ECONOMICS OF ENERGY USE FOR BROILAR PRODUCTION IN EGYPT

Ahmed A. Goueli (Professor) and Ibrahim Soliman*, (Associate Professor) Department of Agricultural Economics, Faculty of Agriculture, Zagazig University, Zagazig, Egypt.

SUMMARY From a sample survey of broiler farms in sharkia Governorate conducted in 1981, it was found that around 3.1% of the farms used kerosene for heating and lighting. 16% of the farms used kerosene for heating and electricity for lighting. 3.1% of the farms used butagaz for heating and kerosene for lighting. Farms used kerosene are small farms (5000 chicks or less per lot). Large farms tend to use their own generator for electrical power supply, which minimizes costs of lighting. Management is a main source of variability in energy consumption rate on farm. Production period length has a positive correlation with energy consumption (r=0.6). Subsidy value per ton liveweight of broiler as a weighted average of all energy use systems was L.E. 12.36 in 1981. Total subsidy of energy use for broiler production was calculated as 8.7 million Egyptian pounds in 1983/84. Producer margin per ton liveweight of broiler, under shadow prices of all inputs, except energy use, was L.E.13 in 1981. Energy under free prices would leave almost nill as a producer margin. Improvement management efficiency, increasing average farm size, solving butagaz distribution and marketing obstacles and supporting electrical power infra-structure may economize energy use for broiler industry in Egypt.

INTRODUCTION Egypt suffers from an increasing gap between meat consumption and production, leading to a decreasing self-sufficiency ratio, table 1. Previous studies indicated that the Egyptian Economy produces red meat at much higher costs than the international

Table 1. Meat production and consumption in Egypt.

Year and Commodity	Production (000) Tons	Imports (000) Tons	Consumption (000) Tons	% Self-sufficiency	Per capita consumption (Kg)
Year 1960:					
Red Meat	149	5	154	96.8	5.9
Poultry Meat	68	0.0	68	100.0	2.6
Fish	100	7	107	93.4	4.1
Year 1970:					
Red Meat	282	37	319	88.4	9.6
Poultry Meat	96	0.0	96	100.0	2.9
Fish	81	2	83	97.6	2.6
Year 1980:					
Read Meat	354	110	664	76.3	11.0
Poultry Meat	119	20	139	85.6	3.3
Fish	142	34	176	80.7	4.2
Year 1981/82:					
Red Meat	362	164	526	68.8	12.4
Poultry Meat	175	25	200	87.5	4.7
Fish	155	100	255	60.8	6.0

Source: Calculated from:

Egypt Ministry of Agriculture: Food Problem in Egypt and Related policies, Feb., 1983 (in Arabic).

costs of such commodity (Soliman, 1982). The five years plan (1982-1987) postulates that broiler production has lover capital-output ratio and lover costs of production than red-meat production. Therefore the plan focuses on broiler industry to approach a per capita consumption of poultry meat around 7 kgs per year and a self-sufficiency ratio of such type of meat around 95 percent (Ministry of Agticultve, 1983). Such goal may raise the share of poultry meat in total meat consumption in Egypt to about one-fourth, however, currently its share is not more than on-fifth, table-1. Number of broiler farms reached 12,000 in 1983/84 (The General Company for Poultry, 1984).

The government intervenes heavily in broiler industry. This intervention extends from direct production by the General Company for poultry, to provision of subsidized input prices . Low intrest rate credit . subsidized feed price and low price baby chicks are provided (Ali, 1983 and Soliman, 1984). Goueli and Soliman (1984)estimated the costs per ton liveveight of broiler at shadow prices of inputs. However, the authers, in their previous study, did not consider the subsidy in energy costs used for broiler industry operations and they did not show its use pattern. Therefore, the present study deals with such issues and the impact of eliminating energy subsidy on

costs of production and producer's margin.

MATERIALS AND METHODS The study used data of 32 broiler farms from a sample survey conducted in 1981 in Sharkia Governorate "the third most important governorate in Egypt producing poultry" (Goueli and Soliman, 1984). It was a stratified clustered random sample, reflecting location (district) farm scale (number of chicks per lot). 22 percent of farms were of scale less than 5000 chicks per lot , 50 percent of farms were of scale 5000 chicks per lot, 12.5 percent were of scale 10,000 chicks per lot, 9.5 percent were of scale between 20,000 to less than 30,000 chicks per lot and 6 percent were of scale 50,000 chicks per lot. The sample were chosen from 6 districts out of 12 districts in Sharkia.

Relationships between source and consumption rate of energy, and farm scale, location and production period length were considered. Comparison between Costs of energy from different sources under current price policy and free market (Shadow) prices of energy were presented. The study showed the impact of free price policy for energy on broiler costs of production and producer margin.

RESULTS AND DISCUSSION Broiler production requires energy use for two operations, heating and lighting. Butagaz in a standard container (15 Kgs per Container) or kerosene fuel is used for heating. Electricity or kerosene is used for lighting. Survey data showed that about 19% of the farms use kerosene for heating. 6% of the farms used kerosene for lighting. All farms used kerosene fuel are of size 5000 chicks per lot or less. 81% of the farms used butagaz for heating and 94% of the farms used electricity for lighting. Two thirds of the largest private farms (20,000 chicks per lot) used their own generator for electrical power supply. It was expensive technology to use a private electricity generator on a small farm. The two largest scale farms of the sample (50,000 chicks per lot) were either "Land-reform cooperative-Anshas station" or "Governorate project-El Khatara", Both farms enjoy special facilities to connect directly with the government power line

Location and farm size did not show any consistant distribution with energy consumption rate per 1000 chicks. However, the two largest farms (50,000 chicks per lot) showed a very high rate of electricity consumption, between 1321 KWH per 1000 chicks, in comparison with the average 185 KWH, presented in table 2. This phenomenon is, partially, due to automation of some operations

Table 2. Energy Consumption Rate per 1000 chicks in Broiler Industry in Egypt, 1981.

Item of Comparison	Heating		Lighting	
	Butagaz Kgs	Kerosene Litres	Electricity KWH	Kerosene liters
Mean	20.5	200	185	14.5
Standard deviation	10.2	0.0	346	2.1
Coeff-variability%	49.7	0.0	187.3	15.2
Range	8-488	0.0	12-1381	12.9-16
% farms	81.25	18.75	90.6	9.4

Table 3. Costs of Energy use per 1000 chicks in L.E., in 1981 for broiler production in Egypt.

Energy use	Under current price policy	under shadow price of energy	Net subsidy per 1000 chicks
Heating:			
Kerosene	6.5	41	34.5
Butagaz	1.43	8.69	7.26
Lighting:			
Kerosene	0.46	2.93	2.47
Electricty	1.19	8.74	7.55

Table 4. Costs per ton liveweight of optional energy use systems for broiler production in Egypt, 1981.

Energy system		% Farms	Under Current price (L.E.)	under shadow prices (L.E.)
Heating	Lighting			
Kerosene	Kerosene	3.1	4.4	27.76
Kerosene	Electricity	15.6	4.86	31.43
Butagaz	Kerosene	3.1	1.9	7.34
Butagaz	Electricity	78.2	1.65	11.01
Weighted	Average	100.0	2.23	14.6

Source: Calculated from the Sample survey data.

on farm and due to non-conservative Consumption of electrical power in those particular farms, because they have a secure continuous cheap electrical supply. Production period length showed a positive significant correlation with energy consumption rate (estimated r = 0.60). There was no variability in kerosene consumption rate, as shown from table 2, because there is no difficulties in the distribution and availability. On the other hand, variability in butagaz and electricity consumption rate was very high. This was because of management efficiency and production period lenght variability. Farms, also, faced difficulties in butagaz containers supply. Therefore, they usually, keep and use extra containers.

Costs of energy used per 1000 chicks are not linear transformation of the consumption rate of energy. Prices of butagaz paid by the broiler operators are variable, in spite of announced fixed subsidized price Marketing and distribution difficuttres cause higher costs. There is a price discrimination policy for electricity supply. From table 3, under current prices in 1981, butagaz is the cheapest source for heating operation, i.e. L.E. 1.43 per 1000 chicks. Kerosene

fuel is the cheapest source for lighting operation, i.e. L.E. 0.46 per 1000 chicks. However using kerosene is not entirely, safe and causes much pollution. Energy sources in Egypt enjoy, heavily, subsidized prices. In 1981, the year of the survey, the shadow (free) prices of the three main energy sources, used for broiler production operations, were P.T. 6.4363/KWH, P.T. 44/Kg and P.T. 20.5/litre for electricity, butagaz and kerosene respectively(Ministry of Electricity, 1983 FAO/Agricultural Research Centre, 1983). Therefore subsidy per 1000 chicks were, in 1981, L.E.34.5 for kerosene and L.E. 7.26 for butagaz (heating) and L.E. 2.47 for kerosene and 7.55 for electricity (Lighting), table 3.

Costs of each four optional systems of energy use per ton liveweight of broiler are presented in table 4, under both current and shadow prices of energy sources-Under current prices the cheapest system is the common one (Butagaz for heating and electricity for lighting). This system costs L.E. 1.65 per ton Liveweight ' Under shadow prices costs per ton liveweight rises to L.E.11.01 for the same system. The weighted average subsidy for energy per ton liveweight was L.E. 12.38, i.e. around L.E. 724.97 per farm. In 1983/84 the total subsidy value for energy used by 12,000 farms was estimated as L.E. 8.6997 millions (1981 prices). Goueli and Soliman

(1984) estimated the average costs per ton• Livewieght of broiler at shadow price of all inputs, but they kept energy costs at current price. Their estimate was L.E. 1032, wheares the current sale price was L.E.1045; in 1981 which left a margin L.E. 13 per ton. Therefore under shodow price of energy the producer margin per ton liveweight would diminsh to L.E. 0.62. It seems that under free prices of all inputs, including energy price, the producer of broilers will not find incentives to operate, unless the efficiency is improved.