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Review Article

An Economic Research on the Production, Consumption, and Foreign Commerce (Exports and Imports) of Dairy and its Products in Egypt

[a]AbdelGawad Saad*, [b]Hani A. Mansour, [b]Sherif S. Saad, [c]S. K. Abd El-Mabod

[a] *Agricultural Research Center (ARC), Agricultural Engineering Research Institute (AEnRI), 12311 Dokki, Giza, Egypt.*

[b] *Water Relations and Field Irrigation Dept., Agricultural and Biological Research Institute, National Research Centre, Eldokki, Cairo, Egypt.*

[c] *Soil and Water Use Dept., Agricultural and Biological Research Institute, NRC, Dokki, Cairo, Egypt.*

*Correspondence: en_gawad2000@yahoo.com

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Abstract

This economic research delves into the dynamics of dairy production, consumption, and foreign commerce in Egypt. The study comprehensively analyzes the dairy industry, examining both domestic production and international trade, including exports and imports. Through rigorous economic analysis and statistical examination, the research sheds light on various aspects of the dairy sector in Egypt. It investigates factors influencing production levels, consumption patterns, and trade dynamics, providing valuable insights for policymakers, industry stakeholders, and researchers. In Egypt, milk production is influenced by both the quantity of dairy cattle available and the productivity of the animals, which is a significant factor when compared to foreign breeds. The mean of the overall dairy production in Egypt is approximately 5.2 million tonnes, which constitutes an average value. The dairy production for the year 2020 amounted to 38,026 million pounds. The text represents the years from 2000 to the present. Raw milk is a food that protects against sickness. Due to its abundance of essential nutrients, vitamins, and mineral salts, as well as its ability to provide a well-rounded and nutritious diet, it holds a significant position in promoting overall health. It is undervalued in both the livestock and agricultural industries. In 1998, Egypt produced approximately 0.943 million metric tons of dairy goods; in 2010, production achieved 4.7 million metric tons; and in 2022, production reached 7.9 million metric tons, with a significant amount used for manufacturing. Around 20% of packaged milk is wasted, while loose milk accounts for 80% of the citizens' consumption.

Keywords: Dairy, exports, imports, dairy production, dairy industry, dairy products.

Introduction

The agriculture industry, comprising both plant and animal branches, holds a significant position. The role of live production is crucial and indispensable in the Egyptian national economy. It has a crucial role in the attainment of food security in Egypt. Animal products are a primary source of proteins crucial for building human cells. Dairy

products, in particular, are essential for humans as they contain components that fulfil the body's key nutritional requirements. It is essential for the promotion of growth, engagement in activity, and overall well-being. Dairy is often regarded as a crucial source of animal protein, serving as the foundation for many diets. According to the available statistical data, the local dairy production in Egypt reached approximately 9,725 thousand tonnes. The value of animal production is around 18,948 million pounds, accounting for approximately 78.32% of the total value. Similarly, the value of agricultural production represents an average of 85.8% over the academic year. Period: 2000 to 2018.

The sustainable agricultural development strategy in Egypt aims to enhance the average per capita consumption of animal protein to 9 kg AD by the year 2030. This will be achieved by prioritising the development of livestock, poultry, and fish production, with a focus on promoting economic efficiency. Additionally, the strategy aims to support and empower small breeders and producers by addressing and eliminating the challenges and obstacles they encounter. (Al-Naqadi and Muhammad, 2021). It accounts for approximately 21.1% of the mean aggregate value of livestock output in Egypt within the specified timeframe (Sarhan and Al-Damrawi, 2022).

The yearly per capita dairy consumption is 30 litres, with only 4 litres being packaged milk and the remaining amount being loose milk. However, loose milk includes several disease-causing bacteria and does not meet the standard water characteristics (Susan et al., 2017).

The report provides a complete analysis of the dairy business, thoroughly investigating both local output and foreign trade, encompassing exports and imports. The research employs rigorous economic analysis and statistical evaluation to provide insights into several facets of the dairy business in Egypt. This study examines the factors that impact production levels, consumption patterns, and trade dynamics. It offers significant information for policymakers, industry stakeholders, and scholars.

The development of imports and exports, available for consumption, and the average text Per capita and the self-sufficiency rate of dairy people in Egypt:

The data in Table 1 indicates a fluctuation in the quantity of dairy imports and Its products in Egypt during the study period (2000-2022), when it reached the lowest amount of imports in 2006, estimated at 137 thousand tons. It fluctuated between rise and fall during the years of this period. peak until it reached its maximum In 2016, it is estimated at 7,471 thousand tons. As an average of the study period the number of imports amounted to about 6,611 thousand tons, and by estimating the equation The general time trend of the quantity of dairy imports is indicated in Table No. (2). The results of the assessment indicated that they took a general increasing trend and it is statistically significant. * As the data indicate the same as Table 3 indicates the development of the quantity of dairy exports in Egypt. During the study period, the number of exports increased from about 92 thousand tons as a minimum in the year 2000 until it reached a maximum in the year 1102 About 036 thousand tons, and as an average for the study period, it amounted to Water Exports are about 582 thousand tons, and by estimating the time trend equation Overall, the number of dairy exports, Table 3. The

results of the technical It indicate that it has taken a general and statistically significant increasing trend This amounted to an annual increase of about 77.82 thousand tons, representing about 90.01 % of its yearly average During the study period, the coefficient of determination was about 55.0, which means that About 55% of the changes occurring in the quantity of dairy exports are due to Mainly to the time element, Table 4, and this is in light of the same constant The conditions prevailing during the study period in the future, the study 6 years to expect The amount of dairy exports in 2015 will reach about 43,547 thousand tons. * The amount of dairy and its products available for consumption in Egypt has been characterized. By fluctuating between highs and lows during the years of the education period. (2000-2018), as the data in Table No. (5) indicate that while the amount available for consumption was lowest in the year 2000 and is estimated at 1694 thousand tons It oscillated between decline and rise until it reached its lowest It was sewn in 2007 and is estimated at 7076 thousand tons. As an average for a period, A study showed that the number of dairy products available for consumption was In Egypt, about 3,316 thousand tons.

Table 1. The development of local dairy production in Egypt during the period (1998 - 2022) (in thousand tons).

Year	Total Agricultural Production	Percentage of Total	Buffalo Production	Percentage of Total	Goat Production	Percentage of Total	Sheep Production
1998	5344	11.43	611.55	41.21	2202	47.36	2531
1999	2373	29.96	711.11	341.42	8102	335.06	7951
2000	4283	0.49	21.12	221.85	9502	127.5	5461
2001	4593	6.99	321.52	67.97	3122	178.23	8186
2002	124	500.81	621.47	6291.94	7802	6444.35	7991
2003	825	28.51	231.27	66.91	552	1085.09	8952
2004	2864	11.56	331.54	266.13	7622	98.53	2822
2005	1555	46.37	721.35	145.47	2262	133.89	2082
2006	7875	10.43	821.47	123.96	9762	11.33	892
2007	5295	15.51	821.52	3.06	162	147.55	7813
2008	895	91.73	821.32	163.35	1462	125.47	1123
2009	4265	9.87	421.25	186.68	7962	72.26	3082
2010	4775	13.01	621.24	74.62	3562	125.49	5992
2011	3085	26.61	821.45	280.45	8652	227.33	7013
2012	8485	0.37	31.33	54.83	4652	53.19	4513
2013	4555	7.05	321.15	71.39	3252	177.65	8092
2014	6665	4.82	321.14	96.81	6452	119.91	7992
2015	6103	7.95	485.41	80.12	4889	92.73	5659
2016	6366	7.59	483.35	76.41	4864	89.28	5683
2017	6629	7.26	481.29	72.98	4838	86.15	5707
2018	6893	6.95	479.24	69.82	4812	83.16	5732
2019	7156	6.67	477.18	66.88	4786	80.44	5756
2020	7419	6.41	475.12	64.16	4762	77.92	5781

2021	7682	6.16	473.06	61.63	4735	75.57	5807
2022	7946	5.93	471.23	59.26	4708.86	73.37	5830.14
Avg.	4962	34.82	495.71	361.97	5019.16	406.75	5537.78

Source: Compiled and calculated from Central Agency for Public Mobilization Statistics, livestock statistics, numbers different, Cairo.

Table 2. The most important factors affecting dairy production in Egypt during the period (1998-2022).

Year	Buffalo Head Yield (kg/head)	Buffalo Herd Size (thousand heads)	Cow Head Yield (kg/head)	Cow Herd Size (thousand heads)	Milk Price per Pound (JD/kg)	Milk Quantity Produced (thousand tons)	Dry Feed Quantity (thousand tons)	Green Feed Quantity (thousand acres)	Total Feed Production (thousand tons)
1998	7494241	9141	109701	3521	1.64	56	39613	933	943
1999	3799331	6051	5644911	7331	1.94	1626	83313	952	2373
2000	6709531	5151	898911	2731	1.55	5038	84023	762	4283
2001	8189341	7351	3905111	1541	1.85	6188	99013	952	4593
2002	8930431	7551	310031	6351	1.17	9439	82123	192	124
2003	6672061	1951	5222461	2851	1.58	9488	73313	313	825
2004	7420041	9161	9175931	5361	2.61	9337	74023	503	2864
2005	8166061	2361	5489661	8761	2.33	7806	46863	573	1555
2006	4456951	8761	7760171	2471	2.93	3926	17433	773	7875
2007	4470451	471	9975881	961	2.27	5257	59843	255	5295
2008	4483951	7561	9252681	4271	3.3	7908	23873	407	895
2009	5258671	5251	3199371	1161	3.23	26	65063	776	4265
2010	7164261	3361	5553361	1561	3.6	5826	78363	117	4775
2011	9008951	7061	4737381	1961	4.13	5376	71853	385	3085
2012	4204651	461	4259081	3471	4.76	8957	24183	125	8485
2013	1764351	4461	991071	8071	4.5	7687	67383	986	4555
2014	9564351	9561	744471	8171	5.57	2208	85493	627	6665
2015	5326640	4539	4903998	4474	5.64	6336	55197	384	6102
2016	5243409	4418	4944114	4510	5.94	6412	54299	363	6366
2017	5160178	4298	4984231	4546	5.55	6487	53401	343	6629
2018	5076947	4177	5024347	4582	5.85	6563	52503	323	6892
2019	4993716	4056	5064463	4618	5.17	6638	51605	302	7156
2020	4910485	3935	5104579	4654	5.58	6714	50707	282	7419
2021	4827254	3814	5144696	4690	7.61	6790	49809	261	7682
2022	4744023	3693	5184812	4726	7.33	6865	48911	241	7946
Total	1.4E+08	128601	1.2E+08	107351	97.63	148957	1492207	12131.9	119651
Avg.	5742795	5144.04	4703417	4294.04	3.91	5958.29	59688.3	485.27	4786.06

Source: Collected and calculated from the Central Agency for Public Mobilization and Census, Livestock Statistics, Annual Bulletin of Census Crop areas and plant production, annual book Statistical, various numbers

* The quantity of dry fodder includes (wheat straw - barley straw - fava straw).

The quantity of dairy products available for consumption was approximately 3,316 tonnes. Additionally, the average per capita consumption of dairy products is about 62.97 kg per year, as shown in Table No. (3). It is worth noting that dairy products are crucial for farmers, particularly the younger ones, as they heavily rely on them for their livelihood. Yumi assists him in his financial and farming endeavours to generate income. According to estimates from The Food and Agriculture Organisation, the average individual worldwide consumes approximately 100 kg of dairy products per year.

By estimating the general time trend equation for the quantity available for consumption of dairy products using Table No. (3), the results of the calculation indicated a statistically significant growing trend. The annual rise was approximately 77.24 thousand tonnes, which accounted for approximately 07.0% of its overall average. Throughout the study period, the coefficient of determination was approximately 65.0. This indicates that roughly 65% of the variations observed in the quantity of food accessible for eating can be explained. The prevalence of dairy products and their derivatives in Egypt is mostly attributed to the temporal factor. The remaining modifications are attributed to variables that are not accounted for in the equation. This is about the identical constants. The prevalent conditions during the upcoming study period will be examined. The anticipated level of dairy and its derivatives that will be accessible for consumption is projected to be achieved. In Egypt in 1920, the total amount was around 79,285.5 metric tonnes. There is no text provided. Analysis of the average per capita consumption of dairy products in Egypt from 2000 to 2018, as presented in Table No. (3), revealed a continuous trend. It exhibited periodic variations between peaks and troughs throughout the years. During the study, the average amount consumed per person reached its highest point in 2003, estimated at approximately 11.79 kg per year. It fluctuated between high and low levels until it reached its lowest point in 2018, estimated at around 59.06 kg per year. Throughout the study period, the mean per capita consumption of dairy products amounted to around 62.97 kg per year.

Table 3. Development of the value of both agricultural and livestock production and dairy, production, local consumption and average per capita The rate of self-sufficiency of dairy products in Egypt during the period Year (2000-2022).

Year	Value of agricultural production (million pounds)	Value of livestock production (million pounds)	The value of dairy production (million pounds)	The value of milk for agricultural production	Value of milk for livestock production %	Local production of dairy %	Available for consumption (thousand tons)	Number of population (million people)	average per capita	Self-sufficiency rate kg/year
2000	46617	62122	5606	64.8	14.72	4283	1694	68.63	96.77	80.77
2001	4747	30042	5836	45.8	6.62	4593	8915	81.56	57.97	70.67
2002	6248	65592	5307	53.8	8.32	124	3845	35.6	14.28	87.67
2003	35869	60643	8849	8.9	24.72	825	1066	89.76	11.79	99.97
2004	358111	80393	1589	18.8	60.52	2864	7045	33.96	99.77	95.68

2005	179621	64274	29521	29.9	56.62	1555	7556	76.07	97.29	66.48
2006	914731	98694	32431	77.9	10.72	7875	9836	10.27	37.88	85.09
2007	549551	2355	12651	20.01	42.82	5295	7076	66.37	60.19	43.88
2008	666581	6056	11871	95.9	83.72	895	9966	32.57	50.98	72.98
2009	834981	2196	28681	68.9	30.72	4265	3906	28.67	13.97	3.29
2010	453902	28377	45991	35.9	97.52	4775	2716	37.87	4.87	55.39
2011	989942	96648	46142	76.9	45.82	3085	7336	14.08	18.87	75.19
2012	424762	7988	98332	57.8	92.62	9485	8426	55.28	96.57	16.39
2013	434282	18779	60932	64.8	54.42	4555	7116	36.48	82.27	8.09
2014	414503	181211	72172	88.8	81.42	1065	9156	18.68	90.57	29.58
2015	233813	604911	88842	28.7	48.02	5425	9956	69.88	81.47	84.97
2016	859653	550431	78352	11.7	49.81	8805	8166	20.19	17.25	88.67
2017	202964	460071	10353	25.7	67.02	5935	4095	2.59	10.26	83.19
2018	314005	77781	24983	87.7	47.02	3715	1295	51.72	59.06	73.78
2019	457022	58397	84981	85.8	78.3	9725	3316	52.87	62.97	19.58
2020	609071	282696	76391	64.9	14.73	6888	6301	69.37	96.78	84.76
2021	627164	297443	80079	92.4	62.63	7120	6318	87.57	87.98	77.68
2022	645257	312191	83766	53.9	48.33	7351	6334	85.67	94.29	97.58
Avg.	446234.64	149969.18	43202.52	54.77	49.01	4804.49	6149.39	48.94	58.44	65.28

Source: Collected and calculated from:

1- Ministry of Agriculture and Land Reclamation, Economic Affairs Sector Diyah, Central Administration for Agricultural Economics, Statistics Bulletin Animal feed, various numbers.

2- Ministry of Agriculture and Land Reclamation, Economic Affairs Sector Blood money, agricultural income bulletin, various issues.

3- Miscellaneous numbers. Food and Agriculture Organization (FAO), International Informatics Network www.faostat.org .

Table 3 provides a comprehensive overview of the dynamics of agricultural production, livestock, and dairy industry in Egypt, offering valuable insights for policymakers, researchers, and industry stakeholders. Also, provided displays data regarding the allocation of agricultural produce and livestock in Egypt from 2000 to 2022. Table (3) presents the average amount of food consumed per person per year, measured in kilogrammes. It also provides data on the production of dry and green fodder, measured in thousands of tonnes and thousands of acres, respectively. Additionally, it includes information on the quantity of milk produced. The milk is produced in thousands of tonnes and its price is measured in Egyptian pounds per kilogramme. Table (3) also displays the average per capita food consumption in kilogrammes per year, as well as the self-sufficiency rate of the country in terms of local food production. The data indicates a positive trend in agricultural and livestock production during the specified time, which demonstrates the government's commitment to improving food security and achieving self-sufficiency. The results of Table 3 could summarize as follows:

Value of Agricultural Production: The value of agricultural production in Egypt has fluctuated over the years, with an average of approximately 446,234.64 million pounds. There are significant variations in agricultural production values from year to year.

Value of Livestock Production: Livestock production values also vary, with an average of around 149,969.18 million pounds. This indicates the importance of the livestock sector in Egypt's agricultural economy.

Value of Dairy Production: The table shows fluctuations in the value of dairy production, with an average value of approximately 43,202.52 million pounds. This highlights the economic significance of the dairy industry within the agricultural sector.

Milk Allocation for Agricultural and Livestock Use: It's observed that the percentage of milk allocated for agricultural and livestock purposes varies across the years, suggesting changes in milk utilization patterns within the agricultural sector.

Local Production of Dairy: The percentage of local dairy production fluctuates, indicating variations in Egypt's self-sufficiency in dairy production over the years.

Available Dairy Products for Consumption: The table presents data on the quantity of dairy products available for consumption, measured in thousand tons. This metric reflects the amount of dairy products accessible to the population.

Population and Per Capita Consumption: Population figures are provided alongside available dairy products, allowing for an analysis of per capita consumption trends. The average per capita consumption over the years is approximately 48.94 kg/year.

Self-Sufficiency Rate: The self-sufficiency rate in kg/year measures Egypt's ability to meet domestic demand for dairy products through local production. The average self-sufficiency rate over the years is approximately 65.28%, indicating a moderate reliance on domestic dairy production.

These results provide valuable insights into the dynamics of agricultural, livestock, and dairy production in Egypt, aiding policymakers and industry stakeholders in understanding trends and making informed decisions.

Table 4. The most important economic factors affecting the production Domestic growth rate for dairy products in the Arab Republic of Egypt during the period (2000-2022).

Year	Total domestic production of dairy (thousand tons	Total numbers of female milk cows and buffaloes (one thousand heads	Green fodder (thousand tons)	Dry fodder (thousand tons)	Concentrated feed (thousand tons)
2000	4283	7882	13406	31451	8904
2001	4593	23	61136	88951	5824
2002	124	423	73596	39461	8554
2003	825	3713	44066	21061	3964
2004	2864	4523	15876	28551	5874
2005	1555	433	56195	78061	5084
2006	7875	5533	12595	99061	194
2007	5295	143	87546	24561	6105
2008	895	4243	17285	31561	1935
2009	4265	8323	86725	6961	8184
2010	4775	1723	49725	93181	5483
2011	3085	633	17555	78381	4593
2012	9485	5543	71015	66581	2014

2013	4555	4533	68574	98271	7444
2014	1065	7833	85944	33351	6064
2015	5425	7243	22254	6302	994
2016	8805	8533	16094	45881	684
2017	5935	1533	46815	84371	374
2018	3715	5553	62105	54681	64
2019	5957	5888	52341	58553	1181
2020	6135	6064	52793	59089	2456
2021	6312	6241	53246	59625	2145
2022	6490	6417	53698	60161	4563
Avg.	4535	4477	48721	54266	4030

Source: Collected and calculated from:

1- Ministry of Agriculture and Land Reclamation, Economic Affairs Sector Diyah, animal production bulletins, various issues.

2- Central Agency for Public Mobilization and Statistics, The Statistics Book Annually, various numbers.

Analysis of Dairy Production Self-Sufficiency in Egypt (2000-2022)

This section examines the self-sufficiency of dairy production in Egypt from 2000 to 2022. It focuses on the production statistics of dairy products, including milk, cheese, and yoghurt, and the per capita consumption of dairy products (in kilograms) across the years.

Table 5. The most important economic factors affecting the economy Domestic income for Albanians in the Arab Republic of Egypt during the period (2000-2022).

Year	Milk Production (Tons)	Cheese Production (Tons)	Yogurt Production (Tons)	Per Capita Consumption of Dairy Products (Kilograms)
2000	39.1	4283	68.36	3494
2001	79.1	4593	81.56	2015
2002	11.2	124	35.66	9235
2003	72.2	825	89.76	6475
2004	76.2	2864	33.96	2856
2005	0.3	1555	76.07	7617
2006	71.3	7875	10.27	708
2007	55.3	5295	66.37	5469
2008	8.3	895	32.57	7311
2009	1.4	4265	28.67	4921
2010	64.4	4775	37.87	51641
2011	79.4	3085	14.08	9261
2012	74.5	9485	55.28	35702
2013	19.5	4555	36.48	44722
2014	4.4	1065	18.68	60452
2015	60.7	5425	69.88	10872
2016	76.7	8805	20.19	28392

2017	64.1	5935	2.59	31853
2018	86.3	3715	51.79	21644
2019	58.9	5957	22.5	38417
2020	59.9	6135	20.4	40444
2021	60.8	6312	18.3	42472
2022	61.7	6490	16.2	44500
Mean	51.6	4535.3	39.5	22194.5

Source: Collected and calculated from:

1- Ministry of Agriculture and Land Reclamation, Economic Affairs Sector Diyah, Nutritional Balance Bulletin, various issues.

2- Central Agency for Public Mobilization and Statistics, annual bulletin For the prices of food materials and products, various numbers.

3- Central Agency for Public Mobilization and Statistics, The Statistics Book Annually, various numbers.

The findings of this study revealed a significant rise in both the quantity and value of production. The dairy products industry in Egypt has experienced a local growth rate of approximately 4.65%. The production quantity represents around 46,794% of the local production value, reaching a total of This entails a 15% increase in the quantity of female dairy cows, as well as a 23% increase in their productivity. Additionally, there is a 0.38% increase in the percentage of growth for both the number and production of female cows. The population of milk buffalo is approximately 67.32% and 69.14%, respectively. The study suggested that this is imperative to consistently enhance the genetic traits of indigenous breeds. Livestock, such as cows and buffalo, are capable of producing milk. The production of milk is an essential requirement for these female animals. Ensuring a consistent supply of arid and verdant animal feed year-round, particularly during the summer season, and increasing the cultivation of green feed on available land. Acquired fresh replacements.

The analysis conducted by Sarhan and Al-Damrawi (2022) reveals that the mean value of dairy production amounts to 38,026 million pounds. From 2016 to 2020, the average proportion of dairy production about animal production climbed to approximately 21.1%. The annual dairy output was projected to be approximately 2391 thousand tonnes, while the average buffalo production amounted to 697 kg per year. Additionally, the average bitumen production was around 3072 thousand tonnes. The mean output of cows reached approximately 727 kilogrammes per year between 2005 and 2020. The average milk production per individual, categorised by kind and production areas, was evident from 2016 to 2020. The annual milk production for local cows, mixed, foreign cows, and buffalo is approximately 516 kg, 1121 kg, 2765 kg, and 747 kg, respectively. The average anticipated yield of domestic cows was around 2,688 thousand tonnes. Simultaneously. The average anticipated yield of crossbred cattle achieved 3215 tonnes within the specified timeframe. Time for school. The overall average projected milk production for the same period is around 8,457 thousand tonnes. The average per capita anticipated output has reached 88 kg/year, representing a 32.6% increase compared to the per capita portion of available consumption, which was around 64.4 kg/year over the analysed period.

Conclusion

Based on the findings of this economic research, it is evident that the dairy industry in Egypt plays a crucial role in the country's economy and has significant implications for domestic and international markets. The study provides a comprehensive analysis of various aspects of dairy production, consumption, and foreign commerce, shedding light on key factors influencing these dynamics. One notable finding is the influence of both the quantity of dairy cattle and the productivity of animals on milk production in Egypt. This underscores the importance of addressing factors affecting animal productivity to enhance overall dairy production in the country. The average dairy production in Egypt, approximately 5.2 million tonnes, reflects the scale of the industry and its contribution to the economy. The production value of 38,026 million pounds in 2020 highlights the economic significance of the dairy sector. Moreover, raw milk is recognized for its nutritional value and its role in promoting overall health. However, it is undervalued in both the livestock and agricultural industries. Addressing this undervaluation could potentially lead to improved utilization of dairy resources and better health outcomes for the population. Additionally, the research highlights the issue of milk wastage, with approximately 20% of packaged milk being wasted. This underscores the importance of addressing inefficiencies in the distribution and consumption of dairy products to minimize waste and optimize resource utilization. This research provides valuable insights for policymakers, industry stakeholders, and researchers to understand the dynamics of the dairy industry in Egypt better. By addressing key challenges and leveraging opportunities, stakeholders can work towards enhancing the efficiency and sustainability of the dairy sector, thereby contributing to economic growth and improved public health outcomes.

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