Forecasting Egypt's Poultry Industry Needs

This section examines estimates of own-price, cross-price, and income elasticities in Egypt and forecasts to 2010 the per capita consumption demand for poultry meat and eggs. Using results of econometric models, total poultry production in terms of live birds will be projected and used to calculate derived feed demand for Egypt's poultry sector to 2010.

Methodology

Consumer demand can be derived from a utility maximizing process, subject to a budget constraint. The general specification of the model is a simple formulation that links per capita consumption of a food item to its own price, the price of close substitute(s), and per capita GDP. The model was formulated such that:

$$\text{Ln } (Q)i_t = \alpha + \beta \text{Ln } (P)i_t + \gamma \text{Ln } (P^*)j_t + \delta \text{Ln } (M)t + \varepsilon_t$$

$$\text{Ln } (Q)h_t = \alpha + \beta \text{Ln } (P)h_t + \gamma \text{Ln } (P^*)j_t + \delta \text{Ln } (P^*)k_t + \theta \text{Ln } (M)_t + \varepsilon_t$$

Where:

$(Q)i_t$ = per capita quantity of poultry meat consumed in year t, measured in kilograms;

$(Q)h_t$ = per capita quantity of eggs consumed in year t, measured in numbers;

$(P)i_t$ = weighted-average domestic prices of poultry meat (i) in year t, measured in real 1995 Egyptian Pounds.

$(P)h_t$ = weighted-average domestic prices of eggs (h) in year t, measured in real 1995 Egyptian Pounds.

$(P^*)j_t$ = weighted-average domestic prices for the close substitute red meat (j) (includes beef, buffalo, lamb, goat, pork, and camel meat,) in year t, measured in real 1995 Egyptian Pounds.

$(P^*)k_t$ = weighted-average domestic prices for the close substitute poultry meat (k), in year t, measured in real 1995 Egyptian Pounds.

$(M)_t$ = per capita Gross Domestic Product in year t, measured in real 1995 Egyptian Pounds.

Ln (.) = natural logarithm function.

ε_t = error term in year t.

α = intercept,

β, γ, δ, θ = parameters to be estimated, which in the log functional form represent own-price, cross-price (red meat), cross-price (poultry), and income elasticities, respectively.

Time-series prices at the retail level were collected from 1965-1999 for poultry, beef, buffalo, lamb, and goat meat, and from 1976-1999 for eggs. The number of observations for meats and eggs were 35 and 23, respectively. Demand is formulated as a linear function of relative prices, per capita income, and a disturbance term. Specifically, per capita consumption of poultry or eggs is hypothesized to respond inversely to own-prices and respond directly to substitute prices and per capita GDP.

All domestic prices were deflated by the Egyptian consumer price index (CPI), and a linear regression in logarithmic form was estimated after adjusting for autocorrelation, to improve the model's forecasting capability. The logarithmic form was chosen because it generates directly, and without any further calculations, estimates that can be interpreted as elasticities.

Estimation Results

Results of the per capita demand model using the Ordinary Least Squares (OLS) regression procedure are presented in table 4. The coefficients of multiple determination show the closeness of the predicted values to the actual historical values. The goodness of fit test (R-bar-square) indicate that in the poultry meat model over 93 percent of the variation in the dependent variable is explained by the explanatory variables. In the egg model, the R-bar-square was 79 percent. The estimated values track the actual historical values fairly well and are within the 5-percent confidence intervals. The estimated coefficients have the expected signs and are significant at the 1- or 5-percent level.

As expected, the response of per capita consumption of poultry to own-price changes is statistically significant. The estimated model indicates that the elasticity of demand for poultry meat and for eggs was negative and inelastic (less than unity) with respect to their own-prices, -0.47 for poultry and -0.58 for eggs. A recent study estimated the country's poultry own-price at -1.89, using variables that included meat prices, fish prices, and Egypt's Gross Domestic Product (GDP) [42]. Despite differences in the estimated elasticity

Table 4—Ordinary least square poultry and egg regression results

Commodity	Intercept	Own-price	Poultry	Red-meat	Income	Adj. R-square
			Percent per year			
Poultry meat	-7.71	-0.47		0.55	1.08	0.93
	(-6.85)**	(-2.04)**		(1.86)*	(9.59)**	
Eggs	-12.66	-0.58	0.62	0.54	1.09	0.79
	(-4.36)**	(-4.63)**	(1.98)*	(1.73)*	(4.32)**	

Note: Numbers between brackets indicate t-value; * = significant at 5-percent level; **= significant at 1-percent level.
Source: Economic Research Service/USDA.

value (which is not unusual), results indicate that poultry became more desirable and easy to obtain in supermarkets and fast-food establishments as a whole bird or in parts, mainly because poultry is less expensive than beef, buffalo, lamb, or goat meat.

The price elasticity of poultry meat was estimated using a red meat price and an egg price as a substitute. The egg price variable proved to be insignificant in the regression and was deleted. The price elasticity of eggs was estimated using a poultry meat price and a red meat price as substitutes. All cross-price elasticities were estimated to be positive and inelastic. The positive sign means that a percentage rise in the price of one meat increases the percentage quantity purchased of other substitute meats. In the demand equation for poultry meat, the cross-price elasticity was estimated at 0.55 with respect to the weighted-average price of red meats, and was significant at the 5-percent level. In the demand equation for eggs, the cross-price elasticity was 0.62 with respect to the chicken meat price and 0.54 with respect to the red meat price. Both were significant at the 5-percent level.

Per capita GDP was positively correlated and significant at the 1-percent level in both the poultry meat and egg equations, indicating that rising income, in real terms, is associated with increasing consumer demand for poultry meat and eggs. The income elasticity was 1.08 for poultry and 1.09 for eggs, compared with 0.8 for poultry indicated in the study cited earlier [42]. The current model indicates that, as income increases, consumers are willing to spend proportionally more of their additional income on poultry meat and eggs.

Poultry Meat and Egg Demand Projections for 2010

The regression analysis revealed declining real price trends for poultry meat (1.3 percent annually) red meat (0.044 percent), and eggs (3.6 percent) annually. However, historical per capita GDP showed a rising trend of 2.2 percent per year in real terms between 1965 and 1999. Egypt's GDP is projected to increase at least 5 percent annually over the next 10 years [44]. With a 1.8-percent expected population growth rate during 2000-2010, per capita GDP will grow at a net rate of about 3.2 percent per year. Since the early 1990s, production efficiency has gained importance in the transition of the Egyptian economy toward a free-market orientation. Consequently, to forecast the levels of per capita consumption for poultry meat and eggs through 2010, three scenarios incorporating trends in meat prices and in per capita GDP noted above are proposed:

1. Scenario I is a time-trend projection assuming historical domestic prices and per capita GDP growth of 2.2 percent annually and the continuation of current feed requirements, technical production methods, and management practices.

2. Scenario II assumes a 3.2-percent per capita GDP growth rate, or approximately the rate of annual GDP forecast through 2010. It also assumes the continuation of current feed requirements, technical production methods, and management practices as in scenario I.

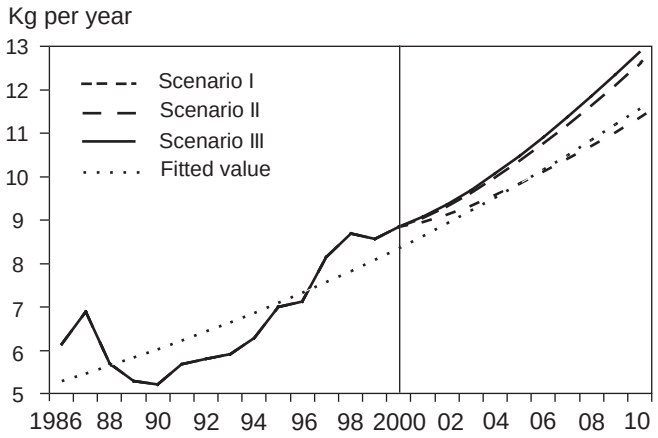
3. Scenario III assumes poultry meat and egg prices decline at an annual rate of 1 percent, due to improved management practices and feed efficiency, and increasing adoption of new technology, with the same price of substitutes, and the same per capita GDP, as in scenario II.

Projection Results

Results of the regression model show that demand for poultry meat will increase in the three scenarios during 2000-2010. In 2000, per capita poultry meat consumption was 8.9 kg, and is forecast to increase to 11.3 kg in scenario I, 12.6 kg in scenario II, and 12.9 kg in scenario III by 2010 (fig. 13). USDA's Agricultural Baseline Projections forecasts per capita poultry meat consumption for Egypt at 11.57 kg in 2010, which falls between scenario I and II [44]. Per capita poultry consumption is forecast to rise at an average rate of 4.2 percent per year in scenario I, 5.2 percent in scenario II, and 5.5 percent in scenario III. These growth

Figure 13

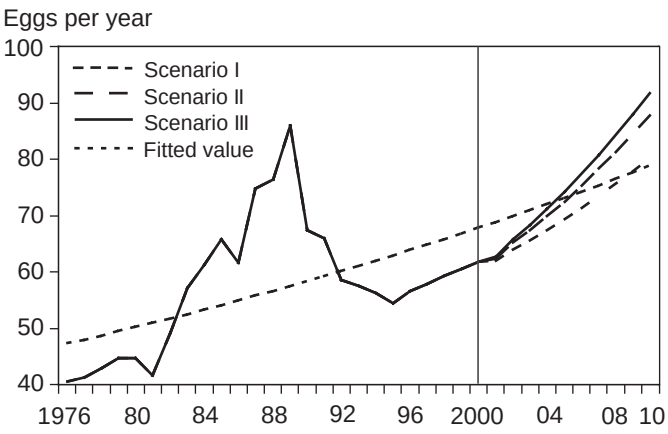
Egypt's per capita poultry meat consumption; 1986-2000 historical data, 2000-2010 forecast



Source: Economic Research Service/USDA.

Figure 14

Egypt's per capita egg consumption; 1976-2000 historical data, 2000-2010 forecast



Source: Economic Research Service/USDA.

rates are considered reasonable, although they are below the average annual rate of 7.6 percent achieved between 1990 and 2000.

Per capita egg consumption is forecast to reverse its yearly average decline of 0.6 percent during the 1990s to rise at an annual rate of 2.7, 3.6, and 4.1 percent under the three scenarios, respectively, by 2010. Per capita egg consumption is projected to rise from 62 eggs in 2000 to 80-92 eggs in the three scenarios in 2010 (fig. 14). Most of the increase will result from increasing numbers of egg layers, which is forecast to increase from 17.2 million birds in 2000 to 26.2 million in scenario I, 28.7 million in scenario II, and 30 million in scenario III (table 5). Egg projections could not be compared with the USDA Baseline because the latter does not include a per capita egg consumption forecast for Egypt.

Per capita consumption of poultry meat and eggs achieved during the 1990s are of great importance because they reflect the impact of government liberalization and economic reform in Egypt that began in 1986, and the sector's privatization in 1991. The end of government subsidies to poultry producers and the deregulation of feed prices constitute the most important variables regarding future policies and trends that most likely will be extended and continued through 2010.

These projections are sensitive to the uncertain outlook for the supply of feedgrains, oilseeds and meals (which are mostly imported), international prices, and the continuation of all government liberalization policies.

Live Poultry Projection to 2010

Forecasting per capita and total consumption of poultry meat and eggs is the starting point for projecting derived feed demand for poultry production. For Egypt to fill these forecast amounts through domestic production, feed must be provided for live birds, which will also be forecast. First, total live broilers, layers, and other poultry types that correspond or produce the total amount of poultry meat and eggs forecast in each of the above three scenarios are forecast. These calculations are based on average bird weight, given slaughter-dressing percentages, number of cycles per year, and adjustments for mortality rates throughout the lifespan in each poultry type per year. Simulation models are developed to estimate numbers of live birds by species in 2010 for each scenario, assuming that basic carcass characteristics and consumer preferences for average bird weight remain unchanged from the 2000 base year. Also, it is assumed that there will be no modification in the genetic composition of the current flocks. Simulation model projections based on these assumptions are shown in table 6. Results indicate that the total number of live poultry birds increases from a calculated 852 million birds in 2000 to 1.272 billion birds in 2010 in scenario I, 1.412 billion birds in scenario II, and 1.444 billion birds in scenario III.

Total numbers of commercial and Balady broilers are forecast to increase from a calculated 664 million birds in 2000 to 1.062 billion birds in 2010 in scenario I, to 1.18 billion birds in scenario II, and to 1.21 billion birds in scenario III. Other poultry, essentially ducks, geese, turkeys, and pigeons, are forecast to increase from 189 million in 2000 to 210 million in 2010 for

Table 5—Total number of egg-layers and their feed requirements, 1995-2010

	Egg-layers			Feed requirements		
	Scenario I	Scenario II	Scenario III	Scenario I	Scenario II	Scenario III
		Million birds			*1,000 tons*	
1995	13.8	13.8	13.8	473.4	473.4	473.4
1996	14.6	14.6	14.6	500.2	500.2	500.2
1997	15.2	15.2	15.2	521.7	521.7	521.7
1998	15.9	15.9	15.9	544.1	544.1	544.1
1999	16.5	16.5	16.5	566.3	566.3	566.3
2000	17.2	17.2	17.2	588.6	588.6	588.6
2001	17.5	17.6	17.7	599.4	604.7	606.9
2002	18.4	18.7	18.9	630.6	642.1	646.9
2003	19.1	19.7	19.9	656.1	674.1	683.4
2004	20.0	20.8	21.2	686.6	711.9	725.1
2005	21.0	21.9	22.4	718.3	751.3	769.1
2006	21.9	23.2	23.8	751.7	793.7	815.1
2007	22.9	24.4	25.2	785.6	836.9	862.5
2008	24.0	25.8	26.7	821.6	883.3	915.9
2009	25.1	27.2	28.3	860.1	932.9	971.4
2010	26.2	28.7	30.0	898.7	983.7	1,028.7

Source: Economic Research Service/USDA.

scenario I, to 234 million for scenario II, and to 239 million for scenario III.

For a more detailed forecast of the derived poultry sector demand for metabolizable energy and crude protein requirements, breeding stocks for both commercial and Balady operations should be included. Commercial broiler breeding stocks, estimated at 6.72 million birds in 2000, are forecast to increase to 11.44 million in scenario I, to 12.70 million in scenario II, and to nearly 13 million birds in scenario III in 2010 (table 7). Commercial layer breeding stocks, estimated at 0.44 million in 2000, are expected to grow to 0.68 million birds in scenario I, 0.74 million in scenario II, and to 0.78 million in scenario III in 2010. Likewise, breeding stocks of Balady broilers were 2.13 million in 2000, and are forecast to reach 2.64. 2.93, and nearly 3 million birds in the three scenarios, respectively, in 2010. No published data are available for Balady layer parents, but they are assumed to decline as the number of commercial layer parents increases by year 2010.

Forecasting Derived Feed Requirements

Forecast energy and protein requirements are derived for the total forecast live bird numbers estimated above. The forecast includes broiler and layer inventories as well as the breeding stock for both commercial and Balady operations. The procedure begins with a determination of required metabolizable energy (ME) and crude protein (CP) needed per bird during its lifespan (see box, "Feed Requirements"). A simulation model, based on fundamentals of physiology and nutrition sciences, was also used to calculate total ME and CP for individual poultry types. Quantity measures of ME and CP were converted to yellow corn and soybean meal, on a dry-matter basis, and then to actual tons of traded corn and meals using conversion factors and tables supplied by the National Research Council. This simulation model is superior to the usual approach of utilizing a feed-to-meat ratio, because results were extracted through experimental trials on individual poultry types [28].

Analysis of ME and CP requirements for Egypt's total poultry population shows that chickens have higher ME and CP requirements than any other species, followed by ducks, geese, and turkeys. Total aggregated metabolizable energy (ME) needed for Egypt's poultry live birds were estimated to increase from 10,330 million mcal[2] in 2000 to 15,593 million mcal in 2010 in scenario I, to 17,262 million mcal in scenario II, and to 17,729 million mcal in scenario III (table 8).

ME requirements are largely supplied by yellow corn and soybean meal, as well as minor items such as fish and meat meal and wheat bran. On a dry-matter basis[3], total poultry feed requirements will rise from 3.12 million tons in 2000 to 4.72 million tons, 5.22, and 5.36 million tons for the three scenarios, respectively, in 2010 (table 9). On an actual basis, yellow

[2] mcal=1 million calories, while kcal is kilocalorie, or 1,000 calories.

[3] Dry-matter basis is calculated on zero moisture content, while actual basis includes the moisture normally found in feeds.

Feed Requirements

Feed diet modeling is based on the concept that poultry receive energy needs from daily feed consumption, assuming that the diet is adequate in essential nutrient requirements, including amino acids, vitamins, and both macro- and micro-minerals. In Egypt, yellow corn contributes most of the carbohydrates to poultry diets, while soybean meal, meat meal, or fish-meal provides total protein and amino acids. Protein and amino acid requirements vary considerably according to a bird's growth rate, body size, and egg production, which in turn are determined by genetics. In addition, daily feed rations differ depending on the age and activity of the bird (growing, laying, or breeding). Poultry go through several stages of growth, each with different feed requirements. Therefore, dietary requirements for chickens vary according to whether the birds are broilers being started and grown for market, broiler breeder pullets and hens, broiler males, or layers for egg production.

Poultry in backyard operations are not fed soybean meal and yellow corn on a regular basis as is the case in commercial operations. Instead, a substantial amount of backyard feeds consist of white corn, sorghum, wheat and rice brans, low-quality barley, wheat grains, and broad beans that are not considered suitable for human consumption. Also, the exact formulations of feed ingredients used in backyard operations are not known, changing considerably according to harvesting seasons and market availability.

The procedure begins with a determination of required metabolizable energy (ME) and crude protein (CP) needed per bird during its lifespan. These are calculated from the daily ME and CP requirements for each bird type and are based on National Research Council (NRC) formulas [28]. For example, broilers are usually allowed to feed under the *ad libitum* feed system (eat all they want) that ensures rapid development to market size. During their life cycle, body weights of commercial meat-type chickens usually increase 50-55 fold by 7 weeks after hatching.

In Egypt, broilers are raised to a preferred live body weight of 1.6 to 1.65 kilograms (kg) for marketing. To reach this desired weight, a cumulative energy consumption of 11,900 ME kcal (kcal=1,000 calories) per bird with a 20 percent CP content is required. These ME and CP requirements are satisfied with typical corn-soybean-meal based feeds composed of 68-72 percent yellow corn, 18-21 percent soybean meal, and other ingredients, such as fish or meat meals, minerals, vitamins, medicines, etc [28]. One kg of this mixture usually provides 3,200 kcal and 0.20 kg of CP. This implies that a total intake of about 3.8 kg of such feed is required for the lifespan of a broiler. Total ME and CP values were also calculated for ducks, geese, and turkeys over their whole lifespan and converted to actual amounts of yellow corn and soybean meal feeds. From a base year, demand for total feedstuffs is finally calculated, according to the forecast numbers of live broilers and layers and the breeding stocks of broilers and layers, as well as the number of eggs per hen per year in each of the three proposed scenarios.

The derived feed demand is developed by aggregating the chemical composition of each feed item to cover a bird's total ME and CP daily nutritional requirements over its lifespan. ME value and CP contents of individual feedstuffs are obtained from Egyptian feed composition tables [25], which are generally comparable to those available in the United States/Canadian tables [28]. Egypt's feed manufacturing mills produce poultry feed mix consisting of 70 percent yellow corn, 19.4 percent soybean meal, 3.4 percent wheat bran, and 1.9 percent broiler concentrates (fish or meat meals). The remainder includes different additives including minerals, vitamins, vaccines, medicines, etc. [12]. Some Egyptian publications estimate that poultry rations include 68-72 percent corn, and 18-21 percent soybean meal [41, 46]. Publications by the National Research Council recommend a similar feed mix for different poultry age groups, including starter, grower, finisher, and breeders, especially in the commercial operations [28]. Egg-layers use a similar formulation with more minerals, particularly calcium and phosphorus.

In some cases, large commercial operations mix their own feeds, substituting certain ingredients depending on availability and price to obtain a least-cost formulation. However, with trade liberalization and unrestricted feedstuff imports beginning in the early 1990s, formulation of poultry feed has been increasingly established around the mix described above. These percentage rates are used in converting the estimated ME and CP to equivalent corn and soybean meal on a dry-matter basis, then adjusted for actual equivalence (as fed to poultry) after accounting for the moisture content normally found in Egypt's corn and soybean meal.

Table 6—Forecast annual number of live birds by poultry type, 2000-2010

	Chickens		Others				
	Commercial	Balady	Ducks	Geese	Turkeys	Pigeons	Total poultry
			Million birds				
Scenario I							
2000	519	145	69	70	16	35	852
2001	542	145	70	69	15	35	877
2002	567	148	70	71	16	35	907
2003	597	151	71	72	16	36	942
2004	631	155	72	73	16	36	983
2005	667	159	73	74	16	37	1,026
2006	706	163	73	74	17	37	1,071
2007	748	167	74	75	17	38	1,119
2008	790	171	75	76	17	38	1,167
2009	835	175	76	77	17	39	1,219
2010	883	179	77	77	17	39	1,272
Scenario II							
2000	519	145	69	70	16	35	852
2001	547	147	70	70	16	35	886
2002	579	151	72	72	16	36	926
2003	616	156	73	74	16	37	972
2004	657	161	75	76	17	38	1,024
2005	703	168	77	77	17	39	1,081
2006	752	174	78	79	18	40	1,140
2007	803	180	80	81	18	41	1,202
2008	859	186	82	82	18	42	1,269
2009	918	192	83	84	19	43	1,339
2010	980	198	85	86	19	43	1,412
Scenario III							
2000	519	145	69	70	16	35	852
2001	549	147	71	70	16	35	888
2002	581	152	72	72	16	36	930
2003	620	157	74	74	17	37	979
2004	663	163	76	76	17	38	1,034
2005	711	170	77	78	17	39	1,093
2006	762	176	79	80	18	40	1,155
2007	816	183	81	82	18	41	1,221
2008	874	189	83	84	19	42	1,291
2009	936	196	85	86	19	43	1,366
2010	1,003	203	87	88	20	44	1,444

Source: Economic Research Service/USDA

corn requirements are forecast to increase from 2.46 million tons in 2000 to 3.71 million tons in scenario I, to 4.11 million tons in scenario II, and to 4.22 million tons in scenario III by 2010.

Soybean meal requirements are forecast to increase from 667,000 tons in 2000 to 1.01, to 1.12, and to 1.15 million tons, respectively, in the three scenarios in 2010 (table 10).

Sensitivity Testing of Feed Requirement Forecasts

To evaluate the reasonableness of these feed requirement forecasts, the feed-to-meat conversion rate for Egypt's commercial operations was calculated, from forecast feed requirements and forecast commercial poultry production, to equal a 2.59 feed-to-meat ratio. This result is comparable to that of a previous study undertaken in Egypt, which estimated the rate at 2.65 [9]. Also, it is comparable with another estimate's range of between 2.4 and 2.5 for commercial broilers [42]. Most recently, the feed conversion rate for poultry in Egypt was reported at 2.5 [45]. These citations indicate that this study's projections are comparable with previous studies and consistent with expectations. Currently, the feed-to-meat conversion rate in the United States is estimated between 1.9 and 2.0, which indicates the U.S. sector's scale of efficiency compared with Egypt's poultry industry.

Table 7—Parent stocks of commercial and Balady broiler and commercial layers, 1995-2010

Year	Commercial broiler parents			Balady broiler parents			Commercial layer parents		
	Scenario I	Scenario II	Scenario III	Scenario I	Scenario II	Scenario III	Scenario I	Scenario II	Scenario III
					Million birds				
1995	4.91	4.91	4.91	1.68	1.68	1.68	0.36	0.36	0.36
1996	5.12	5.12	5.12	1.66	1.66	1.66	0.38	0.38	0.38
1997	5.60	5.60	5.60	1.99	1.99	1.99	0.39	0.39	0.39
1998	6.26	6.26	6.26	2.11	2.11	2.11	0.41	0.41	0.41
1999	6.25	6.25	6.25	2.10	2.10	2.10	0.43	0.43	0.43
2000	6.72	6.72	6.72	2.13	2.13	2.13	0.44	0.44	0.44
2001	7.02	7.09	7.11	2.15	2.17	2.17	0.45	0.46	0.46
2002	7.34	7.50	7.53	2.18	2.22	2.23	0.48	0.48	0.49
2003	7.73	7.97	8.03	2.23	2.30	2.31	0.49	0.51	0.52
2004	8.17	8.51	8.59	2.28	2.38	2.40	0.52	0.54	0.55
2005	8.64	9.11	9.21	2.35	2.47	2.50	0.54	0.57	0.58
2006	9.14	9.74	9.87	2.40	2.56	2.59	0.57	0.60	0.61
2007	9.68	10.41	10.57	2.47	2.65	2.69	0.59	0.63	0.65
2008	10.23	11.12	11.32	2.52	2.74	2.79	0.62	0.67	0.69
2009	10.82	11.88	12.12	2.58	2.84	2.89	0.65	0.70	0.73
2010	11.44	12.70	12.98	2.64	2.93	2.99	0.68	0.74	0.78

Source: Economic Research Service/USDA

Table 8—Forecast feed sources of ME requirements (dry-matter basis) for Egypt's poultry sector, 2000-2010

Year	Total feed requirements			ME from yellow corn			ME from soya meals			ME from other feeds*			Total ME requirements		
	Scenario			Scenario			Scenario			Scenario			Scenario		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	1,000 tons			*1,000 tons*			*1,000 tons*			*1,000 tons*			*Million Mcal*		
2000	3,124	3,124	3,124	2,187	2,187	2,187	625	625	625	312	312	312	10,330	10,330	10,330
2001	3,207	3,240	3,248	2,245	2,268	2,274	641	648	650	321	324	325	10,605	10,713	10,740
2002	3,327	3,395	3,413	2,329	2,377	2,389	665	679	683	333	340	341	11,001	11,227	11,283
2003	3,461	3,569	3,597	2,423	2,498	2,518	692	714	719	346	357	360	11,445	11,799	11,895
2004	3,615	3,765	3,806	2,531	2,636	2,664	723	753	761	362	377	381	11,953	12,449	12,584
2005	3,781	3,978	4,032	2,647	2,784	2,822	756	796	806	378	398	403	12,501	13,153	13,332
2006	3,952	4,201	4,269	2,767	2,941	2,988	790	840	854	395	420	427	13,068	13,890	14,114
2007	4,134	4,436	4,519	2,894	3,105	3,163	827	887	904	413	444	452	13,671	14,668	14,941
2008	4,318	4,684	4,785	3,023	3,279	3,350	864	937	957	432	468	479	14,277	15,487	15,823
2009	4,514	4,946	5,067	3,160	3,462	3,547	903	989	1,013	451	495	507	14,925	16,355	16,753
2010	4,716	5,221	5,362	3,301	3,654	3,753	943	1,044	1,072	472	522	536	15,593	17,262	17,729

* Other feeds include fish meal, meat meal, and wheat brans.

Source: Economic Research Service/USDA

Table 9—Forecast total feed requirements (dry-matter basis) for broilers, layers, parents, and grandparents, 2000-2010

Year	Feed requirements for poultry meat			Feed requirements for egg-layers			Feed requirement for paretns & grandparents (broilers & layers)			Total poultry feed requirements (meat, layers, parents, and grandparents)		
	Scenario			Scenario			Scenario			Scenario		
	I	II	III	I	II	III	I	II	III	I	II	III
	1,000 tons											
2000	1,979	1,979	1,979	589	589	589	557	557	557	3,124	3,124	3,124
2001	2,035	2,056	2,061	599	605	607	573	579	580	3,207	3,240	3,248
2002	2,103	2,148	2,157	631	642	647	593	606	608	3,327	3,395	3,413
2003	2,188	2,257	2,273	656	674	683	617	637	641	3,461	3,569	3,597
2004	2,284	2,381	2,402	687	712	725	645	672	678	3,615	3,765	3,806
2005	2,388	2,516	2,545	718	751	769	674	710	718	3,781	3,978	4,032
2006	2,496	2,657	2,693	752	794	815	705	750	761	3,952	4,201	4,269
2007	2,611	2,807	2,851	786	837	863	738	793	805	4,134	4,436	4,519
2008	2,726	2,963	3,017	822	883	916	770	837	853	4,318	4,684	4,785
2009	2,848	3,129	3,192	860	933	971	805	885	903	4,514	4,946	5,067
2010	2,975	3,303	3,377	899	984	1,029	842	934	956	4,716	5,221	5,362

Source: Economic Research Service/USDA

Table 10—Forecast actual yellow corn and soybean meal requirements for Egypt's poultry sector, 1990-2010

Year	Yellow corn as fed-basis*			Soybean meals as fed-basis*		
	Scenario I	Scenario II	Scenario III	Scenario I	Scenario II	Scenario III
			1,000 tons			
2000	2,457	2,457	2,457	667	667	667
2001	2,523	2,548	2,555	685	692	693
2002	2,617	2,670	2,684	710	725	729
2003	2,722	2,807	2,829	739	762	768
2004	2,843	2,961	2,993	772	804	812
2005	2,974	3,129	3,171	807	849	861
2006	3,108	3,304	3,357	844	897	911
2007	3,252	3,489	3,554	883	947	965
2008	3,396	3,684	3,764	922	1,000	1,022
2009	3,550	3,890	3,985	964	1,056	1,082
2010	3,709	4,106	4,217	1,007	1,115	1,145

* Dry-matter basis is calculated on zero moisture content, while actual fed-basis includes the moisture normally found in feeds.

Source: Economic Research Service/USDA