Overview of the World Broiler Industry: Implications for the Philippines

Hui-Shung Chang
University of New England, U.S.A
Email: hchang@une.edu.au

ABSTRACT

Global production of broiler meat has been growing since the 1960s, faster than that of any other meat. In recent years, this growth has occurred in developing countries. Broiler meat is popular because it is cheaper, more versatile, and is perceived to give more health benefits than red meat. In spite of these advantages, the world broiler industry increasingly faces pressure to improve its production methods, with consumers and government citing health, environment, and animal welfare as the areas for improvement. Demand outlook is positive for the Philippine broiler industry because of the continuing growth in population and household incomes in the country. However, it faces threats from cheaper imports as a result of its higher cost of production and its less efficient marketing system. To compete, the Philippine broiler industry must aim for more efficient systems of production and marketing, and the government must provide an environment conducive to productivity improvement.

INTRODUCTION

Since the 1960s, the global production of poultry meat has been growing faster than that of any other meat in both developed and developing countries. This growth pattern can be expected to continue because of the inherent efficiency in feed conversion[1] and the lower production costs associated with intensive poultry production. Such production efficiency is particularly beneficial to developing countries, which tend to have limited agricultural resources but burgeoning, and often poor, populations. Declining poultry prices and increasing incomes have been attributed to increases in per capita poultry consumption, which is sensitive to both price and income changes (Taha 2003). The significant growth in poultry (especially broiler chicken) production and consumption in the developing countries has important implications for the global trading of all meat products, as well as feeds and related inputs (Landes et al. 2004; Taha 2003).

In spite of its many advantages and the positive market outlook, the world broiler sector faces increasing challenges (Shane 2004). One of these is the increasing consumer concerns over food safety, animal welfare, product quality, and environmental issues associated with industrialized poultry production systems. In addition, there is global competition, intensified by increasing trade liberalization and growing consumer choices. The increasing global competition is of particular concern for many small broiler producers in the developing countries, such as the Philippines, because their production and marketing systems are not yet developed or not as efficient. The objective of this study is to provide an overview of the world broiler market and derive its implications for the Philippine broiler sector. The findings of this paper would be applicable as well to other developing countries where large-scale broiler production is also emerging.

[1] Feed conversion ratio (FCR) measures the amount of feed required to produce a unit of meat. Although FCRs vary with age of animal and other environmental factors, broiler chickens convert feed to meat very effectively. An FCR of 1.80−1.90 is possible for broilers (Lacy and Vest 1997). By comparison, the FCRs for pork and beef are in the 3−4 and 7−10 range, respectively (Dyck and Nelson 2003).

THE WORLD BROILER MARKET

The structure of the world broiler market is affected basically by three factors: resource endowment (as manifested by, among others, agro-climatic conditions, and the availability and cost of major inputs such as land, capital, labor, feed, and technology), consumer preferences, and government policy. In terms of resource endowment, given that broilers are sensitive to changes in temperature and humidity, the matter of ensuring maximum productivity would require that these conditions be inherently favorable to lower the cost of controlling diseases and the environment. Moreover, since feed costs make up about 70% of the total cost of intensive poultry production systems, the availability of cheap feeds is one of the most important factors for industry development. For example, the world's two most efficient broiler producers, the United States and Brazil, are also major grain producers. In addition, access to advanced technology, which is also necessary to achieve a high level of efficiency, is another factor that strongly influences industry performance. As expected, broiler industries in major exporting countries are characterized by modern technologies and a high level of vertical integration (World Poultry 2004a).

Government policies, both domestic and trade-related, also have a significant impact on industry development and trade flow. Despite the World Trade Organization (WTO) and other regional trade agreements, varying degrees of trade and government intervention, such as tariffs, quotas, import taxes, and subsidies, still exist. These barriers play a major role in determining the performance of the poultry industries of some Western and Asian countries. In some cases, domestic industries have remained viable only because they have been protected through government interventions. Disparities in resource endowment and government policy have helped in differentiating nations as self-sufficient, net exporters, or net importers of broiler meat.

In 2003, the major broiler-producing countries in the world, in terms of volume, were the United States, China, Brazil, European Union (EU 15)[2], Mexico, India, Thailand, Japan, and Canada. The world's major exporters were the United States, Brazil, EU 15, Thailand, China, Canada, Argentina, Hong Kong, and Hungary. The major importers were: Russia, Japan, China, Saudi Arabia, EU 15, Mexico, Hong Kong, United Arab Emirates, South Korea, Canada, and Romania. The major consumers were the United States, China, Brazil, EU 15, Mexico, Japan, India, Russia, Saudi Arabia, and Canada. Note that, although in general, production is positively correlated with consumption and exports, there are exceptions.

The major players in broiler production, imports, exports, and consumption in 2003 are summarized in Table 1. Note that among the top 10 producers, the United States, Brazil, EU 15, and Thailand are net exporters, whereas Russia, Japan, China, and Mexico are net importers. India, on the other hand, is self-sufficient in broiler production with no recorded trade. On the other hand, China and EU 15 are both major importers and exporters in the world broiler market. The presence of intra-industry trade implies considerable product differentiation in the world broiler market (Han and Hertel 2002).

The market shares of the major players in 2003 are presented in Table 2. It is evident that the world broiler industry is highly concentrated, with the top four producers (USA, China, Brazil, and EU 15) accounting for 71% of total broiler production in 2003. The top four exporters (USA, Brazil, EU 15, and Thailand) account for 88% of total broiler exports, while the top four importers (Russia, Japan, EU 15, and China) account for 63% of total broiler imports. Relatively high concentration ratios mean that trade may be more easily disrupted by changes in demand and supply conditions in these countries, thereby leading to a less stable trading environment and more volatile prices. The avian influenza (AI) or bird flu outbreaks in China, Thailand, and the United States in 2003-04 are a case in point. These events triggered a major reshuffling of trade flows, accompanied by price hikes. Although high concentration ratios in the world broiler market have not been a major concern to policymakers or market analysts, a high concentration in the domestic broiler market has been more of a concern

[2] The EU 15 was expanded to EU 25 in May 2004. However, data for EU 25 were not available until 1999. Therefore, discussions in this paper will focus only on EU 15.

Table 1. Broiler production, supply, and demand among major players, 2003 (in 1,000 tons ready-to-cook equivalent).

Country	Production	Imports	Export	Consumption
World total	54,254	4,298	6,071	52,590
USA	14,696	0	2,232	12,539
Brazil	7,645	0	1,903	5,742
Thailand	1,340	0	527	763
Russia	560	1,081	1	1,672
Japan	1,127	695	0	1,841
China	9,898	453	388	9,963
EU –15	6,340	280	700	5,875
Canada	929	81	76	939
India	1,600	0	0	1,600
Mexico	2,290	337	0	2,626

Source: Foreign Agriculture Service, United States Department of Agriculture (FAS, USDA), 2005, www.fas.usda.gov/psd/complete tables/LP-table2-29.htm.

Table 2. Market shares of major players in the world broiler market, in %, in 2003.

Country	Production share	Export share	Import share
USA	27.65	38.05	0.00
China	18.63	7.17	9.70
Brazil	14.31	29.40	0.00
EU 15	10.79	11.94	9.82
Mexico	4.35	0.00	6.54
India	3.03	0.00	0.00
Thailand	2.44	8.53	0.00
Japan	2.12	0.00	16.36
Russia	1.06	0.00	27.58
Canada	1.73	1.45	1.99
Top four	71.38	87.92	63.46

because of the potential for large firms to use market power to exercise control over prices and other terms of trade (Digal 2005; Martinez 1999).

In the following sections, the major net exporters (United States, Brazil, EU 15, and Thailand) and the major net importers (China, Japan, and Russia) will be singled out for discussion because of their crucial roles in shaping the world broiler market. More importantly, they are used as case studies to demonstrate how the world broiler industry has developed in the past half century and how it has evolved into what it is today. Such information can be used to predict the development path of, and to derive implications for, broiler industries that are emerging practically everywhere in the world.

MAJOR NET EXPORTERS

In 2003, the major exporting countries were the United States which contributed 38.05% of the world's total broiler exports, Brazil with 29.40%, EU 15, 11.94%, and Thailand, 8.53%. They accounted for 27.65, 14.31, 10.79, and 2.44%, respectively, of the world's total broiler production.

The United States

The US is one of the world's largest producers and exporters of poultry meat. In 2003, US poultry meat production totalled 17.5 million metric

tons (t) (38.5 billion pounds), of which 84% was broiler meat with a farm value of $US15.2 billion (Economic Research Service (ERS) 2004). US broiler production is concentrated in a few states because of agro-climatic conditions that favor broiler production. The top five broiler-producing states are Georgia, Arkansas, Alabama, Mississippi, and North Carolina; together they account for around 60% of total broiler production in the United States (ERS 2004).

The US broiler industry has, no doubt, been a technological and marketing leader. One of its major contributions is the development of contract farming and vertically integrated production systems that prevail in the world broiler industry today (Ollinger et al. 2000; Martinez 1999). Contract farming has been the dominant means of coordinating broiler production in the United States since the mid-1950s (Martinez 2002). Initially, feed companies used contracts with broiler producers to increase and stabilize demand for their products. Later in the 1960s, they also became involved in broiler processing and marketing.

However, unstable prices and low profitability in the early 1970s prompted many feed companies to reduce their investments in the poultry business; as a result, their role in contract farming was gradually taken over by processors. In 1955, about 85% of broilers were produced under contracts, including marketing and production contracts, and vertical integration (Martinez 2002). In 2002, nearly all broiler production was supplied by integrators under contract with growers. Under contract farming, the feed companies or the processors usually provide the chicks, feed, and management and veterinary services to the growers, while the growers provide labor and chicken houses. At the end of the contract, growers receive a payment per kilogram of live broilers produced as well as performance-based bonuses or penalties (Martinez 2002). Contract farming and vertical integration have indeed contributed greatly to higher production efficiency, more consistent product quality, and the ability to respond to consumer demand for a variety of value-added products.

In the mid-1960s, most broilers were sold as unbranded, homogeneous, ready-to-cook, whole birds. Fewer birds are now purchased whole in the United States. Rather, consumers prefer selected cut-up parts as well as de-boned and pre-cooked chicken meat. In 1962, whole birds accounted for 87% of the birds consumed in the United States, but by 1997, the ratio was down to 13% (Ollinger et al. 2000; Martinez 1999). The provision of cheaper and more convenient products has resulted in significant, and continuing, growth in broiler consumption (FAS 2005a). Demand for further processing will continue as consumers and food service sector desire more convenience (O'Keefe 2005).

Other contributing factors to the continuing industry growth in the United States are the marketing efforts devoted to segmenting the broiler market and developing new markets. Because domestic consumers prefer breasts and other white meat and are willing to pay more for these products than whole birds or dark meat (thighs and drumsticks), chicken breasts and other white meat are reserved for the domestic market while dark meat is exported (Ollinger et al., 2000).[3] As a result, US chicken exports, which accounted for no more than 5% of total production in 1975, grew to around 15% during the past decade. In 2003, the major export markets for US broilers were: whole chickens to Mexico, Guatemala, Russia, Bahamas, and Romania; chicken parts to Russia, Hong Kong, China, and Mexico; processed/prepared chicken to Canada, Hong Kong, and Japan; and chicken feet to Hong Kong, China, South Korea, and Singapore (FAS 2005c)[4]. Product differentiation and market segmentation are evident in broiler exports from the United States, Brazil, and Thailand (Table 3).

It is clear from Table 3 that the United States exports mainly leg quarters, wings, and offal for which domestic demand is limited, while Brazil exports mainly whole birds. Thailand, on the other hand, exports mainly processed chicken parts. The trade patterns exhibited in Table 3 are consistent

[3] Asian consumers are known to prefer dark meat (chicken legs and wings) to white meat (chicken breasts). One explanation is that their traditional cooking methods often require meat to remain intact during long hours of stewing or simmering. Another possible reason is that dark meat is more similar to native chickens in flavor and texture, which are highly valued by Asian consumers.

[4] Because there is little demand for leg quarters and other parts in the US market, they are often disposed of overseas at a very low price. The "dumping" of leg quarters in the world market has caused problems for fledgling broiler industries in countries like the Philippines (DA &NAFC 2002) and Guatemala (Urrutia 2003).

with relative cost competitiveness among the world's three major suppliers (Table 4). As can be seen, Brazil has the lowest production costs of live broiler and lowest FOB selling prices for breast fillet and whole broiler, compared with the US and Thailand. By comparison, the US has those of the lowest FOB selling price for leg quarters among the three suppliers. Combined with the relatively low feed grain costs and labor costs, and the increasingly larger economies of scale, Brazil's production costs for whole eviscerated chicken are estimated to be the lowest among those of the major suppliers (Poultry International 2005b; Nunes 2004).

While new products are being developed in the US broiler industry to meet changing demand, new markets are also being developed to support further industry growth. US broiler exports to non-traditional markets, such as the Caribbean, Eastern Europe, Africa, and Central America, have increased in recent years due to overall economic growth and gains in the food industry sector in these countries (FAS 2003). Countries such as Cuba, Romania, Angola, and Guatemala are seen as key growth areas for US broiler exports, particularly leg quarters. Demand for value-added broiler products is expected to increase in the future in importing countries, such as Cuba where tourism is expected to expand. However, export growth in these new markets may be constrained mainly because of poor infrastructure, restrictive tariffs, and other market access issues. Another issue in these emerging markets is that consumers are more price-sensitive and, as a result, demand varies more with changes in price and exchange rate.

Brazil

In 2004, Brazil took over from the United States as the leading exporter of broiler meat in the world because of the AI outbreaks in the United States (specifically Texas, Delaware, Maryland, and Pennsylvania), whose imports to 50 countries, including Japan and China, had been banned.

The Brazilian poultry sector has experienced significant growth in the past three decades. Poultry meat production jumped from 217,000 t in 1973 to 7,654,000 t in 2003, while exports jumped from 3,700 t in 1975 to 1,922,000 t in 2003 (Nunes 2004). Annual per capita consumption also jumped from 2.3 kg to 33.4 kg during the same period. Brazilian broiler production is expected to continue to grow as a result of strong growth in export markets as well as an increase in domestic demand. Broiler meat exports are projected to increase owing to competitive pricing, market promotion efforts, favorable exchange rate, and an AI-free status,

Table 3. Broiler exports by major net exporters by product types, 2003 (in metric tons, ready-to-cook equivalent).

	Whole chickens	Chicken parts	Prepared chickens	Total
Thailand	45	370,713	128,365	499,123
USA	48,541	2,400,265	71,022	2,519,828
Brazil	796,424	1,176,953	37,730	2,011,107
Thailand	45	370,713	128,365	499,123
EU15	261,186	238,691	- 97,719[a]	402,158

[a] Net imports.
Source: FAS, USDA, Broiler Situation for various countries, www.fas.usda.gov/dlp/poultry.

Table 4. Broiler production costs, in US$/kg.

	USA	Brazil	Thailand
Live broiler (cost)	0.5549	0.4192	0.6095
Breast fillet (FOB)	3.10	1.22-1.99	1.77
Grade A whole broiler (FOB)	1.22	0.63	1.19
Grade A whole leg (FOB)	0.44	0.55	0.64

Source: USDA, 2003, Agricultural Outlook Forum.

while the growth in domestic demand is due to Brazil's enlarged base of lower- to middle-income consumers (Poultry International 2004a, 2005b).

One successful marketing strategy of the Brazilian poultry industry is market diversification. In 2004, Brazil exported to 134 countries—an increase of 12 countries from 2003 (FAS 2005a). However, the bulk of its exports are targeted at key import markets such as Saudi Arabia, Russia, Hong Kong, Japan, Germany, the Netherlands, South Africa, and United Arab Emirates (Poultry International 2005b). These key markets for Brazilian exports accounted for two-thirds of the total Brazilian broiler exports in 2003 (Poultry International 2004a). Another successful marketing strategy is to increase the value-added poultry products, such as high-end cuts, specialized trimmings, and other further processed products (FAS 2005a).

Thailand

This country is also emerging as a major supplier to the world market. The Thai broiler industry is export-driven (Shane 2003). Historically, Thai broiler exports consisted of basic boneless parts; however, the focus in recent years has shifted toward high-quality processed products. For example, in 2003 much of the export revenues came from precooked and other value-added products (Shane 2003). Japan and EU are the major markets for Thai poultry exports. Currently, Thailand supplies primarily value-added parts (semi-cooked and cooked products) to Japan, while exporting frozen parts to EU. Thai broiler meat exports are forecast to increase due mainly to the diversification of broiler products. In addition, Thailand is following an international trend of entering into joint ventures dedicated to export. While two of the eight Thai integrators are owned by foreign interests, Charoen Pokphand (CPF), Thai's largest integrator, has extensive investments in Southeast Asia (Shane 2003). According to Shane, the trend toward joint ventures overseas is a direct result of the uncompetitive production costs in home countries due to high labor costs, restrictive environmental legislation, and expensive ingredients, as well as an attempt to gain market access in host countries.

One of the keys to the success of the Thai broiler industry in the export markets is its ability and willingness to quickly respond to market demand. For example, in March 2002, a veterinary drug (nitrofuran) was detected in their frozen product exports to EU. In response, the Thai government quickly implemented strict production guidelines for regulating on-farm drug uses and for monitoring residue levels in poultry products. Concerted efforts were also made both by the Thai government and producers to modernize their broiler sector and to improve the quality of their products (FAS 2004). Another example is their response to AI outbreaks. In January 2004, Thailand was hit severely by AI. More than 30 million birds were culled and fresh broiler meat exports to Japan and other key markets were banned. In response, major Thai exporters expanded their capability for producing heat-treated chicken products and ready-made meals. These expansion plans were part of a long-term strategy to ensure high-quality "farm to table" production that would meet the food safety requirements of their key markets. As a result, the proportion of processed chicken meat exports from Thailand was expected to reach 60% of total Thai exports (Poultry International 2004c) [5]. Farm structure was said to change further as a result of a shift to more closed-farm systems and contract farming to gain greater control over supplies and poultry-raising standards (World Poultry 2004a).

The European Union

The EU 15 is another major exporter in the world broiler market. However, unlike the other three major exporters, the EU 15 is also a key importer of broiler products. It is not one of the most efficient producers in the world and is known for its protectionist policies. Without exception, the EU broiler industry is also supported by the Common Agricultural Policy, which provides subsidies to poultry producers in its member countries, erects trade barriers to limit imports, and uses other measures to encourage exports (FAS 2005a). Without these subsidies and trade barriers, EU

[5] The international trade in cooked and processed chicken will increase notably to reduce the risk of disease spread. However, demand for cooked and processed chicken has, so far, been lukewarm.

broiler products would have been less competitive in both the domestic and overseas markets. As a key importer and exporter of broiler products, the EU 15 exports mostly whole chickens, low-value cuts, and (mechanically deboned) (MDM) broiler meat while importing prepared and processed products (Table 5).

On 1 May 2004, the EU population was expanded by some 75 million to 452 million as ten new member states (NMSs) joined the Community (Poultry International 2004b). It was estimated that the newcomers would add more than 1.8 million t to the EU's poultry meat output, coming mainly from Poland, Hungary, and the Czech Republic. Supply from these three new members is expected to increase for several reasons. Firstly, they have the ability to produce competitively priced, good quality poultry products. Secondly, the lower cost of land and labor, as well as lower environmental and animal welfare standards, is expected to attract investments from existing members and fuel further growth. Thirdly, the decoupling of subsidy payments for cereals is likely to increase the availability of low-cost feed grains to Hungarian and Polish producers, leading to increased production (FAS 2005a). In addition, it is likely that Poland and other NMSs will buy lower-quality broiler cuts from the EU 15 for further processing (FAS 2005a).

MAJOR NET IMPORTERS

Russia, Japan, and China were the world's largest importers of broiler products in 2003. Together, they accounted for more than 50% of total world broiler imports, as shown in Table 2. There are some differences between these three countries. First, the difference between Japan and Russia is that Japan is, politically and economically, a much more stable market for broiler imports, than Russia. In addition, they differ in consumer preference and purchasing power. As a result, Japan imports significantly more high-value prepared chicken products, whereas Russia imports significantly more lower-value whole chickens (Table 6). On the other hand, China is different from Japan and Russia because it is both a significant importer and exporter of poultry products, also in different product categories.

Russia

Under the former Soviet Union, the Russian broiler industry, like all its other industries, was designed, built, and operated entirely by the government for all of seven decades. After the collapse of the Soviet Union in 1991, the industry has gone through significant structural changes,

Table 5. Broiler imports and exports of EU 15, by product types, in t, 2003.

	Whole chickens	Chicken parts	Prepared chickens	Total
Imports	14,213	215,210	118,532	347,955
Exports	275,399	453,901	20,813	750,113

Source: FAS, USDA, Broiler situation for various countries, www.fas.usda.gov/dlp/poultry

Table 6. Broiler imports by major importers, by product type, in t, 2003.

	Whole chickens	**Chicken parts**	**Prepared chickens**	**Total**
Russia	90,387	981,817	8,470	1,080,674
Japan	7,069	459,494	228,746	695,309
China	-28,751	359,451	-152,553a	178,147

[a]Net exports.
Source: FAS, USDA, Broiler situation for various countries, www.fas.usda.gov/dlp/poultry

Table 7. Broiler imports and exports by China, by product type, in t, 2003.

	Whole chickens	Chicken parts	Prepared chickens	Total	Chicken feet
Imports	0	565,608	447	566,055	262,995
Exports	28,751	206,157	153,000	387,908	0

Source: FAS, USDA, Broiler situation for various countries, www.fas.usda.gov/dlp/poultry

as the majority of the government-owned and -operated industries were privatized or sold off. It was estimated that before 1991, there were more than 60 fully vertically integrated broiler complexes in Russia, but only a little more than 20are in production today (O'Keefe 2004). As the remaining ones underwent restructuring and modernization, productivity had improved and new markets for value-added fresh and frozen poultry products had been developed.

The Russian broiler production has more than tripled in the past few years. Heavy investment in the domestic broiler industry is expected to continue to expand production capacity and to increase efficiency through vertical integration. However, there remains a large market for inexpensive, imported frozen chicken because the increased production cannot keep up with the growing demand (O'Keefe 2004). To limit imports, an import quota of 1.05 million t on poultry meat was imposed on 1 May 2003. The long-term effectiveness of such quantity restrictions, however, will depend on the ability of the domestic industry to produce high-quality and competitively priced products.

Per capita consumption in Russia in 2004 was estimated at 11.4 kg, an increase of 40% from four years ago. Demand for broiler meat in Russia has tremendous opportunity to grow because of the country's size and its relative wealth (O'Keefe 2004). The United States is, by far, the largest supplier to Russia with a 65% market share in 2003, followed by Brazil with a 16% market share (Petry and Maksimenko 2004).

Japan

China was the leading supplier of broiler meat to Japan, with a 35% market share in 2002. Other foreign suppliers were the United States, Thailand, and Brazil. Demand for broiler meat imports is expected to increase due to the growth in the food service sector, and the stagnant domestic production (Obara 2004). In 2003, 56% of total chicken meat consumed in Japan was utilized by the food service and catering sector, 33% by households, and 11% by processors. While households consumed mainly domestically produced fresh/chilled cuts, the processing and food service sectors used mainly imported products. A gradual reduction in domestic supply is expected due to foreign competition, especially cheaper imports from China.

China

China is no doubt a key player in the world broiler market, being a significant producer, as well as a key importer and exporter of broiler meat. As indicated in Table 6, China is a net importer of broiler meat in terms of volume. However, because the value of its exports is more than double the import values, it is a net exporter as well (Han and Hertel 2002). This is the case because China imports only low-value products such as chicken feet[6] and wings while exporting higher priced products such as de-boned chicken breast (Table 7). The United States is the number one supplier to China and about 70% of the US poultry exports to China consist of chicken wings and chicken feet. In terms of exports, while most Chinese exports to Hong Kong are live birds, exports to Russia, Japan, and Saudi Arabia consist of processed poultry products (Han and Hertel 2002). In fact, according to Han and Hertel

[6] Chicken feet/paw imports accounted for a significant part of China's and Hong Kong's broiler imports. In 2003, the chicken paw imports of China totalled 262,995 t, of which 241,017 t were supplied by the United States.

(2002), China would be a substantial net exporter if exports in live animal, viscera, and canned products were taken into account.

Much of China's broiler exports are originally imports from the United States, which are then processed or de-boned and re-exported as Chinese products. In addition, more than half of China's poultry meat imports were channelled through Hong Kong (FAS 2005b). Approximately 82% of Hong Kong's imports are re-exported to China. Therefore, broiler imports to Hong Kong hinge on the demand in China. However, Hong Kong will likely become a less important transit point for China's imports as a result of the implementation of new import meat quarantine regulations, effective 1 November 2004. The new regulations are aimed at strengthening border control over diseases and smuggling (Bean and Zhang 2004; FAS 2005b). The resulting pre-inspection cost is expected to cause more direct shipments to China, which otherwise would be re-exported through Hong Kong. In recent years, the transport costs of direct shipments to Shanghai have become comparable with costs re-exported through Hong Kong. Consequently, direct shipments to China will continue to increase, bypassing Hong Kong (FAS 2005b).

MAJOR ISSUES

Technological advances in broiler production and marketing have contributed greatly to the success of the poultry industry, as discussed earlier. However, there has been a steady rise in government regulations on, and consumer dissatisfaction with, industrialized poultry production systems (McMullin 2003). Among the particular concerns are:

- the use of antimicrobial growth promoters, animal protein, and genetically modified materials in feeds;
- the impact on the environment;
- animal welfare; and
- disease control.

Obviously, meeting these additional requirements from the consumer and the government will have significant implications for the future broiler production and marketing, which, in turn, will have implications for cost of production and market competition. These issues, referred to by Ellendorff (2003) as a "field of conflict in broiler production", are depicted in Figure 1.

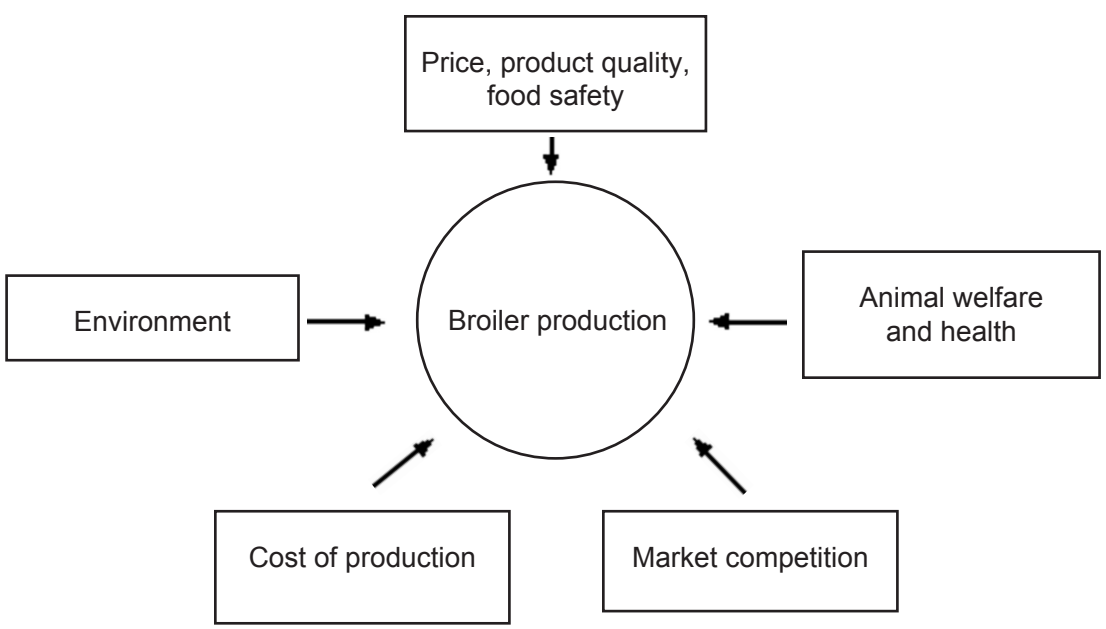

Figure 1. Field of Conflict in Broiler Production.

Consumer Power

It is apparent that meeting the changing and ever more stringent consumer requirements is a major challenge that the broiler industry faces. Take the UK, for example. In the 1970s, price was the main consideration for making purchasing decisions; in the 1980s, price, quality, and product range all became important considerations. By the 1990s, a much wider range of consumer concerns has become evident, which includes food safety, bird welfare, the environment, worker welfare, and ethical trade. In future, as consumers gain in affluence, they are expected to become even more demanding owing to their more discerning tastes and greater information on the impact of food production on their personal health and the environment. Although standards of production and consumer attitudes vary from country to country, quality assurance and traceability in food production have become a global issue with growing complexity and importance, as a result of changing consumer priorities and increased consumer power (Holroyd 2001). Meeting these changing demands will be a challenge for all producers, but for some, it will also create market opportunities for product differentiation and market segmentation. For instance, increasing the supply of free-range and organic chickens is a good example of responding to consumer demand for more socially acceptable products.

Biosecurity

Recent disease outbreaks have presented another significant challenge for the poultry industry. The most recent example is the bird flu virus which started spreading around the world in 2003-04, particularly in Asia (Thailand, China, Taiwan, Hong Kong, Vietnam, Malaysia, South Korea), Europe (the Netherlands), and North America (Canada and USA). It is apparent that poultry industries across the world have been affected, although to varying degrees, by the experience of the bird flu outbreaks. In the short term, the outbreaks have disrupted the world supply of poultry and have caused many producers to suffer financial losses or go out of business. The longer-term and more wide-ranging effect, however, will be in altering the relative competitiveness of poultry producers in the world market. Particularly, biosecurity, rather than cost, is likely to increase in importance in determining overall competitiveness in the future (Yagani et al. 2004). Countries that are free of important poultry diseases will have an obvious marketing advantage. It is indeed a challenge for the industry to simultaneously meet the need of the market for cheap, safe, and convenient products, on one hand, and the need to maintain production efficiency and profitability, on the other hand. As pointed out by Holroyd (2002), meeting these challenges requires continuing research, collaboration, and innovation throughout the total food chain; moreover, he contends that the future of the industry is all about risk management, quality assurance, and traceability.

THE PHILIPPINE BROILER INDUSTRY

The Philippine broiler industry is relatively small, both by world standards and when compared with those of its neighboring countries. As can be seen in Table 8, broiler production in the Philippines in 2003 was 635,000 t, constituting only about 6% and 50% of the Chinese and Thai production, respectively.

The poultry industry in the Philippines, as in most Asian countries, is more diverse and less developed on several fronts, compared with its Western counterparts. First, the supply of chicken meat comes from both exotic hybrids of foreign origin (the so-called broilers) and native chickens (referring to domesticated jungle fowl and the progenies of their crosses with exotic breeds, which are mostly raised under free-range or scavenge-based systems). Specifically, native chickens accounted for around 54% of total chicken inventory in 2005 (BAS 2006), contributing 13% of total chicken meat production and 26% of total chicken egg production (Abuel-Ang, 2005).[7]

A few vertically integrated companies dominate the broiler industry in the Philippines. They are Swift Foods, San Miguel Pure Foods, Vitarich Corporation, Tysons Agro-Ventures, General Milling Corporation, and Universal Robina Corporation (DA-AMAS 2001; Abuel-Ang 2005;

[7] For more details on the commercial and backyard chicken sectors in the Philippines, see Chang (2007).

Table 8. Broiler production and consumption in selected Asian countries, 2003 (in 1,000 t ready-to-cook equivalent).

Country	Production	Imports	Export	Consumption
World total	52,833	4,279	5,861	51,351
Thailand	1,290	0	527	763
Japan	1,120	700	0	1,835
China	9,844	415	420	9,839
Hong Kong	61	164	0	225
Taiwan	685	49	4	730
S. Korea	429	89	2	516
S. Arabia	468	430	25	832
India	1,600	0	0	1,600
Malaysia	835	38	5	868
Indonesia	735	0	3	732
Philippines	635	14	0	640

Source: FAS, USDA, www.fas.usda.gov/dlp/poultry and FAS GAIN Reports, www.fas.usda.gov/gainfiles.

San Miguel Food Group 2006). These integrators are members of the PABI (Philippine Association of Broiler Integrators) and involved in both the production and marketing of broiler chickens, the importation of grandparent and parent stocks, and the manufacture and sale of commercially mixed feeds. Together, they account for about 80% of the broiler supply in the country (DA & NDFC 2002). The balance comes from other independent, non-integrated commercial farms (organized under the banner of the United Broiler Raisers Association) and backyard raisers.

While broilers are raised mostly in large-scale, industrialized production systems, native chickens are raised mostly by backyard smallholders based on traditional methods using locally available resources. Generally, the native chickens have relatively low productivity (e.g., slow growth[8], low laying rate, and high mortality rate) and inconsistent quality and supply because of less organized production systems and management practices. However, native chickens are often preferred by consumers, particularly in Asian and African countries, for their flavor, taste, and texture (Kitalyi 1996; Taha 2003; Landes et al. 2004). Although backyard poultry production has gradually been displaced by commercial exotic breeds and modern technology the world over, there is strong interest to revive native chicken production with improved genetics and management. For example, native chickens (with improved genetics and management) are gaining popularity among producers and consumers in countries such as Taiwan, Thailand, and China. Thailand is tipped to export native chickens in the foreseeable future.

Broiler meat in the Western countries is distributed mainly through supermarkets, fast food outlets, and other food services in frozen/chilled and processed forms. By comparison, in the Philippines, and most developing countries, over 70% of chicken meat is distributed through wet markets where live chickens are purchased or slaughtered on demand. There is a preference for shopping at the wet market because consumers believe that the live birds and freshly slaughtered chickens, which are available only at the wet markets, are fresher and more nutritious compared with frozen chickens. The preference for freshly slaughtered carcass has served as a natural trade barrier against cheaper frozen imported products (Gonzales 1995). However, consumer preference for live birds and freshly slaughtered chickens has significant implications for marketing efficiency, disease control, and public health (Chang 2004).

Live trade and backyard poultry production have come under more intense scrutiny due to the recent AI outbreaks; both were suspected as serving as a reservoir for disease spread. To prevent future

[8] Slow growth has contributed to the distinct flavor and texture of native chickens (World Poultry 2004b).

disease outbreak, increased restrictions are likely to be imposed on live trade and informal smallholder poultry production (Aho 2004). In the foreseeable future, it is likely that smallholder poultry production and live trade will be either actively discouraged or phased out in some areas, or relegated to the poorest and most isolated areas. If implemented, these policies will result in the displacement of smallholder production and quicken the structural change in the poultry industry. The economic and social impacts on smallholder producers and their livelihood of any policy changes should be carefully considered.

The current coexistence between backyard flocks and commercial poultry production, and between the markets for alive/freshly slaughtered chicken and frozen/dressed chicken is likely to become increasingly uneasy because of the difficulty in disease control (Aho 2004)[9]. To avoid potential conflicts, zoning for poultry farms has been proposed in Thailand for greater control of diseases (Poultry International 2004c). Under the proposal, appropriate regions will be selected according to biosecurity standards outlined by the World Health Organization. In addition, if a disease outbreak is detected at any site in a particular region, all farms in that region will be closed and placed under strict quarantine, while unaffected regions will remain in business. Zoning has been implemented in the United States based on state boundaries. An alternative proposal is to categorize chicken farms into two groups, one for the domestic market and one for the export market. Each group will have its own control and biosecurity measures. The goal of the two-tier system is to protect Thailand's export markets in the event of an epidemic. These proposals appear to be relevant to the Philippine broiler industry and warrants further investigation by policymakers in the industry and government.

In addition to structural issues, the on-farm performance of the Philippine broiler industry is lower when assessed against those of the US, China, Thailand, and Brazil. According to industry sources, the integrators have attained only 70% of the international efficiency standards (DA-AMAS 2001). Therefore, there is a need to modernize by adopting the latest technology in poultry-raising; environmental control; and automation in feeding, drinking, and other management practices. Production inefficiency, along with the reliance on high-cost, imported inputs, has resulted in the higher production cost of live birds.

Another reason for the higher production cost for live birds is consumer preference for a smaller carcass (around 1.0−1.2 kg dressed weight for a whole chicken, compared with 1.5 kg in other countries) (DA & NAFC 2002). Consumer preference for a smaller carcass can increase costs because broilers are not allowed to reach their peak feed efficiency (normally at around 1.9 kg live weight). As a result, there is small average weight per bird and, hence, higher cost per kilogram of meat.

Dressed birds at the wholesale and retail levels have also become more expensive in the Philippines, compared with those in the USA, Brazil, and Thailand due to the inefficiency existing in the marketing chain, especially in processing and distribution (DA & NAFC 2002). As discussed earlier, despite the highly concentrated and vertically integrated production structure of the commercial broiler sector, a large proportion of broilers are sold as live birds through the wet markets. The diversity of the marketing channels post-farm-gate means that the broiler industry does not benefit fully from the economies of scale that exist in the production system, resulting in higher broiler prices.

It has been shown that the Philippine broiler sector is less competitive because of higher input costs, below-par on-farm productivity, and an inefficient marketing system (Gonzales 1995; Mangabat 1998; SEARCA 1999; University of Asia and the Pacific 1999; Mateo 2001; Arboleda 2001; SIKAP/STRIVE Foundation 2001; DA & NAFC 2002; Chang 2004).

IMPLICATIONS FOR THE PHILIPPINE BROILER INDUSTRY

Based on the overview of the world broiler industry, it is clear that the world broiler market is highly competitive, with an increasing number

[9] Prohibition of the sale and slaughtering of live poultry at the wet market in major cities, as practiced in Sri Lanka (Bootwalla 2005), may help resolve some of the issues surrounding live trade.

of efficient producers fighting for market share. They succeed by competitive pricing, aggressive marketing, new product development, and new market development. Another observation from the overview is that, although in the past competitiveness was based on cost factors, in future additional factors such as food safety, quality assurance, biosecurity, and environmental and animal welfare issues will become more important in determining overall competitiveness. This means that a well-managed and coordinated supply chain, including production, processing, and distribution, will be key to meeting the changing consumer demands and government regulations.

That the Philippine broiler industry is less competitive implies that it will face increasing threats from global competition and cheaper imports. An important policy question for the policymakers is how to balance the need for developing the country's own industry and the need to provide cheap and high-quality products to the domestic market. In the past, the Philippine government used tariffs and quotas to protect its domestic industry. However, continuing trade liberalization has seen these protectionist measures gradually being reduced or removed, with the emphasis shifting toward becoming more competitive. This will require the industry to improve on-farm productivity by adopting the latest technology and more efficient management practices. Furthermore, there is a need for the broiler industry to become fully vertically integrated to benefit more from the economies of scale and scope.

This will involve integrating backward to produce its own breeding stocks and integrating forward into further processing and retailing. Innovative processing and marketing are crucial in order to change consumer preference for small and fresh/chilled carcass and to lure them away from the live trade and wet markets. In addition, the Philippine poultry industry is fortunate not to be affected by the recent AI outbreaks. The AI-free status has obviously provided a marketing advantage in the short term by opening up some export markets. However, to maintain this marketing edge, the industry must commit to tighter biosecurity measures and to improve cost competitiveness. The large numbers of ducks and native chickens in backyard production, the prevalence of live poultry trade in wet markets, and the reliance on imported breeding stock undoubtedly will make implementing biosecurity measures against bird flu a major challenge.

To help improve the performance of the Philippine poultry industry, government is expected to provide an environment that is conducive to productivity improvement throughout the supply chain. Areas where government could make significant contributions include the collection and dissemination of market intelligence through continuing support of data collection and market research, improving marketing infrastructure, and further reforms in input markets. Finally, potential conflicts between the commercial and backyard sectors, and their impact on disease control and the ultimate competitiveness of the poultry industry also warrant further research in order to set appropriate policy directions.

CONCLUSION

The global production, consumption, and trade of poultry meat have grown faster than that of any other meat in recent decades. This growth is expected to continue because poultry meat is cheaper, more versatile, and provides more health benefits, than do other meats. Among the poultry products, broiler meat is the cheapest and most popular among consumers the world over. Contract farming and vertical integration, which are key features of the world's most efficient broiler producers, have resulted in improved production, more efficient marketing, and the increasing number of value-added products at lower costs.

In spite of its many achievements, the world broiler industry faces increasing challenges from increasing consumer power and government regulations. Meeting these challenges will require continuing innovation on production methods that are both economical and ethical. The broiler industries in the developing countries, such as the Philippines, may not be currently confronted with pressure from consumers to the same degree because the latter are more concerned with prices and quality. However, over time, consumers will become more demanding and more aware of issues that currently concern consumers in the more affluent and industrialized countries.

The future outlook is positive for the Philippine broiler industry because the demand for its products can be expected to grow, given the current low level of per capita consumption and the anticipated growth in population and household income. However, given that the Philippine broiler sector is relatively uncompetitive because of higher input costs, below-par on-farm productivity, and inefficient marketing system, the threat of foreign competition is real and imminent. To survive and grow, the Philippine broiler industry must strive not only for greater efficiency in production and marketing, but also enhanced product development to meet changing market demand.

ACKNOWLEDGMENT

This paper forms part of the research on "Future prospects for smallholder Philippine poultry producers: ducks and native chickens". The author is grateful to the Australian Centre for International Agricultural Research (ACIAR) for funding the said research project.

REFERENCES

Abuel-Ang, P. 2005. "Philippines: Poultry and Products Annual 2005". GAIN Report RP5033. FAS. USDA. www.fas.usda.gov/gainfiles/200509/146130789.

Aho, P. 2004. "The Ripple from Avian Influenza – The Future of the World Poultry Industry". Poultry International, 43(5): 30-34.

Arboleda, C.R. 2001. "The Philippine Poultry Industry: Meeting the Challenges of the 21st Century". Paper presented at the 3rd 2001 PSAS Lecture Series on The Philippine Poultry Industry in the 21st Century: Threats and Opportunities, 17 May 2001, National Agricultural and Fishery Council, Diliman, Quezon City.

Arbor Acres. 2002. "World Market for Chicken Meat". Broiler Economic Bulletin, 10(5). www.aviagen.com//output.aspx?sec=471&con=2197&siteld=3.

Bean, C. and J. Zhang. 2004. "China". USDA FAS GAIN Report No.CH4045. www.fas. usda.gov/gainfiles/200409/146107572.pdf.

Bootwalla, S. 2005. "Poultry and the Population on the Asian Subcontinent". World Poultry, 21 (4): 10-12.

Bureau of Agricultural Statistics (BAS). 2006. "Chicken Industry Performance Report, January-December 2005". Livestock and Poultry Statistics Division, BAS, Department of Agriculture, May 2006. http://www.bas.gov.ph/downloads_view. php?id=167.

Chang, H.S. 2004. "Cross-sector Comparisons of Poultry Production in the Philippines". Working Paper Series No. 2004-12. Agricultural and Resource Economics, School of Economics, University of New England. www.une.edu.au/febl/GSARE/arewp04-12.pdf.

_____. 2007. "Analysis of the Philippine Chicken Industry: Commercial Versus Backyard Sectors. Asian Journal of Agriculture and Development, 4(1): 41-56.

Department of Agriculture–Agribusiness and Marketing Assistance Service (DA–AMAS). 2001. "Broiler Industry Situation Report". www.da.gov.ph/agribiz/broiler.html.

Department of Agriculture and National Agricultural and Fishery Council (DA & NAFC). 2002. Broiler Industry Master Plan. Quezon City, Philippines, June 2002.

Digal, L. 2005. "Market Power Analysis: The Case of Poultry Industry in the Philippines". Paper presented at the 49th AARES Annual Conference, 10-13 February 2005, Coffs Harbour.

Dyck, J. and K. Nelson. 2003. "Structure of the Global Markets for Meat". Economic Research Services (ERS), Agriculture Information BulletinNo. 758. USDA. Washington, D.C.

Ellendorff, F. 2003. "The Crossroad of Consumer Demand and Reality". World Poultry, 19(3): 25-24.

Economic Research Service (ERS) 2004. "Poultry and Eggs: Background". Briefing Room. ERS, USDA, www. Ers.usda.gov/Briefing/Poultry/Background.htm.ERS.

Foreign Agriculture Service (FAS) 2003. "U.S. Broiler Exports Find Prospects in Non-traditional Markets". www.fas.usda. gov/dlp/circular/2003/03-10LP/broilerexports.html.

_____. 2004. "Thailand Poultry and Products 2004". GAIN Report No. TH4088.

_____. 2005a. "World Broiler Trade Overview". www.fas.usda.gov/dlp/circular/2005/05-04LP/broileroverview.html.

_____. 2005b. "The Changing Face of China's Poultry Meat Imports: More Competition and Shifts in Port Inventory". FAS online, FAS, USDA. www. fas.usda.gov/dlp/circular/2005/05-04LP/chinapoultry.html.

_____. 2005c. "U.S. Broiler Situation". USDA. www.fas.usda. gov/dlp/ countrypage/ us.html.

Gonzales, L.A. 1995. "The Impact of GATT-UR on the Philippine Agribusiness Competitiveness: The Case of Poultry and Livestock Products". Final report submitted to the USAID/ASAP Policy Team. DAI, Pasig City, Metro Manila.

Han, Y. and T. Hertel. 2002. "The Puzzling State of China's Meat Trade", Choice Magazine, Second Quarter: 11-15.

Holroyd, P. 2001. "Quality Assurance Is a Global Issue.", Poultry International, November: 10-14.

_____. 2002. "Consumer Power Leads to Litigation". Poultry International, July: 32-38.

Kitalyi, A.J. 1996. "Village Chicken Production Systems in Developing Countries: What Does the Future Hold?". Short communication. FAO. http://www.fao.org/ livestock/ agap/war/warall/w6437t/w6437t07.htm.

Lacy, M. and L. Vest. 1997. "Improving Feed Conversion in Broilers: A Guide for Growers". Http://pubs.caes.uga.edu/caespubs/pubcd/c793-w.html.

Landes, M, S. Persaud, and J. Dyck. 2004. "India's Poultry Sector: Development and Prospects". ERS, USDA, Agricultural and Trade Report WRS-04-03.

Mangabat, M.C. 1998. "Effects of Trade Liberalisation on Agriculture in the Philippines: Institutional and Structural Aspects". The CGPRT Centre Working Paper Series. CGPRT, Bogor, Indonesia.

Martinez, S. 1999. "Vertical Coordination in the Pork and Broiler Industries: Implications for Pork and Broiler Products". ERS, USDA, AER no. 777.

Martinez, S. 2002. "Vertical Coordination of Marketing Systems: Lessons from the Poultry, Egg and Pork Industries". ERS, USDA, AER no. 807.

Mateo, J.P. 2001. "Trends and Prospects of the Broiler Industry in the Philippines for the Millennium". Paper presented at the 3rd 2001 PSAS Lecture Series on The Philippine Poultry Industry in the 21st Century: Threats and Opportunities, 17 May 2001, National Agricultural and Fishery Council, Diliman, Quezon City.

McMullin, P. 2003. "Food Safety and Other Contemporary Industry Concerns". Paper presented at the 13th Congress of the World Veterinary Poultry Association. July 2003, Denver, USA.

Nunes, F. 2004. "What is Behind Brazilian Broiler Industry Competitiveness?" World Poultry, 20 (12): 26-28.

Obara, K. 2004. "Japan: Poultry and Products, 2004". USDA, FAS, GAIN Report no. JA4069. www.fas.usda.gov/gainfiles/200409/146107556.pdf.

O'Keefe, T. 2004. "Russia's Poultry Industry Is Adapting to the Free Market". Poultry International, 43 (7): 20-28.

_____. 2005. "Further-processing Trends in the USA: Delivering Convenience", Poultry International, 44 (5): 20-28.

Ollinger, M., J. MacDonald, and M. Madison. 2000. "Structural Change in the U.S. Chicken and Turkey Slaughter". USDA, AER No. 787.

Petry, M. and M. Maksimenko. 2004. "Russian Federation: Poultry and Products, 2004". USDA, FAS, GAIN Report no. RS4045. www.fas.usda.gov/gainfiles/200409/146107342.pdf.

Poultry International. 2004a. "Around the World: Brazil, Continued Surge in Poultry Meat Exports". Poultry International, 43 (7): 6-8.

_____. 2004b. "Around the World: European Union, The EU Is Now 25". Poultry International, 43 (5): 4-6.

_____. 2004c. "Around the World: Thailand, Industry to Discuss Zoning for Poultry Farms". Poultry International, 43 (9,): 4.

_____. 2005a. "Around the World: Worldwide: Global Poultry Meat Output Close to 80 Million Tonnes". Poultry International, 44 (2): 6.

_____. 2005b. "Around the World: Brazil to Retain Top Broiler Exporter Spot". Poultry International, 44 (1): 4-8.

San Miguel Food Group. 2006. "San Miguel Pure Foods". http://sanmiguelpurefoods. com/?p=1.

SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA). 1999. "The Effects of Trade Liberalisation on the Philippine Livestock Industry". Final report. Los Bañnos, Philippines.

Shane, S. 2003. "Thai Broiler Integrators Committed to Export". Poultry International, June: 16-19.

_____. 2004. "The Challenges, Successes and Issues Facing Today's Industry". World Poultry, 20 (2).

SIKAP/STRIVE Foundation. 2001. "Benchmarking, Global Competitiveness Analysis and Policy Advocacy for the Poultry and Livestock Subsectors". Final report.

Taha, F.A. 2003. "The Poultry Sector in Middle-income Countries and its Feed Requirements: The Case of Egypt". Outlook Report No. WRS03-02. Economic Research Service, USDA. Http://www.ers.usda.gov/publications/WRS03/dec03/ wrs0302.

University of Asia and the Pacific. 1999. "Competitive and Benchmarking Analysis for Selected Agribusiness Products". Interim Report to the Department of Agriculture.

Urrutia, S. 2003. "Guatemala Has Great Growth Potential". World Poultry, 19 (6): 12-14.

World Poultry. 2004a. "Thai Broiler Industry Forced to Change Structure". World Poultry, 20 (5): 24.

_____. 2004b. "Slow Growth Lifts Chick Meat Quality". World Poultry, 20(6): 19.

Yagani, M., A. Nilipour, G. Butcher, R. Miles, and B. Sanei. 2004. "Biosecurity Is the Ultimate Approach to Survival". World Poultry, 20 (7): 30-31.