

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**Sudan University of Science and Technology
College of Graduate Studies**

**Role of Implementation of ISO 22000:2005 on Consumer
Satisfaction in Matthew Poultry Company Sudan**

تطبيق مواصفة ISO 22000: 2005

**و دورها علي رضا المستهلك في شركة ماثيو للدواجن -
السودان**

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الإستهلال

قَالَ تَعَالَى:

﴿يَا أَيُّهَا الَّذِينَ ءَامَنُوا كُفُّوا مِنْ طَيِّبَاتِ مَا رَزَقْنَاكُمْ وَاشْكُرُوا لِلَّهِ إِنْ كُنْتُمْ إِيَّاهُ تَعْبُدُونَ ﴿١٧٢﴾ إِنَّمَا حَرَّمَ عَلَيْكُمُ الْمَيْتَةَ وَالدَّمَ وَلَحْمَ الْخِنْزِيرِ وَمَا أُهْلَ بِهِ لِغَيْرِ اللَّهِ فَمَنْ أَضْطُرَّ غَيْرَ بَاغٍ وَلَا عَادٍ فَلَا إِثْمَ عَلَيْهِ إِنَّ اللَّهَ غَفُورٌ رَحِيمٌ ﴿١٧٣﴾﴾

صدق الله العظيم

سورة البقرة الايات 172-173

DEDICATION

I dedicate this work to the most loving people in my life:

My Father Dr. *Abdelaziz Ahmed Hassan*,

The person who has always given me love, support, encouragement without stopping and paved my way at every step

My Mother *Roda Abdelgadir Abbas* who gave me life and love and encouragement. Always you are looking for my success and happiness, my success come through your prayers for me, my happiness is yours.

To my brothers and my sisters, anything nice has come to my life has been because of your presence in my life.

To my supervisor Professor *Amel Omer Bakhiet* for her advice and guidance to complete this work.

With all my love

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To every person who help and support me to achieve this work

ABSTRACT

The objectives of this research study were to evaluate the impact of ISO 22000:2005 implementation on the quality of products and consumer/customer satisfaction. The study was conducted at Matthew Poultry Company Omdurman Sudan in the period from may to October 2018. A descriptive analytical study took place. The questionnaire was designed with reference to the principal international studies on Food Safety management systems. The final sample studied was 25 respondents who provided a valid set of responses to the questionnaires. The survey responses were analyzed using the Statistical Package for Social Sciences computer software (SPSS 19.0). There was a significant role of ISO22000 in consumer satisfaction, the role of ISO22000 on the internal processes and on the quality of the product. The results showed a significant role of ISO22000 on the increment of the company's profit. The implementation of ISO 22000 supported the company in the awareness of customer and consumers about the quality of food and food safety. The results of this study came out with that application of ISO 22000:2005 have a positive role in consumer satisfaction. The positive role of applying the standard (ISO 22000:2005) that the study had showed on the internal process by enhancing performance also on product quality by improving safety and the finished product quality led to a clear role on consumer satisfaction and retention by increasing customer confidence and reduce compliance. As well as the study showed that applying ISO 22000 have a supporting role in raising the awareness of the community about the importance of food safety and the role and importance of applying the standard to the quality of the product.

مستخلص الدراسة

هدفت هذه الدراسة البحثية الى تقييم تأثير تطبيق ISO 22000: 2005 على جودة المنتجات ورضا العملاء المستهلكين. وقد أجريت الدراسة في شركة ماثيو للدواجن أم درمان السودان في الفترة من مايو الي اكتوبر 2018م أجريت دراسة تحليلية وصفية. تم تصميم الإستبيان مع الإشارة إلى الدراسات الدولية الرئيسية حول نظم إدارة سلامة الأغذية. كانت العينة النهائية التي شملتها الدراسة 25 من المستجيبين الذين قدموا مجموعة من الردود على الاستبيانات. وقد تم تحليل ردود المسح باستخدام برنامج الحزم الإحصائية للعلوم الاجتماعية (SPSS 19.0). ومن النتائج التي توصلت إليها هذه الدراسة ، كان لتطبيق المواصفة ISO 22000: 2005 دور إيجابي في رضا العملاء المستهلكين. أدى الدور الإيجابي لتطبيق المواصفة (ISO 22000: 2005) الذي تظهره الدراسة على العملية الداخلية من خلال تحسين الأداء على جودة المنتج. و تحسين السلامة وجودة المنتج النهائي أدى إلى دور واضح في رضا العملاء والاحتفاظ بهم عن طريق زيادة ثقة العملاء. وكذلك أظهرت الدراسة أن تطبيق المواصفة ISO 22000: 2005 له دور داعم في زيادة وعي المجتمع بأهمية سلامة الأغذية ودور وأهمية تطبيق المواصفة على جودة المنتج.

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INTRODUCTION

Following series of food safety crises throughout the Nineteen Nineties, reduced consumers confidence in the food system's ability to deliver safe, high-quality food (Roosen, 2003). From farm to table, food safety is of utmost concern for all consumers. Absence of cleanliness or misusing of nourishment prompts the spread of sicknesses and diseases. This can be avoided when all food chain operators (such as those involved in manufacturing, producing, processing, preserving, catering, storing, packaging, transporting and operating of restaurants/cafes) implement a food safety management system to ensure the supply of hygienic and safe food products and services (GSO, 2018).

As a result regulators, producers and retailers are attempting to gain consumer confidence by redesigning legislation and quality-assurance programs (Roosen, 2003). Mamalis *et al.*, (2009) and Kafel and Sikora, (2011) recorded that the advantages of ISO 22000 include; optimum distribution of resources inside the food chain organization, effective communication of suppliers, clients, authorities and other involved authorities, prerequisite programs focusing, better documentation and creation of trust with the prerequisite the credibility of management system to increase sales to individual customers / consumers.

ISO 22000:2005 certification endorsed to the organization indicates the safety of the food and the compliance with legal requirements regarding food safety and demonstrates ability to control safety requirements agreed by customers / consumers and regulators and it shows the interests and proposes to improve customer/consumer satisfaction (Dobrin *et al.*, 2015).

Expanding customer interest for safe sustenance has driven numerous food companies to create food quality administration frameworks and nourishment wellbeing consistence the board frameworks, in light of the Hazard Analysis and Critical Control Point (HACCP) approach. In 2001, the International Organization for Standardization (ISO) began the development of a management standard for the food industry, building on HACCP's role in food safety management systems (<https://www.qms.net/iso-22000/>).

ISO 22000:2005 standard defines food safety management requirements for companies that need to meet and exceed global food safety regulations. The standard shares a common approach with other management systems including ISO 9001 and ISO 14001 which benefits creating an integrated management system. This standard serves as a guideline in the implementation of a food safety management system, comprising of effective processes and best practices to improve food safety (<https://www.qms.net/iso-22000/>).

Many food companies in Sudan demonstrate a commitment to food safety, establish food safety objectives, provide support to establish the Food Safety Management System (FSMS), ensure there is adequate infrastructure and work environment and implement ISO 22000/2005 and being certified.

In Sudan, Matthew Poultry Company is a leader in the field of poultry (broilers and layers) for meat and eggs production. It demonstrates ability to control safety requirements agreed by the consumers and customers. It has major interests and proposes to improve their satisfaction through the effective control of food safety hazards.

The objectives of this research study were to:

- Evaluate the impact of ISO 22000:2005 implementation on the quality of products.
- Evaluate the impact of ISO 22000:2005 on consumer/customer satisfaction

CHAPTER ONE

LITERATURE REVIEW

1.1. Back ground

The consumption preferences are diversified and changed than in the past; income, demographic variables and lifestyles, are no longer sufficient to categorize consumers (Fabris, 2003). Consumers are increasingly looking for quality food, healthier, safer, tastier and obtained with environmentally care (Gao *et al.*, 2010; Alfnes *et al.*, 2004; Farruggia *et al.*, 2016).

The conception of quality, assumes these days, particularly for agro-food merchandise, a three-dimensional nature coupled to a plurality of attributes (Grunert, 1997). Some attributes of quality, are simply noticeable and considerable by consumers before purchase (quality expectation), but others, may be perceived solely when (quality experience) (Grunert, 1997). These attributes, are of elementary importance as a result of, together, outline and characterize the merchandise and provides consumer's utility (Lancaster, 1966).

A very important contribute to the definition of the conception of quality for the buyer, has given by Steenkamp (1997) with the approach of the "perceived quality". Steenkamp, on the bottom of the excellence of quality attributes in "extrinsic" and "intrinsic" adopted by Olson and Jacoby (1972), defines quality as a subjective conception that depends on the perceptions, the requirements and objectives of the individual client.

Zeithaml, (1988); Oude Ophuis *et al.*, (1995); Steenkamp, (1997) and Farruggia *et al.*, (2016) stated that based on this assumption, the construct of quality is split into categories, each characterized by variety of things that represent the key components for the formulation of the buyer/consumer judgment (Zeithaml, 1988., Steenkamp, 1997;).

The primary category of things, relate the extraneous attributes (brand, country of origin, price, etc....) that regarding the merchandise however at the identical time doesn't belong it physically (Erickson *et al.*, 1984).

Some of these are representing by price, brand, packaging, certifications or even physical store point (Cardello, 1995; Meiselman *et al.*, 2000; Tuorila *et al.*, 1994; Verbeke *et al.*, 1999; Farruggia *et al.*, 2016). The second category concerns, instead, the intrinsic attributes (taste, smell, color, freshness, nutraceutical properties, etc.) which, unlike the previous ones, are closely related to the physical characteristics of the product; in agreement with Olson and Jacoby (1972), these attributes cannot undergo any modification if not by varying the physical characteristics of the product itself (Bredahl *et al.*, 1998; Bryhni *et al.*, 2003; Hurling *et al.*, 2003; Issanchou, 1996; Farruggia *et al.*, 2016).

Furthermore, intrinsic attributes can be distinguished, in accordance with Nelson (1974), Darby and Karni (1973), in search attributes, experience attributes and credence attributes, with reference to the moment when the consumer verifies the quality of the product (Grunert *et al.*, 2004). The search attributes (size, color, defects, etc.) and experience attributes (taste, freshness, etc) can be applied by the consumers, respectively, before purchase and after consumption. Instead, the credence attributes

are impossible to be evaluated both after the purchase as after consumption (Migliore *et al.*, 2015). Indeed, these joined to the characteristics of the merchandise and also the production method that can't be noted with certainty by customers even after consumption (Farruggia *et al.*, 2016).

1.2. Food consumption:

Farruggia *et al.*, (2016) reported that Menozzi and Mora (2012) argued the differences in consumption are depending on the country of origin, gender or by age. Stark Casagrande and Gary-Webb (2010) argued that the differences for products can be attributed to the cultural profile and the food preferences of the consumers, and to the strong competition of snacks and unhealthy foods; these latter are easily available on the market at lower prices than fresh products. In fact, communication is a valuable tool to reduce the information asymmetry, bringing benefits if the source is credible (Brunsø *et al.*, 2002). Farruggia *et al.*, (2016) mentioned that in a study conducted by Crescimanno *et al.*, (2014), they found the intrinsic characteristics play a decisive role in the choices of consumers and, in particular the health properties. Referring to the classification of the attributes of quality made by Nelson (1974), Darby and Karni (1973), health aspects are among the questionable credence attributes as they cannot be experienced directly by the consumer even after consumption.

Farruggia *et al.*, (2016) reported that there is not a direct relationship between consumption and effect; the latter is too long term and therefore, not measurable by the consumer; however with reference to the healthy eating (Brunsø *et al.*, 2002), these attributes take on considerable importance. Also the attribute color plays an important role in the perception of the quality of consumer and it is in some way connected to health aspects, because, as argued by James *et al.* (2002), the intense

colors, are associated with the presence of substances with preventive value against certain diseases (stroke, cancer, etc.). In addition, the color is also an important indicator of taste, which has mentioned in the literature as one of the main factors on which consumers base their choices (Mitchell *et al.*, 1988; Koewn *et al.*, 1995; Thompson *et al.*, 1995). Koch and Koch (2003) found that red color is linked positively to the degree of sweetness and fruitiness, and negatively with the degree of bitterness, acidity, frothy and syrupy. As found by Péneau *et al.* (2006), in a study conducted in EU countries and AgV (1981) in a study carried out in Germany, the freshness is the attribute that most influences the food choices of consumers. With regard to extrinsic attributes, price is one of the main factors taken into account in purchasing decisions by consumers, because it can gain more influence consumer behavior belonging to low income groups (Williams *et al.*, 2012).

Certification schemes and labeling that give visibility to the territorial origin of the product or, for example, methods of production with low environmental impact, have been by years widely used in the food market (Farruggia *et al.*, 2016). Espejuel (2007) showed that the designations of origin play an important role in the perception of the quality of the consumer. Farruggia *et al.*, (2016) mentioned that Papanagiotou *et al.*, (2013) and Font *et al.*, (2011), showed that the origin of products is one of the attributes that have considerable influence on the choice of the consumer, for which is a guarantee of quality. Farruggia *et al.*, (2016) reported that some studies done by Schimmenti *et al.*, (2013), Schimmenti *et al.*, (2010) and Font *et al.*, (2011) highlight the growing attention paid by consumers both to issues of sustainable development and animal welfare.

Many studies has been carried out about the ethnocentric behaviors through which the consumer expresses a priori, a preference to products originating in their country or region as driven by the belief that the purchase of domestic products is valuable to support the economy of their country (Bertoli *et al.*, 2005). The hypothesis of our study is that consumers are driven by intrinsic attributes mainly in their choice (in particular healthy properties).

1.3. Quality:

Quality is about making organizations perform for their stakeholders – from improving products, services, systems and processes, to making sure that the whole organization is fit and effective.

Managing quality means constantly pursuing excellence: making sure that what your organization does is fit for purpose, and not only stays that way, but keeps improving.

There's a lot more to quality than just manufacturing widgets without any defects or getting trains to run on time – although those things are certainly part of the picture.

What quality means for your organization is ultimately a question for your stakeholders. And by stakeholders we mean anyone who has an interest in the success of what your organization does.

Customers will be the most important group of stakeholders for the majority of businesses, but investors, employees, suppliers and members of our wider society are stakeholders too. Delivering quality in your organization means knowing who your stakeholders are, understanding

what their needs are and meeting those needs (or even better, exceeding expectations), both now and in the future (CQI and IRCA website).

Most people have a conceptual understanding of quality as relating to one or more desirable characteristics that a product or service should possess. Although this conceptual understanding is certainly a useful starting point (Montgomery, 2009).

Quality means those features of products which meet customer needs and thereby provide customer satisfaction, in this sense the meaning of quality is oriented to income (Juran and Godfrey 1999). Also quality means fitness for use, quality improvement is the reduction of variability in processes and products (Montgomery, 2009).

1.4. International Organization for Standardization (ISO):

ISO (International Organization for Standardization) is an independent, non-governmental membership organization and the world's largest developer of voluntary international standards.

It is made up of 162-member countries that are the national standard bodies around the world, with a central secretariat that has been in Geneva, Switzerland (www.iso.org).

1.4.1. The standards:

International standards make things work. They give excellence specifications for products, services and systems, to ensure quality, safety and efficiency. They are instrumental in facilitating international trade.

ISO has published more than 21000 International Standards covering almost every industry, from technology, to food safety, to agriculture and

health care. ISO International standards affect everything, everywhere (www.iso.org).

1.4.2. Food standard:

Food standards give scientific criteria to ensure that products are fit for their stated purposes with legal requirements. They provide common frames of reference for defining the product. Standards are useful to consumers, the industry and regulatory authorities, standards may also include specifications for labeling, packaging, methods of analysis and sampling (Jaiswal, 2009).

1.5. Food safety:

Is the concept that food will not cause harm to the consumer when it is prepared and/or eaten.

Food safety is linked with food-borne hazards present in food at the point of consumption. Since food safety hazards can occur at any stage in the food chain it is essential that adequate control measure be put in place to avoid or minimize food safety hazards (Prati and McIntyre, 2004).

1.6. Food safety management system (FSMS):

Is a network of interrelated elements that combine to ensure that food does not cause adverse human health effects. These elements include programs, plans, policies, procedures, practices, processes, goals, objectives, methods, controls, roles, responsibilities, relationships, documents, records and resources (ISO 22000:2005).

In parallel with improvement in the scientific basis of food microbiology, development have also been made in the more prosaic business of ensuring that this knowledge is applied in a systematic way in order to be

certain that foods are produced, processed and served with the minimum risk of causing illness.

With the advent of microbiology as an experimental scientific discipline, the possibility of testing foods to see if they contained pathogens or other organisms of concern became a possible means for controlling quality. This approach persists to this day although it now plays more of a complementary role to other management schemes since its limitations are widely recognized.

The distribution of organisms in solid foods mean that truly representatives' samples for testing were not easily obtained – the only way to increase confidence in a test result is to take an unfeasibly large proportion of the lot for testing. Hence, with any realistic sampling scheme there is an appreciable chance that acceptable product will be rejected or that unacceptable product will be accepted. A further drawback is that results from failing samples do not necessarily indicate where in the production process a problem arose. Therefore, in the absence of any remedial information similar failures in the future cannot be prevented. Thus, it became recognized that application of good practices during the manufacture or production of food was a more effective way of controlling quality (Wilson 1970).

Sir Graham Wilson summarized this view at a meeting on microbiological standards held in 1969: Food Safety Management Systems in parallel with improvements in the scientific basis of food microbiology. Developments has also been made in the more prosaic business of ensuring that this knowledge is applied in a systematic way in order to be certain that foods are produced, processed and served with the minimum risk of causing illness.

Introduction of Food Microbiology 15 Bacteriologists are better employed in devising means to prevent or overcome contamination than in examining more and more samples, control of processing is of far greater importance than examination of the finished articles. (Wilson 1970).

Microbiological Risk Analysis has been described as the third wave of food safety following GMP and HACCP. It comprises three interrelated activities:

-Risk Assessment

-Risk Communication

-Risk Management

Microbiological Risk Assessment (MAR) is the scientific part and has as its objective the provision of a formal, validated and transparent estimate of the level of risks, which can be communicated to policy and decision makers to inform Risk Management and Risk Communication. The impetus for internationally agreed Risk Assessment procedures came initially from world trade talks in the 1990s, where it was recognized that to prevent food safety being used as a nontariff barrier to international trade in foods, decisions regarding any risk that they might pose should be based on sound, transparent and agreed procedures for the assessment of risk.

Microbiological risk assessment consists of four stages:

-**Hazard identification**- the identification of pathogens, which may be present in a particular food.

-Hazard characterization – a qualitative\quantitative evaluation of the adverse effects of a pathogen including if possible the relationship between pathogen dose and effect (dose\response).

-Exposure assessment – an estimate of the likely intake of the particular pathogen based on food consumption patterns and incidence of the pathogen.

-Risk characterization – a qualitative /quantitative estimate (including its attendant uncertainties) of the probability and consequences of illness caused by the pathogen.

A number of risk assessments have been produced (see, for example and in the assessment of alternative control measures. Ultimately, an MAR should contribute to establishing an agreed food safety objective – a statement of the maximum frequency of occurrence or level of pathogen in a food considered acceptable for consumer protection – something that should be deliverable through the application of good hygiene and HACCP (Notermans and Barendsz 2002).

1.7. HACCP:

HACCP system is a science-based system created to identify specific hazards and actions to control them in order to ensure food safety and quality. It can be considered an efficient tool for both the food industry and health authorities in preventing food borne disease (Vela and Fernandez, 2003). A hazard is a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect (Codex Alimentarius, 1997).

A HACCP system should be developed for every food production line as

HACCP is a production control system for the industry. It is a process that identifies where potential contamination can occur at the critical control points (CCPs) and strictly manages and monitors these points as a way of ensuring the process is in control and that the safest product possible is being produced. HACCP is designed to prevent rather than catch potential hazards (Jackson and Cross 1995).

Unnevehr and Jensen (1998) describe the six principles in developing and operating a HACCP program:

1. Assess the hazard, list the steps in the process where significant hazards can occur and describe the prevention measures.
2. Determine critical control CCPs in the process.
3. Establish critical limits for each CCP.
4. Establish corrective actions to be taken when monitoring indicates a deviation from the CCP limits.
- 5- Establish record keeping for the HACCP system.
6. Establish procedure to verify that the HACCP system is working correctly.

1.8. Good manufacturing practices (GMP):

The South African National standard (SANS 10049:2011) describes Good Manufacturing practices (GMP) or prerequisites for HACCP as basic good hygiene practices that need to be in place before HACCP can be implemented.

The world health organization (WHO, 2011) defines GMP as that part of quality assurance which ensures that products are consistently produced

and controlled to the quality standards appropriate to their intended use and required by the marketing authorization.

Dewanti-Hariyadi (2009) defines GMP as the foundation of the food processing operation to achieve consistent quality and safety. It also provides the basic requirements that should be fulfilled to assure good practices pertaining to the worker, the facility, the environment, the equipment and process control.

Good Manufacturing Practices (GMP) provided a framework for the hygienic production of food rather than retrospectively identifying problems by accepting or rejecting batches based on microbiological testing (Notermans and Barendsz 2002).

Codes of GMP have been produced by a range of bodies such as the Codex Alimentarius commission and number of trade associations. These cover aspects such as plant layout and design and the control of operating procedures. Their principal limitation lies in their broad-brush coverage, which means that they tend to be general in scope and qualitative in terms of the advice provided. This failing was recognized quite early on and led to the development of more systematic approaches based on an analysis of individual processing to identify which important steps were critical to the control of microbial hazards and ensuring that control was exercised and monitored at these points (Da-Wen, 2012).

1.9. Quality Management System (QMS):

According to CERCO Working Group on Quality (2000) a QMS be defined as the managing structure, responsibilities, procedure, processes, and management resources to implement the principles and action lines needed to achieve the quality objectives of an organization.

A QMS is defined by Business Dictionary (2011) as a system by which an organization aims to reduce and eventually eliminate non-conformance to specifications, standards, and customer expectations in the most cost-effective and efficient manner.

1.10. ISO 22000:

ISO 22000 is the new international generic FSMS standard for food safety management systems. It defines a set of general food safety requirements that apply to all organizations in the foodchain.

Recognized worldwide, this universal standard harmonizes key requirements and overcome the difficulties of various food safety standards by region, country, activity, organization and food type. If an organization is part of the food chain, ISO 22000 requires the establishment of a food safety management system (FSMS) and usage of this system to ensure that food products do not cause adverse human health effects.

The requirement of ISO 22000 can be applied to all types of organizations within the food chain ranging from feed products, primary products, food manufactures, transport and storage operators, subcontractors to retail and food service outlets together with inter-related organization such as products of equipment, packaging materials, cleaning agents, additives and ingredients.

Organizations are cognizant of the need to demonstrate and provide evidence of their ability to provide safe food. ISO 22000 will help these organizations to establish an FSMS and implement it in the food plant with proper improvement and update of the FSMS system. This standard promotes conformity of products and services to international standards by providing assurance about quality, safety and reliability.

The ISO 22000 standard intends to define the food safety management requirements that companies need to meet and exceed in order to comply with food safety regulations all over the world. It is intended to one standard that encompasses the entire consumer and market needs. It speeds and simplifies processes without compromising other quality or safety management system.

ISO 22000 uses generally recognized methods of food safety management such as interactive communication across the food chain,

System management, control of food safety hazards through PRPS and HACCP plans, and continual improvement as well as periodic updating of the management system.

Furthermore, the requirement of emergency preparedness and response plan of ISO 22000 is also a basic requirement of ISO 14001 that is the worldwide environmental management system (EMS) (Culley, 1998). This standard has many elements in common with ISO 9001, it has its roots in BS 7750 (Quality Standard), and it is related to Eco-Management and Audit Regulation (EMAR). One of the strengths of ISO 14001 is that it is not a performance standard.

It does not specify how the requirements of any section should be satisfied, nor does it specify levels of environmental performance that an organization should achieve (Ritchie and Hayes, 1998).

The standard has become necessary because of the significant increase of illnesses caused by infected food in both developed and developing countries.

In addition to the health hazards, food borne illness can give rise to considerable economic costs including medical treatment, absence from

work, insurance payments and legal compensation. As a result, a number of countries have developed national standards for the supply of safe food and individual companies and groupings in the food sector have developed their own standards or programs for auditing their suppliers.

While ISO 22000 can be implemented on its own, it is designed to be fully compatible with ISO 9001:2000.

1.11. Customer Satisfaction:

Ramees and Safeena (2016) defined customer satisfaction as a marketing term that measures how products or services supplied by a company meet or surpass a customer's expectation.

Customer satisfaction is important because it provides marketers and business owners with a metric that they can use to manage and improve their businesses.

Here are the reasons why customer satisfaction is so important:

- It's a leading indicator of consumer repurchase intentions and loyalty
- It's a point of differentiation
- It reduces customer churn
- It increases customer lifetime value
- It reduces negative word of mouth
- It's cheaper to retain customers than acquire new ones (Ramees and Safeena, 2016).

It's a point of differentiation:

In a competitive marketplace where businesses compete for customers; customer satisfaction is seen as a key differentiator. Businesses who

succeed in these cut-throat environments are the ones that make customer satisfaction a key element of their business strategy.

- Not only can customer satisfaction help you keep a finger on the pulse of your existing customers, it can also act as a point of differentiation for new customers (Ramees and Safeena, 2016).

It reduces customer churn:

An Accenture global customer satisfaction report in 2008 found that price is not the main reason for customer churn; it is actually due to the overall poor quality of customer service (Ramees and Safeena 2016).

- Customer satisfaction is the metric you can use to reduce customer churn. By measuring and tracking customer satisfaction you can put new processes in place to increase the overall quality of your customer service (Ramees and Safeena, 2016).

It increases customer lifetime value:

- A study by Info Quest found that a ‘totally satisfied customer’ contributes 2.6 times more revenue than a ‘somewhat satisfied customer’. Furthermore, a ‘totally satisfied customer’ contributes 14 times more revenue than a ‘somewhat dissatisfied customer’ (Ramees and Safeena, 2016).
- Satisfaction plays a significant role in how much revenue a customer generates for your business. Successful businesses understand the importance of customer lifetime value (CLV). If you increase CLV, you increase the returns on your marketing dollar (Ramees and Safeena, 2016).

It reduces negative word of mouth:

McKinsey found that an unhappy customer tells between 9-15 people about their experience. In fact, 13% of unhappy customers tell over 20 people about their experience.

Customer satisfaction is tightly linked to revenue and repeat purchases. What often gets forgotten is how customer satisfaction negatively impacts the business. It's one thing to lose a customer because they were unhappy. It's another thing completely to lose 20 customers because of some bad word of mouth.

It's cheaper to retain customers than acquire new ones:

This is probably the most publicized customer satisfaction statistic out there. It costs six to seven times more to acquire new customers than it does to retain existing customers.

If that stat does not strike accord with you then there's not much else I can do to demonstrate why customer satisfaction is important.

- Customers cost a lot of money to acquire. You and your marketing team spend thousands of dollars getting the attention of prospects, nurturing them into leads and closing them into sales (Ramees and Safeena, 2016).

Here are some customer retention strategies:

- Use blogs to educate customers
- Use email to send special promotions
- Use customer satisfaction surveys to listen
- Delight customers by offering personalized experiences

- Lee Resource Inc. found that for every customer complaint there are 26 other unhappy customers who have remained silent (Ramees and Safeena, 2016).

That is an alarming statistic. Most companies think they are the best and they have no unhappy customers. The reality is, 96% of unhappy customers do not complain. In fact, Financial Training Services found that most simply just leave and never come back.

Customer satisfaction plays an important role within your business. Not only is it the leading indicator to measure customer loyalty, identify unhappy customers, reduce churn and increase revenue; it is also a key point of differentiation that helps you to attract new customers in competitive business environments (Beard, 2014).

Satisfaction can be defined as a features or characteristics that can full the either a need or want of a consumer in better way than competitors.

Although this satisfaction explained by different researchers in different ways. If a company provides a product according to the requirements of their consumers it will lead the satisfaction of those consumers.

The higher or lower satisfaction of a consumer will depends upon the quality of brand characteristics that offered by a company. This consumer satisfaction which contributes for the future money making for a company

For the retention of consumers of a company do not take time to switch that brand. A low quality service is such type of service which does not service fulfills the requirements and also lead to satisfaction. However it's all depends upon that which segments a company is targeting and what

Customer satisfaction is the key factor which is used to measure the company internal and external performances and assigning funds to each and every activity.

And there are strong relations between satisfaction and loyalty.

According to Shankar *et al.*, (2003), "In business you get what you want by giving other people what they want".

In marketing the marrow thought is customer satisfaction because it indicates the customer loyalty towards any service or product. The company can generate maximum profit via customer satisfaction is momentous in present world to run the business perfectly.

Finally the basic component of business success is customer satisfaction.

1.12. Matthew Poultry Company Quality and food safety Policy:

Matthew Poultry Company and KaK Restaurant Chains Commitment is to satisfy and minimizing all possible hazards and providing safe, high quality hygienic food products all service outlets as per the international standard for quality and food safety and by implementation of good manufacturing practices production, supply and service of food in order to achieve and maintain this, Matthew Poultry Company and KaK Restaurant Chains Commitment to:

- Producing and supplying food products in high standards of quality and safety, in accordance with good hygiene practice and the principles of HACCP.

- Comply with the requirements of the local and international food safety Acts and all other relevant legislation; Codes of Practice, Industry Guides and other approved guidance.

-Provide adequate and appropriate resources (i.e premises, facilities equipment, protective clothing, staff, supervision, information instruction and training) to assist in the implementation of the above.

-Ensure that this Policy is applied throughout all Units of Matthew Mixed farm Project and Kak Restaurant chains where food business is operated and that all staff involved are aware of their responsibilities and will ensure that this policy is reviewed regularly.

-Improve personal skills and competencies and increase their involvement of our staff on quality and food safety programs.

-Maintain and integrated Management System satisfying requirements which include PASS 99:2012, ISO 9001:2008, and ISO 22000:2005 standards.

-Steering toward total quality and excellence through continual improvement of the effectiveness of Quality and Food Safety management system in all areas of our business management, targeting customer requirement and satisfaction.

CHAPTER TWO

MATERIAL AND METHODS

2.1. Study area:

This study was conducted in Matthew Poultry Company Omdurman - Sudan in the period from may to October 2018.

2.2. Study design:

In this research a descriptive method was used, using a questionnaire testing approached aims to examine impact of application ISO 22000:2005 on a food organization and consumer satisfaction. The selection of research components was done in accordance with the objectives of the research. Research hypotheses also provide the basis for designing a research work (Singh, 2006).

2.3. Study population:

The study targeted only the departments of marketing, sales, quality control and supply chain. The population included managers, supervisors and employees.

The study samples consisted of twenty five (25) questionnaires distributed to respondents from the company. Employees were selected as the stratified random method. The distribution of the samples was according to the variables.

2.4. Study tool:

The study tool included three main parts which were:

The first: dealt with the general demographic information about the respondents on the questionnaire.

The second: was devoted to know the role of implementation ISO 22000 on performance of company from managers and supervisors and employees perspective.

The third: the research study used the Likert Scale, which calculates the Grades as follows:

Grade (5) as a weight for each answer 'Totally disagree'

Grade (4) as a weight for each answer 'Disagree'

Grade (3) as a weight for each answer 'Neutral'

Grade (2) as a weight for each answer 'Agree'

Grade (1) as a weight for each answer 'Totally agree'

2.5. Study procedures and data collection:

The study was conducted according to the following steps:

- 1- Identifying the study sample.
- 2- Preparation of the study measurement of the questionnaire.
- 3- Distribute the study tool on the study samples, and retrieval of the questionnaire. Twenty five (25) questionnaires were distributed all of them were retrieved.
- 4- Data analysis using computer program.

2.6. Statistical Analysis:

Statistical Package for Social Sciences (SPSS) version 19 was used. Chi-square test for the significance of differences between the answers was used.

CHAPTER THREE

RESULTS

The sample size consisted of 25 completed questionnaires in Matthew Poultry Company and all were valid responses, with a response rate of 100%. The respondents which participated in the survey were mainly responsible for food safety, quality managers or administrators of the company and employees.

Table (1) illustrates that the distribution of the sex among the population sample was 12 (48.0%) male and 13 (52.0%) female.

The job title and position was four managers, 4 head departments and 17 employees with percentage 16%, 16% and 68% respectively as shown in Table (2).

Figure (1) shows that fifteen of responders were having bachelor degree (60%) and ten (40%) have masters degree.

Figure (2) illustrates the distribution of the experience of study sample. Ten were having experience less than 5 years (%40.0), 7 with experience between 5 to 10 years (%28.0) and eight were more than 10 years experience (%32.0).

Table1. The frequency and percentage (%) of population/sample sex.

Sex	Frequencies	Percentage
Male	12	48.0%
Female	13	52.0%
Total	25	100.0%

Table2. Job title/position frequency and percentage of population/sample.

Job Title	Frequencies	Percentage
Manager	4	16.0%
Head of department	4	16.0%
Employee	17	68.0%
Other	0	0.0%
Total	25	100.0%

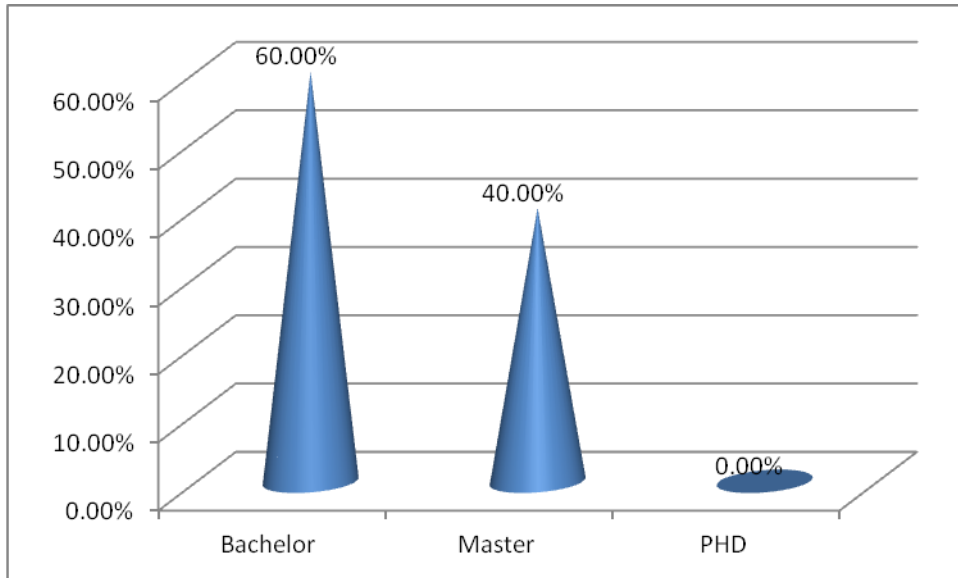


Figure 1. The frequency and percentage of responders qualification.

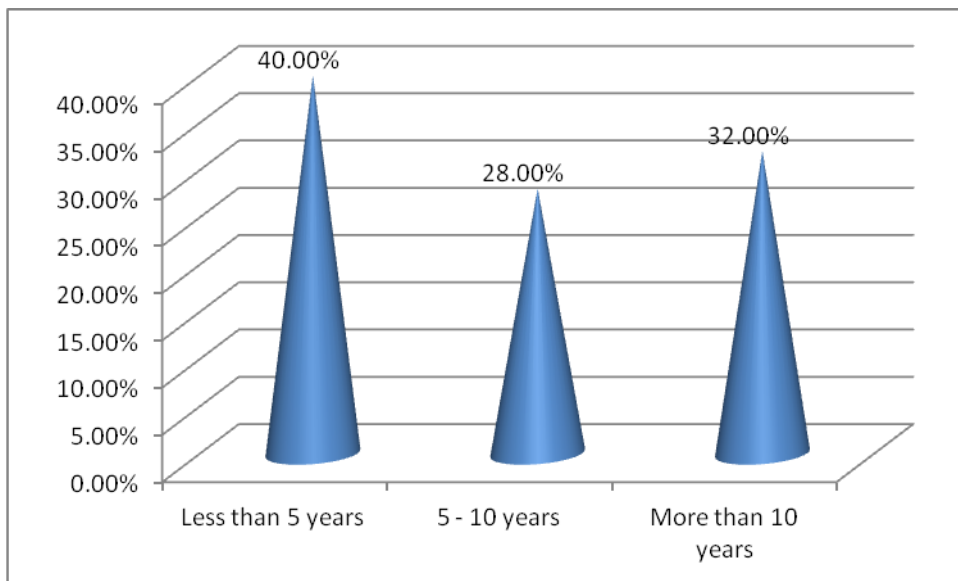


Figure 2. Study population experience/year frequency and percentage .

Reliability and validity of the questionnaire:

Cranach's alpha method:

Reliability was calculated using Cranach's alpha equation shown below:

$$\text{Reliability coefficient} = \frac{1 - \text{Total variations questions}}{\text{variation college grades}} * \frac{n}{N-1}$$

$$\text{Validity} = \sqrt{\frac{n}{N-1} * \frac{1 - \text{Total variations questions}}{\text{variation college grades}}}$$

Cranach alpha coefficient = (.083), a reliability coefficient was high and it indicated the stability of the scale and the validity of the study.

Validity coefficient is the square of the islands so reliability coefficient is (.091), and this shows that there was a high sincerity of the scale and that the benefit of the study (Table 3).

Table 3. Cranach's alpha method for reliability of questionnaire.

No	Value	Reliability	Validity
1	Role of ISO 22000 2005 on customer satisfaction	0.75	0.87
2	Role of ISO 22000 in improvement of Production process	0.76	0.87
3	Role of ISO 22000 on quality of product	0.66	0.81
4	Role of ISO 22000 ON profit	0.74	0.86
5	Role of company that implement ISO 22000 ON awareness of the society about food safety and implementation of ISO 22000	0.69	0.83
Total		0.83	0.91

Table (4) shows the responses to the different statements that addressed for study population.

For consumer satisfaction (the core value for the company) ; the study sample responded with the strongly agree (%84.0), agree (%16.0), neutral (%0.0), disagree (%0.0) and strongly disagree (%0.0).

The consumer confidence of the company product quality would increase when implementing ISO 22000. The study population was strongly agree (%72.0), agree (%28.0), neutral (%0.0) disagree (%0.0) and strongly disagree (%0.0).

The company make survey and questionnaire to identify customer needs; was strongly agree (%20.0), agree (%76.0), neutral (%4.0), disagree (%0.0) and strongly disagree (%0.0).

The company committed to listening to customer and consumer suggestion and proposals: was strongly agree (%12.0), agree (%84.0), neutral (%4.0), disagree (%0.0) and strongly disagree (%0.0).

The company products meet customer and s needs: strongly agree (%12.0), agree (%80.0), neutral (%4.0), disagree (%4.0) and strongly disagree (%0.0).

The company's management is keen to listen and resolve consumer problems: strongly agree (%16.0), agree (%80.0), neutral (%4.0), disagree (%0.0) and strongly disagree (%0.0).

The implementation of ISO 22000 reduces customer complaints: strongly agree (%24.0),agree (%68.0), neutral (%4.0), disagree (%4.0) and strongly disagree by (%0.0).

Isolate nonconformance products from the factory and recall it even after intering the market by traceability team: strongly agree (%36.0), agree (32.0%), neutral (%32.0), disagree (%0.0), strongly disagree (%0.0).

Determine the target consumer to each product, taking into consideration people with special needs: strongly agree (%12.0), agree (%12.0), neutral (%76.0), disagree (%0.0) and strongly disagree (%0.0).

Table (4) Role of ISO 22000 2005 on customer satisfaction (frequency and percentage).

No	Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Consumer satisfaction is a core value for the company and all employees	21	4	0	0	0
		84.0	16.0	0.0	0.0	0.0
2	The implementation of ISO 22000 increase customer confidence on company products	18	7	0	0	0
		72.0	28.0	0.0	0.0	0.0
3	The company make survey and questionnaire to identify customer needs	5	19	1	0	0
		20.0	76.0	4.0	0.0	0.0
4	The company is committed to listening customer suggestion and proposals	3	21	1	0	0
		12.0	84.0	4.0	0.0	0.0
5	Our products meets customer needs	3	20	1	1	0
		12.0	80.0	4.0	4.0	0.0
6	The company's management is keen to listen and resolve consumer problems	4	20	1	0	0
		16.0	80.0	4.0	0.0	0.0
7	The implementation of ISO 22000 reduce customer complain	6	17	1	1	0
		24.0	68.0	4.0	4.0	0.0
8	Isolate non-conformance products from the factory, and recall it even after inter to market by traceability team	9	8	8	0	0
		36.0	32.0	32.0	0.0	0.0
9	Determine the target consumer to each product, taking into consideration people with special needs	3	3	19	0	0
		12.0	12.0	76.0	0.0	0.0

Role of ISO 22000 2005 on customer satisfaction/ Chi-square test results for respondents answer:

1. The value of chi – square calculated to signify the differences between Consumer satisfaction is a core value for the company and all employees: the result was (11.560) with P-value (0.000) which is lower than the level of significant value (5%) This refers to the existence of differences statistically.
2. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 increase customer confidence on company products was (4.840) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
3. The value of chi – square calculated to signify the differences between the company make survey and questionnaire to identify customer needs was (21.440) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
4. The value of chi – square calculated to signify the differences between the company is committed to listening customer suggestion and proposals was (29.120) with P-value (0.000) which is lower than the level of significant value (5%). This refers to the existence of differences statistically.
5. The value of chi – square calculated to signify the differences between our products meets customer needs was (40.760) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
6. The value of chi – square calculated to signify the differences between the company's management is keen to listen and resolve consumer

problems was (25.040) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.

7. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 reduce customer complain was (27.320) with P-value (0.000) which is lower than the level of significant value (5%)/ These refer to the existence of differences statistically.
8. The value of chi – square calculated to signify the differences between Isolate nonconformance products from the factory, and recall it even after inter to market by traceability team was (15.213) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
9. The value of chi – square calculated to signify the differences between Determine the target consumer to each product, taking into consideration people with special needs was (20.480) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.

Table5. Role of ISO 22000 2005 on customer satisfaction/ Chi-square test results for respondents answer.

No	Phrases	Chi-square value	Df	Sig.	Median	Interpretation
1	Consumer satisfaction is a core value for the company and all employees	11.560	1	0.000	5.00	strongly agree
2	The implementation of ISO 22000 increase customer confidence on company products	4.840	1	0.000	5.00	strongly agree
3	The company make survey and questionnaire to identify customer needs	21.440	2	0.000	4.00	agree
4	The company is committed to listening customer suggestion and proposals	29.120	2	0.000	4.00	agree
5	Our products meets customer needs	40.760	3	0.000	4.00	agree
6	The company's management is keen to listen and resolve consumer problems	25.040	2	0.000	4.00	agree
7	The implementation of ISO 22000 reduce customer complain.	27.320	3	0.000	4.00	agree
8	Isolate non conformance products from the factory, and recall it even after inter to market by traceability team	15.213	2	0.000	4.00	agree
9	Determine the target consumer to each product, taking into consideration people with special needs	20.480	2	0.000	3.00	neutral

Table6. Role of ISO 22000 in improvement of Production process (the frequency and percentage of responders) .

No	Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Implementation of ISO 22000 improves the process of manufacturing and monitoring methods	18	7	0	0	0
		72.0	28.0	0.0	0.0	0.0
2	HACCP system reduces problems of production, and product pollution	8	16	1	0	0
		32.0	64.0	4.0	0.0	0.0
3	Critical limit CL for critical control points are defined	7	13	5	0	0
		28.0	52.0	20.0	0.0	0.0
4	Times of monitoring able to detect any un conformance products	4	14	7	0	0
		16.0	56.0	28.0	0.0	0.0
5	HACCP processes improved regularly	2	8	15	0	0
		8.0	32.0	60.0	0.0	0.0
6	There are records to verification processes and it is reviewed with food safety team	2	10	13	0	0
		8.0	40.0	52.0	0.0	0.0
7	The resulting data from the monitoring of preparatory programs for operation and critical control points is assessed by a person with sufficient knowledge and authority to initiate corrective action	3	9	13	0	0
		12.0	36.0	52.0	0.0	0.0
8	Control procedures effective and ensure a safety final product is obtained	3	11	11	0	0
		12.0	44.0	44.0	0.0	0.0
9	Manufacturing phases and control procedures are described and organized and also describe interrelated between them	8	13	4	0	0
		32.0	52.0	16.0	0.0	0.0
10	There is labs for required analysis to check raw material	3	17	3	2	0
		12.0	68.0	12.0	8.0	0.0

From the above Table (6) the implementation of ISO 22000 improves the process of manufacturing and monitoring methods; the results of each statement are as follows

Implementation of ISO 22000 improves the process of manufacturing and monitoring methods by the strongly agree (%72.0), agree (%28.0), neutral (%0.0), disagree (%0.0) and strongly disagree (0.0%).

HACCP system reduces problems of production, and product pollution: strongly agree (%32.0), agree (%64.0), neutral (%4.0), disagree (%0.0) and strongly disagree (%0.0).

Critical limit CL for critical control points are defined: the strongly agree (%28.0), agree (%52.0), neutral (%20.0), disagree (%0.0) and strongly disagree (%0.0).

Times of monitoring able to detect any un conformance products by the strongly agree (%16.0), agree (%56.0), neutral (%28.0), disagree (0.0%) and strongly disagree (%0.0).

HACCP processes improved regularly: the strongly agree (%8.0), agree (%32.0), neutral (%60.0), disagree (%0.0), and strongly disagree (%0.0).

There are records to verification processes and it is reviewed with food safety team: the strongly agree (%8.0), agree (%40.0), neutral (%52.0), disagree (%0.0) and strongly disagree (%0.0).

The resulting data from the monitoring of preparatory programs for operation and critical control points is assessed by a person with sufficient knowledge and authority to initiate corrective action: the strongly agree (%12.0), agree (%36.0), neutral (%52.0), disagree (%0.0) and strongly disagree (%0.0).

Control procedures effective and ensure a safety final product is obtained: the strongly agree (%12.0), agree (%44.0), neutral (%44.0), disagree (%0.0) and strongly disagree (%0.0).

Manufacturing phases and control procedures are described and organized and also describe interrelated between them: the strongly agree (%32.0), agree (%52.0), neutral (%16.0), disagree (%0.0), strongly disagree (%0.0).

There is labs for required analysis to check raw material: the strongly agree (%12.0), agree (%68.0), neutral (%12.0), disagree (%8.0) and strongly disagree (%0.0).

Table (7) Role of ISO 22000 in improvement of production process (chi-square test results for respondents answers).

No	Phrases	Chi-square value	df	Sig.	Median	Interpretation
1	Implementation of ISO 22000 improves the process of manufacturing and monitoring methods	4.840	1	0.000	5.00	strongly agree
2	HACCP system reduces problems of production, and product pollution	13.520	2	0.000	4.00	agree
3	Critical limit CL for critical control points are defined	4.160	2	0.000	4.00	Agree
4	Times of monitoring able to detect any un conformance products	6.320	2	0.000	4.00	Agree
5	HACCP processes improved regularly	10.160	2	0.000	3.00	Neutral
6	There are records to verification processes and it is reviewed with food safety team	7.760	2	0.000	3.00	Neutral
7	The resulting data from the monitoring of preparatory programs for operation and critical control points is assessed by a person with sufficient knowledge and authority to initiate corrective action	6.080	2	0.000	3.00	Neutral
8	Control procedures effective and ensure a safety final product is obtained	5.120	2	0.000	4.00	Agree
9	Manufacturing phases and control procedures are described and organized and also describe interrelated between them	4.880	2	0.000	4.00	agree
10	There is labs for required analysis to check raw material	24.760	2	0.000	4.00	Agree

Table (7) shows the chi-square test results of respondents answers to the statement: Role of ISO 22000 in improvement of production process.

1. The value of chi – square calculated to signify the differences between Implementation of ISO 22000 improves the process of manufacturing and monitoring methods was (4.840) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
2. The value of chi – square calculated to signify the differences between HACCP system reduces problems of production, and product pollution was (13.520) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
3. The value of chi – square calculated to signify the differences between Critical limit CL for critical control points are defined was (4.160) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
4. The value of chi – square calculated to signify the differences between Times of monitoring able to detect any un conformance products was (6.320) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
5. The value of chi – square calculated to signify the differences between HACCP processes improved regularly was (10.160) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
6. The value of chi – square calculated to signify the differences between There are records to verification processes and it is reviewed with food safety team was (7.760) with P-value (0.000) which is lower than

the level of significant value (5%). These refer to the existence of differences statistically.

7. The value of chi – square calculated to signify the differences between The resulting data from the monitoring of preparatory programs for operation and critical control points is assessed by a person with sufficient knowledge and authority to initiate corrective action was (6.080) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
8. The value of chi – square calculated to signify the differences between Control procedures effective and ensure a safety final product is obtained was (5.120) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
9. The value of chi – square calculated to signify the differences between Manufacturing phases and control procedures are described and organized and also describe interrelated between them was (4.880) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
10. The value of chi – square calculated to signify the differences between There is labs for required analysis to check raw material was (24.760) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.

The frequency and percentage for Role of ISO 22000 on quality of product statement are illustrated in Table (8).

Table (9) show the chi-square results for the same statements.

Table (8) Role of ISO 22000 on quality of product (frequency and percentage).

No	Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	The implementation of Standard lead to production of a high quality product	22	2	1	0	0
		88.0	8.0	4.0	0.0	0.0
2	Quality of product is being developed on regular basis according to customer and consumer need	8	15	2	0	0
		32.0	60.0	8.0	0.0	0.0
3	Raw material that affects the quality of product are tested and analysed	4	19	2	0	0
		16.0	76.0	8.0	0.0	0.0
4	HACCP system reduces pollution of product and lead to produce safe product	6	17	1	1	0
		24.0	68.0	4.0	4.0	0.0
5	Critical control limits are established to ensure that the acceptable level of risk in the finished product that has been identified will not be exceeded	5	14	5	1	0
		20.0	56.0	20.0	4.0	0.0
6	All measurement devices are calibrated periodically	4	6	15	0	0
		16.0	24.0	60.0	0.0	0.0
7	Product quality specifications are clearly defined	6	17	2	0	0
		24.0	68.0	8.0	0.0	0.0
8	There is a description to characterization of product including name of product and it is compounds and expired date and stocking recommendations	17	7	1	0	0
		68.0	28.0	4.0	0.0	0.0
9	There is a traceability system help to pull or recall products when detecting problem in it	8	10	7	0	0
		32.0	40.0	28.0	0.0	0.0

Table (9) show the results of the implementation of Standard lead to production of a high quality product statements as follows:

The implementation of Standard lead to production of a high quality products: the strongly agree (88.0%), agree (8.0%), neutral (4.0%), disagree (0.0%) and strongly disagree (0.0%).

Quality of product is being developed on regular basis according to customer and consumer need: the strongly agree (32.0%), agree (60.0%), neutral (8.0%), disagree (0.0%) and strongly disagree (0.0%).

Raw material that affects the quality of product are tested and analyzed: the strongly agree (16.0%), agree (76.0%), neutral (8.0%), disagree (0.0%) and strongly disagree (0.0%).

HACCP system reduces pollution of product and lead to produce safe product: the strongly agree (24.0%), agree (68.0%), neutral (4.0%), disagree (4.0%) and strongly disagree (0.0%).

Critical control limits are established to ensure that the acceptable level of risk in the finished product that has been identified will not be exceeded: the strongly agree (20.0%), agree (56.0%), neutral (20.0%), disagree (4.0%) and strongly disagree (0.0%).

All measurement devices are calibrated periodically: the strongly agree (16.0%), agree (24.0%), neutral (60.0%), disagree (0.0%) and strongly disagree (0.0%).

Product quality specifications are clearly defined: the strongly agree (24.0%), agree (68.0%), neutral (8.0%), disagree (0.0%) and strongly disagree (0.0%).

There is a description to characterization of product including name of product and it is compounds and expired date and stocking recommendations: the strongly agree (68.0%), agree (28.0%), neutral (4.0%), disagree (0.0%) and strongly disagree (0.0%).

There is a traceability system help to pull or recall products when detecting problem in it: the strongly agree (32.0%), agree (40.0%), neutral (28.0%), disagree (0.0%) and strongly disagree (0.0%).

Table (9) Role of ISO 22000 on quality of product (Chi-square test results for respondents' answers).

No	Phrases	Chi-square value	df	Sig.	Median	Interpretation
1	The implementation of Standard lead to production of a high quality product	33.680	2	0.000	5.00	strongly agree
2	Quality of product is being developed on regular basis according to customer and consumer need	10.160	2	0.000	4.00	agree
3	Raw material that affects the quality of product are tested and analyzed	20.720	2	0.000	4.00	agree
4	HACCP system reduces pollution of product and lead to produce safe product	27.320	3	0.000	4.00	agree
5	Critical control limits are established to ensure that the acceptable level of risk in the finished product that has been identified will not be exceeded	14.520	3	0.000	4.00	agree
6	All measurement devices are calibrated periodically	8.240	2	0.000	3.00	neutral
7	Product quality specifications are clearly defined	14.480	2	0.000	4.00	agree
8	There is a description to characterization of product including name of product and it is compounds and expired date and stocking recommendations	15.680	2	0.000	5.00	strongly agree
9	There is a traceability system help to pull or recall products when detecting problem in it	12.560	2	0.000	4.00	agree

The results of Table (8) are as follows:

1. The value of chi – square calculated to signify the differences between the implementation of Standard lead to production of a high quality product was (33.680) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
2. The value of chi – square calculated to signify the differences between Quality of product is being developed on regular basis according to customer and consumer need was (10.160) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
3. The value of chi – square calculated to signify the differences between Raw material that affects the quality of product are tested and analyzed was (20.720) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
4. The value of chi – square calculated to signify the differences between HACCP system reduces pollution of product and lead to produce safe product was (27.320) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
5. The value of chi – square calculated to signify the differences between Critical control limits are established to ensure that the acceptable level of risk in the finished product that has been identified will not be exceeded was (14.520) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
6. The value of chi – square calculated to signify the differences between All measurement devices are calibrated periodically was

(8.240) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.

7. The value of chi – square calculated to signify the differences between Product quality specifications are clearly defined was (14.480) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
8. The value of chi – square calculated to signify the differences between There is a description to characterization of product including name of product and its compounds and expired date and stocking recommendations was (15.680) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
9. The value of chi – square calculated to signify the differences between There is a traceability system help to pull or recall products when detecting problem in it was (12.560) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.

Table (10) illustrates the frequency and percentage for Role of ISO 22000 on profit at Matthew Poultry Company.

Table (11) illustrates chi-square test results for respondents answer about the role of ISO 22000 on profit the company

Table (10). The frequency and percentage for Role of ISO 22000 on company profit.

No	Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	The implementation of ISO 22000 increases profit	14	9	2	0	0
		56.0	36.0	8.0	0.0	0.0
2	The implementation of ISO 22000 increase turnout on company products	8	15	2	0	0
		32.0	60.0	8.0	0.0	0.0
3	The implementation of ISO 22000 increases sales	8	15	2	0	0
		32.0	60.0	8.0	0.0	0.0
4	The implementation of standard increase company market share	8	16	1	0	0
		32.0	64.0	4.0	0.0	0.0
5	The implementation of ISO 22000 enhance company image and reputation	5	17	2	1	0
		20.0	68.0	8.0	4.0	0.0
6	The implementation of ISO 22000 increase the advantages against competitors	5	18	1	1	0
		20.0	72.0	4.0	4.0	0.0
7	The implementation of ISO 22000 decrease the cost of production and reduce waste	4	18	2	1	0
		16.0	72.0	8.0	4.0	0.0

From the above Table (10) results show the following:

The implementation of ISO 22000 increases profit: the strongly agree (%56.0), agree (%36.0), neutral (%8.0), disagree (%0.0) and strongly disagree (%0.0).

The implementation of ISO 22000 increase turnout on company products: the strongly agree (%32.0), agree (%60.0), neutral (%8.0) and disagree (%0.0) and strongly disagree (%0.0).

The implementation of ISO 22000 increases sales: the strongly agree (%32.0), agree (%60.0), neutral (%8.0), disagree (%0.0) and strongly disagree (%0.0).

The implementation of standard increase company market share: the strongly agree (%32.0), agree (%64.0), neutral (%4.0), disagree (%0.0) and strongly disagree (%0.0).

The implementation of ISO 22000 enhances company image and reputation: the strongly agree (%20.0), agree (%68.0), neutral (%8.0), disagree (%4.0) and strongly disagree (%0.0).

The implementation of ISO 22000 increases the advantages against competitors: the strongly agree (%20.0), agree (%72.0), neutral (%4.0), disagree (%4.0) and strongly disagree (%0.0).

The implementation of ISO 22000 decreases the cost of production and reduce waste: strongly agree (%16.0), agree (%72.0), neutral (%8.0), disagree (%4.0) and strongly disagree (%0.0).

Table (11) Role of ISO 22000 on company profit (chi-square test results of respondents answers.

No	Phrases	Chi-square value	Df	Sig.	Median	Interpretation
1	The implementation of ISO 22000 increases profit	8.720	2	0.000	5.00	strongly agree
2	The implementation of ISO 22000 increase turnout on company products	10.160	2	0.000	4.00	Agree
3	The implementation of ISO 22000 increases sales	10.160	2	0.000	4.00	Agree
4	The implementation of standard increase company market share	13.520	2	0.000	4.00	Agree
5	The implementation of ISO 22000 enhance company image and reputation	26.040	3	0.000	4.00	Agree
6	The implementation of ISO 22000 increase the advantages against competitors	31.160	3	0.000	4.00	Agree
7	The implementation of ISO 22000 decrease the cost of production and reduce waste	30.200	3	0.000	4.00	Agree

The results of Table (11) are as follows:

1. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 increases profit was (8.720) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
2. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 increase turnout on company products was (10.160) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
3. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 increases sales was (13.520) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
4. The value of chi – square calculated to signify the differences between the implementation of standard increase company market share was (13.520) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
5. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 enhance company image and reputation was (26.040) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
6. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 increase the advantages against competitors was (31.160) with P-value (0.000) which is

lower than the level of significant value (5%). These refer to the existence of differences statistically.

7. The value of chi – square calculated to signify the differences between the implementation of ISO 22000 decrease the cost of production and reduce waste was (30.200) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.

Table (12) illustrates the frequency and percentage for Role of company that implement ISO 22000 on awareness of the society about food safety and implementation of ISO 22000.

The company runs awareness sessions or lectures about importance of food safety and meaning of getting certificate of ISO 22000: the strongly yes were (7) with percentage (%28) and no were (18) with percentage (%72).

The staff of company they spread and publish in their community and family meaning of ISO 22000 and meaning of getting certificate of ISO 22000: they responded by the strongly yes (22) and percentage (%88) and no by (1) and percentage (%4).

Sales people noticed a change in purchasing behavior to better and decrease objections from customer; the strongly yes were (24) and percentage (%96) and no were (1) and percentage (%4).

The company has conducted community surveys that demonstrate the community's awareness of the importance of food safety, importance of implementing of ISO 22000: the strongly yes were (6) and percentage (%24) and no were (19) and percentage (%76).

Table (12) illustrates the frequency and percentage for role of company that implement ISO 22000 on awareness of the society about food safety and implementation of ISO 22000.

No	Items	YES	%	NO	%
1	The company runs awareness sessions or lectures about importance of food safety and meaning of getting certificate of ISO 22000	7	28.0	18	72.0
2	The staff of company they spread and publish in their community and family meaning of ISO 22000 and meaning of getting certificate of ISO 22000	22	88.0	3	12.0
3	Salespeople noticed a change in purchasing behavior to better and decrease objections from customer.	24	96.0	1	4.0
4	The company has conducted community surveys that demonstrate the community's awareness of the importance of food safety, importance of implementing of ISO 22000	6	24.0	19	76.0

Table (13) Role of company that implement ISO 22000 on awareness of the society about food safety and implementation of ISO 22000 (chi-square test results for respondents answers).

No	Phrases	Chi-square value	df	Sig.	Median	Interpretation
1	The company runs awareness sessions or lectures about importance of food safety and meaning of getting certificate of ISO 22000	4.840	1	0.000	2.00	No
2	The staff of company they spread and publish in their community and family meaning of ISO 22000 and meaning of getting certificate of ISO 22000	14.440	1	0.000	1.00	Yes
3	Salespeople noticed a change in purchasing behavior to better and decrease objections from customer.	21.160	1	0.000	1.00	Yes
4	The company has conducted community surveys that demonstrate the community's awareness of the importance of food safety, importance of implementing of ISO 22000	6.760	1	0.000	2.00	No

The results of Table (12) are as follows:

1. The value of chi – square calculated to signify the differences between the company runs awareness sessions or lectures about importance of food safety and meaning of getting certificate of ISO 22000 was (4.840) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
2. The value of chi – square calculated to signify the differences between the staff of company they spread and publish in their community and family meaning of ISO 22000 and meaning of getting certificate of ISO 22000 was (14.440) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
3. The value of chi – square calculated to signify the differences between Salespeople noticed a change in purchasing behavior to better and decrease objections from customer was (21.160) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.
4. The value of chi – square calculated to signify the differences between the company has conducted community surveys that demonstrate the community's awareness of the importance of food safety, importance of implementing of ISO 22000 was (6.760) with P-value (0.000) which is lower than the level of significant value (5%). These refer to the existence of differences statistically.

Hypotheses:

Table (14) shows that the value of the Chi-square test (14.440) by significant value (0.00). It is less than the probability value (0.05) this means that there is role of ISO22000 on the consumer satisfaction .

Table14. The role of ISO22000 on the consumer satisfaction.

No	Chi-square	Df	Sig.	Median	Scale	Statistical significant
25	14.440	1	0.0	4.0	Agree	Significant

Table (15) shows that the value of the Chi-square test 29.120) by significant value (0.00). It is less than the probability value (0.05) and this means that there is role of ISO22000 on the internal processes.

Table15. The role of ISO22000 on the internal processes.

No	Chi-square	Df	Sig.	Median	Scale	Statistical significant
25	29.120	2	0.0	4.0	Agree	Significant

Table (16) shows that the value of the Chi-square test (9.000) by significant value (0.00). It is less than the probability value (0.05) and this means that there is role of ISO22000 on the quality of product.

Table16. The role of ISO22000 on the quality of products.

No	Chi-square	Df	Sig.	Median	Scale	Statistical significant
25	9.000	1	0.00	4.0	Agree	Significant

Table (17) shows that the value of the Chi-square test (15.680) by significant value (0.00). It is less than the probability value (0.05) and this means that there is role of ISO22000 on profits.

Table 17. The role of ISO22000 on profits.

No	Chi-square	Df	Sig.	Median	Scale	Statistical significant
25	15.680	2	0.00	2.0	No	Significant

Table (18) shows that the value of the Chi-square test (4.840) by significant value (0.00). It is less than the probability value (0.05) and this means that: There is a role of the company that implementing ISO22000 support in awareness of customer about quality of food and also implementing of ISC22000 .

Table 18. The role of the company that implementing ISO22000 in the awareness of consumer about quality of food and implementing of ISC22000.

No	Chi-square	Df	Sig.	Median	Scale	Statistical significant
25	4.840	1	0.028	2.0	No	Significant

CHAPTER FOUR

DISCUSSION

The high response rate from the responders can be explained by the accuracy of the contact data available on company, the accurate period of time for the data collection process, or the interest from the companies' side to participate in the research.

Based on the research findings the most important incentive for implementing food safety management system was to increase and improve safety and quality of food products.

From the questionnaire analysis results and based on the values of Chi-square study came out with implementing ISO 22000 have positive role on consumer satisfaction this results agreed with Dobrin *et al.*, (2015). ISO certification improve customer satisfaction through the effective control of food safety hazards. Respondents of this study agreed that application of ISO 22000 have positive role on internal process and this agreed with Gerundino (2014) ISO 22000 enhance performance and reduce cost of rework also agreed with Deming (2000) approach improve quality to increase productivity. Respondents of this study agreed that application of ISO 22000 have positive role on product quality and this agreed with Nyakiokibe and Wanjaw (2014) mentioned that safety is one of the product quality aspects and also agreed with Jaiswal (2009) ISO 22000 help organization to provide consistently safe end product.

Questionnaire analysis results and based on the values of Chi-square study showed implementing ISO 22000 increase profit and this agreed with the economic benefits of standards mentioned by Gerundino (2014) in Juhayna food industry that implementing this standard increase annual

revenue. Implementation of ISO 22000 have positive role on marketing and this identical to Kafel and Sikora (2011) whom considered the standard as a marketing tool and also agreed with Mamalis *et al.*, (2009) also considered standard as a marketing tool and according to Gerundino (2014) implementing ISO 22000 increased market share. Individuals of this study agreed that application of ISO 22000 have positive role on resources management and this agreed with Mamalis *et al.*, (2009) one of the standard advantages the optimum distribution of resources inside the food chain organization.

In Sudan there are many organizations implement food safety management system that's indicate the awareness of organization and employee with their families and customer s to the significant of food safety and it is role on both business growth and customer health.

CONCLUSION AND RECOMMENDATIONS

Conclusion:

This study concluded that application of ISO 22000:2005 have positive role on consumer satisfaction and retention by increasing consumer confidence and reduce complains, positive role on internal process by enhancing performance and reduce waste, also have positive role on product quality by improving safety and the end product quality.

As well as have a positive role on marketing according to the increase in market share, positive role on profit based on the increasing of sales, positive role on resource management based on the optimum distribution of resources.

Some Companies that applying ISO 22000:2005 have quiet role in raising the awareness of community about the importance of food safety and the role and importance of applying the standard to the quality of the product.

Recommendations:

1 -Adoption and adaptation of the requirements of the ISO 22000 to make it easy to implement in organization in Sudan.

2-Annual training for all company staff to update their skills needed for implementation of ISO 22000 to improve the performance.

3-Increase the awareness on food safety and make it a culture and life style in Sudan.

4-More focus on consumer complaints helps improving products.

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Appendix

بسم الله الرحمن الرحيم

**Sudan University of Science and Technology
College of Graduate studies**

Deanship of Quality and Development

Master of Total Quality Management

Scientific Research Questionnaire

SIR:.....السيد:

تحية طيبة وبعد

أضع بين أياديكم استبانة لأغراض البحث العلمي لموضوع (دور تطبيق مواصفة جودة وسلامة الغذاء على رضا المستهلكين)

وأرجو منكم التفضل والتعاون بالإجابة على جميع العبارات الواردة في الاستبانة ونؤكد بأن المعلومات التي سيتم جمعها من خلال اجاباتكم ستحاط بالسرية التامة وتستخدم لأغراض البحث العلمي لذلك نأمل تعاونكم والإجابة على هذه الأسئلة بموضوعية.

ولكم الشكر و التقدير

الباحثة نضال عبد العزيز

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**Sudan University of Science and Technology
College of Graduate studies**

Deanship of Quality and Development

Master of Total Quality Management

Scientific Research Questionnaire

Part One

Personal data:

Sex: Male () Female ()

Job description:

Manager () Head of department () Employee () other ()

Qualification:

BA () MA () PHD ()

Years of experts:

1-5years () 5-10 years () over 10 years ()

Part Two:

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Role of ISO 22000 2005 on customer satisfaction					
1-Consumer satisfaction is a core value for the company and all employees.					
2-The implementation of ISO 22000 increase customer confidence on company products.					
3-The company make survey and questionnaire to identify customer needs.					
4-The company is committed to listening customer suggestion and proposals.					
5-Our products meets customer needs.					
6-The company's management is keen to listen and resolve consumer problems.					
7-The implementation of ISO 22000 reduce customer complain.					
8-Isolate non conformance products from the factory, and recall it even after inter to market by traceability team.					
10-Determine the target consumer to each product, taking into consideration people with special needs.					
Role of ISO 22000 in improvement of Production process					
1-Implementation of ISO 22000 improves the process of manufacturing and monitoring methods.					
2-HACCP system reduces problems of production, and product pollution.					
3- Critical limit CL for critical control points are defined.					
4-Times of monitoring able to detect any un conformance products.					
5-HACCP processes improved regularly.					
6-There are records to verification processes and it is reviewed with food safety team.					
7-The resulting data from the monitoring of preparatory programs for operation and critical control points is assessed by a person with sufficient knowledge and authority to					

initiate corrective action.					
8-Control procedures effective and ensure a safety final product is obtained.					
9-Manufacturig phases and control procedures are described and organized and also describe interrelated between them.					
10-Threr is labs for required analysis to check raw material.					
Role of ISO 22000 on quality of product					
1- The implementation of Standard lead to production of a high quality product.					
2-Quality of product is being developed on regular basis according to customer and consumer need.					
3- Raw material that affects the quality of product are tested and analyzed.					
4-HACCP system reduces pollution of product and lead to produce safe product.					
5-Critical control limits are established to ensure that the acceptable level of risk in the finished product that has been identified will not be exceeded.					
6-All measurement devices are calibrated periodically.					
7-Product quality specifications are clearly defined.					
8. There is a description to characterization of product including name of product and it is compounds and expired date and stocking recommendations.					
9-Ther is a traceability system help to pull or recall products when detecting problem in it.					
Role of ISO 22000 ON profit					
1-The implementation of ISO 22000 increase profit.					
2-The implementation of ISO 22000 increase turnout on company products.					
3-The implementation of ISO 22000 increase sales.					
4-the implementation of standard increase company market share.					
5-The implementation of ISO 22000 enhance company image and reputation.					
6-The implementation of ISO 22000 increase the advantages against competitors.					
7-The implementation of ISO 22000 decrease the cost of production and reduce waste.					

Role of company that implement ISO 22000 ON awareness of the society about food safety and implementation of ISO 22000	Yes	NO			
1-The company runs awareness sessions or lectures about importance of food safety and meaning of getting certificate of ISO 22000.					
2-The staff of company they spread and publish in their community and family meaning of ISO 22000 and meaning of getting certificate of ISO 22000					
3-Salespeople noticed a change in purchasing behavior to better and decrease objections from customer.					
The company has conducted community surveys that demonstrate the community's awareness of the importance of food safety, importance of implementing of ISO 22000.					

بسم الله الرحمن الرحيم

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

عمادة الجودة والتطوير

ماجستير ادارة الجودة الشاملة

استبانة بحث علمي

السادة:

تحية طيبة وبعد

أضع بين أيديكم استبانة لأغراض البحث العلمي لموضوع (دور تطبيق مواصفة جودة وسلامة الغذاء على رضا المستهلكين)

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ولكم الشكر و التقدير

الباحثة نضال عبد العزيز

بسم الله الرحمن الرحيم

**Sudan University of Science and Technology
College of Graduate studies**

Deanship of Quality and Development

Master of Total Quality Management

Scientific Research Questionnaire

الجزء الاول:-

البيانات الشخصية:

الجنس: ذكر () انثى ()

المسمى الوظيفي:

مدير () رئيس قسم () موظف () اخرى ()

المؤهل العلمي:

بكالوريوس () ماجستير () دكتورة ()

عدد سنوات الخبرة:

اقل من خمسة سنوات () من خمسة الى عشرة سنوات () اكثر من عشرة سنوات ()

الجزء الثاني :-

البيان	وافق بشدة	وافق	محايد	لاوافق بشدة	لاوافق بشدة
دور تطبيق المواصفة على رضا العملاء.					
1- رضا العملاء يمثل قيمة أساسية للشركة وكل الموظفين.					
2- زادت ثقة العملاء بمنتجات الشركة بعد تطبيق نظام جودة الأغذية ISO 22000.					
3- تعمل إدارة الشركة على إجراء دراسات مسحية وإستبانات لمعرفة حاجات العملاء.					
4- تلتزم المؤسسة بسماع مقترحات العملاء.					
5- المنتجات المقدمة تلبي إحتياجات العملاء.					
6- تحرص إدارة المؤسسة على الإستماع لمشكلات المستهلكين وتعمل على معالجتها.					
7- تطبيق النظام قلل من ردود الفعل السلبية وقلل شكاوي المستهلكين .					
8- يتم سحب المنتجات غير المطابقة للمواصفات من داخل المصنع او حتى بعد وصولها للمستهلك بواسطة فريق معين لذلك حفاظا على سلامة المستهلكين.					
9- يتم تحديد مجموعات المستخدمين أو المستهلكين لكل منتج مع الأخذ في الإعتبار المجموعات ذات الإحتياجات الخاصة الذين يمكن أن يتأثروا أكثر من غيرهم بمسألة سلامة الغذاء.					
دور تطبيق المواصفة في تحسين العملية الإنتاجية.					

					1- تطبيق المواصفة يعمل على تحسين سير العملية التصنيعية وطرق المراقبة.
					2- قلت مشاكل التصنيع و تلوث المنتج بعد تطبيق نظام HACCP تحليل المخاطر والنقاط الحرجة اثناء التصنيع .
					3- يوجد تحديد للحدود الحرجة لنقاط السيطرة الحرجة.
					4- عدد مرات المراقبة قادرة على تحديد ما إذا تجاوز الحدود الحرجة في الوقت المناسب الذي يمكن من عزل المنتج قبل ان يصل إلى المستهلك.
					5- عمليات تحليل المخاطر يتم تحديثها باستمرار.
					6- يتم تسجيل عمليات التحقق ويتم إخطار فريق سلامة الغذاء بنتائجها.
					7- يتم تقييم البيانات الناتجة من مراقبة البرامج التحضيرية للتشغيل ونقاط السيطرة الحرجة بواسطة شخص يتمتع بالمعرفة الكافية وسلطة لبدء الإجراءات التصحيحية.
					8- إجراءات السيطرة فعالة وتضمن الحصول على منتج نهائي يتمتع بالإمان المطلوب.
					9- يتم وصف خطوات التصنيع وإجراءات التحكم وترتيب حدوثها والتداخل فيما بينها.
					10- توجد معامل لإجراء التحاليل المطلوبة على المواد الخام.
					دور تطبيق المواصفة في جودة المنتج
					1- تطبيق المواصفة يؤدي إلى إنتاج منتج ذو جودة عالية.
					2- جودة المنتج يتم تطويرها بصورة دورية حسب حاجة العملاء والمستهلكين.
					3- يتم فحص وتحليل المواد الخام التي تؤثر على جودة المنتج.
					4- قل تلوث المنتج بعد تطبيق نظام تحليل المخاطر والسيطرة الحرجة HACCP اثناء التصنيع وبالتالي يؤدي

					إلى إنتاج منتج آمن.
					5- يتم إنشاء حدود حرجة للمراقبة لضمان أن المستوى المقبول للخطر في المنتج النهائي والذي تم تحديده لن يتم تجاوزه نطاقه.
					6- كل أجهزة القياس يتم معايرتها بصورة دورية.
					7- مواصفات جودة المنتج يتم تحديدها بكل وضوح.
					8- يتم وصف خصائص المنتج النهائي متضمنة معلومات عن اسم المنتج ومكوناته وخواصه وفترة الصلاحية وظروف التخزين.
					7- تصدر الشركة نظام لتتبع المنتج يتيح بسهولة عملية رصد المنتجات والمواد الخام بغرض سحبه من السوق عند وجود وإكتشاف مشكلة بالمنتج.
					دور تطبيق المواصفة في زيادة الأرباح وتحسين سمعة الشركة.
					1- تطبيق المواصفة زاد من نسبة أرباح الشركة.
					2- زاد الطلب على منتجات الشركة بعد تطبيق المواصفة.
					3- زادت نسبة مبيعات الشركة.
					4- زاد حجم المؤسسة في السوق بعد تطبيق المواصفة.
					5- تحسنت الصورة الذهنية وسمعة المؤسسة لدى العملاء.
					6- إكتسبت المؤسسة فوائد تنافسية بعد تطبيق المواصفة.
					7- إنخفضت تكاليف الإنتاج وقلت نسبة الهدر بعد تطبيق المواصفة.
			لا	نعم	دور الشركات المطبقة في مدى وعي المجتمع بأهمية سلامة الغذاء ومعنى تطبيق مواصفة أمن وسلامة الغذاء ISO 22000
					1- هل تعمل الشركة دورات أو محاضرات توعوية عن أهمية سلامة الغذاء ومعنى الايزو ومعنى حصول المؤسسة على شهادة ISO22000.

					2- هل ينشر العاملین بالمؤسسة في مجتمعهم وبين أسرهم معنى وثقافة الأيزو ومعنى تمكن مؤسسة من التحصل على شهادة تطبيق ISO 22000
					3- هل لاحظ مندوبي المبيعات تغيير في السلوك الشرائي للأفضل وقلت الاعتراضات من قبل العملاء بعد تطبيق نظام سلامة وجودة الغذاء.
					4- هل قامت المؤسسة بعمل استبانة للمجتمع توضح مدى وعي المجتمع بأهمية سلامة الغذاء وأهمية تطبيق مواصفة سلامة الغذاء ISO 22000