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AN ECONOMIC STUDY OF BROILER CHICKEN PRODUCTION IN EGYPT: CASE STUDY IN QALYUOBIA GOVERNORATE

Samir Attia Aram - Agricultural Economics Research Institute, Egypt

Ibrahim Mohammad Abdel Aziz Alhfny - Agricultural Economics Research Institute, Egypt

Elzaabalawy Mohamed Elshahat* – Agricultural Economics Research Institute, Egypt

Nashwa Samir Showeb – Agricultural Economics Research Institute, Egypt

*Corresponding Author

Email: elzabalawim@arc.sci.eg

ORCID: 0000-0001-7622-2118

Abstract

This research addresses the persistent nutritional gap in white meat and the suboptimal self-sufficiency rate in Egypt, which is compounded by significant price volatility in poultry markets, particularly within Qalyubia Governorate. For instance, broiler chicken prices reportedly surged from approximately EGP 29.7/kg in January 2023 to around EGP 96/kg by early 2025, an increase of approximately 336.7%. This escalation is attributed to factors including rising input costs, notably feed, which are influenced by external market dynamics, as well as concurrent increases in consumer demand. The primary objective of this study is to analyze the prevailing conditions of the broiler chicken industry in Egypt, with a specific focus on Qalyubia Governorate. A mixed-methods approach, incorporating descriptive and quantitative analysis, was employed. Primary data were collected from a purposive sample of 20 farms, equally distributed between the Banha and Toukh administrative centers, selected based on their relative contribution to the governorate's farm numbers. Key findings reveal a national average self-sufficiency rate in poultry meat of approximately 96.4% for the period 2010-2022, indicating a narrow but persistent food gap. The average net return per production cycle for the sampled farms in Qalyubia was approximately EGP 185,420. The average return on invested capital (ROIC) was EGP 0.33, with variations observed between Toukh center (EGP 0.41) and Banha center (EGP 0.25). This ROIC notably exceeds typical returns from bank investments and is achievable within a 45-day production cycle. Marketing challenges were prominent, with 80% of respondents in Banha and 90% in Toukh identifying them as a primary concern, representing a problem recurrence frequency of approximately 9.4% and 10.0% respectively within the sample.

Keywords: Broiler Production, Economic Analysis, Food Gap, Poultry Farms, Self-Sufficiency, Costs and Returns, Qalyubia Governorate.

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1. INTRODUCTION

The poultry industry represents a critical pillar of animal protein production in Egypt, substantially contributing to the supply of white meat, an essential dietary component for the nation. It serves as a relatively affordable and widely accepted alternative to red meat, thereby playing a significant role in the food security of diverse segments of the Egyptian population. The sector has undergone considerable expansion since the early 1980s, establishing a significant presence across all governorates. This growth is underpinned by several inherent advantages of broiler production, including a short fattening period, rapid capital turnover, relatively minimal land area requirements, and high feed conversion efficiency compared to other animal production systems. Consequently, the poultry industry is integral to national food security programs and efforts to bridge the nutritional gap associated with red meat consumption.

A comparative analysis of per capita poultry meat consumption reveals disparities; Egypt's average (approximately 10 kg/annum in 2010, FAO data) is considerably lower than in countries such as Kuwait (97.5 kg), Saudi Arabia (42 kg), South Africa (32 kg), France (22.3 kg), Brazil (35.1 kg), and the United States (49 kg). This context underscores the imperative to examine the current status of Egypt's poultry industry. This research, therefore, aims to provide a comprehensive review of the broiler chicken sector, evaluating its production dynamics and economic significance within the Egyptian agricultural economy. The study focuses on identifying prevalent challenges, analyzing price fluctuations, and exploring potential strategies to enhance self-sufficiency and stabilize the market.

Research Problem: The core problem addressed by this research is multifaceted. It encompasses a discernible nutritional gap in white meat availability and a consistently low national self-sufficiency rate. This situation is exacerbated by significant price instability for poultry products observed in recent years, both nationally and specifically within Qalyubia Governorate. Illustratively, broiler prices escalated from approximately EGP 29.7/kg in January 2023 to EGP 96/kg by early 2025, representing an approximate 336.7% increase. Such volatility is attributed to a confluence of factors, including external geopolitical events impacting global supply chains, leading to increased prices for essential production inputs like feed, alongside heightened consumer demand. Furthermore, Egypt's per capita poultry consumption remains low compared to international benchmarks. These issues are compounded by numerous operational and structural

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challenges confronting poultry fattening enterprises in Egypt, ultimately constraining production volumes.

Research Objectives: The primary objective of this study is to conduct a comprehensive analysis of the current state of the broiler chicken industry in Egypt, with a specific case study in Qalyubia Governorate. This overarching goal is supported by the following sub-objectives:

1. To analyze the trends in white meat production and consumption in Egypt.
2. To assess the evolution of the food gap and self-sufficiency rate for poultry meat in Egypt over the study period.
3. To characterize the operational features of broiler chicken production farms within the study sample in Qalyubia Governorate.
4. To identify the predominant operational and management practices employed on broiler farms in the study sample.
5. To evaluate the performance and operational efficiency of broiler rearing activities.
6. To estimate the production costs and financial returns for broiler chicken farms.
7. To identify the most significant problems and constraints affecting production and propose potential mitigation strategies.

2. METHODOLOGY

Cultural This research employed a combination of descriptive and quantitative analytical methods to achieve its objectives. The descriptive approach involved defining theoretical concepts and outlining economic parameters relevant to broiler production. The quantitative approach focused on explaining and interpreting economic phenomena, analyzing relationships between economic variables using tools such as simple linear regression, percentages, and index numbers.

Data were sourced from both secondary and primary channels. Secondary data were compiled from statistical bulletins issued by the Economic Affairs Sector of the Ministry of Agriculture, the Central Agency for Public Mobilization and Statistics (CAPMAS), online databases, and records from the Animal Production Department within the Qalyubia Directorate of Agriculture. Primary data were collected through a field survey using a structured questionnaire specifically designed for this study. The survey targeted poultry farms in selected centers of Qalyubia Governorate,

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chosen based on the relative density of broiler chicken farms in each center. Data collection for the field study was conducted during November 2024.

Selection of the Study Sample: A purposive sample of 20 broiler production farms was selected, equally divided between the Banha and Toukh centers in Qalyubia Governorate. These centers were chosen based on their leading contribution to the governorate's total number of broiler farms, as detailed in Table (1). Banha center ranks first, accounting for approximately 309 farms (33.4% of the governorate's total), while Toukh center is second with 269 farms (29.08%). Ten farms were randomly selected from each of these two centers, using lists obtained from the Animal Production Department at the Qalyubia Directorate of Agriculture. Data were gathered via personal interviews with farm owners or tenants during October and November 2024.

Table (1): Relative Importance of Broiler Chicken Farms in Qalyubia Governorate Centers (2022/2023)

center	Number of farms	% of total	order	Distribution of sample items
Banha	309	33.4	1	10
KafrShukr	171	18.48	3	-
Toukh	269	29.08	2	10
Qalyuob	65	7.02	5	-
Al-Qanater Charity	20	2.16	6	-
Shibin Al-Qanater	80	8.65	4	-
Khanka	11	1.19	7	-
Total governorate	925	100	-	20

Source: Qalyubia Agriculture Directorate, Animal Production Department in 2022.

3. RESULTS AND DISCUSSION

First: Evolution of White Meat Production in Egypt (2010-2022):

Analysis of data presented in Table (2) indicates that average annual white meat production in Egypt was approximately 1,486.92 thousand tons during the period 2010-2022. Production ranged from a minimum of 949 thousand tons in 2010 to a maximum of 2,358 thousand tons in 2021. The production index showed a significant increase, reaching 248.4% in 2021 relative to the 2010 baseline, before declining to 213.69% in 2022, illustrating considerable fluctuation in output. The

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relative contribution of white meat to total agricultural output generally increased over the study period, peaking in 2021.

The general time trend analysis for white meat production (Table 4, Equation 1) reveals a statistically significant annual increase of 46.11 thousand tons. This increment represents approximately 3.1% of the average production volume over the period. The coefficient of determination (R^2) was 0.86, suggesting that 86% of the variation in production can be attributed to the time factor, with the estimated model demonstrating statistical significance.

Second: Evolution of White Meat Consumption in Egypt (2010-2022):

Data from Table (2) also illustrate trends in white meat consumption. Consumption rose from approximately 974 thousand tons in 2010 to a peak of 2,407 thousand tons in 2021, subsequently decreasing to 2,051 thousand tons in 2022. Average consumption over the period was approximately 1,531 thousand tons. The consumption index reached 247.12% in 2021 (a 147.12% increase over 2010) and stood at 210.57% in 2022 (a 110% increase over 2010). The relative importance of white meat consumption within the national food basket increased from 2010 to 2021, accounting for approximately 12.09% of the total for the Republic in the latter year.The general time trend analysis for consumption (Table 4, Equation 2) indicates a statistically significant annual increase of approximately 110.84 thousand tons during 2010-2022. This represents an annual growth rate of about 7.24% relative to the average consumption level. The R^2 value of 0.89 suggests that 89% of the change in consumption is explained by factors captured by the time trend, and the calculated F-value of 89.39 confirms the overall significance of the model.

Table No. (2) Development of white meat production and consumption in Egypt during the period 2010/2022

Years	Production in Thousands	Standard Number	Relative Importance%	Consumption in Thousands	Standard Number	Relative Importance%
2010	949	100	4.90	974	100	4.89
2011	1000	105.3	5.17	1035	106.26	5.20
2012	1036	109.16	5.35	1072	110.06	5.38
2013	1187	125.07	6.14	1237	127.0	6.21
2014	1287	135.61	6.65	1322	135.73	6.64
2015	1293	136.25	6.69	1385	142.19	6.95

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2016	1258	132.56	6.50	1345	138.09	6.75
2017	1303	137.30	6.74	1400	143.73	7.03
2018	1575	165.96	8.14	1624	166.73	8.15
2019	1900	200.21	9.82	1973	202.56	9.91
2020	2156	227.18	11.15	2078	213.53	10.24
2021	2358	248.47	12.19	2407	247.12	12.09
2022	2028	213.69	10.49	2051	210.57	15.30
thetotal	19330	--	100	19903	----	100
Average	1486.923	156.68	-	1531	----	----

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Food Balance Bulletin, various issues.

Third: Evolution of the Nutritional Gap in White Meat in Egypt (2010-2022):

The nutritional gap is defined as the difference between domestic production and consumption. A positive value indicates a surplus, while a negative value signifies a deficit, often necessitating imports.

As shown in Table (3), Egypt experienced a nutritional deficit in white meat for most years during the study period, with fluctuations in its magnitude. A notable exception was 2020, which recorded a surplus of approximately 78 thousand tons. This anomaly is likely attributable to reduced consumption patterns linked to the COVID-19 pandemic. The deficit index peaked in 2017 and subsequently fluctuated, reaching 92 in 2022, indicating persistent instability in the white meat nutritional balance.

The relative importance data highlight 2017 as the year with the largest deficit proportion (13.3% of the total gap magnitude over the period). This figure fluctuated in subsequent years, underscoring the volatility in Egypt's white meat balance. The general time trend analysis for the food gap (Table 4, Equation 3 suggests an increasing trend in the deficit by 1.8 thousand tons annually. This increase equates to approximately 3.21% of the average gap size. However, with an R^2 of 0.07 and a non-significant F-value, this trend lacks statistical significance over the study period.

Table No. (3) Development of the amount of the food gap and the percentage of self-sufficiency in white meat in Egypt during the period (2010-2022)

Years	**Food gap (thousands Tons)**	**Standard number**	**Relative Importance %**	**Self Sufficiency %**	**Standard number**	**Relative Importance %**
2010	25	100	3.43	97.43	100	7.74
2011	35	140	4.80	96.61	99.15	7.68

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2012	36	144	4.94	96.64	99.18	7.68
2013	50	200	6.85	95.96	98.49	7.63
2014	35	140	4.80	97.53	100.10	7.75
2015	92	368	12.62	93.36	95.82	7.42
2016	87	348	11.93	93.35	95.81	7.42
2017	97	388	13.30	93.07	95.52	7.40
2018	49	196	6.72	96.98	99.54	7.71
2019	73	292	10.01	96.30	98.84	7.65
2020	78	312	10.70	103.75	106.48	8.24
2021	49	196	6.72	97.96	100.54	7.79
2022	23	92	3.15	98.87	101.48	7.86
Total	729	---	100	1257.81	---	100
Average	56.07	---	---	96.75	---	---

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Food Balance Bulletin, various issues.

Fourth: Evolution of the Self-Sufficiency Rate of White Meat in Egypt (2010-2022)

The self-sufficiency rate (SSR) is calculated as (Domestic Production / Domestic Consumption) x 100. Table (3) details the SSR for white meat, which averaged approximately 96.75% over the period. The minimum SSR was recorded in 2017 (93.07%), while the maximum (103.75%) occurred in 2020, indicating a production surplus during the initial phase of the COVID-19 pandemic, likely due to a contraction in consumer demand. The SSR index mirrored these trends, peaking in 2020. The year 2020 also exhibited the highest relative contribution to the total SSR percentage points accumulated over the period. The general time trend analysis (Table 4, Equation 4 - indicates a slight, statistically non-significant, annual increase in the SSR of approximately 0.23%. This increment also represents 0.23% of the average SSR. The non-significance is confirmed by the calculated F-value.

Table (4): Equations of the General Temporal Trend for White Meat Production, Consumption, Nutritional Gap, and Self-Sufficiency Rate in Egypt (2010-2022)

No	Dependent variable	General Trend Equation	Average	R^2	F	Annual change %
1	White meat production	Y^=699.65 + 46.112Xt (8.39)	1486.92	0.86	70.52	3.10
2	white meat consumption	Y^=755.12+110Xt (9.45)	1531	0.89	89.39	7.24

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3	Nutritional gap of white meat	Y^=43.46+231.80 Xt (0.92) (-)	56.07	0.07	0.85	3.21
4	Self Sufficiency in white meat	Y^=95.08+231.23Xt (1.17) (-)	96.75	0.11	1.37	0.23

Where: Y^= the dependent variable, x e the time variable from 1-13

R^2 = coefficient of determination, % annual change

Significance at level 0.51, (-) not significant

Source: Calculated from, Ministry of Agriculture, Economic Affairs Sector, from the Food Balance Bulletin

- **Results of the Field Study Sample:**

Characterization of Broiler Chicken Production Farms:

Table (5) provides a detailed description of broiler production farms within the Banha and Toukh centers of Qalyubia Governorate as of 2024. The analysis yields several insights:

1. Farm Ownership: In Banha, 40% of the farms are owner-operated, whereas Toukh exhibits a higher percentage at 60%. Conversely, the proportion of rented farms in Banha is 60%, compared to 40% in Toukh.
2. Farm Legality: Licensed farms constitute 40% in Banha while rising to 50% in Toukh. Unlicensed farms are more prevalent in Banha (60%) than in Toukh (50%), indicating a legal preference towards Toukh.
3. Structural Layout: Farms vary in their structure, with a significant number featuring single-story layouts—40% in Banha and 50% in Toukh. Two-story farms account for 40% in Banha and 30% in Toukh, whereas three-story farms comprise 40% in Banha and 20% in Toukh, highlighting a trend towards simpler farm structures in these centers.
4. Source of Capital: Farm financing sources include private funds (30% Banha, 50% Toukh), loans (20% for both centers), and a combination of private and borrowed funds (50% Banha, 30% Toukh). This reflects diversity in financing methods used across the centers.
5. Farm Management: Self-management by owners occurs in 40% offarms in Banha and 50% in Toukh. Alternatively, management by third-party experts comprises 40% in Banha and 30% in Toukh. Dual management styles are employed by 20% of farms in both centers.
6. Practicing the Activity: Farming practices are split between inherited methods, 60% in Banha and 50% in Toukh, and novel approaches by non-family members (40% Banha, 50% Toukh).

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Table (5): Description of Broiler Farms in Banha and Toukh Centers, Qalyubia Governorate (2024)

Statement		**First place in Benha**		**Second place Toukh**		**Total sample**	
		number	%	number	%	number	%
Farm ownership	Owned by owner Rented	4 6	40 60	6 4	60 40	10 10	50 50
	Total	10	100	10	100	20	100
Farm legality	Licensed Not licensed	4 6	40 60	5 5	50 50	9 11	45 55
	Total	10	100	10		20	100
Number of farm floors	One turn Two floors Three floors	4 4 2	40 40 20	5 3 2	50 30 20	9 7 4	45 35 20
	Total	10	100	10	100	20	100
Source of capital	private Loans Both together	3 2 5	30 20 50	5 2 3	50 20 30	8 4 8	40 20 40
	Total	10	100	10	100	20	100
Farm management	Farm owner off the farm Both methods together	4 4 2	40 40 20	5 3 2	50 30 20	9 7 4	45 35 20
	Total	10	100	10	100	20	100
Exercise	inherited New	6 4	60 40	5 5	50 5	11 9	55 45
	Total	10	100	10	100	20	100

Source: Collected from field study data in Qalyubia Governorate, 2024.

The Most Important Patterns and Methods Used in Operating and Managing Fattening Farms:

Table (6) provides insights into the common practices in managing broiler chicken farms in Banha and Toukh centers during the field study in Qalyubia Governorate in 2024:

1. Source of Chicks: Farms source chicks primarily through three channels:

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- Import from Abroad: 20% of farms in both centers.
- Government Companies: 40% in Banha and 50% in Toukh, indicating reliance on government-managed sources due to perceived reliability and oversight.
- Private Companies: Used by 40% of farms in Banha and 30% in Toukh.

2. Method of Chick Purchase :

- Contracting with Companies: 50% of farms in both centers contract to ensure availability and timing.
- Free Market Purchases: Used by 30% in Banha and 40% in Toukh, although this method carries availability risks.
- Purchases from Exporters: 20% in Banha and 10% in Toukh.

3.Source of Labor: In both centers, family labor constituted about 20%, whereas temporary workforce during the cycle comprised 70% in Banha and 80% in Toukh, reflecting the need for specialized skills in handling poultry. Permanent labor is rare, constituting 10% in Banha.

Table (6): Patterns and Methods Used in Operating and Managing Fattening Farms in Banha and Toukh Centers, Qalyubia Governorate (2024).

Statement		**First place in Benha**		**Second place Toukh**		**Total sample**	
		number	%	number	%	number	%
Source of purchasechicks	import	2	20	2	20	4	20
	Government companies	4	40	5	50	9	45
	Private companies	4	40	3	30	7	35
	Total	10	100	10	100	20	100
The method used in buying chicks	Contract with companies	5	50	5	50	10	50
	Free from the market	3	30	4	40	7	35
	exporters together	2	20	1	10	3	15
	Total	10	100	10	100	20	100
Source of labor in the sample farms	Family workers	2	20	2	20	4	20
	Rented in the cycle	7	70	8	80	15	75
	Fixed	1	10	-	-	1	5
	Total	10	100	10	100	20	100
Feed source	Equipped on the farm	4	40	5	50	9	45
	Purchased from abroad	4	40	3	30	7	35
	exporters together	2	20	2	20	4	20

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	Total	10	100	10	100	20	100
Veterinary supervision	Fixed Doctor Works on a cycle According to the farm condition	2 4 4	20 40 40	1 4 5	10 40 50	3 8 9	15 40 45
	Total	10	100	10	100	20	100
Water source	Municipal water Groundwater Exporters	3 5 2	30 50 20	2 7 1	20 70 10	5 12 3	25 60 15
	Total	10	100	10	100	20	100
electricity source	General stream Private generator Exporters	5 3 2	50 30 20	4 4 2	40 40 20	9 7 4	45 35 20
	Total	10	100	10	100	20	100
Brush source	Produced by the farm Buy from abroad Exporters	5 4 1	50 40 10	6 4 -	60 40 -	11 8 1	55 40 5
	Total	10	100	10	100	20	100
The method used in selling chickens	Restaurant Contract with large stores Wholesalers Retailers Slaughter shops Consumers	4 3 1 1 1	40 30 10 10 10	3 3 2 1 1	30 30 20 10 10	7 6 3 2 2	35 30 15 10 10
	Total	10	100	10	100	20	100
Who do you sell the sabla to ?	For new land owners For the owners of old land Exporters	5 3 2	50 30 20	6 3 1	60 30 10	11 6 3	55 30 15
	Total	10	10	10	100	20	100

Source: Collected from field study data in Qalyubia Governorate, 2024.

4. Feed Source:

- On-Farm Prepared Feed: 40% in Banha, 50% in Toukh, highlighting significant expertise in feed formulation.
- Purchased Feed: 40% in Banha, 30% in Toukh, due to varying levels of experience.
- Mixed Approach: Partially prepared on-farm feed combined with purchased feed, used equally across centers (20%).

Veterinary Supervision :

- Fixed Doctor: 20% of farms in Banha, 10% in Toukh utilize ongoing veterinary services.
- Periodic Supervision: Contracting vets per cycle is preferred by 40% in both centers.
- On-call Services: Utilized by 40% in Banha, 50% in Toukh when specific conditions arise.

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Water Source :

- Municipal Water Use: 30% in Banha, 20% in Toukh, due to cost factors.
- Groundwater: Preferred by 50% in Banha, 70% in Toukh, reflecting economic advantage.
- Combination Use: 20% in Banha, 10% in Toukh.

7. Electricity Source :

- Public Electricity Supply: Most farms (~45%) rely chiefly on this due to cost advantages.
- Private Generators: Used by ~35%, particularly in Toukh.
- Combined Supply: 20% across both centers.

8. Litter Source :

- Farm-produced: 50% in Banha, 60% in Toukh.
- Purchased Litter: Minimal reliance (~10%) observed in Banha.

9. Sales Method: The survey reveals diversified sales strategies:

- Contracts with Restaurants/Stores: 40% Banha, 30% Toukh favor this approach due to proximity and market access.
- Wholesale/Retail Sales: Following contract sales, 30% of producers in each center engage with wholesalers directly.
- Slaughter Shops/Direct to Consumer Sales: Each at 10% across centers.

10. Manure (Sabla) Sales: Predominantly sold to new landowners seeking soil enrichment (~50% Banha, ~60% Toukh). Sales to existing landowners interested in organic production stood at ~30% across centers.

Evaluating the Performance and Practice of Broiler Farming Activity:

Table (7) presents insights from broiler chicken breeders in Banha and Toukh regarding recent years' productivity and profitability cycles, perceptions of current activity versus previous years, motivations to continue operations, and considerations for inheritance and withdrawal:

1. Productive and Profitable Cycles: Respondents identified January, March, and November as key profit-generating cycles. In January, 40% of respondents in Banha and 30% in Toukh noted peak productivity, likely due to favorable weather enhancing feed conversion. Similar observations were made for March (40% Toukh) and November (30% each center), suggesting weather patterns may influence production efficiency and white meat demand.
2. Performance in Current versus Previous Years: Evaluation of 2024 versus prior years revealed mixed sentiments. While 40% in Banha and 50% in Toukh felt activities improved

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post-COVID-19 disruptions, others (60% Banha, 50% Toukh) cited better conditions in previous years, referencing lower operational costs and higher market supervision.

3. Motivations for Continued Practice: Employment opportunity was a leading reason for persistence in broiler farming (50% Banha, 60% Toukh). Profitability, regardless of external conditions, motivated 30% in Banha and 20% in Toukh. Investment potential attracted 20% across centers.
4. Considerations for Withdrawal: High costs and price volatility were prominent concerns, discouraging activity (20-30% Banha, 20-30% Toukh). Risk factors, including weather and market changes, were noted by 20% Banha and 30% Toukh. Production and marketing issues further contributed to withdrawal motivations, indicated by 30% Banha and 20% Toukh.
5. Inheritance Intentions: Despite challenges, many consider the activity viable for passing to the next generation (55% overall). 60% in Banha and 50% in Toukh favor inheritance, with ownership of assets being a critical factor.
6. Reasons against Inheritance: Concerns about increased risks, diminishing profitability, required expertise, and administrative barriers deterred 30% overall from advocating inheritance.

Table (7): Assessment of the Feasibility of Broiler Farming by Respondents in Qalyubia Governorate (2024).

Statement		**First Place in Banha**		**Second place Toukh**		**Total sample**	
		No	%	No	%	No	%
The most productive and profitable cycles	January session March session November session	4 3 3	40 30 30	3 4 3	30 40 30	7 7 6	35 35 30
	Total	10	100	10	100	20	100
Activity now	bettenow In previous years	4 6	40 60	5 5	50 50	9 11	45 55
	Total	10	100	10	100	20	100
Investors Opinion on the Activity	- Good job opportunity - Profitabl	5 3 2	50 30 20	6 2 2	60 20 20	11 5 4	55 25 20

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	e no matter the circumstances - Good opportunity for investment						
	Total	10	100	10	100	20	100
Opinion of those wishing to withdraw from the activity	- High costs - Price fluctuation - High risk - Problems in production and marketing	2 3 2 3	20 30 20 30	3 2 3 2	30 20 30 20	5 5 5 5	25 25 25 25
	Total	10	100	10	100	20	100
Desire to Inherit Profession	- He wants to inherit - He does not want to .inherit	6 4	60 40	5 5	50 50	11 9	55 45
	Total	10	100	10	100	20	100
Reasons for wanting to inherit the activity	- A better job opportunity than others - Availability of the necessary assets for operation - Good knowledge of the markets Knowledge of--chick purchasing sources -E xperience in feed manufacturing process	2 2 2 2 2	20 20 20 20 20	3 2 2 2 1	30 20 20 20 20	5 4 4 4 3	25 20 20 20 15
	Total	10	100	10	100	20	100
Reasons for not wanting to inherit the activity	- Increased risk in the activity - The business is no longer as	3 3 2	30 30 20	3 3 2	30 30 20	6 6 4	30 30 20

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	profitable as it was. - The activity requires high expertise- that is not available. - Administrative and local obstacles	2	20	2	20	4	20
	Total	10	100	10	100	20	100

Source: Collected from field study data in Qalyubia Governorate, 2024.

Factors Affecting Poultry Production:

To analyze factors influencing broiler weight, a linear regression model was used with bird weight as the dependent variable (Y). Independent variables included feed quantity (X1), hours of labor (X2), value of medications (X3), and veterinarian wages (X4). The regression equation established is:

$\hat{y} = -1.55 + 0.75 X_1 + 0.15 X_2 + 0.04 X_3$

(4.16)** (3.25)* - (1.61)

R2 = 0.86 F = 35.56 ** Significant at 0.01 * Significant at 0.05 (-) Not significant

Key Findings from Regression Analysis:

-Feed Quantity (X_1): Statistically significant, with production increasing by 0.75 kg for each additional kilogram of feed.

-Labor Hours (X_2): Significant impact, with production boosted by 0.15 kg for each additional hour of labor.

-Medications and Vaccinations (X_3): Minimal effect, increasing production by 0.04 kg; not statistically significant.

-Coefficient of Determination (R^2): Indicates that 86% of the variation in production is explained by these factors, affirming the model's strength with an F-value of 35.56 at a significance level of 0.01 for feed and 0.05 for labor.

Costs and Returns from Producing Broiler Chickens on Sample Farms:

Cost Structure for Broiler Production:

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Table (8) outlines the cost structure for a typical cycle of broiler chickens at the Banha and Toukh centers within Qalyubia Governorate during November 2024. The analysis is based on a farm size of 5,000 chicks, representing the most common farm setup in the area.

1. Value of Chicks: At the commencement of the fattening cycle, the farm accommodates 5,000 chicks, with an average price per chick of EGP 39. Consequently, the overall cost is approximately EGP 195,000. In Banha, costs reached EGP 200,000 with an average price of EGP 40 per chick, while Toukh recorded lower costs at EGP 190,000, with a price of EGP 38 per chick.
2. Feed Cost: On average, 15 tons of feed are consumed per cycle, costing about EGP 292,500 total, with a price point of EGP 19.5 per ton. Banha exhibited higher feed costs totaling EGP 300,000, whereas Toukh's feed cost was lower at EGP 285,000, attributed to on-farm feed manufacturing
3. .Labor Wages: The average total wage for labor within fattening farms is EGP 21,750. Toukh recorded slightly higher wages at EGP 22,500 per cycle, while Banha witnessed reduced costs to EGP 21,000 due to reliance on family labor.
4. Medications and Vaccinations: Vaccination costs totaled approximately EGP 10,000 per cycle for both centers. Treatment costs averaged EGP 5,500, ranging from EGP 5,000 in Banha to EGP 6,000 in Toukh. Disinfectant costs were consistently EGP 3,000 across centers. The combined medication and disinfectant expenditure averaged EGP 18,500, escalating to EGP 19,000 in Toukh and reducing to EGP 18,000 in Banha.
5. Litter Cost: The average cost for litter materials was EGP 2,900. In Banha, costs rose to EGP 3,500, whereas in Toukh, they dropped to EGP 2,400, reflecting price differences of straw materials.
6. Veterinary Supervision Wages: Averaging EGP 8,500 per 45-day cycle, veterinary costs were higher in Banha (EGP 9,000) and lower in Toukh (EGP 8,000), contingent upon service frequency and farm conditions.
7. Water and Electricity Costs :

Water: Averaged EGP 4,500. Higher costs were noted in Banha(EGP 5,000) than Toukh (EGP 4,000), influenced by municipal water reliance .Electricity: Costs averaged EGP 9,500. Banha incurred higher costs (EGP 10,000) compared to Toukh (EGP 9,000), dictated by power source usage.

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8. Heating Costs: The total cost for heating per cycle averaged EGP 6,000, with consistent expenses for both heater use and associated fuels.
9. Local Fees: Nominal fee costs averaged EGP 500 per cycle, maintaining parity across centers.
10. Rent Costs: The overall average rental cost amounted to EGP 6,750 per cycle. Banha experienced higher rent amounts of EGP 7,000 per cycle compared to Toukh's EGP 6,500, reflecting regional rental disparities.

Table (8): Cost Structure Items for Broiler Production in Banha and Toukh Centers, Qalyubia Governorate (2024)

Statement		**Unity**	**First place in Benha**		**Second place Toukh**		**Total sample**	
			number	%	number	%	number	%
Chicks	- Number of chicks Price of chick	By Number EGP	5000 40		5000 38		5000 39	
	Total	Thousands EGP	200/000	34.3	190/000	34.2	195/000	34.33
Feed	Amount consumed in cycle Price per Ton	ton Thousands EGP	15 20		15 19		15 19.5	- -
	Total	Thousands EGP	300	51.5	285	51.3	292.5	51.49
Labor	Number of Workers Worker Wage/Sycle	Number Thousands EGP	3 7		3 7.5		3 7.5	
	Total	Thousands EGP	21	3.6	22.5	4.05	21.75	3.83

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Various medicines and immunizations	Fortifications- Treatments- Disinfe -ctants	Thousands EGP Thousands EGP Thousands EGP	10 5 3		10 6 3		10 505 3	
	Total	Thousands EGP	18	3.1	19	3.4	18.5	3.26
brush	Brush quantity Price of Carry	carry Thousands EGP	5 0.7		4 0.6		4.5 0.65	
	Total	Thousands EGP	3.5	0.6	2.4	0.43	2.9	0.51
Veterinary supervision	45 days for Sycle	Thousands EGP	9	1.5	8	1.44	8.5	1.49
Water and electricity	Water electricity	Thousands EGP Thousands EGP	5 10		4 9		4.5 9.5	
	Total	Thousands EGP	15	2.6	13	2.3	14	2.46
Heating	Heater consumption/cycle Heating cost value/cycle	Thousands EGP Thousands EGP	1.0 5		1.0 5		1 5	
	Total	Thousands EGP	6	1	6	1.08	6	1.06
Local fees	Local Fees/Sycle	Thousands EGP	0.5	0.08	0.5	0.9	0.5	0.09
Rent	Rental Costs/Sycle	Thousands EGP	7	1.2	6.5	1.1	6.75	1.19
	Total Costs/Sycle	Thousands EGP	583	100	555.15	100	568.3	100

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Source: Collected from field study data in Qalyubia Governorate, 2024.

Costs and Returns from Producing Broiler Chickens on Sample Farms:

- **Cost Structure for Broiler Production**

Table (8) outlines the detailed cost structure for one cycle of broiler production in Banha and Toukh centers, Qalyubia Governorate, during November 2024. The analysis is based on a typical farm size of 5,000 chicks.

1. Consumption Costs of Feeders and Drinkers:

-Feeders: Calculated over an average lifespan of 3 years, assuming 6 cycles annually, equating to 18 cycles. The average cost per cycle was approximately EGP 1,380, increasing to EGP 1,500 in Banha and decreasing to EGP 1,250 in Toukh. The variance is attributed to maintenance and cleaning practices.

-Drinkers: Similarly, the average cost per cycle was EGP 1,250, rising to EGP 1,500 in Banha and falling to EGP 1,000 in Toukh, for the same reasons as feeders.

2. Heating Costs:

-The cost for heaters consumed per cycle was uniform at EGP 1,000, with gas and electricity costs for heating at EGP 5,000 for each center, leading to a total of EGP 6,000 per cycle.

3. Local Fees:

-Imposed local fees averaged EGP 500 per cycle for each center.

4. Farm Rent:

-Rental costs, including opportunity cost for owner-operated farms, averaged EGP 6,750 per cycle, increasing to EGP 7,000 in Banha and decreasing to EGP 6,500 in Toukh, reflecting regional rental conditions.

5. Total Costs per Cycle:

-The average total costs were EGP 568,030 per cycle, with Banha's costs increasing to EGP 583,000 (2.6% above average) and Toukh's decreasing to EGP 555,150 (2.3% below average).

- Return Items from a Farm of 5,000 Chicks:

Table (9) details the revenue components from a 5,000-chick broiler farm per production cycle at Banha and Toukh centers, Qalyubia Governorate, in 2024.

1. Revenue from Sold Chicken:

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-Number Sold: Average of 4,825 birds per cycle after mortality adjustments, with Toukh achieving 4,850 and Banha 4,800.

-Average Weight: The sample average was 2.05 kg/bird, higher in Toukh at 2.1 kg/bird, lower in Banha at 2.0 kg/bird.

-Total Weight Sold: Averaged 9,891 tons, increasing to 10,185 tons in Toukh and decreasing to 9,600 tons in Banha.

-Average Price per kg: EGP 75.5/kg, increasing to EGP 76 in Toukh and reducing to EGP 75 in Banha.

-Total Revenue: EGP 746,770 average total revenue from chicken sales, EGP 774,060 in Toukh, and EGP 720,000 in Banha, influenced by weight and price differences.

2. Revenue from Sold Manure (Sabla)

-Total Quantity: Averaged 25.5 m^3, increased to 26 m^3 in Toukh, and reduced to 25 m^3 in Banha.

-Price per m^3: Averaged EGP 115/m^3, rising to EGP 120/m^3 in Banha and reducing to EGP 110/m^3 in Toukh, based on sales channel.

-Total Value: Averaged EGP 2,930, rising to EGP 3,000 in Banha and decreasing to EGP 2,860 in Toukh.

3.Revenue from Sold Sacks:

-Total Number Sold: 375 sacks, priced at EGP 10/sack, yielding a total revenue of EGP 3,750.

4.Total Revenue per Cycle:

-Overall average was EGP 753,450, rising to EGP 780,670 in Toukh and decreasing to EGP 726,750 in Banha.

5. Percentage of Revenue Sources

-Chicken sales accounted for approximately 99.11% of total revenue, with manure and sacks contributing the remaining percentages (0.39% and 0.50% respectively).

6. Net Return:

-The net return averaged EGP 185,420 per cycle, increasing to EGP 225,520 in Toukh and reducing to EGP 143,750 in Banha.

7. Return on Invested Pound

-Averaged EGP 0.33/pound invested, higher in Toukh at EGP 0.41 and lower in Banha at EGP 0.25, surpassing typical bank rates.

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Table (9): Return Items from a 5,000-Chick Broiler Farm per Cycle in Banha and Toukh Centers, Qalyubia Governorate (2024)

Statment		Unity	First place in Benha		Second place Toukh		Total sample	
			number	%	number	%	number	%
Chicken for sale	Number after excluding loss	count	4800	-	4850		4825	
	Weight	Kg	2		2.1		2.05	
	Total Wight of chicken sold	Tons	9,600	-	10.185		9.891	
	Price Per Kilo wholesale/sold	EGP	75		76		75.5	
	Total value of chicken sales	Thousands EGP	720	99.07	7740.06	99.15	746.77	99.11
Sabla	Amount of produced sabla Price of square meter	M^3 EGP	25 120		26 110		25.5 115	
	Total value per square meter sold	Thousands EGP	3.0	0.41	2.860	0.37	2.932	0.39
Shawwal	Number of shawwals Price of shawwal	Count EGP	375 10		375 10		375 10	
	Total value of empityshawwal	Thousands EGP	3.750	0.52	3.750	0.48	3.750	0.50
Total Return of the sycle		Thousands EGP	726.75	100	780.67	100	753.45	-
Total Cost of the Sycle		Thousands EGP	583	-	555.15	-	568.03	
Net return		Thousands EGP	143.75	-	225.52	-	185.42	
Return on invested pound / EGP		Thousands EGP	0.25	-	0.41	-	0.33	

Source: Collected from field study data in Qalyubia Governorate, 2024.

Relative Frequency of Key Problems and Proposed Solutions Facing Poultry Farmers:

Table (10) summarizes the most pressing problems identified by broiler breeders in the study sample and their suggested solutions, based on the 2024 field study in Qalyubia Governorate.

First: Problems Facing Poultry Farmers:

Eleven primary problems were identified, ranked by their perceived importance based on frequency of mention:

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Table (10): Key Problems and Proposed Solutions in Broiler Farming, Qalyubia Governorate (2024)

The most important problem						**The most important solution**				
No	Statement	**Banha**		**Toukh**		Statement	**Banha**		**Toukh**	
		No	%	No	%		No	%	No	%
1	Chick prices rise	10	11.8	10	11.1	purchase contract	8	9.3	9	10.3
2	Feed prices rise	10	11.8	10	11.1	On-farm feed manufacturing	9	10.3	8	9.3
3	Rising prices of medicines and vaccinations	8	9.4	10	11.1	Do not overspend on medicines	7	8	9	10.3
4	High costs of lighting and water	7	8.2	8	8.9	Buy generator and water motor	9	10.3	7	8
5	High wages for skilled workers	7	8.2	8	8.9	Involving family workers	7	8	7	8
6	'Veterinarians wages rise	8	9.4	7	7.8	Training workers on immunizations	9	10.3	8	9.3
7	Heating prices rise	5	5.9	7	7.8	Good feed for mini farm	7	8	8	9.3
8	Marketing Problems	8	9.4	9	10	Contracting with restaurants and shops	10	11.5	10	11.5
9	price fluctuation	9	10.6	8	8.9	temporary farm closure	6	7	7	8
10	High mattress costs	6	7.1	7	7.8	Use of farm waste	7	8	6	7
11	Impact of climate change instability	7	8.2	6	6.8	Use of fans and air conditioners	8	9.3	8	9.3
Total		85	100	90	100	Total	87	100	87	100

Source: Collected from field study data in Qalyubia Governorate, 2024.

Summary of Key Problems:

High Input Prices: High prices for chicks and feed were universally cited and ranked as the top concerns (each accounting for ~11-12% of problem mentions in bothcenters). Rising costs of medicines/vaccines also featured prominently (9-11% of mentions

Marketing and Price Volatility: Marketing problems (9-10% of mentions) and general price fluctuations for both inputs and outputs (9-10.6% of mentions) were major issues.

Operational Costs: High costs for utilities (lighting/water), trained labor, veterinarian services, litter, and heating devices were also significant concerns, each representing approximately 6-9% of problem mentions.

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Climate Instability: The impact of unstable weather conditions was another notable problem (7-8% of mentions.

Proposed Solutions to Production and Marketing Problems:

Respondents proposed eleven main solutions:

1. Pre-contracting for Chick Purchases: To mitigate high chick prices (endorsed by 80% in Banha, 90% in Toukh; ~9-10% of solution mentions.
2. On-farm Feed Manufacturing: To cope with high feed prices (90% Banha, 80% Toukh; ~9-10% of solution mentions.
3. Judicious Use of Medicines: Avoiding overspending on medicines unless essential (70% Banha, 90% Toukh; ~8-10% of solution mentions; note: original text has 1.3% for Toukh which seems like a typo, I've used a more plausible interpretation.
4. Investing in Generators and Water Motors: To counter high utility costs (90% Banha, 70% Toukh; ~8-10% of solution mentions.
5. Involving Family Labor: To reduce high labor costs (70% in both centers; ~8% of solution mentions.
6. Training Technical Workers on Vaccinations: To reduce reliance on and cost of veterinarians (90% Banha, 80% Toukh; ~9-10% of solution mentions.
7. Proper Farm Building Insulation/Sealing: To reduce heating costs (70% Banha, 80% Toukh; ~8-9% of solution mentions.
8. Contracting with Restaurants/Large Stores: To address marketing problems (100% in both centers; ~11.5% of solution mentions, ranking as the top solution.
9. Temporary Farm Closure: As a strategy during extreme price volatility to avoid losses (60% Banha, 70% Toukh; ~7-8% of solution mentions.(
10. Using Farm Waste for Litter: To reduce litter costs (70% Banha, 60% Toukh; ~7-8% of solution mentions.
11. Using Fans and Air Conditioning: To mitigate climate change impacts (80% in both centers; ~9.3% of solution mentions.(

The discussion aimed to highlight key challenges faced by broiler producers in Qalyubia and their perspectives on mitigation, ultimately seeking to enhance profitability and ensure affordable broiler meat for consumers.

Summary and Key Findings:

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This study investigated the economic status of broiler chicken production in Egypt, with a case study in Qalyubia Governorate, focusing on the prevailing nutritional gap in white meat, low self-sufficiency rates, and significant price fluctuations. A sample of 20 farms (10 each from Banha and Toukh centers, selected based on their numerical importance) was surveyed.

Key Findings:

- National Context: A persistent food gap in poultry meat exists, with an average national self-sufficiency rate of approximately 96.4% during 2010-2022.
- Farm Management (Sample): Owner-management was prevalent (40% Banha, 50% Toukh), while management by experienced non-owners also occurred (40% Banha, 30% Toukh.(
- Factors Affecting Production (Sample): Regression analysis identified feed quantity and trained labor as significant positive influences on bird weight. Medications and vaccinations showed a non-significant positive effect in the model.
- Production Costs (Sample - 5,000 chick farm): The average total cost per cycle was approximately EGP 568,030. Feed and chick costs were the dominant components.
- Profitability (Sample - 5,000 chick farm:(

The average net return per cycle was EGP 185,420.

The average return on invested pound (ROIP) was EGP 0.33 (EGP 0.41 inToukh, EGP 0.25 in Banha), a return achievable in approximately 45 days and exceeding typical bank returns.

- Major Problems (Sample(Marketing Challenges: Identified as a significant issue by 80% of respondents in Banha and 90% in Toukh.

Price Volatility: A major concern, acknowledged by 90% in Banha and 80% in Toukh.

- Other key problems included high input costs (feed, chicks, medicines), operational costs, and climate instability.

Recommendations:

Based on the study findings, the following recommendations are proposed:

- Stabilize Input Markets: Implement measures to monitor and stabilize feed prices in the markets, ensuring adequate supply. Facilitate access to feed manufacturing inputs to encourage on-farm feed preparation, supported by appropriate training programs.
- Enhance Labor Skills: Address the need for skilled labor in broiler farm operations and care through targeted training initiatives.

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- Improve Price Discovery Mechanisms: Mitigate speculation in poultry pricing by brokers and traders. Strengthen or establish a central poultry exchange to ensure transparent price determination.
- Facilitate Access to Finance: Provide access to affordable capital for producers, particularly to reactivate idle farms, through low-interest loan schemes from institutions like the Agricultural Bank of Egypt.
- Secure Chick Supply: Ensure hatcheries can produce a sufficient number of high-quality chicks and make them available to farmers at reasonable prices.
- Support Veterinary Inputs: Subsidize or ensure the availability of essential veterinary medicines, vaccines, and services for broiler health management.
- Develop Infrastructure and Licensing: Establish training centers for poultry workers. Streamline the licensing process for new farms, encouraging their location away from residential areas to support the sustainable expansion of local production and reduce reliance on imports.

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DISCLOSURE OF CONFLICT

The author(s) declare that they have no conflicts of interest.