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Views on the Crisis

(Manufacturing Industries – Cont'd)

Industries that Benefited from the Crisis

Food Industries: Dairy Products



Introduction to detailed reports on manufacturing

Further to the first report on the impact of the current crisis on manufacturing industries as a whole, detailed reports aim to provide an in-depth analysis to the various types of industries. Accordingly, the manufacturing sector was divided into three categories according to the impact of the crisis on it in its early stages, as follows:

- 1- Industries that benefited from the crisis
- 2- Industries that moved out of the spotlight
- 3- Industries that are struggling to survive

For each group of industries, the report will provide an assessment of the current situation on the basis of a detailed economic analysis of an industry that represent each group. The report will achieve this goal by answering the following questions:

- 1- What are the details of the sudden change in the value chain?
- 2- How is the industry affected during the crisis cycle by external and internal supply and demand shocks?

3- What are the measures required to reduce the negative impact or increase the comparative advantage during the time of the crisis?

“Here are things that we have to address. Let’s address them now before they become an issue.” Spoiler alert... the rate of change in the food and ag industry, including dairy, won't slow down!”

Fred Schonenberg

Founder at VentureFuel, Inc., which helped California Milk do a "Shark Tank" style program.

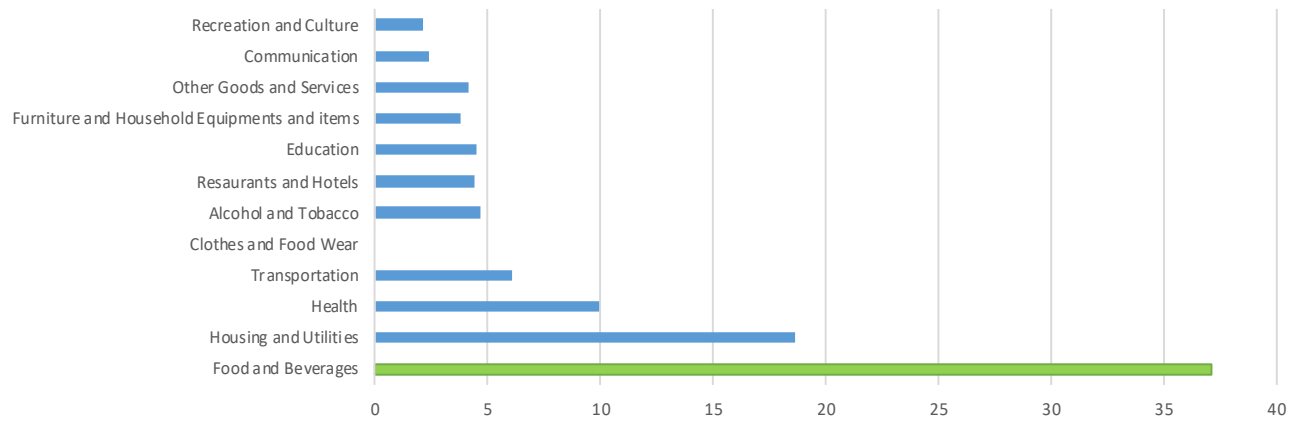
First: Why was the food industry chosen as a model for the industries that benefited from the crisis?

The food industries are among the list of industries that ECES classified as industries that benefited from the crisis, which is the group of industries that witnessed great demand during the pandemic at least in the first stage. Further, the food industries have great importance, as follows:

- The need for food is at the forefront of the basic needs of the individual, as food and drink formed the first item in the total expenditure of families in 2017/2018¹ with a share of 37.1 percent as shown in Figure 1. This percentage increases in the rural areas to reach 40.2 percent compared to 33.9 percent in urban areas.

Figure 1. Actual Consumption/Household Expenditure in Total Expenditure according to the 2017/2018 Expenditure Items

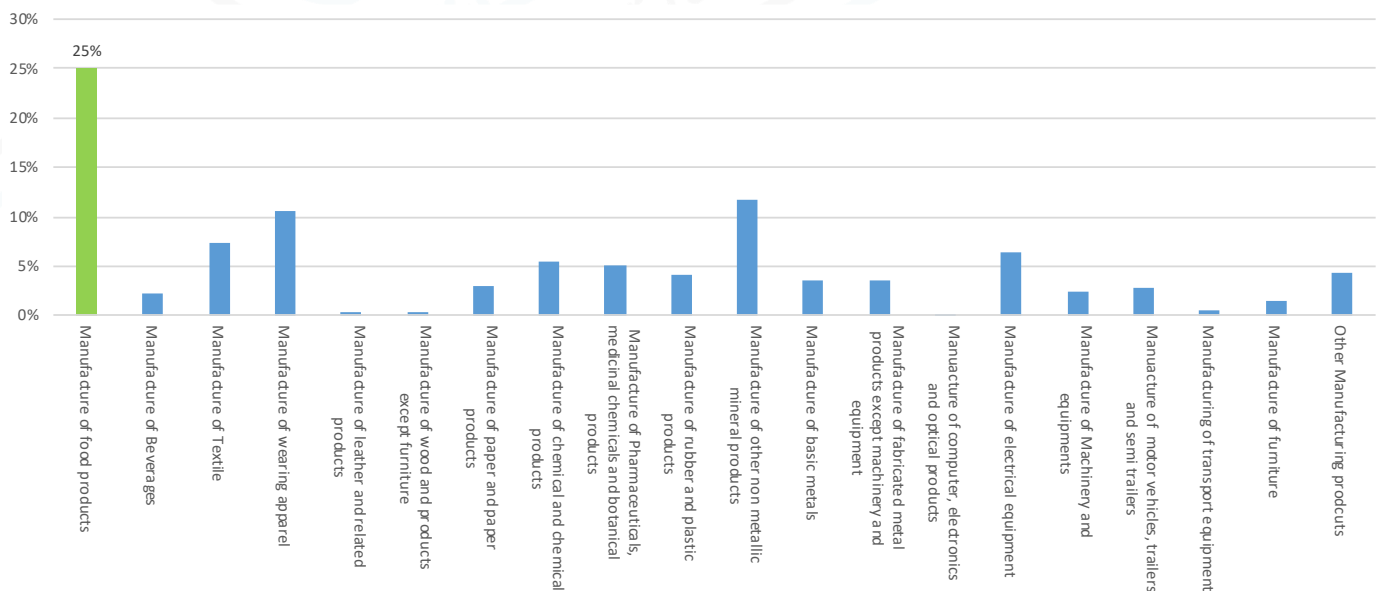
¹ Latest available data.



Source: Central Agency for Public Mobilization and Statistics (2019), key indicators of household income, expenditure, and consumption survey, 2017-2018.

- The food industry sector is the largest employer among manufacturing industries, with about 25 percent of total workers in the manufacturing industry.

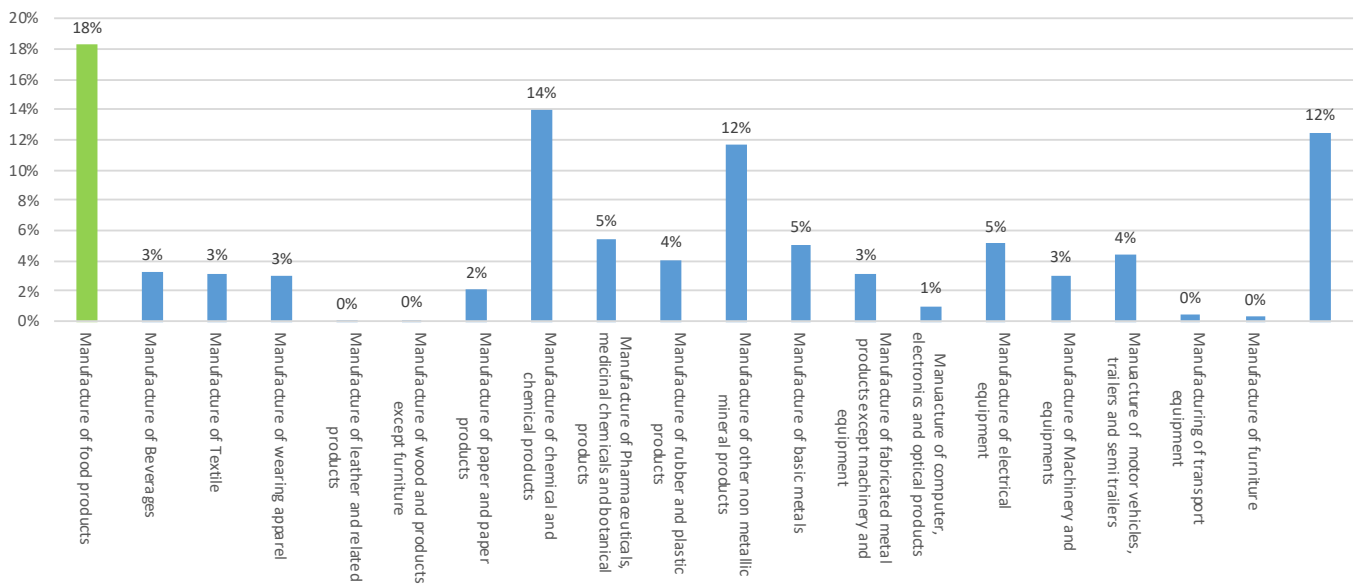
Figure 2. Percentages of workers in the manufacturing by sector



Source: Calculated from data of the Central Agency for Public Mobilization and Statistics - Annual Industrial Statistics, Private Sector, 2016.

- The food industry is the largest industry in terms of its share in the net manufacturing value added, as shown in Figure 3.

Figure 3. Sectoral contribution to net value added



Source: Calculated from data of the Central Agency for Public Mobilization and Statistics - Annual Industrial Statistics, Private Sector, 2016.

- Food industries are considered one of the industries for which most of the links of the value chain are locally available, because they depend primarily on agricultural activity. Thus, food industries play an important role in the agricultural sector, whether in developing agricultural strains used or improving agricultural practices by generating demand for high-quality agricultural products,

which ultimately reflects on increased farmers incomes' and reduction of rural poverty levels.

Given that the food industries include a variety of products that differ in terms of value chain, we will focus in this analysis on a number of products selected based on the following criteria:

- 1 - Products of strategic importance from the consumer and producer perspectives
- 2 - Most of their value chain elements are available locally
- 3 - The product is linked to international trade (imports and exports)
- 4 - There is a demand for this product at the time of the crisis

Based on these criteria, two sectors of the food industry were chosen for the detailed analysis: the dairy and confectionery industries. In this report, we will focus on the dairy industry.

Dairy industry

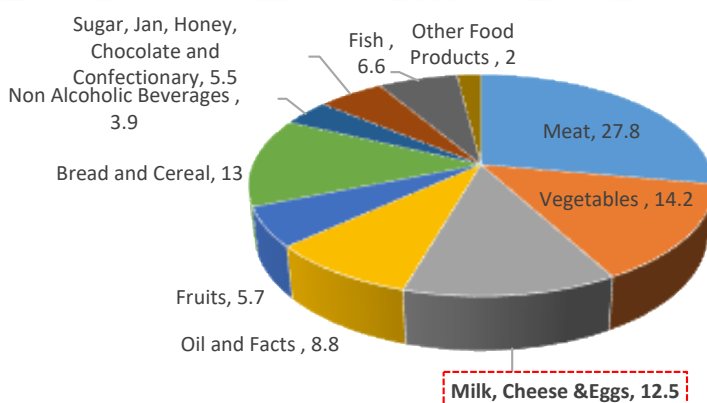
First: Why the interest in the dairy industry?

The dairy industry is one of the industries which preliminary research proved that it could have been positively affected by the

crisis via the increase of demand for its products. Further, the dairy industry has great health, social and economic importance. The following are the most important facts related to this sector:

- The dairy industry includes a variety of products, including pasteurized milk, all types of cheese, butter, ghee, yogurt and ice cream. Dairy also enters into other food industries such as chocolate, biscuits, and sweets.
- Dairy industry is generally considered to be an important source of low-priced protein compared to other protein sources,² and thus accounts for a large proportion of actual household consumption as shown in Figure 4.

Figure 4. Relative distribution of actual household consumption in the food and beverage group, 2017/2018³



² Each kilogram of cow's milk contains 3.2 grams of protein, 3.7 grams of fat, and 4.6 grams of starches.

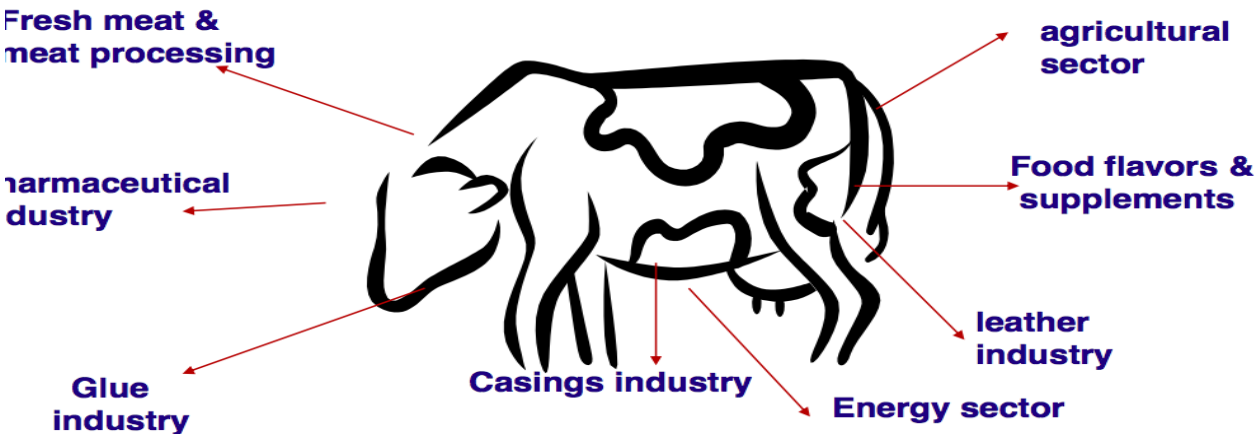
³ Latest available data.

Source: Central Agency for Public Mobilization and Statistics (2019), key indicators of household's income, expenditure, and consumption survey for 2017-2018.

- The dairy industry can play an important role in achieving inclusive growth. On the one hand, we find that the vast majority of dairy production in Egypt comes from rural areas, and thus the dairy industry can contribute to job creation and increasing incomes in rural areas. On the other hand, a large part of the dairy industry and its products are linked to micro and small enterprises, and thus can contribute to job creation especially among the youth and women, in addition to employment in larger enterprises (medium enterprises).
- The dairy industry is characterized by strong linkages with a number of sectors and other value chains: agriculture, processed meat industries, flavorings, leather, medicine, glue and energy as shown in Figure 5.

Figure 5. Interlinkages between the dairy production sector, economic activities, and other industrial sectors

Strong linkages between the milk sector and a number of non-dairy sectors

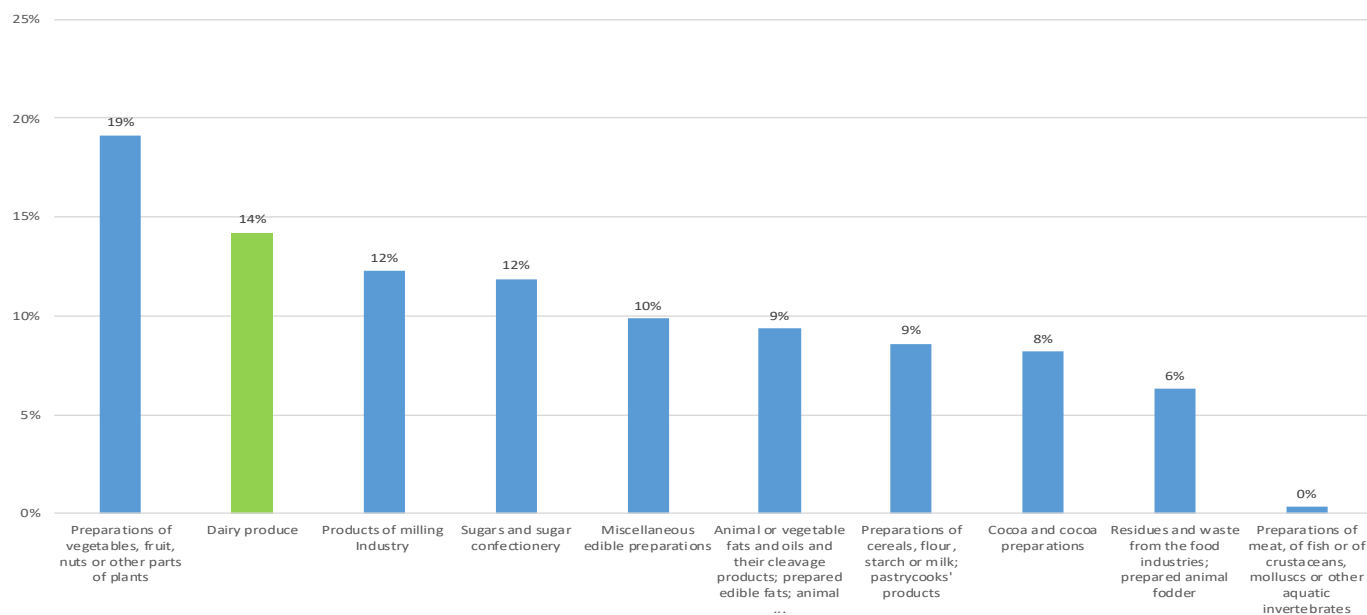


Source: Abdel-Latif, A. (2018).⁴

- Dairy products are considered an important export product, as they are the second export product in the food industry after preparations of vegetables and fruits. The dairy industry represents 14 percent of total exports of the food industry in 2019, as shown in Figure 6.

⁴ Abdel-Latif, A. (2018), "The milk Sector in Egypt: Potential Crisis & Proposed Solutions, Food Chamber- unpublished study.

Figure 6. Export structure of the food industry products



Source: Trade map, May 2020.

- Seven percent of the total employed in the food industries work in this industry, and they constitute 9 percent of the value added in the food industries as shown in Table 1.

Table 1. Dairy industry's share of total employees and net value added in food industries

Product	Share in the total employed	Share in net added value
Processing and preserving meat and meat products	5%	5%
Processing, preserving fish, crustaceans and molluscs	0%	0%
Processing and preserving fruit and vegetables	14%	15%

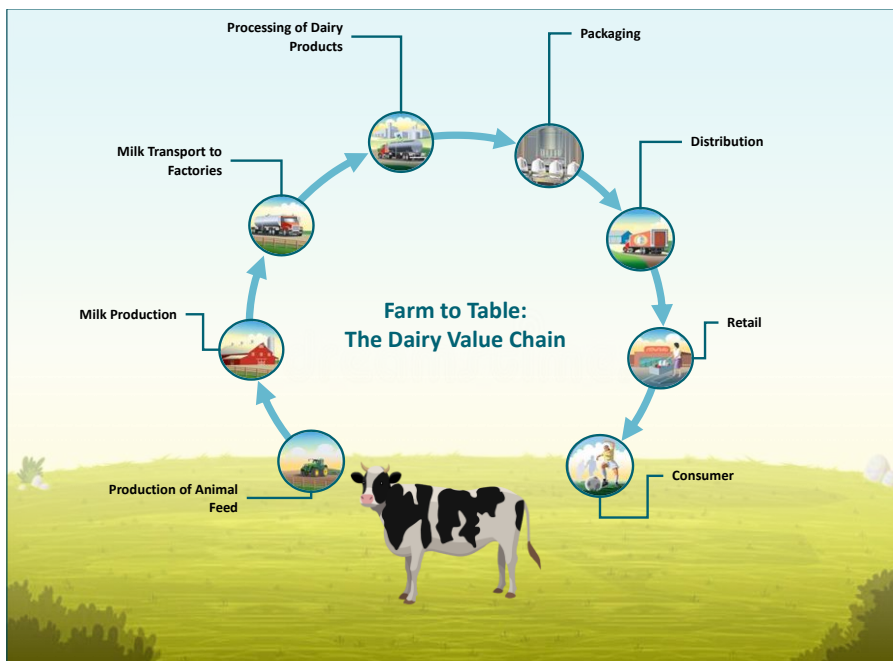
Manufacture of vegetable and animal oils and fats	5%	13%
Manufacture of dairy products	7%	9%
Manufacture of grain mill products	8%	8%
Manufacture of starch products	1%	2%
Manufacture of bakery products	35%	15%
Manufacture of sugar	4%	5%
Manufacture of Cocoa, chocolate and sugary confectionary	2%	1%
Manufacture of Macaroni, noodles, couscous & similar farinaceous products	2%	3%
Manufacture of prepared meals and dishes	1%	1%
Other food products n.e.c	13%	20%
Manufacture of prepared animal feed	2%	3%

Source: Calculated from data of the Central Agency for Public Mobilization and Statistics - Annual Industrial Statistics, Private Sector, 2016.

Second: The value chain in the dairy industry

The value chain of the dairy industry in Egypt is a complex one, due to multiplicity of actors and their different sizes. The following is a brief description of the value chain:

Figure 7. The value chain in the dairy industry



1 - Raw materials

It is possible to distinguish between two types of raw materials:

- The raw materials associated with dairy production, the most important being the animal feed.
- The raw materials used in the manufacture of dairy products, which comprise milk, whether in liquid form or powdered,

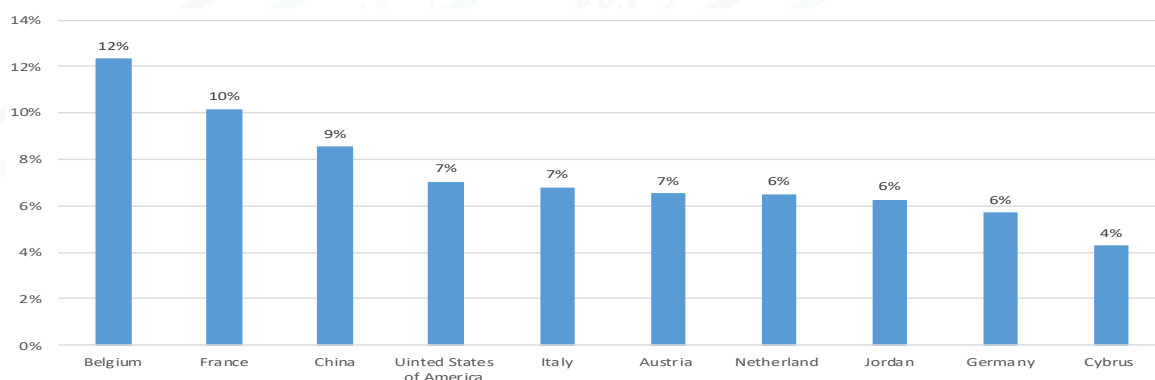
packaging materials and other raw materials related to the manufacture of dairy products.

We will discuss each in more detail as follows:

a. Animal feed

Egypt imports about 12 percent of the total quantity available for consumption of animal feed in 2014-2015.⁵ European countries are at the forefront of countries from which Egypt imports animal feed as shown in Figure 8, as seven European countries account for 52 percent of total Egyptian imports of these products.⁶

Figure 8. Top ten countries from which Egypt imports animal feed in 2019*



Source: Trade Map, 2020.

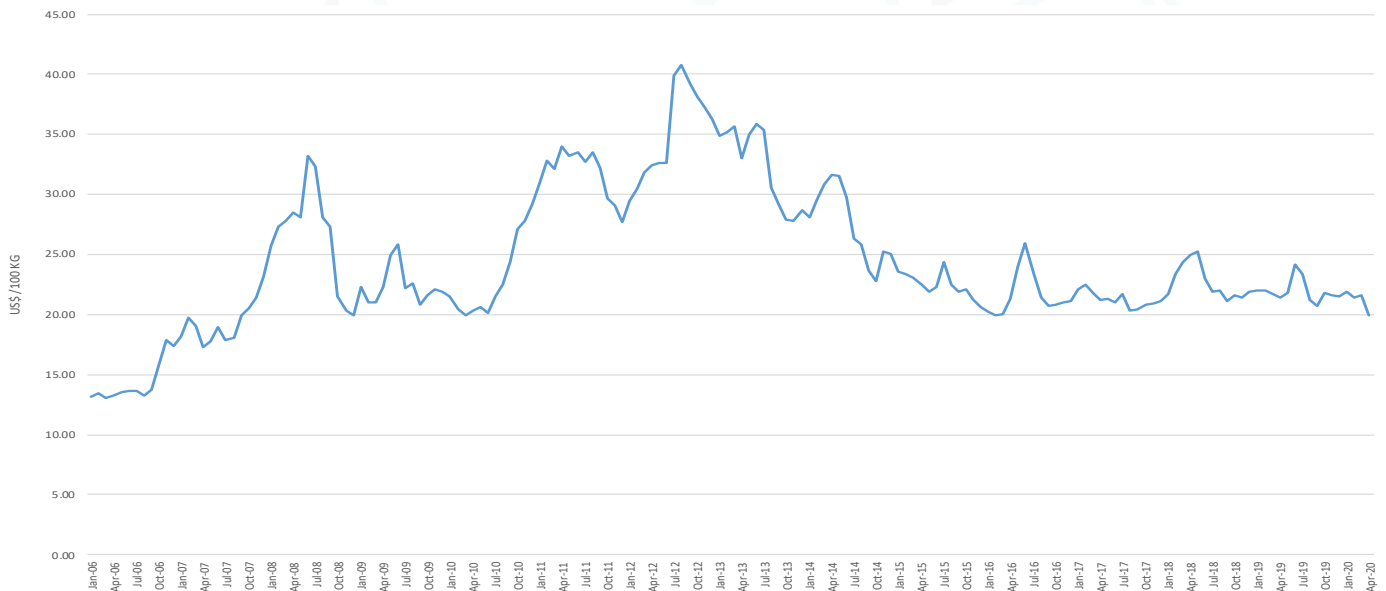
⁵ Latest available data.

⁶ Animal-based animal feed constitutes the majority of Egyptian imports of feed with a share of 61 percent, followed by additives containing vitamins and plant-based antibiotics with a share of 28 percent.

* HS 230990 including vitamins and antibiotics not including cat and dog food sold in retail stores.

The industry is currently benefiting from the apparent downward trend in global feed prices since 2013, driven by a decline in global prices for both maize and wheat.

Figure 9. World feed prices during the period January 2006 - March 2020



Source: IFCN, May 202

b. Milk

There are three types of dairy farmers in Egypt: small farmers, commercial barns, and large specialized livestock farms. The

characteristics of each product are reflected in the way milk is supplied as shown in Table 2.

Table 2. Dairy producers in Egypt, method of supply and the most common problems facing them

Producer	Characteristics	Method of Supply	Most Common Problems
<p>Small farmers (Farm size ranges from 1-20 cows)</p>	<ul style="list-style-type: none"> ▪ Considered the traditional dairy supplier in Egypt. ▪ Responsible for producing nearly 70 percent of milk production in Egypt ▪ Cows are milked via traditional methods 	<p>There are four main channels for selling dairy:</p> <ul style="list-style-type: none"> ▪ From the farmer to the consumer directly ▪ From farms to factories directly within the same village, if available. ▪ From the farmer to a middleman who then delivers the milk to the dairy factory. ▪ From the farmer to the collection point inside the village 	<ul style="list-style-type: none"> ▪ Need for high-yielding breeds of cows. ▪ Inability to provide quality feed for cows. ▪ Primitive methods for milking cows, and transporting and collecting milk. ▪ Weak technical support services provided. ▪ Increased informal activity in relation to dairy

		and from there to the wholesaler and then to major dairy factories or retail stores then to the consumer.	<p>collection centers</p> <ul style="list-style-type: none"> ▪ Monopolistic position of feed producers and traders ▪ The credit system of paying the price of raw milk from the collection point to farmers ▪ Multiple supply chains
Commercial Barns (farm size ranges from 10-50 cows)	<ul style="list-style-type: none"> ▪ Located on the borders of major cities. ▪ These farms are concerned with livestock feed. ▪ Cows are milked via traditional methods ▪ These barns can use refrigerated containers to keep milk fresh 	<ul style="list-style-type: none"> ▪ Dairy produced from commercial barns is usually sold directly to consumers in major cities through retail shops. 	<ul style="list-style-type: none"> ▪ Primitive methods for milking cows, and transporting and collecting milk. ▪ Dependent heavily on imported feed, which exposes them to fluctuations in world feed prices and high production costs.

<p>Large specialized livestock farms (farm size over 50 cows)</p>	<ul style="list-style-type: none"> ▪ Big farms usually specialized in one type of livestock. ▪ Responsible for producing approximately 10% of the total milk production ▪ Depend on modern technology and mechanical means in milking cows. ▪ These farms are a priority for large collection centers and large dairy factories. ▪ There are some livestock farms owned by the major dairy farmers. 	<ul style="list-style-type: none"> ▪ These farms supply their production to collection centers owned by a large dairy factory or independent collection centers. 	<ul style="list-style-type: none"> ▪ Dependent heavily on imported feed, which exposes them to fluctuations in world feed prices and high production costs. ▪ Lack of regulated relationship between dairy producers and dairy factories. The price of raw milk is determined by the large dairy factories (3 factories)
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Sources: Abdel latif, A. (2008); Soliman, I. & Ahmed Mashhour (2011).⁷

⁷ Ibrahim,S. & Ahmed Mashhour.(2011), ."Dairy Marketing System In Egypt", SustainMed Working Paper.

- The milk production season is in winter and spring, with 65-75 percent of the total annual milk production being produced during that period. According to the 2016 Annual Bulletin of Livestock Statistics, Egypt produces 5,088 million tons of milk, 51 percent of which is cow milk and 45.8 percent is buffalo milk.⁸
- The governorates of Lower Egypt⁹ are the main source of milk, with a share of 58 percent of total milk production in Egypt, led by Beheira Governorate, with a share of 21 percent (Figure 1 in the appendix shows the geographical distribution of milk production in Egypt).
- Dairy factories use powdered milk to make up for the shortage of local milk supply. Powdered milk is mainly imported, as it made up 44 percent of total Egyptian imports of dairy products in 2019 (Table 1 in the appendix shows the structure of Egyptian imports of dairy products). Egypt imports from only five countries (New Zealand, Germany, France, Canada, and the United Kingdom) 69 percent of its total imports of these products. Meanwhile, the global price of powdered milk (both full-fat and skimmed) witnessed a

⁸ Latest available data.

⁹ Lower Egypt includes the following governorates: Beheira, Sharqia, Gharbiya, Menoufia, Dakahlia, Damietta, Qalyubia, Kafr El-Sheikh and Alexandria.

declining trend since mid-December 2019, after rising during the previous months of 2019,¹⁰ to reach the lowest level in May, and then rose again in June and July (Figures 2 and 3 in the appendix show the evolution of international prices of whole and skimmed powdered milk. The demand from China plays an essential role in determining the prices of powdered milk and dairy products in general.

- Raw milk is the main cost item in total production costs of dairy products. According to one study,¹¹ raw milk accounted for 76 percent of yogurt production costs, 85 percent of white cheese production costs, and 91 percent of pasteurized milk production.

a. Other intermediate products

The dairy industry uses a range of other intermediate products, primarily packing products,¹² as well as other intermediate products such as rennet, calcium balance salts, table salt,

¹⁰ Although it witnessed an increase during the month of January, it did not reach the levels during the previous months of 2019, and it fell again in February.

¹¹ Abdul Salam, Mahmoud (2015). "Economics of dairy processing and marketing in Fayoum Governorate," PhD thesis, Department of Agricultural Economics, Faculty of Agriculture. Fayoum University.

¹² There are six types of packaging used by dairy industries: multi-layer cardboard, metal packaging, plastic packaging, glass packaging, aluminum foil, cardboard.

stabilized salts, emulsifiers and vegetable fat, in addition to the machines used in the dairy industries.

Plastic products represent 58 percent of total imported packing materials,¹³ followed by aluminum foil by up to 28 percent, then paper products, including paperboard, with a share of 14 percent, in addition to machinery and equipment for packaging, cleaning, drying, filling, and sealing bottles and containers, as well as spare parts, valued at nearly \$235 million.¹⁴ Regarding the most important countries from which Egypt imports packaging products, we find that although China is one of the five largest suppliers of packaging products to Egypt, it does not enjoy a monopolistic position in this regard except in aluminum foil, as Egypt imports 96 percent of its imports of aluminum foil from China followed by India. As for plastic products, Saudi Arabia comes at the top of the list with a share of 37 percent, then China with a share of 11 percent, and finally in terms of paper, China tops the list of suppliers with an

¹³ The codes include: 760711, 392020, 3923550, 392329, 481910, 4808010, 481159, 4808049, 480820, 4808030.

¹⁴ These figures represent the total Egyptian imports of those products, of which the dairy products industry is considered one of its most important users.

estimated share of 25 percent, followed by Saudi Arabia with an estimated share of 21 percent.

In general, this stage of the dairy value chain is characterized by high risks associated with this activity, as a result of the following:

- Primary capital is cows, which have special care requirements in nutrition and health care that vary with the life cycle of cows.
- In the event that the herd is exposed to an epidemic-like disease, it may affect the entire farm, which causes the farm heavy losses.
- Dependence on imported feed.
- The main product (milk) is a perishable product that is extremely sensitive to refrigeration, hygiene and all elements of handling.
- There is some seasonality in dairy production.
- Milk is delivered on a daily basis with payment made between 10-25 days, which exposes farmers to a real crisis in the event of any shock, especially in light of the need to buy animal feed in large quantities and maintaining an acceptable amount of stock in some types of feed.

- The process of exiting this activity is slow and costly, as dairy farmers cannot sell the whole herd without incurring significant losses, and therefore, farmers resort to gradual selling, and the degree of risk is higher for small farms (Abel-Latif, A. 2008).

2 - Manufacture of dairy products

- The dairy industry is characterized by significant size of the informal sector. According to data of the Chamber of Food Industries, there are 1144 dairy products factories registered with the Chamber in the year 2020. However, we find that according to data of the Ministry of Agriculture there are only 1147 factories for manufacturing white cheese in 2015. This discrepancy in numbers indicates that there is a huge informal activity in this sector that is not reflected in the numbers registered with the Chamber (Figure 3 in the appendix includes the geographical distribution of dairy products factories and dairy production areas in Egypt).
- In general, not all factories take advantage of their full production capacity, with differences between governorates,

which results in higher costs¹⁵ (Figure 4 in the appendix shows the ratio of actual production capacity to maximum capacity for white cheese production in the governorates).

- The sizes of establishments operating in the dairy industry vary between small and medium in addition to large factories, and factories that operate informally, and each group of enterprises faces a set of its own problems as summarized in the following table:

Table 3. Characteristics of the different sizes of enterprises operating in the dairy industry and the most common problems they face

Enterprise size	Characteristics	Most common problems
Small enterprises (formal and informal)	<ul style="list-style-type: none"> ▪ Traditional technologies. ▪ A limited range of dairy products. ▪ The majority of them are in the governorates, especially in the villages. ▪ Obtain dairy directly from farmers, 	<ol style="list-style-type: none"> 1. Problems related to raw materials: <ul style="list-style-type: none"> ▪ High rate of milk waste ▪ Bad quality of the milk supplied ▪ Problems with other production inputs, especially rennet. ▪ Inability to use good packaging products. ▪ The high cost associated with importing powdered milk. 2. Problems related to the production process:

¹⁵ For example, with regard to white cheese, the ratio of actual production capacity to maximum capacity ranges between 21 percent at a minimum achieved in Gharbia Governorate, and 89 percent at a maximum achieved in Cairo Governorate.

	<p>wholesalers, or traditional collection centers.</p> <ul style="list-style-type: none"> ▪ Dependent on powdered milk. ▪ Much of its production is not packed through automated methods ▪ Direct its production mainly to the local market. ▪ The traditional grocery store is the primary distribution channel. 	<ul style="list-style-type: none"> ▪ High percentage of waste in the final product. ▪ Shortage of liquidity to upgrade production technologies. ▪ Lack of tests required for checking product quality. <p>3. Problems related to distribution and marketing:</p> <ul style="list-style-type: none"> ▪ High percentage of waste and returned goods. ▪ Lack of marketing information. ▪ Low demand for traditional cheeses, such as Damietta cheese.
<p>Medium and large facilities</p>	<ul style="list-style-type: none"> ▪ There are only three large companies in the production of pasteurized milk and yogurt. ▪ Automated modern technologies ▪ A variety of dairy products ▪ High-quality products 	<p>1. Problems related to raw materials:</p> <ul style="list-style-type: none"> ▪ Increased production costs due to the import of a large portion of production requirements. <p>2. Production problems</p> <ul style="list-style-type: none"> ▪ Shortage of skilled manpower ▪ Weak research and development ▪ Absence of research activities to develop traditional products (from Damietta cheese)

	<ul style="list-style-type: none"> ▪ Obtain milk from either its farms or major farms and collection centers ▪ Direct its production to the local and export markets 	<ul style="list-style-type: none"> ▪ Lack of an Egyptian standard for nutritional value in various dairy products ▪ Unavailability of laboratories to perform some tests, as well as problems related to the accuracy of test results and the speed of obtaining them. <p>3. Distribution and Marketing problems</p> <ul style="list-style-type: none"> ▪ Lack of marketing efforts for traditional cheeses, such as the presence of brand names. ▪ Bad handling and storage by wholesalers and retailers. <p>4. Problems related to foreign trade, such as</p> <ul style="list-style-type: none"> ▪ Length of customs clearance periods ▪ No differentiation in customs based on the protein content of the product. ▪ Lack of bilateral trade agreements with some potential export markets such as Brazil ▪ Unavailability of the necessary market information, and weak marketing effort in some non-traditional export markets such as the African market, Russia, and China ▪ Slow refunds of the export subsidy entitlements to exporters.
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Sources: Soliman, I. & Ahmed Mashhour (2011); 2018. Kassem, et al.; Abdel- Latif, A., 2008.¹⁶

3 - Marketing and Distribution

As for the marketing of final products, we find that dairy products are mainly consumed locally, as Egypt exports 22 percent of the total production of dairy products in 2016.¹⁷ In general, traditional grocery stores are the main outlet for selling dairy products in Egypt with a share of 54.2 percent (EU 2019)¹⁸ (Figure 5 in the appendix shows dairy distribution channels in Egypt). The channel through which the distribution is made varies according to the type of cheese as shown in Table 4, and there are some cheeses, especially European cheeses, that are sold mainly to restaurants and hotels.

Table 4. Different types of cheese and their distribution channels

Type of cheese	The channel through which it is distributed:
Cheese made from vegetable oil	<ul style="list-style-type: none"> ▪ wholesalers ▪ Cheese Traders ▪ Direct selling to retailers using refrigerated vehicles ▪ Refrigerated distribution area

¹⁶ Kassem, a.et al.(2018), “Strengthening Entrepreneurship and Enterprise Development: Dairy Value Chain Mapping and Assessment”, USAID.

¹⁷ Central Agency for Public Mobilization and Statistics (2018), Annual Industrial Statistics: Private Sector, 2016

¹⁸ EU (2019). “The food and Beverage Market Entry Handbook-Egypt”, Egypt Market Entry Handbook.

	<ul style="list-style-type: none"> ▪ Factory outlet direct sale to the consumer
Damietta cheese	<ul style="list-style-type: none"> ▪ Cheese traders
Roumy cheese	<ul style="list-style-type: none"> ▪ Cheese traders
Malawi cheese	<ul style="list-style-type: none"> ▪ Cheese Traders, mainly distributed in Upper Egypt ▪ Hypermarket
European cheeses	<ul style="list-style-type: none"> ▪ Hotels, restaurants, supermarkets and hypermarkets
Syrian cheeses	<ul style="list-style-type: none"> ▪ Hotels, restaurants, wholesalers and retailers (grocery stores specializing in Syrian products)
processed cheese	<ul style="list-style-type: none"> ▪ wholesalers ▪ Retailers
Ghee	<ul style="list-style-type: none"> ▪ large companies ▪ Confectionery factories and stores ▪ Homes in rural areas
Instant soluble milk	<ul style="list-style-type: none"> ▪ Supermarkets and hypermarkets ▪ Retailers ▪ Sales representatives

Source: Kassem, A. et al, 2018.

Egypt's market size is witnessing increasing growth for all dairy products. For example, the market size for yogurt and curdled milk achieved an average growth rate of about 13.3 percent during the period 2012-2017, followed by both milk and cheese with an average annual growth rate of about 12.3 percent and 7.4 percent, respectively (EU 2019). Figure 6 in the appendix includes growth rates for the size of the dairy products market in Egypt during the

period 2012-2017 and expectations for future growth rates during the period 2017-2022.

As for exports, Egyptian exports of dairy products are concentrated in cheese, which constitutes 83 percent of total Egyptian exports of dairy products in 2019. By focusing on exports of cheese, we find that it is concentrated in processed cheese and fresh cheese "un-ripened or uncured cheese," with the two representing 80 percent of total Egyptian exports of cheese. Egypt is one of the largest exporters of processed cheese in the world. However, it was not able, at any stage, to have a product brand of its own despite the fact that Damietta cheese has the characteristics that qualify it for that.

Despite concentration of Egyptian exports of cheese in these two products, Egypt has managed to achieve a degree of diversification in Egyptian exports of cheese in recent years, with blue veins and other cheeses achieving the highest average growth in exports during the period 2016-2019 compared to declining growth rates of traditional Egyptian exports of processed cheese and un-ripened fresh cheese (Figure 7 in the appendix includes the growth rates of Egyptian exports of different types of cheese).

Egypt exports dairy products mainly to the Arab countries, as this group constitutes 92 percent of total Egyptian exports of milk in 2019. Saudi Arabia, Libya and Jordan are among the top countries to which Egypt exports dairy products, with shares estimated at 19 percent, 16 percent and 14 percent, respectively, of total Egyptian exports of dairy products. As for non-Arab countries, Russia, Turkey and Eritrea are at the forefront of countries to which Egypt exports dairy products, with shares of 1.2 percent each. Small enterprises export through an exporting agency.

Fourth: How the dairy industry was affected by previous crises

The dairy industry, like other manufacturing industries, was affected by previous crises, which were analyzed in detail in the previous ECES report No. 6 on the manufacturing industries combined. However, due to the fact that dairy products are an essential commodity (and hence the low elasticity of demand for them), in addition to the fact that the vast majority of its sales are directed to the local market, the impact on that industry from previous crises was less severe than the rest of manufacturing industries. Also, the impact most of the time was temporary. Here

we will focus on analyzing how the dairy industry was affected by the latest shock the faced the manufacturing industry, namely the flotation of the Egyptian Pound in 2016. The flotation of the pound had two main effects:

1. Increase in the price of production inputs: Here, a distinction must be made between two types of production inputs:

a. Packaging materials (tetra pack, aluminum foil and plastic products):

Enterprises dealt with the increase in the cost of packaging materials according to the availability of a local substitute to these products. In the case of packaging materials with no local substitute, such as aluminum foil and tetra pack, companies gradually passed the cost on to the consumer. As for packaging material such as plastic for which there may be a local substitute, enterprises resorted to using the local substitute, even partially, provided that the quality is appropriate.

b. Powdered milk: The increase in the price of powdered milk as a result of the dollar price hike drove establishments to increase the percentage of liquid milk used in production (from farms and collection centers), especially companies producing

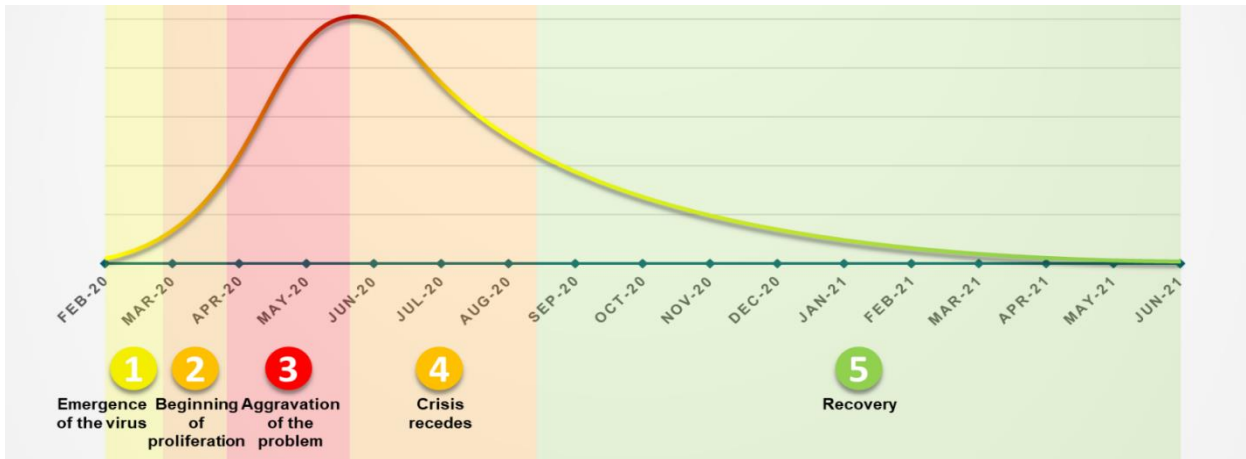
pasteurized milk and yogurt, subject to milk quality and the appropriate bacterial count. The substitution process resulted in the saving of hard currency, in addition to availing greater liquidity with companies, as liquid milk is paid in installments based on supply, unlike powdered milk, which is purchased in large quantities at once and stored. The cheese producing companies were unable to replace powdered milk, because the nature of its production process necessitates the use of milk powder.

- 2. Decreased demand:** Due to the decrease in the purchasing power of citizens. This resulted in a decrease in the volume of sales, and the industry was expected to return to its normal levels by the year 2020.

Fifth: How the dairy industry has been affected by supply and demand shocks in the context of the crisis cycle

The expected effect on the demand and supply sides relates to the stage we are dealing with in the crisis cycle. Accordingly, we can track five stages according to the crisis cycle. The following figure summarizes these stages as follows:

Figure 10. The stages of the crisis (Crisis Cycle)



Source: The Egyptian Center for Economic Studies.

Below is a brief description of each stage:

The first stage: Emergence of the virus

The crisis began and aggravated in China only. The rest of the world, including Arab and European countries, were not yet affected by the crisis.

The second stage: Beginning of proliferation

The spread of the virus globally. Arab countries began to be affected at the end of February and initiated precautionary measures to prevent the spread of the virus. European countries are greatly affected.

The third stage: Aggravation of the problem

The situation in the world has worsened, tougher measures in Arab countries, especially Saudi Arabia, and in European countries, a

major worsening of the crisis in Italy, beginning of the virus's receding in China, and beginning of its spread in the United States.

The fourth stage: Crisis recedes

The beginning of recovery from the virus globally, starting from China, which is expected to be followed by European countries, and finally, Arab countries and the United States.

Fifth stage: Recovery

Gradual recovery in all countries, including Arab countries, although the latter's recovery is expected to be delayed due to being strongly impacted by the global economy and its weak impact on it.

In Table 5, we will show the impact on the dairy industry from the crisis since its inception and analyze the current situation and expectations for the next phase starting from August 2020 until June 2021, in light of the following concepts and assumptions:

Concepts

- **Demand shock:** A sudden change in demand for dairy products and consumption patterns
- **Supply shock:** Dairy factories are unable to meet demand or align with consumption patterns

Assumptions of analysis

1. Demand for dairy products is tracked through supermarket ordering.
2. The supermarket's demand for prepacked dairy products relates to its storage capacity.
3. The nature of the capital cycle in the dairy industry, which is linked to the impact of the crisis on the sector, has the following characteristics:
 - a. Seasonality in producing liquid milk.
 - b. Need to store an acceptable amount of feed products to ensure sustainable feed availability.
 - c. Need to store powdered milk, which in some cases may reach maintaining a sufficient stock for six months.
 - d. Limited ability of farmers in general, especially small livestock breeders, to control the price, with dairy factories paying the price of milk supplied from dairy farms on credit.
4. The degree to which dairy farms are affected by the crisis is linked to the degree to which dairy factories are affected.
5. Focusing mainly on the local market, given that the dairy industry in Egypt is primarily geared to the local market.
6. Exports are not analyzed in the table, not only because it constitute as small share in total production but also because processed cheese (the main export product for Egypt) is a

basic consumer product for all citizens all over the world, and thus export performance has not been affected by the crisis.¹⁹

7. The quantitative estimate of the change in sales was made roughly through a limited questionnaire directed to a number dairy factories producing different varieties of dairy products.²⁰

Table 5. The effect of the crisis on the dairy industry since its inception and analysis of the current situation and expectations for the next stage starting from August 2020 - until June 2021

Stage	Demand and/or supply shock	Analysis	Impact on Egypt
The first stage: the emergence of the virus (December 2019 - January 2020)	No shocks	<ul style="list-style-type: none"> ▪ The emergence of the virus in China but Egypt was not affected during that period, thus economic activity continued normally ▪ Decrease in the world price of powdered 	<ul style="list-style-type: none"> ▪ There is no impact on the demand side. ▪ There is no effect on production cost as producers purchased production requirements of powdered milk and stored them prior to the lower price. ▪ As for other production requirements, especially packaging products, the fact that

¹⁹ According to the limited survey conducted with a number of dairy factories.

²⁰ Meeting was arranged with the group of dairy products manufacturers in cooperation with the Chamber of Food Industries.

		<p>milk in the second half of December, mainly driven by the decrease in China's imports of milk as a direct result of Covid 19, in addition to a surplus in milk production, due to expectations of positive growth rates in the largest seven dairy producing regions in the world during the second quarter of the year 2020.²¹</p> <ul style="list-style-type: none"> ▪ China's inability to supply production requirements of packaging products and feed. 	<p>producers, whether dairy farms or dairy products factories, maintain some stock has mitigated the impact of the crisis in China on the availability of production requirements, especially with regard to aluminum foil, in addition to availability of alternative markets, especially Saudi Arabia and Turkey, in the case of plastic and paper products.</p>
Stage 2: the beginning	Limited demand shock and	<ul style="list-style-type: none"> ▪ The global situation 	<ul style="list-style-type: none"> ▪ Supply was not affected as producers maintain a stock of

²¹ <https://www.dairyreporter.com/Article/2020/03/17/The-ripple-effects-of-COVID-19-A-look-into-global-dairy>

<p>of the virus spreading (February - mid-March 2020)</p>	<p>no supply shock</p>	<p>continues as before</p> <ul style="list-style-type: none"> ▪ The beginning of the increase in local demand for dairy products, especially with the start of precautionary measures in March, driven by consumer fear of the future of their food security and the extent of availability of their food needs. ▪ The decision to suspend schools and implement some precautionary measures. ▪ Unclear sources of disease transmission. 	<p>production inputs, especially in light of Ramadan preparations.</p> <ul style="list-style-type: none"> ▪ Consumption patterns change in the direction of larger containers due to lack of demand for small packages with the suspension of schooling, in addition to the desire of consumers to store. ▪ A slight reduction in restaurants and cafes ordering as a result of the beginning of consumer tendency to avoid eating outside homes, because they are not sure if the disease is transmitted via food.
<p>Stage 3: the crisis worsening (mid-March to</p>	<ul style="list-style-type: none"> ▪ Significant demand shock ▪ Limited supply shock 	<ul style="list-style-type: none"> ▪ Significant increase in demand for all food products, including dairy products, 	<ul style="list-style-type: none"> ▪ High demand for dairy products was reflected in increased demand for liquid milk, but was

<p>mid-May 2020)</p>		<p>specifically driven by the consumers' desire to store, due to their fear with the strengthening of precautionary measures and the effecting of curfews.²²</p> <ul style="list-style-type: none"> ▪ The worsening of the crisis coincided with the advent of the month of Ramadan at the end of April ▪ The complete suspension of tourist activity ▪ Increased health awareness of citizens as a result of fear of Covid-19, and hence lack of demand for certain products and not others. 	<p>not clearly reflected in the price.²³</p> <ul style="list-style-type: none"> ▪ Demand continued to rise despite declining consumer desire to store due to the large demand for milk and yoghurt during the month of Ramadan, coupled with the promotional offers made by companies. ▪ Demand came mainly through sales outlets (supermarkets, hypermarkets and grocery stores), while demand from hotels, restaurants and cafeterias²⁴ decreased due to precautionary measures and the suspension of tourism. ▪ The impact of curfew measures on the movement of goods and workers was limited to the first two weeks, and that effect was eliminated after the Government's decision to exclude industrial activity from
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²² The price of raw milk is determined by the dairy factories.

²³ The price of raw milk is determined by dairy factories.

²⁴ For more details on the impact of the crisis on demand for restaurants and cafes, see Views on Crisis, Issue No. 16.

			<p>curfew hours' subject to obtaining the necessary permits.</p> <ul style="list-style-type: none">▪ Establishments managed to increase the supply of dairy products due to a combination of factors:<ol style="list-style-type: none">1. The companies' prior readiness for the month of Ramadan and thus availability of all production requirements.2. The presence of idle capacity in some establishments and consequently the ability to increase production to meet increasing demand, or resort to work with more than one shift in order to meet the increase in demand.▪ Supply shock in some establishments, especially small ones, due to their inability to meet demand for automatically packaged products as a result of inability of these factories to shift towards packed products. This attributed to the high
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			<p>costs associated with this and the need to inject new investments.</p> <p>This effect varied according to the sales outlet for unpacked products, as supply to supermarkets and hypermarkets decreased by 20-25 percent. Meanwhile, supply stopped completely to companies that provide meals to their employees, which represents a large percentage of the activity of some small factories, which may reach 40 percent and above.</p> <ul style="list-style-type: none">▪ The significant decline in demand for fresh European cheeses, which are required by hotels primarily. The producers in this group of products were exposed to a liquidity crisis due to the return of goods sold to hotels with the vast majority of it damaged, and the presence of delays in payment of dues,
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			<p>which led to some factories resorting to production of cheese with a longer shelf life.</p> <ul style="list-style-type: none"> ▪ As a result of losses incurred by some factories, they resorted to a reduction in workers' salaries and a limited reduction in employment ▪ Increase in domestic sales of basic dairy products such as milk and yogurt by 12% - 13% in the first quarter of this year compared to the first quarter of last year, mostly in the last half of March.
<p>Fourth stage: crisis receding (Mid-May-august 2020)</p>	<ul style="list-style-type: none"> ▪ Continued major shock in demand ▪ Continued limited supply shock 	<p>This period can be divided into three stages:</p> <p>The first stage in May: This period witnessed a decline in demand for dairy products due to the low purchasing power of consumers and the decline in incomes, in addition to</p>	<p>The first stage:</p> <ul style="list-style-type: none"> ▪ Sales of milk and yogurt decreased during the month of May by about 5% compared to the previous year. ▪ Dairy farms suffered during the month of May for only one week due to the presence of stocks in dairy factories and decrease in demand during the month of May ▪ Manufacturers continued to produce

		<p>careful spending in the case of high-income brackets as a result of uncertainty about the future of the virus.</p> <p>The second stage: June - July With the easing of precautionary measures and gradual return of restaurants and hotels activity, the demand for dairy products improves.</p> <p>The Third stage: August There are three scenarios according to the evolution of the virus:</p> <ul style="list-style-type: none"> ▪ Optimistic scenario: continued low rates of virus 	<p>cheese with a higher shelf life and to move away from fresh and expensive cheese products.</p> <ul style="list-style-type: none"> ▪ Factories plan to update production lines to automated packaging methods, provided the necessary funding is available. <p>The second phase</p> <ul style="list-style-type: none"> ▪ The slight increase in demand during the months of June and July was reflected in the increase of sales by 2% -3% compared to the same period last year. <p>The Third Stage</p> <ul style="list-style-type: none"> ▪ Optimistic scenario: Gradual improvement in sales continues during August ▪ Medium scenario: Sales remain at the same levels achieved during July ▪ Pessimistic scenario: Sales fall to May levels
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		<p>infection and further mitigation of precautionary measures</p> <ul style="list-style-type: none"> ▪ Medium scenario: virus infection rates continue at the same level as July and extending the same precautionary measures ▪ Pessimistic scenario: Rise in infection rates again as a result of mitigation of precautionary measures during the months of June and July. 	
<p>The Fifth Stage: Recovery (beginning from September 2020 to June 2021)</p>	<ul style="list-style-type: none"> ▪ Demand and supply shocks are related to the pace of recovery. 	<ul style="list-style-type: none"> ▪ Optimistic scenario: The recovery continues until the crisis ends completely during the second half of September, and thus economic 	<ul style="list-style-type: none"> ▪ Optimistic scenario <ul style="list-style-type: none"> - Significant improvement in demand and a return to the levels of demand achieved during the same period of the previous year, but without realizing what was expected by dairy

		<p>activity returns normally and schools start in October, as announced by the Ministry of Education.</p> <ul style="list-style-type: none"> ▪ Medium scenario The continuation of the virus until the end of the year and the continuation of precautionary measures applied in the medium scenario from the previous stage. ▪ Pessimistic scenario Emergence of a second wave of the virus with the onset of winter, and schools not returning. 	<p>manufacturers of a return of profits to pre-flotation decision levels in 2016.</p> <ul style="list-style-type: none"> - The tendency of small factories to modernize the manufacturing process towards investing in packaging due to increased health awareness of citizens, albeit this depends on the availability of financing. - Return of previous consumption patterns in the size of packages sold or the types of cheese sold with the return of tourist activity and the return of the activity of restaurants and cafes. <ul style="list-style-type: none"> ▪ Medium scenario <ul style="list-style-type: none"> - Sales remain at the same levels achieved during July - Factories continue to shift their production lines away from fresh cheese.
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			<ul style="list-style-type: none"> ▪ The pessimistic scenario - Demand levels fall to the level achieved during the month of May at the height of the crisis - Some small and micro factories shut down due to not being able to invest in modernizing their production process and moving towards automatically packaged products. - The tendency of some enterprises to reduce employment levels.
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We conclude from the previous analysis that despite the apparent benefits for the dairy products industry from the crisis, these benefits are in reality temporary being related to citizen fear, and were not achieved for all establishments and all products, as follows:

- Not all sub-sectors of the dairy products industry benefited, as the main benefit was in favor of products with higher storage capacity, basic products in the citizen's food pattern, and low-

priced products. This group of products includes pasteurized milk, yoghurt and dry and processed cheese. However, fresh cheese products and European types of cheese suffered losses during the crisis.

- Not all enterprises have benefited from the crisis. Enterprises that benefited include those who use automated packaging methods, and have the production capacity to meet increased demand during the period of crisis aggravation.
- The temporary benefit achieved for the industry will not repeat in the event of the emergence of a second wave of COVID-19 as a result of citizens acclimatizing to the existing situation of the virus and the existence of a kind of reassurance about their food security. However, the negative impact associated with the low purchasing power of citizens is expected to continue in the case of non-recovery or slow recovery. The expected change in the consumption patterns of citizens is also expected to continue.

Here, it is worth noting that the dairy products industry can benefit greatly from increasing the citizen's health awareness to modernize production lines by using automated packing methods and increasing the quality of products. This requires government support for this industry by providing the necessary

financing, and overcoming the institutional obstacles facing this industry, which will be addressed in the following section.

Sixth: Measures required to mitigate the negative impact at the time of the crisis

Enterprises, especially small ones, currently suffer from a liquidity crisis as a result of very low demand, which requires:

- 1 - Revisiting policies adopted by the Micro, Small and Medium Enterprise Development Authority to be, at a minimum, in line with the policies approved by the Central Bank of Egypt, both with regard to the period of postponing loan repayments or the administrative expenses prescribed in exchange for postponing loan repayment.
- 2 - Paying all arrears of export subsidies due to exporters.
- 3 - Designing a financing program for the benefit of small enterprises working in the dairy industry to modernize production lines and purchase equipment for automated packaging on concessional terms.

Seventh. Institutional weaknesses revealed by the crisis and proposals to overcome them

Analysis of the value chain of the dairy industry has revealed a set of institutional problems that the industry suffers from, impede its growth. This requires the implementation of a set of integrated measures to address these problems within the framework of a clear vision for the future of the sector. These measures include, but are not limited to, the following:

1. The need to organize the relationship between dairy farms and factories to reach a fair formula for the price of milk supply.
2. The importance of developing a different model for the improvement of dairy collection centers (similar to the Dutch model) and not just a set of partial reforms, due to their important role in increasing benefit from liquid dairy through improving its quality and suitability to the specifications required for dairy products industries. This ultimately reflects in the reduction of costs associated with importing powdered milk.²⁵

²⁵ At the beginning of this year, the Government announced its plan to increase dairy production in Egypt by organizing work and expanding dairy collection centers and organizing them through issuing licenses for this operation in addition to genetic improvement programs for livestock breeds. There is also an experiment carried out through the Food Industries Chamber in cooperation with the International Labor Organization to develop a center through a model based on the partnership between companies and dairy collection centers. These efforts should be coordinated within the framework of a comprehensive review of the dairy production system in Egypt, and its link to the rest of the links of the value chains of associated industries.

3. The need to provide technical support from specialized government institutions for small farmers to improve the quality of milk.
4. Study the possibility of expanding the feed industry in Egypt so that imported feed is minimized.
5. Expediting the process of issuing and updating the specifications for dairy products, and the participation of small-scale producers in the committees concerned with setting these standards.
6. The necessity of fully activating the role of the Food Safety Authority, as some regulatory authorities, such as health and supply, still operate separately despite the existence of the authority.
7. The importance of developing government laboratories to increase the accuracy of results, ensure they are not contradictory, and reduce the time period for obtaining results.
8. The necessity of providing government agencies with the necessary financial and human resources (including veterinary units, supervisory bodies, and laboratories) in order to carry out their duties to the fullest.
9. The need to increase research and development to promote the value added of this important industry, and achieve more

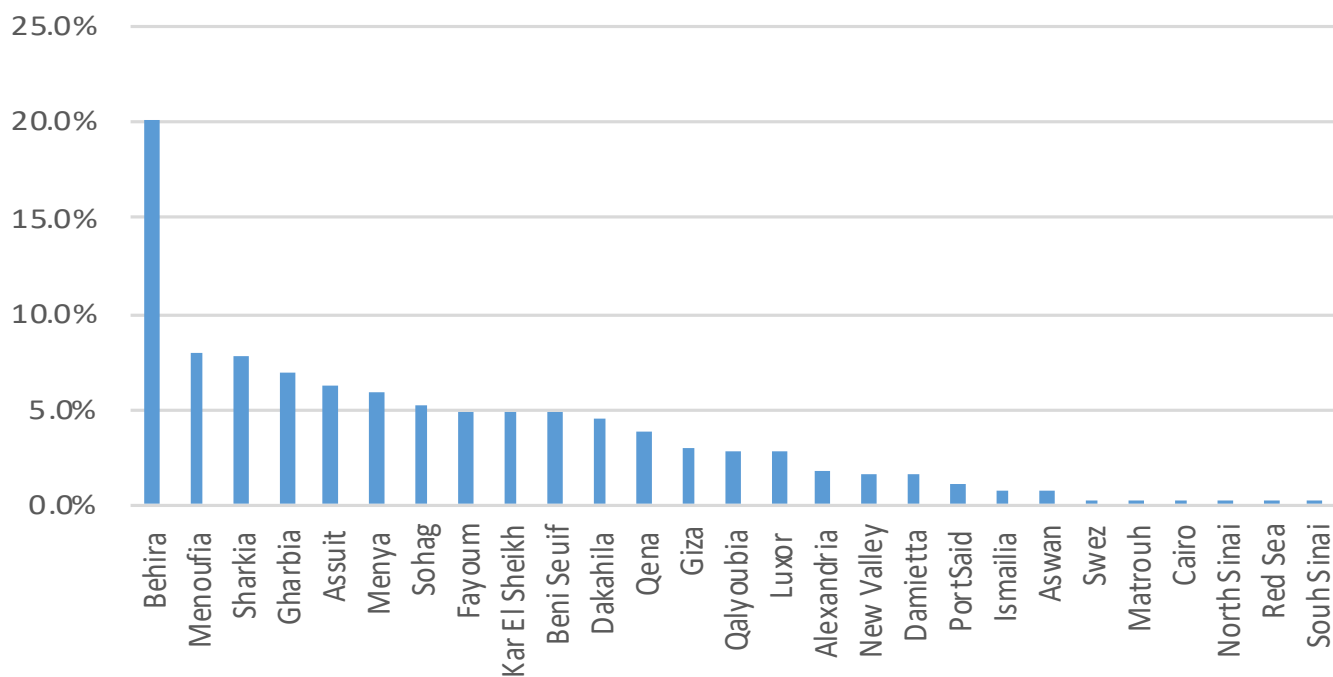
diversity in its products as found in the global markets (example, lactose-free milk).

10. Increasing the role of commercial representation in attracting export opportunities, especially in the African continent.
11. The need to provide benefits to export and import companies similar to those provided to manufacturers due to the role these companies play in serving small enterprises that do not export and import directly.



Appendix

Figure A1. Geographical distribution of domestic milk production, 2016



Source: Central Agency for Public Mobilization and Statistics (2018), Annual Bulletin of Livestock Statistics.

Table A1. Structure of Egyptian imports of dairy products, 2019

Code	Product Name	Share in total dairy imports
'040110	Milk and cream of a fat content by weight of <= 1%, not concentrated nor containing added sugar ...	0%
'040120	Milk and cream of a fat content by weight of > 1% but <= 6%, not concentrated nor containing ...	0%
'040130	Milk and cream of a fat content by weight of > 6%, not concentrated nor containing added sugar ...	0%
'040150	Milk and cream of a fat content by weight of > 10%, not concentrated nor containing added sugar ...	0%
'040210	Milk and cream in solid forms, of a fat content by weight of <= 1,5%	30%
'040221	Milk and cream in solid forms, of a fat content by weight of > 1,5%, unsweetened	14%
'040229	Milk and cream in solid forms, of a fat content by weight of > 1,5%, sweetened	0%
'040291	Milk and cream, concentrated but unsweetened (excluding in solid forms)	0%
'040299	Milk and cream, concentrated and sweetened (excluding in solid forms)	0%
'040310	Yogurt, whether or not flavoured or containing added sugar or other sweetening matter, fruits, ...	0%

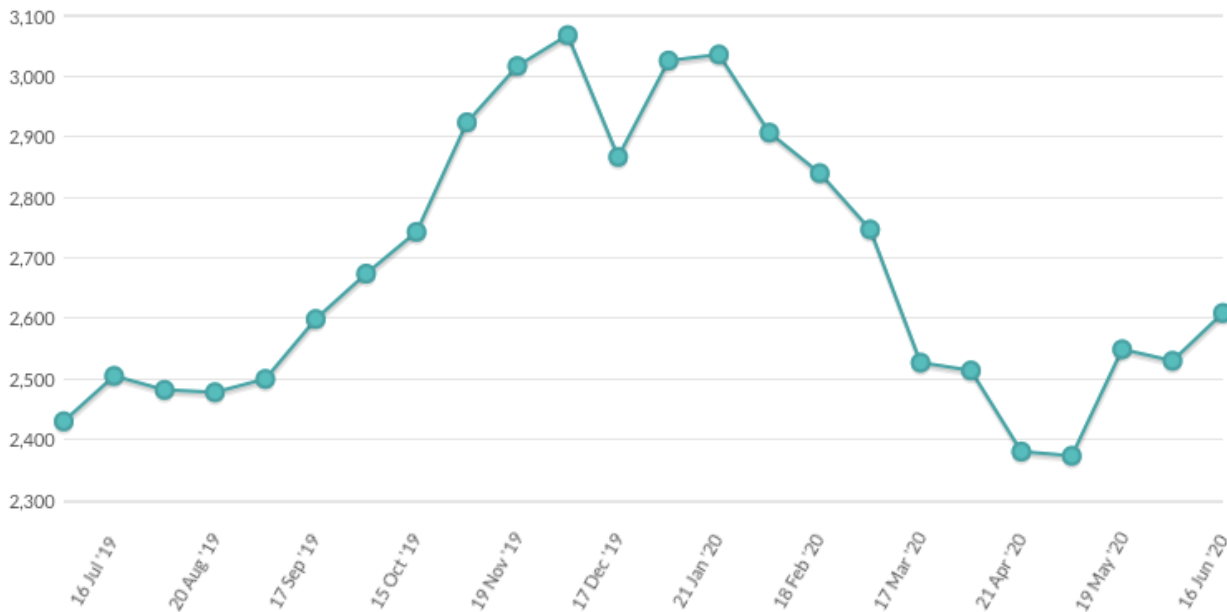
Code	Product Name	Share in total dairy imports
'040390	Buttermilk, curdled milk and cream, kephir and other fermented or acidified milk and cream, ...	0%
'040410	Whey and modified whey, whether or not concentrated or containing added sugar or other sweetening ...	3%
'040490	Products consisting of natural milk constituents, whether or not sweetened, n.e.s.	10%
'040510	Butter (excluding dehydrated butter and ghee)	14%
'040520	Dairy spreads of a fat content, by weight, of >= 39% but < 80%	0%
'040590	Fats and oils derived from milk, and dehydrated butter and ghee (excluding natural butter, ...	8%
'040610	Fresh cheese "unripened or uncured cheese", incl. whey cheese, and curd	0%
'040620	Grated or powdered cheese, of all kinds	1%
'040630	Processed cheese, not grated or powdered	4%
'040640	Blue-veined cheese and other cheese containing veins produced by "Penicillium roqueforti"	1%
'040690	Cheese (excluding fresh cheese, incl. whey cheese, curd, processed cheese, blue-veined cheese ...	14%

Source: Trade map 2020.

Figure A2. Evolution of international prices for skim milk powder

Skim Milk Powder Prices

12 months | 5 years

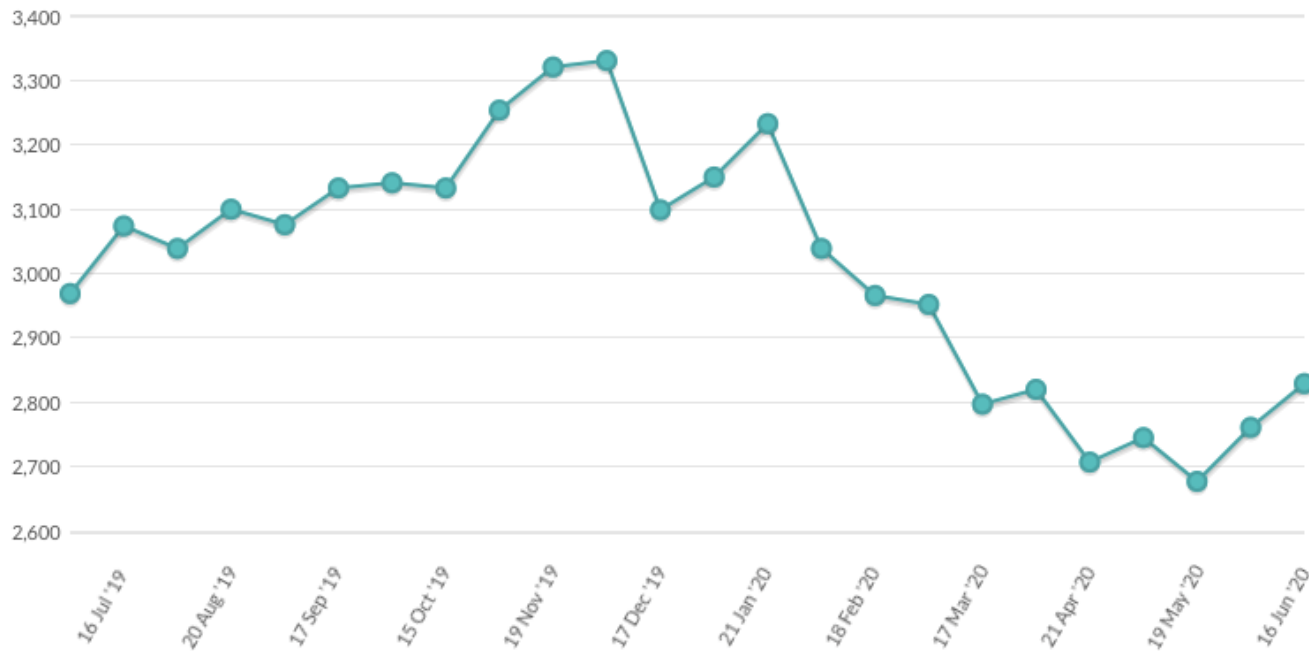


Source: <https://www.globaldairytrade.info/en/product-results/>

Figure A3. Evolution of international prices for whole milk powder

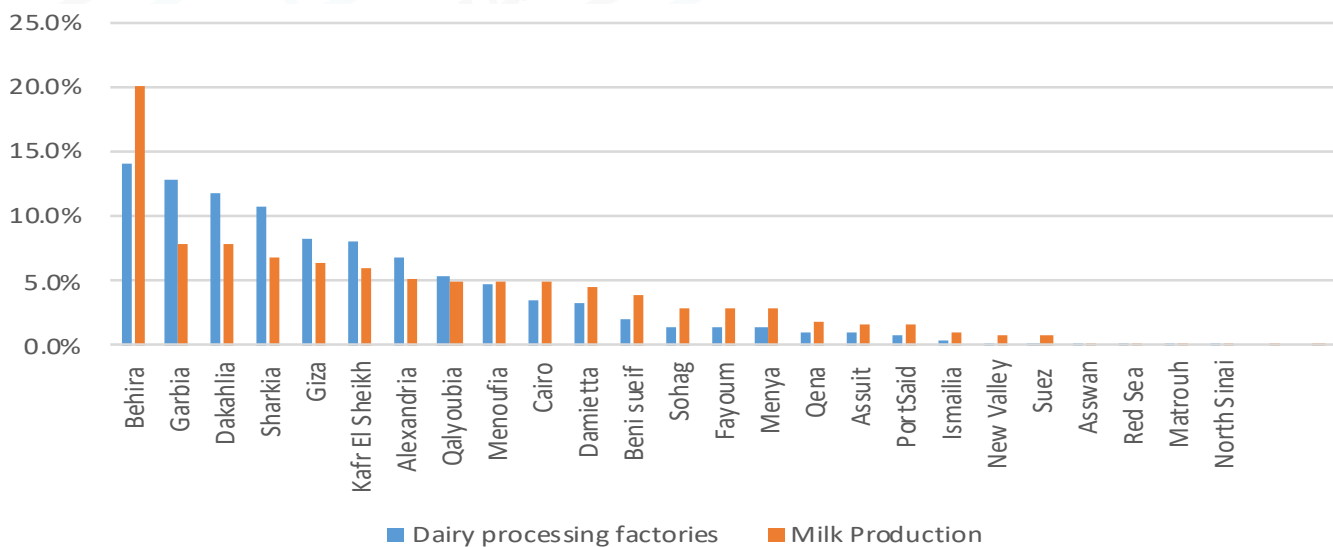
Whole Milk Powder Prices

12 months | 5 years



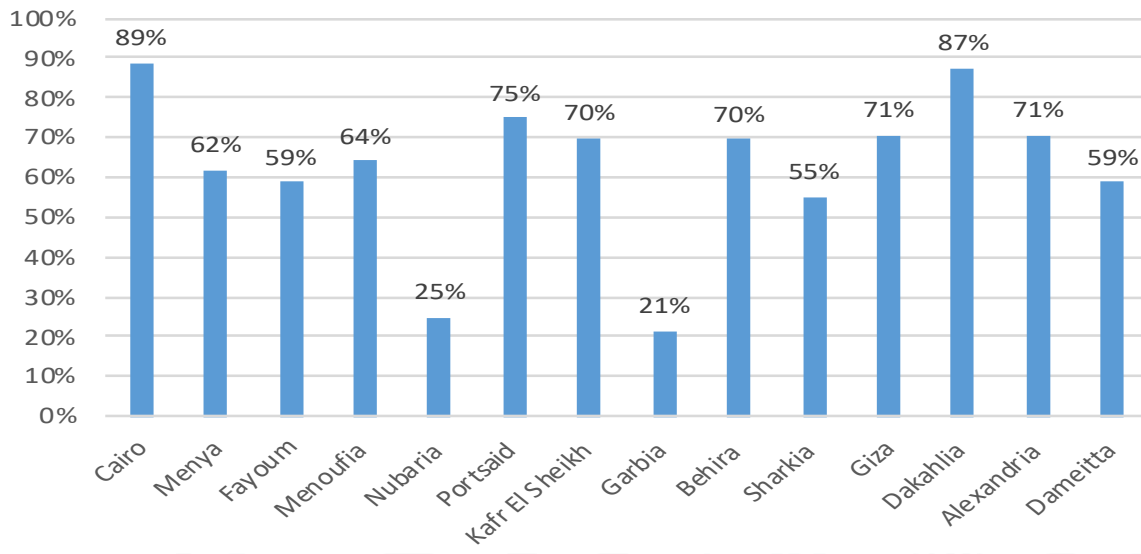
Source: <https://www.globaldairytrade.info/en/product-results/>

Figure A4. Geographical distribution of dairy products' facilities and dairy production regions in Egypt



Source: Researcher's calculations based on data from both the Chamber of Food Industries and the Central Agency for Public Mobilization and Statistics.

Figure A5. Ratio of actual production capacity to maximum capacity for producing white cheese in governorates

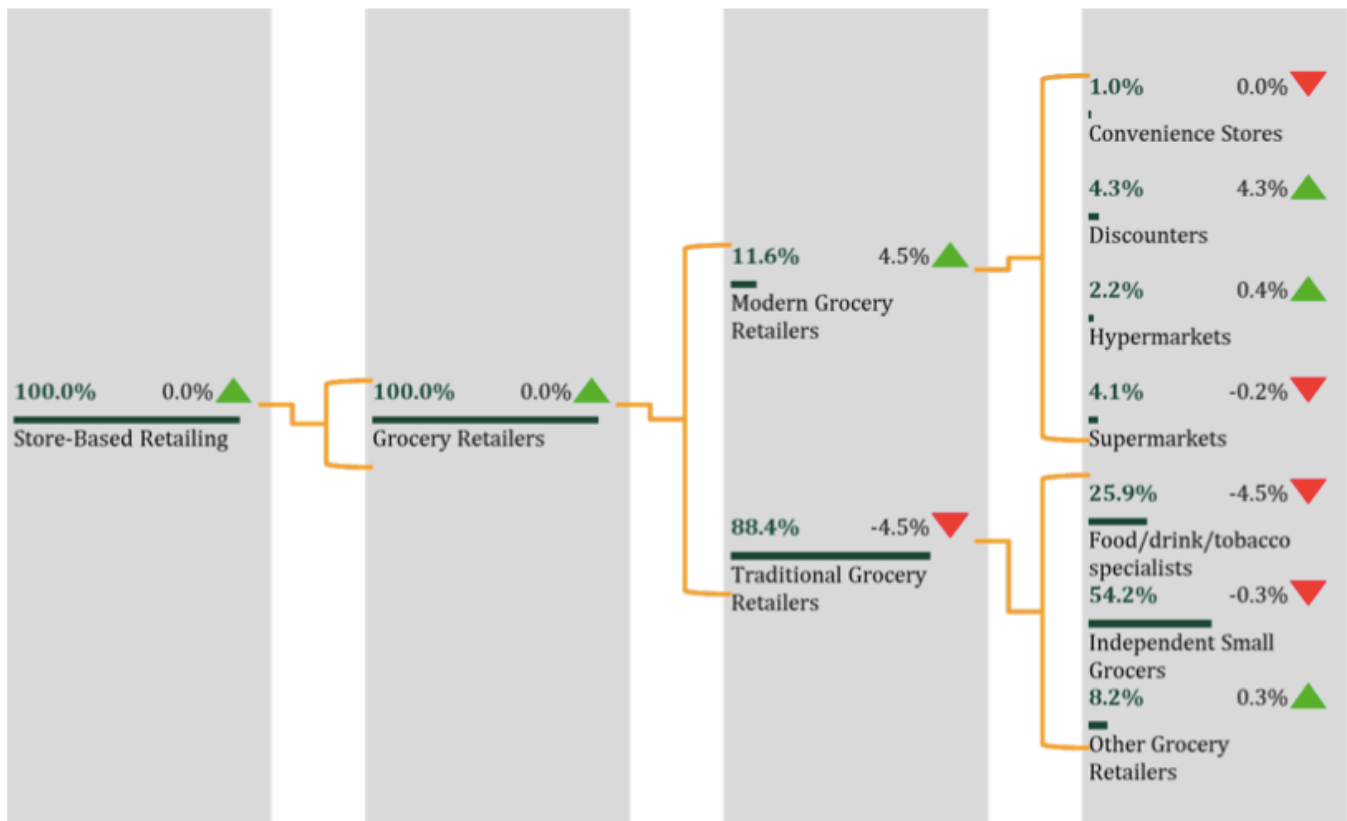


Source: Calculated by the researcher based on data from Kassem, A.et al. (2018)).²⁶

Figure A6. Dairy products distribution channels in Egypt

²⁶ Kassem, A.et al.(2018), "Strengthening Entrepreneurship and Enterprise Development: Dairy Value Chain Mapping and Assessment", USAID

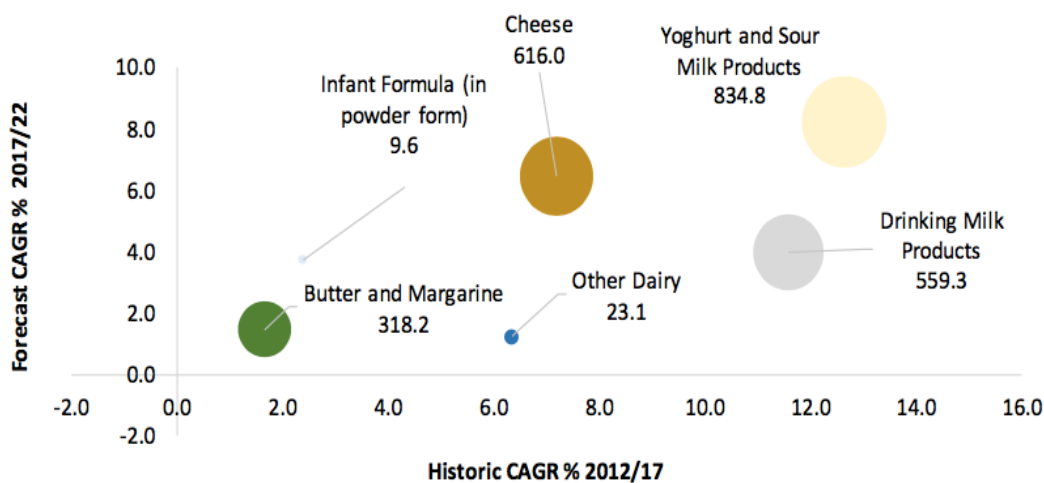
Figure 5-4: Distribution channel overview of dairy in Egypt (2017); all dairy products; retail value



Source: Euromonitor International: Packaged Food, 2018

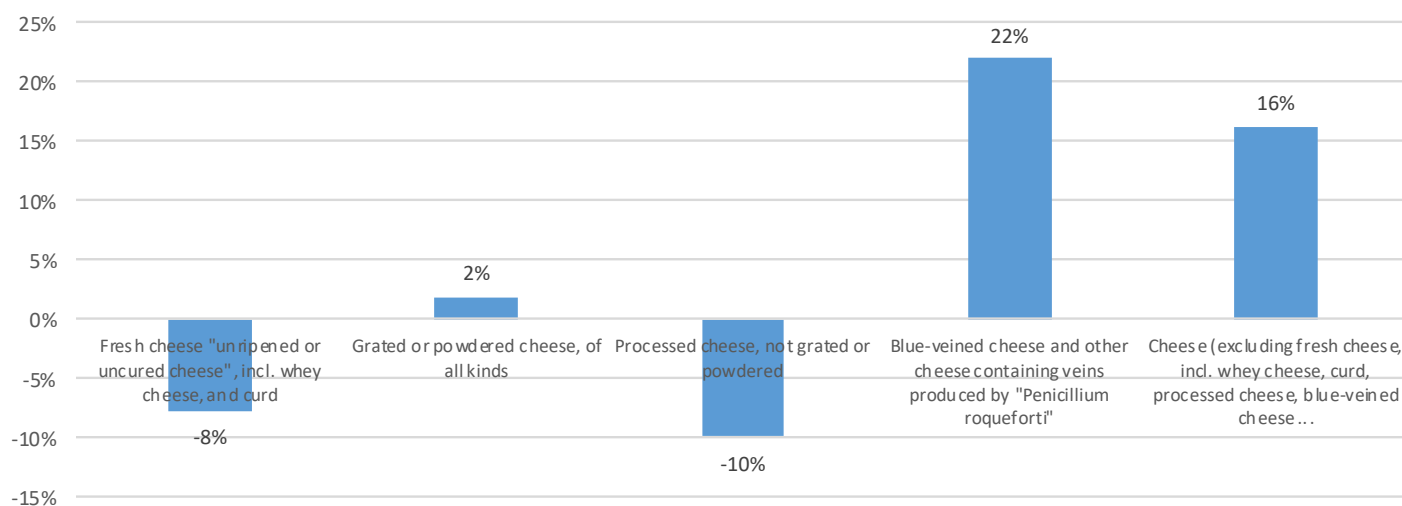
Figure A7. Growth rates of the dairy products market in Egypt and expectations of future growth rates

Figure 5-1: Evolution and forecast of dairy market (000 tonnes) in Egypt, retail total volume 2012-2022



Source: Euromonitor International: Packaged Food, 2018

Figure A8. Average growth rate of Egyptian exports of cheese during the period (2016-2019)



Source: Trade map 2020.

