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An assessment of the performance and Financial Analysis of milk collection centers in Egypt. "Case study of Beni Suef Governorate"

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Abstract: Milk production is a source of supplementary income for thousands of small and marginal farmers and landless laborers in Egypt, through the sale of surplus, as well as an important source of animal protein for milk consumers. On the other hand, dairy industry is vital industries in Egypt that aims toward cover the gap between raw milk production and consumer's demand of the final dairy products, Total employment in Dairy products about 26,461 employee, (CAPMAS, 2013) represent 4% of total food processing employment, Number of establishments about 1,883 represent 2% of total number of enterprises in food processing, dairy products represented 27.1% and 9.7%of the total animal production value and total agricultural production value, In 2015, respectively, (CAMPAS, 2017), in addition to Egypt enjoys a comparative advantage in exports of dairy products, (Hanan M. Mahrous, et al, 2019), due to investment advantages in dairy industry, the shortness of production cycle and the high nutritional value of milk products, This study was conducted in Beni Suef Governorate aiming to carry out an assessment of the performance of Egyptian milk collection centers under the supervision of agricultural cooperatives, to enable policy maker and decision makers to understand and development dairy sector. The study depended on primary and secondary data. Primary data were collected through the questionnaire which designed for this purpose and distributed to 240 respondents within Beni Suef Governorate, the study used the descriptive analytic and quantitative methods to identify the statistical indicators and measurements that serve the research objectives. The result showed that: The MCC's role is to chill milk, which ensure the milk quality and safety until supplying the milk to retailers or processors, also MCCs are promoting women, It provided woman employment, trainings and market raw milk. Recently collectors are progressively delivering milk to processers, through MCCs, this formal market is growing thanks to the Egyptian Government Authorities who decided to support Milk Collection Centers to facilitate milk marketing and provide raw milk to Dairy industries. The study indicates that agricultural cooperatives could be one of the solutions towards developing of dairy industry, and there are direct relationships between total milk collected by MCC, milk price, Dairy plan, and investment profitability, The Financial Analysis showed that MCC investments had positive NPV, and IRR is 40%. The (MCC) is financially viable The costs can be repayable in four years and four months. There are obstacles facing the dairy industry as well as the study recommended future plans to alleviate the problems and giving adequate level of extension services and Improve on the rural infrastructure" with proper cooling facilities and transportation networks at farmers level ", Create more milk collection centers and development & support of milk collection centers and provide training to dairy farmers at Milk collection centers (MMCs) about practices which will improve the quality and quantity of milk procured; led to a rise in milk prices and improvements to milk hygienic quality, At policy level, government should also encourage investment in training on milk hygiene and quality by deploying extension staff into villages, support partnership with civil society institutions and local and international donors, to Benefit from it's experience in this MCCs in establishing other MCCs in other Egyptian governorates, especially for the rural areas.

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Keywords: Dairy industry, agricultural cooperatives, Egypt, Milk collection centers (MMCs)**,** Financial Analysis.

Introduction:

Livestock farming has an important role in Egypt, Dairy farming is one of the main branch of the livestock sector and agricultural production, Egyptian dairy production and trade have experienced increases during the last five decade, Egypt's milk sector is still largely traditional represent nearly 80%. Most dairy farmers are smallholders with limited sources of labor, capital, and technology, This lead to inappropriate cows breeding, disease, limited market access, The

milk industry of the Egypt is growing, according to" Food Industries Chamber" increased factories to more than 250 factories in year1998, it provides necessary food products, such as pasteurized milk, yogurt, white cheese, dry cheese, ice cream and ice cream powder, while the other system is small municipal laboratories, increased from 600 in 1990 to 1003 laboratories in 2012. The number of registered white-cheese factories about 1147 factory, with capacity to handle 0.58 million tons of milk and produce 0.16 million tons of cheese. While, these factories received 0.38 million tons of milk and produced 0.10 million tons, representing 64.59% and 37.06% of their respective operating capacity in the year 2015. (MALR, 2016). Egyptian Government and development practitioners need up-to-date information about the MCC needs and constraints in order to inform policies and interventions that contribute to dairy value chain development, and Assuring the quantity and safety of milk, Milk collection centers are an indispensable tool for dairy industry in Egypt, dairy farmers sell milk to MCCs which sell milk to the milk plants, The total number of milk collection centers about 862 centers in Egypt, 2020. Milk collection center is the place to which the milk is transported from its production farms, in order to determine its quantity, be examined, cooled and stored until it is transferred to the dairy factories, there for milk collection centers (MCCs) function as a bridge between the breeders as the first step in milk supply chain and the processing in dairy industry, The main target of MCCs is to collect adequate milk volumes to meet the demand of processing industries, in addition to saving time and money for Farmers who deal with milk collection centers, on the other hand, Farmers receive cow breeds, feeds, Conducting of Necessary Trainings, medical treatment, and other support from the milk processors. Moreover Development of efficient milk collection centers with proper cooling facilities "cooling" and transportation etc., would help strengthen milk safety and quality for dairy industry, which indicate that there are opportunities to improve the dairy sector in the Egypt.

The Problem of the study:

According to the national policy of agriculture and livestock development in Sustainable Agriculture Development Strategy, 2030, (MALR), 2009), it is planned to reconstructing the animal protein basket from different sources in favor of the local less costly sources, as well as achieve self-sufficiency especially in milk and milk products, Reduce the import of milk to marginal levels, and increase per capita share of animal protein by approximately 4 gm/day by the year 2030, Increase per capita share of milk from 63 kg / year to 90 kg by 2030, but Egypt suffers from a shortage of animal protein, which is reflected in The total milk production in Egypt is not enough to meet the demands for dairy products Based on the Egyptian dairy products about 5.59 million tons year 2015, and exporting dairy products equivalent to 1.07 million tons of milk with a total value of $408.7 million, (AOAD), 2016). While imported about 1.42 million tons with a total value of $839.4 million, there is a deficiency in the trade balance of milk and dairy products about $430.3 million. The total consumption deficit was 5.95 million tons; the self-sufficiency ratio was 94 %, due to Disruptions in the supply chain in Egypt's, dairy farmers still find difficult to participate formal markets, the concentration of farms in the rural areas, whereas the factories are in the urban areas, reflected negatively on livestock breeders such as transporting cost of milk to cities, encourage establish milk collecting centers (MCCs) at recommended location in Egypt, To collecting milk from producers, and carrying milk produce to the plant, Therefore, need to be examined and analyzed.

Objectives of the study:

Egyptian Government aims to set-up milk collection centers (MCCs), This research was conducted to The carry out an assessment of the performance of Egyptian milk collection centers, to enable policy maker and decision makers to understand and development dairy sector, supporting the dairy sector productivity, and improve the dairy sector performance to improve rural standard of living in Egypt i and, Beni Suef Governorate which has been purposefully selected, in order to point out the main problems and constraints obstructing the milk production, processing and trade in Egypt, The study's specific objectives were as follows:

- ❖ Background of Egyptian Government Policies and Principles in the Dairy Sector and Impact of national and International Organizations in the Egyptian dairy sector:
- ❖ Identify the dairy sector challenges and suggest actions to overcome and improving the supply of milk in quality and in quantity.
- ❖ Clarifying the advantages of (MCCs) through using financial assessment, to determining the (MCCs) project's ability to continue.

Methodology and data sources:

The research used the descriptive and quantitative method to analysis and introduces the study problem, this research based on primary and secondary data. Primary data were obtained from Questionnaires were prepared to facilitate interviews with who form part of the dairy value chain, such as the MCC managers & employees, cooperative employees, and farmers who dealing with MMCs, and sell milk to milk collection centers in Beni Suef governorate. used the multi stage random sampling method to select the respondents. The research was

conducted during the season 2019/2020, The research was conducted in six milk collection centers located in different geographic center from Beni Suef Governorate (Beni Suef, Biba, Ihnasiya), to permit an analysis of the costs and benefits. Data collected from 240 the respondents. Data and information about inputs, fixed and variable cost components, salaries and wages of procurement staff and administrative staff, transporter's payment, total quantity and prices of milk procured from the records maintained in the co-operative milk collection centers for the financial year 2019/2020. The research relied on achieving its goals on the published and unpublished secondary data and reports of Ministry of Agriculture, the Central Agency for Public Mobilization and Statistics,…etc., in addition to in addition to websites, reports and studies issued by the authorities concerned with the subject of the research.

Results:

The Impact of Egyptian Governmental Policies in the Egyptian dairy sector:

Traditional/informal milk markets have apparently played a key role in dairy development in Egypt, small-scale markets control over 80% of marketed milk; Milk production began as early as 6,000 years ago during the "Agricultural Revolution.". The dairy industry is a major enterprise in Egypt, occupying a significant place in food supply. Dairy industries have shown tremendous growth in size which products (pasteurized milk, cheese, butter, etc.), (Jai, *et al* 2010). The Egyptian modern dairy industry products started in Egypt since 1920 when the first factory in Damietta for the manufacture of white cheese was started. Then In 1945 the company "Astra" started producing pasteurized milk with a capital investment about 100 thousand pounds, followed by the company "Cyclam" in Alexandria in 1952 for the manufacture and trade of dairy with a capital investment about 577 thousand pounds, which was characterized by the application of practical foundations in manufacturing and quality control operations and relied on a dairy farm Attached to the company, in addition to collecting milk from major producers in the vicinity of the company. According to the agreement concluded between the Egyptian government and the International Childhood Relief Authority, a dry milk powder factory in Sakha, was established in Kafr El Sheikh Governorate in 1956, and actual production began in 1960. Also In the year 1956, the largest company for the manufacture of dairy products was established in Egypt, which is the Misr Dairy Company "a public sector" with a capital investment about 400 thousand pounds, a partnership between the Ministry of Awqaf and the Bank of Misr, then the capital investment of this company was increased to 700 thousand pounds and it became the dominant dairy industry and its products throughout the sixties and beginnings of The seventies and its factories were equipped at the highest level of technology with German and Swedish experience. Then a dairy pasteurization factory was established in Cairo with a production capacity about 100 tons of raw milk daily. This factory started in January 1961, and a Republican decision was issued to establish El Nasr Dairy and Food Products Company, followed by three factories in Ismailia, Tanta and Mansoura, each with a capacity of about 25 tons of raw milk daily and with a joint capital Its capacity is about 1250 thousand pounds, and those factories started production in 1965. In the seventies the policy of economic openness, led to entry of the private sector in this industry and this sector was able to establish several large factories at a high level of technology and quality and new products appeared that were not previously in the Egyptian market, including "cooked cheese, sterilized milk, white cheese mixed with vegetable oils", in addition to well-known products such as pasteurized milk, yogurt, natural pasta, Roquefort dry cheese... etc. In 1974, the policy of "openness" opened the dairy industry to private sector investment. Over the next ten years, around 150 licenses were issued to private dairy factories, and 20 new ones were opened. Hence, "Misr Dairy & Food" lost its market share in favor of more active and dynamic private companies; The packaged dairy industry effectively began in the 1980s with the entrance of the private sector, with several major producers (including Juhayna and Enjoy) coming onto the scene. Prior to this, the packaged dairy market was relatively small and dominated by the public sector, In 1997, the share of Misr Dairy and Food Company on the market did not exceed 5% of the total volume of commercially produced milk; In the same year, there were nearly a ten major domestic industrial facilities for dairy products - in addition to Misr Dairy - on the way to privatization. It has become important to note that the role of the private sector in the dairy industry has gained increasing importance over the years, to the point where the proportion of state ownership in the dairy sector has diminished. The number of registered white-cheese factories about 1147 factory, with capacity to handle 0.58 million tons of milk and produce 0.16 million tons of cheese. While, these factories received 0.38 million tons of milk and produced 0.10 million tons, representing 64.59% and 37.06% of their respective operating capacity in the year 2015. (MALR, 2016)) The packaged dairy industry started in the 1980s due to private sector. The goal of the Egyptian Sustainable Agricultural Development Strategy, 2030 is to increase livestock productivity and production in a sustainable manner while protecting the environment, preserving animal biodiversity, and ensuring both bio-security and

farmers' livelihoods. To reach these goals, Egypt has adopted certain policies that have had a positive impact on the milk sector development. These policies shown in table (1). These goals can be achieved by (Othman, et al, 2010; ABDEL, F., and HASSAN, M, 2008; ALQAISI, O., NDAMBI, O. A., and HEMME T, 2009):

Table (1): the role of the Egyptian Sustainable Agricultural Development Strategy 2030 in dairy products.

Description	2007	2017	2030
Milk production (thousand tons))	5925	7200	9450
Share Per capita (kg/year)	91.1	79.8	90
Import of Milk (thousand tons))	948	140	0
Self-Sufficiency for raw milk%	90.6%	98.2%	100%

Source: Collected and calculated from the Sustainable Agricultural Development Strategy, 2030, 2009.

Attracting of foreign investment in the milk sector, Supporting of milk collection centers, this has helped in the marketing operations and the flow of milk to factories and consumers, Supporting of small producers by providing them with loans, Supporting the import of foreign breeds of high-yielding cows, Supporting of animal production, especially in newly reclaimed land, as in the case of Egypt where in the year 2020. Egyptian government Inclusion milk collection centers within the initiative of financing small and medium enterprises with a simple, diminishing interest about 5% from Egyptian central Bank, as Ministerial Decree No. 94 of 2020 was issued to regulate the issuance of licenses for milk collection centers in accordance with the requirements and controls of public health and food safety, and transferring them from randomization to the regular work that guarantees the quality of the milk. In this context, the President directs the government to bear about 50 thousand pounds/ MMC, for the international certificate for the adoption of standard specifications for production quality, on the other hand; there is coordination and cooperation between the Ministries of Agriculture and Military Production to provide the necessary equipment and devices for milk collection centers enhancing food health, safety of citizens, and increase dairy export.

The Impact of national and International Organizations in the Egyptian dairy sector:

International Organizations play an important role in the Egyptian dairy sector such as CARE, which consider one of the world's largest private international humanitarian organizations committed to fighting global poverty, all over the world, with its Secretariat based in Geneva, Switzerland. CARE's work in Egypt began in 1954, with the introduction of a nationwide school meals program. Milk Collection Communities (MCCs) is the program's flagship project that fosters the value chain approach, which aims to empower the small-scale dairy producers and improve the dairy-producing cattle breeds, in addition to providing veterinary care for livestock in the dairy gathering areas, the project provides veterinary care, including vaccinations, and fodder with discounts for farmers, training on milking and feeding methods. a grant from CARE, registration of the (MCC) with the Food Safety Authority of the Ministry of Agriculture, CARE created a model for inclusive value chains and through the Danone Ecosystem Fund, Danone owns the second largest dairy farm in Egypt, "Danone Farm", and has a partnership with the International Organization "CARE", with the support of the Danone Ecosystem Fund for the establishment of the milk Collection Centers project

Egyptian government have realized the importance of the economic and social role that agricultural cooperatives associations play in the Egyptian economy, as the experiences of many countries have shown that when working alone, small farmers achieve fewer gains than in the case of groups such as agricultural cooperatives as a result of their increased ability to benefit From the available market opportunities, mitigating the negative effects of food crises, assisting small farmers, smallholders and livestock breeders in obtaining the information, services and tools they need, to upgrade the skills and experiences of small producers, in addition to providing them with appropriate information and knowledge, helping them innovate and adapt to changing markets, and adopt appropriate practices and technology.

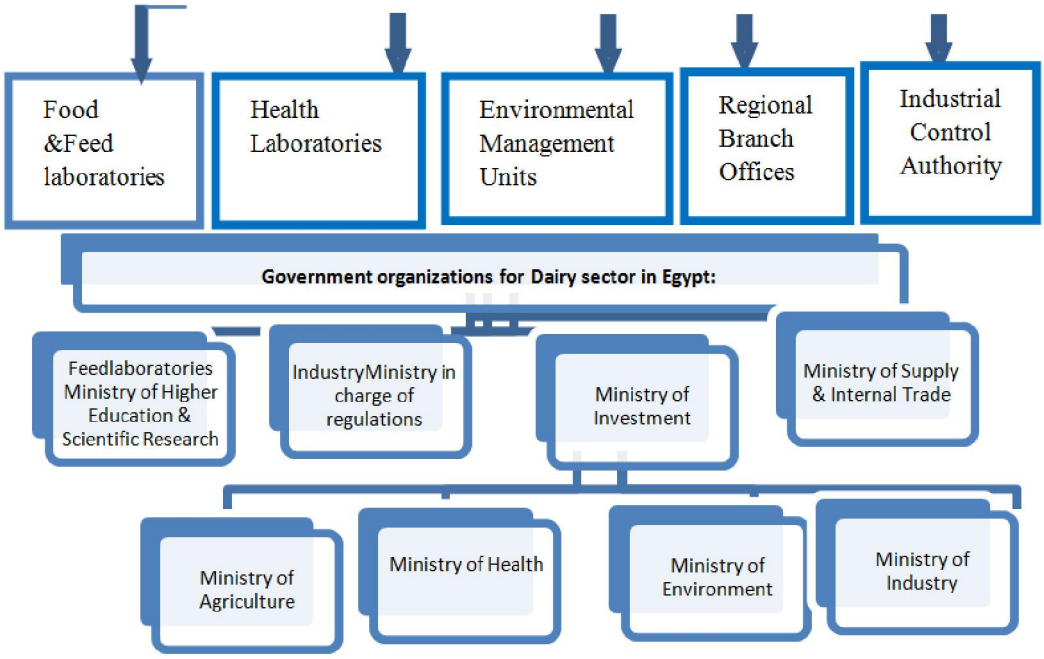
Agricultural cooperative is an economic enterprise with a social return, based on optional membership and international cooperative principles, Ministerial (Decree no1658/2001) working in market economy, representing the interest of its members, within a legal framework which protects its capital, and enable cooperatives to manages its financial resources as a private enterprises, which participates in the formulation and implementation of the agricultural policy"(Strategy for the Development of Agricultural Cooperatives; 2001), there are four type of Agricultural Cooperatives, first; Agricultural Credit Cooperatives" serve old lands in the Delta and Nile Valley, and the 12 General Marketing Cooperatives. Its branches regulate credit cooperatives on the

governorate, district, and village levels", second; Agrarian Reform Cooperatives" serve nationalized lands as stated in Law 178 in 1952.", third; Reclaimed Land Cooperatives, Credit cooperatives" serve new cultivated lands", fourth; Cooperative societies for water wealth, The number of agricultural cooperatives reached 5801, cooperatives, Agriculture Credit Cooperatives represent 74.4% of total cooperatives, The number of contributing members is about 4.8 million member. (CAPMAS, 2017/2018). Egyptian policy maker and decision makers aims to raise the capacity of the agricultural cooperative association in managing development projects, and creating new marketing channels in the Egyptian Governorates, The (MCCs) project under the supervision of agricultural cooperatives, will lead to an improvement in milk products production, developing of manpower, marketing and making available monitoring mechanisms for quality.

Danone has 11 milk collection centers, started working in Egypt since 2010, with an investment of one million euros (El Borsa, 2019), Danone Egypt was able to secure up to 13% (El Borsa, 2017), of its fresh raw milk needs through milk collection centers that guarantee safe and healthy high quality milk that conforms to Danone's standards for manufacturing all dairy products. Danone Farm covers the rest of the company's dairy needs, while the collection centers are relied on to cover the. The development of milk collection centers has provided competitive advantages to Danone, while at the same time serving one of CARE's goals in combating poverty and achieving social justice. This partnership between Danone, CARE and Agricultural cooperative has had a positive social impact such as providing job opportunities, improving the incomes of small farmers by increasing sustainable revenue flows, and building capacities by CARE, which contributes to solving the unemployment problem, and empowered women.

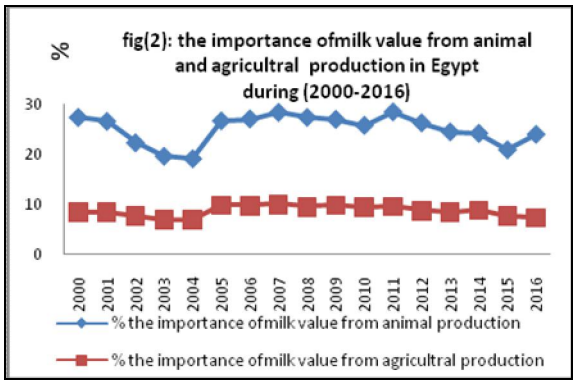
Dairy market structure: Government organizations for Dairy Development Administration:

There are around 25 companies involved in the industrial processing and packaging of dairy products, only 14 companies are members of the Dairy Industry Development Association (DIDA) and about 7 or 8 can be considered as significant players. Most of these companies use fresh milk as the main input for their production processes. Recombination (use of skimmed milk powder) remains unimportant due to its higher cost. These Organizations play a major role in dairy development as shown in fig (1).

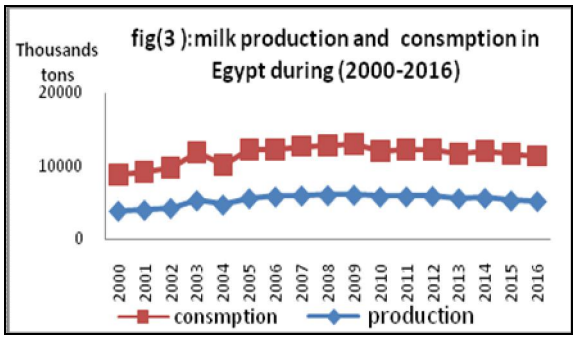


Development of Milk production in Egypt during the average period (2000-2016):

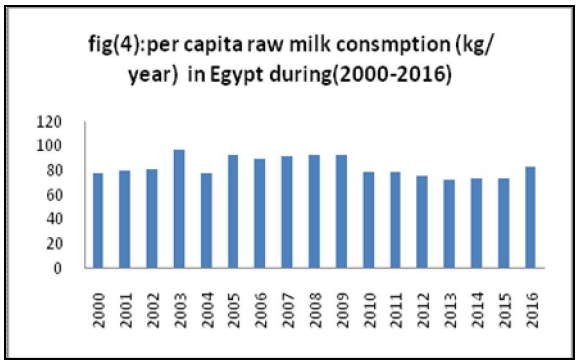
In Egypt, animal production accounted about 30 % of the total agriculture in the 1990s, increased to35% of the total agriculture during the average period (2000-2016), Milk production is carried out in all the geographical parts of Egypt. However, Egypt's dairy sector accounts for about 25% of its livestock industry, during the average period (2000-2016), making it an important sector in the Egypt.



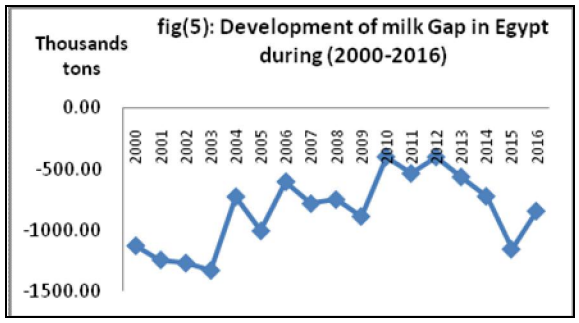
The expenditures of an Egyptian household on milk, cheese, and eggs represented about 4.70% CAMPAS, 2016), of total consumption in total Egypt, year 2016. Egypt was admitted to membership of the International Dairy Federation on 12 November 2008. Egypt's milk sector is still largely traditional with a majority of the population consuming unpasteurized milk. Milk production, which increased from 3.83 million tons in 2000 to 5.16 million tons in 2016, approximately an increase of 34.8%. Around 20% of the produced raw milk, is consumed on the farm itself. The remaining 80%, 70% is distributed and processed through MSME-scale producers to supply milk, cheese and home-made butter. Only 10% is processed by the modern commercial large-scale sector. Cheese production is the major activity, both in MSMEs and the large scale dairy operations in Egypt. However, the largest amount of cheese production is accomplished at the MSMEs, Milk consumption in the Egypt increased from 4.96 million tons in 2000 to 6.16 million tons in 2016, approximately an increase of 24%, fig (3).



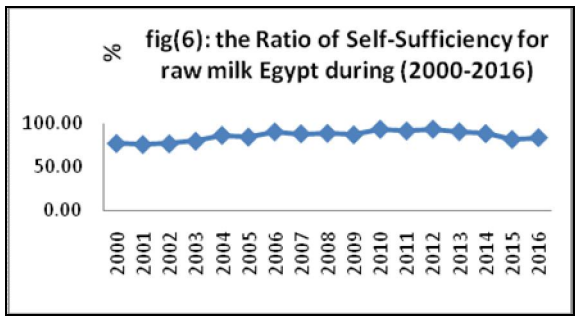
Egyptian demand for milk is increasing, per capita consumption of the raw milk has reached a 83 kg per year during the year 2016, fig (4), the average per capita daily dairy decrease from 212 gm/day year 2000 to 199 gm/day year 2015/2016(MALR,2017),



Development of Gap and Ratio of Self-Sufficiency for raw milk Egypt during (2000-2016):



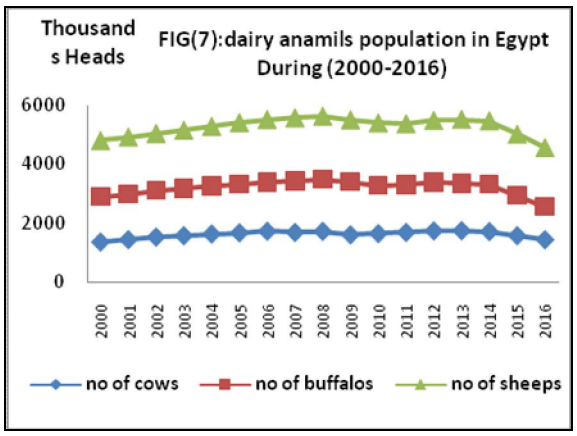
As shown in fig (5) raw milk Gap started decreasing since year 2014 until now, reflected positively on Self-sufficiency of raw milk in Egypt, year 2015 was 81.94% Fig (6), Domestic production was 5245 thousand tons, while milk available for consumption was 6401thousand tons.



Dairy animals Population in Egypt During (2000-2016):

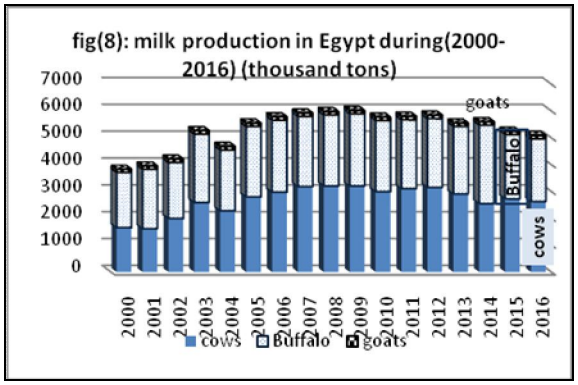
Most of the milk in the country is produced by small, marginal farmers and landless laborers; it is clear from the fig (7) the high rate of cows' contribution to the total domestic milk production in Egypt (MALR, livestock statistics, different issues). The amount of domestic production of milk increased, the increase in milk production is mainly due to two factors: an increase in the number of livestock and an increase in productivity (yield). Buffaloes and local

baladi cows are the main dairy animals. Fertilization rates of cows are higher than buffaloes.



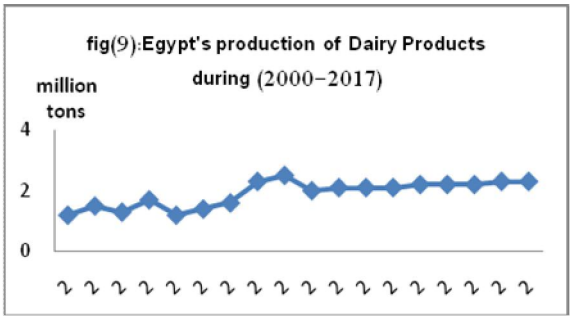
Develoment of milk production in Egypt during (2000-2016):

Milk and milk products production and consumption have registered a continuous augmentation globally and domestically, due to have Appropriate demand trends for Dairy market in Egypt.



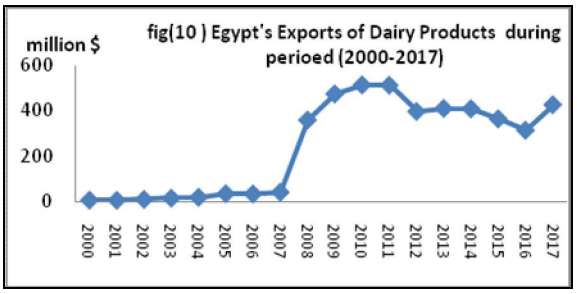
Development of Egypt's production of Dairy Products during period (2000-2017):

Dairy producers purchase their milk directly from dairy farms as well as from milk collection centers where small-scale farmers sell their milk. Factors that affect the price include feed prices, the milk-to-feed ratio, comparable market prices, and world powdered milk prices. Egyptian Dairy Industry has high potential of increase in volume of production, Egyptian dairy products contribution to the total agricultural and food exports (7.7%), as the average for that period versus 4.5% as average during the period 2009-2013 (FAO, 2018), production quantity of dairy products during the period (2000-2017), increased from 1.2 million tons in 2000 to 2.3 million tons in 2017, an increase about 1.1 million tons.

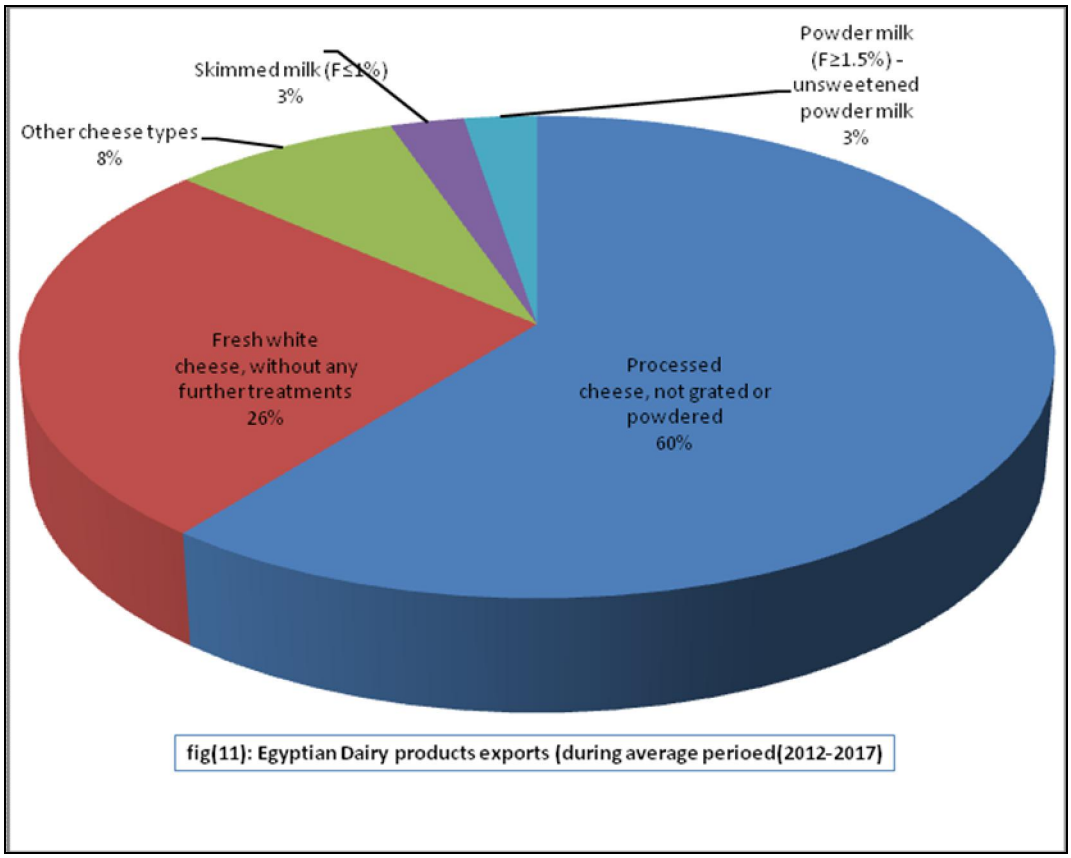


Egypt's export performance of Dairy Products during period (2000-2017):

Dairy Products export has only minor position in Egypt's Export, it was 84.6 thousand tons to the world for the worth of LE 240.6 million $ during the average period (2000- 2017), fig (10), Egypt main exports goes to Arab countries and consist of milk, Yoghurt and cheese, There is a potential to increase exports but it requires assurances from the Egyptian government and the dairy sector about the quality and safety of Egyptian products**.**



Exports of Egyptian dairy products, such as cheese and types represent about 1.1% of the value of world exports, ranked 18th among the world's export, various types of cheese exports represent about 92% of dairy products. And Egyptian melted cheese on the list of top 10 Egyptian goods exporter in commodity structure of agricultural and food exports (CAPMS, 2016), Fig (11) shows that there is a tremendous growth in the years after 2007. But there is decline of exports in the 2011 But Egypt's Share in global exports is very low. Egypt's Export of dairy Products was 84.6 thousand tons to the world to the net worth of 193.1 million $ during the period (2000-2017), (FAO, 2018), Major Export Destination for the Dairy Products was Saudi Arabia, Libya, Jordan and **Kuwait etc (O Alqaisi; O A Ndambi and T Hemme, 2009).**



fig(11): Egyptian Dairy products exports (during average perioed(2012-2017)

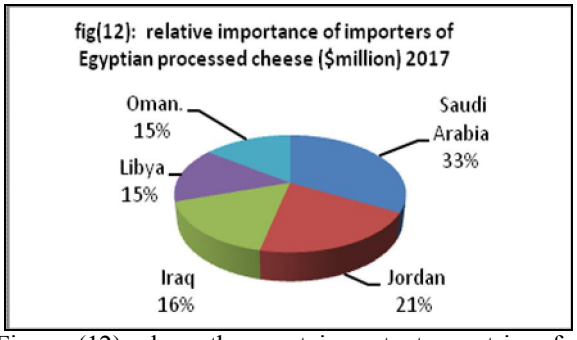
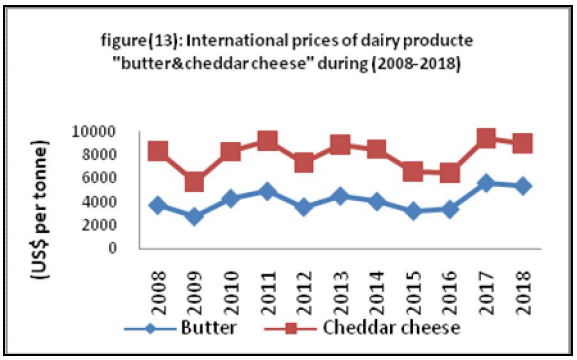


Figure (12); show the most important countries, for exported Egyptian processed cheese, Saudi Arabia ranked the first place in milk exports that accounted for 33% of the total exported value, year 2017, and Jordan, Iraq, Oman, and Libya (https://www.trademap.org

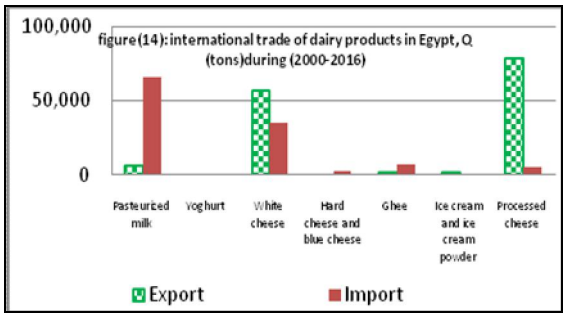
Imports system:

Egypt is importer of dairy products, its imports coming from Australia, New Zealand and the Netherlands. Egyptian government intervention to preserve strategically dairy Products, to manage deficit due to Domestic supply is below the consumption level. Egypt does not meet the increasing demand caused by population growth and the increased consumption of dairy products per capita, so that Egypt government had to import dairy product**,** Egypt is a remaining importer of dairy products due to The import amount exceeded the export amounts of dairy products, the majority of its imports coming from Australia, New Zealand, the Netherlands, and The U.S. The dairy products affected by tendency to rise in international prices, fig (13).



Sources: FAO for indices. Product prices: Mid-point of price ranges reported by Dairy Market News (USDA).

The value of milk and cream imports in 2012 reached US$ 330 million, for butter the total value of imports reached US$ 200 million and for whey it reached US$ 77 million.



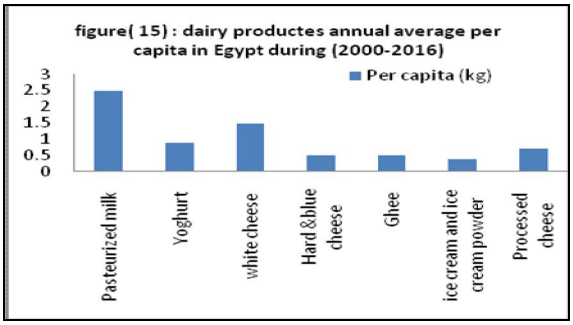


Figure (15) shows per capita consumption of dairy products, such as pasteurized milk, white cheese, yoghurt, processed cheese, hard cheese and blue cheese, ghee, ice cream and ice cream powder, were about 2.50, 1.50, 0.90, 0.70, 0.50, 0.50, 0.40 kg, respectively, during (2000–2016).

Trade Policy and Tariff:

Egypt joined the WTO in 1995. In addition to participating actively in the WTO, Egypt is increasingly focusing on preferential trading agreements as a way to improving trade flows, trade restriction, especially the import tariff imposed and charged by the main importing countries Egypt has removed most non-tariff measures, decreased tariff protection, and liberalized foreign investment. Egypt has increasingly moved de-restricted imports onto a list of articles requiring quality control inspection. Since liberalization of dairy imports in 1993, the imports of all kinds of dairy Products have increased. However, applied tariffs on several dairy products, including Non-fat dry milk, whey powder, grated cheese, cheeses, duties on dairy products was 5.9% in 2005 increased to 6.7% in 2017, table (2). The government declared raising "ice cream", customs rates up to 45%, to preserve foreign exchange, and to substitute by Domestic products, which improves the trade balance of the Egypt.

Table (2): Dairy products tariff analysis

description	Average (%)	Range (%)	Share of duty free lines (%)
2005	11.5	2-32	0.0
2012	5.9	0-20	41.0
2016	6.7	0-20	31.5
2017	6.7	0-20	31.5

Source: WTO Secretariat calculations, report by the secretariat of Egypt, June 2018.

Table (3): Milk processing capacities" Full, actual and deactivated capacity "of dairy products in Egypt during the average period (2000-2016), quantity is (thousand tons), value (LE million)

description	Full capacity		Available capacity		Actual production		Deactivated capacity		Deactivated / Full cap.		Per capita
	Q	V	Q	V	Q	V	Q	V	Q	V	kg
Pasteurized milk	128.4	1090.3	128.36	1090.3	125.84	1068.9	2.51	21.38	1.95	1.96	1.5
Yoghurt	40.18	381.62	40.18	381.62	40.18	381.62	=	=	=	=	0.5
White cheese	45.84	596.86	42.44	522.66	39.3	511.71	3.14	40.95	6.85	6.86	0.6
Hard cheese and blue cheese	1.03	25.7	0.95	23.81	0.88	22.07	0.07	1.74	6.80	6.77	=
Processed cheese	112.02	1782.2	106.69	1697.4	101.61	1616.5	5.08	80.82	4.53	4.53	0.5
Ghee	12.95	358.64	12.95	358.63	12.33	341.55	0.62	17.09	4.79	4.77	0.2
Ice cream and ice cream powder	22.35	440.33	22.35	440.23	22.35	440.23	=	=	=	=	0.3
total	362.73	4675.7	353.92	4544.6	342.49	4382.6	11.42	161.98	3.15	3.46	3.9

Source: CAPMAS, Annual Bulletin of the Movement of Production, Foreign Trade & Available for Consumption of Most Important Industrial Commodities (Public and Private Sectors), different Issues.

Milk processing capacities of dairy products in Egypt during the average period (2000-2016):

As shown in Table (3), Milk processing capacities " Full, actual and deactivated capacity" of dairy products in Egypt, during the average period (2000-2016), the total quantity and value of actual production of the most important dairy products in Egypt during to about342.49 thousand tons, 4382.6 LE million respectively during the average period (2000-2016), the Deactivated capacity of the most important dairy products about 11.42 thousand tons, it worth about 161.98 LE million respectively during the average period (2000-2016), the importance of Deactivated capacity to Full capacity of the most

important dairy products quantity and value about 3.15%, 3.46 % respectively during the average period (2000-2016). Some of dairy products in Egypt were operating at or below their installed capacity, Dairy public and private sectors industry factories in Egypt are facing several constraints that lead to increase of deactivated capacity of dairy products in Egypt, There are many reasons for this low utilization of capacity, as shown in Fig (16).

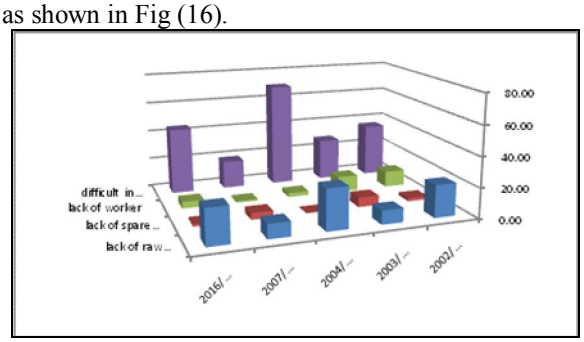
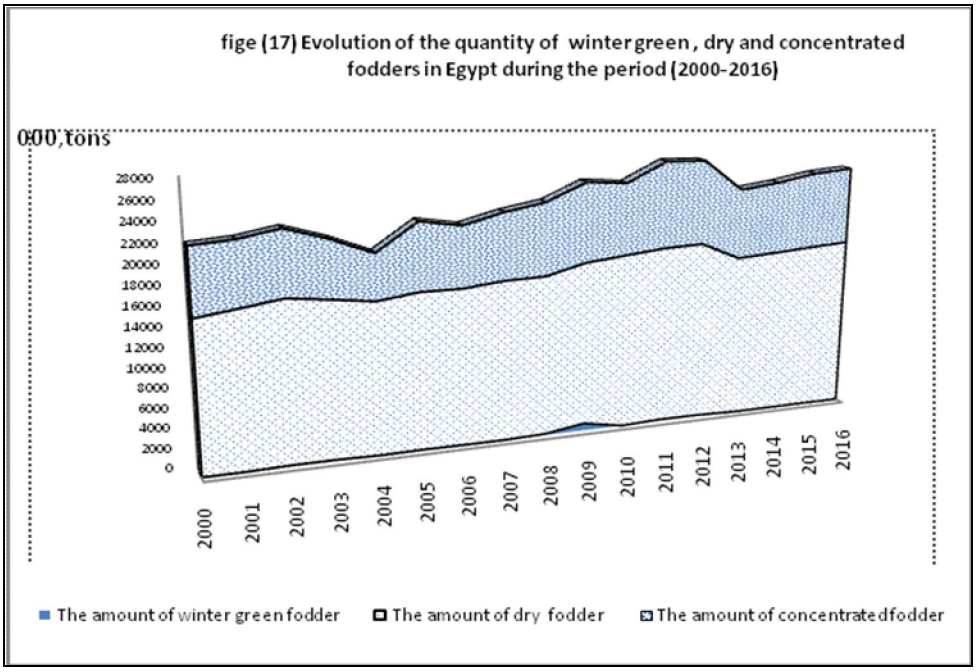


Fig (16): Relative importance of Causes of idle energies in for dairy products in Egypt

Source: Central Agency for public mobilization and statistics, industrial statistics, various issues. 2015/2016.

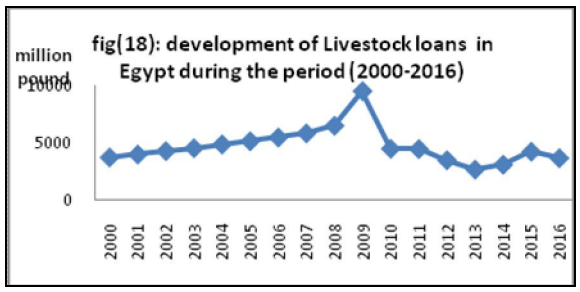
The difficulties of marketing products by 37%, 52% at public and private industry factories respectively year 2015/2016, and rising production costs by 32%.21% at public and private industry factories respectively year 2015/2016, lack of raw materials, especially imported due to the high price of the dollar against the Egyptian pound by 26 %, 21% at public and private industry factories respectively year. The underemployment rate of 5%, 4% at public and private industry factories respectively year 2015/2016 and the lack of spare parts by 1%, 2% at public and private industry factories respectively year 2015/2016. The dairy plants should utilize the full plant capacity to reduce costs of their products. The dairy industry depends also on importing of feed, vaccines, and medicine which affected by tendency to rise in international prices, **animal feed** is one of the main inputs affecting the size of livestock production and occupies the first place among production factors in terms of cost; The demand for feed derived from the demand for animal products. Animal feed can be divided into 3 types: green feed, coarse feed, and concentrated feed, fig (17).



The problem of fodder was the shortage of green fodder during the summer and reliance on concentrated fodder, which requires work to provide green fodder throughout the year by making silage.

Credit policy: The credit policy is one of the most important agricultural policies affecting dairy production due to the low agricultural incomes and high risks, the weak savings, the difficulty of relying on self-financing, and the reluctance of most breeders to raise milk cattle for increase the prices of livestock, and this clarify the importance of the role played by the financial and credit agencies to advance The development of dairy projects, as it gives an opportunity to use capital items at the present time,

provided that the cost is paid out of the profits in the future, Fig (18).



Animal Health: The most important economic diseases (Dhuyvetter, k. c. 2011) affecting dairy cows under Egyptian conditions includes mastitis, lameness, cystic ovarian disease, endometritis and retained placenta,), recently, the impact of Corona Viruses in Raw Milk and traditional Milk Products may play an important role in spreading the viruses, and infecting human with corona viruses, Due to used milk insufficient heat treatment, on the other hand. Canned milk products free from corona virus due to sufficient heat treatment and application of HCCP. Given the importance of developing livestock in quantity, quality and quantity To produce it is necessary to have a veterinary health system to preserve this wealth of diseases and epidemics Which, if they occur, leads to major economic losses in animals and it's milk products, in addition to protecting humans from diseases Shared. Without controlling diseases, improvement in milk cattle is weak, and attempts to provide adequate nutrition and access to good management are useless, for a good health animal is not necessarily a productive animal but the animal that is produced is necessarily a healthy animal, Veterinary care and disease control are among the most important factors affecting livestock preparation and productivity, so veterinary services must be provided. The number of heads infected with Foot and mouth disease (FMD), (CAPMAS), 2017) and lumpy skin disease in Egypt was estimated at 379 cases, with the majority being FMD with 320 cases. The governorates with the highest amounts of infections of both diseases were Beni Suef (62), Dakahlia (43), Qena (34), Kafr El-Sheikh (33), and Beheira (26), representing 52% of the total number of cases in the country in the year, **2016,** (CAPMAS), 2017)**.** Table (4) shows the medical and treatment cost in Egypt during the period (2002-2009).

Table (4): medicines and vaccines costs in Egypt during (2002-2009) (LE million)

year	medicines	vaccines
2002	**21.463**	**26.861**
2009	**20.695**	**34.533**
Average (2000-2009)	**23.733**	**27.325**

Source: Collected and calculated from the Ministry of Agriculture and Land Reclamation - Central Administration for Agricultural Economics - General Administration of Statistics

Table (5): Numbers of cattle and sheep vaccinated, 2016

Vaccine	Triple vaccine strain of FMD	Rift Valley fever	Lumpy Skin	Hemorrhagic Septicemia
Cows	3,716,354	2,874,608	1,654,344	315,251
Buffaloes	1,966,823	1,543,510	-	174,279
Sheep	80,316	585,470	34,788	43,385
Goats	170,817	109,767	7,013	5,194
Total	6,664,310	5,113,355	1,696,145	538,109

Source: CAPMAS, Annual Bulletin of Animal and Poultry Disease Statistics 2016, June 2017

Table (6): Number of cows and buffaloes treated for productivity diseases, 2016

Cattle	Udder disease	Neonatal disease				Total
		Respiratory System	Udder disease	Neonatal disease	Surgical Cases	
Cows	28,533	3,979	4,787	916	455	38,670
Buffaloes	18,014	1,911	2,249	1,778	321	24,273

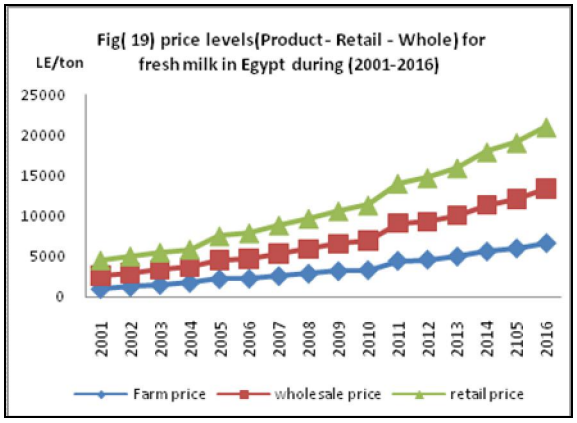
Source: CAPMAS, Annual Bulletin of Animal and Poultry Disease Statistics 2016, June 2017

Table (7): Cattle and animals treated by governorate (top five), 2016

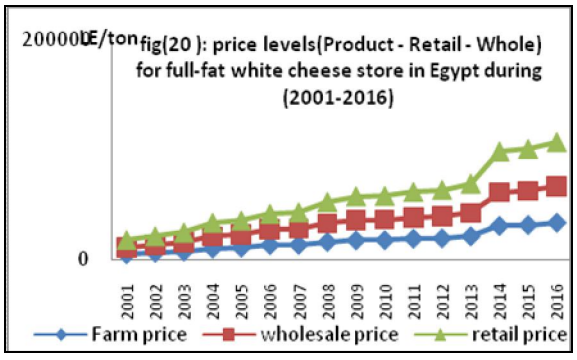
Governorate	Cases of artificial insemination	Cases treated for infertility	Total
Assiut	57,530	4,842	62,372
Beni Suef	53,845	7,456	61,301
Fayoum	53,192	16,103	69,295
Beheira	40,738	40,058	80,796
Monufia	38,258	15,487	53,745
Total	368,140	185,582	553,722

Source: CAPMAS, Annual Bulletin of Animal and Poultry Disease Statistics 2016, June 2017.

Milk-Marketing System: Milk is a perishable produce which necessitates effective marketing channels. The prices of fresh milk at different along the chain and the costs accrued in milk trading were presented in fig (19). Shows that, price levels at Product - Retail - wholesaler for fresh milk in Egypt during (2001-2016). Variety of intermediaries (middlemen), through a various business activities (Coughlin et al., 2001).



Shown price levels at Product - Retail – Whole, for full-fat white cheese store in Egypt during (2001-2016), Fig (20) shown price levels (Product - Retail - Whole) for full-fat white cheese store in Egypt during (2001-2016)



Marketing channels for fresh milk:

The milk marketing channels are similar in most areas of the Beni Suef governorate, The breeders may play two roles, the role of the milk producer only, or the role of the producer and the manufacture" processers". There are multiple forms of this channel, which start from the producer and end with the consumer through "various rings". **The first** producer (farmer) - consumer: The breeder sells its production directly to the final consumer. "The producer does not bear any significant marketing costs, and this available on a small scale in is the village". Fig (21). **The second** producer (farmer) - the dairy factory: breeders sell their produce to the dairy factory. **The third** producer - intermediary – dairy lab, **The fourth** a producer - a collection point MCPs "belong to MCC"- a seller or a merchant at a wholesale price (or a factory) - a dairy lab or a consumer: the mediator transfers the milk from the breeders to the wholesaler to arrive directly "to the consumer ", the fresh milk goes through several episodes, starting with the producer to reach through the intermediary to the wholesaler and from it to the retailer and then to the consumer and is the longest marketing chain for the milk, Fig (21)**.**

The fifth a producer - a seller at a wholesale price - a consumer, a producer - a seller at a retail price - the consumer: where the product is used to collect its production and transfer it at its own expense to the market, and there is a small percentage of the producers who take their production to the sellers (whether "wholesale or retail") to start Then, a path that is completely similar to the "path" that incorporates the loop of the medium, thereby increasing the profit the product receives while bearing the burden of milk transportation.

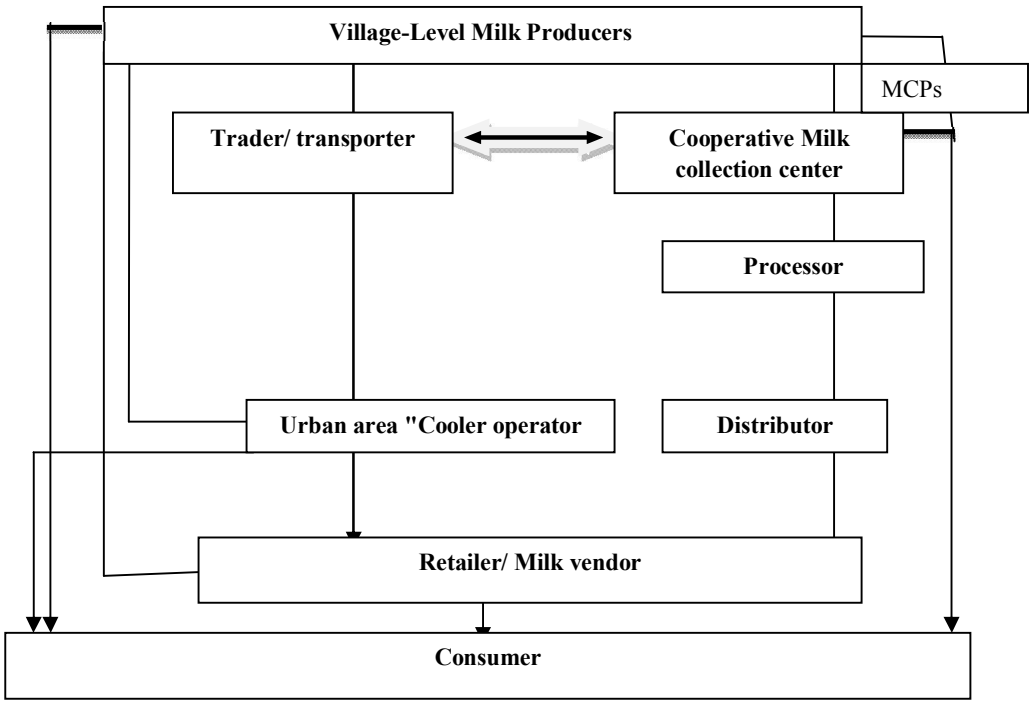


Fig (21) Milk Market and Marketing Channels in Beni Suef Governorate

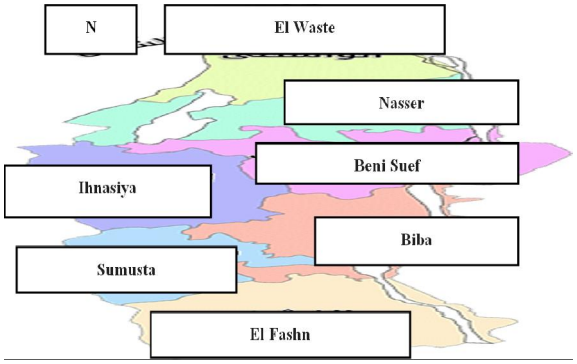
Sampling Design: This research was specifically conducted in the Beni Suef Governorate MAP (1). Beni Suef Governorate, is located in the north corner of Upper Egypt region, (120 km south of Cairo, bordered on the north by the Giza Governorate (109 km^2), on the east red sea Governorate (450km^2), on the south by Elmina (120 km^2), and on the west by Fayoum Governorate, (45 km^2), Beni Suef (120 km south of Cairo). The total area of Beni Suef Governorate is 10.91 thousand square kilometers. The population was estimated to be 3.038 million, year 2017, table (8), Wheat, sugarcane, maize, onion, and perssem are the major crops which are grown in plenty.

MAP (1): Map of Egypt showing the location of Beni Suef Governorate, Beni Suef

Table (8): Beni Suef Governorate, year 2017

description	2017
Governorate area (thousand km2)	10.91
Number of cities and centers	7
Number of local units	40
Number of villages	222
The area of land within the reins (old lands) " thousand feddan"	254.63
The area of land outside the reins (new lands) " thousand feddan"	38.93
Population in 1/1/2017 (million)	3.038
Number of industrial areas in the governorate	8
Number of producing factories	383

Source: Beni Suef Governorate - Information and Decision Support Center - Statistics Department.



The research was conducted **over season 2019/2020** in six milk collection centers located in different geographic center from Beni Suef Governorate **(Beni Suef, Biba, and Ihnasiya**). The geographical location of study area could be seen in Map **(2).** Based on data collected, milk collection centers established in Beni Suef governorate at Beni Suef center which consider appropriate location for production is selected based on the availability of infrastructure services such as; Veterinary services, feed factories, water and electricity, availability of raw materials and the prevailing production system. For example, As a result of the presence of large numbers of buffalos and cow's, Table (9) and the availability of raw material.

Sampling techniques, multi stage random sampling technique was applied to select the respondents. In the first stage of sampling, three district from Beni Suef governorate, "Beni Suef, Biba, and Ihnasiya" In the second stage, 8 villages were randomly chosen from the selected districts from Beni Suef Governorate from villages; Appishna, Belivia, Nuwaira, Manial Ghaidan, Parot, Ahua, At the final stage, a purposive sampling technique was used to select thirty the respondents from each district and thus a total of 240 respondents from three districts were interviewed include dairy farmers, cooperative employees and managers & employees on the (MMCs) some dairy and livestock experts to obtain the useful information to the specific objectives of this research.

Table (9): Beni Suef Governorate, year 2017.

description	Bani Sweif	Biba	Ihnasiya	gov
number of live agricultural animals" thousand head)"	140.9	155.5	140.0	858.1
feddan load for live agricultural animals (Animal / feddan)	4.14	4.45	3.17	3.23
Animal load of live agricultural animals (per area planted with green fodder) (Animal / feddan of green fodder)	12.8	12.5	12.8	11.8
dairy animals "buffalos & cows)" feddan load for live agricultural animals (Animal / feddan "	2.1	1.71	2.3	1.9
quantity of milk production (ton)	28596	30902.5	32670.5	175381
average share per capita (kg milk)	43.843	71.092	84.646	57.714
Infrastructure of live agricultural animals	Bani Sweif	Biba	Ihnasiya	gov
Veterinary units	18	12	14	85
Veterinary pharmacies	14	27	24	149

refrigerators and coolers	6	1	1	22
animal feed factories	10	0	0	11
Cooperative societies according to their activities	Bani Sweif	Biba	Ihnasiya	gov
Agricultural	31	42	36	221
animal wealth	1	-	1	3
Other	2	-	-	7

(-)Not available, Source: Beni Suef Governorate - Agricultural Directorate - Food Security Division - Unpublished data. - Cooperative Union of Associations, Beni Suef Governorate. - Beni Suef Governorate, and Beni Suef Veterinary Medicine Directorate - Information Center.

General Characteristics of Milk Collection Centers and Farmers:

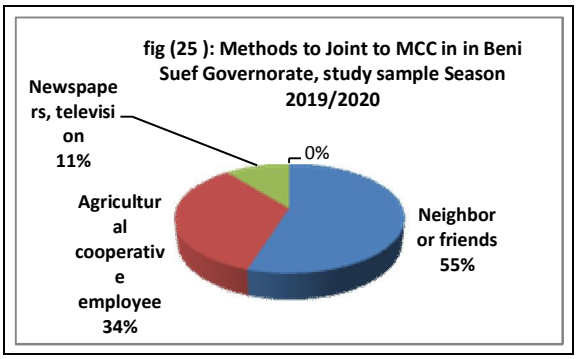
The milk collection center consists: as shown in fig (24).

Fig (24)the milk collection center structure

- **Management, marketing and other services Department**: Management offices and offices for employee
- **Laboratory Department** : to examination of raw milk and evaluation, and determine the quality
- **The storage department:** In stainless steel tanks refrigerated until the milk is to be transformed, to dairy factories by special cars and tanks of transportation
- **Department of receiving and storage of raw milk refrigerated**: Acceptance or rejection of milk

Methods to Joint to MCC in Beni Suef Governorate, study sample Season 2019/2020:

The majority of the respondents said that I was not aware of the MCC, but they know about the MCC by Neighbor or friends, about 55%, about 34% knew from Agricultural cooperative employee, and about 11%, knew from Newspapers, television.



Economic and social importance of MCC towards Dairy Farmers in study sampling of Beni Suef Governorate, the season 2019/2020:

- About 30% of the respondents said that, The MCC provide me better access to credit.
- About 42% of the respondents agree that the MCC able to support MCC Farmers.
- About 30% of the respondents said that, the MCC training taught the Farmers new practices for feeding and milking.
- About 87% Farmers reported that, they are became more respected in their community and family, especially for women.
- About 75% of the respondents said that, Participation in the MCC allows them to be competitive economically, and about 60% The MCC helped community to grow.
- About 30% of the respondents agree that the MCC helped them to achieve stable income, and sustainable livelihood.

Variables affecting on Farmers milk delivery their milk to (MCCs):

There are many Variables such as age, experience, grow fodder plant….etc., could impact on Farmers' milk decision for delivery their milk to (MCCs), on the other hand there are relationships between Milk Collection Centers Characteristics and Farmers' Adopter" Attitudes towards the MCCs in Beni Souef Governorate, Table (10) shown that about 70.42% of the respondents were of middle age (35 to 53 years), about 55% of the respondents were medium herd size (2 to 4 animals), due to the Farmer possibility or preference to sell milk to MCCs increase as the number of cows decrease.

Table (10): variables affecting on decision of Farmers milk delivery milk to (MCCs) in study sampling of Beni Suef Governorate, the season 2019/2020.

Description	no	%
farmers' preference to sell milk to MCCs as their age increases (35-53) years old.	169	70.42
Number of cows that farmer has (2-4)	132	55.00
farmers experience (5-10) years.	146	60.83
cultivated land between (1/2-5) kirat*	150	62.5
education level from primary up to middle school.	157	65.4
socio-economic status	110	46
access to loans	96	40
grow fodder plant.	210	87.50
satisfied with the milk prices	225	93.75
attend Training by agricultural cooperative.	200	83.33
Farmers who are closer to the rural area.	205	85.41
Member of agricultural cooperative	213	88.8

*fedden =24 kirat

Source: Collected and calculated from the questionnaire data for the year 2019/2020.

Farmers' preference to sell milk to MCCs as farmers experience increases (5-10) years. small size of land holding" cultivated", between (1/2-5) kirat* preference to sell milk to MCCs, farmers' preference to sell milk to MCCs as their education level increases, about 65% of the respondents were educated from primary up to middle school. Many of the respondents were from medium socio-economic status about 46%, due to the income, and the response of the farmer. (MCC) facilities access credit or loan helps the farmer to make long-term investments that would boost milk quality and production, about 40% of participants borrow money from Agri cooperative milk collection centers in Beni Suef Governorate in the past year,

. About 87.5% of farmers who grow fodder plant preference to sell milk to MCCs. The most important factor has impact on the decision to sell milk to (MMC) is satisfied with the milk prices about **93.75**%. Farmers who attend any Training by agricultural cooperative, preference to sell milk to MCCs about 83.33 %. Farmers who are closer to the rural area, prefer to sell milk to (MMC), 85.41%, but Farmers who are closer to the urban area, prefer to do marketing on their own to get extra profit. Farmers can deliver milk to a milk collection center without being a member of the Agri cooperative, about 88.8% and 11.2% members and non-members of agricultural cooperative respectively.

Table (11): The most important problems facing the farmer and milk collection center in Beni Suef, season 2019/2020.

problem	no	%
production problems		
weakness of animal feed production in Egypt negatively affect milk production.	215	89.58
the absence of governmental support.	205	85.42
weakness of veterinary services and the inefficiency of available vaccines: Animal diseases that affect both milk quantity and quality (e.g. foot and mouth disease).	66	27.50
The quality of the supplied milk is usually low and Poor quality of milk leads to short shelf life.	175	72.92
Higher price of feeding items (e.g. soybean and maize) and higher costs related to their import.	220	91.67
Lower purchase prices, in addition to type of payments "every 10 days".	166	69.17
The lack of use of modern production and feeding methods.	120	50.00
Climatic change is not suitable to the dairy sector.	55	22.92
Unavailability of good breeds that negatively affects the milk quantity and quality produced.	162	67.50
Frequent power outages that reduce the volume of production.	185	77.08
agricultural Cooperative administrative problems		
The absence of linkage between milk collecting centers, agricultural Cooperative and dairy plants.	122	50.83
Lack of skill workers in the cooperative Societies.	60	25.00
Lack of awareness in the Dairy sector development and management.	100	41.67
High competitive environment in the dairy sector, cooperative society should compete with traditional marketing etc.	125	52.08

Low salaries of workers in the field.	140	58.33
The multiplicity and complexity of licensing procedures for setting up a milk collection center.	75	31.25
financial problems		
Lack of financial assistance to expand the dairy activities, and support the agricultural cooperative.	169	70.42
Lack of different agri cooperatives in the villages in (Beni Suef, Biba, Ihnasiya).	175	72.92
Lack of awareness to get the loans from financial resources.	142	59.17
Marketing problems		
Milk never or seldom rejected at the milk collection centers.	211	87.92
too many intermediaries greed and brokers educators and control prices may result in price fixing and low prices for farmers	189	78.75
The high price of milk in the summer, due to Milk was exposed to corruption, especially with high temperatures in the summer.	211	87.92
Lack of awareness in the marketing strategies.	164	68.33
Lack of awareness in the value added products as butter, and yoghurt.	142	59.17
Very low milk prices paid to farmers.	109	45.42
Lack of transport facilities to deliver the milk to (MCC).	173	72.08
MCC collecting problems		
lack of collection and processing facilities and some equipment & devices, to preserve the value added products.	185	77.08
Lack of trained workers, and other professional workers as accountant, consultant in the cooperative society.	35	14.58
Cheat milk "addition the water to the raw milk" in addition to mixing cow milk with buffalo.	68	28.33
the transportation costs increase, due to High energy prices (electricity and fuel).	197	82.08
High competition in the dairy sector, with others to get the high yield.	213	88.75
decrease earning through the pure milk Delivery.	98	40.83
Insufficient storage space.	174	72.50
Small and Narrow area for receiving milk.	215	89.58
Lack of training.	166	69.17
use of antibiotics.	133	55.42
pay the price of milk to farmer by installment and not advance.	240	100

Source: Collected and calculated from the questionnaire data for the year 2019/2020.

Methods of milk transportation to MCC:

The transporters collect milk at collection points (MCPs) and deliver it to the MCCs In the agri-cooperative. The most common mode of transportation was on foot (75%) while (25%) of the respondents used own transport, i.e. a bicycles, motorcycle,; and public transportation. The time taken from the time the farmer finished milking to milk delivery at the milk collection point was within the recommended time, because it is good practice to deliver milk within 2 hours of milking before bacterial growth.

Problems facing the milk collection center in Beni Suef: The research applies the Questionnaires methodology; to assess the milk collection centers and what are the weaknesses points of the milk collection centers in Beni Suef, are identified based on the interviews The major problems mentioned are grouped into four different issues According to the table (11).

The most important problems are the absence of milk collecting centers, and marketing as a major problem was mentioned by the dairy farmers interviewed. The employees of the agricultural cooperatives consider the lack of the necessary milk collection infrastructure, Farmers deliver milk in aluminum or stainless steel cans to a "pick-up point", is an open place, usually along the roadside without enough milk chilling equipment established by the Agri co-operative, trader, in addition to roads, transportation, communications and refrigeration warehouses, absence of milk collection centers and sometimes the inappropriateness of some centers, quality tests are not done and milk may be accepted even when it is obviously adulterated with water or contains physical contaminants such as straw, hair, manure or flies.

Suggestions for milk collection improvement the in Beni Suef Governorate, the season 2019/2020:

farmer and Employee of (MMCs), and agricultural cooperative employee provided suggestion to improve the milk marketing in the Beni Suef Governorate. about 80.4% proposed increasing the prices, while about 47.9 % suggested to improve the quality, %72.5 said to provide milk in time and 72.9% suggested conducting milk producer education campaign, about 87.5% suggested to build new MCCs, giving adequate level of extension services to improve

milk production capabilities about 83.33%, table: (12), about 90% suggested to Cooperative and the dairy company should provide more basic and specified services to the farmers, free vaccination and treatment to animals, veterinarian services, for free cost, trainings. Seasonal fertilizers, pesticides, herbicides etc.

Table (12): Suggestions for milk collection improvement the in Beni Suef Governorate, season 2019/2020.

Suggestions	no	(%)
Encouraging Agri co-operative contracting with farmer to supply milk	190	79.17
build new MCCs, milk collection centers with high quality at various places	210	87.50
Specifications Provide milk coolers before manufacturing	168	70.00
Improve quality by applying more tested and clean quality.	115	47.92
Training in milking and manufacturing	143	59.58
Purchase milk from a reliable source	180	75.00
establishment dairy plants in villages and cities near to milk production areas	163	67.92
Supply in time Improve in quality	174	72.50
Higher milk price, payment according to quality	193	80.42
provide more basic and specified inputs and services to the farmers, fertilizers, pesticides, free vaccination and treatment,…etc.	216	90%
milk producer education campaign	175	72.92
giving adequate level of extension services	200	83.33

Source: Collected and calculated from the questionnaire data for the year 2019/2020.

Dairying Process:

The milking process starts at the farmer house, and the milk is put into a clean container for transportation to the milk collection center, sample of milk from each container is tested to quality and determine milk fat percentage. The batch of milk is weighed, and then the data for the farmer write, and print out a receipt. The manager of the (MCCs) each morning and each night, picks up the milk, loaded into a tanker truck and delivered to plant to be processed.

Average volume of milk collected ton /day:

The average volumes of milk collected by MCC in the Beni Suef Governorate between 2500- 5000 ton/day. The MCC which established in the agricultural cooperative Association, needs building a total area of (60-100) square meters, for management office, milk collection and storage hall, refrigerated warehouses, reception and storage, and the remaining space is allocated for services, facilities and aisles. table (13) shown fixed cost for MCC in study sample in Beni Suef Governorate.

Table (13) Average Capital Expenditures: fixed cost for MCC in Beni Suef Governorate, study sample Season 2019/2020.

STATMENT	Gross Cost LE/ MCC	%
Land and building	250000	16.81
Machinery and Equipment	548550	36.89
Furniture	10000	0.67
Pre-operating expenses	69620	4.68
Initial working capital	500000	33.63
Other	62000	4.17
Total Fixed Assets	1440170	96.86

Source: Collected and calculated from the questionnaire data for the year 2019/2020

The milk collection center Machinery and equipment's:

Refrigerated, transport vehicles, unit for receiving milk, weighting and cleaning' a balance, milk refineries, pumps and heat exchanger and Treatment and cooling section, table (14).

Table (14): Required Machinery and Equipment M

Machinery and Equipment	Quantity
Receiving Tank and Balance	1
Scissor Cooler	1
Stainless Steel Cooling Containers (1 Ton)	2
Stainless Steel Cooling Containers (2 Ton)	2
Milk Containers	250
Pipes	1
Electricity Generator	1
Special Equipment for Cooling Room	1
Others	1
Laboratory Tools	1
Other Tools (Furniture)	1

Source: Collected and calculated from the questionnaire data for the year 2019/2020.

Milk collection and transportation of Beni Suef:

Agriculture cooperative milk collection center has collected milk from farmer and each milk collection points, about 5000Lof milk per day. The milk came from cows, According to the season. Milk Collection Centers (MCCs), purchase milk from farmers twice per day, once in the morning between (6am - 9am) and once in the evening between (6pm - 9pm). The farmers who are a far distance from the MCC can easily sell their milk to these Point Collection Centers (PCCs), milk cooled down in tanks until transferred to the MCCs stored in tank and transports the milk to the processing plant. The farmers deliver their milk to the milk collection center by using bicycle where other go on foot to deliver their milk. From the research conducted it was observed that majority of the milk was delivered to the nearest collection on foot. To collect this volume of milk, Beni Suef agriculture cooperative has assigned works at each collection center Table (15) who are in charge of milk quality control, record keeping, measuring and receiving of milk from the members. Finally, the milk was transported to the dairy plant.

Table (15): The Required Human Resources

Description	**no**
Agricultural Engineer/Food Processing	1
Supply and Marketing Employee	1
Guard	1
Total Indirect Employees	3
Laboratory Employee	1
Drivers	2
Cleaner and reporter	1
Total Direct Employees	4
Total Employees	7

Source: Collected and calculated from the questionnaire data for the year 2019/2020**.**

Initial investments:

To meet the basic infrastructure required for milk collection system to function according to the Egyptian regulations, This includes simple laboratories, clean water and can-cleaning facilities, cooling tanks and using aluminum or stainless steel cans in all milk collection centers.

Cost of training:

The co-operative organizes training the trainer does not pay cost for the training offered by the co-operative MCC.

Transportation the milk to collection center:

Needs refrigerated transport vehicles to transport milk from the area of the breeders to the plant as well as to a medium transport vehicle to market the production to dairy factories, Table (16).

Table (16): Required Transportation and vehicles

Transportation	**Quantity**
Refrigerated Milk transfer Truck	**1**
Refrigerated Milk Tank	**2**

Source: Collected and calculated from the questionnaire data for the year 2019/2020**.**

An operational cost:

Table (17) shown average Operating Costs for (MCC) in study sample in Beni Suef Governorate, Season 2019/2020, includes Raw material expenses, transportation expenses, Maintenance expenses, Direct salaries, Services expenses such as Electricity, water and transportation services, cleaning, and the essential needs of the (MCC).

Table (17) Average Operating Costs for (MCC) in Beni Suef Governorate, study sample Season 2019/2020

Variable Costs	costs of MCC (L E/ MCC)
Raw material expenses	807000
transportation expenses	264000
Service expenses	102000
Maintenance expenses	30000
Direct salaries	48000
Other expenses	18000
Total	1269000

Source: Collected and calculated from the questionnaire data for the year 2019/2020**.**

MCC Revenues Analysis:

Cow's milk can be produced throughout the year., the focus is on the collection of Cows milk from different villages of Beni Suef governorate and marketing the milk to dairy factories in other governorates, especially Cairo and Giza, where most factories are located. MCCs collected quantity from villages, and then supplied to dairy factories will lead to a reduction in imports of milk and dairy products.

Raw Materials Requirements:

The price of cow's milk starts at LE 5.00 at the beginning of the season (January) and reduced to (4.70 LE) at the peak of the milking season (March, April and May). The average price of fresh milk from the breeders was assumed by (4.38 LE), where the center will take charge of the transportation and collection process.

Annual Revenues:

The price of fresh milk was estimated at (5.45*1215) LE per ton, or 5.45 LE per kilogram, and is increased by 2 % annually, based on the (.MCC) as shown in Table (18).

Table (18) Average Net returns of MCC in Beni Suef Governorate, study sample Season 2019/2020.

STATMENT	(L E/ MCC)
Total costs	2709170
Average Total sales (ton)	1215
Average Selling Price ((LE/ton	5453
Total gross return (LE / MCC)	6625149
Net return (LE / MCC)	3915979

Source: Collected and calculated from the questionnaire data for the year 2019/2020.

Bonus payments:

Milk collection centers under the supervision of agricultural cooperatives, pay to MCCs farmers their bonus payments. For milk grade A and grade B milk, with better milk standards.

Financial Analysis:

Net present value and internal rate of return calculations for MCC costs and returns over a 10-year period indicate that the cash flow analysis covering the Benefit Cost Ratio (BCR) Net Present value (NPV) and Internal Rate of Return (IRR) (Hayes,. 2002.). has been worked out for the MCC and presented in Table (19). Benefit-Cost Ratio (BCR) is given by the ratio of gross return to total variable costs **(Gittenger, 1982; Jehanzeb, 1999)**. The BCR is 2.45, NPV is LE 459002 and IRR is 40%. The project is financially viable the costs can be repayable in four years and four months.

Table (19): Financial Analysis Results

STATMENT		value
(NPV)	LE	. 459002
benefit /cost ratio	Rate	2.45
return of LE	LE	1.45
Discounted Pay-Back Time Period	Year	(4) years and (4) Months
(lRR)	Rate	**40%**

Source: Collected and calculated from the questionnaire data for the year 2019/2020.

Sensitivity Analysis:

Sensitivity analysis was done to determine the response of the MCC viability to the different possible scenarios, using the principle 'what if' (**Anca and Ana, 2016; Kohl, 1992).** This includes changes in revenues, and operating costs.

First Scenario: There will be an increased 10% in the operating costs throughout the ten year economic life of the MCC, the NPV showed positive, and the IRR exceeded the required rate of return, thus, the project is acceptable table (20). **Second Scenario:** Decreased in the net revenue, the NPV showed positive, and the IRR exceeded the required rate of return.

Table (20): Sensitivity Analysis

Sensitivity Analysis	IRR	NPV	B/C
Original scenario	**40%**	4985150	2.45
Revenues declined by 10%	**35 %**	3721037	2.20
Operating Expenses Increased by 10%	**36%**	4363569	2.34

Source: Collected and calculated from the questionnaire data for the year 2019/2020.

Conclusions

This research was conducted to The carry out an assessment of the performance of Egyptian milk collection centers, to enable policy maker and decision makers to understand and development dairy sector, supporting the dairy sector productivity, and improve the dairy sector performance to improve rural standard of living in Egypt and, Beni Suef Governorate which has been purposefully selected, in order to point out the main problems and constraints obstructing the milk production, processing and trade in Egypt. There for The research used the descriptive and quantitative method to analysis and introduces the study problem, this research based on primary and secondary data. Primary data were obtained from the rural farmer in Beni Suef governorate, who dealing with six milk collection centers. The results show that Egyptian dairy product about 5.59 million tons year 2015, and exporting dairy products equivalent to 1.07 million tons of milk with a total value of $408.7 million, (AOAD), 2016). While imported about 1.42 million tons with a total value of $839.4 million, there is a deficiency in the trade balance of milk and dairy products about $430.3 million. The total consumption deficit was 5.95 million tons; the self-sufficiency ratio was 94.10%, due to Disruptions in the supply chain in Egypt's, dairy farmers still find difficult to participate formal markets, The concentration of farms in the rural areas, whereas the factories are in the urban areas reflected negatively on livestock breeders such as transporting cost of milk to cities, encourage establish milk collecting centers (MCCs) at recommended location in Egypt, To collecting milk from producers, and carrying milk produce to the factory, to facilitate milk marketing and provide raw milk to Dairy industries, Therefore, which need to be examined and analyzed. Egypt dairy industry is based in smallholder producers, processors and traders, milk collection centers are set up in various parts of the Egypt to support the marketing of milk, collection and marketing requires the farmers to be organized in Producer groups and /or cooperative societies. Milk collection centers can play an important role between the producers and the processing plants and the consumers. The performance of a milk collection center depends on the cost effectiveness of milk collection centers by agricultural cooperative and the amount of milk that can be marketed. To identify Financial Analysis, Net present value and internal rate of return calculations for MCC costs and returns over a 10-year period indicate that The cash flow analysis covering the Benefit Cost Ratio (BCR). About 2.45, NPV is LE 459002 and IRR is 40%. The (MCC) is financially viable the costs can be repayable in four years and four months.

Recommendations:

In order to facilitate the efficient milk production, collection and marketing the following policy measures are being suggested to adopt:

- Create more milk collection centers and development & support of milk collection centers.
- giving adequate level of extension services.
- Improve on the rural infrastructure" with proper cooling facilities and transportation networks at farmer's level ".
- provide training to dairy farmers at Milk collection centers (MMCs) about practices, to improve the quality and quantity of milk procured; led to a rise in milk prices and improvements to milk hygienic quality.

-studying cooperation with CARE in establishing other (MCCs) in other Egyptian governorates.

-Agricultural cooperative will lead to an improvement in milk products production.

- Developing of manpower, marketing and making available monitoring mechanisms to control quality, --Investment in agricultural research to achieve growth in dairy sector.
- Price differentiation for ample premium price for high quality milk is important for increasing milk production and consumption.
- Look after the health of animals, such as vaccination and checking against contagious diseases by the qualified veterinarians.
- To avoid spoilage, milk collection centers should be set up at locations where producers can easily access.

. Sharing between researchers, Industry Company, and policymakers in the examination and discussion of dairy sector development policy.

- check the quality of milk delivered, **by** Agricultural Cooperatives at the milk collection point or (MMCs).
- Egyptian government should support the dairy sector in funds to sustainable dairy sector which include food safety.

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