

Ministry of Agriculture/Food and Agriculture

Agricultural Census Project

**Analysis and Assessment of the Poultry Sector in
Lebanon**

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1. General Framework

i. Introduction

Poultry production was one of the major components of the Lebanese agricultural sector. During the late 1960's and the 1970's, the poultry industry was one of the largest and most advanced in the Middle East.

The poultry industry has been historically since its beginnings controlled by the private sector with little interference from the public sector, namely the Ministry of Agriculture. The sector covered in the 70's a significant part of the needs of Arab countries such as Kuwait, Saudi Arabia and Iraq. Lebanese poultry exports covered most Arab countries that were lagging behind in production technology. The production was estimated at 40 million Broilers and 600 million table eggs. This period also witnessed a few investments from Lebanese producers in the region and this was a major force in the development of poultry production in that area. Even till the mid 1980's producers were still decreasingly exporting to these countries that were developing their industry.

Currently, there are about 450,000 breeding hens that produce about 2,500,000 layers and about 65,000,000 broilers per year. There are also small ventures in quail, duck and turkey production. Exports are limited as most of the Arab states produce the major portion of their needs while imports are mainly from countries like Brasil, Thailand and China where production costs are much lower than Lebanon.

Production is done mainly in open systems with inferior conditions of heating, lighting, ventilation and nutrition. Since the mid-1980's onwards, due to the increased involvement of large scale enterprises in the production process and the increased, production conditions are being improved with the aim at maximising production and reducing losses, thus strengthening the competitive advantage.

ii. Sector organisation

As mentioned previously, this sector is completely in the hands of the private sector. According to the data published by the Agricultural census project supported by FAO for 1998/1999, there are about 1500 poultry farms in the country with a capacity of about 10 million broilers and 4.5 million laying hens. The owners or their employees operated earlier the farms. However and due to the high fluctuations in prices, the majority of those is operated for the benefit of large producers who provide all the agricultural inputs at a fixed price with a special arrangement for price increase.

Currently, Two major producers namely Hawa Chicken and Tanmia currently control about 40 % of the poultry sector. The rest is divided among around 18 major producers followed by Wilco, Shouman, Maalouf, Freiha, Sayyed, Yaseen, Ashour and others.

While Hawa slaughters about 50% of his produce, Tanmia slaughters it all in state of the art slaughterhouses and processing units with strict hygiene measures. This process

reduces the losses due to the low prices of live birds and reduction of loss from carcasses through the processing of undesired parts into various recipes such as mortadella, nuggets, kafta, falafel etc..

The other producers are also into the slaughterhouse business; however with less sophisticated equipment.

A significant working force is involved in the poultry industry, which is divided into 4 major parts:

- Suppliers of major feed ingredients
- Companies that import and rear parents stocks for production of day-old chicks. These companies are becoming increasingly involved in meat and egg production with a tendency to have closed production cycles.
- Suppliers of micro ingredients and veterinary products, and
- Small farmers involved in meat and egg production

Most strains available in the international market are being grown in Lebanon such as Lohmann, Ross, Cobb, Arbor Acres, Hubbard, Hybro and Avian for Broilers; and Shaver, Hy-line, Bovans, Babcock and Lohmann for layers.

All these strains are being used according to their performance presented by the international breeding firms and there is practically no comparative information about their performance under local conditions.

2. Production analysis

According to the agricultural census project, poultry production from meat and eggs during the years 1997-2001 was as shown in table 1:

Table 1: Poultry production in Lebanon during the years 1998-2001

Type	Quantity (1000 tons)				Number (millions)			
	1998	1999	2000	2001	1998	1999	2000	2001
Broiler	85.6	88	105	109	59	60.7	62	64
Layers (for meat)	0.6	0.8	1.7	1.8	0.4	0.5	1.1	1.2
Local chicken	1.3	1.3	6.4	6.6	0.9	0.9	3.2	3.3
Eggs	-	-	-	-	690	720	720	740
Turkey	-	-	0.14	0.22	-	-	0.019	0.029

Source: MoA/FAO Agricultural Census Project

Data shown in table 1 clearly show the continuous increase in both the production of broilers and table eggs. The table also indicates a sharp increase in turkey production. Turkey is one of the promising unexplored components of this sector and its future depends on a change in marketing tools affecting the consumption habits of the population to change it from the seasonal to the daily pattern.

Data on game bird production is still very limited and needs further investigation.

i. Production zones

The poultry production operations cover practically most of the Lebanese territory and are not anymore focused in the Bekaa plain. The North, South and the lower Mount Lebanon are more favourable for Broilers and this is where the activity is concentrated as compared to egg production that is still mainly concentrated in the Bekaa. The following table shows provided by the agricultural census project (2000) show the production capacity and the number of practitioners per Mohafaza.

Mohafaza	No holders	Traditional production	Layers	Broilers
Mount Lebanon	7,754	651,676	261,518	2,252,010
North Lebanon	10,240	188,275	263,196	3,582,460
Bekaa	3,445	135,751	3,888,680	2,614,002
South	2,535	239,666	107,600	1,033,954
Nabatieh	2,836	71,277	27,385	288,430
Total	26,630	1,286,645	4,548,379	9,770,856

This table shows similarities between North and Mount Lebanon in the capacities for Broilers and Layers. Interestingly, there is a higher capacity for traditional production in Mount Lebanon than all the other areas despite the higher urbanization level. The Bekaa is confirmed as the area of egg production while the South and Nabatieh have a lower population.

ii. Density and yield

The open production system is still the dominant one. In most enterprises, 11-13 birds are housed per m² for a period of 42-50 days and yielding broilers of 1.7-2.3 kg (22-26 kg/m²). There are attempts in some units to increase the productivity to more than 30 kg/m². This is achieved in closed or semi-closed systems with adequate ventilation and cooling.

iii. Production costs

The cost of feed represents between 65 and 70% of the production cost. The poultry industry depends on imported feed except for the locally produced minor elements Sodium, Calcium and Chlorine. These do not represent more than 8% of the feed.

All other ingredients such as Soybean, Maize, Barley, sunflower meal, peanut meal, animal proteins, vitamins, mineral salts and other feed additives such as growth promoters and enzymes are imported.

With the absence of control mechanisms and facilities, feed quality seriously affects quality and quantity of production.

Fungal contaminants producing mycotoxins, or merely affecting the nutrient content of feedstuffs whether protein, amino acids, fiber or energy could cause severe production losses.

The control mechanisms for feed quality are nearly absent. Most producers rely on theoretical information regarding the composition of feedstuffs especially with amino acids and energy content.

Broilers usually require about 2 kg of feed to produce 1 kg of live weight. Laying hens require about 100 g per day. However, this quantity is influenced by many factors:

Environmental conditions in the farm (house) especially in the prevailing open system,

- Health conditions
- Feed quality with regard to its content in energy, amino acids, anti-nutritional factors and others.

Day-old chicks costs are the second most important part of production bill ranging from 15-25% of the total cost. Usually, parent stocks should be disease free and raised under optimum conditions. In many cases, these requirements are not fulfilled resulting in low quality chicks with a high mortality and/or a low productivity. Usually, chicks are sorted in the hatchery to remove any weak or abnormal ones. In few cases, especially when chick prices rise, chicks are not sorted at the hatchery and hence, farmers encounter more problems resulting in a lower productivity.

The prevailing open housing system subjects birds, whether layers or broilers to heat or cold stress depending on the season. Farmers tend usually to save on expenditure of electricity or fuel to alleviate the impacts of these factors with the intention of reducing cost. Others use gas for heating without adequate ventilation causing serious health impacts. Cooling methods in summer are mostly primitive varying from natural ventilation, to water showers inside and outside the house or painting the ceilings with white material.

Besides these aspects, there is an additional factor that affects the production costs. Practically all feed and medication suppliers are resorting to cash sales as a result of the economic crisis in the country. Consequently, many small and medium size producers

who do not have retail outlets and hence have less cash flow are suffering. In addition, the suppliers are offering discounts of up to 20% on the cash paid deliveries. This reduces the production cost of large producers and hence enhances their comparative advantage and increases the gap between them and their weaker competitors.

iv. Management

As mentioned earlier, the poultry industry is a completely in the hands of the private sector with minimal intervention from governmental authorities such as the ministries of commerce and agriculture.

Cooperatives, which were active in the early seventies, are nearly absent and farmers are being controlled by middlemen or the large producers. Actually, the large-scale producers are increasingly aiming at closing their production circuits and control the major nodes, namely:

- Import of primary feed ingredients and additives feed import,
- Preparation of feeds
- Import of breeder chicks for egg production
- Hatching the eggs,
- Raising the birds for meat of table egg production,
- Slaughtering and processing of broilers,
- Marketing of birds as carcasses, cut-up parts or as a processed product and/or marketing table eggs through the traditional marketing lines and their own outlets

These firms are also imposing their production techniques on farmers by giving them all their needs and talking their produce at a prefixed price. Here, farmers are given a margin of the profit if prices rise beyond this agreed price.

A survey was conducted by the Agricultural Census Support project executed jointly between FAO and the Ministry of Agriculture.

The survey covered 98 Broiler and 55 Layer units of different capacities. The presentation in this case did not give a specific weight for the size of the farm and its capacity, however it should be indicative of the overall situation.

Broilers:

Results from the Agricultural census (2000) showed that more than 70% of the farms are privately owned with more than 63% of personal investment and more than 82% of the owners managed their farms.

Feed is supplied by companies to 92% of the farms as balanced diets (56%) and separate ingredients (38%). 80% of the farms have a open system depending on natural ventilation. Health care is mainly (61%) provided by a veterinarian or an agricultural engineer from the feed or chick supplier.

On a yearly basis, each farm has an average of 5 cycles of 50 days, giving an average weight of 1.9 kg at an average price is about \$ 0.97/kg live weight.

Layers:

A similar structure is seen in the layer farms of which more than 83% are privately owned and more than 72% of the investments are private. The companies supply the feed (91%); however more as individual ingredients (72%) than ready mixes (26%). More than 85% of the houses are of the open system depending on natural ventilation. The suppliers also provide health care upon request.

Strains producing white eggs are commonly used (43%) whereas 23% of the farms produce both white and brown eggs with an average productivity of 277 eggs/layer/year. However, layers are kept to an average of 15 months. Egg collection is still conducted manually because of the production system. This of course causes a quality problem related to the hygiene.

This survey confirms that the sector is still based on traditional rearing methods that negatively influence the productivity. There is a high dependency on suppliers in terms of feed and health care.

v. Environmental impacts

Most of the poultry farms in Lebanon do not abide by the set environmental standards. The location of farms with respect to residential areas, the destination of their waste. Dead animals, faecal material, slaughterhouse waste and spoiled eggs from hatcheries often end-up in river beds, run-off canals or even domestic waste bins.

The environmental standards in the construction of farms are also rare and this imposes a significant stress on the birds from extreme temperatures, low ventilation and extreme humidity.

Such issues result in risks on the neighbouring communities with regard to the air quality and in lower productivity in the farms in addition to lower productivity

3. Supporting activities

i. Research

Very little is done at the level of research to support the poultry producers. These have to rely mainly on manufacturers data regarding all inputs.

While the American University of Beirut is the leading institution in this domain, there is a severe deficiency of will, infrastructure and financial possibilities halting the work of the other institutions such as the Lebanese University, the Lebanese Agricultural Research Institute and others.

The major research activities focus on alternative feed sources and the use of prebiotics in feed. Due to many reasons, research work and results remain at the scientific level and rarely reach the farmers.

ii. Extension services

Despite the limited research activities, another serious problem is affecting the farmers, which are the complete absence of independent extension agents that could guide the farmers and support them. The only active extension is that of the various suppliers and this is practically marketing and not extension, often leading farmers to undesired problems.

The dependency on the suppliers as extension agents contributes to the increase in production costs as farmers are generally requested to vaccinate and treat their animals more frequently.

These practices might have serious impacts on consumer safety and health, thus requiring serious attention from the authorities.

iii. Handling and transport

In view of the prevailing systems of production, it is expected that the handling systems are compatible with them. This is applicable in most of the cases of Broiler and egg production with the exception of some automated closed units for meat and eggs.

Broilers are usually loaded in open boxes (10-12 birds/box) in which they are transported to the respective slaughterhouses or the retail markets. Loading of birds is done manually by untrained workers, thus resulting in significant stress on the animals, causing mortality and undesired product quality deterioration.

The transport of animals is mostly in open trucks. Despite that this practice is done early in the morning to reach the marketing points, there is also a significant stress on the animals which ultimately is reflected in the deterioration of the quality of the end-product

Eggs are packed manually in boxes of 30 and reach the market this way. Recently, cages were introduced for layer production. These are linked with automatic collection and packaging systems.

iv. Transformation

As mentioned earlier, large producers are closing their circuits and hence are making use of practically all the parts of the chicken. Hence, processing plants are being increasingly linked to the existing slaughterhouses and thus make use of all leftovers from cut-up parts preparation. The processed products vary from the regular chicken ham and bacon to the new Kafta, falafel, nuggets, etc. The products are either made from ground and flavoured processing leftovers, from retrieved cut-up parts or excluded carcasses that are larger or

smaller than the demanded size. On the other, retail shops are increasingly offering a variety of transformed products such as Taouk, Breast steaks, etc. These practices increases the sales through targeting more customer groups and improves the profits through increasing the value of the products.

Food safety measures at the retail shop level are in many cases questionable. Sometimes the product is left in the open for demonstration subjecting to insects, dust, etc. In other cases the cooling conditions are not adequate or the product is even kept longer than the hygienically allowed time causing microbial contamination leading to health problems.

4. Marketing

i. Supply

Lebanon consumes yearly about 135000 of food meat, 50% of which is poultry meat for human consumption. As compared to other countries in the region, Lebanon enjoys a high level of meat consumption per capita, which is exceeded only by Israel and Cyprus.

In Lebanon, poultry meat is traditionally marketed fresh, namely through small retail shops which slaughter birds upon request and choice of the customer. During the last decade, and with the increased involvement of day-old chicks producers in meat production and the establishment of closed chains, the sales of slaughtered birds as whole or cut-up parts increased significantly. High capacity slaughterhouses >30000 birds/ day were installed to cover the increasing demand for processed broilers by Hypermarkets or the producers' marketing outlets that are increasing steadily and offering a broader selection of raw and cooked products.

Table 2: Meat supply in some Mediterranean countries (2001)

10 ³ metric tons	Lebanon	Syria	Jordan	Turkey	Greece	Cyprus	Israel
Meat supply	157	351	134	1350	498	103	364
- Poultry	105	111	119	595	154	35	296
Food Meat	135	351	169	1347	931	83	433
- Poultry	77	111	120	593	186	28	289

Despite the market tendency, live animals are still being marketed by small-scale outlets especially in suburbs and rural areas. This trend still has preference by many families due to the “freshness” factor and the religious aspect during slaughtering. In this operation, middlemen play a crucial role in price regulation and determination of farmer profit and it is well proven that middlemen make the major profit of this business.

On the other hand, Eggs are marketed by middlemen that play a decisive role in price regulation as in the broiler sector. Hence, small-scale farmers are practically dependent on them. Grading and labelling of eggs is nearly not existent especially when it comes to the traditional marketing in 30 eggs boxes. But, this is also witnessing some changes as the demand by supermarkets and chain stores is moving towards graded and labelled eggs in smaller packages of 6, 10 and 12 eggs.

Following the complete chain discourse is a clear attempt to increase the profit through keeping the margins of every process; hence increase the productivity of the whole operation. Despite the validity of this theory, these firms are facing many problems and still are not able to completely market their produce in a labelled form. On the contrary, the sales of generic product accounts to more than 70% of the sales as generally the labelled product is still more expensive. Chain stores request generic product to bear their own label or even be sold as is without labelling at very low prices. The reason for the low prices in this case is the need to compete with legally or illegally imported merchandise.

a. Product Quality

The quality and hygiene of poultry products is an internally regulated practice, which is being implemented mainly by large-scale producers who have their own bio-safety and sanitation control procedures. The quality of poultry products is influenced at three levels:

- Production or farm level
- Transportation and storage
- Market level

At the farm level quality is determined by the hygiene and production procedures. There is few if any control mechanisms to determine the hygiene control at the farm level. Many birds are subject to stressful conditions that affect their market quality. On the other hands, there is also no control on the use of growth promoters, antibiotics or coccidiostats during the pre-market stages. Hence, both birds and eggs could be practically containing various amounts of residues that represent a long-term threat to consumer health.

During transportation, the products are often subject to the prevailing environmental conditions such as high temperature, wind, dust and fumes. This in turn negatively affects the quality of the products.

Beyond the processing phase, deterioration of product quality is also related to the storage conditions provided by the retailers. At this level, quality control measures by the relevant official authorities are nearly absent due to staff shortage or the lack of will within this authority. However, quality is not restricted at this level only.

As mentioned earlier, a significant quantity of the produced broilers is marketed directly in local shops where they are slaughtered upon request. The hygienic standards in these shops are usually at a minimum. There is no control of any kind to these standards, from

water quality, to processing temperature and handling methods. This in turn results in unknown effects on the product quality which in turn are reflected on the consumer safety.

Lebanon is known for the abundance of small snack restaurants, which offer poultry products such as shawarma, taouk and the various sandwiches. These outlets in turn are subject to minimal control procedures that target their products storage and handling conditions. The impacts of these conditions are also minimally documented.

b. Imports

Most of the poultry production in Lebanon is destined for the local market. Before the war, poultry sector was the only one that covered the domestic demand and even had significant exports to the neighbouring Gulf countries. After the war and influenced by the development at the regional and global level, the sector is currently regulated by market needs.

There are estimates that Lebanon imports yearly through illegal activities about 25000 tons of Breast meat from Syria. If these estimates were real, these parts would come from about 60 million broilers. However, the same sources indicate a significant export of thighs and drumsticks to Syria. This activity is related to the market preference differences between Syria and Lebanon.

According to the FAO food balance sheets in 2001 (table 3), Lebanon imports 2000 tons of poultry meat from various sources. These quantities are insignificant if the figures of the illegal imports from Syria are valid. Interestingly, the official imports are similar to poultry imports in neighbouring countries except for Israel, which has self-sufficiency in poultry.

There are various statements regarding the illegal imports from Syria and their influence on the sector. Some regard them as negatively affecting the producers, while others regard them as a kind of consumer support and protection. Nevertheless, official information indicates that the Syrian government is currently controlling this issue as it represents a drain of national wealth. Feed and Medication are still being subsidized in Syria.

Table 3: Total meat and poultry meat imports in some Mediterranean countries (2001)

10 ³ metric tons	Lebanon	Syria	Jordan	Turkey	Greece	Cyprus	Israel
Imports	37	0	37	2	512	6	77
- Poultry	2	0	2	1	47	0.7	0

Source: FAO Food Balance Sheets 2001

c. Potential evolution

Imports of poultry meat are most likely to increase especially with the deadlines for the entry to force of trade agreements getting closer. A limiting factor for the consumption of

imported products is the consumer preference favouring fresh products or even the directly slaughtered birds.

However, with the deterioration of the economic situation and the decreasing income level, the consumers are increasingly seeking cheaper products. This problem, coupled with the lifting of barriers, meaning possibilities of access of fresh products might increase the imports of poultry meat with their negative impacts on the local production.

ii. Demand

As mentioned earlier, the poultry products are the most consumed animal products in Lebanon. For poultry meat, this demand is restricted to the lean broiler meat. Despite the small-scale availability of other sources such as turkey or quail, the demand for these products is not growing beyond seasonality. This is possibly related to the abundance of poultry meat in the Lebanese dishes.

Consumption of Broilers has increased steadily from 18.6 kg/person/ year to 22 kg in 2000. The decrease in 2001 was mainly traced to the decrease in meat consumption due the BSE scandal. As for the eggs, the FAO food balance sheets indicate a consumption of 5.4 eggs/person/year. This is about half of the figure reported by the Agricultural census project of 172 eggs/year. It is possible that the figures represented by FAO are those of non-processed eggs or egg components (table 4).

Table 4: Broiler and egg consumption during the years 1997-2001

Year	Broiler (kg/capita)	Eggs (kg/capita)	Source
1997	18.6	5.6	FAO FBS 1997
1998	20.6	4.6	FAO FBS 1998
1999	20.4	5.2	FAO FBS 1999
2000	22.0	5.4	FAO FBS 2000
2001	21.0	172 eggs	Agr. Census

Source: FAO Food Balance Sheets and MoA/FAO Agricultural Census Project

a. Exports

According to table 4, Lebanon exported no poultry meat in 2001. This indicates again that this sector is practically self-sufficient. However, information from poultry producers indicates that there are attempts to export processed products, however these are facing quality related problems that most probably related to market protectionist measures but the recipient countries. This requires serious attention from the governmental authorities

to insure that Lebanese products are treated in other countries in a similar manner to the treatment of foreign products in Lebanon

Table 5: Meat exports in some Mediterranean countries (2001)

10 ³ metric tons	Lebanon	Syria	Jordan	Turkey	Greece	Cyprus	Israel
Exports	0	0	2	6	19	4.6	7
- Poultry	0	0	0	4	6	0.4	6

Source: FAO Food Balance Sheets

The records of the customs do not show any significant imports of poultry products. The imports are mainly day-old chicks, which would serve as breeders.

On the other hand, there were significant exports of eggs in 1997 (about 70 million) that decreased by about 40% (38 million) in 1998. This in turn decreased to about 9 million eggs in 1999. This increased to about 22 millions in 2000 to decrease to a minimum of about 4 million eggs in 2001. The exports increased again in 2002 to about 55 million eggs, which represent about 8% of the total production.

b. Agro-Industrial sector (processing)

The consumption of processed poultry products is increasing steadily. This increase is indicated by the increase in local processing operations outside the poultry producer circuit, as is the case with Taghzia and Halal brands. The quantities produced by those companies and the sources of meat need thorough investigation and analysis. There is reasonable potential the processors are using frozen or chilled imported products to reduce their costs and increase their competitiveness in the market of processed meats.

Similar to many other sectors, monitoring of processing practices with regard to additives, colorants and stabilizing agents is not adequate and is highly dependent of the capacity of monitoring authorities such as the Consumer Protection department at the Ministry of Economy. There is mandatory analysis for products destined for export and these are restricted to bacteriological tests.

The validity of these tests is highly related to the internal quality assurance in the authorised laboratories. This in itself is a subject for thorough review and analysis.

Data from 1997 show that on average, a Lebanese citizen consumes about 2.0 kg/year of Mortadella and Jambon. However, there is no indication of the percentage poultry products from this quantity.

c. Market evolution

The demand for poultry products is expected to increase during the next decade. The major reason behind this assumption is the consumer habits in Lebanon and the abundance of poultry products, especially meat, in the Lebanese culinary traditions. These traditions, which are not that different from many countries in the Mediterranean basin, represent the basis for the development of the sector. As seen in Table 2, Cyprus and Israel have a per capita poultry meat consumption exceeding all other neighbouring countries. Indicating a better social standard, the future of the Lebanese poultry sector lies especially if the country overcomes its economic problems.

Table 6: Meat, protein, calories and fat supply per capita from poultry and other animals in some Mediterranean countries (FAO Food Balance Sheets, 2000)

Supply/Cap	Lebanon	Syria	Jordan	Turkey	Greece	Cyprus	Israel
Meat (kg/yr)	38.6	21.7	34.4	20.2	87.8	106.2	71.7
- Poultry	22.0	6.9	24.5	8.9	17.6	36.0	47.8
Calories/day	3151	3038	2749	3416	3705	3259	3562
- Plant Products	2711	2628	2423	3040	2858	2305	2902
- Animal Products	440	410	326	376	847	953	660
Protein (g/day)	82.4	74.1	75.2	97.7	120.3	103.9	114.8
- Plants	53.6	52.9	52.3	72.3	55.0	42.4	55.4
- Animals	28.8	21.2	22.9	25.4	65.3	61.5	59.5
Fat (g/day)	111.5	103.7	80.9	90.2	150.5	129.9	128.7
- Plants	79.5	71.6	58.9	66.1	92.4	61.5	88.8
- Animals	31.8	32.1	22.0	24.2	58.0	68.4	39.9
Calories/day	173	130	140	88	339	433	288
- Poultry	77	24	85	30	60	128	169
Protein (g/day)	14.1	8.0	12.6	7.5	28.6	33.8	29.4
- Poultry	7.9	2.5	8.8	3.0	7.2	13.0	20.0
Fat (g/day)	12.4	10.6	9.5	6.1	24.0	31.0	18.1
- Poultry	4.8	1.5	5.3	1.9	3.3	8.0	9.2

Table 6 shows clearly that the supply of protein and energy per capita is still about 15% less than in Israel, while the supply from poultry is about 30% less.

This is an additional indicator of the potential trend of the poultry sector.

Table 7: Expected demand for poultry products between 2000 and 2020

Year	Population Evolution	3% Consumption Evolution	5% Consumption evolution
2000	100 %	100 %	100%
2005	107 %	116 %	127 %
2010	116 %	134 %	162 %
2015	125 %	150 %	200 %
2020	135 %	185 %	260 %

As seen in Table 7, the demand for poultry products would rise between 85 and 160% until 2020 assuming the consumption rises between 3% and 5% yearly. This increase would mean a parallel decrease in the consumption of other products such as legumes, which will be replaced by poultry meat or eggs.

5. Economic analysis

i. Feasibility of production

The feasibility of the poultry production operation is affected by many factors that were discussed previously. It is obvious that the profit margins are relatively low when birds are marketed alive as compared to the processed condition whether as carcasses or cut-up parts.

A farm survey conducted by the Economic and Social Commission for West Asia in 1998 indicates all the inputs and outputs of a poultry operation. Regarding broilers, the report had a serious error by assuming the price of 1kg between 2300-2500 L.L. (1.5-1.6 USD). This figure is totally unrealistic, as the prices did not exceed 1.3 USD during the last 2-3 years. Even earlier there were high fluctuations and the average annual price was lower than reported.

If lower figures are adopted according to the same report, the operation shows to be non-profitable.

An additional difference is that the traditional farmer/grower does not calculate or account for depreciation on buildings and equipment. On the other hand, very few farmers run the operation with one thousand birds only. This reduces the cost of production. Veterinary service is usually provided free of charge by the supplier of birds. Except in larger operations, labour costs are those of the farmer himself and/or his family

While the prices went down last year to around 0.65USD, currently the market prices for live birds at about USD 1.1. At this price, farmers have a margin from 0.20-0.35 USD per

kg depending on the size of the operation. A copy of one of the ESCWA survey sheets is attached to this report.

ii. Improvement possibilities

Many steps could be taken to increase the profitability of the poultry production operation.

- Implement measures to insure the quality of feed,
- Put in place and implement regulations to reduce the margins between farm and market prices where middlemen make most of the profit,
- Strengthen the quality assurance processes and regulations in an attempt to facilitate exports,
- Provide soft loans for small farmers to improve the quality of their farms and hence increase their productivity and improve the quality of the produce,
- Reduce the price of fuel or electricity for agricultural holdings or operations
- Revive and strengthen the producers cooperative which had major achievements from 1959-1975

Such interventions should be initiated relatively early to strengthen the sector before the entry into force of the regional and international trade agreements. The impacts of these agreements on the poultry sector will be discussed later.

6. Conclusions and recommendations

As mentioned earlier and synthesized from the available information, the situation of the poultry sector in Lebanon is not that different from other agricultural sectors. The advantage is in the hands of large-scale operators who have established themselves during the war or who have benefited from huge soft loans provided by international monetary institutions. During the preparation of this study, many medium-size operators withdrew from the market or reduced their operations due to financial difficulties.

One interesting change is what happened in South Lebanon, which was considered a separate market to a certain extent. During the last year, Hawa and Tanmia which were still outside this market because of its specificities and the accompanying security risks.

This has increased the pressure on the local operators who were managing but still suffering from the impacts of the Israeli aggressions prior to 2000.

There are currently indications that the two major producers will be the ones to survive at the long term especially with regard to their capacity to reduce their production costs and profit margins. This ability is based on the size of the operations and that their production circuits are closed.

i. Impacts of the free trade agreements

As of 2005, Lebanon will be officially opening its markets gradually as a result of the different trade agreements signed with the Arab countries, the European Union and the World Trade organisation.

These agreements are seen by many experts to have serious implications on the Lebanese agriculture. The impacts are likely to increase if Lebanon is not well prepared and does not make use of the grace periods offered by the agreements.

According to these agreements, countries are expected not to implement subsidies, customs or even labels that might be regarded as trade restrictive activities.

For the poultry sector, this will indicate a free flow of products from neighbouring countries. At the short term, this would mean that Syrian products would negatively affect the Lebanese market until the harmonisation of the two markets occurs. Key stakeholders indicate that there would be no problem caused by the Syrian market as Lebanese producers can compete in productivity and quality of the produce.

There would be however serious impacts from other markets such as China, Brasil, Thailand and others. These countries have cheaper raw material, labour and investment cost. Their impacts would cover the processed product market through the imports of frozen and chilled birds and cut-up parts at very low prices. Nevertheless, more than 50% of the domestic consumption is in the form of directly slaughtered birds whose import from these countries is practically impossible.

A more serious problem will face the egg and the canned meat producers who would have to compete with products from these countries.

The major activity to limit the impacts of these agreements is to set strict and high quality standards for import merchandise. These standards and norms should target tangible and measurable quality related issues such as antibiotic and growth promoter residues.

However, the Free Trade Agreement on Agriculture includes a so-called "Green Box". Under the Green box, subsidies that do not distort trade or cause minimal distortion are allowed. These subsidies are not subject to reduction commitments, but must be government-funded (not by charging consumers higher prices) and must not involve price. Other Boxes are also available and Lebanon should deeply investigate the possibilities in each box in order to provide some protection to its market against the dumping of products from other countries. Support examples are Research, extension, food security stocks, disaster payments, "decoupled" income support, and currently agri-environmental measures.

ii. Niche market products

Poultry production in Lebanon is still based on conventional egg and broiler production. Despite some private initiatives to produce turkeys, ducks, quails and some-by-products, the current production has little international competitiveness.

Producers could make use of the Lebanese ecosystems and microclimates to produce niche products such as organic chicken and eggs, free range or grain fed game birds.

Large-scale operators do not view organic poultry production as a promising activity due the requirements for feed and spacing that might hinder their flow of operations. This in itself is a chance for smallholders who could make use of this niche market. It would be possible to make use of marginal lands for the production of these commodities to supply the growing international and national markets.

Of course, there is always the possibility of competition with other developing countries, but still these markets are not subject to similar competition as the conventional ones and the farmers have the advantage of climatic conditions.

iii. Quality assurance

A serious problem facing the national consumption of poultry products is the quality of the produce mentioned earlier. It is imperative to facilitate the development possibilities for the sector through the implementation of strict regulations towards product quality especially residues of antibiotics and other feed additives.

Another aspect of quality is the hygiene and safety is at the level of the local retail shops that need strict licensing and monitoring regulations, as they are still a consumer demand.

This is achievable through the establishment or strengthening of existing laboratories and other control bodies that will enhance consumer confidence.

iv. Recommendations for improvement

In view of the above analysis of the sector, the following suggestions might help in the improvement of the overall situation

- Provision of soft loans for small farmers aimed at improving their farm structure and condition to increase production quantity and quality. This should be couple with a awareness campaign for farmers to inform them of all the possibilities,
- Reduce the energy cost (electricity, gas, diesel or fuel oil) for farmers as is the case in other sectors,
- Monitor the quality of imported feedstuff and insure the conformity to standards and requirements. This is achieved through strengthening the quality control measures at entry ports and the dependence on accredited laboratories,

- Monitor the quality of the parent stocks and the chicks to insure a uniform production
- Support the poultry extension services in an attempt to reduce the excessive use of veterinary products and the dependency of poultry growers on the services of the suppliers that are mostly driven by the need to market their products,
- Support and guide poultry research towards the support of the sector such as alternative feedstuffs, common health problems and frequent diseases and the production of non-traditional poultry such as guinea fowl, turkey, quail
- Put in place and implement quality standards for poultry products before the entry into force of regional and international agreements signed by Lebanon to reduce the impact of these agreements on the poultry sector,
- Adopt a national policy that allows for the guidance of farmers towards the production needs based on consumption trends,
- Set up and implement strictly a plan for the disposal of poultry offals and waste to reduce the negative environmental impacts of the sector.