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RESEARCH PAPERS AND REPORTS IN ANIMAL HEALTH ECONOMICS

AN ACIAR THAI-AUSTRALIAN PROJECT

Working Paper No. 10

Overview of Pigs and Poultry: Specific Livestock Industries, Livestock Diseases and Policies in Thailand

by

T Murphy and Clem Tisdell

December 1995

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The Commissioned Organization is the Queensland Department of Primary Industries. Collaborating institutions in Australia are CSIRO-ANHL, Geelong, Victoria and the University of Queensland (Department of Economics; Department of Geographical Sciences and Planning). In Thailand, the collaborating institutions are the Department of Livestock Development (National Institute of Animal Health; Disease Control Division), Chiang Mai University (Department of Agricultural Economics; Department of Animal Husbandry) and Thammasat University (Faculty of Economics). The collaborating institution in Laos is the Department of Livestock and Veterinary Services. Dr F.C. Baldock, Senior Principal Epidemiologist, Queensland Department of Primary Industries is the Project Leader in Australia and Dr P. Chamnanpood, Senior Epidemiologist, Thai Department of Livestock Development is the Project Leader in Thailand. Professor Clem Tisdell and Dr Steve Harrison, Department of Economics, University of Queensland are responsible mainly for the economic component of this project.

'The overall goal of this project is to develop and evaluate the .necessary tools to provide decision-makers with reliable animal health information which is placed in context and analysed appropriately in both Thailand and Australia. This goal will be achieved by improving laboratory diagnostic procedures; undertaking research to obtain cost-effective population referenced data; integrating data sets using modern information management technology, namely a Geographical Information System (GIS); and providing a framework for the economic evaluation of the impact of animal diseases and their control.

A number of important diseases will be targeted in the project to test the systems being developed. In Thailand, the focus will be on smallholder livestock systems. In Australia, research will be directed at the northern beef industry as animal health information for this sector of livestock production is presently scarce.'

For more information on *Research Papers and Reports Animal Health Economics* write to Professor Clem Tisdell (c.tisdell@economics.uq.edu.au) or Dr Steve Harrison,(s.harrison@uq.edu.au) Department of Economics, University of Queensland, Brisbane, Australia, 4072.

Overview of Pigs and Poultry: Specific Livestock Industries, Livestock Diseases and Policies in Thailand

ABSTRACT

The pigs and poultry industries are the major livestock sectors in terms of commercial livestock production in Thailand. The dramatic growth of the Thai economy since the 1960s was spearheaded by rapid expansion of agricultural industries such as the poultry sector and has since generated increased demand for other livestock commodities such as pork. While pigs have traditionally been an important part of the integrated farm system in Thailand, pork production has only recently developed into a promising commercial sector. While small growers once dominated the industry it is now reported that over 80% of the industry is involved in commercial production. While the commercial development of the poultry sector was characterised by substantial support from government and private sectors, the swine industry has suffered a long history of government intervention that constrained its progress toward a viable commercial sector. The degree of government intervention and associated factors such as the level and control of disease have been critical factors in the development and performance of both industries and will continue to determine how well they compete.

Keywords: animal disease, Thailand, livestock

JEL Codes: Q18, Q16

Overview of Pigs and Poultry: Specific Livestock Industries, Livestock Diseases and Policies in Thailand

1. Introduction

Compared to the production of cattle and buffalo in Thailand, the pig and poultry industries are much more commercialised. The commercialisation of broiler production commenced in Thailand in the early 1970s and today possibly less than a quarter of Thailand's total poultry production is supplied by villagers. Nevertheless, poultry in villages remains an important source of local supply and a significant source of supplementary income for villagers.

Whereas village supplies of poultry appear to have remained stationary, commercial production has expanded rapidly, mainly as a result of the efforts of large companies many of which are multinationals. As a result, Thailand has become a significant exporter of broilers. However, Thailand's level of exports may now have stabilised and actually appear to be in slight decline due to factors discussed later.

As for the pig industry, it became increasingly commercialised in the 1980s and since that time, village production of hogs appears to have declined. While some large companies are involved in pig production, the companies are on the whole smaller than those involved in the commercial poultry industry, with most firms being Thai domestic firms rather than large multinational companies. Thailand is able to meet its own pork requirements and exports a modest amount of frozen and boiled pork. Its pork industry has not been as internationally competitive as its broiler industry. Let us consider Thailand's poultry and pig industries in more detail.

2. Pigs in Thailand

2.1 Introduction

Swine production is concentrated in the central plains area of Thailand which is compromised of the provinces around Bangkok such as Nakhon Pathom, Ratchaburi and Chachoengsao. This area accounts for approximately 36-40% of total production of pigs. The Northern Region ranks second accounting for 26-30% of total Thai production (Office of Agricultural Economics, 1992).

Until a decade or so ago, Thai pig production showed little development with most of the pigs being crossbreds raised in the backyards of paddy farmers to provide cash income. However, there are now a large number of commercial pig farms throughout Thailand. Within the last decade the large-scale holder or industrialised pig-farming has rapidly increased especially in Eastern and Central regions of the country. Assuming that commercial pig farms raise at least 50 pigs per farm, in 1984 only four large farms raised more than 10,000 pigs at a time around Bangkok but several hundred farms grew more than 1,000 pigs in the same area. Over the last decade commercial pig farms have increased significantly. It has recently been estimated that around 80% of all pig production is now carried out by commercial enterprises (Sheehan, 1993).

This development can be attributed to significant socio-economic change in Thailand that has seen an increase in population and income levels (following dramatic economic growth over the last twenty years) and an associated increase in demand for meat both domestically and internationally.

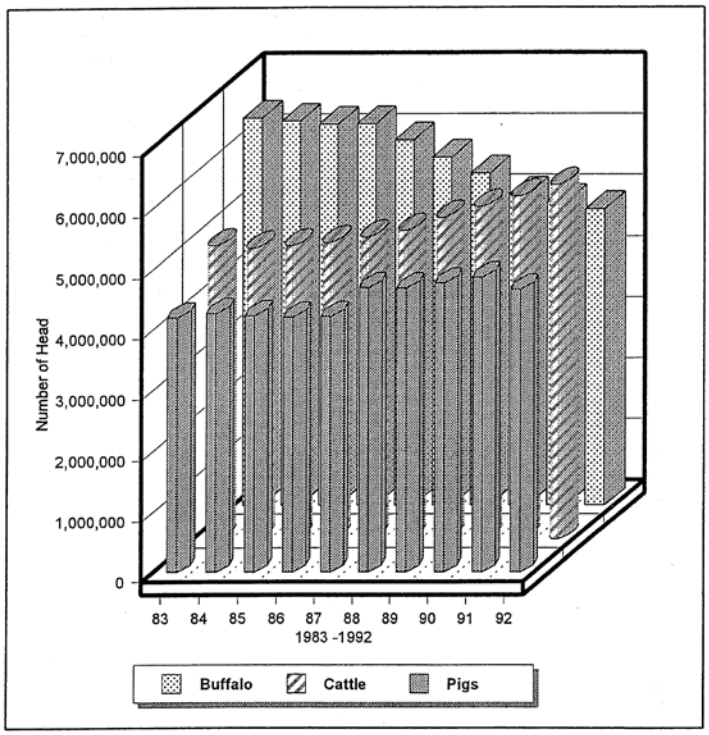
2.2 Development of the pig industry

Throughout the 1960s and 1970s the nature of pig production was predominantly characterised by the backyard raising of pig crossbreds for consumption and generation of supplementary income. Most pigs in Thailand were traditionally raised by Thai rice farmers to consume farm by-products and wastes and generate extra farm income to support their crop production. Along with buffalo, cattle and poultry, pig production was an important component in the integrated nature of the small farm cropping system where buffalo and cattle were used for draught purposes and pigs and poultry for consumption (Murphy and Tisdell, 1995b).

While in 1975, pigs generated the largest share of value added in the Thai livestock sector, Poapongsakorn (1985) noted that the change in the structure of pig production has been minimal and its development up until the 1980s had been remarkably slow. Most analysis of the Thai pig industry attributes this slow development in the commercial production of swine to the instability in the market price of pigs, feed costs and government regulations.

2.3 Commercial pig raising

Despite the appropriate infrastructure and availability of technical production knowledge, the development of Thai commercial pig farming has been predominantly influenced by government intervention and the associated monopsonistic dominance of the market by carcass wholesalers. Figure 1 provides an indication of pig production levels in Thailand relative to other livestock. It has shown no clear trend in recent years.



Source: Based on Office of Agricultural Economics, 1993.

Figure 1: Official statistics on reported number of buffalo, Cattle and Pigs: Thailand 1983-1992

The virtual stagnation of the industry in the past has been interpreted as a consequence of a long history of government intervention. The past intervention especially in the areas of marketing and slaughtering has meant that it has often not been commercially profitable for new private investors to invest and expand in the hog marketing and processing business.

This contrasts with the broiler industry which has received substantial private investor and government support for industry promotion.

Commercial pig raising farms have gradually been developed in provinces around Bangkok due to a rapid increase in urban demand for pork. The concentration of the industry in this Central plains region is generally accounted for by the size of the Bangkok market, its population, level of per capita income, and the ready availability of raw material for feed production. Furthermore, the large scale enterprises prefer to be situated near urban areas (that is, the Central region) due to an effective supply infrastructure, including governmental and non-governmental services (Luengyosluechakul, 1989, p. 96). These commercial farms use intensive fattening methods in order to produce higher quality swine and pork products to meet domestic urban and export markets (Poapongsakorn, 1985, p. 229). Commercial development of this sector was fostered by a small number of feed mill companies who provided piglets, animal feeds, drugs, veterinary services and farm management expertise to contracted pig producers. Therefore, as in commercial poultry rearing, the contract system played an important role in the commercial development of the Thai pig industry.

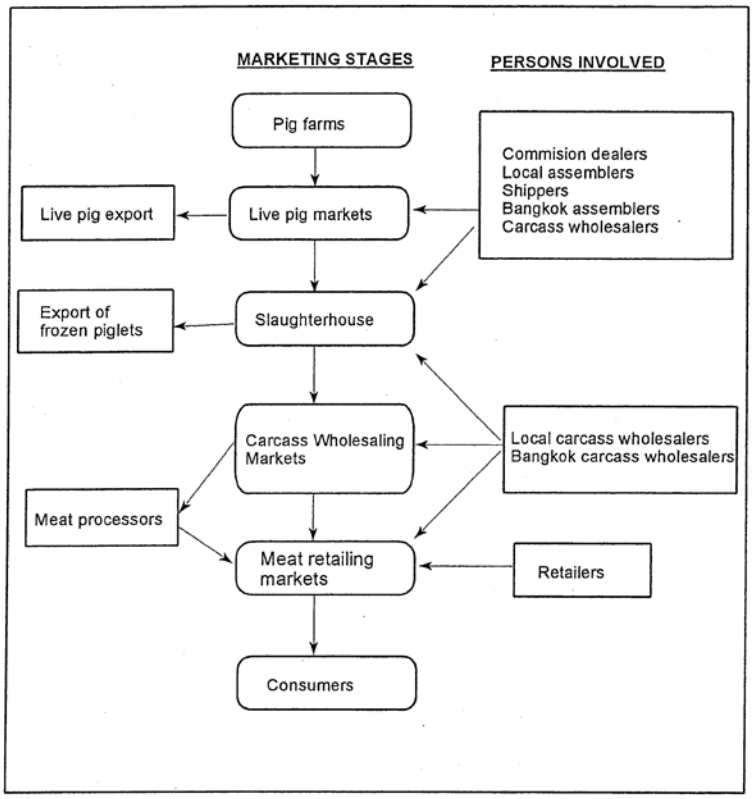
As Bangkok is the major market for pork in Thailand, large numbers of pigs are transported from provincial areas in the North and North-East. However since the development of intensive farming in the Central Plain region fewer pigs are transported to Bangkok (Poapongsakorn, 1985).

2.3.1 Marketing of pigs and pork

Up until the mid-1980s, pig marketing and slaughtering activities had not altered much from the situation of the previous few decades. A high proportion of pigs were still illegally slaughtered, that is they were slaughtered without a permit in both the government and unregistered slaughterhouses (Poapongsakorn, 1985). Small middlemen, often the agents of large wholesalers still travelled from village to village to assemble the required supply of pigs. In recent times however, village supply of pigs is of considerably reduced importance.

In the mid-1980s, pig marketing and slaughtering was described ‘traditional commercial’ (Poapongsakorn, 1985, p. 229) because these activities were still largely in the hands of a large number of middlemen and agents. Since most of the swine were raised in the backyards of small farmers scattered throughout the country, only the small middlemen could efficiently assemble small numbers of pigs from those farms. Figure 2 reflects this general relationship

and the pig dealers in various marketing stages. However while small middlemen still play a role in assembling pigs from the villages (ACIAR, 1994), with the development of more intensive commercial industry located in accessible urban regions this dependence on the small middlemen is gradually diminishing.



Source: Poapongsakorn (1985, p.241)

Figure 2: Swine marketing in Thailand

Processed pork consists of two types, with the major proportion of production being used domestically. The two types are (1) varieties of traditional meat products such as Chinese sausages, roasted pork etc. and (2) continental meat products such as ham, bacon and baloney. A small proportion of Thailand's live pigs and frozen piglets have been exported to Hong Kong and Singapore. Exports of frozen and boiled pork have expanded substantially since 1989, whereas live pig exports are negligible in the 1990s (see Table 1).

Table 1: Import/export statistics for Thai swine and pork.

	Imports of swine		Exports of swine		Exports of Pork	
Years	Head	1000 baht	Head	Ml baht	Volume(ton)	Ml baht
1977	739	*	639	0.70	16	*
1982	1389	*	11488	20.50	27	*
1987	2,529	61,047	12631	21.30	21.5	0.66
1988	3,582	57,212	1201	2.40	36.2	1.53
1989	1,653	34,989	510	1.14	182.9	9.04
1990	1,137	29,707	38	0.30	1436.5	71.61
1991	2,897	74,253	-	-	1128.9	56.47
1992	763	19,421	40	14	288	*

Source 1: Office of Agricultural Economics (1992, p.158) and (1993)
Source 2: F.A.O. (1993) and (1983)
* Statistics not stated here.

2.3.2 Exports of pigs and pork

Exports of swine and of pork products have only ever represented a small proportion (generally reported to be around 5%) of Thailand's meat exports and a small proportion of Thailand's total pork production. The industry is primarily orientated to supply of the home market. Table I gives a picture of Thailand's pig export performance from 1977-92 for live pigs and pork. The export pattern for both live pigs and frozen piglets has been extremely unpredictable in terms of volume exported and country of destination. This has been predominantly a result of the unwillingness of foreign countries to accept unhygienic pork meat or diseased hogs. The stagnation of Thai pork exports throughout most of the 1980s has also been attributed to the poor conditions of slaughterhouses, as mentioned above, as well as the fact that the meat processing sector had been underdeveloped (Poapongsakorn, 1985, p. 225). However with the improvement in these conditions toward the end of the 1980s, Thailand's exports of frozen and boiled pork increased markedly (see Table 1).

2.4 Constraints on the Swine Industry and Possible Reforms

The Thai government has imposed several regulations on the trading of live hogs and pig carcases and on slaughtering activities. By considering these, we can better understand the behaviour and performance of the Thai pig industry. Table 2 gives a brief summary of some

of the important government regulations and policies that existed in the mid-1980s applied in both swine and broiler industries.

Table 2: Thai government policies involving intervention in broiler and hog industries (mid-1980s)

POLICY	BROILER	SWINE
A. Input		
1. Breeding and vaccine	• genetic upgrading of native chickens by DLD[a] and some Universities.	DLD providing • a boar loan service • selling three-way cross weaners at subsidized price • producing vaccines sera and antigens
2. Credits	• rediscount facilities from Bank of Thailand • low interest loan from BAAC[b]	• same as broiler • same as broiler
3. Feeds	• price control by DIT[c] • quality control by DLD	• same as broiler • same as broiler
B. Processing		
1. Ownership	• freely operated by private firms	• no private slaughterhouses but allow private operator
2. Fees	• No slaughtering fee or permit	• slaughtering permit • slaughtering fee • quarantine fee
3. Disease control	• disease inspection strictly enforced at export plant • no disease zone declared	• enforced by requiring a slaughtering permit • prohibition of shipping animals into disease free zones • shipping license
C. Trade		• prohibition of carcass shipment across provinces except to Bangkok
1. Carcass	• No regulation	• quota on frozen piglets
2. Export Quota	• No regulation	
D. Price control	• No regulation	• Minimum farm gate price • Maximum carcass wholesaler price • Maximum pork retail price
E. Tax	• income tax and company tax paid by producer and large firms respectively	• Hog shipper pays 10 baht for each hog • Carcass dealer pays 20 baht per carcass
D. Investment promotion	• Privileges to slaughterhouses for export	• Same as broiler
E. Research and information	• Research on breeding nutrition and disease • Market information	• A government-private sector investment established to grow, slaughter, process and export pigs to Singapore
D. Government investment	• None	

Source: Poapongsakorn (1985, p. 246)
a Dept of Livestock and Development
b Dept of Internal Trade
c Bank of Agriculture and Agricultural Cooperatives

Studies by Luengyosluechakul (1989) and Poapongsakorn (1985) have identified some of the major constraints on the growth of the Thai pig industry. Poapongsakorn (1985) highlighted the laws and policies governing the swine industry (as noted in Table 2) as having seriously affected its growth in the past. This study particularly noted the law prohibiting shipping of meat carcasses across the trading area of each slaughterhouse and allowed only one slaughterhouse in each trading area. Given the constraint on slaughterhouse location, this provides limited market alternatives for pig growers and often results in the slaughtering of stock in poor condition, often due to the prolonged distance of transportation. Furthermore it strengthened the monopsonistic position of the local slaughterhouse.

The transportation of carcasses rather than live animals is more economical because of the increased loading capacity of vehicles. Similar to the bovine industry (Murphy and Tisdell, 1995b) this system of marketing generally burdens pig growers and to a lesser extent the pig wholesalers given the higher marketing costs associated with transportation. Furthermore, to the extent that it encourages movement of live pigs, it also adds to the likelihood of spread of diseases of swine. Poapongsakorn (1985) notes that due to the price elasticities of demand in the Thai pig market, the distribution of losses from high marketing costs are incurred predominantly by pig growers.

Luengyosluechakul (1989, p.96) outlines further problems with Thai pig farming associated with disease incidence, inadequate knowledge and fluctuating prices.

2.4.1 Uncertainty in the market price for pigs and feed

Luengyosluechakul (1989, p. 97) and Poapongsakorn (1985) have both highlighted the important impact that fluctuating pig and feed prices have had on constraining the growth of the Thai pig industries. Poapongsakorn (1985, p. 253) noted in an historical analysis of the 'hog cycle' in Thailand that the large variations in the price of pigs was a result of overreaction of markets to supply and demand. Long hog cycles were evident due the slow dissemination of price information amongst the numerous small-scale pig producers. The frequency of government intervention and uncertainty associated with policies was also a contributing factor in this instability. The hog-bran price ratio was also seen as an important factor in determining the nature of the hog cycle and of fundamental importance in determining hog profitability and supply. Luengyosluechakul (1989, p. 96) suggested government and other relevant organisations had not appropriately concerned themselves with these problems.

2.4.2 Disease incidence

Certain factors have seriously affected the spread of disease amongst pigs. Particularly at the village level these factors include an inability to identify the diseases, movement of sick animals, high density of pig population together with non-hygienic and poor sanitation. As Donaldson (1993) noted, although high mortality rates for FMD outbreaks are rare amongst adult livestock, they can reach 90%, particularly among piglets in high density populations. Therefore as the intensive commercial production of pigs in Thailand has grown, the susceptibility of pigs to rapid outbreaks of disease has increased. The periodic shortage of some vaccines when disease outbreaks occur and inadequate response to these outbreaks has also been seen as a problem. The main pig diseases in Thailand are listed in Table 3.

TABLE 3 - DISEASE OF PIGS IN THAILAND

Swine Fever - highly contagious, incurable in infected pigs, with non-vaccinated pigs being the source of the infection. Causes losses in breeding and fattening.

Foot and Mouth Disease - occurs where close contact between cattle and pigs, highly contagious and high mortality with new born and sucklings.

Aujeszky's Disease - major cause of loss in suckling pigs with respiratory signs another form of infection, vaccines available.

Atrophic Rhinitis - incidence in some herds 45-50%. Infection occurs within first week of age with anatomical lesions persisting lifelong and upper respiratory infections retarding growth and damaging lung tissue with pneumonia the cause of losses.

Transmissible Gastroenteritis - causes almost 100% loss in baby pigs under ten days of age. Vaccination is an uncertain preventative measure.

Enzootic Pneumonia - highly contagious and effects the respiratory system. There is no effective treatment that eliminates the infection although clinical diseases may be reduced. Disease affects feed conversion efficiency and daily rate of weight gain.

Swine Dysentery and Porcine Intestinal Adenomatosis - causes heavy mortality on growing pigs and effects production efficiency, especially effecting grower finisher and breeding herds.

Other sporadic diseases in endemic areas are swine erysipelas, salmonellosis and some pneumo-enteritis complexes. In badly managed farms there exists some parasitic infection.

Source: Luengyosluechakul (1989).

2.4.3 Inadequate knowledge and appropriate technology

The pig industry has been constrained in the past by lack of appropriate technical expertise at the village level. Luengyosluechakul (1989) criticised the limited level of innovation, communication, technological transfer, and implementation of basic research by the agencies responsible for developing the industry.

Therefore, while the growth of intensive commercial pig farms is beginning to expand in

spite of the traditional domination of the industry by small backyard growers, it is still constrained in several important areas. As noted earlier, disease still plagues the industry aided by the unhygienic standard of many slaughterhouses, low level of meat inspection and high incidence of illegal slaughter - factors that have cost Thailand valuable foreign exchange in lost export opportunities. While the market at the producer level is characterised by competition, the carcass wholesalers and slaughterhouses are granted local monopsonistic power. As a consequence of the monopsonistic power of the carcass wholesalers and limited market for live pigs, swine growers have received low farm gate prices. Consumers are also worse off under such conditions, due to the higher retail prices for pork and the fact that the quality of meat consumed is often of low standard and unhygienic. Many of the problems are attributed to government intervention and misunderstanding of the market. This situation is made worse by the problems of the hog cycle and increasing price of feedstuffs which helps explain why the number of commercial hog farms has been limited.

Given these past constraints therefore, pricing and marketing should be a prime concern to the policy makers in the future. A range of policy recommendations have been suggested in recent times (Poapongsakorn, 1985) to remedy some of these problems, these include

- The government to increase its incentive and promotion of pig production, meat processing and free trade and support the free private establishment and ownership of slaughterhouses with sufficient government inspection.

- The establishment of disease control programs (such as regional eradication campaigns) enabling export to higher valued disease free markets with private companies encouraged to join the program.

- Poapongsakorn (1985) suggests there be no export quota but inspection of meat export must be strictly enforced. Variable export taxes and subsidies may be devised to help stabilise the domestic prices of pigs with the major aim of helping the producers. If domestic price is very high due to export demand, an export tax may be imposed and the revenue used for export subsidies at times of low price (Poapongsakorn, 1985).

3. Poultry in Thailand

3.1 Introduction

Broilers, laying hens and ducks compromise the poultry industry of Thailand. The broiler industry has experienced a rapid expansion because of the increase in the number of commercial farms since 1982. As in the swine industry, the Central plains is the major zone for broiler production and more than 35% of all broilers are raised.

In this region, the largest chicken raising provinces are Chacheongsao, Nakhon, Pathon, Suphanburi and Ratchaburi (O.A.E., 1993).

In addition to production by poultry farms, it is estimated that 65-85 million native chickens are raised by 4.3 million farm families in Thailand. One third of the native chicken population is raised in the North-East. The chickens live freely around the house and neighbouring yard. The owners do not usually provide either feed, housing, medication or vaccination against infectious disease hence the growth rates of these chickens is low. They do however play an important part in the national economy of the country as a source of additional income for villagers. Due to their meat quality and due to their taste, they are preferred by consumers and so command a price premium.

3.2 Types of poultry production in Thailand

Poapongsakorn (1985) classified chicken farms into three types 1) Backyard growers 2) Independent commercial farms and 3) Contract farms.

1. *Backyard Growers*: Farm households usually raise five to ten native chickens each. This provides the family with protein, meat and a small amount of supplementary cash and eggs. The average flock on all types of backyard farms is estimated at around 70 birds with over half of all growers raising less than 20 birds. The type of chickens traditionally raised are native chickens called Kai Ooh and Kai Tapao as opposed to Kai Kaow (or white chickens) raised by commercial farms (Poapongsakom, 1985, p. 259).

   A distinctive feature of the village chicken raising industry given its small scale and subsistence nature is the limited use of vaccines against infectious disease, and thus rendering the system highly vulnerable to disease outbreaks. In 1985 it was estimated

that approximately 99.7% of all growers were backyard growers although they constituted only about a third of production (Poapongsakorn, 1985, p. 259). Today they would account for less than one quarter of production due to the expansion of commercial production. Village production has remained relatively constant.

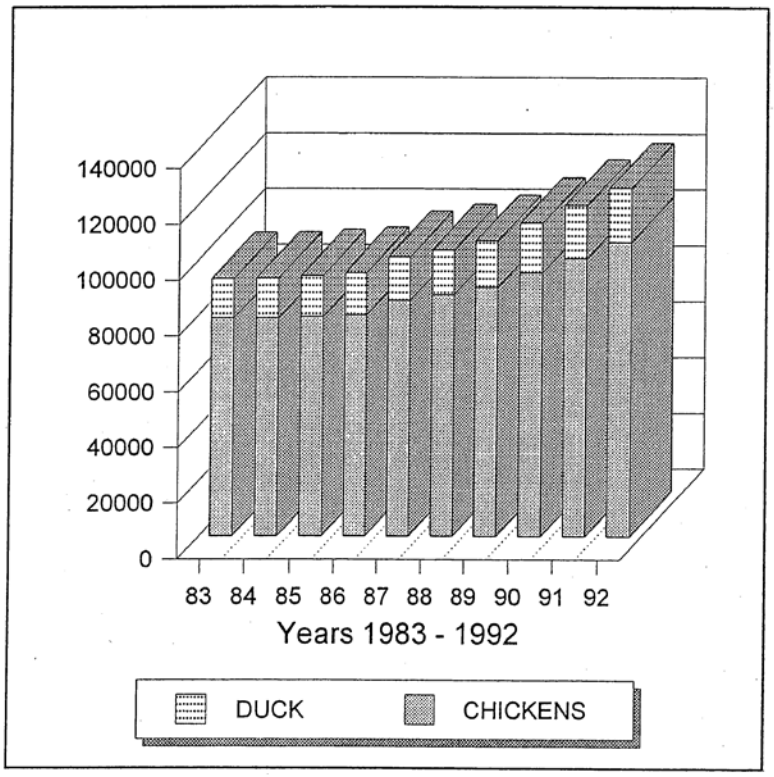
2. *Independent commercial growers*: Usually more experienced producers adopting more advanced methods of production. These producers are commercial hence are subject to the associated risks of their production, marketing and price variations. Independent growers often engage in contract farming with smaller growers (Poapongsakorn, 1985, p. 260). The inability of such farms to benefit from the economies of size associated with the larger contract- growers indicates a decline in their numbers in the future.

3. *Contract growers*: The introduction of contracts between chicken growers .and hatcheries or feed companies, which supply inputs for pre-emptive marketing of output, only became genuinely widespread when the Charoen Pokphand (CP) Company introduced wage and price guarantee contracts in 1976 (Poapongsakorn, 1985, p. 260). Almost 100% of commercial growers in Thailand are full or part contract growers.

It has only been since the 1970s that dramatic structural changes and growth in the Thai poultry industry began to occur. Prior to this there were a few attempts to stimulate growth in the industry with the introduction of modern production methods in 1946 and importation of high yielding stock in 1956 (Poapongsakorn, 1985). These modern production methods in raising poultry began to be implemented by some growers in the late 1960s, however it was not until the early 1970s that significant expansion in the industry began to occur through a few large private companies. In 1973 the Charoen Pokphand Company (CP) exported the first lot of chickens to Japan. This firm established the first modern chicken slaughterhouse in the same year, in order to process frozen chicken for the export market. In 1977, the Bangkok Livestock Trading Company (this is a subsidiary firm of CP) initiated a contract farming system in Sri Racha. Since then slaughter houses have been established by a number of large firms and contract farming has become common in Thailand (Poapongsakorn, 1985, p. 230).

3.3 The commercial poultry industry

In the past two decades there has been tremendous expansion in Thailand's commercial broiler industry (see Figure 3). In the early 1970s most farmers grew small numbers of indigenous chickens for on-farm consumption and there were virtually no exports. As noted above, this was soon to change, for between 1974 and 1981 the annual growth rates of the number of broiler and formula feed produced were 30% and 24% respectively (Poapongsakorn 1985). Thailand is now one of the world's largest chicken producing countries in terms of number of broilers produced and one of the largest exporters to Japan. The success has been attributed to the initiative and ability of a few private feed mill companies.



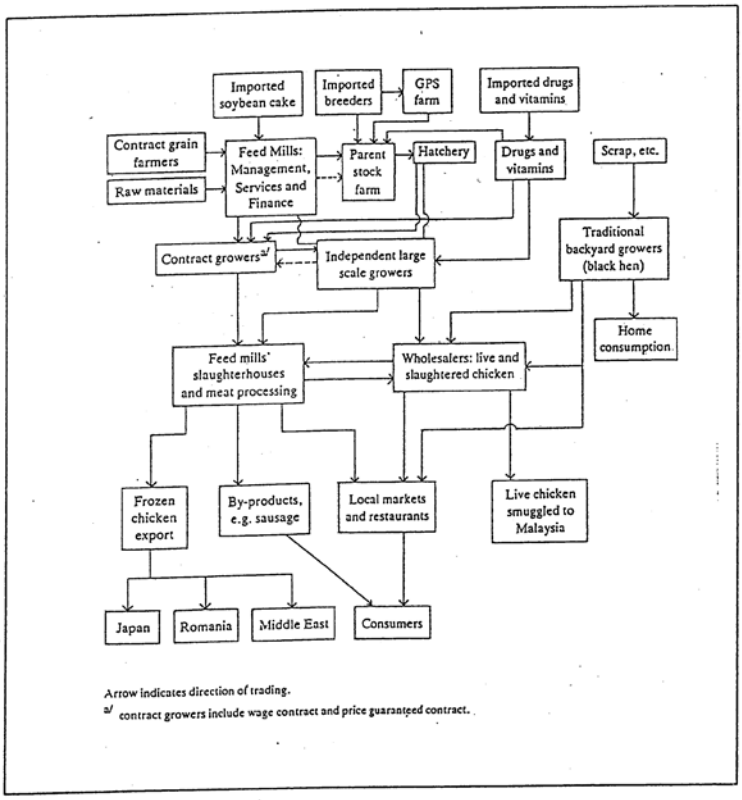
Source: Based on Department of Livestock (1992) cited in O.A.E. (1993).

Figure 3: Thai Poultry Inventory unit: 1000hd

3.3.1 Structure of the poultry industry

Figure 4 indicates the product flows for poultry in Thailand. The economies of scale associated with large scale production, marketing and processing saw the major feed mill companies begin to introduce vertical integration into the Thai poultry industry. For instance these large feed mill companies began to purchase their own slaughterhouses in the late

1970s. This development lessened the past dependence of the industry on large Chinese wholesalers who were unable to compete with the superior broiler processing and marketing adopted by these modern chicken processing firms.



Source: Poapongsakorn (1985, p.265)

Figure 4: Product flows for chicken in Thailand

The structure of the Thai poultry industry therefore has become highly concentrated in the hands of a few leading integrated companies such as C.P., Saha Farm, Centrago and Betrago (Poapongsakorn, 1985, p. 297). While the success of the Thai poultry industry can be attributed to the ability and initiative of such firms, it must be noted that oligopolistic structure of market has not benefited all in the industry. The high market concentration of the industry by such firms has often created public concern about possible exploitation of small farmers by such market power and fears about eventual monopolisation of the market with consequent welfare loss to the consumers.

3.3.2 Poultry export

The first lot of frozen chickens exported from Thailand was in 1973 when the Bangkok Livestock Trading Company exported 142 tons to Japan (OAE, 1992, p. 160). The export of broiler meat has since increased from 4,254 tons in 1977 to 180,261 tons in 1992. As can be

noted from Table 4 the big increase occurred in the 1977-82 period. Some recent trends in exports of broiler meat from Thailand are graphed in Figure 5.

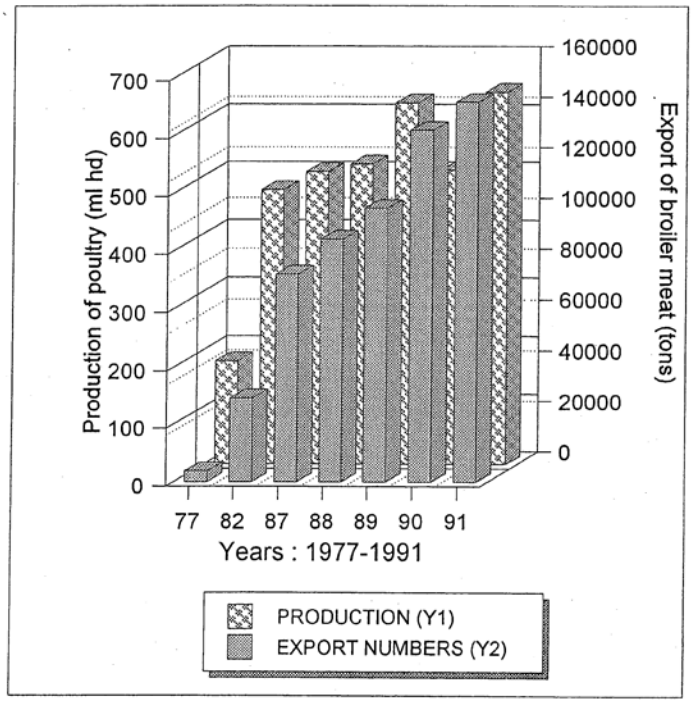
Table 4 Import/export and production statistics for Thai broiler meat

Thailand	IMPORTS Poultry - fresh/chilled/frozen		EXPORTS (frozen broilers)		PRODUCTION
YEARS	TONS	Value (1000 baht)	TONS	Value (mln Baht)	Frozen Broiler Meat (mlton)
1977	-	-	4,254	157.50	179.60
1982	-	-	33,217	1,310.00	474.05
1987	-	-	81,905	4,019.90	505.67
1988	63	3,326	95,784	4,869.90	518.98
1989	106	5,304	107,983	5,879.80	625.02
1990	121	6,727	138,945	7,589.70	508.14
1991	101	5,493	150,000	8,000.00	643.58
1992	143	7,293	180,261[1]	*	*

Source: Office of Agricultural Economics (1992 and 1993)

1. FAO (1993)

* Statistics not stated here.



Source: Office of Agricultural Economics (1992)

Figure 5: Thai production and export of poultry: 1977-1991

Thailand has achieved a premium position in the world market due in a large part to its ability to raise chickens at a lower average cost than other exporters. Among several factors affecting the cost of chicken production, feed and labour costs are the most important with Thailand's comparatively low levels of such factors of production being one of the major factors in its international competitiveness. However these factors need to be watched closely as labour costs are increasing and while Thailand may appear to have an abundance of agricultural and fishery products (especially corn and fish meal), the quality is relatively low and supply is becoming scarcer. In fact, due to rising labour costs and shortages of livestock feedstuffs, Thailand's poultry industry is finding it difficult to compete with China. Furthermore recent F.A.O. predictions stated that increased labour costs for Thailand poultry production could result in decreased sales and erode its competitiveness in Japan, its major market (Anon., 1994a). Thailand's poultry exports are declining and its production stagnated over the 1994-1995 period because many of the large multinational companies (involved in contracting chickens for raising) are moving their production offshore. Competition from Brazil and from subsidised U.S. exports is also creating difficulties for the Thai poultry industry. It seems quite possible that Thailand's relative position as an exporter of broilers will continue to decline at least marginally.

3.3.3 Duck exports

Stocks of ducks in Thailand are much smaller than those of chickens (see Figure 3) The Department of Livestock has introduced imported breeds with high feed conversion to commercial duck farms, in response to growing domestic demand. Export market opportunities have opened for Thai frozen duck meat and egg, although the value of such exports has been relatively insignificant. Thailand's overseas markets include Hong Kong, Singapore, Japan and Germany.

3.4 Constraints on the Thai poultry industry

The operation of the broiler industry has been relatively free of major problems over the last couple of decades. Its farm and disease management and integration of modern technology, has provided it with a solid foundation for consistently high performance in recent times.

While sensitivity to price fluctuations have in the past hindered progress in the industry[1] it has predominantly been labour costs and disease that have impacted significantly on its

[1] Poapongsakorn (1985) reported that in 1980 the cost of one kg of live chicken varied around 14-15 baht with the industry performance at that time particularly sensitive to even a few unit changes in price.

competitiveness within the domestic and international economy.

3.4.1 Labour costs

As noted earlier, the international competitiveness of the Thailand poultry sector over the last few decades has been dependant to a large degree on the significantly low production costs incurred through cheap labour and feeding costs. This competitive edge is beginning to diminish however as standards of living rise throughout Thailand and this is reflected in higher wages and increased labour costs in the poultry industry. This trend has halted the rapid expansion of the Thailand poultry industry and will increase pressure on companies to focus more attention on production efficiency and securing neighbouring markets, such as Australia as its competitive advantage in relation to the rival poultry industries of China and other countries is declining

3.4.2 Disease incidence

In terms of their disease resistance, poultry have reduced resistance to disease when temperature and humidity are high. Stress induced during the hot humid months of summer (March to April) often causes heightened susceptibility of poultry to disease in Thailand.

Table 5 provides an outline produced by Ratanasethakul (1989) of infectious diseases such Newcastle disease and Fowl Cholera that annually kill a large number of village chickens. The recommended vaccination and deworming programmes are not strictly followed by most villagers.

TABLE 5 - DISEASES OF POULTRY IN THAILAND

Newcastle Disease - first reported in 1943 when outbreak reported in Bangkok. The disease spreads among the unvaccinated chickens very rapidly and produces high mortality and causes great economic losses. Ready access to vaccines of reliable quality is important if farmers are to maintain a successful vaccination program. They generally have to travel long distances in hot climates to purchase vaccine at livestock offices in Amphoe or in Changwad.

Infectious Coryza - an acute and subacute disease of chickens caused by Hemophillus Gallinarum where in native chickens the disease occurs more frequently in birds over 6 months and birds under 2 months during the rainy season. At present there is no local vaccine available only an expensive imported bacterin.

Fowl Cholera - an acute septicemic disease of chickens and various other species of birds including turkeys, pigeons and pheasants caused by Pasteurella multocida. The disease occurs more frequently in native chickens under two months of age. Local bacterin is prepared from killed cultures of Pasteurella multocida. Revaccination should be carried out every three months.

Fowl Pox - a slow spreading viral disease of chickens, turkeys and other birds. The disease occurs mainly in the chicks under two months of age during February to April. There is no specific treatment with the control of the disease by vaccination.

Large Round Worm Infestation - can occur in the upper third of the small intestine. About 77% of 3-4 month old native chickens are infested with this worm. Treatment with a variety of piperazine compounds has been found to be satisfactory.

Tapeworm Infestations - young birds and those under poor conditions of management are most susceptible. About 88% of 3-4 month old native chickens are infested with tapeworms.

Stick Fast Flea - light brown to brownish black in colour, the male being smaller and darker then the female. The effect of the flea on the bird is to weaken it from loss of blood. About 25% of the total mortality in young native chickens under two months old is due to stickfast flea infestation. Adult fleas can be controlled by the smearing of the birds with non-burning greasy substance.

Source: Ratanasethakul (1989)

The development of more intensive commercial livestock industries while offering a greater level of control in application and regulation of hygiene standards also results in large numbers of higher valued livestock in confined spaces (i.e. feedlots) where a disease outbreak would be swift and costly. The issue of improved animal health therefore remains important for the progress of the Thai livestock industry. It is however at the village level rather than the commercial level that control of poultry diseases in Thailand remains a major problem.

4. CONCLUDING COMMENTS

While the Thai broiler industry experienced rapid expansion in the 1980s and into the early 1990s, favourable conditions for further expansion are no longer present. In fact, according to The Nation, (September 1995, p. B4), the Research Department of Bangkok Bank indicates that Thai exports of frozen chicken declined in 1993 and 1994 due mainly to increasing

competition from China, the United States and Brazil. Furthermore, it is expected that Thai production of broilers will drop in 1995 by 2.3%.

The GATT agreement, due to come into effect in 1995, may result in lower subsidies for broiler production in the USA and Brazil and may cause countries like South Korea and Taiwan to allow greater access to their markets of imported frozen chicken. However despite these opportunities, China, the United States and Brazil are likely to continue to provide strong competition for Thailand and limit its exports of broilers. This is partly because wage costs have risen in Thailand and now exceed those of China and Vietnam and furthermore because of a growing shortage of grain and animal feed in Thailand.

According to the Research Department of the Bangkok Bank (reported in The Nation, September 11, 1995, p. B4), Thailand is facing considerable constraints on expanding its livestock industries using local grains and food supplies. The Animal Food Manufacturers were given special clearance in 1995 to import maize, which has been in short supply in Thailand for several years. Although there is reduced demand from the E.U. (European Union) for Thai tapioca pellets (because E.U. produced animal feed has fallen in price), the price of tapioca pellets has not fallen in Thailand. This is partly because Thailand reduced its acreage of cassava and globally demand for processed animal food is increasing. Rising livestock feed prices not only affect the poultry industry but also its pig and cattle industries involved in feedlotting or supplementary feeding.

In Thailand’s commercial poultry industry, considerable care is taken to control poultry diseases. The control of such diseases is vital for sustaining the profitability of the large companies involved and for maintaining the reliability of their supply. Most of the large companies involved in broiler production in Thailand operate on a sub-contract basis, supplying high quality chickens to sub-contractors for rearing.

Commercial piggeries also appear to be keenly aware of the economics of controlling diseases in their stocks of pigs. However, it appears from casual observation that the larger piggeries give more attention to this control than the smaller ones. Among villagers much less attention is given to control of animal diseases than in Thailand's commercial livestock sector.

From this paper and from Murphy and Tisdell (1995 a,b) it is clear that substantial structural change has occurred in the Thai livestock sector in the last two decades. Commercialisation

has been most marked in the pig and poultry industries, whereas most beef and buffalo production remains in the hands of villages. It is in the village level that control of animal diseases lags most and this constrains the scope for Thailand's commercial livestock industries to operate in a relatively disease free environment and in some instances limits their export prospects.

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