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Economic problems of poultry production in Egypt

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I. – Introduction

Poultry production has become an industry, rather than an agricultural activity. The major conditions required to make such an industry an efficient sector in a given national economy are:

1) mass production
2) large scale entreprises
3) horizontal and vertical integration as a marketing institution pattern

Because of the high investment attractiveness criteria shown by this industry (associated with severe shortages in animal protein production in most developing countries) national investments were strongly devoted towards expansion in broiler and egg production.

Governments encouraged such expansion in the poultry industry through several economic policies. The most common were subsidy policy, finance policy and protection of domestic production from imports through tariffs or restrictions.

However, government interventions and the much higher prices of substitutes (red meat, fish and milk) hid the economically inefficient performance of the poultry industry in many Middle East countries. These problems increased the burden on either the government budget or the consumer budget.

This article presents the major economic problems of poultry production in Egypt. Illustrative cases were taken from empirical field studies in Egypt (see attached reference list). Even though the author has participated in related studies in neighbouring countries which have shown similar performances, he restricted the empirical results to the case study of Egypt in order to avoid bias.

II. – Criteria that identify economic inefficiency in the poultry market

The two major criteria which can be used to identify the current economic inefficiency in the poultry market are:

I°- **Price spread**: this identifies the location of the marketing inefficiency among several internal market levels. It shows the share of each level of the market in the consumer's money spent on a given commodity.

Table 1 shows the price spread model for broilers. It is possible to conclude that the trader's profit (14,2%) is higher than the producer's profit (10,8%), although the latter bears high risks in production, marketing and price fluctuations. In addition, the trader does not offer much marketing services (cost of marketing is onlly 1.9%). On the other hand, feed processing enjoys high profits (8.2%) with minimum, if

any, risk. The government was responsible for the importation of corn (65% of the feed content) and providing it at subsidized price to processing plants until 1986. Because of feed shortages the producers do not suffer from any price fluctuations. They sell feeds at continuously increasing prices. Low feed efficiency and poor feed quality add to the inflation of production costs. The burdens are transfered to the consumer as feed ingredients represent 33.5% of retail prices.

Table 1 shows the price spread model for table eggs. It is easy to reach the same results with respect to the feed processing profit and producer's profit. Trader's margin is less than broiler because this market enjoys to some extent a better marketing conditions. There is a significant proportion of transactions under a contracted price system.

II°- **Comparative advantage criteria**: this compares the economic efficiency of poultry production in a given country with the international market. The operational indicator used is "Net Economic Protection Coefficent" (NEPC).

$$NEPC = \frac{\text{Net economic cost of production per unit at shadow prices}}{\text{International price at shadow exchange rate}}$$

Where, shadow prices of inputs = prices without subsidies or taxes at shadow exchange rate

if NEPC > 1, this implies that a given country does not have comparative advantage in the production of a given commodity;

if NEPC ≤ 1, this implies that a given country has a comparative advantage in producing a given commodity.

With respect to broilers, the MEPC of Egypt is 1.10, i.e. some adjustments are required to make the domestic cost of production equivalent to the international one. With respect to table eggs, the NEPC is 0.75, i.e., there is a comparative advantage of Egypt in table eggs production. This measure leads one to investigate the causes of high costs of production in order to achieve a comparative advantage.

III. – Economic obstacles which affect poultry industry performance

The following sections analyse the major economic problems which may increase production costs, reduce producer's profit and reduce investment attractiveness indicators.

1. Under utilization of the existing investment scales

Table 2 shows that the utilization rate of broiler enterprises, table eggs enterprises, hatcheries and feed processing plants is 68%, 67%, 60% and 40%, respectively.

Under utilization of the full capacity means, in general, higher fixed costs per unit of production. For example, the current utilization rate of broiler enterprises is 68%. Fixed costs, including depreciation, maintenance, permanent labour, farm rent, management and opportunity costs of capital (interest), represent 14% of the production costs of one ton liveweight of broilers. Therefore, full utilization of the existing capacity, i.e. five lots per year instead of the current performance of three, will cause a relative decrease in the costs of production by:

$$0.14 \times 0.32 = 4.5\%$$ which will also cause less increase in consumer prices.

Generally, under utilization of the existing scales is due to inconsistency in the supply schedule of inputs, particularly, feeds and chicks. These two major inputs depend mainly on imports. The government is not able to finance the total subsidy required to import the full requirements of these inputs.

2. Lack of enough parent stock scales

With respect to the broiler industry only 55% of the demand for one-day old chicks is produced from domestically raised stock. Fertile eggs produced by parent stock costs ¢ 11 (1985 price), while imported fertile eggs cost ¢ 21 (in 1985), i.e. the sale price of a one day old chick produced from domestically raised parent stock was ¢ 22 while a chick from imported fertile eggs sold for ¢ 31.

With respect to the production of laying hens, the available parent stock in Egypt produces 25% of the full demand for such chicks. However, the price of the domestically produced chick was ¢ 40 in 1985, while imported fertile eggs produced chicks at a price of ¢ 76.

In brief, the establishement of parent stock companies would diminish the costs of production. For example, in the case of the broiler industry, the price per chick would be 29% less. Baby chick prices account for 20% of production costs, i.e. the costs of broiler production would be lowered by 5.8%.

3. Poor feed quality control

The absence of efficient feed quality control associated with feed supply shortages gives an opportunity to provide lower quality feeds at higher prices which raises production costs and diminishes the net economic return per unit of feed.

In Egypt it as assumed that the private sector offers better quality of feeds at higher prices than the public sector. However, the higher costs of feed purchased from the private sector result in the same economic return per ton of feed purchased from the public sector at lower costs which was assumed as lower quality feed (**Table 3**). Accordingly, poor quality feed provided to farms contributes to low feed efficiency.

4. Low feed efficiency

From field surveys it was found that the average feed efficiency of broiler farms was 2.7 tons of feed per 1 ton liveweight, with a coefficent of variability around +9%. In developed countries it averages 2 kgs of feed or probably less. Therefore, it is possible to save 25% of the feed costs by improving feed efficiency, i.e. around 14% of the costs of production (0.25 × 56).

Causes of low feed efficiency are:

a) poor feed quality control;

b) lack of large scale enterprises;

c) lack of slaughter-house capacity. This marketing infrastructure leads to selling broilers at the proper time (optimum marketing weight) which reduces feed losses;

d) inconsistency of feed delivery to the farms;

e) lack of proper technology, such as automated feeding, etc..., and

f) high mortality rates (the field survey showed an average of about 6.4% death rate, while it should not be more than 4%).

☐ Unfair transaction in wholesale monopolistic markets

If there are few traders in the market they control the supply delivered as well as the price paid to producers. They avoid flooding the market with available output to keep the wholesale price stable and high. Also, they load only the heaviest broilers at a time, leaving the others for later periods. Therefore, it could be more efficient for the producer to sell at a marketing date before the optimum one, to minimize the regret value (losses) due to delay in loading the finished broilers by the trader.

c) Price seasonality

There is a kind of seasonality with respect to the demand for table eggs. In summer the demand decreases while it increases again in winter. The supply is almost stable throughout the year. Therefore, the price of eggs decreases in summer and increases in winter. The producers may face a low profit in summer (sometimes they lose) and a reasonable profit in winter. The absence of a contracted price system enlarges the negative impacts of this phenomenom on the industry.

7. Shortage in the marketing infrastructure

Automated broiler processing plants and associated cold storages with offal processing units are important parts of the marketing infrastructure for the broiler industry. It encourages stability in supply and demand and creates consistency and equilibrium in the market. Indirectly such aspects raise productivity by facilitating the sale of broilers at the optimum economic weight thereby reducing the feed consumed by the birds.

8. The breeding policy is not economically oriented

It was found that the egg yield per hen housed per month is negatively correlated with the cost per egg ($r = -0.62$). There was a positive correlation between the feed consumption per egg ($r = 0.57$) and the cost per egg. However, there was intercorrelation between feed consumption and egg yields ($r = 0.95$). Therefore, one variable (egg yield per hen housed per month) was used to estimate the cost per egg (**Figure 1**). The optimum egg yield is at minimum cost per egg. It was possible to estimate the required feed consumption per hen housed per month using a second relation which related feed consumption to egg yield.

The B foreign strain under Egyptian conditions (**Table 5**) has the highest egg yield and the lowest feed consumption. The substitution of its average egg yield into the estimated cost response (**Figure 1**) results in a cost level per egg almost similar to the cost level of the domestic improved strain (Dokki-4), in spite of its lower egg yield. In other words, the optimum egg yield per hen housed per month was 13 eggs at cost per egg of 4.5 cents.

It is therefore concluded that the breeding policy based upon the selection for the highest eggs yields is not economically efficient. Selection for the minimum cost per egg is recommended.

IV. – Reducing the economic obstacles

The best approach to reach an efficient poulty industry is to establish an integrated marketing system. Such a system should include:

1°- **Horizontal integration** among small scale production units, in order to enjoy the economies of scale and create opportunities for the application of modern technology.

2°- **Vertical integration** among the successive stages and components of the market with respect to inputs and outputs. This type of integration diminishes the marketing margins, raises the marketing efficiency and creates conditions of stability and consistency in prices.

The insitutional structure of these two types of integration varies according to the given economic system. The options are:

1) co-operatives;
2) counteracted prices and delivery among the industry components;
3) working under the umbrella of multi-disciplinary regional companies.

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Table 0: Abstract of the current broiler and table eggs production and consumption in Egyptian economy

(A) Broiler market structure (1985)

Item	Total supply (000) Tons	*Per Capita* (kg/year)	%
Public sector	30	0.63	8.4
Private broiler's enterprise	255	5.34	71.0
Rural household's production	20	0.42	5.6
Imports	54	1.13	15.0
Total	359	7.52	100.0

(B) Egg market structure (1985)

Item	Million units	%
Public sector	500	10
Private commercial sector	2,989	62
Traditional rural sector	1,344	28
Total	4,833	100

Table 1: The price spread of the consumer's expense

Market Margins	Broiler	Table eggs
Consumer's sale price	100.0	100.0
Marketing costs	1.9	2.5
Trader's profit	14.2	8.6
Producer's profit	10.8	6.7
Feed producer's profit	8.2	6.8
Feed ingredients costs	33.5	30.8
Baby chicks costs	14.7	-
Other costs of production	16.7	44.6

Table 2: Utilization rate of the existing scales of the poultry industry

Industry component	Existing scale	Actual production	Utilization rate %
Broiler enterprises	420,000 T	285,000 T	68
Table egg enterprises	5,500 x 10^6 eggs	367 x 10^6 eggs	67
Hatcheries	568 x 10^6 chicks	340 x 10^6 chicks	60
Feed processing plants	4,996,000 T	1,966,000 T	40

Table 3: Economic return to feed used from private sector versus that used from public sector ($)*

Comparative item	Forms which used feeds from private sector	Forms which used feeds from public sector
Shadow price/one ton live weight	1,009.3	1,009.3
Adjusted costs to produce one ton live weight without feed costs (at shadow prices)	538.6	512.9
Net economic return to feed used	470.7	496.4
Tons of feed used per ton live weight	2,456	2,610
Economic return per ton of feed used	191.65	190.20
Shadow price per ton of feed	200.50	178.2
Net economic return per ton of feed	- 8.85	+ 12.00

* 1981 price levels.

Table 4: Productive and economic efficiency measures for broiler enterprises (L.E./ton live weight) (1981/1982 average prices)

Form scale & optional policies	Net total costs	Pure profit	% Return to capital
Less than 5,000			
option (1)	895	159	49.4 %
option (2)	1,080	- 70	- 21.6 %
5,000			
option (1)	854	200	69.6 %
option (2)	1,027	- 18	- 6.1 %
10,000 - 24,000			
option (1)	842	212	73.9 %
option (2)	1,011	- 1	- 4 %
More than 25,000			
option (1)	789	265	91.6 %
option (2)	978	32	11 %
Average			
option (1)	856	198	67.5 %
option (2)	1,032	- 23	- 7.2 %

(1) Current prices.
(2) Shadow (free market) prices.

Table 5: Estimated means of the productive performance trait

Strain	Mortality rate %	Eggs produced per hen housed	Feed consumption per egg (g)
Dokki-4*	11.3	11.3	317.7
A**	33.3	8.65	368.0
B**	28.3	15.86	202.7

* Improved Egyptian strain.

** Foreign strains.

Table 6: Final weight frequency at optional production and period (broilers)

Optional production period (days)*	Final weight interval gm/bird	Relative frequency (%)
42	1,000 - 1,050 1,050 - 1,100 1,100 - 1,150 1,150 - 1,200	60 20 10 10
49	1,200 - 1,250 1,250 - 1,300 1,300 - 1,350	10 40 50
56	1,350 - 1,400 1,400 - 1,450 1,450 - 1,500 1,500 - 1,550 1,550 - 1,600	10 20 20 30 10

* Does not include 14 days for marketing, fumigation, sanitation and delivery of the successive lot.

Table 7: Probability of receiving a positive profit at different selling prices and different finishing time

	Selling price*	Finishing time (days)		
	94	42	49	56
		0	0	0
	110	28 %	63 %	28 %
	143	20 %	20 %	20 %
Average	115	48 %	83 %	48 %

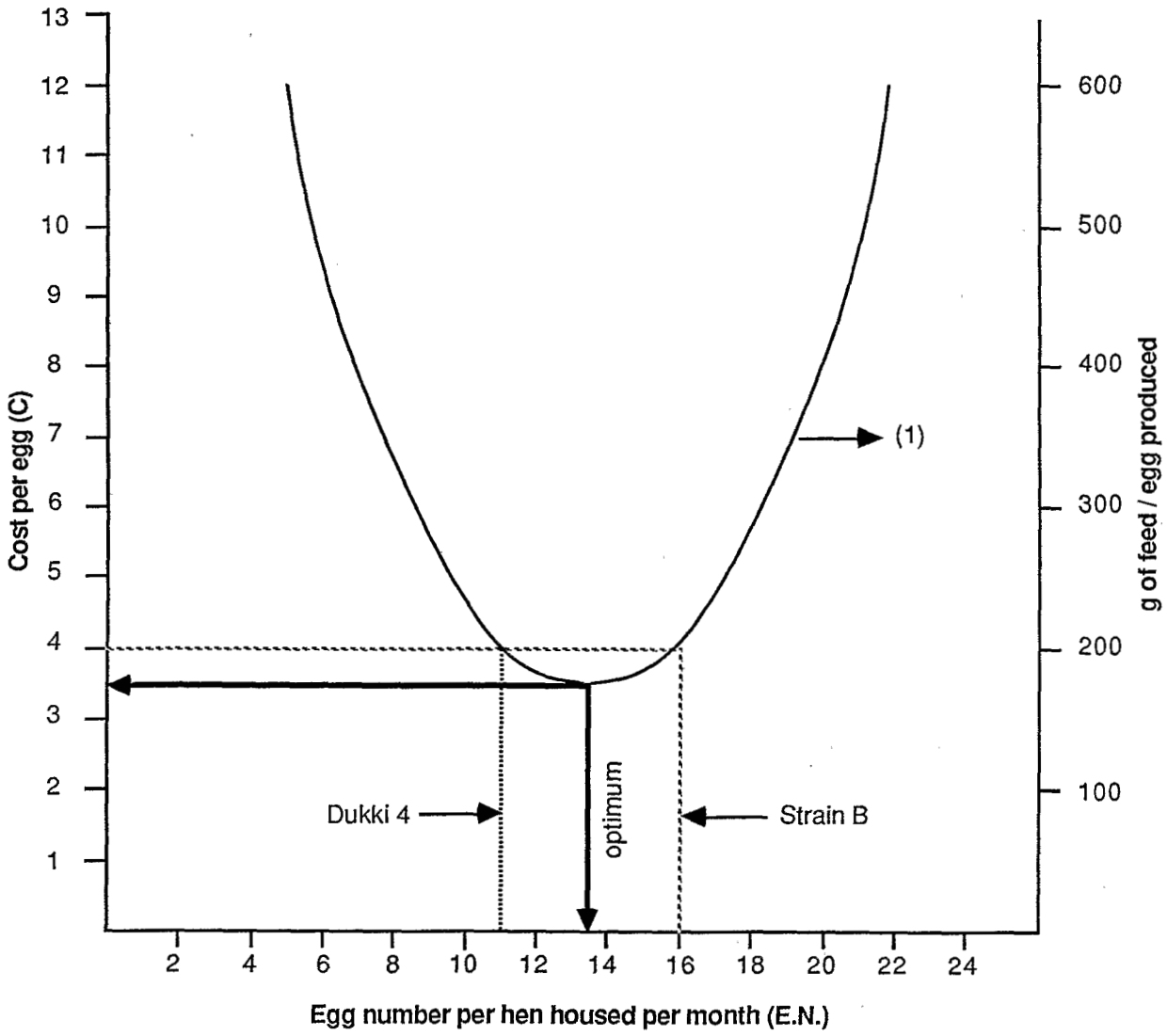
* Price probabilities along the year:

C/kg 94 → prob. 10%

110 → prob. 70%

143 → prob. 20%

Figure 1: Relationship between the cost per egg and the eggs yield per hen housed per month



(1) Estimated from the equation : $C = 26.12 - 3.41\ EN + 0.127\ (EN)^2$