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Milk production and its role in food security in Egypt

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Abstract: Animal protein is the most fundamental elements in the issue of food security in Egypt due to limited production increase of livestock sources and rely on imports from abroad. It is necessary to pay attention to the dairy activity for closing the food gap of animal protein. The aims of the current study are analyzing the sources of milk production, study the factors affecting milk production. As well as, the policies of dairy product in Egypt, examining the role of dairy in achieving food security and estimate the size of the projected gap of animal protein in 2025. The study based on published and unpublished data during (2000-2014).

The results indicated that, dairy product ranking the second in contributing to the value of animal production (26.66% of the total animal production). The equation of general time trend for dairy development in Egypt indicated that the livestock of cows, Buffalo and goats took a general trend statistically significant at 0.01%. The study proved that setting the milkmaid from cows and Buffalo and the productivity of each of them have a moral effect on milk production and was responsible for 97% of the variation in the amount of milk produced. As well as, the milk takes the highly daily per capita protein consumption, where milk contribution ratio of animal protein in 2014 about 7.4 gm (represents28.8%) of the average daily per capita. The policies that help to increase milk production in Egypt clarify that, apparent increase of livestock loans size and the moral link between the size of loans and the increasing productivity of dairy product. As a moral set between green fodder and the coarse feed. Reduction in the size of the actual energy to feed production plants with an average of about 129.4 thousand tons, which estimated 26.3% of average total energy (4674.1 tons) during the study period. The study recommended that there is a serious need for the optimization of good breeds, especially with higher milk production rates. As well as, development of feed mills with deactivated energy and provide investment crisis. Finally, utilize remnants of silage industry fields to use in the summer.

Keyword: Milk production - Preparation of dairy cattle - Livestock loans – Per capita animal protein.

Introduction

Food security means access for all members of society to food security and health for their activity and their health, and all classes and prices match the real incomes of all individuals. Food security is based on four main axes[1]: Food Availability, Food stability, Food Accessibility (as all individuals and groups in society to obtain food) and Food safety.

Egyptian food security problem is centered in the breadth of the food gap year after year, and reliance on foreign markets in food. Where, the Egyptian net importer for food, depend on food imports by about 45.8% to secure the food need, where food import bill amounted to 6.513 billion dollars toward Egyptian[2].

Food manufacturing sector is one of the important pillars in achieving food security with many different manufacturing activities including dairy products. Dairy products are the best food for humans, the importance of dairy products after food awareness and individual incomes, which in turn led to an increase in demand. This importance is because it contains many elements necessary, in addition to contain many vitamins and minerals. Dairy consists of farm animals like buffalo's, cows and goats dairy products, dairy represents one of the major components of income, dairy production amounted to 27.1 billion pounds in 2014 representing 23.9 % of total animal production and about 113.2 billion pounds. While, the average annual per capita approximately 72.9 kilograms including Parallels 199.7 grams per day, dairy food gap in size towards 237 thousand tons for the same year [3,4].

Search problem:

Egypt suffers from a shortage of animal protein due to the shortage of food needs production from him, which leads to widening food gap in General and especially for animal protein. So, it is necessary to give attention to the dairy activity in the food gap of animal protein to diminish the food gap. Despite the apparent increase in milk production in Egypt, which rose from about 3.8 million tons in 2000 to about 5.6 million tons in 2014, there is a gap in animal protein is to study the problems facing increasing milk production, with appropriate policies.

Goal of research:

Through the research problem, we can summarize the objectives of the study are as follows:

1. A study of the evolution of the relative importance of dairy value relative to the total value of animal production, and important food (2000-2014).
2. Milk production sources and study the changes in them and the factors affecting milk production in Egypt.
3. Contribution of the dairy in an individual's daily needs of animal protein.
4. Examine the current policies to produce milk in Egypt.
5. Estimate the volume of production and consumption and per capita expected from dairy and animal protein gap in 2020, 2025.
6. Dairy food security requirements in Egypt.

Research method and data sources:

The search was adopted in order to achieve its objectives on the descriptive and quantitative economic analysis showing the economic aspects, the use of econometric analysis method by simple and multiple regression. In addition to identifying key progress factors affecting milk production in Egypt and chose the best and consistent with economic logic and most acceptable from statistical point of view. Regarding data sources was search on time-series data and statistical bulletins from the Economic Affairs, Ministry of agriculture and land reclamation and the statements of the Central Agency for public mobilization and statistics, as some scientific references and publications and research related to research topic.

Results:

1: Study the relative importance of the value and importance of dairy food (2000-2014):

This part of the study reviews the relative importance of dairy value to the total value of animal production,

1.1: relative importance of dairy value for total value of animal production:

A study of table (1) shows that, the value of animal production during the period (2000-2014) has varied between a minimum of around 22.126 billion pounds in 2000 and a maximum of about 113.2 billion pounds in 2014 with an annual average of about 60 billion pounds. The table reviews also, the evolution of the relative importance of dairy value relative to the total value of animal production during the period (2000-2004), which revealed that dairy took second place after red meat has contributed approximately 26.66% of the total value of animal production followed by white meat and eggs and municipal compost each estimated about

18.05%, 11.02%, 7.2%, respectively, of the total value of animal production. This demonstrates the importance and prestige of the dairy activity in Egypt and its impact on animal and agricultural gross income.

1.2. Nutritional importance milk:

Milk contributes greatly to meet the needs of the body of calcium, magnesium, selenium, vitamin riboflavin (B_2), vitamin (b_{12}) and Pantothenic acid vitamin (b_5). So, milk is closest to perfection because it contains most of the nutrients that helps growth and energy sources of fat, protein and carbohydrates, which provide the human body with most food and necessary requirements of protein, fat and carbohydrate finally.

1.2.1. Protein:

Protein is composed of 20 amino acids, human can build 12 amino acid, either eight other acids, should be available in the human body and it's called essential amino acids and these acids are available in milk. The data in the table (2) illustrated that, the individual dairy provide about 7.8 g of daily needs during an average period (2000-2014) that lie between a minimum of approximately 4.9 grams per day in 2001 and a maximum of approximately 9.6 grams daily in 2003.

1.2.2. FAT:

The most important characteristic of milk fat is easy to digest and consume a large amount of it which do not lead to indigestion, as happens in some other animal fats, it features a low degree of melting of fats. The data in the table (2) illustrate the evolution of average per capita daily requirement of fat in milk, so the results show that per capita is between 10.2 kg, 13 kg during the period (2000-2004) average of about 11.5 kg.

Table (1): The relative importance of the Albanians among the most important sources of animal production during the period(2000-2014).

Year	Milk	Red meat	White meat	Egg	Wood and hair	Compost	The total value of livestock production
2000	6065	8939	3477	1028	107	2420	22126
2001	6385	9061	4458	1347	114	2541	23906
2002	7035	1147	6266	1923	125	2701	19197
2003	9488	12525	6404	2078	132	3879	34506
2004	9851	13412	7587	2142	135	3981	37108
2005	12591	18816	7748	2042	137	5794	47128
2006	13423	20128	7182	2785	139	5912	49569
2007	15671	21532	8404	3089	158	6283	55137
2008	17811	24202	10371	4488	164	7972	65008
2009	19951	26872	12338	5887	170	9661	74879
2010	22199	28276	13560	7590	189	10032	81846
2011	23031	29588	14126	8323	191	10150	85409
2012	25777	34992	14287	8233	193	10963	94445
2013	23900	37300	21800	6400	185	8100	97800
2014	27100	43300	24800	7600	184	9000	113200
Average	16019	22006	10854	4330	155	6626	60085
%Total	26.66	36.62	18.05	7.2	0.26	11.02	-

Source: (4).

Table (2): The average calorie needs, protein and fat derived from milk during the period (2000-2014).

Year	The average per capita daily dairy (g)	The average per capita daily dairy protein (g)	The average per capita daily from dairy fat (g)	The average per capita daily dairy Energy (kcal)
2000	212.3	7.8	10.7	166
2001	218.1	4.9	11.0	172
2002	221.1	8.0	10.8	171
2003	266.0	9.6	13.0	206
2004	213.7	7.8	10.8	168
2005	254.3	9.3	12.6	198
2006	243.1	8.8	12.2	191
2007	249.6	9.1	12.3	193
2008	244.1	8.9	12.0	189
2009	217.3	7.9	11.1	172
2010	214.8	7.7	10.9	169
2011	215.9	7.7	10.9	168
2012	204.4	7.6	10.6	162
2013	198.0	7.2	10.2	155
2014	199.7	7.4	10.5	159
Average	224.8	7.8	11.8	176

Source: (4).

1.2.3. Carbohydrates:

Milk is a source of carbohydrates for energy-producing activity and vitality as it contains lactose which have glucose and galactose sugars. The data contained in the table (2) describe the evolution of average per capita daily requirement of carbohydrates available in milk, so the results show that the average per capita approximately 176 calories daily during the study.

2. Analysis of dairy sources in Egypt during the period (2000-2014):

This part of the study reviews the evolution of the total production of milk of various sources which involving cows, buffaloes, and goats milk. As well as, the evolution and productivity of these major sources of milk production in Egypt, and finally identify the determinants of milk production in Egypt.

2.1. Development of dairy production:

Table shows (3) that the average dairy production in Egypt during the period (2000-2014) has approximately 5318.4 thousand tons of cattle as cows 72.34% of the total of about 2689.3 thousand tons. While, Buffalo is about 47.20% of the total estimated at about 2510.4 tons and about 2.4% goat possesses an estimated 127.7 thousand tons. By estimating the equation of the general time trend as shown in equation (1) table (4) to the development of the productive capacity of the dairy in Egypt shows that, dairy production has taken an increasing trend and the statistical annual increment of about 133.4 thousand tons, representing about 3.79% of the average value. The coefficient of determination (R^{-2}) indicates that 58% of the emerging changes in the production quantity is due mainly to the time factor and the remaining were due to other factors not measured in function during the study period .

Estimate the equation of the general time trend equations 4, 7, 10 for dairy production of milk cows, Buffalo and goats as shown in the table (4) shows, an increase of an estimated statistical moral 86.75, 41.57, 0.09 tons respectively, representing about 3.2%, 1.7%, 0.07% of the average period of study of dairy sources respectively.

Table (3): the evolution of the number and productivity of dairy production of the main sources in Egypt during the period (2000-2014).

Year	Cows			Buffaloes			Goat		
	preparation (Thousand head)	Yield (Kg)	Production (Tons)	preparation (Thousand head)	Yield (Kg)	Production (Tons)	preparation (Thousand head)	Yield (Kg)	Production (Tons)
2000	1372.1	1198	1645	1515.1	1358	2059	1178.9	101	120
2001	1450.5	1115	1618	1536.8	1440	2213	1179.4	104	123
2002	1536.0	1300	1997	1557.6	1339	2087	1191.2	105	126
2003	1581.9	1643	2598	1590.5	1603	2550	1274.0	103	132
2004	1635.4	1395	2282	1619.1	1400	2267	1297.1	102	133
2005	1678.2	1669	2802	1631.9	1606	2622	1152.9	110	127
2006	1728.6	1723	2980	1653.1	1620	2679	1170.4	109	128
2007	1690.4	1885	3687	1739.8	1500	2610	1358.5	94	128
2008	1724.3	1862	3211	1657.3	1574	2640	1058.5	134	142
2009	1419.8	1974	2803	1797.8	1500	2697	1312.9	94	124
2010	1651	1815	2995	1633	1625	2653	1335.7	94	126
2011	1691	1838	3107	1607	1598	2568	1351.0	95	128
2012	1743	1810	3154	1640	1563	2565	1386.4	94	130
2013	1747	1664	2908	1593	1584	2523	130.3	94	123
2014	1719	1485	2553	1600	1827	2923	1327.7	94	125
Average	1624.5	1692	2689.3	1625	1543	2501	1258.6	101.8	127.7

Source: (3).

2.2. Evolution of productivity of dairy from their main sources in Egypt:-

Studying the evolution of dairy sources in Egypt and of cattle, buffaloes and goats during the period (2000-2004) show that average preparation of dairy sources in Egypt during the study was about 3351.3 thousand head of cattle and buffaloes both obsess about 48.5% of the total of about 1625 head. While, goat representing 3.04% of the total estimated 101.8 a header. The general time trend equation of equations 2, 5, 8 in table (4) of cattle, buffaloes and goats indicated to a moral statistically increased to prepare all of cows, Buffalo and goats around 18.59, 6.38, 12.14 000 respectively and the increase represents about 0.4% 1.14% 9.6% respectively of average annual study period. For the productivity of cows, Buffalo and goats during the study period was about 1543, 1543, 101.8 kgs respectively, reflecting the General time trend equation equations 3, 6, 9 to the same table for cattle and Buffalo productivity increase statistically productive moral both cattle and Buffalo are around 52.3, 20.23 kg respectively for the head and an annual increase of about 3.1%, 1.3% respectively, of average annual study period.

Table (4): **The equations of general time trend to prepare the sources of milk production in Egypt during the period (2000-2014).**

No.	The dependent variable	α	β	Average	% The annual rate of change	T	R^2	F
1	Total production of milk (thousand tons)	4244.7	133.41	5318.4	3.79	4.535	0.58	20.565**
2	Prepare cows (thousand head)	1475.8	18.59	1624.5	1.14	3.267**	0.40	10.676**
3	The productivity of cows (kg / head)	1273.4	52.299	1692	3.1	2.503*	0.27	6.265*
4	Total production of cows (thousand tons)	1995.4	86.75	2689.3	3.2	3.177**	0.39	10.097**
5	Prepare buffaloes (thousand head)	1573.7	6.385	1625	0.4	1.554-	0.16	2.415-
6	The productivity of buffaloes (kg / head)	1380.6	20.23	1543	1.3	3.804**	0.52	14.466**
7	Total production of buffaloes (thousand tons)	2177.8	41.57	2501	1.7	4.252**	0.58	18.077**
8	Prepare Goat(thousand head)	1161.5	121.14	1258.6	9.6	2.480*	0.32	6.150*
9	The productivity of Goat (kg / head)	108.3	- 0.81	101.8	- 0.8	(1.307) -	0.12	1.708-
10	Total production of Goat (thousand tons)	126.9	0.1	127.7	0.07	0.325-	0.06	0.082-

** Significant at the 1% level, * at the 5% level, --- no significant.

Source: Calculated from Table (1).

2.3.Factors affecting milk production in Egypt:

we can identify the most influential factors on milk production in Egypt to be taken into consideration for policy makers productivity by measuring progress Stepwise gradient regression relationship between goal working quantity produced milk thousand tons, and all of the explanatory factors that affect the dependent variable containing the cattle milkmaid thousand head (X_1), and the productivity of cows per kilogram for head (X_2), setting up Buffalo milkmaid thousand head (X_3), and Buffalo productivity per kilogram for head (X_4), prepare a goat dairy maid thousand head (X_5) and goat production per kilogram for head (X_6), forage thousand tons (X_7), fodder thousand tons (X_8) during the period (2000-2014), logarithmic formula is suited better images to illustrate the relationship through the following equation:

$$Lny_1 = - 14.003+0.652\ lnX_1+ 0.0.178\ lnX_2 + 1.356\ lnX_3 + 0.569\ lnX_4$$

$$(3.195)^{*} \quad (2.777)^{*} \quad (4.724)^{**} \quad (3.345)^{*}$$

$R^{-2}= 0.94$ $F= 41.150^{**}$

Model results suggest the existence of a direct correlation between the amount of milk produced and the milkmaid setting of cattle and buffaloes. The productive flexibility amounted to cattle and Buffalo dairy maid about 0.652, 1.356, respectively, indicating that increasing numbers of both cattle and Buffalo by 10% to increase the quantity of milk produced by 6.52% of cows and about 13.56% of Buffalo. Model results indicate the existence of a direct correlation between the amount of milk produced and the productivity of both cattle and buffalo where valued productive flexibility for productivity both cows and buffalo dairy maid about 0.178 0.569, respectively, indicating that the increased productivity of both cattle and buffalo by 10% to increase the quantity of milk produced by about 1.78% 5.69% of cows and buffalo around.

3. Contribution of the dairy in an individual's daily requirements of protein compared with various confiscated:

You can't bring vegetable protein rather than animal protein so as to contain animal protein to amino acids for the body, as that animal protein is an essential compound for protoplasm that in addition to being helps

build flesh and blood. With surveying data in the table (5) during the period (2000-2004) illustrates the evolution of total consumption and singles from the dairy, where total consumption rose from about 4961 thousand tons in 2000 to approximately 6514 in 2014 with an estimated increase of about 25.5% of average total consumption for the study period. As in the same table indicates that the average annual per capita milk consumption dropped from approximately 97.1 kg in 2003 to about 72.3 kg 2013 by 10.4% decline representing some average period estimated at 82.7 kg.

As the same table shows that milk are the largest animal protein sources which represents by red and white meat, eggs and fish which contribute a daily per capita where contribution of milk protein of about 19.9% in 2001 to about 36.8% in 2008, with an average daily consumption of milk protein during the study period approximately 7.8 kg and represents about 30.1%. While, the contribution of each of the red and white meat, eggs and fish about 21.2%, 12.7%, 4.6%, 22.7% respectively.

Table (5):The Evolution of the average per capita daily animal protein consumption and national average Per capita dairy during the period (2000-2014).

Year	Population (million)	National consumption (Thousand tons)	Average per capita (Kg)	Average daily per capita animal protein from different sources						%milk protein of the total
				Red meat (gm)	White meat (gm)	Egg (gm)	Fish (gm)	Milk (gm)	Total (gm)	
2000	63.98	4961	77.5	5.7	4.7	1.1	6.7	7.8	26	30.0
2001	65.34	5198	79.6	5.1	6	1.2	7.4	4.9	24.6	19.9
2002	66.64	5483	80.7	5.4	7.6	1.4	6.4	8	28.8	27.8
2003	67.98	6610	97.1	5.8	6.9	1.3	6.7	9.6	30.3	31.7
2004	96.33	5407	78	5.4	6.3	1.3	6.3	7.8	27.1	28.7
2005	70.67	6557	92.8	5.8	5.7	1.1	6.5	9.3	28.4	32.7
2006	72.01	6389	88.7	6.5	4.2	0.8	5.2	8.8	25.5	34.5
2007	73.66	6707	91.1	6.8	4.4	1	5.2	9.1	26.5	34.3
2008	75.22	6699	89.1	5.6	3.9	1.2	4.9	8.9	24.5	36.3
2009	77.5	6093	79.3	5.6	4.3	1.2	4.9	7.9	23.9	33.0
2010	78.69	6172	87.4	5	4.5	1.4	5.9	7.7	24.5	31.4
2011	80.53	6337	78.8	4.8	4.8	1.4	5.6	7.7	24.6	31.3
2012	82.52	6248	75.7	4.7	4.7	1.5	5.4	7.6	23.9	31.8
2013	84.63	6117	72.3	5	5.4	1.5	5.1	7.2	24.2	29.7
2014	86.81	6518	72.9	5.3	5.6	1.2	6.2	7.4	25.7	28.8
Average	76.17	6099	82.7	5.5	5.3	1.2	5.9	7.8	25.9	30.1

Source: (4).

4- Most current policies to produce milk in Egypt:

Towards food security requires so much effort, putting many policies and programs that help to increase overall production and increase milk production in particular, thus narrowing the size of the food gap and then Egyptian food security of animal protein.

a. Livestock:

Livestock in Egypt, one of the main resources for the current shortages of individual needs of food animal production represents a cornerstone in achieving food security as a primary source to provide animal

protein contributes to revenue 34% of total animal farm income and contributes to animal production b 4.8 GDP in 2013[(4)].

b. Funding policy:

Funding or credit policy is one of the most important policies that significantly affect dairy production due to several reasons together, low farm incomes, and thus lower saving, cattle prices, hence the importance of the role of financial and credit policies for the development of dairy projects, short-and medium-term loans for livestock development. Shows the evolution of this size loans granted during the period (2000-2014)[(2)] increased the size of loans for the development of animal production of 4.4 billion pounds in 2000 to about 11.5 billion pounds in 2009, then fell to 4.6 billion pounds in 2014, and occupies the first place short-term loans to total loans granted to animal production estimated relative importance approximately 73.9% to distinguish them fast capital turnover, representing about 68.7% of the total loans short term investment. While, long term loans represent approximately 23.6% of total loans granted to animal production and some 38.4% of total loans long term investment.

The results showed a correlation between the productivity of dairy cows and loan volume of about 0.39 during the study period. As well as, the results indicated a lack of correlation between the productivity of each of buffaloes, goats and loan size. This is illustrate the direction of the investors to raise dairy cows and this demonstrates the important role of financing or credit policies to increase the productivity of the cattle milkmaid.

c- Politics feed:

A competition on agricultural land for use in the production of field crops for human nutrition and fodder production for animal feed. Livestock development on intensive green fodders provided by vertical expansion creates barley germination rooms is the technology used in large farms in Europe for their great nutritional values and abundance in the process cost, and are fed organic rather than chemical feed and provide water and land if they are circulate it will dispense with Alfalfa cultivation and provide spaces for wheat as well as provide water for irrigation. Time trend equation indicates the year of production of forage during the period (2000-2014) has moral increase statistically at a level of 0.05, which is estimated at about 1176 tons and represents 1.85% of the annual average of about 63614 thousand tons. The selection coefficient indicates (R^{-2}) that about 32% of the emerging changes in the amount of fodder production mainly due to the time factor and that about 68% due to other factors not measured in function during the study period as described by the following equation:

$$Y_I = 73025.5 - 1176.46X_1$$

$$(2.479)^*$$

$$R^{-2} = 0.32 \qquad F = 6.148^*$$

The data shown in the table (6) illustrated to decrease the size of the actual energy of 1407.4 thousand tons in 2000 and represents approximately 33.9% of total energy volume to about 761.1 thousand tons in 2014 represents approximately 16.5% of the total energy.

Table (6): The total animal feed production in Egypt (2000-2014).

Year	Green fodder (thousand tons)	Concentrated feed (thousand tons)	The number of feed factories	Total energy (thousand tons)	Actual energy (thousand tons)	Deactivated energy (thousand tons)	%Actual capacity of the total energy
2000	63199	1185	107	4148.2	1407.4	2740.8	33.93
2001	59749	1236	113	4426.2	1570.0	2856.2	35.47
2002	92229	1202	117	4557.8	1437.9	3119.9	31.55
2003	71802	1172	120	4561.8	1285.2	3276.6	28.17
2004	70136	1101	129	5078.8	1397.2	3699.6	27.51
2005	61504	1431	138	5059.4	1431.4	3628.0	28.29
2006	61479	903	144	5795.9	1401.5	4394.4	24.18
2007	67270	949	144	4438.2	1154.7	3283.5	26.02
2008	61276	645	110	4547.6	872.9	3674.7	19.19
2009	57201	696	132	4561.8	1285.2	3276.6	28.17
2010	59665	1376	152	4911.0	1376.3	3534.7	28.02
2011	58397	1014	146	4440.3	1013.8	3426.5	22.83
2012	54575	924	151	4533.1	923.5	3609.6	20.37
2013	56486	969	150	4447.1	1122.2	3324.8	25.23
2014	59239	1055	145	4606.2	761.1	3845.0	16.52
Average	**63614**	**1057.2**	**133.2**	**4674.2**	**1229.4**	**3446.06**	**26.30**

Source: (4)

5. Estimate the volume of production and consumption and per capita expected from dairy and animal protein gap in 2020, 2025:

First: dairy in gap assessment Egypt in 2020, 2025:

Making prediction to the production and consumption of the gap, and self-sufficiency rate per capita in Egypt during the years (2020, 2025) compared to the average during the study period (2000-2014), the table (7) shows that, the expected population in Egypt 2020 about 94.95 million, 127.4% change rate average period estimated at 74.5 million. While, increased to about 99.89 million in 2025, about change rate of 135.8% of the average period of study.

Whereas, the expected amount of dairy production in 2020 about 7046.3 thousand tons, the rate of change of some 132.6% of average study period of about 5312 thousand tons. While, the expected amount of dairy production by 2025 approximately 7713.3 thousand tones at the rate of change of approximately 88.19% average of the period. As milk production per capita has risen to around 74.21 kg/year by 2020 at a rate change was about 104.1% of the average period of study to approximately 76.2 kg/year 2025 at a rate change about 106.9% of average.

While, the expected quantity consumed milk 2020 about 7067.3 thousand tones at the rate of change of about 115.9% of the average period of study, while consumption has increased to about 7439.7 thousand tons in 2025 at a rate change approximately 93.8%. Whereas, per capita dairy consumption to about 74.43 kg/year by 2020 at a rate change was about 90 percent to about 73. 5 kg/year 2025 by the rate of change of approximately 88.9% of the average period of study.

As expected from the gap 2020 about 21.13 tons estimated change rate of 2.68% of the average period of study and of about 787.13 thousand tons, gap resulting a surplus estimated by 274 thousand tons in 2025, resulting in lower per capita gap, and self-sufficiency ratio has increased from the dairy in 2020 to about 99.7%.

The rate of change of swallowing about 114.5% of the average period of study, and estimated 2025towards 103.07% rate increasing total change About 119.1% of the average period of study.

Table (7):The size of the projected gap of milk until the year (2020-2025) average of the comparison period (2000-2014).

Statement	Average Period(2000-2014)		Year 2020				Year 2025			
	Average	Per capita	expected	% change	Per capita	% change	expected	% change	Per capita	% change
Population(million)	74.5	-	94.95	127.4	-	-	99.89	135.8	-	-
Quantity production milk(thousand tons)	5312	71.3	7046.3	132.6	74.21	104.1	7713.3	145.2	76.2	106.9
Quantity consumed milk(thousand tons)	6099	82.7	7067.3	115.9	74.43	90.0	7439.7	121.9	73.5	88.9
Gap (thousand tons)	787.13	11.4	21.13	2.68	0.22	14.1	274 +	273.6 +	2.7 +	0.24 +
Self-sufficiency ratio	87.1	1.17	99.7	114.5	1.05	89.5	103.7	119.1	1.02	87.6

Secondly: estimation of average per capita animal protein daily through 2020, 2025:-

Estimate the average per capita animal protein daily expected by the equation of general time trend in the following image:

$\hat{Y}_i = 27.888 - 0.248\hat{X}_i$

$(-2.468)^*$

$R^{-2} = 0.27 \qquad F = 6.918^*$

The average daily per capita protein expected in 2020 is approximately 22.68 grams/day with an average annual rate about 12.4% of the average period of study and of around 25.9 g/day. While, the expected amount of daily per capita protein 2025 around 21.44 grams/day with an annual rate estimated at around 17.2% average of the period. This means that dairy protein plays in contributing to the low proportion of protein from animal sources, and this future expectation that assure him surplus dairy gap size, high self-sufficiency rate of milk.

6. Dairy food security requirements in Egypt:

The dairy industry is the stone of Egyptian food security and provide food and population requirements in increasing investment in agricultural sector and its role in investment in scientific research, the study suggests many requirements needed to achieve food security in Egypt and that is the importance of the private sector contribution in support of the Egyptian food security. Where, the role of the private sector comes to contribute to and support the food security of being represented

- Capital that can be invested in the agricultural sector.
- Scientific expertise that has developed through experience in investment projects.
- Ability to harmonize other elements of production (land, capital, labour) and get better production, and profits.
- Flexibility in response to market demands, and his ability to deal with its variables.

- Speed in taking decisions and override routine procedures.
- Economic and financial feasibility projects and art. The private sector can promote the dairy industry and contribute to food security through:

1) Agricultural investments:

In spite of the importance of the agricultural sector and the role it plays in achieving food security. This sector investment is weak, reflecting the relative importance of the agricultural sector investments have increased from 6.56% in 1990 to about 12.62% in 2000, increased to approximately NET in 2004, then declined to about 2.89% in 2011, has been decreased to about 2.18 in 2012 [(2)]. This explains the reasons for the decline in the agricultural sector and reduced its contribution to the gross national product. On the other hand, agricultural imports and consequent loss of "food sovereignty" but States that paid agricultural sector investment and it deserves the support and interest is perhaps the strongest skip food crises. China States that were receiving assistance from the world food program, but now donor countries since 2005, at a time when many developing countries reduced investments and financing in the agricultural sector, China has been interested in investing in this sector and developed to become a leading country In agriculture[5.]

In General, most of the recommendations of international organizations to deal with the food crisis underlines that investment of various kinds, whether direct or indirect investment or local or foreign investment and encourage one effective ways to face the food crisis.

2) Raising the productivity of the cattle milkmaid:

Where the productivity of the relationship between the cattle milkmaid, between production costs, the greater the productivity of the cattle milkmaid lower college costs per unit produced from milk, as increasing the quantity produced leading to lower average unit costs. You can see the available possibilities to achieve vertical expansion in milk production by comparing the productivity of Egyptian Foreign cattle under environmental conditions; we can raise productivity in one of the following ways:

1. Increasing the volume of production with the same costs.
2. Produce the same volume of production at lower costs.

The first trend is preferred where output is increased so that even has a marginal costs per unit produced with marginal revenue (kilo grams of milk) and therefore the product can achieve the highest level of profit.

3) Investment in scientific research:

From financing scientific research in Egypt, we find it very different from the global rate of spending on scientific research, where in Egypt the Government sector is a major provider of scientific research systems, with about 80 percent of total funding for research and development, compared with 3 percent, and 7 percent from different sources, unlike developed nations like the United States, Europe and Japan where the share of the private sector in funding scientific research of 52 percent. To 70 percent. This is due to the fact that this sector of scientific research and its usefulness. Hence we must encourage the private sector to invest in scientific research and allocate a portion of its annual profits to support research efforts.

Finally, to achieve food security be conditional on improving the performance of the agricultural sector and increase agricultural productivity in Egypt, in order to achieve this goal must be to acquire agricultural technology and scientific progress to develop agricultural methods of crop production.

References:

1. Afaf Zaki Ali Osman. An economic study of the economic and socialfactors influencing the consumption of animal protein in Egypt, the Egyptian Journal of agricultural economics, Volume 11, number 1, March 2001.
2. Central Agency for public mobilization and statistics, statistical year book.
3. Ministry of agriculture and land reclamation, economic affairs sector, food scales, different numbers.

4. Ministry of agriculture and land reclamation. Economic affairs sector, livestock statistics, unpublished data, different numbers.
5. Newsletter of the United Nations in Egypt, January 2013.
6. Hanan Mohamed Mahrous. Economic analysis of dairy production in Egypt, the Egyptian Journal of agricultural economics, volume 25, number 3, September 2015.
7. Iman Mohamed Ahmed Bedewi. Wheat production role in the food security of Egypt, Egyptian Journal of agricultural economics, volume 25, number 4, December 2015, pp 1675-1690.
8. Talaat RezkAllah El nakkadi, and others. Food security in local and international variables, Egyptian Journal of agricultural economics, t wentieth Congress of agricultural economists, 16, 17 October 2012, pp 219-234.
9. Samar Shazili Abdul Jalil. Dairy production and achieve food security in Egypt, the Egyptian Journal of agricultural economics, volume 21, issue 1, March 2011.
10. Yahya Mohamed Metwaly, Akram Ibrahim Ali. An economic study on dairy production and consumption in the Arabic Republic of Egypt, the Egyptian Journal of agricultural economics, volume 20, issue 1, March 2010, pp 141-150.
11. Yahya Mohamed Metwally Khalil, Khaled Abdul Hamid Hassanein. An economic study on the food security of the most important strategic food commodities, Egyptian Journal of agricultural economics, twentieth Congress of agricultural economists, 16, 17 October 2012, pp 137-146.

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