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## Juhayna Food Industries S.A.E., Egypt

**Country:** Egypt

**ISO member body:** Egyptian Organization for Standardization and Quality Control (EOS)

**Project team:**

**Project leader:** Eng. Ms. Heba Hammad Radi, Standards and Projects Expert, Textile Department (EOS)

**Assistant project leader:** Eng. Ahmed Abo Zaid, Head of TBT Enquiry Point Division (EOS)

**Co-Project leader:** Eng. Ahmed M. El-Helw, Food Standards Specialist, Food Standards Division, General Department of Standards (EOS)

**Member:** Eng. Basma Ghazy, Food Standards Specialist, Enquiry Point in the General Organization for Export and Import Control (EOS)

**Member:** Eng. Samir Musallam, Quality Assurance Manager, Juhayna Food Industries

**ISO Central Secretariat advisor:** Reinhard Weissinger, Manager, Research, Education & Strategy

**Duration of the study:** November 2011 – June 2012

### 3.1 Objectives and organization of the pilot project

For a number of years, ISO has undertaken case studies in different countries to determine the economic impacts and benefits of standards for companies by applying the "ISO Methodology". This is described in documents such as the "ISO Methodology Essentials" and aims at assessing and quantifying in financial terms the benefits companies can derive from the use of standards.

These studies are undertaken in conjunction with the national standards body of the country as an ISO member organization, a local university or business school, the ISO Central Secretariat, and a local company. The term "standard" used in this context refers to consensus-based documents that have been developed through an open and transparent process by standards organizations of all types (ISO, CEN, EOS or an industry consortium open to industry players) and that are available to any interested party. We call these types of standards "external" standards. The study does not include company-internal specifications developed by the company itself and not shared with others, unless those specifications are more or less identical to certain external standards.

This study is an assessment of the economic benefits of standards carried out in an Egyptian company, Juhayna Food Industries S.A.E., following the ISO Methodology. It was undertaken by the Egyptian Organization for Standardization and Quality (EOS) in close cooperation with the company's management and technical staff, and with the advisory support of the ISO Central Secretariat.

After the first meeting with Juhayna in November 2011, it was decided to focus the assessment on the use of standards in the company's fruit

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Note: "El-Dawleya" is the name of the fruit juice factory of Juhayna which is the focus of this assessment.

juice business at its El-Dawleya factory, situated in the 6<sup>th</sup> October City near Cairo. The assessment was carried out in several stages starting from interviews with management, engineering and technical staff, with the cooperation of EOS experts.

The assessment of the industry and the company's main processes is called the value chain analysis. Key value drivers and those areas of the company mostly impacted by standards were then selected for the assessment. To measure the impacts of standards we used operational indicators for selected activities and quantified them in monetary terms as cost savings or increases in revenue.

## **3.2 Introduction to the selected company**

### **3.2.1 Juhayna Food Industries S.A.E.**

Juhayna is a leading producer and distributor of packaged milk, juice and yogurt products in Egypt. Since commencing operations in 1987, the company has established itself as a household name throughout the country, where, according to the Middle East Market Research Bureau (MEMRB), it held market-leading shares of 69% of the plain packaged milk market, 31% and 86% of the spoonable and drinkable yogurt markets, and 35% of the carton-packaged juice market in 2009 – representing approximately 15% of the overall juice market in Egypt.

The company's products in these segments are sold to both consumer and business customers in domestic and export markets. In addition, it manufactures and sells concentrate products to local and export business customers. Juhayna's extensive range of products is marketed to a diverse range of consumer and business customers and, as at 31 March 2010, comprised 153 distinct products, or stock

keeping units (SKUs). Most studies consider it as the leading dairy and juice industry company in the country.

For the year ended 31 December 2009, Juhayna's net sales were EGP 1 578.0 million (about USD 284.9 million), generating net profit after tax of EGP 184.8 million (about USD 33.4 million). For the three month period ended 31 March 2010, net sales were EGP 404.8 million (about USD 73.1 million) generating net profits after tax of EGP 60.2 million (about USD 10.9 million). This compared to net sales and net profits after tax of EGP 313.4 million (about USD 56.6 million) and EGP 16.3 million (about USD 2.9 million), respectively, for the same period in 2009<sup>1)</sup>.

Juhayna operates its business through eight subsidiaries, divided into four key business segments: dairy (which includes UHT milk, cream and cheese); yogurt (which includes spoonable and drinkable yogurts); juice and concentrates. These business segments are supported by two subsidiaries, one of which is focused on the company's centralized sales, marketing and distribution activities, and the other on its agricultural activities. Through this latter subsidiary, Enmaa, it has acquired 2 595 acres of land and is in the process of acquiring rights over an additional 12 036 acres which it intends to develop for agricultural purposes. Furthermore, Juhayna has a 40% minority interest in a joint venture company, Milks Dairy Co. ("Milks"), which owns and operates a dairy farm.

As at 31 March 2010, the company owned and operated six modern factories. Following the destruction of the EgyFood factory as a consequence of a fire in late April 2010, Juhayna intends to construct a new yogurt production factory at the EgyFood site, and has begun to commission designs for this new facility.

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1) 1 EGP – 0.16433 USD.

The company has increased its overall production capacity from 35 tons per day when it commenced production in 1987, to approximately 2 700 tons per day as at 31 March 2010. It has 20 distribution centres located throughout Egypt, two key distributors and a fleet of 523 distribution vans which deliver an average of 700 tons of products daily. As at April, 2012, Juhayna had 3 860 employees.

Figures in EGP	2009 A	2010 F	2011 F	2012 F
EPS	0.3	0.3	0.4	0.5
EPS Growth	NA	21 %	35 %	23 %
P/E	22.8	18.9	13.9	11.3
Dividend Yield	0 %	0 %	2 %	4 %
EV/EBITDA	12.8	10.7	8.4	7.0
Revenue (Millions)	1,578	1,827	2,257	2,645
Revenue Growth	8 %	16 %	24 %	17 %
EBITDA (Millions)	341	410	519	622
EBITDA Growth	221 %	20 %	27 %	20 %
EBITDA Margin	22 %	22 %	23 %	24 %

A = actual, F =forecast. Sources : Reuters and NBK Capital

**Table 1 – Juhayna key financial information**

## 3.2.2 The fruit juice industry in Egypt

### 3.2.2.1 The legal framework

As a dairy and juices manufacturer Juhayna is supervised by the Egyptian health and industry ministries, and is regulated by Law No. 48 of 1941 (amended by Law No. 281 of 1994) pertaining to Trade Deceit, and Law No. 10 of 1966, regulating foodstuffs and their circulation.

According to Law No. 48, a producer shall be liable in the event that he sells or distributes defective products. A product shall be considered to be defective if the producer misleads or attempts to mislead

in connection with the design, production, installation, processing, packaging or display of such product. The producer of a defective product shall be liable vis-à-vis any third party who suffers damage if he proves that such damage has been caused by the product. The directors of an Egyptian company found guilty of a violation of the Trade Deceit Law could be subject to such penalties in their individual capacities. If found guilty, the company may also be subject to an equivalent fine and the court has the discretion to order the company to cease its activities for a period not exceeding one year. If the same violation is committed again by the company, the court may order that the company cease its activities for a period not exceeding five years, or alternatively terminate the company's operating license.

Law No. 10 prohibits the production, preparation, presentation or offering of products, or the storage, transfer or delivery of the same if this is not in compliance with the requirements specified by applicable laws and regulations; the products contain harmful ingredients; or if the labelling is misleading. Persons found to be in violation of any of the foregoing shall be subject to a penalty of up to one month's imprisonment. The directors of a violating company could also be subject to this penalty in their individual capacities. If found guilty, the company may be subject to a minor fine and the court has the discretion to order the company to cease its activity for a period not exceeding one year.

The Egyptian Standardization Authority amends the applicable standards from time to time.

### **3.2.2.2 Focus of the study : the El-Dawleya juice factory**

The El-Dawleya factory is equipped with a control system with full up- and downstream traceability, built for integration with the business IT system, which provides fully automatic functions for controlling

the production and cleaning processes. The factory produces juice products with a total average processing capacity of 2 000 tons per day, while total average filling capacity is 667 tons per day.

Juhayna has implemented and maintains a controlled manufacturing system which plays a key role in ensuring the quality control of its products. The company also has a dedicated quality assurance department responsible for good manufacturing practice, audits, ISO standards, inductions to HACCP for new employees, and refresher training of all employees with respect to food hygiene and safety. It has a legislation department that keeps the company updated as to the relevant changes to local and international laws and regulations applicable to quality control and food safety.

All products manufactured by Juhayna are subject to periodic quality control audits. Each factory is equipped with a laboratory to test that all products are produced and analyzed in accordance with the required specifications.

Several of the company's facilities have received a number of quality certifications including ISO 9001, ISO 14001, ISO 22000, EOS standards and OHSAS 18001.

### **3.2.2.3 Market size and market segments of the Egyptian juice industry**

The juice market in Egypt is fragmented with more than 300 producers estimated to be active in 2009 according to the National Council for Production and Economic Affairs (NCPEA). This is mainly due to the low barriers to entry in the segment with some brands being produced in small houses in rural areas.

The juice market in Egypt can be categorized in two different ways, either by packaging type (carton, bottles and pouches) or by the fruit concentration level. Juice with 100 % fruit content is termed “**pure**

**juice**". "Nectar" juices are products with at least 25 % or more juice content, and "drink" juice products are those with up to 25 % juice content. These different packaging types and fruit concentration levels are designed to appeal to different demographic markets and often also to a different geographical region within Egypt.

In 2009 the total level of Egyptian juice consumption was approximately 218 000 tons (Source: MEMRB\*).

This implies a per capita consumption of 2.8 litres per annum, which is considered to be one of the lowest consumption levels within the Middle East and North Africa (MENA) region. For example, juice consumption per capita in Saudi Arabia and Oman was 26 and 24 litres respectively in 2009.

One reason for the traditionally low consumption of juice products in Egypt was due to consumer's historic preference for water or tea to accompany meals and, more recently, the dominance of the carbonated soft drink (CSD) segment. In 2009, sales of CSD products significantly outnumbered those of juice products, driven by the extensive marketing campaigns of multinational players such as Pepsi and Coca Cola (Source: company estimates).

However, over the past three years, the size of the Egyptian juice market has increased by a compound annual growth rate (CAGR) of 18 % for the period 2007 to 2009 according to MEMRB\*. This increase was driven by the historic under-penetration of this market and, in addition, reflected the increase in gross domestic product (GDP) per capita over this period. These trends, coupled with the increasing focus on the relative health benefits of juice consumption, in comparison with certain CSDs, mean that the Egyptian juice market is well positioned for future growth.

\*MEMRB: International Market Studies & Analysis, Statistics, Statistics Consulting. Cairo, Egypt.



### 3.2.2.4 The juice segment at Juhayna

The following table sets forth the sales volumes for the products within Juhayna's juice segment product range, and the average prices per ton at which they were sold in its local and export markets during the specified periods, and a comparison of the actual and percentage change between the two periods.

	For year ended 31 December			
	2008	2009	2008 v 2009	
			Change	% Change
Domestic volumes (tons)	44,328	45,764	1,436	3.2 %
Export volumes (tons)	3,851	3,348	(503)	(13.1) %
<b>Total volumes (tons)</b>	<b>48,179</b>	<b>49,112</b>	<b>933</b>	<b>1.9 %</b>
Domestic price per ton (EGP)	5,657	5,993	336	5.9 %
Export price per ton (EGP)	3,545	3,753	208	5.9 %
Domestic sales (EGP 000's)	250,783	274,264	23,481	9.4 %
Export sales (EGP 000's)	13,652	12,565	(1,087)	(8.0) %
<b>Segment net sales (EGP 000's)</b>	<b>264,435</b>	<b>286,829</b>	<b>22,394</b>	<b>8.5 %</b>

**Table 2** – Juhayna juice products sales volume and prices 2008-2009

The juice segment accounted for 18.2% of Juhayna's consolidated net sales in 2009 as compared to 18.1% in 2008. Juice segment net sales increased by 8.5% to EGP 286.8 million (about USD 51.8 million) in 2009 from EGP 264.4 million (about USD 47.7 million) in 2008. In 2009, the company sold 49 112 tons of juice segment products, an increase of 932 tons (representing a 1.9% increase) over the 48 180.0 tons sold in 2008. The increase in sales was principally attributable to growth in the size of the overall market, and an increase in Juhayna's production capacity as a result of the opening of the new El-Dawleya juice production facility. The increase in average selling prices between those periods reflected an increase in sugar prices.

Throughout the period the company sold its products at a lower price to its export customers than domestically in order to attract market share in export markets.

### **3.2.2.5 Juhayna's juice products**

The products are divided into three main categories (nectar, pure and drinks), consumed in local and export markets.

#### **Juhayna Nectar**

Juhayna Nectar is the company's flagship brand within its juice division. As at 31 December 2009, the Egyptian nectar juice market represented 56 % of the total juice market. Juhayna Nectar had a 20 % share of the Egyptian nectar juice market, representing 11 % of the total Egyptian juice market in that year. The company began producing Nectar juice in 1987 and its Nectar range currently comprises 20 SKUs. Juhayna Nectar is targeted at urban adult consumers in the upper- and middle-income segments.

#### **Juhayna Pure**

The company introduced Juhayna Pure, the first pure juice product launched in Egypt, in 2001. Its Pure juice is marketed as a premium product and the range currently comprises eight SKUs. The Egyptian pure juice market is currently very small, representing 3 % of the total juice market (Source: MEMRB) but is growing rapidly ahead of the overall juice market in Egypt. In 2009 Juhayna Pure had a 55 % share of the Egyptian pure juice market representing 1.7 % of the total Egyptian juice market in that year (Source: MEMRB). Juhayna Pure is targeted at urban adults in the upper- and middle-income segments who are health conscious and willing to pay for a premium product.

#### **Bekhero, Juhayna Jump and Juhayna Tingo Drinks**

In 2009 Juhayna's Bekhero drink range comprised six SKUs and had a 6 % share of the drink market, which represented 2.5 % of the total

Egyptian juice market. The company planned to phase out Bekhero drink by the end of 2010 as part of its sales and marketing strategy to promote the two new Juhayna drink brands: Jump and Tingo, both of which were launched in November 2009.

Tingo, the company’s first entry in the bottle segment of the juice market, is offered in PET bottles. Tingo is targeted at young adults in the upper- and middle-income segments who lead an active life. Jump is offered in carton packaging in three sizes (125 ml, 200 ml and one litre). Jump features various juice blends and is targeted at urban teenagers in the upper- and middle-income segments.

Product innovation remains key to Juhayna’s strategy for its juice products. Accordingly, it strengthened and broadened its Tingo range in 2010 by introducing a new range of innovative flavours to provide an alternative to popular carbonated soft drinks.

Product	2007	2008	2009
Juhayna Nectar	15	16	20
Juhayna Pure	56	55	55
Bekhero Drink	13	11	6
Total juice market	16	16	15
(Source : MEMRB)			

**Table 3 – Juhayna juice products and their market share (in %) 2007 – 2009**

### 3.3 Attitude of the company towards standardization

The Quality Assurance Manager of Juhayna, Mr. Samir Musallam, expresses Juhayna’s attitude towards standardization as follows :

*“As a trusted dairy and juice manufacturer in Egypt serving our customers for more than 25 years, maintaining high quality standards and adopt-*

*ing best international practices are integral to promise to deliver quality products at best value and service to our customers. Juhayna is a real player in most of the Egyptian standardization organization committees, we share in reviewing the national standards, and we are also a member of the Codex Alimentarius. To be able to measure and quantify how our adoption of standards has helped our organization and our customers is invaluable as it helps us to clearly identify areas that we have done well, areas that we can further improve upon and to also identify gaps that we need to bridge. Similar to how we conduct surveys and gather feedback to further improve our product offerings to customers, the ISO Pilot project gives us the tools to measure how our implementation of standards have impacted our organization as a whole. It is certified against ISO 9001:2008, ISO 22000, ISO 14001 and OHSAS 18001.*

*Juhayna is a strong believer in standards and has been involved in the development and the implementation of standards in Egypt for more than 25 years.”*

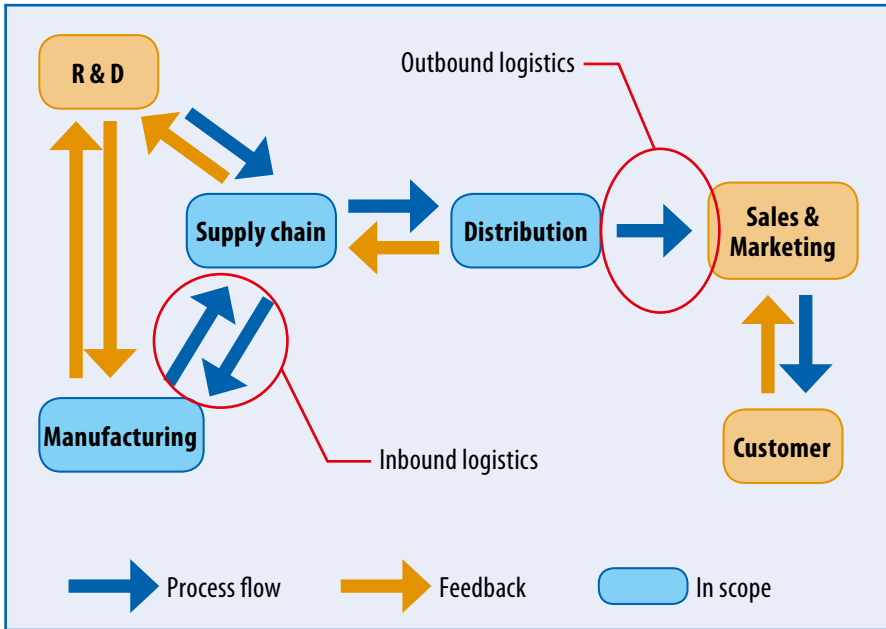
### **3.4 Analysis of the value chain**

Juhayna operates an extensive direct distribution and sales network in Egypt which would be costly and difficult to replicate. In general the steps of activities from input by suppliers to the final consumed products is called the value chain. The focus of the assessment was on the processes carried out in the company as part of the Juhayna value chain.

#### **3.4.1 Juhayna’s value chain**

The scale of Juhayna’s value chain and processes are large, starting from international and local suppliers to the end-user – both local

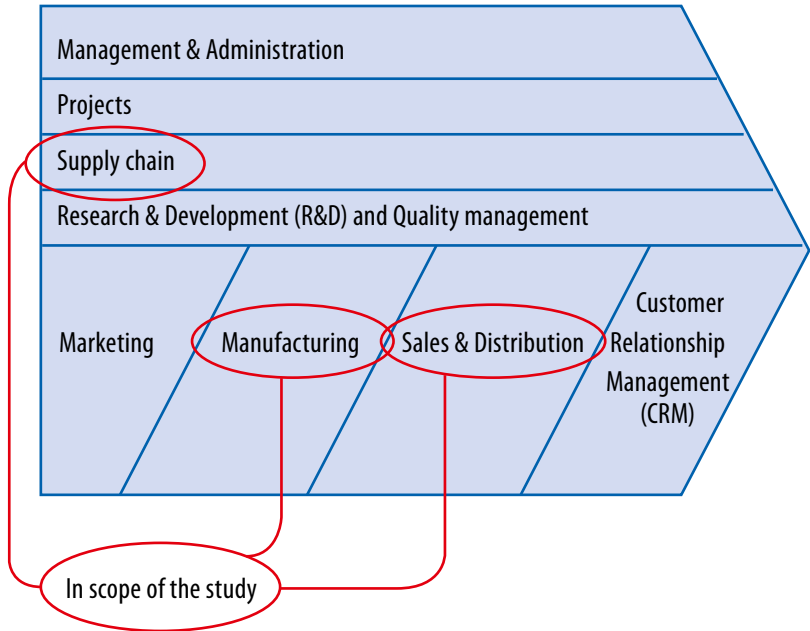
and export customers – to ensure that all consumer segments receive premium quality as shown in **Figure 1**.



**Figure 1** – Juhayna process chart

### 3.4.2 Company value chain

This study covers the El-Dawleya factory, which is specialized in producing all types of juice to cover all customer needs. The company value chain and the scope of this study is shown in **Figure 2**.



**Figure 2** – Scope of the study

The operations of the company depend on several key business functions, each of which is associated with a set of specific value chain activities. The functions in supply chain operations are responsible for purchasing of raw materials and supplies for the company and the evaluation of suppliers. The activities deal with inbound and outbound logistics functions, testing of raw materials, supply manufacturing chain and final products to verify conformity with applicable standards or other requirements of the company.

### **3.4.2.1 Management & administration**

The company's management includes the information technology department and is separated into two divisions: business support and technical support, each headed by an experienced manager. The business support division is responsible for matters such as enterprise software applications, IT services and training. The technical support department is responsible for technical application support, system administration and operational and maintenance support.

Juhayna currently operates a corporate computer network and enterprise software applications for certain business processes to integrate procurement processes with its production, logistics and distribution activities. Accordingly, all of the company's key business transactions are automated and periodically generated reports on its financial and operating performance enable management to take decisions based on reliable data. In addition, except for the El-Marwa factory which is semi-automated, all factories are fully automated with computer controlled reception, pasteurizing, standardization, concentrating and filling functions and cleaning processes. Over the last five years, management estimates that the company spent approximately EGP 8 million (about USD 1.4 million) on its information technology systems.

### **3.4.2.2 The project department**

The project department is responsible to establish all new factories and distribution centres and to develop and maintain the current factories and distribution centres.

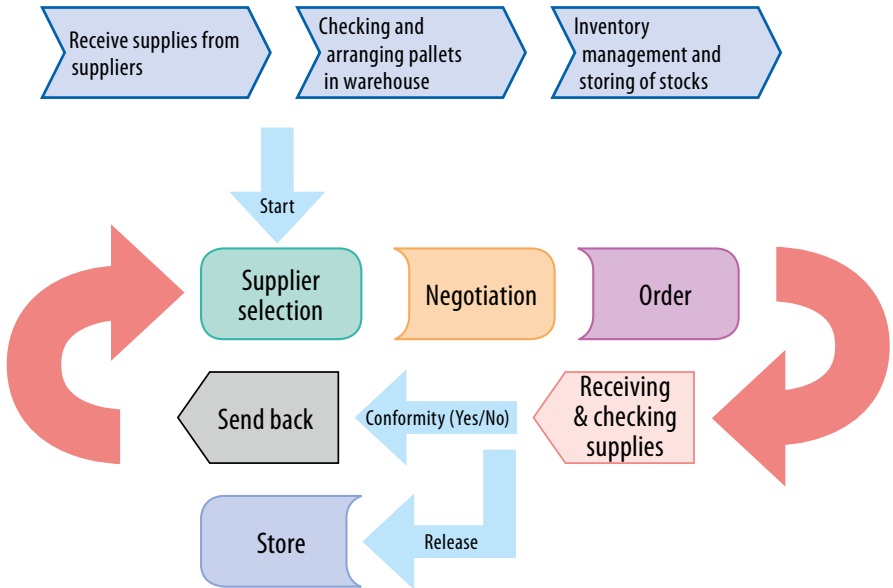
### **3.4.2.3 Supply chain**

Juhayna believes that the supply chain control offered by a vertically integrated model will benefit it by ensuring the quality of key raw

materials used in the manufacture of its products, and by helping to protect against future increases in their prices. The company believes that increasing its own production of raw milk and fruit while expanding the number of potential third-party sources will give it greater pricing leverage in relation to these key raw materials.

The company considers that its focus on supply chain control and integration assists it in ensuring reliable access to quality raw materials at an acceptable price, thereby enabling it to supply high quality products to customers while controlling manufacturing costs and increasing profit margins. In addition, this ability to control the supply of raw materials provides greater flexibility in developing new value-added or premium priced products and, in the future, to enter new market segments such as organic products and the fresh milk segment.

**Supply chain processes :**



**Figure 3** – El-Dawleya Factory supply chain (procurement and inbound logistics)



### 3.4.2.4 Research & development (R&D)

Juhayna has developed a consumer-focused innovation and product development strategy focused on the company's key product segments and aims to maintain a competitive edge through continued emphasis on product innovation and quality.

Product development is centrally managed by its quality and innovation division, whose purpose is to develop new and improve existing products, packaging designs, processes and technologies in order to deliver sustainable and value-added solutions and enhance profitability. The division, which currently comprises a team of nine specialists, benefits from in-house expert knowledge of milk and juice product development, as well as good relationships with international suppliers such as *Dohler*, *Danisco* and *WILD INDAG*, with whom the team liaises on occasions.

The quality management division has a dedicated product and technology team of nine people responsible for the development of new products and improvements to existing products. The team provides technical support to the company's facilities to enable them to maintain and enhance product quality, works closely with marketing to identify new product opportunities based on consumer research, establishes sourcing of ingredients for new products, and co-ordinates business to business project development.

### 3.4.2.5 Marketing

Management believes that the Egyptian juice market is currently under-developed and offers potential for significant growth. The company has established a modern production facility for its juice business division and aims to build its market position in the nectar and drink categories, as well as in the carton, bottle and pouch packaging categories.

Juhayna intends to produce drinks in pouches and to continue to market its carton and bottled drinks with innovative advertising campaigns. The company intends to focus its marketing efforts on the younger segment of the Egyptian population. Management believes that engaging with this consumer segment will assist in creating Juhayna brand loyalty from a young age. Many of its drink products have been specifically designed with young consumers in mind. For example, in November 2009 the company launched Tingo in a PET bottle and Jump in brightly coloured 125 ml., 200 ml. and 1 litre cartons designed to appeal to younger customers.

Juhayna also intends to emphasize general marketing and advertising in an effort to strengthen its market position. Although the Egyptian juice market has grown at a CAGR of 18% from 2007 to 2009, management believes that this growth has occurred despite the absence of significant marketing or advertising efforts, or product innovation by producers. The company is eager to gain a “first mover” advantage and believes that the effective advertising and marketing of its juice products will provide significant market advantage. Juhayna began to execute this strategy with the dual launch of Tingo and Jump in November 2009. Since their inception, both brands have been supported by investment in branding, pack design, and advertising.

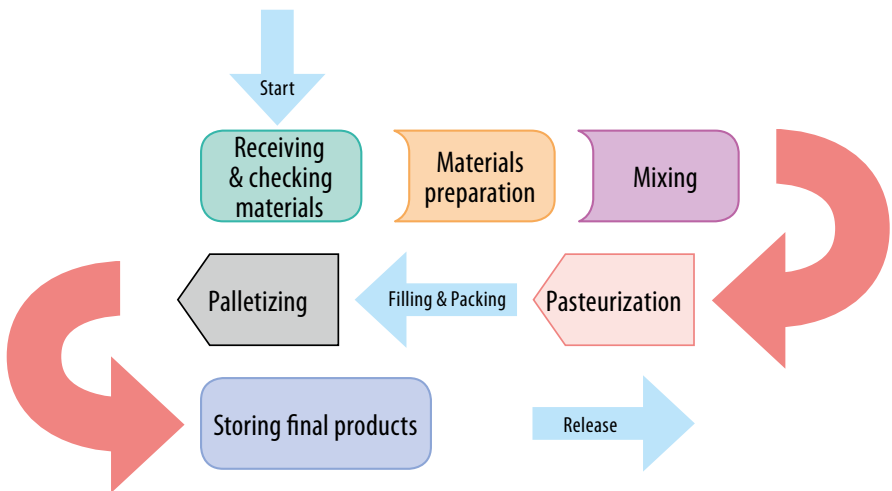
### **3.4.2.6 Manufacturing**

The company’s juice products are manufactured at its newly built and state-of-the-art El-Dawleya factory. This facility was designed and built according to international food and hygiene standards and, as it was a greenfield project, all utilities and buildings were designed to accommodate further expansion. Production at this factory uses an automated process that controls the reception of raw materials, the mixing process, package filling and palletizing of the final product via computerized systems. The system has proven to be efficient in

securing high and uniform quality production with minimum waste and limited manual intervention by employees. The main stages of the production process are as follows :

- **Raw material reception :**
  - Fruit concentrates are automatically emptied and processed. The process is controlled by inline flow meters.
- **Production of sugar syrup and other ingredients :**
  - Sugar syrup and other basic juice ingredients are produced in a fully automated system to ensure a very high level of accuracy. All measures are automatically controlled by inline flow meters.
- **Mixing process :**
  - The mixing process of fruit concentrate, sugar syrup, aromas and other ingredients is fully automated. The process secures what management believes to be the most accurate mixing process currently available.
- **UHT treatment :**
  - The juice is sterilized by heating it to 98°C for four seconds. This treatment destroys nearly all bacteria in the juice and renders it commercially sterile.
  - A special system for aroma and flavour recovery ensures that the product maintains a high level of flavour throughout the heat treatment process. The process is controlled and monitored by computerized systems to ensure maximum accuracy. The equipment is designed to secure the most efficient use of energy and, at the same time, maintain product quality, reduce the product's air content and maximize ingredient and/or product recovery.
- **Filling :**
  - Carton products are filled using high speed and fully automatic UHT filling lines (60 000 packs per hour on average) supplied and serviced by Combibloc.

- PET bottles are filled by a modern high-speed hot fill system supplied by Krones (25 000 bottles per hour on average).
- **Palletizing :**
  - The palletizing process is fully automated, maximizing the stability of the pallets during transportation and handling in the market. Currently, the El-Dawleya factory has a total juice filling capacity of 667 tons per day.
- **Storing :**
  - The pallets are transferred to a storage until release by the quality department after chemical and microbiological testing.
  - They are then shipped to the distribution centre.
- **Manufacturing – feedback from R&D :**
  - The manufacturing chain sends to, and receives feedback from, R&D and the different processing units in order to maintain premium product quality for launching new products, and to ensure that production processes are following standards.



**Figure 4** – El-Dawleya factory manufacturing value chain

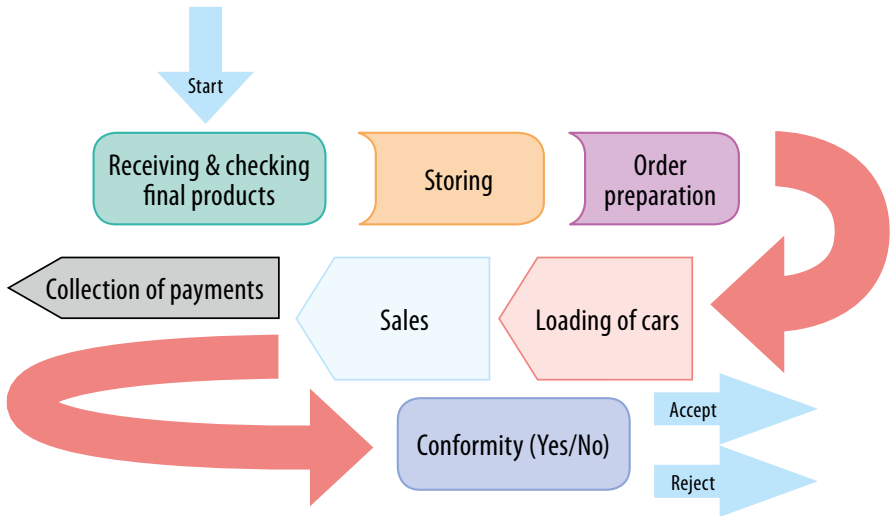
### 3.4.2.7 Distribution

Juhayna's domestic distribution network, operated by its Tiba subsidiary, plays a key role in the penetration of its products into Egypt's fragmented customer base, and the company believes it also constitutes a barrier to entry for potential new competitors. As of 31 March 2010, Tiba owned and operated a fleet of 523 distribution vans of which 294 were adapted for dry goods and 229 for chilled goods (although the latter can also accommodate dry goods). This distribution network helps to ensure product delivery across a wide geographical area so that its products are kept in good condition. All vehicles used in the company's distribution network are branded with the Juhayna logo and therefore support the high levels of Juhayna brand recognition in Egypt. On average, its distribution vans currently transport approximately 700 tons of products per day, with vans adapted to deliver dry products twice per week, and those adapted for chilled products deliver three times per week. In addition to its distribution fleet, Juhayna operates a distribution network comprised of 20 branches located throughout Egypt. Through its direct distribution fleet and network, the company currently supplies an average of 25 000 retailers per week.

In rural areas too remote to be served directly by its own distribution fleet, the company operates through four sub-distributors and also wholesalers enabling its products to reach an additional 50 000 outlets.

Juhayna exports its products to Europe, the United States and the Arab Gulf region since 1988, and currently supplies products to 41 countries. For the year ended 31 December 2009, the company's key export markets were located primarily in the MENA region, where Libya, Lebanon and Jordan together accounted for 78.8% of total exports during the period. The company believes it had approximately

a share of 20% of the milk segment in Libya in 2009. It assigns an exclusive distributor in each of its major export countries.



**Figure 5** – El-Dawleya Factory distribution value chain (Outbound logistics)

### 3.4.2.8 Customer relationship management (CRM)

Customer relationship management was established one and a half years ago. The objective was to accelerate solving any product handling problems in the marketplace, by setting up a call centre to direct customer complaints to representatives who send defective products to the factory. Complaints are analyzed and feedback is provided to explain possible reasons for a defect and to ensure customer satisfaction. Juhayna’s aim is to improve communications between the company and customers of all levels to resolve conflicts and respond to their enquiries. The process also opens an active channel to measure customer satisfaction and send their feedback to R&D to develop the best solutions to meet customer needs.

Business function	Activities
Management & administration	Organizational structure, human resource management, financial and risk management
Projects	Establishing new factories and distribution centres
Supply chain	IT management, procurement, inbound logistic, warehousing
Research & development and quality management	Quality management, study and apply up to date research, design and develop products, provide ideas to the units, testing of raw materials and supplies
Marketing	Launching new products, product campaigns, promotions and offers, marketing methods, studies and advertising
Manufacturing	Apply sales plans to production processes, packing, deliver final products to the warehouse, engineering and maintenance management, quality control, safety and environmental aspects
Sales & distribution	Supply and demand planning, export unit, local distribution, transportation, retail, wholesalers and special markets
Customer relationship management	Call centre, customer services, after sales follow up

**Table 3 – Business functions and related activities**

### 3.4.3 Key value drivers

According to the definition applied in the ISO Methodology, a value driver is a crucial organizational capability that gives a company a competitive advantage. Ways to achieve a competitive advantage include reducing cost levels or through the production of new and different products. The effects of value drivers can be observed in increased sales revenues, reduction in costs, or both.

The R&D department studies of the degree of competition and market requirements for juices provided helpful indications on potential value drivers for the company. Management was interviewed and the following value drivers were identified :

Value drivers	Descriptions
Quality of products	Produce premium quality products
Quality of production processes	Minimize mechanical and human errors
Efficiency of production	Optimize production processes in terms of accurate process time and low costs
Efficiency of the quality control system	Monitor the production process and perform tests as per standards requirements
National and international sales	Being positioned to cover all local and international customer segments
Marketing competition	Be the leader in the local and international dairy and juice products sector, matching the best marketing ideals
Up-to-date standards	Early adoption of specific internal and international standards for new products and consumers
Customer satisfaction	Achieve full satisfaction of all customers

**Table 4** – Key value drivers

### 3.5 Scope of the assessment

The scope of the company assessment was chosen after discussions between the EOS team and company management and staff. We focused on the following business functions which include those areas where standards have the highest impact.

Business functions :

Key value chain components

#### 1. Supply Chain

- Central procurement, inbound logistics

#### 2. Manufacturing

- Production
- Maintenance
- Warehousing

#### 3. Sales and distribution

- Outbound logistics



- Wholesale and retail
- Distribution branch (DB)

### 3.6 Standards used in the company value chain

Egypt encourages food industry producers to follow the national food standards. Since Juhayna was one of the first and leading companies to apply the standards, our products are trusted in the marketplace. Most of the national standards we follow are adopted ISO International Standards.

Juhayna applies the latest editions of the standards and plans to implement those national and international standards that help in achieving premium quality.

Business function	Activity processes	Standards	Description	
Supply Chain	Procurement	Supplier selection	ISO 9001:2008	• Quality management systems
		Negotiation		
		Ordering materials		
	Inbound logistics	Reception of inputs from suppliers	ISO 22000:2005	<ul style="list-style-type: none"> <li>• Food safety management systems</li> <li>• Hazard analysis and critical control point</li> <li>• Environmental management systems</li> <li>• Occupational health and safety management systems</li> <li>• Food quality systems</li> </ul>
			HACCP	
			ISO 14001:2004	
OHSAS				
Testing materials	Lot acceptance	ISO 22000:2005	<ul style="list-style-type: none"> <li>• Food safety management systems</li> <li>• Excellence in analytical methods</li> <li>• General requirements for the competence of testing and calibration laboratories</li> </ul>	
		AOAC International*		
		ISO 17025:2005		
Lot rejection	Lot rejection	ISO 22000:2005	• Food safety management systems	

\*AOAC : Association of Analytical Communities

### Other standards used in the supply chain process:

Standard	Description
ES 2239/2007	Nectars for certain citrus fruits preserved exclusively by physical means
ES 3951/2008	Requirements for packaging fresh fruits
ES 6206-1/2007	Methods of analysis and testing – Part 1 : Physical analysis – Determination of net and drained weight, viscosity – Head space – Entrance matter and damaged fruits
ES 1012-2/2005	Apricot juices preserved exclusively by physical means – Part 2 : Concentrated apricot juice
ES 1690/2007	Fresh fruits banana
ES 1691/2007	Fresh fruits mango
ES 1704/2006	Strawberry fruits for local marketing
ES 1731/2007	Guava fruits for local marketing
CAC/GL 21-1997	Micro criteria for foods
CAC/RCP 57- 2004	Code of hygienic practice
ES 1602-1/2005 ES 1602-2/2005	Non-carbonated sweetened drinks Part 1 : Fruit nectar Part 2 : Fruit drinks and artificial drinks
ES 7136/2010	Maximum levels of certain contaminants in food stuff
ES 745/2008	Corrugated board boxes
ES 1546/2011 Codex 1/ 1985	Labelling of prepackaged food products
ES 2479/2006	Plastic sacks for milk packaging
ES 358 – 1/2005 Codex 212/1999	Refined sugar and white sugar – Method for analysis and testing – Part 1 : Refined sugar and while sugar
ES 190 – 1/2007	Drinking water and ice – Standard test method – Part 1 : Drinking water
ES 2613 – 1/2008	Durability periods for food products – Part 1 : General requirements
ES 2613 – 2/2008	Durability periods for food products – Part 2 : Shelf life
Codex Standard 234 – 1999	Recommended method of analysis and sampling – Part 1
Codex Standard 156 – 1987	Codex standard for follow up formula
ES 3120/2008 CAC/GL2 – 1985	Guidelines on nutrition labeling
ES 4245/2008	Determination method of printing ink resistance to removal from food packaging labels

ES 6050/2007	General requirements for packaging and wrapping		
ES 3393/2005	Hygienic requirements for food products establishment		
ES 3778/2005	Hazard Analysis Critical Control Point System and guidelines for its application (HACCP)		
ES 3856/2006	Recommended Egyptian code of practice – General principles of food hygiene		
ES 3857/2005 Codex 30/1999	Principles and guidelines of microbiological risk assessment		
ES 4884/2008 ISO 22000:2005	Food safety management systems – Requirements for any organization in the food chain		
Business function	Activity processes	Standards	Description
<b>Manufacturing</b>	Raw material reception	ISO 22000:2005 ISO 17025:2005	<ul style="list-style-type: none"> <li>• Food safety management systems</li> <li>• General requirements for the competence of testing and calibration laboratories</li> </ul>
	Materials preparation : sugar syrup and other production ingredients	GMP standards ISO 22000:2005	<ul style="list-style-type: none"> <li>• General requirements for the competence of testing and calibration laboratories</li> <li>• Good manufacturing practice</li> <li>• Food safety management systems</li> </ul>
	Mixing process	GMP standards ISO 22000:2005	<ul style="list-style-type: none"> <li>• General requirements for the competence of testing and calibration laboratories</li> <li>• Good manufacturing practice</li> <li>• Food safety management systems</li> </ul>
	UHT treatment (pasteurization)	GMP standards ISO 22000:2005	<ul style="list-style-type: none"> <li>• General requirements for the competence of testing and calibration laboratories</li> <li>• Good manufacturing practice</li> <li>• Food safety management systems</li> </ul>
	Filling and packing	GMP standards ISO 22000:2005	<ul style="list-style-type: none"> <li>• Good manufacturing practice</li> <li>• Food safety management systems</li> </ul>
	Palletizing	GMP standards ISO 22000:2005	<ul style="list-style-type: none"> <li>• Good manufacturing practice</li> <li>• Food safety management systems</li> </ul>
	Storing until dispatch to distribution centre	ISO 22000:2005	<ul style="list-style-type: none"> <li>• Food safety management systems</li> </ul>
<b>Other standards used in the manufacturing process:</b>			
Standards	Description		
ES 1012-1/2005	Apricot juice preserved exclusively by physical means – Part 1 : Natural apricot juice		
ES 4339/2005	Canned fruit cocktail		

ES 6206-1/2007	Methods of analysis and testing – Part 1 : Physical analysis – Determination of net and drained weight, viscosity – Head space – Entrance matter and damaged fruits
ES 129-1/2005	Preserved fruit products Part 1 : General standard for fruit juices preserved exclusively by physical means
ES 1012-2/2005	Apricot juice preserved exclusively by physical means – Part 2 : Concentrated apricot juice
ES 1550-2/2005	Mandarin juice preserved exclusively by physical means – Part : 2 Concentrated mandarin juice
ES 4206/2003	Refraction meters for the measurement of the sugar content of fruit juices
ES 129-2/2005	Preserved fruit products – Part 2 : Jams and jellies
CAC /GL 21-1997	Micro criteria for foods
CAC/RCP 57- 2004	Code of hygienic practice
ES 132/2005	Preserved tomato products
ES 132-5/2005 Codex 49/1981	Preserved tomato products – Part 5 : Natural tomato juice
ES 686-2 /2005 Codex 64 /1981	Orange juice preserved extensively by physical means – Part 2 : Concentrated and frozen orange juice
ES 1578 – 1 /2005 Codex 83/1981	Grape juice preserved extensively by physical means – Part 1 : Natural grape juice
ES 1578 – 2 /2005 Codex 82/1981	Grape juice preserved extensively by physical means – Part 2 : Concentrated grape juice – Concentrated grape juice frozen
ES 1581 – 2 /2005 Codex 63/1981	Apple juice preserved extensively by physical means – Part 2 : Concentrated apple juice – Concentrated apple juice frozen
ES 2360 – 1/2007	Maximum levels of certain contaminants in food stuff
Codex Standard 156 – 1987	Codex standard for follow up formula
ES 4245/2008	Determination method of printing ink resistance for removal from food packaging labels
ES 3120/2008 CAC/GL2 – 1985	Guidelines on nutrition labelling
ES 6050/2007	General requirements for packaging and wrapping used in food products
ES 3393/2005	Hygienic requirements for food product establishments
ES 3778/2005	Hazard Analysis Critical Control Point System and guidelines for its application (HACCP)
ES 3856/2006	Recommended Egyptian code of practice – General principles of food hygiene
ES 3875/2005 Codex 30/1999	Principles and guidelines of microbiological risk assessment

ES 4884/2008 ISO 22000/2005	Food safety management systems – Requirements for any organization in the food chain		
Business function	Activity/ processes	Standards	Description
Distribution (Outbound logistics)	Receiving and checking final products	ISO 9001:2008 GMP standards	<ul style="list-style-type: none"> <li>• Quality management systems</li> <li>• Good manufacturing practice</li> </ul>
	Storing	ISO 9001:2008	<ul style="list-style-type: none"> <li>• Quality management systems</li> </ul>
	Order preparation	ISO 9001:2008 GMP standards	<ul style="list-style-type: none"> <li>• Quality management systems</li> <li>• Good manufacturing practice</li> </ul>
	Loading of cars	ISO 9001:2008	<ul style="list-style-type: none"> <li>• Quality management systems</li> </ul>
	Acceptance (by customers)	ISO 9001:2008 CRM standards	<ul style="list-style-type: none"> <li>• Quality management systems</li> <li>• Call centre and final control point standards</li> </ul>
	Rejection (by customers)	ISO 9001:2008 CRM standards	<ul style="list-style-type: none"> <li>• Quality management systems</li> <li>• Call centre level standards</li> </ul>
<b>Other standards used in the distribution process:</b>			
Standards	Description		
ES 2613 – 1/2006	Durability periods for food products – Part 1 : General requirements		
ES 2613 – 2/2008	Durability periods for food products – Part 2 : Shelf life		
Codex Standard 234 – 1999	Recommended method of analysis and sampling – Part 1		
Codex Standard 156 – 1987	Codex standard for follow up formula		
ES 3120/2008 CAC/GL2 – 1985	Guidelines on nutrition labelling		
ES 4245/2003	Determination method of printing ink resistance for removal from food packaging labels		
ES 6050/2007	General requirements for packaging and wrapping used in food products		

**Table 5 – Standards used in the business functions**

Basically, Juhayna depends on three types of standards in the company :

### 1. International standards :

- ISO 9001:2008, *Quality management systems – Requirements*
- ISO 14001:2004, *Environmental management systems – Requirements with guidance for use*

- ISO 22000:2005, *Food safety management systems – Requirements for any organization in the food chain*
- OHSAS 18001, *Occupational health and safety management system*

These standards are intended to be used for the following purposes :

- To establish management systems
- To ensure food safety in manufacturing and in delivery to markets
- To ensure optimal environmental conditions
- To ensure a healthy and safe environment for the work force

## 2. National standards of Egypt:

The relevant Egyptian Standards (ES) are listed in **Table 5** and are therefore not repeated here.

These standards are intended to be used for the following purposes :

- To provide criteria for the identification of suppliers
- To test materials
- To provide acceptance criteria
- To implement codes of best practice
- To ensure conformity to applicable regulations and laws

## 3. Internal standards:

Developed by suppliers and customers, such as McDonald's, Burger King, hotel chains, etc.

These standards are intended to be used for the following purposes :

- To enhance the functional quality of the units
- To define quality acceptance levels
- To provide a basis for customer acceptance or rejection
- To create Juhayna's own recipes

The key impacts from using standards for Juhayna are summarized in **Table 6**.

Business function		Key impacts from using standards
Supply chain	Procurement	<ul style="list-style-type: none"> <li>• Basis for operating a high quality management system</li> <li>• An easy way to collect information from the company's design documentation</li> <li>• Application of an automated system that minimizes human errors</li> <li>• Reduction of cost due to re-work</li> <li>• Provision of more facilities especially between the company and suppliers</li> <li>• Easy accounting system saves time, reduces errors</li> </ul>
	Inbound logistics	<ul style="list-style-type: none"> <li>• Leads to high quality and safe food</li> <li>• Minimizes nonconforming materials</li> <li>• Helps in meeting regulations</li> </ul>
Manufacturing		<ul style="list-style-type: none"> <li>• Higher volumes and efficiency</li> <li>• Reduction in waste and scrap</li> <li>• Increased efficiency</li> <li>• Minimizes human error</li> <li>• Helps deliver safe products</li> </ul>
Distribution (Outbound logistics)		<ul style="list-style-type: none"> <li>• Increased market share</li> <li>• Helps deliver premium quality product</li> <li>• Minimizes nonconforming products</li> </ul>

**Table 6 – Key impacts from using standards**

### 3.7 Selection of operational indicators

After identifying the standards used in the company and their impacts, we defined operational indicators in order to measure the changes that occurred as a result of the use of standards. We then translated the quantified impacts of the standards into financial terms.

The operational indicators selected by interviewing company managers and engineering staff and EOS experts are presented in the **Table 7**.

Business function	Related activities	Value drivers	Standards used	Operational Indicator	Definition of the indicators	
Supply chain	Procurement	Supplier selection	ISO 9001:2008 ES 4884/2008	Order availability on time	Avoidance of misunderstandings about required specifications for supplied raw materials and other goods	
		Order (formulation and communication)	Secure availability	Order availability on time	Availability of raw materials for manufacturing whenever needed	
		Warehousing	Optimum storage conditions	Stock levels comply with planning	Cover all planned orders in both local and export markets	
	Inbound logistics	Quality assurance	Comply with standard	ISO 22000:2005 HACCP	Rate of non-conforming materials	Minimize the risk of receiving non-conforming lots through inspection plans
		Quality control	Matching agreed specifications	ISO 9001:2008 AOC ES 4884/2008	Analysis of supplies versus Certificates of Analysis (COA)	Measure control point to ensure materials conformity
		Receiving & checking of supplies	Acceptance criteria	ISO 22000:2005 GMP	Rate of non-conforming materials	Minimize the risk of receiving non-conforming lots through inspection plans
	Store conforming supply	Safe stock	ISO 22000:2005	Reduction in losses	Ensure optimal storage to reduce losses before manufacturing	



Business function	Related activities	Value drivers	Standards used	Operational Indicator	Definition of the indicators
Manufacturing	Receiving ingredients	Correct specifications	ISO 22000:2005	Zero faults	Assurance of using the right materials in the right recipe
	Concentrates dump	Correct specifications	OHSAS 18001 ISO 14001:2004 ISO 22000:2005 FSSC	Time consumed per batch	Three hours reduced to one hour
	Solution preparation	Correct specifications	ISO 22000:2005 OHSAS 18001 ISO 14001:2004 ES 1012-1/2005 ES 6206-1/2007 ES 4206/2003 ES 2360/2007	Chilled store failure	Assurance of using the standard solution in the right recipe. 4 % error reduced to 0.1 %
	Pasteurization	No contamination	ISO 22000:2005 ES 4884/2008	Customer feedback Pasteurization efficiency	No claims from customers about contamination risk. Pasteurization efficiency increased from 95 % to 100 %
	Filling	Meeting sales plan on time	ISO 22000:2005	Sales Satisfaction Product failure	Sales department receives the required products within the planned time. 3 % product failure reduced to 0.1 %

Business function	Related activities	Value drivers	Standards used	Operational Indicator	Definition of the indicators	
Manufacturing	Palletizing and storage	Products conform to specification	ISO 22000:2005 ES 3120/2008 CAC/GL2 – 1985 ES 4245/2003 ES 6050/2007	Less non-conformity Product failure	Apply First-In-First-Out (FIFO) policy without problems. 2 % product failure reduced to 0.2 %	
	Sending to distribution	Meet customer needs	ISO 9001:2008 CAC/RCP 57- 2004	Less product availability	Meet customer needs via country-wide distribution network	
	Receiving and checking final products	Products conform to specification	ISO 9001:2008 ES 2613/2006 ES 3120/2008 CAC/GL2 – 1985 ES 4245/2003	Less non-conformity & product failure	Apply FIFO policy without problems. 2 % product failure reduced to 0.2 %	
Distribution (Outbound logistics)	Storage	Safe stock	ISO 9001:2008	Ready to sell	Prepare stock to cover the sales plan	
	Order preparation	Safe stock	ISO 9001:2008	Ready to sell	Prepare stock to cover the sales plan	
	Loading of cars	Safe stock	ISO 9001:2008	Ready to sell	Prepare stock to cover the sales plan	
	Sales	Acceptance (by customers)	Meet customer satisfaction	CRM	Rate of conforming product	Product meets or exceeds customer expectations
		Rejection (by customers)	Does not meet customer satisfaction	CRM	Rate of nonconforming product	Product fails to meet customer expectations

**Table 7 – Operational indicators and the impact of standards**

### 3.8 Calculation of the economic benefits of standards

The changes as a result of the impact of standards in the selected indicators can be clearly observed in the years from 2008 to 2012. During this period Juhayna improved and extended the applied standards and added other new standards, compared with the time before 2007. The impacts of standards are seen as reductions in costs and increases in sales revenues, as shown in **Table 8** below.

Business Function		Operational indicators	Impacts	Contribution of stds (as % sales revenues) 2008-2012
Supply chain	Procurement	Time for orders	Reduced by 50 %	0.08
		Manpower to deal with suppliers	Reduced by 50 %	
	Inbound logistics	Downtime	Reduced by 2 %	5
		Manpower for testing incoming raw materials	Reduced by 50 %	
		Risk of using defective materials	Reduced by 25 %	
Manufacturing	Efficiency	Increased by 70 %	10	
	Energy used in the units	Reduced to lowest level		
	Waste	Reduced by 2 %		
Distribution (Outbound logistics)	Nonconforming products in the market	Reduced by 5 %	1.5	
<b>Total percentage contribution (compounded over five years) :</b>				<b>16.58 %</b>
<b>Average annual contribution:</b>				<b>3.32 %</b>

**Table 8** – Cumulative economic benefits of standards

If we express the average annual contribution of 3.3% in absolute financial values on the basis of the revenues for 2009-2012 (see **Table 1**), we can see that the impact of standards is as follows:

The average annual revenue over the period 2009-2012 is EGP 2 076 750 000. If we deduct 3.3% from this revenue (assuming that the respective standards had not been used), we arrive at an average revenue of EGP 2 010 017 421. This means – in absolute terms – that the **annual average contribution of the standards of 3.3% amounts to EGP 66 732 578 per year.**

### **3.9**    **Qualitative and semi-quantitative considerations**

After having determined the quantitative impacts of standards in different business functions, we recognized that there are certain impacts which we could not quantify:

- 1. Quality mark:** This is one of the most important benefits to the company from applying standards – it helps to improve the company's reputation in the market and lowers transaction costs between buyers and sellers
- 2. Environmental aspects:** The positive environmental impacts resulting from the use of local and international standards are of huge benefit to the company. The improvement in environmental performance is the result of using less raw material and thus producing less waste, as well as raising the level of internal and external cleanliness of the company and its products
- 3. Training and education in the food industry sector:** The company conducts training and education on the production of healthy foods, including training on the relevant standards. This

activity has indirect benefits in disseminating knowledge about standards in industry and society

4. **Advertising:** As a result of the high quality level of the company's products through the use of standards, Juhayna generates more responses from its advertising and publicity about healthy products and their benefits, and greater awareness of the importance of the quality factor – especially connected to human health
5. **Active participation** in the development of standards has given a competitive advantage to companies through access to information about standard specifications, and the incentive to achieve quality marks and certifications
6. **Opening a communication channel** to those interested in studying economics and food science in different research centres, universities, and scientific institutions, whether governmental or private, so they can observe the rapid growth of the company as a result of applying standards
7. **The use of technology** has helped to reduce the need for additional manpower to serve the increasing number of outlets over the last five years, and in handling the growing demand for Juhayna's products. This has helped to reach the higher-margin high-income market without lowering the level of service directed to the needs of the middle- and lower-income markets

### 3.10 Evaluation of results

The contribution of standards to corporate value creation is estimated at 3.3% of the average annual sales revenues for the period 2009 – 2012. The major contribution of standards is in the production function. It has been found that the production process is more efficient and effective, resulting in less downtime and less waste and scrap.

Juhayna is a mature organization and has adopted good procurement practices based on standards since inception. The company has used standards mainly for three functions – supply chain, production and distribution. Its competitive advantage rests to a large extent on undertaking these activities efficiently and effectively. Juhayna may be able to further enhance its competitive advantage by using standards in other value chain activities as well.

It has been the objective of the study to identify benefits attributable to the impacts of standards. However, it was not always easy to distinguish those impacts from other factors such as changes in technology and good practices in human resource management, which certainly have improved the company's turnover.

It is further noted that the data has been gathered as first-hand information provided by the personnel of the company under study. This information is subjective and may not be as precise as could be desired.

Generally, standards are implemented to achieve cost reduction through a decrease in waste, in the number of rejected products, and in rework. Other objectives are the efficient use of energy and good procurement practices which reflect favourably in this study.

### **3.11** Conclusions

Juhayna Food Industries S.A.E. has developed sophisticated and integrated sourcing, production and distribution capabilities that enable it to leverage its scale and purchasing power to manage costs, and implement more efficient processes throughout its operations. It is acknowledged that standards contribute to the organizational bottom line. A longer study of the impact of standards may reveal

whether the competitive advantage can be maintained or further improved by the use of standards.

The ISO Methodology is applicable by comparing situations before a company has implemented standards with the results achieved after the implementation of standards. However, such a comparison is often not available under real conditions, particularly for companies that have a certain history with less involvement in standards, and operate in markets that are well established.

In addition, the project has shown that Juhayna's partnership with suppliers who have committed to using standards, including process chain management standards for their products, has also benefitted and resulted in less waste and improved operational efficiencies.

The methodology has enabled us to identify, describe and evaluate the economic benefits of standards on various functions of an organization.

A concerted effort by Juhayna to lead in standards development and implementation initiatives has been justified through this pilot study since it demonstrates the interconnectivity of standards throughout the company value chain, and the contribution of the standards to Juhayna's value drivers.

The impact of the standards is not limited to the value chain of an individual organization, but extends to the external environment in which the organization operates, including its network of suppliers. Standards and in particular ISO International Standards have strengthened the position of the company in both the local and national markets, which has had an impact in sales turnover, leading to continuous growth for the company.

