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NORWEGIAN MINISTRY
OF FOREIGN AFFAIRS

► Developing the Dairy Value Chain in Egypt's Delta

Market System Analysis





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Foreword

The International Labour Organization (ILO)'s Value Chain Development sector-specific interventions come at the core of its work to promote decent work and job creation. Powered by market-system-development approach and private sector-based strategies, such interventions aim to address systemic and institutional constraints towards stimulating competitiveness and improving the business environment in sectors of high growth and employability potentials.

To ensure the effective implementation of pro-poor, employment-driven initiatives, the ILO's Value Chain Development methodology offers a set of tools that enables practitioners and market facilitators to develop and manage well-defined and carefully designed interventions. This study serves as one of these vital tools, the analysis of the market system.

Within the framework of the ILO's project Egypt Youth Employment (EYE): Jobs and Private Sector Development in Rural Egypt "RAWABET" the dairy sector/ value chain in Egypt's Delta has been assessed, and selected as one of the promising sectors in which the project can work to have an impact. The EYE RAWABET project is an ILO Cairo Office project that is funded by the Norwegian government, and is implemented in partnership with the Ministry of International Cooperation. The project aims to stimulate local economic development in rural Egypt through promoting decent private-sector employment opportunities especially within rural micro, small and medium enterprises (MSMEs) along value chains of highest employability and growth potentials.

Following the selection of the dairy sector, it was, then, the time to do the market system analysis, to go much deeper, to understand the market structures, to map out key market actors, to unravel main business relationships, and most importantly to identify bottlenecks and, thereof, opportunities to improve the performance of the value chain. In fact, getting to know the underlying causes of the underperformance of the target group, in this case, micro and small dairy farmers, through the market system analysis, constitutes the foundation upon which project interventions and activities shall be designed. Consequently, the sound implementation of the project interventions would, in many ways, be determined by the vision obtained through the research and analysis done at this stage.

I hope this study provides clear understanding and practical guidance, not only for dairy-specific initiatives in Egypt, but also for similar value-chain-development initiatives at large.

Finally, I would like to thank Mr. Wael Refaat, agribusiness expert, and the ILO RAWABET team for their efforts towards producing this study. Thanks are, also, extended to the technical department at the ILO Headquarter, SECTOR, and the SME unit in ENTERPRISE for their support to review and comment on this study.

Eric Oechslin

Director

ILO Decent Work Team for North Africa/Cairo



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EXECUTIVE SUMMARY

The development of the dairy sector, in particular, raw milk production is important for the rural economy. The dairy value chain in Egypt penetrates deep within rural communities and constitutes an indispensable component of the rural economy and the livelihoods of farmers and micro and small-scale dairy producers. Many factors determine the performance of the raw milk subsector in Egypt. These factors include practices of milk production, seasonality in milk production and consumption, organizational structures (or lack thereof) in the farmer community, availability of and access to financial resources, the behaviour of middlemen, infrastructure for production, transport and handling, prevalent price fixing mechanisms and the role of the private sector, government and non-governmental agencies.

In this context, this study aims to capture, examine and analyse the basic features of dairy/ raw milk value chain, including the role and contribution of key actors, the market dynamics and other elements in the ecosystem, which influence and govern the productivity and potential of the subsector.

The main objective of the study is to identify gaps, opportunities and constraints, and, hence, to propose market-oriented interventions to facilitate the creation of income generating opportunities, and improve the quality of existing employment in the sector. Such market-oriented interventions will focus on improving the production and distribution of raw milk by organizing and upgrading local value chains, supporting dairy producers and creating new markets for their products. The study is intended to work as the foundation of an intervention model, which will address the identified gaps in the value chain and engage all market actors. This intervention will seek to promote private sector development by enhancing the capacity of existing and potential micro, small and medium enterprises (MSMEs) to improve their contribution along the dairy value chain, and, hence, to increase their ability to expand and generate new work opportunities. The intervention will also engage disadvantaged groups such as micro and small-scale farmers and producers, with an aim to boost their

contribution as competent participants within the value-chain.

The overall rationale of the intervention is to increase and sustain the economic efficiency of the Egyptian dairy sector by improving micro and small farmers' livelihoods, linking them to the market, improving their productive and allocative capacity, generating employment and creating a sustainable development model in the sector.

The dairy sector is among the better performing of Egypt's agribusiness subsectors with numerous investments and employment opportunities throughout the value chain, and particularly at the production level.

However, the dairy industry in Egypt fail to capture the full potentials of the sector that is largely present at the level of micro and small-scale dairy farmers. The inconsistency of milk supply in terms of quantity and quality, being the key challenge to the dairy/ milk production in Egypt is largely attributed to the underdeveloped conditions of dairy production systems, primarily the subsistence and traditional systems/patterns of production. It is, therefore, easy to come to the conclusion that unlocking the potentials of the milk production sub-sector can hardly be achieved unless required interventions are carried out to upgrade and enhance the capacities of micro and small-scale dairy farmers of subsistence and traditional production systems, who account for more than 80 per cent of milk production in Egypt. Nevertheless, working to enhance small-scale-farmers milk production capacities can only be feasible unless necessary actions are in place to address inefficiencies, constraints and weaknesses of the whole eco-system through a number of backward and forward linkages, including input supplies, in terms of animal feed and health care, accessibility to improved animal breeds, and to adequate extension services. Addressing weaknesses and gaps in post-production activities like milk handling, collection, storage and transportation is of equal importance to maintain and put forward the value added during production phase.



INTRODUCTION

Background

The project “Egypt Youth Employment (EYE): Jobs and private sector development in rural Egypt” (RAWABET), funded by the Government of Norway, aims to promote decent private sector employment in rural Egypt through increased opportunities for employment within large enterprises as well as rural MSMEs along value chains of highest employability and growth potentials. The project is Implemented in partnership with the Ministry of Investment and International Cooperation, and in collaboration with the Federation of Egyptian Industries (FEI) and the private sector. This project intends to capitalize on ILO expertise and experience in promotion of decent employment in rural economy and to build on and scale-up past and ongoing initiatives with focus on rural economy implemented in Egypt.

A core component of the project involves the selection of economic subsectors/ value chains with high employability and growth potentials. Within selected value chains, the project will work to provide relevant technical support and necessary access to business management services to develop the capacities of existing suppliers (MSMEs), with an aim to boost their competitiveness and growth potentials and, subsequently, improve their ability to generate decent work opportunities.

During the inception phase of the EYE RAWABET project, and based on a series of technical consultations with stakeholders and the findings of a Rapid Market Assessment (RMA), the dairy sector was identified as a prominent subsector with great potential for growth and employment creation. The structure of the dairy value chain appears to incorporate several elements that supports the feasibility of the planned project interventions. The present in-depth market system analysis (MSA) will facilitate a better understanding of this structure and also identify the bottlenecks, possible market incentives, pathways of change and entry points for potential market-system-based interventions in the dairy value chain. The MSA will present its findings on the value chain within the dairy subsector, which is best suited to the project’s approach, tools, duration and scope. The MSA study will also guide the project

in identifying the underlying constraints in the dairy market system and possible sectorial interventions that can help enable target groups capture economic opportunities with strong potentials for inclusive growth and systemic change in the dairy subsector.

Based on the MSA, an intervention model shall be designed to address the different aspects of the selected value chain, by engaging all relevant stakeholders from the private sector and national public institutions.

The MSA is intended to realize the following objectives:

- ▶ (i) Identify the structure of the dairy subsector, mapping out relevant actors and systems, including the size of the target group, the nature of operational enterprises, prospects of growth and productivity, improvement in working conditions, availability and willingness of key actors to be engaged in possible interventions, and the conduciveness of legal and economic factors.
- ▶ (ii) Identify opportunities and constraints/ bottlenecks in the value chains under study, giving priority to those with high potential for job creation, specifically for youth and disadvantaged groups, and for sustainable growth for MSMEs in rural areas;
- ▶ (iii) Highlight feasible entry points for the value chain intervention in the dairy subsector that will address bottlenecks and harness the potential of the subsector in interest of all engaged actors.

Methodology

The present MSA follows a multi-dimensional approach towards value chain analysis (VCA), capturing and examining the elements and dynamics of the dairy market system including market supporting functions, relevant policies, rules and regulations, key market actors and stakeholder institutions which influence different phases of dairy/ raw milk production.

For data collection, the study has relied on secondary sources from the Food and Agriculture Organization of the United Nations (FAO), the Ministries of Agriculture and Trade, among other related sources. The study has also comprised information generated from a number of interviews and technical consultations with key dairy market actors, including lead dairy firms, relevant government institutions, academia, and most importantly, owners of milk collection centres and micro, small and medium-scale milk producers who constitute the main target group that the project is working to impact. The interviewed actors belonged to different parts of the value chain, from the starting point of the production systems, going through trading and service provision, up to the processing stage of the dairy value chain (Annex 2).

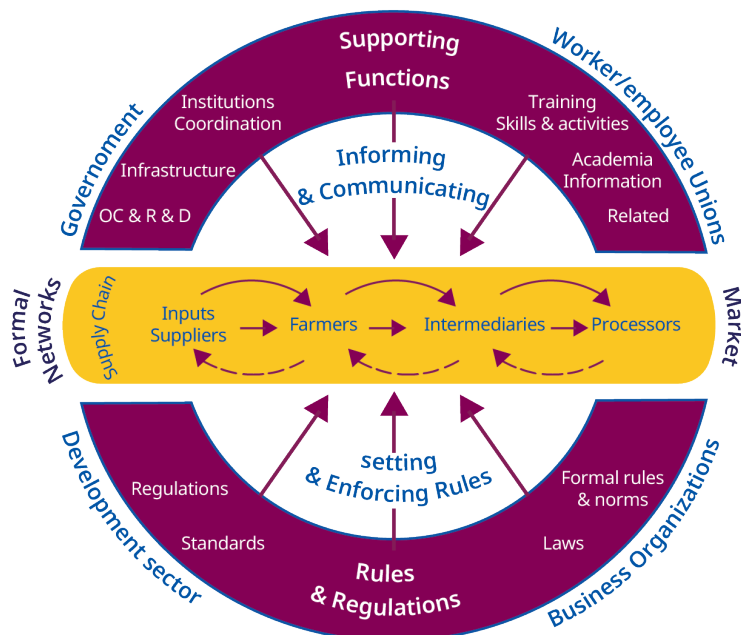
In addition, the study conducted a field survey of a sample of 10 municipal milk collection centres in four governorates; Sharkia, Gharbia, Baheira, and Bani Suef, where most of Egypt's milk collection centres

are located, as well as a survey on a sample of four modern companies with specialized large dairy plants (Annex 2).

Market system framework: ILO's approach to value chain analysis.

From a value-chain development perspective, as illustrated in Figure 1 below, input supplies, subsequent production stages and transactional and marketing activities constitute the "core" of the market. The performance of the dairy sector, as a supply chain, also tends to be influenced and shaped by the broader system/ eco-system comprising different market players engaged in various roles and functions, including supporting-functions actors, such as business development service providers and relevant research institutions. Applicable rules and regulations also have an impact on the performance of the dairy milk production sector.

Figure 1: ILO's approach to value chain analysis



1

The Dairy Sector in Egypt's Delta: Value Chain Mapping





Overview of milk production in Egypt

Agriculture contributes to 13 per cent or nearly US\$ 27.2 billion of the GDP in Egypt, out of which animal production accounts for US\$ 9.99 billion. In 2017, milk represented almost 33 per cent (US\$ 3.3 billion) of the total animal production. (CAPMAS, 2017) In Egypt, there is a large ruminant population of 3.7 million buffaloes, 4.9 million cattle and 3.4 million other dairy animals providing an average of 4.7 million tons of milk annually. Between the year 2012 and 2016, Egypt produced an average of 5.3 million tons of milk. (FAOSTAT, 2016)

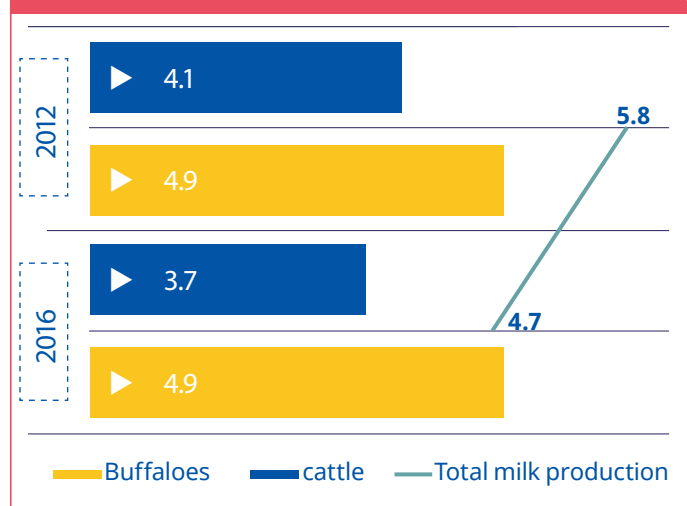
Domestic production meets only 72 per cent of Egypt's demand¹. In order to fill the gap between the demand and supply of good quality milk, dairy processors and retail channels tend to rely on imports of milk powder and other dairy products. In 2017, Egypt imported 2,255,000 tons of whole milk powder

(WMP) and 190,000 tons of non-fat/skimmed milk powder (SMP). (UN Comtrade, 2017)

Nearly 75 per cent (3.513 million tons) of the milk is produced by traditional and subsistence systems in the informal sector. 45 per cent of the produced milk is consumed locally at production areas, for on-farm consumption, calf-rearing and other value added dairy products. The remaining 55 per cent is marketable milk for commercial use and is transferred to urban areas. 34.8 per cent of the marketable milk is consumed as liquid milk. The consumption of milk in its liquid form has not been common in Egypt but has seen an increase in the last few years, especially in urban areas. Most of the milk from buffaloes and cows and almost all from sheep and goats is consumed in the form of cheese and ghee. Nearly 54 per cent (approx. 0.484 million tons)

¹ Ministry of Agriculture and Land Reclamation -Economic affair sector MALR-EAS, 2017. Dairy Marketing System Performance in Egypt by Dr. Soliman, Ibrahim and Mashhour, Ahmed. https://mpr.ub.uni-muenchen.de/66799/8/MPRA_paper_66799.pdf

Figure 2: Milk Production (2012-2016)



is supplied through the informal sector and lacks product safety and quality control checks. (Euromonitor, 2017)

Winter and spring are the milk production seasons in Egypt, accounting for 65-75 per cent of total annual production, due to availability of green fodder (clover) during the period from October to June.

Geographical mapping of milk production

West Delta, Lower Egypt and Nile Valley regions account for nearly 89 per cent of the total dairy production. Despite having 44 per cent of dairy livestock², Upper Egypt constitutes a smaller percentage in total production due to several factors including unfavourable geographical conditions, small landholdings, and weak support services.

Almost all modes of milk production, especially for large dairy farms, tend to rely on the availability of arable land for the production of fodder or concentrated feed.

In drier regions like the Red Sea, Sinai and Matrouh, the unavailability of water is the main reason for the lower number of cattle and people mostly rear sheep and goats.

Formal vs. informal dairy market channels

Egypt's dairy sector comprises of both formal and informal market channels. The formal market is served mainly by medium to large-scale dairy farms that pass over their milk production to large dairy processors using chilling facilities.

On the other hand, informal or traditional milk market in Egypt often provide the main outlet for smallholder dairy producers and constitute the major source of fresh milk supply for consumers. Informal market channels may involve small to medium-scale producers, mobile middle traders, large-scale wholesalers and retailers (milk shops). The informal sector

of milk production lacks quality control allowing only limited access of small dairy producers to the formal market, which restricts the potential of the dairy sector and its contribution to the national economy despite the quantity of milk produced. The total informal milk supply in the year 2016 was estimated at 2.163 million tons divided into two marketing channels- 22 per cent goes into liquid milk, which is sold to milk shops (street milk) in urban areas or big cities, and the other 78 per cent is sold to small and medium enterprises (SMEs) such as cheese dairies.³

However, milk collection centres act as the link between the informal market and the formal dairy supply chain by adding value through chilling, transport and some quality control.

² Ministry of Agriculture and Land Reclamation -Economic affair sector MALR-EAS, 2017

³ <https://www.euromonitor.com/dairy-in-egypt/report2018>



Key market actors

The study lists key actors participating in the dairy value chain through one or more functions including: production, distribution, processing, and marketing.

1. Dairy producers

Milk production in Egypt takes place through three main actors: 1) subsistence micro-farmers who contribute with the largest share of milk in the Egyptian market, 2) traditional small and medium breeders and 3) a limited number of specialized and modern commercial farms that import foreign breeds of cattle, like "Holstein". The terms "subsistence", "traditional" and "modern" are used to denote whether production is mainly geared towards producing for family and domestic consumption (as in the case of subsistence production systems) or for the market (under the traditional and modern or commercial production systems). The subsistence and traditional livestock production system in Egypt is dominated by indigenous livestock breeds, while the modern livestock production system maintain improved and exotic livestock breeds.

The following section highlights the characteristics, potential and improvement opportunities in these three dairy production systems:

- ▶ **(i) Subsistence dairy production system:** With one to ten cows per household, this system has most of the animal inventory in Egypt representing 89 per cent. Micro-landholders and landless farmers keep dairy animals for subsistence purposes. The economics behind a subsistence livestock system makes it unviable as business. Typically, animals in such system are subject to poor conditions of nutrition, health and welfare, and, hence, are not likely to produce milk of marketable quality.

Milk produced within subsistence systems is largely consumed within the producing household (about 45 per cent) and what remains is sold through a multiparty payment system monopolized by middlemen. Since dairy production in the subsistence livestock production system is primarily geared toward meeting basic family requirements of dairy products, only small and fluctuating amounts of surplus milk and milk products are usually available for marketing, however representing 69 per cent of the national production (3.232 million tons). The system is fragile, making it difficult for farmers to persist through difficult business conditions. As a result, they are the first to exit the business easily by selling their animals or slaughtering them for beef.

- ▶ **(ii) Traditional dairy production system:** Traditional production system usually takes the form of family farms with the capacity of 11 - 100 cows. Representing 6 per cent of all the dairying animals in Egypt. Dairy farming in such modalities is part of a diversified farming system, aiming to generate sufficient income for the family members. This size of farms is common in arable areas, largely within new dairying communities established in areas such as Noubaria, Behaira, Kafr El-Sheikh, New Demyetta, etc., as a result of the Agrarian Reform law. Milk produced from such farms is marketable but controlled and dominated by networks of intermediaries similar to that of the subsistence system. The traditional dairy production systems

accounts for 6 per cent of the milk production in Egypt. These dairy farms can be described as “household farms”. A large part of the milk produced in these farms is consumed within the household and what remains is sold locally, often to an informal market. The sale of milk provides cash for daily sustenance to the household.

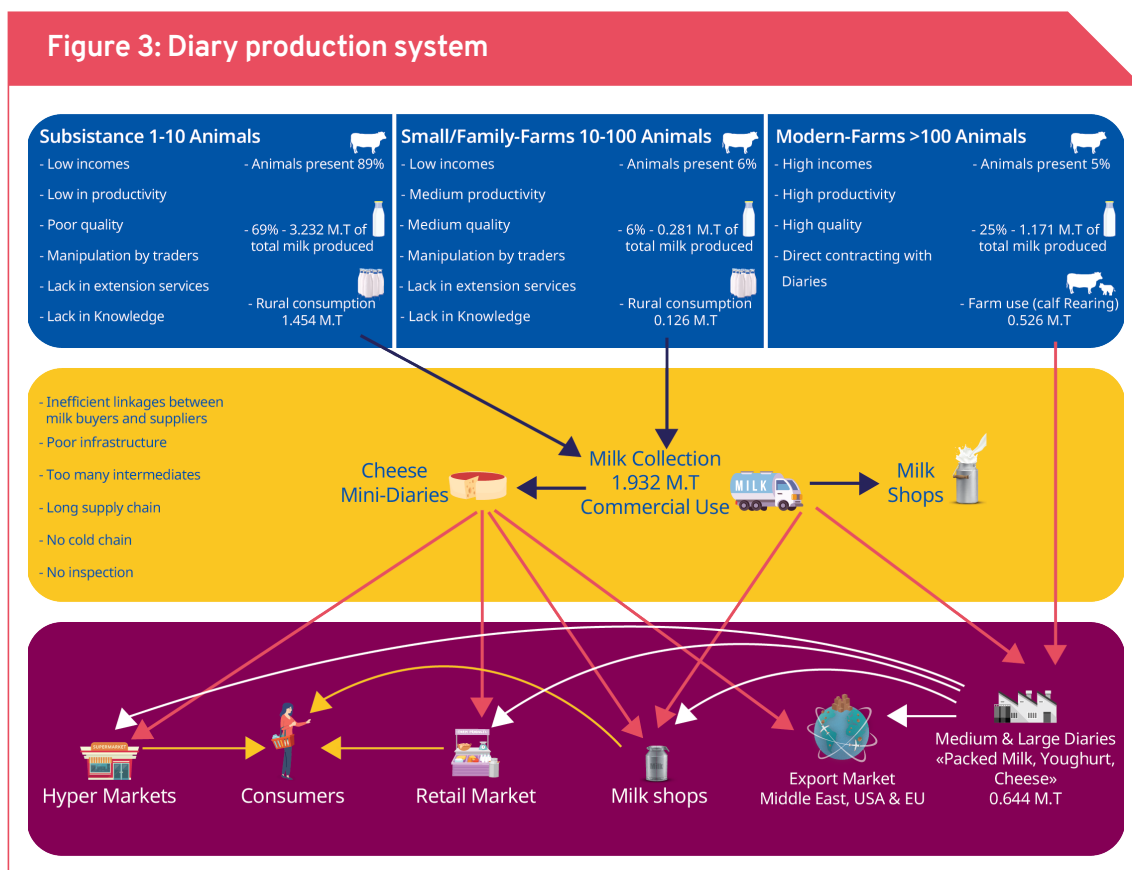
The subsistence and traditional systems, both of which are referred to as the “informal sector” account for 75 per cent (3.513 million tons) of the total milk production. Out of the milk produced, about 45 per cent is locally consumed at the village level for calf rearing (25 per cent) and family use 75 per cent. The remaining 55 per cent surplus milk is marketable milk, sold through a multi-layered distribution system of intermediaries and direct sales.

- ▶ (iii) Modern dairy production system: This system constitutes large dairy farms with more than 100 cows, and represents only 5 per cent of the dairy animals in Egypt. These farms can be described as “business farms” as most of the work is done by employees. The main aim of these enterprises is to generate the expected return on investment. There are approximately 134 large farms in Egypt with an average herd size of 3,100 cattle, mostly located in the Delta region and around Nobarria.

2. Dairy marketing and distribution agents/actors (intermediaries)

Milk collection, cooling, and transport are usually done through a long chain of intermediaries, namely: milk collectors, wholesalers (middlemen) and milk collection centres.

Figure 3: Dairy production system



- ▶ **(i) Middlemen:** Milk marketing system begins at the individual milk collectors, with small daily collection capacity of 300-500 kg and no elaborated facilities. They live in villages in rural areas, next to smallholder milk producers and function as middlemen between smallholder producers and milk wholesalers. Milk collectors have important functions in milk marketing and logistics, such as bulking the milk for commercial handling, averaging milk price and milk quality as different qualities have different prices, transferring milk out of the villages. Usually milk collectors provide payments to the farmers for milk on a weekly basis or similar period. Dairy farmers receive a marginal price for their milk, with middlemen controlling the increase in their margins and reduction of their costs. When small quantities of milk are delivered by dairy farmers who themselves are not in a position to go to a fixed point or a collection centre, they accept lower prices. As surplus milk is available in limited quantities, traders need to ensure a decent margin to cover the cost and make profit from the small quantities of milk collected. Unless the collection is done on behalf of family members or neighbours, middle-men are a weak link in the quality chain as they often adulterate the milk to make up for the costs of fragmented collection in low quantities. Milk collectors usually sell their collected milk to milk-wholesalers who come early every day with pick-up trucks equipped with scales and milk analysers and buy milk from different collectors (middlemen). Middlemen have assembly lines in the village or surrounding villages to collect milk directly from farmers immediately after milking time, and deliver it to the wholesalers.
- ▶ **(ii) Milk collection centres (MCCs):** In 1960s-70s, the state cooperative system and the state MISR Dairy Processing Company jointly undertook large-scale development of cooperative milk collection centres to serve producers of small

and medium farms. About 50 collection centres were established in the Delta with the support of the EU. Around 1980, the General Cooperative for Animal Wealth and Development, supported by a governmental feed subsidy programme, imported for the first time Friesian/Holstein breed of cattle, for the registered cooperatives' members, including the region of Qutor-El Gharbia, and Shanshour-El Monoufia. In the late 1980's, the subsidy was discontinued, which led to a crisis in the dairy sector. Many farmers had to sell their livestock. The MISR Dairy Company was unable to produce affordable low cost milk in cheap packaging, which forced it to cut down on quantity of milk received and led to closing of most of the milk collection centres and regional factories. Previously, most of the MISR Dairy Company collection centres were rented and run by a local employee. After the scaling down and closing, some of the employees continued operating the centres and selling the milk to MISR and some others started private mini-dairies for soft and hard (Romy) cheese. Thereon, the collection centres gradually began to run as private businesses. The small-scale dairy farming sector started to depend on this distribution channel for marketing their milk. The milk was then collected by middlemen and sold to a wholesaler to be sold to the milk collection centres and local mini-dairies or supplied directly to the nearest town as fresh milk. Currently, most villages have private milk collection centres equipped with cooling facilities of different capacities. Centres with small capacities collect milk from small farmers and collection points that have no cooling facilities and limited capacity of 50-100 kg. Larger centres collect milk from medium scale farmers, collection points, low capacity collection centres and milk traders. They also separate the milk from each supplier according to the quality and send the highest quality milk to modern dairy factories they have contracted with and send the low quality milk to the traditional cheese plants.

Over 1,000 collection centres exist in Delta and Nile Valley.¹ In contrast, in Upper Egypt, the number of milk collection centres with cooling tanks is limited, especially farther away from Cairo. Milk marketing channels are different in Lower and Upper Egypt, given the variation in availability of cow milk, feeds and buyers.

3. Dairy processors

Most of the dairy-processing facilities in Egypt operate on less than one ton of milk per day, whereas a small number of facilities process more than 10 tons of milk daily. Very few dairy-processing companies have the capacity to process over 200 tons of milk per day (on yearly average).

► **(i) Lead dairy processors:** In 2012, there were, roughly, 25 of large-scale private-sector companies in Egypt engaged in industrial processing and packaging of dairy products, 14 of which were members in the Dairy Industry Development Association (DIDA). Among DIDA members, only seven or eight firms have been considered as “significant players” of the dairy industry in Egypt. (The Flemish Institute for Technological Research; the Egyptian Ministry for Environmental Affairs, 2012) These companies include Juhayna, Almarai, Lamar, Obourland and Danone. Such large dairy firms tend to dominate the dairy market and have the capacity to control prices of different sorts of dairy products. It is worth noting that the market share of the private sector in dairy production has been steadily growing since the 1980s, following the demise of the Misr Milk and Food Company.

► **(ii) Mini dairies or cheese processors:** The number of small-scale municipal dairy plants was reported at 717 licensed plants in early 2000s, among many other unlicensed plants. Almost 66 per cent of municipal dairy plants are based in rural areas. In the year

2011, 38 per cent of municipal dairy plants were located in Dakahleya governorate, 15 per cent in Fayoum governorate, and 13 per cent in Damietta governorate. In addition, 10.7 per cent were located in Menoufia governorate, 8 per cent in Gharbia governorate, whereas the rest of municipal dairy plants were located in Sharkia, Cairo, Giza and Kafr El Sheikh governorates (Soliman & Mashhour, 2011). The size and processing capacity of municipal dairy plants in Egypt vary significantly, with capacity of raw milk processing ranging from 100 kg per day to 6 tons per day. Although mini dairies do not feel threatened by the increasing market share of large dairies, competition for shelf-space in regional markets has increased significantly. Some key problems facing mini dairy processors with respect to sales and distribution concern collection of payments from sales outlets and retailers, inadequate transport vehicles and poor roads. Most dairies find it difficult to work with supermarkets, citing bad payment and contractual terms, payment delays, no quantity guarantees, and excessively expensive shelf-space pricing.

1 Chamber of Food Industries, Milk and Dairy Products



Supporting functions and key service providers

1. Chamber of Food Industries¹

The Chamber of Food Industries (CFI) is a non-profit organization that works under the Federation of Egyptian Industries (FEI), as a congregating platform for companies in the food and beverage sector. Established in 1958, the CFI has seen its member base grow to over 3,000 companies, which renders the CFI the official representative of the food and beverage industry in Egypt. With an aim to provide adequate support to its members and to help develop the competitiveness of the industry at large, the CFI undertake a wide range of services, including the following:

- ▶ **(i)** Voicing the combined interest of Chamber members, including the coordination with the Egyptian government on policies that are relevant to the food industry,
- ▶ **(ii)** Identifying challenges in the food and beverage industry, and working to address them through strategic alliances,
- ▶ **(iii)** Providing access to information and updates on the “latest international trends, standards, organizing seminars and conferences,”
- ▶ **(iv)** Offering a variety of skills-development training programmes, as well as relevant social services.

Milk and dairy products constitute one of the main divisions inside the CFI. In fact, the dairy industry has been among the strategic areas of CFI activities.

2. Agricultural Research Centre

The Agricultural Research Centre (ARC) was established under the Ministry of Agriculture and Land Reclamation (MALR) in the early 1970s, to help support the development of the agriculture sector. Towards that end, the ARC works to conduct rigorous applied and basic research to generate a flow of new technologies that are transferred to the rural communities to increase productivity.

Over the last two decades, the ARC has been noted for many achievements, including “the development of new agricultural varieties, introducing improved agronomic practices and livestock development.”

3. Food Technology Research Institute

Established in 1991, the Food Technology Research Institute (FTRI) is a research institute that conducts research work on all areas of food-processing sectors, including dairy products. In fact, one of FTRI's eight key research departments is solely dedicated to the provision of dairy technology research.

Having dairy producers among its main beneficiaries, the FTRI works to provide adequate access to necessary technical support and guidance on areas that are key to business growth. More generally, the FTRI provides a range of services to the food industry, including research and development, technical support, knowledge transfer, as well as skills development.

¹ <http://www.fei.org.eg/index.php/en/chambers-en/634-food-chamber>



Rules and regulations

As other food items, dairy products, along their production and processing stages, fall in the range of multi-sectoral regulatory schemes, mostly under the frameworks of the Ministry of Health and Population, Ministry of Agriculture and Land Reclamation as well as the Ministry of Trade and Industry, among other entities with “food inspection” mandates.

1. National Food Safety Authority

Food quality and safety have become an important topic in the agro-food sector in Egypt. In January 2017, Egypt established the National Food Safety Authority (NFSA). The NFSA will consolidate the Egyptian food safety system under one umbrella. This is a significant development as there are currently 17 government agencies trying to enforce over 120 food safety related regulations. The multitude of agencies and laws creates significant inefficiencies and gaps that are envisaged to be reformed through the NFSA. Article 2 of the law establishing the NFSA indicated that the NFSA shall exclusively assume all the responsibilities and jurisdiction of all ministries, public institutions, government agencies and municipalities in relation to supervision over the handling of foodstuff, wherever that appears in any legislation concerned with food safety. In addition, the NFSA shall assume all competencies awarded to it. According to the law, the NFSA is to exercise these responsibilities within one year starting from the date of the issuance. By that time, employees working in other ministries, public entities, government agencies or municipalities, and who are in charge of food safety, shall be transferred to NFSA. The NFSA's mandate is “achieving the requirements of food safety in a way as to preserve human health and safety”. To this end, the NFSA will supervise the food handling to make sure that all specifications and requirements set out by relevant legislations

are fulfilled. The NFSA also will apply audits on the food companies ensuring that they obtain raw materials from approved sources that comply with food safety standards and requirements. Further, it will acquire factories and companies to register their suppliers list. Food and raw materials samples shall be analysed in accredited laboratories in accordance with the provisions of the Commission's law referred to above. These tests shall include the following:

- ▶ Tests of chemical contaminants (pesticide residues, heavy metals, unauthorized additives) according to binding rules issued by the NFSA.
- ▶ Microbial contaminants testing to ensure microbiological safety, in accordance with binding rules issued by the NFSA, in addition to being free of hepatitis A virus.

The NFSA shall include suppliers, companies and factories that comply with the food safety requirements set by the commission in the white list of certified and approved food manufacturing companies, retailers and food suppliers for the domestic market and export. This list is updated on a continuous basis including products or types of products.



The market system of Egypt's dairy sector: the big picture of the dairy value chain

This part of the study brings together all dairy actors, supporting functions, relevant policies and regulations, as identified above, within the overarching framework of the market system, highlighting the relationships between different market actors as well as their engagement within the value chain from the very early stages of production up until the dairy product reaches the consumer (Figure 4).

1. Main market channels

Around 2.576 million tons of marketable milk is produced annually in Egypt. Categorized into A, B and C milk on the basis of quality, this milk goes to formal as well as informal processing industry. Class "C" milk goes to the seasonal cheese processing mini dairies as well as some commercial cheese dairy factories, such as Greenland, Faraglla, Domty, Katelo, El Masreen, Reyada, Farm-Cheese, etc. Class "A" milk goes directly to the UHT milk processors such as Juhayna, Beyti, Danone, Lamar, etc.

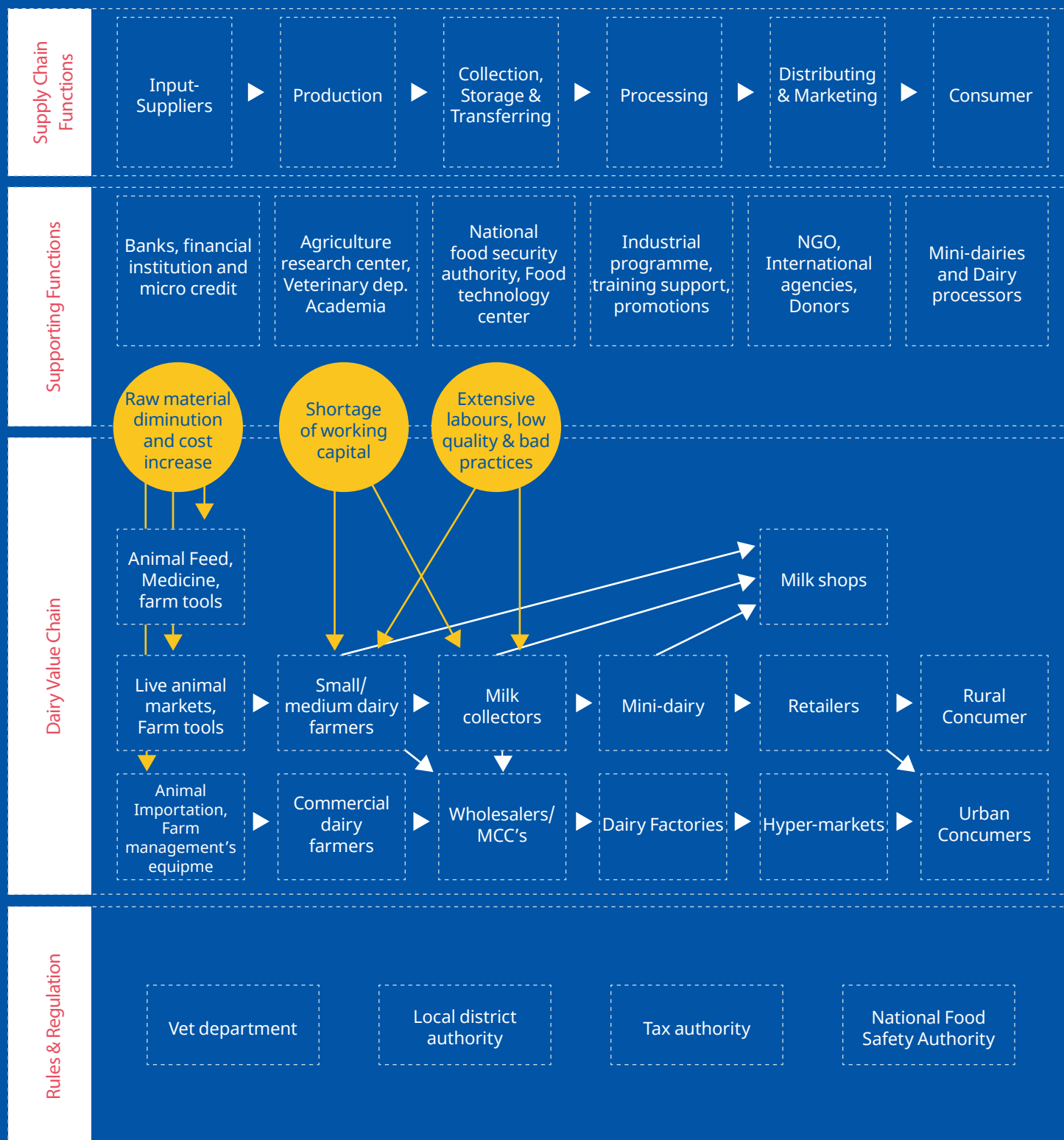
As mentioned previously, dairy production systems largely fall in two main categories: 1) subsistence and traditional production systems of small and medium capacity and 2) the large commercial farms.

Subsistence and traditional production channels

Milk produced in the subsistence and traditional systems is largely used for domestic purposes, including family consumption, feeding calves and processing at home. The surplus milk has several marketing channels depending on the type, quantity, quality and location of the village. Typically, the milk produced from the subsistence and traditional systems is marketed through the following four channels:

- ▶ (i) From the farms to the direct consumer or milk shops: In addition to directly supplying liquid milk to consumers, in some villages, farmers' wives also use the produced milk to make local dairy products such as Kariesh cheese, skimmed milk cheese, Rayeb (fermented skimmed milk) and butter, which are also sold directly to consumers. Egyptian law does not allow the sale of home-made products to retail or catering establishments. However, such sales are commonplace because of the lack of market supervision, especially in the economically less developed regions. Small grocery stores sometimes also act as collection points. In return for milk, the grocery store will provide the farmers with household products such as sugar, rice, oil, etc.
- ▶ (ii) From the farms directly to the mini dairies for cheese making: Given the low quality, milk produced within the subsistence and traditional systems is largely directed to meet the high demand from mini and small cheese plants in rural areas, where quality is not a requirement.
- ▶ (iii) From the farms to milk collectors-the intermediary small traders: The milk collectors collect milk from subsistence and traditional farms and deliver it to merchant

► Figure 4: Egypt's Dairy Market System



brokers. In order to maintain the quality of milk, it has to be cooled, pasteurized or processed within an hour of milking. In absence of these processes, traders of loose raw milk have been known to add external substances (often alkaline substances such as carbonate or caustic soda), formalin or antibiotics to prevent milk spoilage, making the milk spurious. For this reason, trading in loose milk, as it is currently practiced, is danger to public health.

- ▶ **(iv)** From the farms to the collection centres in the village: Milk from subsistence and traditional farms is sold to the collection centres in the villages and subsequently transported by the wholesaler to:
- ▶ 1. A mini dairy plant for processing or milk shops and retail stores as fresh milk. Many shops with small cooling tanks (with a capacity of 300 - 500 kg) sell raw milk in plastic bags to serve the local market for loose white, fatty milk, especially in milk producing governorates.
- ▶ 2. Large dairy processors. About 15 per cent of the subsistence and traditional milk production goes to the modern dairy processing factories. Milk producers from the traditional livestock production system with small and fluctuating surpluses for sale can use the modern systems as long as they can organize themselves to deliver their supply of milk to those channels. Considering the small amounts involved, most producers in the traditional subsector often find it more convenient and rewarding to use the traditional marketing channel as their sales outlet, unless this channel can no longer handle their products.

There are rare cases where large dairy processors enter into long-term fixed price agreements with medium-sized farmers where payments are revised on three-month basis. These farms are subject to quality assurance inspection by the dairies.

Large modern commercial farms production channels:

On the other hand, most of the milk produced by large modern dairy farms is channelled to large dairy processors under individual agreement on prices, quality and quantity. Some dairy processors also have their own dairy farms to ensure consistency of supply. Dairy products, either as fresh milk or in cheese form, are then sold directly to retail shops, catering companies, and hypermarkets. A small share of milk products is exported, mainly to Middle East, and Northern African countries.

Export vs. imports of dairy products:

Egypt's dairy exports have seen a significant increase between 2013 and 2017, in both volume and value, as reflected in data from United Nations International Trade Centre (ITC) data (Table 1). At the same time, Egypt's dairy imports from the USA and the EU have seen a decrease in the same period, indicating a positive trade balance in the dairy sector.

Egypt's main export trading partners are Libya, Algeria, Morocco, Saudi Arabia, Iraq, Syria, Jordan, etc., where Egypt dominates with feta cheese and some non-fat powder milk exports.

The dairy industry in Egypt depends upon many imported dairy supplies for lack of local alternatives. Egypt imports constitute about 70,403 tons of milk powder with an estimated value of 314 million pounds in 2015. In many products, milk powder was replaced by natural milk. Milk powder is used in manufacturing white cheese and cooked cheese, with each representing about 25 per cent of milk powder usage.

Table 1: Export of dairy products, 2013-2017 (US\$/thousands)

CODE	PRODUCT LABEL	2013	2014	2015	2016	2017
0401	Milk and cream, not concentrated nor containing added sugar	14,059	10,939	8,896	13,321	8,635
0402	Milk and cream, concentrated or containing added sugar	10,981	13,907	11,188	11,684	19,380
0403	Buttermilk, curdled milk and cream, yogurt, etc.	58	1	34	93	20
0404	Whey, whether or not concentrated or containing added sugar	3,253	465	377	192	111
0405	Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy spreads	5,675	3,090	1,901	3,649	2,036
0406	Cheese and curd	374,938	378,924	340,811	284,143	273,494
Total	-	408,964	407,326	363,207	313,082	303,676

(UN Comtrade, 2017)

Table 2: Import of dairy products, 2013-2017 (US\$/thousands)

CODE	PRODUCT LABEL	2013	2014	2015	2016	2017
0401	Milk and cream, not concentrated nor containing added sugar	451	251	804	321	470
0402	Milk and cream, concentrated or containing added sugar	389,404	407,168	314,264	241,133	185,777
0403	Buttermilk, curdled milk and cream, yogurt, etc.	140	348	536	177	335
0404	Whey, whether or not concentrated or containing added sugar	69,934	88,495	68,685	55,364	57,525
0405	Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy spreads	176,060	213,773	228,013	162,800	120,326

Table 2: Import of dairy products, 2013-2017 (US\$/thousands)

CODE	PRODUCT LABEL	2013	2014	2015	2016	2017
0406	Cheese and curd	132,321	166,335	150,656	126,591	107395
Total	-	768,310	876,370	762,958	586,386	471828

Source: ITC calculations based on UN COMTRADE statistics

2. Milk pricing systems

As a result of a complex collection and distribution systems, the current milk quality in Egypt is below international standards. The average farm-gate price of milk is EGP 4.50 per kilo. It varies from EGP 3.50 to EGP 5.50 per kilo depending upon the season. Variation in farm-gate prices is not linked to the quality of the milk but depends on the financial arrangement between the customer and seller as well as the geographical location.

Currently, there are no policies to regulate milk prices at the farm level. The processed packed milk retail prices range from EGP 14.00 – 16.00 per kilo whereas loose milk retail price ranges from EGP –8.00 - 11.00 per kilo.

Unprocessed milk passes through middlemen before it reaches urban retailers. The price of milk increases by EGP 0.5 per kilo at each stage of sale. The milk collectors generally have undocumented contracts with farmers for regular milk supply. They pay farmers an average price of EGP 4.00 per kilo. Transportation generally costs EGP 0.35 - 0.5 per kilo.

The type and size of the farm as well as the season of milk production play a major role in determining the price. For example, the demand for cow milk is high between November and April each year. This is also the

season for production of Romy, a kind of hard cheese. As a result, there is strong competition among traditional cheese plants and between traditional plants and modern dairy factories during this season, driving up the price of milk significantly. Unfortunately, this competition may drive some milk traders to cheat, by using milk synthesized from water, powdered skimmed milk, soya protein, dry whey protein, and vegetable oils, mixed with small portions of natural milk. This could possibly explain the willingness of milk traders to pay higher prices for natural milk.

2 The dairy value chain development: constraints and opportunities

This section of the study explores the bottlenecks and challenges that need to be addressed to harness the potential of the dairy sector in Egypt. It also highlights potential opportunities that could work as market incentives and entry points for key actors and stakeholders to pursue corrective actions to enhance the sector's overall performance. The main challenges in the dairy sector in Egypt include:





Underdeveloped dairy production systems

The dairy sector in Egypt is characterized by thousands of small and marginal farmers, including those who do not own land and rely on sustenance dairy farming as the main source of income. Poverty and illiteracy translate into overall low productivity and inefficiency in rearing dairy animals and in handling the produced milk. Some of the systemic challenges to development of dairy farming at village levels and marketability of rural milk in formal and domestic markets include:

- ▶ **(i)** Poor quality, productivity and milk handling practices: The improper and manual handling of milk exposes it to pollution and significantly compromises the quality, limiting the opportunity to sell it to large dairy plants. Furthermore, and given the low and inconsistent quantities of milk produced, small farmers have little leverage to push milk prices higher when selling to milk collection centres and traders. In addition, the system of payments is unstructured, where payment to farmers can be delayed for weeks.
 - ▶ **(ii)** Limited use of technology in milking and related practices: The use of technology in milking and related practices is limited, largely owing to the inadequate access to market information about new technological solutions in the dairy field and the inability of farmers to financially afford the acquisition of such new technological applications. Small-scale farmers are isolated from the sophisticated market mechanisms present in the advanced parts of the value chain. There is minimum transfer of knowledge and technology to village-level small-scale farmers, which further discourages them from increasing production and expanding their dairy business.
 - ▶ **(iii)** Inadequate linkages with milk collection points/centres: Small-scale farmers are not properly linked to milk collection points/ centres, which contributes to their isolation from the sophisticated market systems present in the advanced parts of the value chain. This results in the farmers being offered low prices for the milk that they produce. They therefore tend to be reluctant to sell their milk and instead prefer to increase their household consumption.
-



Poor milk handling and distribution:

Lack of adequate equipment in the milk collection system for filtering, testing the fat content or sampling bottles or preservatives contributes to the low quality of the milk

supplied, which adversely impacts the quality of dairy products and the competitiveness of the industry as a whole.



Lack of extension services at the village level

Most of the small dairy producers complain about the shortage of extension and veterinary services, high input costs and quality of animal feed, which affect the quality and quantity of milk production.

- ▶ **(i)** Limited access to adequate veterinary and animal healthcare services: Limited access to adequate veterinary and animal healthcare services contributes to the low quality and quantity of milk produced.
- ▶ **(ii)** Poor quality of local animal breeds and inadequate access to improved breeds: Poor quality of local breeds, inadequate access to improved breeds and high operating costs of high-yield dairy breeds leave the farmer with no option but the available low-yield breeds, jeopardizing the quality and quantity of milk produced.
- ▶ **(iii)** Poor quality of feed resources and feeding plan/systems: The quality of available feed and feeding plan/systems is poor, partly due to the high cost of agricultural inputs that constitute a major source of feed supplies, given

the pressure on the availability of land for pasture crops. Egypt is one of the higher-cost dairy producers, especially when compared with other developing countries, because of the high cost of pastures and scarcity of grain crops. High cost of cultivating land for green fodder and the high prices of concentrate feed mix force traditional farmers to use lower quality materials to feed their dairy animals, such as grass vegetation or crop residue on fields, especially in summer and fall, when fodder is scarce. Milk animals are also exposed to chemicals and pesticide residue from grass and crops. These seasons therefore witness lower productivity and deteriorated health of dairy animals in general.

A need for a more conducive regulatory framework

Food and hygiene laws relevant to the milk production industry fall under the mandate of the Ministries of Agriculture, Health, Trade and Industry, and Housing. The Ministry of Agriculture holds jurisdiction over veterinary services responsible for control of zoonotic diseases in farm animals. The Ministry of Health is responsible for supervising the handling of milk, but not for the processing, which falls under the supervision of the Ministry of Trade and Industry. Lastly, the Ministry of Housing controls the buildings where milk is handled.

While there is clarity on standards of product quality, it was reported by the respondents that laws governing the dairy processes such as milk-handling were sometimes contradictory and difficult to follow, underscoring the need of a clear regulatory framework for the dairy sector.

Each ministry has its own inspection mechanism and scope, leading to gaps in inspection apparatus. To elucidate, respondents highlighted the case of unused pasteurizers in cheese factories where the scope of inspection by Ministry of Trade extends to availability of machines but not to its actual utilization.

The inspection department at the Ministry of Health has been the most active in this sector.

In 2012, they examined 12,000 samples of milk from different dairies, of which approximately 1,000 were found to deviate from the required standards. Inspections under the Ministry of Health only look at pathogenic agents and do not consider bacteria counts as a measure for hygiene.

In 2012, a draft law was prepared under guidance of the Prime Minister's Office to create a single National Food Safety Authority (NFSA). While acknowledging that collaboration among the existing departments would be challenging, the creation of the NFSA was considered necessary.

On the other hand, to bring about significant improvements in the three production systems, sectoral policies are required to address the systemic issues around pricing and quality of products and availability of market facilities at affordable prices, especially to small and medium scale producers. Policies are needed to ensure inter alia higher and stable prices to producers, reliable milk supplies for urban areas at reasonable prices, reduced market costs and improved hygiene and quality of products.

3

Value chain analysis: roadmap to interventions for Value Chain Development



In Egypt, dairy processing accounts for 11 per cent of agricultural value added and dairy companies constitute over 45 per cent of all agribusinesses in the dairy sector (CAPMAS, 2017). Although milk production and consumption are increasing, efficiency and productivity remain low and product quality issues limit further development in the sector. The dairy sector in Egypt has significant potential to improve its resource-use and product quality for enhanced competitiveness.

As mentioned above, 34.8 per cent of the marketable milk is consumed as liquid milk, of which 54 per cent is unhealthy and supplied through the informal sector. This has several negative implications on the dairy value chain and all its actors, in terms of both quantity and quality of milk available for consumption as well as for the formal processing industry. Dairy processors have to account for the deficiency in the amount of adequate milk produced through imports of milk powder and other dairy products. Egypt imported 2,255,000 tons of whole milk powder and over 190,000 tons of non-fat/skimmed powder milk in 2017. (UN Comtrade, 2017)

The expansion of dairy production in Egypt is fuelled by the increased demand for quality milk. The subsistence and traditional systems of milk production are largely perceived to have the potential to meet this ever-growing demand. However, in order to harness that potential, a serious, systemic transformation that addresses the issues of milk-handling and productivity in these segments of milk production is quite essential. As discussed earlier, the subsistence and traditional livestock production systems suffer from poor quality of local breeds, lack of access to improved breeds and quality of feed resources and feeding systems. In addition, both modes of production have to live with inadequate veterinary and animal healthcare services, improper management of animal manure, disorganized marketing of milk and limited market outlets. These are among the challenges that significantly limit the potential of the dairy sector in Egypt and need to be addressed.

Furthermore, the subsistence and traditional production systems have to compete with larger dairy farms of more than 100 animals, which are likely to grow faster with the economies of scale. Large dairy farmers are responding to market pricing signals and boosting output by increasing the use of higher-priced feeds that increase yields sufficiently to cover for these costlier inputs. Smaller farmers usually do not invest in costly grains to boost output and often just put their cattle out to pasture. Further, the larger dairy farms employ veterinarians for general animal health care. They also have the capacity to perform artificial insemination for improved breeds. Most importantly, from a value chain approach, the larger farms are more integrated with the dairy processing industries and receive direct feedback from the market with price premiums for quality.

That said, today, due to high demand, even micro and small-scale dairy farmers are also interested and willing to invest in business transformation and exploring ways to expand milk output so as to benefit from prevalent high prices. It is worth noting that the low price offered for milk contributes to the reluctance of traditional farmers to sell their milk in the market and instead prefer to increase their household consumption. The proper integration of the small farmers with the value chain will allow new markets for their production with fair prices. The high prices of high-quality milk will then work as the key incentive for the micro, small and medium-scale farmers to grow. Addressing these challenges will also provide entry points for productivity improvement of micro, small and medium-scale dairy farmers and the quality of milk produced as well as an increase in their competitiveness to eventually boost the effectiveness of the dairy value chain.

It should also be mentioned that improvements in production systems must be accompanied by complementary improvements in the marketing system to ensure that there are sufficient outlets for milk produced. Therefore, government policies should not only focus

► Pricing as market incentive

Dairy processors purchase their milk directly from dairy farms as well as from milk collection centres where small-scale farmers sell their milk. Until 2009, raw milk prices used to be set through a committee comprised of large dairy farmers, manufacturers, and Ministry of agriculture officials. The committee used to convene four times a year to set a price for raw milk. Factors that affect the price included feed prices, the milk-to-feed ratio, comparable market prices, and global price for powdered milk.

Despite the efforts of the committee, there was an ongoing tug of war between dairy farmers and processors over the price of raw milk, particularly when the price of feed increased. In 2016, after the devaluation and the huge increase in the imported animal feed prices most of the dairy companies increased the price paid to large and medium-sized dairy farms to EGP 7.2 per litre as compared to EGP 4.5 per litre paid to the small farmers.

With this difference of almost EGP 3 per litre, milk traders determined the prices of the milk from the small-scale milk producers as well as with the mini dairies, irrespective of the cost of production. The cost of production is higher in the summer as the yield of raw milk per cow declines due to the hot weather and lower in the winter due to feed cost and high productivity of the cows.

Consumer dairy prices differ for packed and bulk un-packed milk, and depend on quality. Packaged dairy products in Egypt are chiefly dependent on high to middle income families due to several factors: GDP per capita is relatively low in Egypt, nearly 57 per cent of the population lives in rural areas with even lower spending per household, and the population is young and growing, indicating a high family formation rate. Accordingly, there is a need for differential market prices to satisfy the needs of the different consumers, optimizing the quality and fairness of prices to producers.

on modern marketing infrastructure for milk collection, processing and distribution, but also the viability of investment and market channels in the dairy industry.

In addition, a well-performing livestock sector could make substantial contribution to raising nutrition levels, increasing agricultural productivity, improving the lives of rural people, contributing to growth of the economy and eradication of extreme poverty and hunger. The dairy sector, in particular, has great potential to contribute to improving nutrition levels, household incomes and national economy in general. There are more than 25 million people engaged in milk production in

Egypt. It is estimated that one million litres of milk per year on small-scale dairy farms creates approximately 200 on-farm jobs as compared to less than five on-farm jobs in intensive dairy farms. Rural women hold the majority of these jobs.¹

¹ <http://www.fao.org/3/i1522e/i1522e.pdf>



Drivers of change

The following activities have been identified to address the critical issues in the Egyptian dairy sector:

- ▶ **(i)** Improve the supply of milk both in terms of quality and quantity by encouraging the establishment of milk producers groups and assist them in establishing advanced milk collecting centres that provide services and contract supply of milk with industries.
- ▶ **(ii)** Encourage milk processors to procure raw milk from the mentioned collection centres as an indirect support to the efforts of small-scale farmers to produce enhanced-quality milk.
- ▶ **(iii)** Improve marketing channels to address low level of marketing compared to European cheese makers. Egyptian cheese

is popular, especially in the Arab world, and a continuous marketing strategy should be developed to maintain Egypt's share of the Arabian market while an aggressive strategy must be developed targeting the European and North American markets.

- ▶ **(iv)** Selecting the right stakeholders to support future intervention based on their roles, and willingness to make changes in the dairy value chain. Based on the analysis and interviews, stakeholders can be ranked as follow

Skill		
Will	HIGH	
	LOW	
	HIGH	LOW
	<ol style="list-style-type: none"> 1. Chamber of Food Industries 2. Food Technology Research Institute 3. National Food Safety Authority 4. Faculty of Agriculture "Ain Shams University" 5. Central Bank of Egypt 6. Nile University 	<ol style="list-style-type: none"> 1. Private Milk Collection Centres 2. Small farmers "Traditional livestock production system" 3. Private local veterinarian
	<ol style="list-style-type: none"> 1. Agricultural Research Centre 2. Lead Dairy Factories 	<ol style="list-style-type: none"> 1. General Organization for Veterinary Services 2. Micro farmers "Subsistence livestock production system" 3. individual milk collectors"



Main findings

Milk production constitutes a major activity for the small-scale farmers. The lack of technical support and the prevalent pricing system for milk and feeds affect the sustainability of the sector, necessitating governmental and non-governmental interventions to support farmers with increased access to high quality feed and livestock improvement services.

The import of dairy products in Egypt such as skimmed milk powder, butter and high quality cheese, exceeds its dairy exports. Egypt's milk production is declining and is expected to go down further by 25-30 per cent in the next three years. Smallholder milk producers' segment will shrink further and more big dairy farms will emerge. Milk quality will remain the main reason for preference of big dairy farms over smallholders by formal milk processors, as most mini dairies and milk collection centres lack adequate quality control facilities to analyse for these characteristics. In order to devise a viable development strategy for micro/ small-scale dairy producers, a thorough analysis of strengths, weaknesses, opportunities and threats will be necessary as listed in Annex 5. Some of the key challenges and their drivers are identified below.

Issue 1: Low milk quality

Underlying constraints/causes:

- ▶ Farmers' lack knowledge on modern and hygienic milking techniques and Good Dairy Farming Practices (GDFFP). Small-scale farmers will not be able to produce good quality milk unless they are adequately informed, technically prepared and organized to address this challenge;

- ▶ Contamination of milk by bacteria during the transit to distant urban areas in the absence of cooling facilities, prolonged collection times and the addition of adulterations;
- ▶ Inadequate implementation of quality control procedures or at least Good Manufacture Practices (GMP);
- ▶ Lack of incentives to produce quality milk as it may not necessarily fetch higher prices in the absence of laws and regulations organizing the prices of milk;
- ▶ Lack of clear regulations as well as coordination between the inspection bodies under various relevant ministries;
- ▶ Lack of milk testing devices at production sites to ensure quality control.

Issue 2: Low productivity of dairy producers

Underlying constraints/causes:

- ▶ Inefficient production practices and expensive, making it nearly impossible for dairy and livestock businesses to break-even;
- ▶ Lack of private services for micro and small-scale farmers (eg. Extension and financial services, artificial insemination, etc.);
- ▶ Small and medium-sized farmers' lack of access to adequate veterinary services;
- ▶ High input costs, especially of feed;
- ▶ Farmers' lack of knowledge about ways of increasing productivity.

Issue 3: Lack of access to extension services and market opportunities for dairy products

Underlying constraints/causes:

- ▶ Lack of transparency and high number of middlemen within the marketing channels for smallholder products;
-

- ▶ Lack of cost-effective marketing techniques to reinforce the milk supply chain;
-
- ▶ Lack of reliable knowledge among farmers about demand and market needs as they are not directly connected to cheese processors or potential clients.
-

▶ Conclusion



In light of the challenges and constraints highlighted above, the following systemic changes are recommended to be facilitated by a project and operated by the local actors involved in the sector:

- ▶ MCCs could play a vital role in rural communities in terms of local development by allowing a good valorisation of milk and in setting new quality standards.
- ▶ New regulations and policies should be proposed to protect the traditional actors along the chain.
- ▶ Specific dairy quality control programmes should be developed along the value chain.
- ▶ Dairy sector regulation and norms, should be reviewed to ensure balance along the chain, set a fair pricing system and guarantee food safety for all consumers in local villages as well as urban markets.
- ▶ Dependency on imported inputs should be reduced, notably translating in increased substitution of imported skimmed milk powder by local small dairy producers.
- ▶ Knowledge and capacity of breeders and processors to produce high quality dairy products need to be improved.

Potential interventions and approach

The vision for developing the dairy sector is primarily to work on achieving increased income and good standard of living for micro and small dairy producers. This can be only achieve by improving production by capitalizing on enhanced skills and increasing the competitiveness of Egyptian products by improving quality and complying with the requisite standards. This will have a direct positive impact on the livelihood of small producers.

Towards that end, potential interventions could include:

- ▶ **(i)** Facilitating coordination and learning among actors within the dairy value chain

(e.g. local value chain platforms) to enhance availability and use of information, and access to efficiency support services (training, extension, financial).

- ▶ **(ii)** Stimulating linkages between producers, processors and consumers, so that producers can better identify the needs of processors and consumers to produce quality products.
- ▶ **(iii)** Incentivizing the capacity development of women and men dairy producers on improved processing and production.
- ▶ **(iv)** Exploring economic feasibility and providing investment (co-financing) for producers to get their milk delivered to processors through milk collection centres. The main aim is to ensure the safety and quality of the product while reducing spoilage before delivery to processors. Costs should be offset by improved quality of supply, volume and reduced losses.
- ▶ **(v)** Facilitating linkages between producers and processing units and private enterprises and services (as well as training/extension organizations) in developing and introducing new local production lines. Generally, local milk is mainly used for white cheese, yogurt and butter with low profit margin.
- ▶ **(vi)** Stimulating academic, field and action research to promote good production practices, green fodder production, and quality control. Further studies are also needed to explore nutrition for dairy cattle and the quality of green fodder available.
- ▶ **(vii)** Building the capacity of extension service providers and relevant training organizations to stimulate productivity and sustainable agriculture approaches, as well as marketing techniques and practices. Extension agents should have the capacity to coach and train breeders through participatory research in producer focus groups to increase the quality of the daily feeding ration. This way, producers will be more encouraged to learn how to

exploit better and combine green and concentrated fodders (good ratio between energy, proteins, minerals, vitamins and roughage), for positive effect on milk yield and quality (fat content). This could be doubly beneficial by improving the health of

animals as well as the quality of the milk and decrease the rampant use of antibiotics by smallholders. Replacement of concentrates by green fodder will also reduce the cost of the feed ration.

► Annexes



▶ Annex 1: Egypt's dairy sector: Economic profile¹

KEY INDICATORS²

Population (M)	95.7	UN Education Index	0.634
Pop. Growth ³ (% p.a.)	2.0	Gender inequality ⁴	-
Life expectancy (years)	71.3	GDP p.c., PPP (\$)	11132
Urban population (%)	43.2	Rural (%of total)	56.8
Poverty ⁵ (%)	16.1	Gini Index	31.8
HDI	0.691	HDI rank of 188	111
Aid per Capita (\$)	26.5		-

ECONOMIC INDICATORS

	2013	2014	2015	2016
GDP \$M	288586.2	305529.7	332698	336296.9
GDP growth %	2.2	2.9	4.4	4.3
Inflation (CPI) %	9.4	10.1	10.4	13.8

1 World Bank Egypt profile (World Development Indicators database) https://databank.worldbank.org/views/reports/reportwidget.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=EGY

2 Egypt Country Report <https://www.bti-project.org/en/reports/country-reports/detail/itc/EGY/>

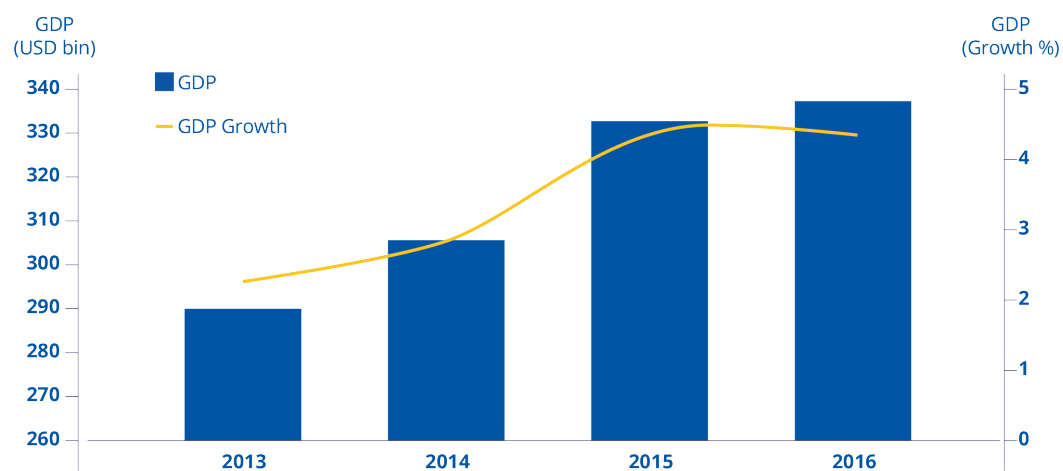
3 Average annual growth rate

4 Gender Inequality Index (GII)

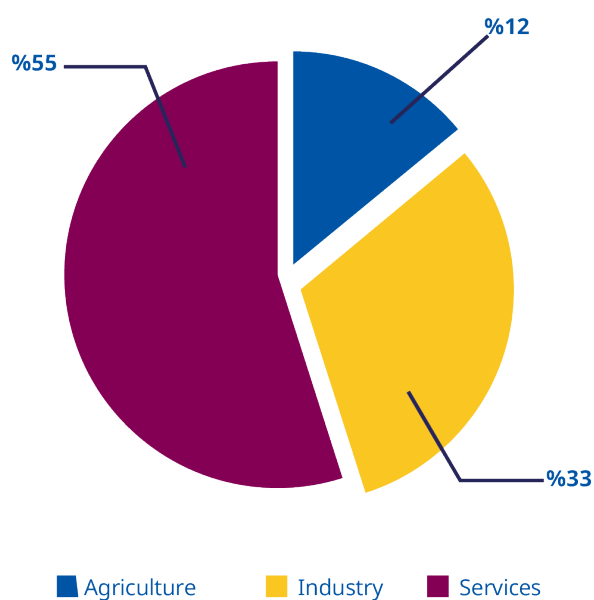
5 Percentage of population living on less than \$3.20 a day at 2011 international prices

	2013	2014	2015	2016
Unemployment %	13.2	13.2	12.8	12
Foreign direct investment % of GDP	1.5	1.6	2.1	2.4
Export growth %	5.6	-11.9	-0.6	-14.5
Import growth %	0.5	0.2	0.6	-1.9
Current account balance \$M	-3533.7	-5972.1	-16786.5	-20129.5
Public debt % of GDP	84	85.1	88.5	96.9
External debt \$M	46562	41826.5	48459	67214.1
Total debt service \$M	3401.1	5926.7	3780.8	6573.5

GDP



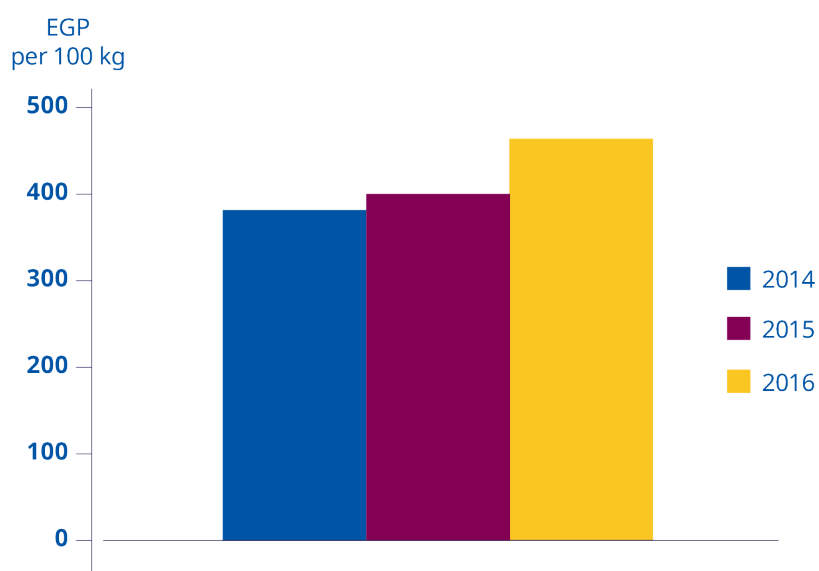
GDP Sector composition

DAIRY FARMING KEY FIGURES⁷

Cow's Milk Production 000 tons	2,379	Number of dairy cows 000 tons	4,954
% of world milk production	0.7%	-	
% Cow's milk delivery	71%	-	
Buffaloes milk production 000 tons	2,188	Number of buffaloes 000 tons	3,693
% of world milk production	1.0%	-	
Number of dairy farms	614,241		

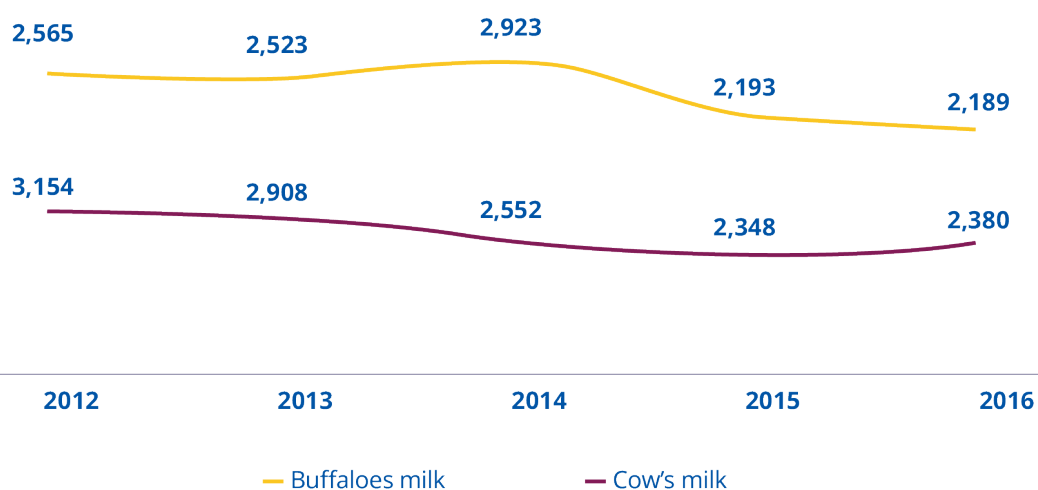
⁷ FAOSTAT

Cow's milk prices

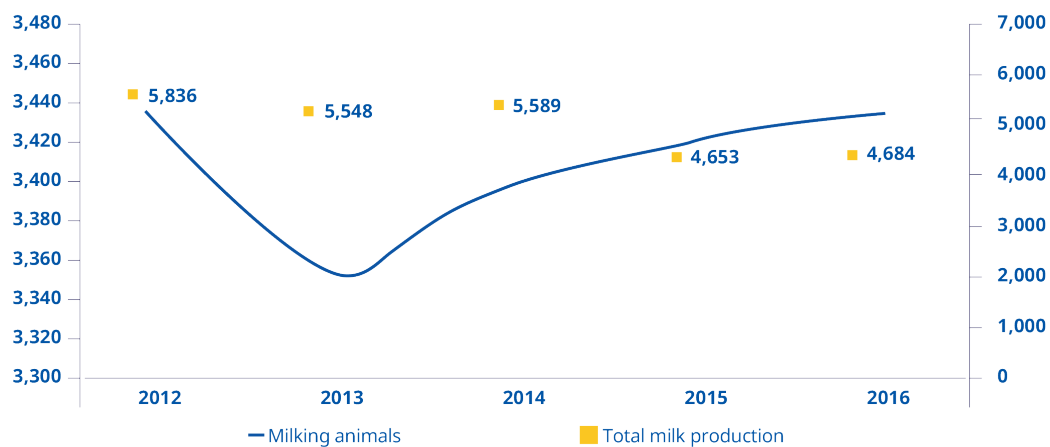


MILK PRODUCTION 000 TONS⁸

Milk production



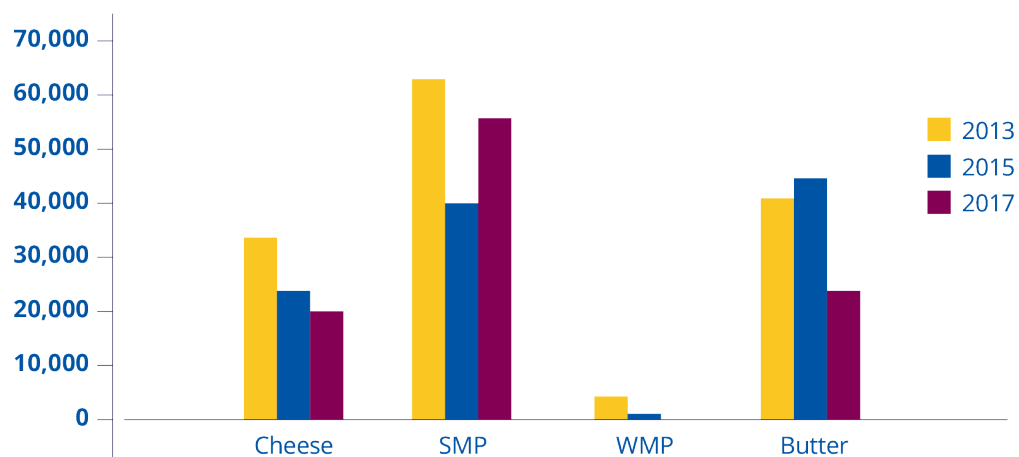
Milk production

PROCESSING INDUSTRY, MAIN PROCESSORS⁹

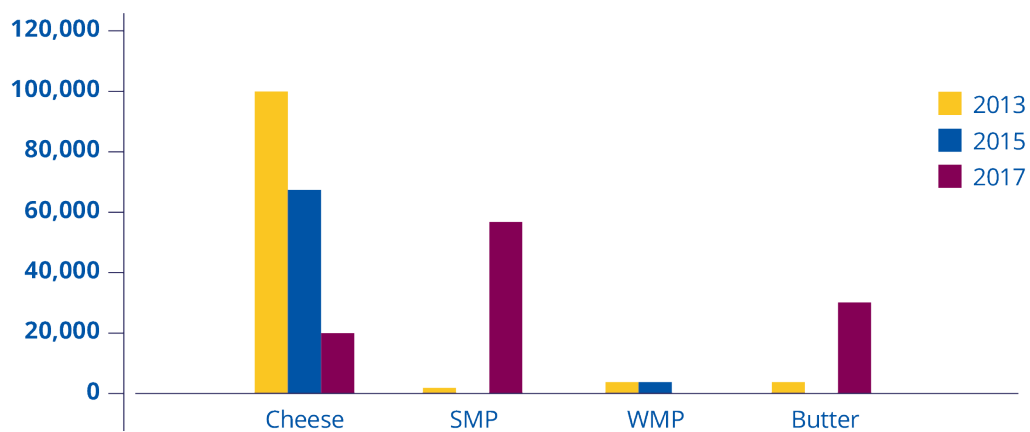
	Volume % Share- FY'17		Volume % Share- FY'17
JUHAYNA FOOD INDUSTRIES	59.8	SAKR GROUP	1.0
BEYTI CO	17.4	SECLAM	0.9
THE FARM ALEX CO	6.2	EL MASRIA CO	0.9
LACTALIS-HALAWA	3.5	NESTLE	0.4
FARAGALLA GROUP	3.4	NILE CO	0.3
GROUPE DANONE CO.	2.7	HEALTHY MILK CO.	0.2
DINA FARMS CO	1.9	MISR OCTOBER CO.	0.1
AMERICANA GROUP CO	1.1	-	-

TRADE 000 TONS¹⁰

Imports



Exports



¹⁰ FAOSTAT

DAIRY CONSUMPTION¹¹

	X 1000 tons	kg per capita
Milk	1770	18.8
Butter	74	0.8
v	402	4.2

PROCESSING AND TRADE¹²

	Production		Import		Export	
Volume (X 1000 tons)	2016	(2015=100)	2016	(2015=100)	2016	(2015=100)
Liquid milk	1398	105	0	16	12	133
Fermented products	248	105	0	42	0	328
Cream	4	105	0	82	2	358
Butter and butteroil (A)	18	100	44	93	1	251
Cheese	328	115	24	99	68	105
Whole milk powder	0	0	0	2	3	141
Skim milk powder	0	0	58	138	0	10
(A) Production Butter only year 2014						

11 FAOSTAT

12 FAOSTAT

TOTAL DAIRY PRODUCTS¹³

US \$	2013	2014	2015	2016	2017
Imports 000	389,404	407,168	314,264	241,133	185,777
Export 000	10,981	13,907	11,188	11,684	19,380
Balance 000	378,423	393,261	303,076	229,449	166,397



Annex 2: Interviews with stakeholders and market actors

This MSA used in-depth qualitative and quantitative methods to investigate the key aspects of the value chain. Primary data was gathered through semi-structured interviews with industry experts (Table 3) and structured interviews with a representative sample of dairy processing SMEs and farms from different regions. The complexity of the dairy sector, characterized by various milk types (cow, buffalo, etc.), production systems and a wide range of dairy products, requires significant data for detailed analysis. There is, however, lack of reliable and recent data on this sector.

The majority of small and medium players in the dairy value chain are not registered either within the Ministry of Trade and Industry, the Chamber of Food Industries or the Ministry of Agriculture (especially farmers). Thus, it was difficult to access them and count them as part of the sample population. This resulted in a relatively small sample of farmers and processors for the structured and semi-structured interviews. This study

summarizes the existing rough data and introduces empirical insights gathered from different dairy chain players. Multiple data gathering techniques were used to formulate the research outcomes. Results are analysed through the 'SWOT' method. The findings are presented below (in Annex 4) along with recommendations.

Table 3

Position	Organization
Director	Animal Production Research Institute (APRI)
General Manager and Associate Manager	Food Technology Centre (Ministry of Industry and Foreign Trade)
General Manager	Chamber of Food Industries
Sector Head Milk and Dairy Products Sector	Chamber of Food Industries
Purchase Director and Dairy Category Manager	Juhayna
Operational GM and Purchase Director	Beyti - A Joint Venture of Almarai and PepsiCo
Operational Director and Purchase Manager	Labanita - SECLAM
General Manager	Al Sakr for Food Industries
Owner - General Manager	Domty - Arabian Food Industries Co
Owner and Manager	Pharaohnic Company for dairy Product - Milk Collection Centre
General Manager	Ebshaway Cooperative Milk Collection Centre
Owner and Manager	Hamdy Tawfek Milk Collection Centre
Owner and Manager	Defeno Milk Collection Centr

Objectives of the interviews

The study aims at answering the following questions:

- ▶ How developed is the Egyptian dairy chain?
- ▶ What type of problems do Egyptian dairy SMEs face which prevent them

from developing and improving their production, distribution and visibility?

- ▶ What are the different services that can be developed through the value chain?
- ▶ Is there a real opportunity for developing the dairy value chain?

Annex 3: MCC's Assessment Questionnaire

Assessment Questionnaire

Milk Collection Centers Project Implemented by

Capacity Assessment Questionnaire

Introductory Note for Surveyors

The following framework lists the key characteristics of the successful MCC. The characteristics are consistent with the principles of good practice in milk collection activity. The framework is used to develop specific questions and criteria for MCC assessment. The important point in this questionnaire is that give real meaning to the characteristic of MCC (or indeed the service provider good practice principles).

<p>Milk Collection Center Information :</p> <p><i>Service Area</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Input supply <input type="checkbox"/> Marketing services <input type="checkbox"/> Consultancy <input type="checkbox"/> Machinery services/Tools instruments suppliers <input type="checkbox"/> Feed supply <input type="checkbox"/> Milk processing <input type="checkbox"/> Marketers <p>Name:</p> <p>Position:</p> <p>Address</p> <p>Governorate: District: Village:</p> <p>Telephone: Fax:</p>	<p>Questionnaire number</p>
<p>Project Notes</p> <p>Interviewer Name:</p> <p>Office:</p> <p>Contact Info:</p>	

	Yes	No	NA	Surveyor Notes
A. OWNERSHIP: who's in control?				
<p>Importance?</p> <ul style="list-style-type: none"> • Close to client – personal ownership • Is defining characteristic of SP 	<p>Questions</p> <ul style="list-style-type: none"> • Is the manager/operator the owner of the MCC?..... • Has the manager invested own money in MCC?..... • Registration (Legal)..... • Organization structure..... • Who makes decisions: manager or external party? E.g. Incentives, risk, reward Negotiate contracts, Sign cheques, Authorize significant (Answer in Notes)..... • Responsiveness purchases (e.g. computer); Hire and fire staff..... • Founder problem? Is decision n-making or other operation delayed or constrained by absence or ability of owner/manager? (Founder problem)..... <p style="text-align: right;">Partial Total</p>			
B. COMMERCIAL ORIENTATION: business-like?				
<p>Why important? Clarity about roles & relationships</p> <p>Historical background</p> <p>Organization culture -</p> <p>Perception: customers or beneficiaries? -</p> <p>Motivation: profit or cost recovery?</p>	<p>Questions</p> <ul style="list-style-type: none"> • Does service provider have a non-business background?.. • Do people regard themselves as a business or an assistance program • Does service provider 'fly the company name or logo'? • Do the company regard service provider as a business?.... • Does service provider have transactional relationship with the company?..... • Does service provider have 'mixed relationship with clients; e.g. other processors, commercial MCC?..... <p style="text-align: right;">Partial Total</p>			

		Yes	No	RA NA	Surveyor Notes
E. RESOURCES & CAPACITY:					
viability or sustainability					
Why important?					
Key factors in determining					
Future					
viability:					
• Skills/ability to deliver services:	Does service provider have appropriate skills, people, and facilities to deliver services sustainably?	<input type="radio"/>	<input type="radio"/>		
technical/business Staff mix	• Can service provider finance capacity (and new capacity development) from client revenues?	<input type="radio"/>	<input type="radio"/>		
• Sources of finance: equity debt, client over-dependency?	• Where does the service provider's money come from?	<input type="radio"/>	<input type="radio"/>		
• Over-capacity: overloading or burden Networks and linkages	• What is the balance of revenue-earning to non-revenue earning staff?	<input type="radio"/>	<input type="radio"/>		
	• Does the service provider depend on a small no. of clients for bulk of its revenues? (Also are main clients or other donor projects?)	<input type="radio"/>	<input type="radio"/>		
	• Volume and value of sales over the last 3 years (what is the trend and why) (Answer in Surveyor notes).....	<input type="radio"/>	<input type="radio"/>		
	• Who are your suppliers? (Are they reputable?).....	<input type="radio"/>	<input type="radio"/>		
	• Customer retention (do you have a set of customers that grow every year) (Answer in Surveyor notes).....	<input type="radio"/>	<input type="radio"/>		
	• Inventory cycle (once a year/ low times etc.) (Answer in Surveyor notes).....	<input type="radio"/>	<input type="radio"/>		
	Partial Total	<input type="radio"/>	<input type="radio"/>		
F. SYSTEMS: getting information and measuring performance					
Why important?					
• Information is required to manage and make decisions.	• Do you have record keeping system?	<input type="radio"/>	<input type="radio"/>		
• Costing and pricing	• Do you make an annual plan?	<input type="radio"/>	<input type="radio"/>		
• Resource allocation and investment	• Do existing 'systems' or procedures produce info that is really needed?	<input type="radio"/>	<input type="radio"/>		
• Client care and development	• (are systems appropriate for service provider - inputs/outputs?)	<input type="radio"/>	<input type="radio"/>		
• New product and market development	• Are systems 'owned' by service provider or imposed by external party?	<input type="radio"/>	<input type="radio"/>		
• Systems need to be appropriate: control and cost burden	• Do financial controls allow staff time, money use etc. to be assessed?	<input type="radio"/>	<input type="radio"/>		
	• How are pricing decisions made? How are costs accounted and allocated? (Answer in Surveyor notes)				
	• Is client feedback captured? How is it utilized?				
	• Who are clients and where do they come from? (Answer in Surveyor notes).....				
	Partial Total				

		Yes	No	NA Nil	Surveyor Notes
G. Financial capacity and Financial practices Why important? • This group of questions is related to the sustainability of the service provider from financial point of view	Questions				
	Supplier facility Supplier credit, consignment).....	8	0	
	• Do you have a need for debit (bank loans, other type of Debit)	8	0	
	• Accounting system (financial statements).....	8	0	
	• Costing system	8	0	
	• Client facilities (credit or cash and carry. In the case of credit what are the terms do the customers pay? Or accounts receivable cycle).....	8	0	
	• Total paid in capital (Answer in Surveyor notes).....	8	0	
	• Total sales (if possible, the profit margin which is net income divide by sales(Answer in Surveyor notes))....	8	0	
	Partial Total				
	Grand Total Rank of the Service Provider				

Surveyor opinion of the client		
.....		
<input type="checkbox"/> Does not recommends	<input type="checkbox"/> Partly recommends	<input type="checkbox"/> Does not recommends
Referees & their opinion		
.....		
<input type="checkbox"/> Does not recommends	<input type="checkbox"/> Partly recommends	<input type="checkbox"/> Does not recommends

Source: author



Annex 4: SWOT analysis for dairy production

Prospects in the dairy sector are influenced by regional/geographical characteristics in Delta and Upper Egypt. Milk is produced on commercial, private, and state-owned farms, as well as small family farms. The commercial farms usually have more animals and mechanized feeding and milking systems for higher milk quality. Family farms are usually

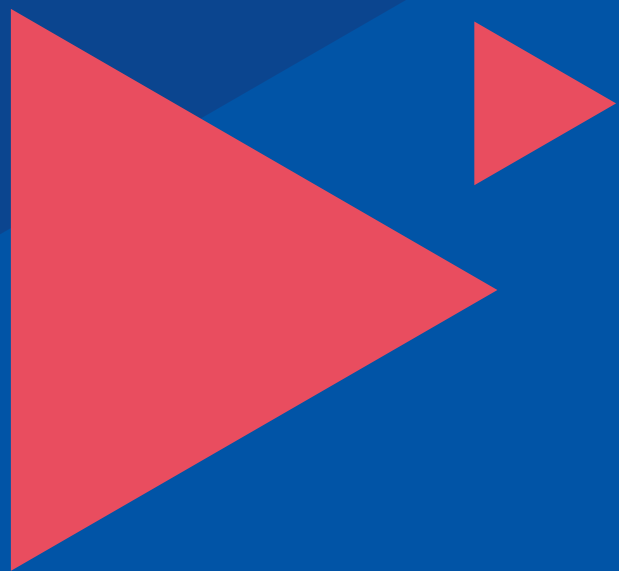
small with generally only one or two cows, often with poor facilities and mostly manual milking. Egypt has yields of about 6 liters per day per cow, compared with about 20 litres per day per cow in the EU dairy farms because of Egypt's lack of financial resources, poor breeding structure, small farm plots, and poor farm management practices.

Table 4

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. Foreign direct investments in dairy industry 2. Strong existing processing capacity 3. Favourable conditions to enter milk production 4. Consumer preference for domestic dairy products 5. Regionally recognized cheese types 6. Economically competitive forage production 7. Readily available labour at competitive cost 	<ol style="list-style-type: none"> 1. High production costs 2. Low profit margins 3. Lack of knowledge and technical know-how 4. Poor access to support services 5. Low capital reserves and limited access to credit 6. Low (labour) productivity and 7. Poor milk quality, all of which limit their ability to take advantage of market opportunities
Opportunities	Threats
<ol style="list-style-type: none"> 1. Growing demand for dairy products in Egypt 2. Probable milk price increase 3. Potential to increase milk yields through relatively few additional inputs 4. Potential to increase dairy labour productivity and 5. Employment generation in the dairy value chain (for example, absorbing family labour released by higher on-farm labour productivity) 6. Increased consumer demand for food safety 	<ol style="list-style-type: none"> 1. Increasing local wage rates; 2. Intergenerational discontinuity (children of the better-performing farmers leave the system) 3. Under-investment in dairy chain infrastructure and 4. Inappropriate dairy development policies and investment plans

In Egypt, small-scale dairy producers did not receive sufficient technology and policy support due to lack of awareness compounded by disproportionate emphasis given to large-scale dairy farms. Unfair competition has threatened the traditional small-scale dairy industry and the smallholders raising dairy animals. In the sub-region, there is a high potential for developing and transferring dairy technologies, particularly related to post harvest technologies, handling, processing,

genetic resources management, and accessing inputs and markets. In terms of institutions, organizing farmers into producer groups or associations (to supply milk in the collection centres) alone could improve market access, bargaining power (market share of farmers), income, and livelihoods of families engaged in the dairy sector. This will increase production and quality of products as market pool improves.



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