, 57 (or 25%) showed a non-significant decrease and 4 (or 2%) showed no change in customer satisfaction.

Table 5.7: Summary of Comparisons of CTS Customer Satisfaction Levels by Growers-Only per MGB between the 1998 and 2003 Surveys.

Characteristic *	AK	DL	EN	ES	FX	GH	KM	ML	MS	NB	PG	SZ	UF	UK
General Satisfaction	↑↑	↓	↓	↓	↑↑	↑	↑	↓	↑	↑	↓↓	↓	↑	↓
Impartiality and Integrity	↑	↓	↓	↓	↑	↑	↑	↓	↓	↑	↓	↑	↑↑	↑
Employee Ability	↑	↓	↓	↓	↑	↑	↓	↓	↑	↑	↓	↑	↑↑	↑
Cost-Effectiveness	↑	↓↓	↓	↓	↑	↑	↓	↓	↑	↓	↓	↑	↑	↑
Customer Satisfaction	↑	↓	↑	↑	↑	↑↑	↑	↓	↑	↑	↑	↑	↑↑	↑
Recent Improvement	↑	↓	↓	↓	↑	↑	↓	↓	↑	↑	↓	↑	↑	↓
Continuous Improvement	↑	↑↑	↑	↑↑	↑	↑	↑	↑	↑	↑↑	↑	↑	↑↑	↑↑
Testing Accuracy Satisfaction	↑↑	↓	↓	↓	↑	↑	↑	↓	↑	↑	↓↓	↑	↑	↑
Testing Frequency Satisfaction	↑	→	↓	↓	↑	→	↑	↑	↑	↑↑	↓	↑↑	↑↑	↓
Provision of Information	↑	↑↑	↑	↑	↑	↑↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑
Technical Competence/ Effectiveness	↑↑	↑↑	↑	↑	↑	↑↑	↓	↑	↑↑	↑	↓	↑	↑↑	↑
Suitability of Technology	↑	↑	↑	↑	↑	↑	↑	↑↑	↑	↑	↑	↑	↑↑	↑
World-Class	↑	↓	↓	↑	↑	↑	→	↓	↑	↑	↓	↑	↓	↑
Housekeeping	↑	↓	↑	↓	↑	↑	↓	↑	↑	↑	↓↓	↓	↑	↑
Monthly Reports	↑↑	↑↑	↑↑	↑	→	↑	↑	↑↑	↑	↑	↑	↑	↑	↑
Handling Queries	↑	↓	↓	↓	↑	↑	↑	↓↓	↓	↑	↓↓	↑	↑	↓
Overall	↑	↓	↑	↑	↑	↑↑	↑	↓	↑	↑↑	↓↓	↑↑	↑↑	↑
No. of Significant Increase	4	4	1	1	1	3	0	3	2	2	0	1	7	1
No. of Non-Significant Increase	12	1	6	6	14	12	10	4	12	13	5	13	8	11
No. of Significant Decrease	0	1	0	0	0	0	0	1	0	0	4	0	0	0
No. of Non-Significant Decrease	0	9	9	9	0	0	5	8	2	1	7	2	1	4
No Change	0	1	0	0	1	1	1	0	0	0	0	0	0	0

* See Appendix G (List of Abbreviations) for full MGB name.

5.5.3 Comparing CTS Customer Satisfaction Levels for Millers-Only per MGB between the 1998 and 2003 Surveys

Table 5.4 in Section 5.4.3 showed that the combined overall mean score for all service characteristics for millers-only reflected a significant difference with $p = 0.000 < \alpha = 0.05$. There was a significant increase in the perceived levels of satisfaction from 1998 to 2003 by miller members of all MGBs with CTS's service to MGBs. The nature of the difference with regard to which specific MGBs contributed to the overall significant increase in customer satisfaction is now described.

Table 5.8 presents the analysed data in a summarised, tabular format for the total miller perceptions for each of the sixteen CTS service characteristics for each MGB. The research findings showed that four of the fourteen MGBs (miller-only responses) had a significant increase in the overall levels of satisfaction with CTS's service and seven MGBs (miller-only responses) reflected an increase, though not significant, in customer satisfaction. None of the MGBs showed a significant decrease in the overall level of satisfaction with CTS's service and three MGBs reflected a decrease, though not significant, in customer satisfaction.

The maximum MGB responses equals two hundred and twenty-four and of this, 16 (or 7%) showed a significant increase, 137 (or 61%) showed a non-significant increase, 2 (or 1%) showed a significant decrease, 60 (or 27%) showed a non-significant decrease and 9 (or 4%) showed no change in customer satisfaction.

Table 5.8: Summary of Comparisons of CTS Customer Satisfaction Levels by Millers-Only per MGB between the 1998 and 2003 Surveys.

Characteristic *	AK	DL	EN	ES	FX	GH	KM	ML	MS	NB	PG	SZ	UF	UK
General Satisfaction	↑	↓	↓	↓	↑	↑	↑	↓	↑	↑	↓	↑	↑	↓
Impartiality and Integrity	↑	↓	↓	→	↑	↑	↑	↓	↑↑	↑	↓	↓	↑	↑
Employee Ability	↑	↓	↑	→	↑	↑	↑	↓	↑	↑	↓	→	↑	↓
Cost-Effectiveness	↑	↓	↓	↑	↑	↑	↓	↓	↑	↓	↓	↓	↓	↓
Customer Satisfaction	↑	↓	↑	↑	↑	↑↑	↑↑	↓↓	↑	↑	↓	↑	↑	↑
Recent Improvement	↑	↓	↑	↓	↑	↑	↓	↓	↑	↑	↓	↑	↑	↑
Continuous Improvement	↑	↑	↑	↑	↑↑	↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Testing Accuracy Satisfaction	↑	↓	↓	↓	↑	↑	↑↑	↓	↑	↑	↓	↑	↑	↑
Testing Frequency Satisfaction	↑	↑	↓↓	↑	↑	↑	↑	↑	↑	↑	↓	↑	→	↓
Provision of Information	↑	↑	↑	↑	↑↑	↑↑	↑↑	↑	↑↑	↑	↑	↑	↑	↑
Technical Competence/ Effectiveness	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↓	↑↑	↑	↑
Suitability of Technology	↑	↑	↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↑	↓	↑
World-Class	↑	↓	↓	→	↑	↑	↑	↓	↑	↑	↓	↑	↑	↑
Housekeeping	↑	↓	→	↓	↓	↑	↓	↓	↑	↑	↓	→	↓	↓
Monthly Reports	↑	↑↑	↑	↑	→	↑↑	↑	↑	↑	→	↑	↑	↑	↑
Handling Queries	↑	↓	↓	↓	↑	↑↑	↑↑	↓	↓	↑	↓	↓	↑	↓
Overall	↑	↓	↑	↑	↑↑	↑↑	↑↑	↓	↑↑	↑	↓	↑	↑	↑
No. of Significant Increase	0	1	0	0	2	5	5	0	2	0	0	1	0	0
No. of Non-Significant Increase	16	5	8	8	12	11	8	6	13	14	4	10	12	10
No. of Significant Decrease	0	0	1	0	0	0	0	1	0	0	0	0	0	0
No. of Non-Significant Decrease	0	10	6	5	1	0	3	9	1	1	12	3	3	6
No Change	0	0	1	3	1	0	0	0	0	1	0	2	1	0

* See Appendix G (List of Abbreviations) for full MGB name.

5.5.4 Conclusion for Specific MGBs

The results collected from responses of the MGB members were presented in tabular format and showed the overall miller and grower results for specific MGBs. The results were also separated for millers and growers and this approach permitted a more detailed analysis. The results showed that twelve of the MGBs had increased levels of customer satisfaction with CTS service delivery, with both millers and growers showing a similar increased trend. The majority of service characteristics surveyed also reflected an improved level of customer satisfaction. The separation of results for specific MGBs will assist in formulating MGB-specific strategies to improve CTS service delivery.

The overall conclusion for the results presented in Chapter 5 will be discussed in the next section.

5.6 CONCLUSION

This chapter includes the overall presentation and interpretation of results on customer satisfaction levels of total MGB members, growers-only, and millers-only as well as for specific MGBs

The perceptions of customer satisfaction with CTS service characteristics for total millers and growers of all MGBs between the 1998 and 2003 surveys showed a statistically significant increase with $p = 0.000 < \alpha = 0.05$. The perceived levels of satisfaction increased from a mean score of 4.5789 in 1998 to 5.1406 in 2003. This meant that following

the 1998 CTS customer survey, the overall perceived level of total MGB members' satisfaction with CTS's service was below five and thus a cause for concern for CTS management. In order to address this concern and to improve perceived levels of satisfaction with CTS's service, specific service characteristics were targeted and were the focus of strategic planning in respect of both service delivery and the management of customer perceptions. The service characteristics that were targeted and that would make the largest contribution to improving the overall levels of perceived customer satisfaction were those that received a rank of less than five in the 1998 CTS customer survey.

Of the ten service characteristics that had a mean score of less than five in 1998, six showed an improvement to a mean score above five. Of the four that did not achieve a mean score above five, three showed an increase in mean score (one of which was a significant increase), whilst the one service characteristic showed a non-significant decrease in mean score. It can be concluded that the strategies developed and implemented for the ten service characteristics to improve their ranking were successful. The individual service characteristics improvement had contributed significantly to the improved overall mean score from below five (4.5789) to a mean score above five (5.1406) which meant that the null hypothesis is not rejected. There was, thus, a significant improvement in the 2003 total MGB members' perceptions of CTS in general.

It must be noted, that of the six characteristics that had a mean score above five in 1998, four showed improvements in mean scores (one significant increase) and two showed non-significant decreases in mean scores. It can be concluded that these four service characteristics had also improved from the strategies developed and implemented.

The combined overall mean score for all service characteristics for growers-only from all MGBs showed a statistically significant increase with $p = 0.000 < \alpha = 0.05$. The perceived levels of satisfaction increased from a mean score of 4.5747 in 1998 to 5.1913 in 2003. This meant that following the 1998 CTS customer survey, the overall perceived level of growers-only satisfaction with CTS's service was below five, and thus a cause for concern for CTS management.

For the growers-only surveys results for all MGBs, the same ten service characteristics as were noted for combined millers and growers, had a mean score below five. Of the ten service characteristics that had a mean score of less than five in 1998, seven showed an improvement to a mean score above five. The three characteristics that did not achieve a mean score above five, all three still showed an increase in mean score. It can be concluded that the strategies developed and implemented for the ten service characteristics to improve their ranking were successful for growers specifically. The improvement of individual service characteristics mean scores had significantly contributed to the improved growers mean score from below five (4.5747) to a mean score above five (5.1913) which meant that the null hypothesis is not rejected. There was, thus, a significant improvement in the 2003 grower MGB members' perceptions of CTS in general.

The combined overall mean score for all service characteristics for millers from all MGBs showed a statistically significant increase with $p = 0.000 < \alpha = 0.05$. The perceived levels of satisfaction increased from a mean score of 4.5838 in 1998 to 5.0616 in 2003. This meant that following the 1998 CTS customer survey, the overall perceived level of millers-only satisfaction with CTS's service was below five and thus a cause for concern for CTS management.

For the millers-only survey results for all MGBs, in addition to the ten service characteristics that were noted for combined millers and growers, cost effectiveness also had a mean score below five. Of the eleven service characteristics that had a mean score of less than five in 1998, five showed an improvement to a mean score above five. Of the six that did not achieve a mean score above five, four showed an increase in mean score (one of which was a significant increase) and two reflected a decrease in mean score. It can be concluded that the strategies developed and implemented to improve customer satisfaction levels were successful for millers specifically. The improvement of individual service characteristics had contributed significantly to the improved millers mean score from below five (4.5838) to a mean score above five (5.0616) which meant that the null hypothesis is not rejected. There was, thus, a significant improvement in the 2003 miller MGB members' perceptions of CTS in general when compared to 1998.

Completing the analysis on a MGB-specific level, provided data that established the effectiveness of the strategy implementation at a specific MGB. Separating the analysis for millers and growers, also provided a more specific analysis per MGB.

From the results presented it was noted that for both millers and growers separately, and for millers and growers combined, the majority of MGBs (twelve out of fourteen) had shown an improvement in customer satisfaction levels. The assessment of individual service characteristics showed that across all MGBs and for all customer groupings, an average of 65% of service characteristics (one hundred and fifty-eight out of two hundred and forty-four characteristics) had reflected an increase (either significant or non-significant) in customer satisfaction levels. An average of 25% of service characteristics (twenty four out

of two hundred and forty-four) had reflected a decrease (either significant or non-significant) in customer satisfaction levels with the balance reflecting no change. The benefit of reflecting MGB-specific data for each service characteristic becomes apparent to identify poorly performing areas needing focussed attention.

For millers and growers combined, three MGBs (Darnall, Entumeni and Noodsberg) still had 2003 overall mean scores below five. For grower MGB members separately, only Entumeni had a 2003 mean score below five and for miller MGB members, four MGBs (Darnall, Entumeni, Felixton and Malelane) had 2003 mean scores below five. Of concern was that Entumeni, and to a lesser extent Darnall, seemed to be consistently underachieving in terms of customer levels of satisfaction across the different customer groupings. CTS is now in a position to identify the successful and deficient strategies, or ineffective implementation of strategies, and to focus on poorly performing CTS centres and on specific service characteristics.

The conclusions and recommendations of this study are presented in the following chapter.

CHAPTER 6 - CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

In order to maintain a competitive market position, CTS has to determine, on a regular basis, the levels of CTS customer satisfaction. Following the CTS customer survey in 1998, customers were re-surveyed in 2003 to determine current levels of CTS customer satisfaction. The overall objective of the survey was to identify levels of satisfaction with CTS's service and identify changes since the 1998 survey. Sub-objectives included establishing MGB members' levels of customer satisfaction compared to the 1998 survey, as well as the millers' and growers' levels of satisfaction with current services provided by CTS. The contribution of individual MGBs to the overall levels of customer satisfaction will be determined as well.

The data analysis presented in Chapter 5 will be discussed in relation to the objectives and hypotheses of the study as summarised above. Conclusions will be made and recommendations proposed, to improve both future CTS customer research and to improve implementation and monitoring of customer satisfaction strategies by CTS. Finally, recommendations for future research will be presented.

6.2 CONCLUSION OF RESEARCH FINDINGS

The overall objective of this study was to identify the perceived levels of satisfaction with CTS's service and to identify changes since the 1998 study. In establishing whether this objective was successfully achieved, the first sub-objective was to establish MGB members'

perceptions of CTS in general and to compare this to perceptions held in 1998. The evaluation of the data confirmed that the null hypothesis is not rejected and that there was a significant improvement in MGB members' perceptions of CTS in general. The significant increase in perceived levels of overall satisfaction confirms that there has been an improvement with combined millers and growers perceptions of current services provided by CTS.

The second sub-objective of this study was to determine the millers' level of satisfaction with current services provided by CTS. The evaluation of data confirms that the null hypothesis is not rejected and that there was a significant improvement in miller members' (of all MGBs) levels of satisfaction with current services provided by CTS. The significant increase in perceived levels of overall satisfaction confirms that millers are satisfied with current services provided by CTS.

The third sub-objective of this study was to determine growers' level of satisfaction with current services provided by CTS. The evaluation of data confirms that the null hypothesis is not rejected and that there was a significant improvement in grower members' (of all MGBs) levels of satisfaction with current services provided by CTS. The significant increase in perceived levels of overall satisfaction confirms that growers are satisfied with current services provided by CTS.

The 1998 customer survey identified areas of weakness in CTS's service delivery to its customers. Sub-objective four in Section 4.2 was included to consider whether the weaknesses were actual or perceived. It can be concluded that the weaknesses identified in

1998 were actual weaknesses. This conclusion is motivated following the improvement of customers' perceptions of satisfaction in 2003 after service improvement strategies were implemented across CTS. The service improvement strategies focussed on addressing actual weaknesses in CTS service delivery and these strategies were successful in improving overall miller and grower perceptions of satisfaction with CTS service levels.

Gerson (1993) views customer satisfaction as whenever a customer's needs, real or perceived, are met or exceeded. The above section concludes that actual needs (weaknesses) were addressed following the 1998 survey, and by Gerson's definition, the CTS customer's actual needs were satisfactorily addressed which resulted in improved levels of CTS customer satisfaction. This study is, therefore, in agreement with the finding of Gerson (1993) that by meeting or exceeding customer needs, customer satisfaction is attained.

The results of the current longitudinal study of CTS customer satisfaction are in disagreement with the research of Boulding, Kalra and Staelin (1999) and Mazursky and Geva (1989). Both these studies contend that previous performance is assessed against rising expectations and, therefore, customer satisfaction reduces over time. The levels of CTS customers' perception of satisfaction show an improvement from 1998 to 2003 and this is in contrast to the previous research findings. A possible reason for this disagreement can be found in the research of Sheth, Mittal and Newman (1999). These researchers found that prior experience with a particular service is one of the key factors that shapes customer perceptions. Due to the long-standing relationship between CTS and its customers, customer perceptions about CTS service quality were positively influenced by the CTS

customer enhancement initiatives. This is, however, still dependent on CTS successfully identifying customer needs. The current study successfully identified the key service quality criteria by both internal and external sources.

Whilst Parasuraman, Zeithaml and Berry (1985) indicate that only by assessing expectations as well as perceptions can service quality gaps be identified, the CTS study followed the Cronin and Taylor (1994) and Teas (1993) definition of customer satisfaction, that customer satisfaction depends primarily on customer's perception of service. The 2003 CTS study measured the improvement of customer perceptions of satisfaction with specific CTS service characteristics. A later study by Parasuraman, Zeithaml and Berry (1994) indicates that perception alone might be a better predictor of satisfaction but provides less understanding of the underlying causes. The 2003 CTS study successfully used the approach of measuring differences in customer perceptions by using the 1998 levels of customer satisfaction as the baseline for the 2003 study. A better understanding of the underlying causes of levels of satisfaction with CTS is not a concern because the service criteria being measured are well understood and were verified using both CTS customers and CTS management.

Those individual service characteristics that did not show the desired level of improvement need closer scrutiny. The lack of improvement is attributed to the poor, or ineffective, implementation of service improvement strategies. If there are weaknesses that are perhaps considered as perceived rather than actual, the reason for them being perceived as poor would be the poor communication by CTS to its customers. However, as a laboratory service provider, the provision of data and other information is a core competence for CTS

and therefore, the poor communication by CTS to its customers would be considered an actual weakness.

6.3 RECOMMENDATIONS

The deregulated market environment in which CTS operates necessitates that CTS track and understand the satisfaction levels of its customers. By achieving continuous improvement in customer satisfaction levels, CTS would be able to turn as many customers as possible into true, long-term, loyal customers. The lack of an effective monitoring system to continuously monitor the implementation of service improvement strategies across CTS has resulted in some CTS centres implementing strategies effectively and some less effectively. The assessment of effective strategy implementation could be measured only through the completion of the 2003 customer survey. No other more immediate type review mechanism is used to monitor the effectiveness of strategy implementation. Some CTS centres showed a significant improvement in perceptions of customer satisfaction whilst others showed a significant decrease for the same service characteristic.

It is recommended that a management tool be used to monitor effective strategy implementation across all the CTS centres. In particular, the Balanced Scorecard is recommended as a suitable management tool that CTS should consider implementing. The Balanced Scorecard (Kaplan and Norton, 1992) concept acknowledges the expectations of different stakeholders and relates an assessment of performance to choice of strategy. More importantly, performance is linked, not only to short-term outputs, but also to the way in which strategy implementation processes are managed.

The second CTS customer survey was conducted five years after the first survey. In a competitive market environment, CTS must be more responsive to changing customer needs and changing industry circumstances. Strategies developed and implemented may no longer be appropriate or the service improvement initiatives may no longer be effective. The majority of service improvement strategies developed and implemented after the 1998 customer survey would have shown benefits or lack thereof after one year. It is, therefore, recommended that a CTS customer survey be conducted every three years, together with regular monitoring of strategy implementation by the Balanced Scorecard tool. It is only through more regular surveys that CTS customer service trends and patterns will become apparent. This is clear following the completion of the current CTS study where customer satisfaction levels improved following targeted customer improvement initiatives. It is strongly recommended that ongoing customer research be undertaken by CTS to achieve customer driven improvement continuously and to maintain the link between customer satisfaction measurement and internal business process systems.

6.4 FUTURE RESEARCH

As discussed previously, CTS still operates in a monopolistic market environment. The customers of CTS therefore, have no benchmark against which to compare CTS. It was for this reason that, instead of measuring the difference in the gap between expectation (ideal service provider) and perception (service provider being studied), this study measured customer satisfaction on selected CTS service characteristics. It is recommended that CTS carry out benchmarking exercises on other analytical laboratory service providers such as those of the South African Bureau of Standards. Whilst not part of the sugar industry,

benchmarking against other similar service providers from other industries would assist CTS in refining its service characteristics and comparing its rankings on similar service characteristics. Future research into CTS customer satisfaction can therefore, consider a gap analysis between customer expectations and perceptions by using the modified SERVQUAL questionnaire. The concerns about the use of the SERVQUAL instrument as recorded in Section 3.2.8 should, however, be noted. Using the SERVQUAL questionnaire will enable CTS to compare results with other SERVQUAL studies and assist in benchmarking CTS's service offering against other service industries.

A quantitative study such as the current study provides critical feedback from customers and helps CTS to improve its customer satisfaction levels continuously. The use of the pilot test on selected customers was found to be useful in gaining important customer feedback from key customers. It is recommended that this type of qualitative research be continued and that a CTS customer focus group be selected and used on an annual basis to obtain input and feedback from selected customers. This focus group approach would be useful for those CTS centres where the quantitative results of this study indicates certain shortcomings for specific service characteristics. As proposed by Naumann and Giel (1995), focus group discussions can be used for understanding the basis of the quantitative findings and are also a useful source of ideas for improving CTS service delivery.

The completion of the longitudinal study of customer perceptions of satisfaction with CTS service levels has shown that there was a significant improvement in overall customer satisfaction levels. With continuously improving customer satisfaction and loyalty levels, CTS can face the future market challenges with growing confidence.

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APPENDIX A

CTS SERVICE CHARACTERISTICS

1. GENERAL SATISFACTION

The extent to which the Mill Group Board are satisfied with the performance of the Cane Testing Service.

2. IMPARTIALITY AND INTEGRITY

The extent to which the Cane Testing Service can be relied upon to act at all times with integrity and impartiality.

3. EMPLOYEE ABILITY

The extent to which the Cane Testing Service is perceived to be staffed by suitably competent and experienced employees who are motivated and perform effectively.

4. COST-EFFECTIVENESS

The extent to which the Cane Testing Service is seen to be worth more than its costs, the extent to which Cane Testing Service can be relied upon to control costs responsibly.

5. CUSTOMER SATISFACTION

The extent to which the Cane Testing Service is seen as demonstrating a strong concern for our commitment to the provision of high quality service to customers.

6. RECENT IMPROVEMENT

The extent to which they believe that the performance of Cane Testing Service has improved in recent time.

7. CONTINUOUS IMPROVEMENT

The extent to which the Cane Testing Service is seen to be able to meet their changing circumstances and the extent to which they can see continuous improvement in the Cane Testing Service's service.

8. TESTING ACCURACY SATISFACTION

The extent to which they are satisfied with the general level of testing accuracy.

9. TESTING FREQUENCY SATISFACTION

The extent to which they are satisfied with the test frequency and related costs.

10. PROVISION OF INFORMATION

The extent to which the information provided by the Cane Testing Service is user-friendly and meaningful, satisfaction with monthly reports (15).

11. TECHNICAL COMPETENCE/EFFECTIVENESS

The extent to which the Cane Testing Service is seen to be performing its tasks competently and effectively.

12. SUITABILITY OF TECHNOLOGY

The extent to which the Cane Testing service is seen as using up-to-date and suitably advanced technology that is up-to-date with international trends.

13. WORLD-CLASS

The extent to which Cane Testing service is seen to be a world-class operation.

14. HOUSEKEEPING

The extent to which they are satisfied with the appearance of the Cane Testing Service facility.

15. MONTHLY REPORTS

The extent to which they are satisfied with the monthly reports.

16. HANDLING QUERIES

The extent to which queries are handled efficiently.

APPENDIX B

SOUTH AFRICAN SUGAR ASSOCIATION

CANE TESTING SERVICE

CUSTOMER SURVEY

2003

GUIDELINES FOR QUESTIONNAIRE COMPLETION AND RETURN

On the following pages you will find several statements designed to obtain your perceptions of the Cane Testing Service. The survey is divided into different sections, each of which has specific completion instructions. Please read these statements carefully, but try to respond to them as quickly and spontaneously as possible.

Please respond as honestly and frankly as possible. This is essential, as the information obtained from the survey will be used to help improve our service to you.

Please return the completed survey in the self-addressed envelope provided via **internal SASA mail** (via CTS laboratory) **OR normal mail** as soon as possible, but before 8th September 2003.

Thank you for your participation.

CANE TESTING SERVICE

CUSTOMER SURVEY

PART ONE

Listed below are a number of statements that might be used to describe the Cane Testing Service.

Please indicate the extent to which each description describes the Cane Testing Service in your opinion, by allocating a score in accordance with the scale provided.

Please try to be as objective as you can in deciding how accurately each statement describes your view of the Cane Testing Service.

Please note: Some statements are expressed negatively (i.e. a 'well' response indicates a weakness in CTS), and some positively (i.e. a 'well' response indicates a strength in CTS).

Write a NUMBER in the box beside each statement, based on the following scale:

1	2	3	4	5	6	7
Very Badly	Badly	Not Very Well	Uncertain	Fairly Well	Well	Very Well

How well, in your opinion, does each of the following statements describe the Cane Testing Service?

	1. The Cane Testing Service can be completely trusted to make fair and impartial decisions.
	2. The Cane Testing Service seems to carry on doing things the way they have always done them, despite the need for change and improvement.
	3. There has been a marked improvement in the performance of the CTS during the past year or so.

	4. The performance of the Cane Testing Service would be greatly improved if their staff were more competent and dedicated.
	5. The benefits to us of the Cane Testing service far outweigh its cost.
	6. When I have queries I am highly satisfied with the concern and attention these are given.
	7. The information provided by the Cane Testing Service could be far more useful and user-friendly than it is at present.
	8. The Cane Testing Service places a high value on the importance of customer satisfaction.
	9. One can feel completely confident about the way Cane Testing Service is managing its budget and controlling expenditure.
	10. The accuracy with which testing is performed by the Cane Testing Service is reliable.
	11. There are times when I think that the Cane Testing Service could perform its task with a greater degree of competency and effectiveness.
	12. If only Cane Testing Service would use more up-to-date technology they would be able to achieve their results more effectively.
	13. In my opinion, Cane Testing service is truly a world-class operation.
	14. One of the things that pleases me is the general appearance of the Cane Testing Service laboratory.
	15. The monthly reports given by the Cane Testing Service to the Mill Group Board could be greatly improved.
	16. I really need to be kept more up-to-date by Cane Testing Service regarding its operational and analytical performance.

PART TWO

Each of the following statements below is something you may or may not say about the Cane Testing Service. Please indicate the extent to which they match your own view by allocating a score in accordance with the scale provided.

Write a NUMBER in the box beside each statement, based on the following scale:

1	2	3	4	5	6	7
Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly

	1. The DAC system is the most cost-effective system for testing cane.
	2. It is essential that there is an impartial body to test cane.
	3. The Cane Testing Service cannot be completely trusted to act impartially in applying the Sugar Industry Agreement.
	4. The Cane Testing Service is definitely good value for money.
	5. There could be a huge improvement to the quality and type of information the Cane Testing Service provides.
	6. One of the Cane Testing Service's strengths is the fact that it is staffed by highly competent and experienced employees.
	7. The Cane Testing Service's performance in achieving the test frequency level as set by the Mill Group Board is very satisfactory.
	8. Generally speaking I am highly satisfied with the performance of the Cane Testing Service.
	9. The Cane Testing Manager can be completely relied on to withstand attempts to sway him/her with pressure.
	10. There is definitely not enough emphasis placed on the level of customer service provided by the Cane Testing Service.
	11. The explanations given by the Cane Testing service for variations in test results are not very convincing.
	12. The Cane Testing Service's explanation when the target test frequency is not achieved is acceptable.

PART THREE

Please indicate how satisfied you are with each of the following aspects of the Cane Testing Service's performance. Once again, write the appropriate number in the block beside each statement.

How satisfied are you with each of the following aspects of Cane Testing Service's performance?

1	2	3	4	5	6	7
Extremely Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Satisfied	Extremely Satisfied

	1. The extent to which the Cane Testing Service can be relied upon to make fair and impartial decisions.
	2. The extent to which the Cane Testing Service is staffed by competent employees.
	3. The efficient way in which the Cane Testing Service handles queries and problems.
	4. The level of commitment to customer service that the Cane Testing Service demonstrates.
	5. The extent to which the information provided to us is meaningful and useful.
	6. The degree of control that the Cane Testing Service exerts over its costs.
	7. The professionalism with which our queries and problems are handled.
	8. The accuracy with which the testing is performed by Cane Testing Service.

PART FOUR

Please respond to the following questions in the space provided.

1. Is there any other feedback you can give us about your views on Cane Testing Service in general or the local centre in particular?

2. Are there any ways in which the service provided to you by the Cane Testing Service could be improved?

3. I have/have not had a tour of the local Cane Testing Service operation.

4. I would/would not like to have a tour of the local Cane Testing Service centre.

5. General comments. (Any other points you would like to add.)

Name: _____.

Thank you for taking the time to complete this questionnaire and for sharing your views with us. We look forward to improving our service to you based on your feedback.

Please place your completed questionnaire in the self-addressed envelope provided and post it off as soon as possible via internal SASA mail (CTS laboratory) OR normal mail.

APPENDIX C

SERVICE DIMENSION RANKING

There are five service dimensions listed below in no particular order together with the meaning of each. You are please requested to rate how important each of the five service dimensions are to you. The most important service dimension must be awarded a score 5, the second most important a score of 4, the third most important a score of 3, the fourth most important a score of 2 and the least important a score of 1. The same score must not be used for more than one service dimension. Please write legibly.

ASSURANCE ◦ The extent to which CTS can be relied upon to act at all times with integrity and impartiality. ◦ The extent to which CTS is seen to be worth more than its costs and can be relied upon to control costs responsibly. ◦ The extent to which the information provided by CTS is user-friendly and meaningful. ◦ The extent to which CTS is seen to be performing its tasks competently and effectively.	**SCORE**
EMPATHY ◦ The extent to which CTS is seen as demonstrating a strong concern for our commitment to the provision of high quality service to customers. ◦ The extent to which customers are satisfied with the monthly reports. ◦ The extent to which queries are handled efficiently.	**SCORE**
RELIABILITY ◦ The extent to which the MGB are satisfied with the performance of CTS. ◦ The extent to which CTS is perceived to be staffed by suitably competent and experienced employees who are motivated and perform effectively. ◦ The extent o which customers are satisfied with the general level of testing accuracy. ◦ The extent to which customers are satisfied with the testing frequency and related costs. ◦ The extent to which CTS is seen to be a world-class operation.	**SCORE**
RESPONSIVENESS ◦ The extent to which customers believe that the performance of CTS has improved in recent time. ◦ The extent to which the CTS is seen to be able to meet their changing circumstances and the extent to which customers can see continuous improvement in CTS's service.	**SCORE**
TANGIBLES • The extent to which CTS is seen as using up-to-date and suitably advanced technology that is up-to-date with international trends. • The extent to which customers are satisfied with the appearance of the CTS facility.	**SCORE**

APPENDIX D

GN/GN
9 July 2003

Dear Mill Group Board Member

SURVEY OF CANE TESTING SERVICE CUSTOMERS - LETTER OF INFORMATION AND CONSENT

The Cane Testing Service is working hard at improving the customer service it provides at each of its centres. As a member of the Mill Group Board, your views on the Cane Testing Service and its strengths and weaknesses are of particular importance to us. It is only with honest feedback regarding your perceptions and experience that we can be sure that our service improvement plans are designed to meet the actual needs of the Cane Testing Service customers.

I am currently undertaking a research project that aims to establish the Mill Group Board members' perceptions of Cane Testing Service and compare this to perceptions held in 1998.

TITLE OF STUDY: **A longitudinal study of customers' perception of their confidence in, and satisfaction with the South African Sugar Association Cane Testing Service division.**

Attached is a questionnaire that will take approximately 20 minutes to complete and you are kindly requested to complete it and return it urgently (**before 8th September 2003**). The information you give will be used for research purposes and to ultimately improve the service that CTS provides to the Mill Group Board and your identity and individual answers will be kept totally confidential. Should you wish to discuss this further please feel free to contact me at the contact numbers listed below.

Your assistance will be much appreciated.

Yours faithfully

Seelan Naidoo (General Manager - Cane Testing Service)
031 508 7141
082 654 3552

APPENDIX E1

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of AK MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Impartial and Integrity	1998	3	5.2667	1.30128	5.000	-1.055	0.291
	2003	6	6.2333	0.32042			
Customer Satisfaction	1998	3	4.8889	1.07152	4.500	-1.192	0.233
	2003	6	5.5000	0.62361			
Cost-Effectiveness	1998	3	4.4667	1.36137	5.000	-1.055	0.291
	2003	6	5.5000	0.60332			
General Satisfaction	1998	3	4.0000	0.00000	0.000	-2.598	0.009
	2003	6	6.1667	0.40825			
Recent Improvement	1998	3	4.0000	0.0000	6.000	-0.853	0.394
	2003	6	4.6667	1.21106			
Technical Competence/Effectiveness	1998	3	4.0000	0.00000	0.000	-2.598	0.009
	2003	6	5.8333	0.40825			
World-Class	1998	3	4.0000	0.00000	1.500	-2.121	0.034
	2003	6	5.5000	0.83666			
Handling Queries	1998	3	4.0000	0.90139	0.000	-2.364	0.018
	2003	6	5.7917	0.45871			
Employee Ability	1998	3	3.8889	1.01835	2.000	-1.823	0.068
	2003	6	5.3889	0.71233			
Provision of Information	1998	3	3.8667	0.80829	1.500	-1.953	0.051
	2003	6	5.0333	0.51251			
Testing Frequency Satisfaction	1998	3	3.6667	0.57735	0.000	-2.438	0.015
	2003	6	6.0000	0.63246			
Suitability of Technology	1998	3	3.6667	1.15470	3.000	-1.596	0.110
	2003	6	5.0000	0.89443			
Testing Accuracy Satisfaction	1998	3	3.3333	0.28868	0.000	-2.558	0.011
	2003	6	5.9167	0.20412			
Continuous Improvement	1998	3	3.3333	0.57735	1.000	-2.129	0.033
	2003	6	5.0000	0.89443			
Monthly Reports	1998	3	3.3333	0.57735	0.000	-2.416	0.016
	2003	6	5.5000	0.54772			
Housekeeping	1998	3	2.3333	0.57735	1.000	-2.119	0.034
	2003	6	4.1667	1.16905			
Overall	1998	3	3.8778	0.15692	0.000	-2.324	0.020
	2003	6	5.4498	0.28093			

APPENDIX E2

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of DL MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Impartial and Integrity	1998	5	6.3200	0.68702	6.500	-1.809	0.071
	2003	7	5.2571	0.92170			
General Satisfaction	1998	5	6.0000	0.70711	8.500	-1.573	0.116
	2003	7	4.8571	1.46385			
Testing Accuracy Satisfaction	1998	5	5.8000	0.44721	9.000	-1.543	0.123
	2003	7	4.7857	1.21988			
Testing Frequency Satisfaction	1998	5	5.8000	0.83666	17.500	0.000	1.000
	2003	7	5.7143	0.95119			
Cost-Effectiveness	1998	5	5.7600	0.32863	0.000	-2.852	0.004
	2003	7	3.1429	0.89974			
Handling Queries	1998	5	5.7000	0.54199	6.500	-1.809	0.071
	2003	7	4.5357	1.02499			
World-Class	1998	5	5.4000	1.14018	8.500	-1.502	0.133
	2003	7	4.0000	1.73205			
Housekeeping	1998	5	5.2000	0.44721	8.500	-1.570	0.117
	2003	7	4.2857	1.11270			
Customer Satisfaction	1998	5	5.0667	0.36515	5.000	-2.066	0.039
	2003	7	4.3333	0.79349			
Recent Improvement	1998	5	5.0000	1.0000	12.000	-0.940	0.347
	2003	7	4.4286	0.97590			
Employee Ability	1998	5	4.9333	1.03816	13.000	-0.748	0.454
	2003	7	4.5238	1.11981			
Provision of Information	1998	5	3.8000	0.63246	3.500	-2.282	0.023
	2003	7	4.8857	0.70102			
Suitability of Technology	1998	5	3.8000	1.48324	6.500	-1.828	0.067
	2003	7	5.4286	1.27242			
Continuous Improvement	1998	5	3.6000	0.54772	0.000	-2.975	0.003
	2003	7	5.4286	0.78680			
Technical Competence/Effectiveness	1998	5	3.0000	1.0000	2.000	-2.591	0.010
	2003	7	5.0000	0.81650			
Monthly Reports	1998	5	3.0000	1.73205	4.000	-2.295	0.022
	2003	7	5.8571	0.69007			
Overall	1998	5	4.8863	0.28672	16.000	-0.244	0.808
	2003	7	4.7790	0.61613			

APPENDIX E3

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of EN MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*P*
General Satisfaction	1998	6	5.5000	0.54772	15.000	-1.523	0.128
	2003	9	4.2222	1.92209			
Impartial and Integrity	1998	6	5.4000	0.55136	14.000	-1.567	0.117
	2003	9	5.0000	0.44721			
Handling Queries	1998	6	5.1667	0.54006	22.500	-0.539	0.590
	2003	9	4.8056	1.00606			
Testing Frequency Satisfaction	1998	6	5.1667	0.40825	13.000	-1.799	0.072
	2003	9	4.1111	1.45297			
Testing Accuracy Satisfaction	1998	6	4.6667	0.51640	21.500	-0.669	0.504
	2003	9	4.2222	1.00347			
Cost-Effectiveness	1998	6	4.6333	1.20277	18.500	-1.006	0.314
	2003	9	4.0667	1.36748			
Recent Improvement	1998	6	4.5000	1.76068	25.500	-0.193	0.847
	2003	9	4.2222	1.78730			
World-Class	1998	6	4.5000	1.37840	18.500	-1.032	0.302
	2003	9	3.7778	1.56347			
Technical Competence/Effectiveness	1998	6	4.3333	1.03280	19.500	-0.923	0.356
	2003	9	4.7778	1.09291			
Customer Satisfaction	1998	6	4.2778	0.92896	22.000	-0.600	0.549
	2003	9	4.4444	0.83333			
Continuous Improvement	1998	6	3.8333	1.16905	8.000	-2.379	0.017
	2003	9	5.2222	0.66667			
Employee Ability	1998	6	3.7778	0.54433	24.000	-0.362	0.717
	2003	9	3.8148	0.76578			
Suitability of Technology	1998	6	3.5000	0.83666	7.000	-2.441	0.015
	2003	9	4.8889	0.92796			
Provision of Information	1998	6	3.4667	1.22420	9.000	-2.135	0.033
	2003	9	4.8667	0.67082			
Housekeeping	1998	6	3.3333	1.50555	24.500	-0.303	0.762
	2003	9	3.4444	1.50923			
Monthly Reports	1998	6	3.3333	0.51640	8.000	-2.324	0.020
	2003	9	4.5556	1.13039			
Overall	1998	6	4.3368	0.44299	20.000	-0.825	0.409
	2003	9	4.4027	0.66615			

APPENDIX E4

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of ES MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*P*
General Satisfaction	1998	5	6.4000	0.54772	11.500	-1.805	0.071
	2003	10	5.3000	1.33749			
Testing Frequency Satisfaction	1998	5	6.4000	0.54772	22.500	-0.374	0.708
	2003	10	6.3000	0.48305			
Testing Accuracy Satisfaction	1998	5	6.3000	0.44721	7.000	-2.237	0.025
	2003	10	5.0500	0.92646			
Handling Queries	1998	5	5.9000	0.51841	14.500	-1.308	0.191
	2003	10	5.4000	0.57975			
Housekeeping	1998	5	5.8000	0.83666	14.000	-1.419	0.156
	2003	10	5.0000	0.94281			
Impartial and Integrity	1998	5	5.7600	1.28374	18.000	-0.860	0.390
	2003	10	5.2400	1.02762			
Employee Ability	1998	5	5.1333	0.55777	23.500	-0.187	0.852
	2003	10	5.2000	0.87771			
Customer Satisfaction	1998	5	5.1333	0.73030	18.000	-0.890	0.374
	2003	10	5.4667	0.54885			
World-Class	1998	5	5.0000	0.70711	24.500	-.0.065	0.948
	2003	10	5.1000	0.99443			
Recent Improvement	1998	5	5.0000	0.70711	21.500	-0.462	0.644
	2003	10	5.1000	0.99443			
Cost-Effectiveness	1998	5	4.8400	0.95289	23.000	-0.247	0.805
	2003	10	5.0400	0.89839			
Monthly Reports	1998	5	4.4000	1.94936	16.000	-1.152	0.249
	2003	10	5.5000	1.50923			
Suitability of Technology	1998	5	4.0000	1.22474	10.000	-1.923	0.054
	2003	10	5.3000	0.94868			
Provision of Information	1998	5	3.7600	1.13490	6.000	-2.408	0.016
	2003	10	5.2600	0.36576			
Technical Competence/Effectiveness	1998	5	3.4000	0.89443	6.000	-2.465	0.014
	2003	10	5.1000	1.19722			
Continuous Improvement	1998	5	2.6000	0.89443	0.500	-3.081	0.002
	2003	10	5.4000	0.84327			
Overall	1998	5	4.9892	0.24606	16.000	-1.102	0.270
	2003	10	5.2973	0.62212			

APPENDIX E5

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of FX MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Impartial and Integrity	1998	5	5.2000	0.95917	13.000	-1.284	0.199
	2003	9	5.7111	0.95452			
Testing Frequency Satisfaction	1998	5	5.2000	0.83666	11.000	-1.934	0.053
	2003	9	5.8889	0.33333			
Testing Accuracy Satisfaction	1998	5	5.0000	1.54110	20.000	-0.388	0.698
	2003	9	5.3889	0.99303			
Housekeeping	1998	5	4.8000	1.09545	21.000	-0.222	0.824
	2003	9	5.1111	1.26930			
World-Class	1998	5	4.2000	1.30384	14.000	-1.175	0.240
	2003	9	5.0000	1.11803			
Suitability of Technology	1998	5	4.2000	1.30384	12.500	-1.388	0.165
	2003	9	5.1111	0.92796			
Customer Satisfaction	1998	5	4.1333	0.69121	6.000	-2.230	0.026
	2003	9	5.1852	0.68943			
Employee Ability	1998	5	4.0000	1.33333	12.500	-1.348	0.178
	2003	9	4.8519	1.32404			
Monthly Reports	1998	5	4.0000	1.22474	20.500	-0.279	0.780
	2003	9	3.7778	1.48137			
Handling Queries	1998	5	3.9000	1.16726	9.500	-1.753	0.080
	2003	9	5.0278	0.68971			
General Satisfaction	1998	5	3.8000	1.30384	4.500	-2.531	0.011
	2003	9	5.5556	0.72648			
Technical Competence/Effectiveness	1998	5	3.8000	0.83666	5.500	-2.348	0.019
	2003	9	5.2222	0.83333			
Cost-Effectiveness	1998	5	3.7600	0.84143	9.500	-1.737	0.082
	2003	9	4.8222	1.12002			
Provision of Information	1998	5	3.6800	0.62610	1.500	-2.812	0.005
	2003	9	5.1556	0.58119			
Recent Improvement	1998	5	3.6000	0.89443	10.000	-1.716	0.086
	2003	9	5.0000	1.41421			
Continuous Improvement	1998	5	2.8000	0.44721	2.000	-2.865	0.004
	2003	9	5.1111	1.16667			
Overall	1998	5	4.1296	0.31846	5.000	-2.333	0.020
	2003	9	5.1200	0.65928			

APPENDIX E6

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of GH MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Testing Frequency Satisfaction	1998	5	5.8000	0.44721	29.500	-0.406	0.684
	2003	13	5.8462	0.68874			
General Satisfaction	1998	5	5.2000	0.44721	13.000	-2.126	0.033
	2003	13	5.9231	0.64051			
Impartial and Integrity	1998	5	5.1200	0.87864	13.500	-1.884	0.060
	2003	13	5.9385	0.55609			
Testing Accuracy Satisfaction	1998	5	5.1000	1.34164	27.500	-0.506	0.613
	2003	13	5.5769	0.70256			
Cost-Effectiveness	1998	5	4.4000	0.54772	19.500	-1.286	0.198
	2003	13	4.9385	1.16443			
Handling Queries	1998	5	4.4000	0.80234	4.500	-2.814	0.005
	2003	13	5.5769	0.62404			
Employee Ability	1998	5	4.2667	1.14018	14.000	-1.841	0.066
	2003	13	5.2821	0.70509			
Recent Improvement	1998	5	4.0000	1.00000	23.500	-0.936	0.349
	2003	13	4.5385	1.19829			
World-Class	1998	5	4.0000	1.00000	18.500	-1.424	0.154
	2003	13	4.9231	1.18754			
Customer Satisfaction	1998	5	3.9333	1.18790	11.500	-2.104	0.035
	2003	13	5.2308	0.62929			
Suitability of Technology	1998	5	3.8000	1.09545	14.000	-1.925	0.054
	2003	13	5.2308	1.23517			
Continuous Improvement	1998	5	3.6000	0.54772	13.500	-2.236	0.025
	2003	13	4.4615	0.77625			
Provision of Information	1998	5	3.5600	0.47749	0.000	-3.254	0.001
	2003	13	5.2769	0.53253			
Technical Competence/Effectiveness	1998	5	3.2000	0.83666	6.000	-2.747	0.006
	2003	13	4.9231	1.03775			
Housekeeping	1998	5	2.8000	1.30384	10.500	-2.228	0.026
	2003	13	4.7692	1.42325			
Monthly Reports	1998	5	2.8000	0.83666	2.500	-3.035	0.002
	2003	13	5.0769	1.11516			
Overall	1998	5	4.1238	0.18668	0.000	-3.204	0.001
	2003	13	5.2196	0.50217			

APPENDIX E7

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of KM MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Impartial and Integrity	1998	7	5.9143	0.59841	21.000	-0.469	0.639
	2003	7	5.9143	0.63095			
General Satisfaction	1998	7	5.5714	0.97590	19.500	-0.710	0.477
	2003	7	5.8571	0.89974			
Testing Accuracy Satisfaction	1998	7	5.4286	0.67259	12.000	-1.727	0.084
	2003	7	5.7857	1.07460			
Testing Frequency Satisfaction	1998	7	5.4286	0.97590	12.500	-1.710	0.087
	2003	7	6.1429	0.37796			
Handling Queries	1998	7	5.3214	0.98652	10.000	-1.906	0.057
	2003	7	6.1429	0.64319			
Employee Ability	1998	7	5.2381	0.68622	21.000	-0.468	0.640
	2003	7	5.3810	0.82616			
Customer Satisfaction	1998	7	4.9048	0.59982	14.000	-1.377	0.169
	2003	7	5.2857	0.78004			
World-Class	1998	7	4.8571	1.46385	24.000	-0.071	0.943
	2003	7	5.0000	0.57735			
Cost-Effectiveness	1998	7	4.8571	0.61875	10.500	-1.873	0.061
	2003	7	4.5714	0.73420			
Technical Competence/Effectiveness	1998	7	4.4286	0.97590	19.000	-0.770	0.441
	2003	7	4.7143	0.48795			
Housekeeping	1998	7	4.4286	1.27242	19.000	-0.744	0.457
	2003	7	4.0000	1.41421			
Provision of Information	1998	7	4.3429	0.74578	2.000	-2.927	0.003
	2003	7	5.2286	0.24300			
Continuous Improvement	1998	7	4.1429	0.69007	5.000	-2.622	0.009
	2003	7	5.5714	0.78680			
Suitability of Technology	1998	7	3.8571	1.34519	9.500	-2.054	0.040
	2003	7	5.1429	0.37796			
Monthly Reports	1998	7	3.7143	1.11270	18.000	-0.922	0.356
	2003	7	4.2857	0.75593			
Recent Improvement	1998	7	3.5714	0.78680	19.500	-0.712	0.476
	2003	7	3.2857	0.95119			
Overall	1998	7	4.7504	0.22088	6.000	-2.418	0.016
	2003	7	5.1443	0.24480			

APPENDIX E8

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of ML MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Handling Queries	1998	6	6.2500	0.44721	2.000	-2.741	0.006
	2003	7	5.0357	0.52893			
Testing Accuracy Satisfaction	1998	6	6.0000	0.31623	8.500	-1.845	0.065
	2003	7	4.8571	1.14434			
General Satisfaction	1998	6	5.8333	0.75277	16.500	-0.666	0.505
	2003	7	5.1429	1.67616			
Testing Frequency Satisfaction	1998	6	5.8333	1.16905	18.500	-0.382	0.702
	2003	7	6.1429	0.69007			
Impartiality and Integrity	1998	6	5.6667	0.48442	5.500	-2.261	0.024
	2003	7	4.9714	0.45356			
Recent Improvement	1998	6	5.5000	0.83666	9.000	-1.753	0.080
	2003	7	3.7143	1.70434			
Housekeeping	1998	6	5.5000	0.83666	15.000	-0.938	0.348
	2003	7	4.8571	1.06904			
Customer Satisfaction	1998	6	5.3333	0.63246	10.500	-1.550	0.121
	2003	7	4.7143	0.73102			
World-Class	1998	6	5.3333	0.81650	16.000	-0.746	0.456
	2003	7	5.0000	1.15470			
Cost-Effectiveness	1998	6	5.2333	0.94163	15.500	-0.792	0.428
	2003	7	4.6286	0.98947			
Employee Ability	1998	6	4.9444	0.71233	15.500	-0.796	0.426
	2003	7	4.4286	1.30120			
Technical Competence/Effectiveness	1998	6	4.0000	1.26491	7.000	-2.091	0.037
	2003	7	5.4286	1.13389			
Continuous Improvement	1998	6	3.8333	0.98319	10.000	-1.645	0.100
	2003	7	4.8571	1.06904			
Monthly Reports	1998	6	3.5000	0.54772	0.000	-3.127	0.002
	2003	7	5.7143	0.48795			
Provision of Information	1998	6	3.4000	0.76942	0.000	-3.025	0.002
	2003	7	5.1714	0.45356			
Suitability of Technology	1998	6	2.8333	0.98319	1.000	-2.910	0.004
	2003	7	5.4286	0.97590			
Overall	1998	6	4.9372	0.22209	18.000	-0.429	0.668
	2003	7	5.0058	0.58942			

APPENDIX E9

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of MS MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Handling Queries	1998	10	5.8500	0.68920	26.000	-2.063	0.039
	2003	11	5.2045	0.58968			
General Satisfaction	1998	10	5.5000	0.97183	47.000	-0.648	0.517
	2003	11	5.6364	1.36182			
Testing Frequency Satisfaction	1998	10	5.3000	0.82327	26.500	-2.308	0.021
	2003	11	6.0909	0.53936			
Impartial and Integrity	1998	10	5.2400	0.46952	27.000	-1.992	0.046
	2003	11	5.7273	0.65892			
Testing Accuracy Satisfaction	1998	10	5.1000	1.19722	35.000	-1.457	0.145
	2003	11	5.5455	1.42223			
Housekeeping	1998	10	4.9000	0.73786	48.500	-0.478	0.633
	2003	11	5.0909	1.22103			
Employee Ability	1998	10	4.8667	0.44997	29.000	-1.885	0.059
	2003	11	5.3030	0.45837			
Customer Satisfaction	1998	10	4.6333	1.17010	33.000	-1.574	0.115
	2003	11	5.4242	0.76144			
Cost-Effectiveness	1998	10	4.4800	0.81758	39.500	-1.110	0.267
	2003	11	4.9273	0.93498			
World-Class	1998	10	4.4000	1.17379	32.500	-1.654	0.098
	2003	11	5.1818	1.25045			
Recent Improvement	1998	10	4.3000	0.82327	49.000	-0.471	0.638
	2003	11	4.5455	1.03573			
Monthly Reports	1998	10	3.9000	1.10050	27.500	-2.005	0.045
	2003	11	5.0000	1.34164			
Suitability of Technology	1998	10	3.8000	1.54919	13.000	-3.018	0.003
	2003	11	6.0909	1.04447			
Technical Competence/Effectiveness	1998	10	3.6000	1.17379	12.000	-3.148	0.002
	2003	11	5.3636	0.80904			
Continuous Improvement	1998	10	3.4000	1.17379	14.500	-2.930	0.003
	2003	11	5.0909	1.04447			
Provision of Information	1998	10	3.3200	0.87025	1.500	-3.773	0.000
	2003	11	5.1091	-0.55399			
Overall	1998	10	4.5369	0.48707	7.000	-3.380	0.001
	2003	11	5.3332	0.44770			

APPENDIX E10

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of NB MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Cost-Effectiveness	1998	6	5.6333	1.50422	7.500	-1.684	0.092
	2003	6	4.2667	0.71181			
Handling Queries	1998	6	4.8333	1.12546	11.000	-1.135	0.256
	2003	6	5.4583	0.71443			
Impartiality and Integrity	1998	6	4.6667	1.09301	6.500	-1.858	0.063
	2003	6	5.8000	0.73756			
Customer Satisfaction	1998	6	4.2778	1.45169	9.000	-1.462	0.144
	2003	6	5.3889	0.49065			
General Satisfaction	1998	6	4.1667	1.32916	6.000	-2.162	0.031
	2003	6	5.5000	0.54772			
Monthly Reports	1998	6	4.1667	1.16905	12.000	-1.135	0.256
	2003	6	4.8333	1.16905			
Testing Accuracy Satisfaction	1998	6	3.7500	0.93541	4.000	-2.258	0.024
	2003	6	5.2500	0.93541			
Provision of Information	1998	6	3.7333	1.45144	8.500	-1.527	0.127
	2003	6	5.0333	0.46332			
Technical Competence/Effectiveness	1998	6	3.5000	1.51658	5.500	-2.087	0.037
	2003	6	5.1667	0.40825			
World-Class	1998	6	3.3333	1.21106	10.000	-1.311	0.190
	2003	6	4.5000	1.51658			
Recent Improvement	1998	6	3.1667	0.75277	5.500	-2.079	0.038
	2003	6	4.6667	1.21106			
Continuous Improvement	1998	6	3.1667	0.75277	2.000	-2.647	0.008
	2003	6	4.8333	0.75277			
Suitability of Technology	1998	6	3.1667	1.16905	3.500	-2.421	0.015
	2003	6	5.0000	0.63246			
Testing Frequency Satisfaction	1998	6	3.0000	0.00000	0.000	-3.140	0.002
	2003	6	5.8333	0.98319			
Employee Ability	1998	6	2.6111	0.71233	5.000	-2.108	0.035
	2003	6	4.0556	1.14342			
Housekeeping	1998	6	2.6667	1.03280	7.500	-1.798	0.072
	2003	6	4.3333	1.50555			
Overall	1998	6	3.7399	0.35861	0.000	-2.882	0.004
	2003	6	4.9950	0.34006			

APPENDIX E11

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of PG MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Handling Queries	1998	7	6.7500	0.25000	0.000	-3.055	0.002
	2003	6	5.5417	0.40052			
General Satisfaction	1998	7	6.7143	0.48795	6.000	-2.535	0.011
	2003	6	6.0000	0.00000			
Testing Accuracy Satisfaction	1998	7	6.7143	0.26726	2.000	-2.829	0.005
	2003	6	5.9167	0.37639			
Testing Frequency Satisfaction	1998	7	6.5714	0.53452	9.000	-2.138	0.033
	2003	6	6.0000	0.00000			
Impartiality and Integrity	1998	7	6.3714	0.37289	10.500	-1.554	0.120
	2003	6	6.0333	0.36697			
Cost-Effectiveness	1998	7	6.1429	0.73679	10.500	-1.554	0.120
	2003	6	5.4667	0.35024			
World-Class	1998	7	6.0000	1.00000	11.500	-1.445	0.148
	2003	6	5.1667	0.75277			
Housekeeping	1998	7	6.0000	0.57735	4.000	-2.574	0.010
	2003	6	4.1667	1.32916			
Employee Ability	1998	7	5.8571	0.63413	8.000	-1.897	0.058
	2003	6	5.0556	0.71233			
Customer Satisfaction	1998	7	5.3810	0.78004	20.500	-0.073	0.942
	2003	6	5.3889	0.87981			
Technical Competence/Effectiveness	1998	7	5.2857	0.75593	15.000	-0.909	0.364
	2003	6	4.8333	0.98319			
Recent Improvement	1998	7	4.7143	0.75593	12.000	-1.493	0.135
	2003	6	4.1667	0.40825			
Provision of Information	1998	7	4.2571	1.27914	12.000	-1.293	0.196
	2003	6	5.1667	0.49666			
Continuous Improvement	1998	7	4.0000	1.00000	15.500	-0.825	0.409
	2003	6	4.5000	1.04881			
Monthly Reports	1998	7	3.8571	1.06904	9.500	-1.695	0.090
	2003	6	5.0000	1.09545			
Suitability of Technology	1998	7	3.7143	0.95119	9.500	-1.792	0.073
	2003	6	4.8333	0.98319			
Overall	1998	7	5.5207	0.11430	1.000	-2.857	0.004
	2003	6	5.2023	0.15777			

APPENDIX E12

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of SZ MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Impartiality and Integrity	1998	6	5.4333	0.90701	24.000	-0.656	0.512
	2003	10	5.6800	0.99867			
General Satisfaction	1998	6	5.3333	0.81650	25.500	-0.565	0.572
	2003	10	5.5000	0.84984			
Handling Queries	1998	6	5.0833	0.98319	26.500	-0.387	0.699
	2003	10	5.1750	0.96501			
Cost-Effectiveness	1998	6	5.0667	0.66533	25.000	-0.559	0.576
	2003	10	5.0600	0.95242			
Testing Accuracy Satisfaction	1998	6	5.0000	0.83666	22.500	-0.857	0.391
	2003	10	5.4000	0.77460			
Customer Satisfaction	1998	6	4.7222	0.49065	18.500	-1.261	0.207
	2003	10	5.1333	0.77300			
Employee Ability	1998	6	4.4444	1.06805	15.000	-1.648	0.099
	2003	10	5.1667	0.77380			
World-Class	1998	6	4.3333	0.51640	26.000	-0.504	0.614
	2003	10	4.6000	0.84327			
Housekeeping	1998	6	4.3333	1.50555	26.500	-0.390	0.696
	2003	10	4.1000	1.37032			
Technical Competence/Effectiveness	1998	6	4.1667	0.98319	14.000	-1.793	0.073
	2003	10	5.2000	1.22927			
Continuous Improvement	1998	6	4.0000	1.09545	12.000	-2.025	0.043
	2003	10	5.2000	1.13529			
Recent Improvement	1998	6	3.8333	1.32916	20.500	-1.106	0.269
	2003	10	4.4000	0.84327			
Suitability of Technology	1998	6	3.8333	0.75277	13.500	-1.926	0.054
	2003	10	4.8000	0.91894			
Monthly Reports	1998	6	3.6667	1.36626	7.500	-2.489	0.013
	2003	10	5.6000	0.96609			
Testing Frequency Satisfaction	1998	6	3.5000	1.51658	5.500	-2.853	0.004
	2003	10	6.0000	0.81650			
Provision of Information	1998	6	3.4667	1.13608	5.000	-2.722	0.006
	2003	10	5.2000	0.71802			
Overall	1998	6	4.3885	0.41045	7.000	-2.497	0.013
	2003	10	5.1384	0.51908			

APPENDIX E13

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of UF MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Cost-Effectiveness	1998	5	5.5200	0.55857	15.500	-0.671	0.502
	2003	8	5.2500	0.79821			
General Satisfaction	1998	5	5.4000	1.51658	14.500	-0.985	0.324
	2003	8	6.1250	0.35355			
World-Class	1998	5	5.2000	0.83666	15.000	-0.782	0.434
	2003	8	5.5000	1.19523			
Testing Accuracy Satisfaction	1998	5	5.0000	1.06066	8.500	-1.724	0.085
	2003	8	6.0000	0.53452			
Impartiality and Integrity	1998	5	4.8800	1.48728	8.000	-1.774	0.076
	2003	8	6.2500	0.69076			
Recent Improvement	1998	5	4.8000	0.83666	15.500	-0.684	0.494
	2003	8	5.2500	1.38873			
Housekeeping	1998	5	4.8000	0.83666	17.000	-0.454	0.650
	2003	8	4.3750	1.40789			
Monthly Reports	1998	5	4.8000	0.83666	14.500	-0.833	0.405
	2003	8	5.2500	1.28174			
Provision of Information	1998	5	4.6800	0.64187	9.500	-1.550	0.121
	2003	8	5.3500	0.49857			
Handling Queries	1998	5	4.6500	1.71026	14.000	-0.898	0.369
	2003	8	5.7500	0.51755			
Testing Frequency Satisfaction	1998	5	4.4000	1.51658	6.000	-2.345	0.019
	2003	8	6.2500	0.46291			
Employee Ability	1998	5	4.2000	0.76739	15.500	-0.671	0.502
	2003	8	5.7917	0.56167			
Continuous Improvement	1998	5	4.2000	0.83666	5.000	-2.272	0.023
	2003	8	5.6250	0.91613			
Customer Satisfaction	1998	5	3.8000	1.83485	6.500	-2.021	0.043
	2003	8	5.9583	0.72237			
Technical Competence/Effectiveness	1998	5	3.6000	1.51658	6.000	-2.166	0.030
	2003	8	5.5000	0.75593			
Suitability of Technology	1998	5	3.6000	1.34164	8.000	-1.856	0.063
	2003	8	5.0000	0.75593			
Overall	1998	5	4.5956	0.66803	5.000	-2.196	0.028
	2003	8	5.5766	0.33498			

APPENDIX E14

Comparison of CTS Customer Satisfaction Levels for Combined Millers and Growers of UK MGB between the 1998 and 2003 Surveys.

Characteristic	Year	N	Mean	Std. Deviation	Mann-Whitney U	Z	*p*
Handling Queries	1998	4	5.9375	0.37500	4.500	-1.655	0.098
	2003	6	5.2917	0.67854			
General Satisfaction	1998	4	5.7500	0.50000	11.000	-0.306	0.759
	2003	6	5.8333	0.40825			
Testing Frequency Satisfaction	1998	4	5.7500	0.95743	10.500	-0.335	0.737
	2003	6	5.5000	1.04881			
Impartiality and Integrity	1998	4	5.7000	0.62183	6.000	-1.365	0.172
	2003	6	6.2000	0.21909			
Employee Ability	1998	4	5.3333	0.60858	10.000	-0.434	0.664
	2003	6	4.8333	1.29529			
Cost-Effectiveness	1998	4	5.1000	0.73937	12.000	0.000	1.000
	2003	6	5.0667	0.96056			
Housekeeping	1998	4	5.0000	1.82574	10.500	-0.327	0.744
	2003	6	4.6667	1.63299			
Testing Accuracy Satisfaction	1998	4	4.8750	0.85391	6.500	-1.255	0.209
	2003	6	5.5833	0.80104			
Technical Competence/Effectiveness	1998	4	4.7500	0.50000	6.500	-1.260	0.208
	2003	6	5.5000	1.04881			
World-Class	1998	4	4.7500	1.25831	9.500	-0.571	0.568
	2003	6	5.3333	1.03280			
Suitability of Technology	1998	4	4.5000	1.00000	7.500	-0.996	0.319
	2003	6	5.3333	1.21106			
Recent Improvement	1998	4	4.2500	1.25831	10.500	-0.332	0.740
	2003	6	4.3333	1.36626			
Continuous Improvement	1998	4	4.2500	0.50000	4.500	-1.768	0.077
	2003	6	5.1667	0.98319			
Customer Satisfaction	1998	4	4.1667	0.96225	5.500	-1.412	0.158
	2003	6	5.0556	0.57413			
Monthly Reports	1998	4	4.0000	1.82574	7.000	-1.153	0.249
	2003	6	5.3333	0.51640			
Provision of Information	1998	4	3.4000	0.58878	0.500	-2.474	0.013
	2003	6	5.2000	0.75895			
Overall	1998	4	4.8445	0.32424	3.000	-1.919	0.055
	2003	6	5.2644	0.33147			

APPENDIX F1

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of AK MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Impartial and Integrity	1998	5.3000	0.812	Customer Satisfaction	5.3333	0.221
	2003	6.2000			5.8333	
Cost-Effectiveness	1998	4.7000	0.617	Impartial and Integrity	5.2000	0.221
	2003	5.7000			6.3000	
Customer Satisfaction	1998	4.6667	0.481	Handling Queries	4.2500	0.221
	2003	5.3333			6.1250	
General Satisfaction	1998	4.0000	0.046	General Satisfaction	4.0000	0.157
	2003	6.2500			6.0000	
Employee Ability	1998	4.0000	0.159	Cost-Effectiveness	4.0000	0.221
	2003	5.5833			5.1000	
Recent Improvement	1998	4.0000	0.617	Recent Improvement	4.0000	0.480
	2003	4.7500			4.5000	
Technical Competence/ Effectiveness	1998	4.0000	0.046	Testing Frequency Satisfaction	4.0000	0.157
	2003	5.7500			6.0000	
Suitability of Technology	1998	4.0000	0.134	Provision of Information	4.0000	0.221
	2003	5.5000			5.1000	
World-Class	1998	4.0000	0.114	Technical Competence/ Effectiveness	4.0000	0.157
	2003	5.5000			6.0000	
Handling Queries	1998	3.8750	0.060	World-Class	4.0000	0.221
	2003	5.6250			5.5000	
Provision of Information	1998	3.8000	0.165	Employee Ability	3.6667	0.221
	2003	5.0000			5.0000	
Continuous Improvement	1998	3.5000	0.095	Testing Accuracy Satisfaction	3.5000	0.157
	2003	5.2500			6.0000	
Testing Frequency Satisfaction	1998	3.5000	0.060	Continuous Improvement	3.0000	0.221
	2003	6.0000			4.5000	
Monthly Reports	1998	3.5000	0.049	Suitability of Technology	3.0000	0.157
	2003	5.7500			4.0000	
Testing Accuracy Satisfaction	1998	3.2500	0.049	Monthly Reports	3.0000	0.157
	2003	5.8750			5.0000	
Housekeeping	1998	2.5000	0.095	Housekeeping	2.0000	0.221
	2003	4.2500			4.0000	
Overall	1998	4.1667	0.064	Overall	4.4722	0.221
	2003	5.5694			5.4722	

APPENDIX F2

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of DL MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Impartial and Integrity	1998	6.5500	0.099	Impartial and Integrity	5.4000	0.125
	2003	5.7000			4.6667	
General Satisfaction	1998	6.2500	0.186	Cost-Effectiveness	5.4000	0.591
	2003	5.7500			3.0000	
Testing Accuracy Satisfaction	1998	6.0000	0.317	General Satisfaction	5.0000	0.643
	2003	5.6250			3.6667	
Testing Frequency Satisfaction	1998	6.0000	1.000	Recent Improvement	5.0000	0.658
	2003	6.0000			4.3333	
Handling Queries	1998	5.8750	0.180	Testing Accuracy Satisfaction	5.0000	0.584
	2003	5.1875			3.6667	
Cost-Effectiveness	1998	5.8500	0.019	Testing Frequency Satisfaction	5.0000	0.335
	2003	3.2500			5.3333	
World-Class	1998	5.7500	0.369	Housekeeping	5.0000	0.913
	2003	5.0000			3.6667	
Housekeeping	1998	5.2500	0.350	Handling Queries	5.0000	0.741
	2003	4.7500			3.6667	
Customer Satisfaction	1998	5.1667	0.178	Customer Satisfaction	4.6667	0.664
	2003	4.7500			3.7778	
Employee Ability	1998	5.0833	0.877	Employee Ability	4.3333	0.576
	2003	5.0000			3.8889	
Recent Improvement	1998	5.0000	0.544	Continuous Improvement	4.0000	0.110
	2003	4.5000			5.6667	
Suitability of Technology	1998	4.0000	0.056	Technical Competence/ Effectiveness	4.0000	0.647
	2003	6.2500			5.3333	
Provision of Information	1998	3.9000	0.029	World-Class	4.0000	0.517
	2003	5.1500			2.6667	
Continuous Improvement	1998	3.5000	0.017	Provision of Information	3.4000	0.194
	2003	5.2500			4.5333	
Monthly Reports	1998	3.0000	0.040	Suitability of Technology	3.0000	0.062
	2003	6.2500			4.3333	
Technical Competence/ Effectiveness	1998	2.7500	0.025	Monthly Reports	3.0000	0.022
	2003	4.7500			5.3333	
Overall	1998	5.2569	0.386	Overall	4.6111	0.655
	2003	5.0069			4.0648	

APPENDIX F3

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of EN MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
General Satisfaction	1998	5.2500	0.643	General Satisfaction	6.0000	0.068
	2003	4.0000			4.6667	
Impartial and Integrity	1998	5.2500	0.125	Impartial and Integrity	5.7000	0.374
	2003	4.8667			5.2667	
Testing Frequency Satisfaction	1998	5.2500	0.335	Handling Queries	5.3750	0.767
	2003	4.1667			4.9167	
Handling Queries	1998	5.0625	0.741	Cost-Effectiveness	5.0000	0.248
	2003	4.7500			4.2000	
Customer Satisfaction	1998	4.5000	0.664	Recent Improvement	5.0000	0.414
	2003	4.6667			5.3333	
Testing Accuracy Satisfaction	1998	4.5000	0.584	Testing Accuracy Satisfaction	5.0000	0.554
	2003	4.0000			4.6667	
Technical Competence/ Effectiveness	1998	4.5000	0.647	Testing Frequency Satisfaction	5.0000	0.046
	2003	4.8333			4.0000	
Cost-Effectiveness	1998	4.4500	0.591	World-Class	5.0000	0.182
	2003	4.0000			4.3333	
Recent Improvement	1998	4.2500	0.658	Continuous Improvement	4.0000	0.068
	2003	3.6667			5.3333	
World-Class	1998	4.2500	0.517	Technical Competence/ Effectiveness	4.0000	0.554
	2003	3.5000			4.6667	
Employee Ability	1998	3.9167	0.576	Customer Satisfaction	3.8333	0.767
	2003	3.6667			4.0000	
Continuous Improvement	1998	3.7500	0.110	Employee Ability	3.5000	0.374
	2003	5.1667			4.1111	
Provision of Information	1998	3.6500	0.194	Suitability of Technology	3.5000	0.139
	2003	4.9000			5.0000	
Suitability of Technology	1998	3.5000	0.062	Provision of Information	3.1000	0.083
	2003	4.8333			4.8000	
Housekeeping	1998	3.5000	0.913	Housekeeping	3.0000	1.000
	2003	3.6667			3.0000	
Monthly Reports	1998	3.5000	0.022	Monthly Reports	3.0000	0.554
	2003	4.6667			4.3333	
Overall	1998	4.4167	0.831	Overall	4.4722	0.248
	2003	4.4259			4.5926	

APPENDIX F4

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of ES MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Impartial and Integrity	1998	6.6000	0.067	General Satisfaction	6.6667	0.182
	2003	5.2500			6.0000	
Testing Frequency Satisfaction	1998	6.5000	0.513	Testing Accuracy Satisfaction	6.5000	0.374
	2003	6.2500			5.7500	
Handling Queries	1998	6.1250	0.231	Testing Frequency Satisfaction	6.3333	0.739
	2003	5.4063			6.5000	
General Satisfaction	1998	6.0000	0.400	Housekeeping	6.0000	0.374
	2003	5.1250			5.0000	
Testing Accuracy Satisfaction	1998	6.0000	0.110	Handling Queries	5.7500	0.374
	2003	4.8750			5.3750	
Recent Improvement	1998	5.5000	0.885	Customer Satisfaction	5.4444	0.374
	2003	5.2500			5.8333	
Housekeeping	1998	5.5000	0.489	Impartial and Integrity	5.2000	1.000
	2003	5.0000			5.2000	
Employee Ability	1998	5.3333	0.790	Employee Ability	5.0000	1.000
	2003	5.2500			5.0000	
Cost-Effectiveness	1998	5.3000	0.790	World-Class	5.0000	1.000
	2003	5.1500			5.0000	
World-Class	1998	5.0000	0.891	Monthly Reports	5.0000	0.543
	2003	5.1250			6.0000	
Customer Satisfaction	1998	4.6667	0.264	Recent Improvement	4.6667	0.739
	2003	5.3750			4.5000	
Provision of Information	1998	4.0000	0.112	Cost-Effectiveness	4.5333	1.000
	2003	5.3250			4.6000	
Suitability of Technology	1998	3.5000	0.222	Suitability of Technology	4.3333	0.128
	2003	5.2500			5.5000	
Monthly Reports	1998	3.5000	0.174	Technical Competence/ Effectiveness	3.6667	0.414
	2003	5.3750			4.0000	
Continuous Improvement	1998	3.0000	0.044	Provision of Information	3.6000	0.197
	2003	5.5000			5.0000	
Technical Competence/ Effectiveness	1998	3.0000	0.060	Continuous Improvement	2.3333	0.068
	2003	5.3750			5.0000	
Overall	1998	5.2083	0.433	Overall	4.9444	0.083
	2003	5.2813			5.1944	

APPENDIX F5

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of FX MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Impartial and Integrity	1998	5.5000	0.402	Impartial and Integrity	5.0000	0.487
	2003	5.8333			5.4667	
Testing Frequency Satisfaction	1998	5.5000	0.378	Testing Frequency Satisfaction	5.0000	0.121
	2003	5.8333			6.0000	
Testing Accuracy Satisfaction	1998	5.2000	0.703	Housekeeping	5.0000	0.121
	2003	5.5000			4.0000	
Customer Satisfaction	1998	4.5000	0.306	Testing Accuracy Satisfaction	4.8333	0.796
	2003	5.2222			5.1667	
Suitability of Technology	1998	4.5000	0.378	Monthly Reports	4.3333	1.000
	2003	5.1667			4.3333	
World-Class	1998	4.5000	0.441	General Satisfaction	4.0000	0.099
	2003	5.3333			5.6667	
Housekeeping	1998	4.5000	0.475	Suitability of Technology	4.0000	0.369
	2003	5.6667			5.0000	
Employee Ability	1998	4.3333	0.306	World-Class	4.0000	0.637
	2003	4.9444			4.3333	
Cost-Effectiveness	1998	4.1000	0.094	Handling Queries	3.9167	0.072
	2003	5.1667			5.0000	
Recent Improvement	1998	4.0000	0.293	Customer Satisfaction	3.8889	0.072
	2003	5.3333			5.1111	
Technical Competence/ Effectiveness	1998	4.0000	0.161	Employee Ability	3.7778	0.500
	2003	5.3333			4.6667	
Handling Queries	1998	3.8750	0.615	Technical Competence/ Effectiveness	3.6667	0.105
	2003	5.0417			5.0000	
Provision of Information	1998	3.8000	0.064	Provision of Information	3.6000	0.046
	2003	5.2333			5.0000	
General Satisfaction	1998	3.5000	0.049	Cost-Effectiveness	3.5333	0.658
	2003	5.5000			4.1333	
Monthly Reports	1998	3.5000	1.000	Recent Improvement	3.3333	0.261
	2003	3.5000			4.3333	
Continuous Improvement	1998	3.0000	0.068	Continuous Improvement	2.6667	0.046
	2003	5.1667			5.0000	
Overall	1998	4.3472	0.182	Overall	4.0278	0.050
	2003	5.2685			4.8981	

APPENDIX F6

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of GH MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Testing Frequency Satisfaction	1998	6.0000	1.000	Testing Frequency Satisfaction	5.6667	0.887
	2003	6.0000			5.6667	
General Satisfaction	1998	5.5000	0.109	Testing Accuracy Satisfaction	5.5000	0.601
	2003	6.1429			5.7500	
Impartial and Integrity	1998	4.7000	0.056	Impartial and Integrity	5.4000	0.298
	2003	5.8286			6.0667	
Employee Ability	1998	4.5000	0.299	General Satisfaction	5.0000	0.165
	2003	5.1905			5.6667	
Testing Accuracy Satisfaction	1998	4.5000	0.645	Cost-Effectiveness	4.7333	0.239
	2003	5.4286			5.2000	
World-Class	1998	4.5000	0.747	Handling Queries	4.6667	0.019
	2003	5.0000			5.7500	
Handling Queries	1998	4.0000	0.091	Customer Satisfaction	4.3333	0.042
	2003	5.4286			5.6111	
Cost-Effectiveness	1998	3.9000	0.303	Recent Improvement	4.3333	0.785
	2003	4.7143			4.6667	
Provision of Information	1998	3.8000	0.032	Employee Ability	4.1111	0.138
	2003	5.3143			5.3889	
Recent Improvement	1998	3.5000	0.282	Suitability of Technology	4.0000	0.039
	2003	4.4286			5.3333	
Continuous Improvement	1998	3.5000	0.117	Continuous Improvement	3.6667	0.125
	2003	4.4286			4.5000	
Suitability of Technology	1998	3.5000	0.357	World-Class	3.6667	0.179
	2003	5.1429			4.8333	
Housekeeping	1998	3.5000	0.443	Provision of Information	3.4000	0.016
	2003	4.8571			5.2333	
Monthly Reports	1998	3.5000	0.091	Technical Competence/ Effectiveness	3.3333	0.090
	2003	5.2857			5.0000	
Customer Satisfaction	1998	3.3333	0.032	Housekeeping	2.3333	0.065
	2003	4.9048			4.6667	
Technical Competence/ Effectiveness	1998	3.0000	0.035	Monthly Reports	2.3333	0.017
	2003	4.8571			4.8333	
Overall	1998	4.0833	0.040	Overall	4.3611	0.020
	2003	5.2302			5.4213	

APPENDIX F7

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of KM MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Testing Frequency Satisfaction	1998	6.0000	0.761	Impartial and Integrity	6.0800	0.074
	2003	6.3333			6.2000	
Impartial and Integrity	1998	5.5000	1.000	General Satisfaction	5.8000	0.558
	2003	5.5333			6.0000	
Cost-Effectiveness	1998	5.5000	0.374	Testing Accuracy Satisfaction	5.6000	0.024
	2003	4.8000			6.0000	
Housekeeping	1998	5.5000	1.000	Handling Queries	5.5500	0.031
	2003	5.3333			6.5000	
General Satisfaction	1998	5.0000	0.543	Employee Ability	5.4000	0.079
	2003	5.6667			6.0000	
Testing Accuracy Satisfaction	1998	5.0000	0.767	Customer Satisfaction	5.2000	0.031
	2003	5.5000			5.6667	
Technical Competence/ Effectiveness	1998	5.0000	0.182	Testing Frequency Satisfaction	5.2000	0.079
	2003	4.3333			6.0000	
World-Class	1998	5.0000	1.000	World-Class	4.8000	1.000
	2003	5.0000			5.0000	
Employee Ability	1998	4.8333	0.564	Cost-Effectiveness	4.6000	0.079
	2003	4.5556			4.4000	
Handling Queries	1998	4.7500	0.248	Provision of Information	4.6000	0.010
	2003	5.6667			5.4000	
Customer Satisfaction	1998	4.1667	0.543	Continuous Improvement	4.4000	0.009
	2003	4.7778			6.0000	
Recent Improvement	1998	4.0000	0.767	Technical Competence/ Effectiveness	4.2000	0.118
	2003	3.6667			5.0000	
Suitability of Technology	1998	4.0000	0.197	Housekeeping	4.0000	0.079
	2003	5.3333			3.0000	
Monthly Reports	1998	4.0000	0.554	Suitability of Technology	3.8000	0.123
	2003	4.6667			5.0000	
Provision of Information	1998	3.7000	0.083	Monthly Reports	3.6000	0.561
	2003	5.0000			4.0000	
Continuous Improvement	1998	3.5000	0.139	Recent Improvement	3.4000	0.176
	2003	5.0000			3.0000	
Overall	1998	4.7639	0.248	Overall	5.0222	0.032
	2003	5.1019			5.4444	

APPENDIX F8

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of ML MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Handling Queries	1998	6.5833	0.024	General Satisfaction	6.0000	0.374
	2003	5.1000			4.5000	
Testing Accuracy Satisfaction	1998	6.1667	0.216	Handling Queries	5.9167	0.076
	2003	4.8000			4.8750	
Testing Frequency Satisfaction	1998	6.0000	0.752	Testing Accuracy Satisfaction	5.8333	0.068
	2003	6.2000			5.0000	
General Satisfaction	1998	5.6667	0.877	Impartial and Integrity	5.6667	0.139
	2003	5.4000			5.0000	
Impartial and Integrity	1998	5.6667	0.089	Testing Frequency Satisfaction	5.6667	1.000
	2003	4.9600			6.0000	
Cost-Effectiveness	1998	5.6667	0.227	Housekeeping	5.6667	0.076
	2003	5.0000			3.5000	
Recent Improvement	1998	5.6667	0.288	Customer Satisfaction	5.3333	0.046
	2003	3.8000			4.6667	
Employee Ability	1998	5.3333	0.638	Recent Improvement	5.3333	0.076
	2003	4.6000			3.5000	
Customer Satisfaction	1998	5.3333	0.288	World-Class	5.3333	0.543
	2003	4.7333			5.0000	
World-Class	1998	5.3333	0.536	Cost-Effectiveness	4.8000	0.374
	2003	5.0000			3.7000	
Housekeeping	1998	5.3333	0.860	Employee Ability	4.5556	0.374
	2003	5.4000			4.0000	
Technical Competence/ Effectiveness	1998	4.6667	0.279	Continuous Improvement	4.0000	0.139
	2003	5.6000			5.5000	
Continuous Improvement	1998	3.6667	0.273	Provision of Information	4.0000	0.083
	2003	4.6000			5.4000	
Monthly Reports	1998	3.6667	0.020	Technical Competence/ Effectiveness	3.3333	0.068
	2003	5.6000			5.0000	
Provision of Information	1998	2.8000	0.021	Suitability of Technology	3.3333	0.076
	2003	5.0800			5.5000	
Suitability of Technology	1998	2.3333	0.024	Monthly Reports	3.3333	0.068
	2003	5.4000			6.0000	
Overall	1998	5.1019	0.655	Overall	4.9815	1.000
	2003	5.0056			4.7361	

APPENDIX F9

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of MS MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Impartial and Integrity	1998	5.8667	0.642	Handling Queries	6.0000	0.104
	2003	5.8571			5.2500	
Handling Queries	1998	5.5000	0.416	General Satisfaction	5.7143	0.903
	2003	5.1786			5.7500	
Customer Satisfaction	1998	5.3333	0.563	Testing Accuracy Satisfaction	5.2857	0.135
	2003	5.4762			6.0000	
Testing Frequency Satisfaction	1998	5.3333	0.246	Testing Frequency Satisfaction	5.2857	0.076
	2003	6.1429			6.0000	
Cost-Effectiveness	1998	5.2000	0.906	Impartial and Integrity	4.9706	0.008
	2003	5.3143			5.5000	
General Satisfaction	1998	5.0000	0.542	Employee Ability	4.8571	0.215
	2003	5.5714			5.2500	
Housekeeping	1998	5.0000	0.812	Housekeeping	4.8571	0.754
	2003	5.1429			5.0000	
Employee Ability	1998	4.8889	0.292	Recent Improvement	4.5714	0.754
	2003	5.3333			4.7500	
Testing Accuracy Satisfaction	1998	4.6667	0.486	Customer Satisfaction	4.3333	0.239
	2003	5.2857			5.3333	
Suitability of Technology	1998	4.6667	0.056	World-Class	4.2857	0.088
	2003	6.4286			5.7500	
World-Class	1998	4.6667	0.473	Cost-Effectiveness	4.1714	0.846
	2003	4.8571			4.2500	
Provision of Information	1998	4.0000	0.022	Monthly Reports	3.8571	0.214
	2003	5.3143			4.7500	
Technical Competence/ Effectiveness	1998	4.0000	0.023	Technical Competence/ Effectiveness	3.4286	0.076
	2003	5.5714			5.0000	
Monthly Reports	1998	4.0000	0.202	Suitability of Technology	3.4286	0.055
	2003	5.1429			5.5000	
Recent Improvement	1998	3.6667	0.301	Continuous Improvement	3.2857	0.054
	2003	4.4286			5.0000	
Continuous Improvement	1998	3.6667	0.067	Provision of Information	3.0286	0.008
	2003	5.1429			4.7500	
Overall	1998	4.9259	0.087	Overall	4.4900	0.008
	2003	5.4048			5.1319	

APPENDIX F10

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of NB MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Cost-Effectiveness	1998	5.8000	0.180	Impartial and Integrity	5.4000	0.180
	2003	4.2667			6.0000	
Handling Queries	1998	4.9500	0.544	General Satisfaction	5.0000	0.317
	2003	5.5833			5.6667	
Impartial and Integrity	1998	4.5200	0.219	Monthly Reports	5.0000	1.000
	2003	5.6000			5.0000	
Customer Satisfaction	1998	4.2000	0.368	Cost-Effectiveness	4.8000	0.655
	2003	5.4444			4.2667	
General Satisfaction	1998	4.0000	0.124	Customer Satisfaction	4.6667	0.157
	2003	5.3333			5.3333	
Monthly Reports	1998	4.0000	0.442	Handling Queries	4.2500	0.157
	2003	4.6667			5.3333	
Provision of Information	1998	3.8400	0.230	Recent Improvement	4.0000	0.346
	2003	5.2667			5.0000	
Testing Accuracy Satisfaction	1998	3.7000	0.097	Continuous Improvement	4.0000	0.346
	2003	5.3333			5.0000	
Technical Competence/ Effectiveness	1998	3.6000	0.127	Testing Accuracy Satisfaction	4.0000	0.346
	2003	5.3333			5.1667	
World-Class	1998	3.2000	0.442	World-Class	4.0000	0.317
	2003	4.3333			4.6667	
Suitability of Technology	1998	3.2000	0.095	Provision of Information	3.2000	0.180
	2003	5.0000			4.8000	
Recent Improvement	1998	3.0000	0.150	Testing Frequency Satisfaction	3.0000	0.157
	2003	4.3333			5.3333	
Continuous Improvement	1998	3.0000	0.030	Technical Competence/ Effectiveness	3.0000	0.083
	2003	4.6667			5.0000	
Testing Frequency Satisfaction	1998	3.0000	0.010	Suitability of Technology	3.0000	0.083
	2003	6.3333			5.0000	
Employee Ability	1998	2.6000	0.174	Housekeeping	3.0000	0.564
	2003	3.8889			4.0000	
Housekeeping	1998	2.6000	0.093	Employee Ability	2.6667	0.180
	2003	4.6667			4.2222	
Overall	1998	4.1111	0.025	Overall	4.1111	0.180
	2003	5.0370			5.0093	

APPENDIX F11

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of PG MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Handling Queries	1998	6.8500	0.012	Cost-Effectiveness	6.8000	0.121
	2003	5.4375			5.9000	
General Satisfaction	1998	6.8000	0.024	General Satisfaction	6.5000	0.317
	2003	6.0000			6.0000	
Testing Accuracy Satisfaction	1998	6.8000	0.022	Testing Accuracy Satisfaction	6.5000	0.102
	2003	6.0000			5.7500	
Testing Frequency Satisfaction	1998	6.6000	0.074	Testing Frequency Satisfaction	6.5000	0.317
	2003	6.0000			6.0000	
Impartial and Integrity	1998	6.4800	0.060	Housekeeping	6.5000	0.221
	2003	6.1000			5.5000	
World-Class	1998	6.4000	0.121	Handling Queries	6.5000	0.121
	2003	5.5000			5.7500	
Employee Ability	1998	6.0000	0.169	Impartial and Integrity	6.1000	0.683
	2003	5.3333			5.9000	
Cost-Effectiveness	1998	5.8800	0.178	Employee Ability	5.5000	0.221
	2003	5.2500			4.5000	
Housekeeping	1998	5.8000	0.009	Customer Satisfaction	5.5000	0.683
	2003	3.5000			5.3333	
Customer Satisfaction	1998	5.3333	0.796	Technical Competence/ Effectiveness	5.5000	0.683
	2003	5.4167			5.0000	
Technical Competence/ Effectiveness	1998	5.2000	0.439	Recent Improvement	5.0000	0.083
	2003	4.7500			4.0000	
Recent Improvement	1998	4.6000	0.558	World-Class	5.0000	0.317
	2003	4.2500			4.5000	
Provision of Information	1998	4.4400	0.323	Continuous Improvement	4.0000	0.683
	2003	5.3000			4.5000	
Continuous Improvement	1998	4.0000	0.432	Suitability of Technology	4.0000	0.317
	2003	4.5000			5.0000	
Monthly Reports	1998	4.0000	0.101	Provision of Information	3.8000	0.439
	2003	5.2500			4.9000	
Suitability of Technology	1998	3.6000	0.157	Monthly Reports	3.5000	0.683
	2003	4.7500			4.5000	
Overall	1998	5.7222	0.014	Overall	5.6111	0.439
	2003	5.3819			5.3472	

APPENDIX F12

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of SZ MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
General Satisfaction	1998	5.7500	0.693	Impartial and Integrity	5.7000	0.814
	2003	5.5000			5.6500	
Impartial and Integrity	1998	5.3000	0.451	Cost-Effectiveness	5.3000	1.000
	2003	5.7000			5.1500	
Testing Accuracy Satisfaction	1998	5.1250	0.645	Handling Queries	5.2500	0.812
	2003	5.4167			5.1875	
Customer Satisfaction	1998	5.0000	0.193	Employee Ability	5.1667	1.000
	2003	5.3889			5.1667	
Handling Queries	1998	5.0000	1.000	Testing Accuracy Satisfaction	4.7500	0.348
	2003	5.1667			5.3750	
Cost-Effectiveness	1998	4.9500	0.732	General Satisfaction	4.5000	0.211
	2003	5.0000			5.5000	
Housekeeping	1998	4.5000	0.825	World-Class	4.5000	0.803
	2003	4.1667			4.7500	
Continuous Improvement	1998	4.2500	0.102	Customer Satisfaction	4.1667	0.333
	2003	5.6667			4.7500	
Technical Competence/ Effectiveness	1998	4.2500	0.276	Recent Improvement	4.0000	0.264
	2003	5.3333			4.5000	
World-Class	1998	4.2500	0.693	Testing Frequency Satisfaction	4.0000	0.171
	2003	4.5000			6.2500	
Employee Ability	1998	4.0833	0.065	Technical Competence/ Effectiveness	4.0000	0.025
	2003	5.1667			5.0000	
Suitability of Technology	1998	4.0000	0.118	Housekeeping	4.0000	0.812
	2003	5.0000			4.0000	
Provision of Information	1998	3.8500	0.051	Continuous Improvement	3.5000	0.134
	2003	5.2000			4.5000	
Recent Improvement	1998	3.7500	0.438	Monthly Reports	3.5000	0.095
	2003	4.3333			5.2500	
Monthly Reports	1998	3.7500	0.065	Suitability of Technology	3.5000	0.171
	2003	5.8333			4.5000	
Testing Frequency Satisfaction	1998	3.2500	0.014	Provision of Information	2.7000	0.064
	2003	5.8333			5.2000	
Overall	1998	4.6042	0.032	Overall	4.5139	0.165
	2003	5.2454			5.1528	

APPENDIX F13

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of UF MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
World-Class	1998	5.6667	0.683	General Satisfaction	6.0000	0.480
	2003	5.5000			6.2500	
Recent Improvement	1998	5.3333	0.554	Testing Frequency Satisfaction	6.0000	1.000
	2003	5.7500			6.0000	
Cost-Effectiveness	1998	5.2667	0.586	Impartial and Integrity	5.9000	0.814
	2003	5.4500			6.3500	
General Satisfaction	1998	5.0000	0.435	Cost-Effectiveness	5.9000	0.100
	2003	6.0000			5.0500	
Monthly Reports	1998	5.0000	0.354	Testing Accuracy Satisfaction	5.7500	0.617
	2003	5.7500			6.2500	
Provision of Information	1998	4.5333	0.142	Handling Queries	5.7500	1.000
	2003	5.4000			5.8125	
Testing Accuracy Satisfaction	1998	4.5000	0.105	Housekeeping	5.5000	0.340
	2003	5.7500			4.0000	
Housekeeping	1998	4.3333	0.554	Customer Satisfaction	5.3333	0.325
	2003	4.7500			6.3333	
Impartial and Integrity	1998	4.2000	0.048	Technical Competence/ Effectiveness	5.0000	0.576
	2003	6.1500			5.5000	
Employee Ability	1998	4.0000	0.050	Suitability of Technology	5.0000	0.480
	2003	5.6667			4.7500	
Continuous Improvement	1998	4.0000	0.028	Provision of Information	4.9000	0.481
	2003	6.2500			5.3000	
Handling Queries	1998	3.9167	0.271	Employee Ability	4.5000	0.060
	2003	5.6875			5.9167	
Testing Frequency Satisfaction	1998	3.3333	0.029	Continuous Improvement	4.5000	0.453
	2003	6.5000			5.0000	
Customer Satisfaction	1998	2.7778	0.048	World-Class	4.5000	0.348
	2003	5.5833			5.5000	
Technical Competence/ Effectiveness	1998	2.6667	0.029	Monthly Reports	4.5000	0.812
	2003	5.5000			4.7500	
Suitability of Technology	1998	2.6667	0.031	Recent Improvement	4.0000	0.623
	2003	5.2500			4.7500	
Overall	1998	4.2500	0.034	Overall	5.3472	0.643
	2003	5.6736			5.6250	

APPENDIX F14

Comparison of CTS Customer Satisfaction Levels for Millers-Only and Growers-Only of UK MGB between the 1998 and 2003 Surveys.

Characteristic	Year	Growers		Characteristic	Millers	
		Mean	*p*		Mean	*p*
Handling Queries	1998	6.1250	0.374	General Satisfaction	6.0000	0.414
	2003	5.7500			5.6667	
Testing Frequency Satisfaction	1998	6.0000	0.761	Handling Queries	5.7500	0.076
	2003	5.6667			4.8333	
Impartial and Integrity	1998	5.9000	0.519	Impartial and Integrity	5.5000	0.197
	2003	6.2667			6.1333	
Employee Ability	1998	5.8333	0.543	Cost-Effectiveness	5.5000	1.000
	2003	6.0000			5.4000	
General Satisfaction	1998	5.5000	0.221	Testing Frequency Satisfaction	5.5000	0.767
	2003	5.4364			5.3333	
World-Class	1998	5.5000	0.543	Housekeeping	5.5000	0.543
	2003	6.0000			4.6667	
Testing Accuracy Satisfaction	1998	5.2500	0.221	Suitability of Technology	5.0000	0.554
	2003	6.0000			5.6667	
Technical Competence/ Effectiveness	1998	5.0000	0.182	Employee Ability	4.8333	0.053
	2003	5.6667			3.6667	
Customer Satisfaction	1998	4.8333	0.374	Continuous Improvement	4.5000	0.543
	2003	5.3333			5.3333	
Cost-Effectiveness	1998	4.7000	0.767	Testing Accuracy Satisfaction	4.5000	0.374
	2003	4.7333			5.1667	
Recent Improvement	1998	4.5000	0.767	Technical Competence/ Effectiveness	4.5000	0.543
	2003	4.3333			5.3333	
Housekeeping	1998	4.5000	1.000	Monthly Reports	4.5000	0.519
	2003	4.6667			5.6667	
Continuous Improvement	1998	4.0000	0.046	Recent Improvement	4.0000	0.414
	2003	5.0000			4.3333	
Suitability of Technology	1998	4.0000	0.374	World-Class	4.0000	0.519
	2003	5.0000			4.6667	
Provision of Information	1998	3.5000	0.083	Customer Satisfaction	3.5000	0.139
	2003	5.3333			4.7778	
Monthly Reports	1998	3.5000	0.221	Provision of Information	3.3000	0.139
	2003	5.0000			5.0667	
Overall	1998	5.0000	0.248	Overall	4.7778	0.248
	2003	5.5000			5.1296	

APPENDIX G

List of Abbreviations

Abbreviation	Description
AK	Amatikulu
CTS	Cane Testing Service
DL	Darnall
EN	Entumeni
ES	Eston
FX	Felixton
GH	Gledhow
KM	Komati
MGB	Mill Group Board
ML	Malelane
MS	Maidstone
NB	Noodsberg
PG	Pongola
SASA	South African Sugar Association
SZ	Sezela
UF	Umfolozi
UK	Umzimkulu