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Recent Trends in the Production and Trade of
Cattle, Beef and Pigs in Thailand

by

Alister Smith and Steve Harrison

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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.

Recent Trends in the Production and Trade of Cattle, Buffalo and Pigs in Thailand

ABSTRACT

The Thai economy has experienced rapid changes in the underlying factors that determine demand for meat and livestock products. GDP growth has remained at over 8% over the last decade and has not fallen below 5% in the last 30 years. Incomes have grown at a faster rate than other ASEAN countries and the development of a new urban-based middle class has stimulated a westernisation of tastes and preferences (Sindelar, 1996; Hassalls & Associates, 1996). These changes have, in some cases, stimulated extensive development in Thailand's domestic and international trade in meat and livestock products. While some rural industry sectors have been able to adapt to demand changes for their products others have been slower to respond. This paper will focus on recent trends in the trade of meat and livestock products in Thailand. To provide a more comprehensive understanding of these trends, some discussion of the constraints to domestic production and marketing, raised in earlier papers, will be necessary.

Keywords: livestock production, Thailand, GDP growth, trade in livestock products.

JEL Classification: Q1

Recent Trends in the Production and Trade of Cattle, Buffalo and Pigs in Thailand

1. Introduction

The Thai economy has experienced rapid changes in the underlying factors that determine demand for meat and livestock products. GDP growth has remained at over 8% over the last decade and has not fallen below 5% in the last 30 years. Incomes have grown at a faster rate than other ASEAN countries and the development of a new urban-based middle class has stimulated a westernisation of tastes and preferences (Sindelar, 1996; Hassalls & Associates, 1996). These changes have, in some cases, stimulated extensive development in Thailand's domestic and international trade in meat and livestock products. While some rural industry sectors have been able to adapt to demand changes for their products others have been slower to respond. This paper will focus on recent trends in the trade of meat and livestock products in Thailand. To provide a more comprehensive understanding of these trends, some discussion of the constraints to domestic production and marketing, raised in earlier papers, will be necessary.

2. Background of the Thai Beef Industry

The production of beef, from cattle and buffaloes, is dominated by the traditional village production system. The village system accounted for approximately 95% of total beef production as late as 1985 (Tokrisna and Panayotou, 1985). Under traditional Thai village farming practices of the past, the production of beef was part of an integrated farming system primarily focussed on the cultivation of rice and crops. Buffalo and cattle were used to supply draught power for cultivation and for a variety of other farm uses, including transport and waste management. The production of meat was secondary to these functions. The value of cattle and buffaloes in the traditional system, therefore, reflected the productive capacity of animals in an integrated farming system. Value was not determined by the value of their meat and other products (Perkins, Petheran, Rachman and Semali, 1986).

Valuing cattle and buffalo as productive assets ensures they are retained to an age of between 12 and 15 years. Cattle and buffalo are selected on their capacity to perform farming and other tasks and not for their meat production characteristics. Herd sizes in the village

production system are small and native cattle breeds have comparatively low productivity. Animals are fed rice straw and waste products or grazed on inadequate areas of poor quality pasture. The poor nutrition of cattle and buffalo contributes to low growth rates and increases their susceptibility to diseases such as foot and mouth disease (FMD), (Falvey, Gibson and Andrews, 1990; Falvey, 1986; Kamonpatana, 1981).

Over the last decade, buffaloes have increasingly been replaced for draught by mechanisation. Buffaloes were once the major bovine species in Thailand but numbers have been falling since the mid 1970's. Overall buffalo numbers were surpassed by cattle numbers in 1991. The exception is the North East, where buffalo numbers, though falling, still exceed cattle numbers and many traditional village farming practices prevail. However, buffalo numbers remain dominant in the Northeastern region and continue to be a considerable component of overall Thai beef production.

The decline in buffalo numbers may be attributed to a number of factors. These factors include growing farm mechanisation and the greater suitability of cattle and machinery to the steeper nature of the most recently cleared areas (Tokrisna and Panayotau, 1985). Overall numbers of beef producing stock have declined since 1980 despite increases in cattle numbers. There have been substantial imports of breeding stock in more recent times.

There is no clear distinction between the village system and commercial cattle production system. However, some larger herds are run on improved pastures with higher nutrition and more efficient disease control measures. Commercial beef production, which accounted for only 5 % of total Thai beef production in 1985, is primarily marketed to the small live animal export industry (Tokrisna and Panayotau, 1985). Malaysia and Laos were the only importers between 1990 and 1995. Exports accounted for between 5,000 and 12,000 head per year.

Thailand's domestic beef marketing chains are characterised by a large number of agents who accumulate cattle from the small herds and arrange transportation to slaughterhouses in provincial capitals and Bangkok. The large number of farmers and agents ensures competitive price structures at the lower end of the market. However government legislation directs producers and agents kill cattle and buffaloes at specific provincial slaughterhouses or in Bangkok. This has created a monopsonistic processing sector that influences price determination and contributes to the high cost of transportation. Quality has declined and the number of illegal slaughters has risen (Tokrisna and Panayotau, 1985; Asian Productivity

Organisation, 1989). Until the late 1980's the farm price for beef was around 75 %cent of the retail prices in Bangkok (Thai Bureau of Agricultural Economics Research, 1996). Marketing margins were dominated by high transport costs.

3. Recent Trends in the Thai Beef Industry

The rapid growth and development of the Thai economy in recent years has stimulated the demand for beef. Increasing population and income levels and a westernisation of tastes have contributed to this demand increase. Domestic beef production has failed to keep pace with growing demand despite increases in cattle numbers and slaughtering, increases in domestic stock movements and significant imports of genetically improved beef and dairy cattle. Increased demand for beef has led to an increase in the Bangkok market price but the price received by producers has declined. As a result marketing margins have widened.

3.1 Production Levels in the Thai Beef Industry

In the early 1990's indicators suggested total buffalo and cattle numbers were increasing. More recent official statistics, from the Thai Department of Livestock Development (DLD), suggest that overall numbers of beef producing animals are stagnating or decreasing. As indicated by Figure 1, cattle numbers have gradually increased from 4.9 m head in 1980 to 7.6 m head in 1995. However, buffalo numbers have declined significantly, falling from 5.6 m head to 3.7 m. The overall numbers of beef producing animals showed a gradual decline between 1980 and 1987 with numbers falling from 10.9 m head to 9.1 m head. Numbers rose more dramatically between 1988 and 1993 reaching a peak of 12.3 m head. Numbers of buffalo and cattle declined in 1994 and 1995, with overall numbers falling to 11.3 m head, just 500,000 head more than overall numbers in 1980.

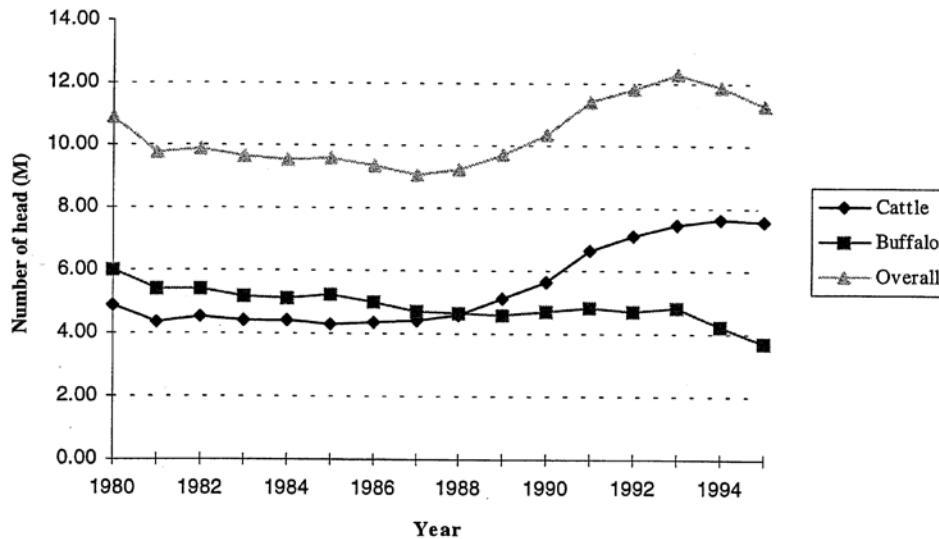


Figure 1: Cattle and buffalo numbers, 1980 to 1995 (Source: Thai Office of Agricultural Economic Research, 1996)

These statistics indicate the continuing substitution of cattle for the traditional buffalo. This trend reflects the reduced use of draught power, the greater suitability of cattle and machinery on steeper, newly cleared areas and the greater productivity of cattle in beef production (Falvey, Gibson and Andrews, 1990). While the decline in the number of buffalo has been greatest in the Northeastern and Northern Provinces it is apparent throughout Thailand. Cattle numbers have increased over all regions, at similar rates across regions.

Despite only minor increases in the total amount of cattle and buffalo numbers over the period 1980 and 1995, there was a much more dramatic increase in the number of animals slaughtered. As displayed in Figure 2, the number of cattle slaughtered annually, increased from around 344,800 in 1980 to 626,600 in 1995. Slaughter numbers of buffalo also nearly doubled, increasing from 84,600 to 158,800 between 1980 and 1995. This occurred in spite of the severe decline in total buffalo numbers, and may have been a reflection of the liquidation of the buffalo herd. The figures confirm the movement, in the cattle and buffalo industries, away from the use of animals for draught and towards beef production. It may also indicate an improvement in the proportion of animals slaughtered legally.

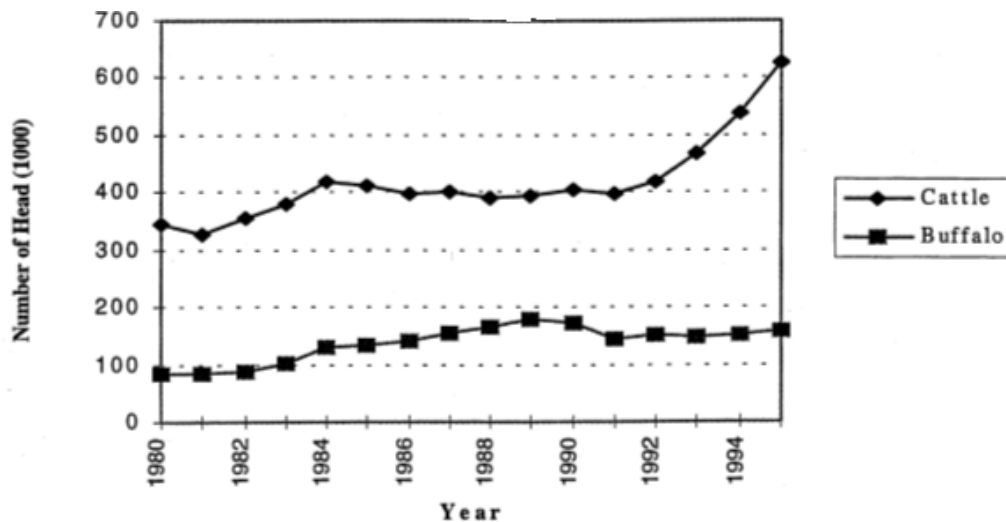


Figure 2: Livestock slaughtered, 1980 to 1995 (Source: Thai Office of Agricultural Economic Research, 1996)

Livestock movements have also exhibited dramatic increases in recent years. As displayed in Figure 3, the number of animals in transit has grown dramatically from 338,800 head, in 1982, to 2,560,900 head in 1995. A component of this increase may reflect an improvement in the procedures for monitoring the transport of livestock. Increases in the movement and interaction of cattle with their own and other species raise important considerations with respect to the disease spread.

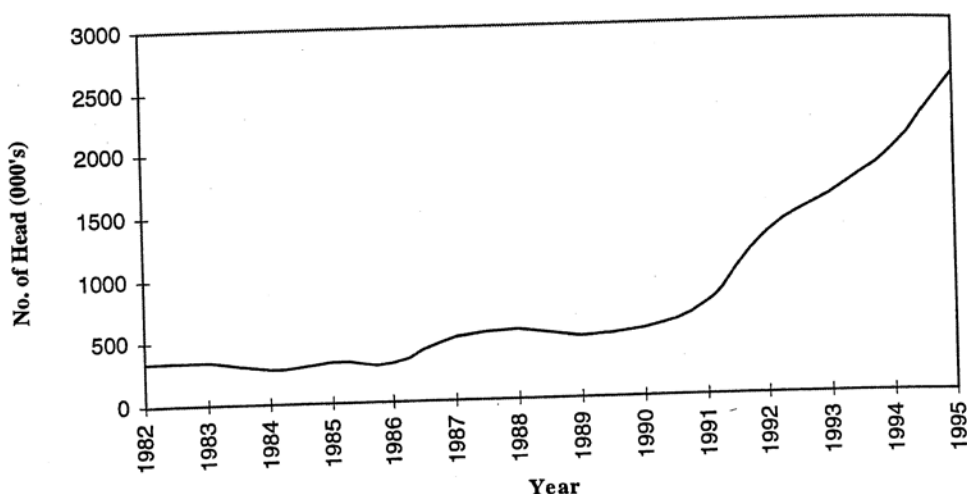


Figure 3: Number of animals in transit within Thailand, 1982-95 (Source: Thai Department of Agricultural Economic Research, 1996)

3.2 Imports and Exports of Cattle, Buffalo and Beef Products

The importation of cattle into Thailand over the 10 year period from 1986 and 1995 has been considerable. Imports of live cattle increased to a peak of around 21,100 head in 1991 before tailing off. Only 5,300 head of cattle were imported in 1995. The vast majority of these live imports were breeding stock for beef and dairy operations. Figure 4 indicates that imports of beef breeding stock peaked in the early 1990's before tailing off in 1994 and 1995. Imports of dairy breeding stock were more constant over time.

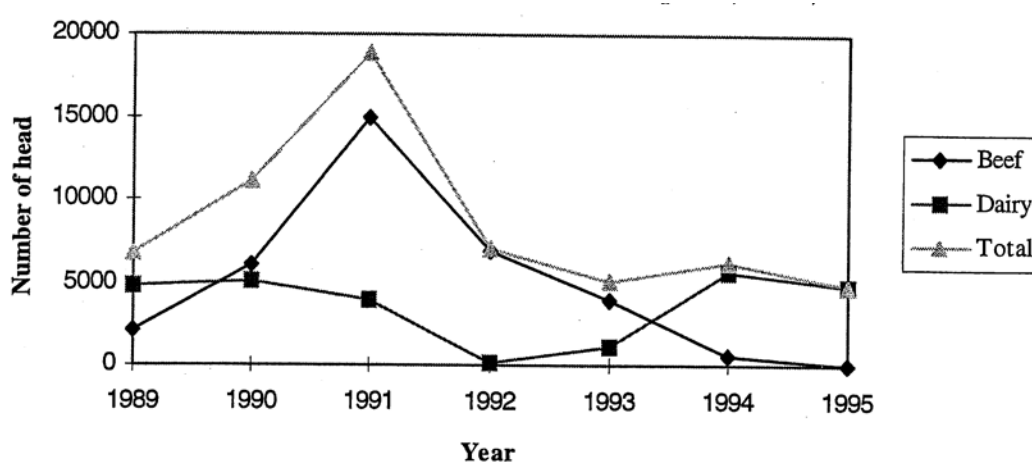


Figure 4: Imports of beef and dairy breeding stock, 1989 to 1995 (Source: Thai Department of Livestock Development, 1995)

Imports of live buffalo were insignificant prior to 1991. There were been over 20,000 head of buffalo imported between 1991 and 1995. While the rate of increase is dramatic, the absolute quantity is still relatively small. Source countries include Myanmar and Laos. These animals are imported to improve the milk and meat production efficiency of domestic buffalo.

The increasing Thai demand for beef has resulted in an almost tenfold increase in beef imports between 1983 and 1995. This dramatic increase, illustrated in Figure 5, reflects the impact of increases in the Thai population, increasing income levels and changes in tastes and preferences of Thai consumers. Imports of beef rose steadily from 1983 to 1989. Dramatic increases followed with imports peaking in 1993 at a level of 1,676 tonnes. Imports fell to 1,024 tonnes in 1994 before recovering to 1,400 tonnes in 1995. Demand for beef and other livestock products is expected to continue to expand, following the patterns experienced in

others Asian economies (Sindelar, 1996).

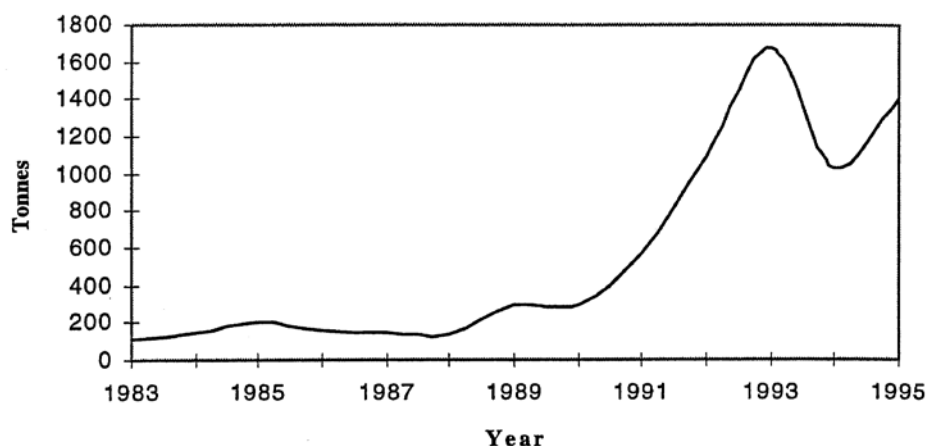


Figure 5: Beef imports into Thailand, 1983-95 (Source: Thai Department of Livestock Development, 1996)

Thailand exports live cattle to neighbouring countries of Malaysia and Laos. The trade increased from zero animals reported in 1986 to 16,000 in 1995. Exports of beef are negligible.

3.3 Beef Prices

Thailand's retail prices for cattle meat have risen by over 50% between 1986 and 1995, reflecting the strong underlying demand growth. Beef prices at the Bangkok markets rose steadily from 28.1 bht/kg in 1986 to 42.5 bht/kg 1995. This increase in price indicates that domestic production is unable to accommodate increases in demand for beef. Figures obtained from the Thai Department of Commercial Economy show no change in price between 1994 and 1995. Unfortunately, figures on the farm price for cattle are not available, so it is not possible to evaluate changes in marketing margins.

The wholesale price of buffalo meat has risen more dramatically than that of cattle meat. Between 1986 and 1995, prices increased from 17.5 bht/kg to 38.5 bht/kg. A 120% increase over the 10 year period. The price increase may reflect the increasing demand for buffalo meat at a time of decreasing stocks of these animals. However, the farm price for buffaloes has shown minimal increments. This has resulted in an expansion of the margin between the farm price and wholesale price from 4.65 bht/kg to 24.79 bht/kg. The price paid to farmers as a percentage of the wholesale price has fallen from 74% to 36% over the same 10 year

period.

Increasing marketing margins, as illustrated in Figure 5, have continued to develop in recent years. This is despite wholesale prices remaining at a level of 38.5 bht/kg for the years 1993 to 1995. The widening marketing margins and the decrease farm prices relative to wholesale prices reflect the strength of bargaining power held by monopsonistic processors and the comparative lack of market power of farmers. There is no information available to suggest any recent changes in slaughtering arrangements.

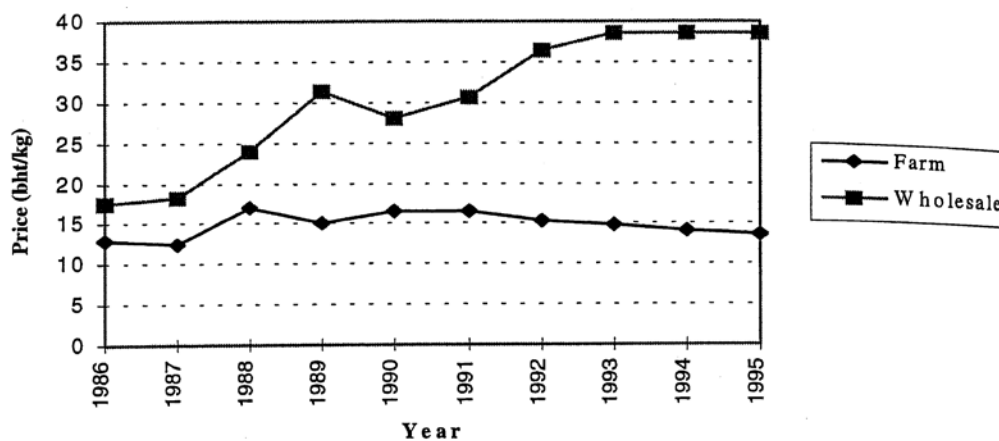


Figure 6: Farm and wholesale prices for buffalo meat, Thailand 1986 to 1995 (Source: Thai Office of Agricultural Economic Research, 1996)

4. Background of the Thai Dairy Industry

The consumption of dairy products in traditional Thai society prior to the 1960's was negligible and dairying close to non-existent. Increasing incomes, population and a burgeoning tourism industry, coupled with government sponsored schemes to improve nutrition by increasing the consumption of milk, have induced a gradual increase in the demand for dairy products. Increasing the domestic level of milk consumption has been pivotal in the decline in severe malnutrition in Thailand from 15% to less than 1% during the 1980's (FAO, 1996). Increasing demand and government development programmes and regulations have provided the stimulus for dramatic increases in domestic production of milk and dairy products. Thailand hopes to achieve milk self-sufficiency. However, many impediments to industry growth remain.

The negligible use of milk and dairy products in the traditional Thai diet is related to geographical and cultural aspects (Bobst, 1975; Mittendorf, 1981). The geographic and political situation surrounding Thailand impeded the migration of dairy cattle into the immediate area and Thailand, unlike some other South East Asian countries, did not experience exposure to western tastes through colonialism. Diet consisted of up to 80% rice with protein supplemented by fish and traditional livestock and poultry. These factors explain the persistence of relatively low milk consumption.

In 1962, the establishment of the Dairy Farm and Training Centre supported by the Danish Government first introduced commercial dairy farming techniques (Tokrisna and Panayotau, 1985). The Dairy Farming Promotion Organisation (DFPO) was also created by the Thai government to promote milk consumption and foster self-sufficiency. These measures together with the dramatic economic growth, and increases in incomes, population and tourism contributed to the steady growth in demand for milk and dairy products during the 1970's and 1980's. More dramatic growth has occurred in more recent times. High income elasticity of demand of between 0.5 and 0.6 has been demonstrated for food products in low income Asian countries such as Thailand (Reithmuller and Smith, 1994). This helps to explain the dramatic increases in milk consumption of in recent years.

Commercial production of milk is centred in the Northern and Northeastern provinces of Chiang Mai, Nakorn Pathom, Ratchaburi and Saraburi and in the areas surrounding Bangkok. Dairying in traditional village farming systems is inhibited by inadequate feed, poor nutrition and the prevalence of diseases such as FMD.

FMD can have a severe impact on calf mortality. It delays the achievement of maturity in dairy cattle, thus increasing costs and restricting the productive life of cows. Food intake is reduced and milk production suffers as a result. The development of FMD related mastitis is a further restraint on production. FMD also indirectly reduces milk production by causing infertility, thereby reducing calf numbers. The nutritional effects of FMD extend the interval to conception and reduce the number of lactations per year (Ellis, 1994). In confluence with its aims of achieving milk self-sufficiency, and recognising the high cost imposed on the dairy industry from an FMD outbreak, the majority of Thailand's milk producers have adopted 100% vaccination against FMD. Vaccines are provided free of charge to milk producers to assist in the control of the disease.

Despite the efforts of development programmes, average herd size remains small at around six head and associated diseconomies of scale persist (ADC, 1993). The lack of adequate finance and the high costs of purchasing dairy livestock prevent many small farmers from increasing herd size. Limited technical experience, unsuitability of local breeds to milk production and susceptibility of imported breeds to local diseases and harsh conditions are further reasons for reduced dairy production capacity (McCool, 1992). Further dairy industry expansion is constrained by the unavailability of land.

The DFPO, in addition to the promoting milk product consumption and developing the industry, functions as a collection agency for raw milk. Together with private companies, the DFPO produces finished milk products for retail sale. Marketing margins are high with producers receiving as little as 25% of retail prices.

The Thai government has introduced a number of regulations to assist in attaining self-sufficiency in the production of milk and dairy products. Central to these regulations are the local content provisions. These provisions require importers to buy a proportion of local milk with every imported purchase. This is designed to stimulate domestic production but in effect raises the domestic milk price and because of the small size of the domestic industry it is sometimes necessary to relax these provisions. A system of customs duties applying to various milk products is in place. However, levels of protection have been reduced considerably in recent times.

Consumption of milk and dairy products has displayed dramatic increases in recent times with consumption increasing by 75% between 1985 and 1990. The rate of increase in consumption has slowed in the 1990's but consumption of drinking milk still grows at a rate exceeding 5% per annum (Murphy and Tisdell, 1995b). Despite these increases in consumption and the restraints on domestic production, domestic producers were able to increase their market share from 4.2% to 16.3% between 1980 and 1991.

4.1 Recent Trends in the Thai Dairy Industry

Increased domestic production has been achieved through an increase in the size of the Thai dairy herd and by increasing herd productivity. Thai dairy operating costs have risen over the last 10 years with increases in feed prices and the price of breeding stock. Despite the dramatic expansion of the Thai dairy industry imports of milk and dairy products continue to rise.

4.1.1 Production levels

The increased capacity of the dairy industry to meet market share is demonstrated by the dramatic increase in the size of the domestic herd, as illustrated in Figure 6. Between 1986 and 1995, total herd numbers rose from 62,400 head to 292,700 head and cow numbers rose from 33,200 cows to 159,100 cows or 380%.

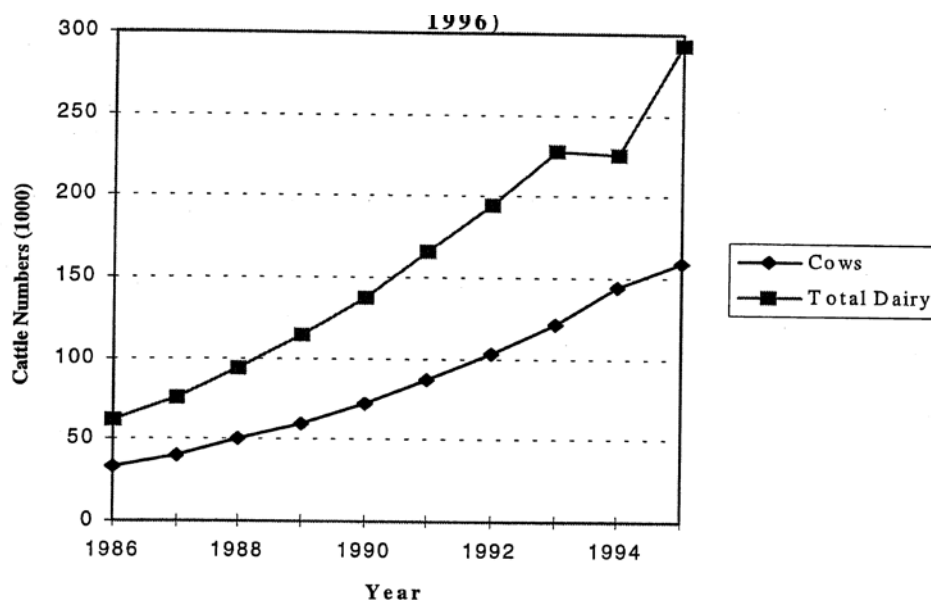


Figure 7: Dairy herd size, Thailand, 1986 to 1995 (Source: Thai Office of Agricultural Economic Research, 1996)

Production levels for fresh and processed milk have also displayed considerable growth during the 10 year period from 1986 to 1995. Fresh milk production has risen from 75,300 tonnes per year to 350,200 tonnes per year, an increase of 365%. Annual production of processed milk climbed from 126,200 tonnes to 527,500 tonnes during this period, an increase of 317%. Information as to the contribution of dairy buffalo to milk production is not available but the quantity is probably negligible. Increases in milk production have been assisted by the high effective rates of protection for some agricultural products in Thailand (Rae, 1992).

Imports of breeding stock have resulted in the achievement of gradual improvements in productivity over the last 10 years although there is a great deal of variation around the trend. Productivity fell between 1987 and 1992 before rising from 1993 to a maximum for the 10 year period of 10.89 kg of milk/cow/day in 1995, up 1.12 kg from the 1986 figure of 9.77 kg

of milk/cow/day. These increases in productivity have not come without cost. Operating costs for dairy operations have risen from 3.86 bht/kg of milk to 6.62 bht/kg of milk, an increase of 76%. The rise encompasses substantial increases in both variable and fixed costs. Variable costs have risen by over 50% whilst increases in fixed costs have grown by 140%. Unfortunately, figures on some variable costs are not available. However, feed costs have risen considerably over this period and have had a major impact. Another possible explanation is an increase in the use of feed concentrates which are more expensive than conventional feeds.

The trend of continuing increases in the cost of replacement stock has contributed the increases in operational costs in the dairy industry. Between 1986 and 1995 the farm price for dairy cows rose from 6.55 bht/kg to 7.96 bht/kg, an overall increase of 20% over the 10 year period. Dairy cattle prices are reported on a baht /kg and not on a per head basis in official statistics. Prices appear to have stabilised from 1993 to 1995 with the average price exhibiting little variation over this period.

4.1.2 Thai imports of milk and dairy products

Increases in herd size and production were achieved by the introduction of foreign dairy cattle genetic material. Imports of dairy breeding stock were relatively consistent between 1990 and 1995 at approximately 5,000 head. Imports have come from EC member nations as well as Australia and New Zealand.

Despite the increased productive capacity of the Thai dairy industry, continuing demand growth for milk and dairy products has seen significant increases in imports of milk and dairy products. Imports of powdered milk and milk and cream products have displayed increasing trends over the five years from 1991 to 1995. As illustrated in Figure 8, imports of powdered milk and cream maintained strong growth throughout the period, except for a temporary fall in 1993. Imports grew at an average of 10% per annum between 1990 and 1995. In 1995, Thailand was one of the top five importers of whole and skim milk powder on the international market. Thai imports represented 3.5% of total world trade in whole milk powder and 7.8% of total world trade in skim milk powder (FAO, 1995). Australia, New Zealand and EC member countries are the major exporters of milk and dairy products to Thailand.

There are no significant exports of Thai dairy products.

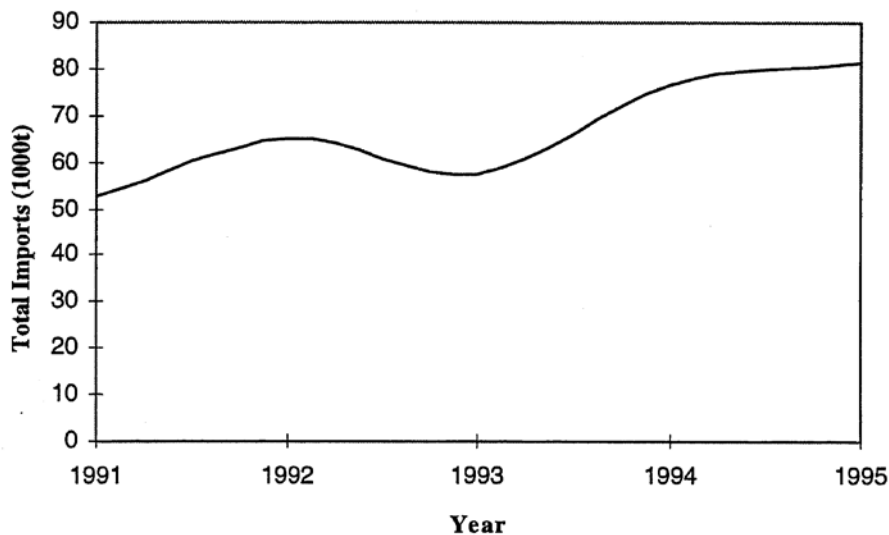


Figure 8: Imported powdered milk and cream products, Thailand, 1991 to 1995.
(Source: Thai Dept of Livestock Development, 1995)

5. The Thai Pig Industry

The Thai pig industry has developed from one dominated by village production practices to one that is now heavily reliant on commercial production. Production levels are able to satisfy domestic demand and significant export levels have been achieved. However, there is great potential for further export growth into lucrative Asian markets if FMD free status can be achieved. Many of the restrictions that impaired industry development in the 1970's and 1980's remain and continue to diminish industry efficiency and impede export expansion.

5.1 Background of the Thai Pig Industry

The origins of the Thai pig industry emanate from the traditional village-based integrated farming system. Rice and crop cultivation were the central focus of farms with draught power supplied by cattle and buffaloes. Pigs and poultry were used to convert waste products into meat and to provide farm cash income. The village or backyard raising practices of pork production continued to dominate the industry into the early 1980's when commercial developers began to have a substantial impact. The commercial pig raising industry now accounts for 80% of pigs raised in Thailand.

The mediocre speed of development in the pig industry until the early 1980's, compared to the rapid development of the poultry industry, may have been related to the wide variance in

pig and feed prices, high feed costs, government regulation and intervention and the prevalence of endemic diseases, including as FMD, Aujesky's Disease and Hog Cholera. The small scale and often remote nature of the industry restricted the dissemination of information about prices for pigs and feed. This, in turn, led to over-reaction by producers to changes in input prices and prices for final products and prolonged the hog cycle. The relationship between feed prices and the hog cycle is of fundamental importance in determining the profitability and supply of pigs (Poapsongsakorn, 1985).

Legislation governing the slaughter, processing and transport of pigs also contributes to higher costs, retarded industry growth and spread of disease (Poapsongsakorn, 1985). Legislation requires the slaughter of animals in provincial slaughterhouses, and transport of carcasses between provinces is prohibited. This has led to the development of a monopsonistic processing sector with the ability to influence prices. Hygiene and productivity standards in some slaughterhouses have also been affected. The systems encourage the transport of live animals that is a high cost alternative and can increase the risks of spreading FMD and other infectious diseases. Other barriers to increased production include the high cost of feed imports, high land prices and increasing planning and environmental restrictions on the approval of new piggeries.

FMD and other endemic diseases, including Swine Fever (Aujesky's Disease) and Hog Cholera, have the potential to restrict the industries capacity for further development. FMD, particularly, impacts heavily on two aspects of the industry. Firstly, the productivity of animals is reduced through poor conception rates, high mortality of immature pigs, reduced weight gain and other physical aspects of production. Secondly, the inability to eradicate FMD from cattle, buffaloes and pigs in Thailand prevents the industry from exporting live animals and pork products to many lucrative markets in Asia. Many nations seek to protect their domestic industries by sourcing products only from nations with FMD-free status. Whilst Thailand is more than self-sufficient in pork production these restrictions have limited exports to approximately 5% of total production. Main importers of pork from Thailand have been Hong Kong, Singapore and Malaysia. Thailand does export some pig meat to Japan, but only particular cooking methods are acceptable to the Japanese (baked and steamed but not fried or roasted) and the quantities traded are small the Japanese are very “conscious of product quality and freshness” (Knipe, 1987).

Commercial pig producers generally adopt strict vaccination programs for pig diseases

because it is in their own financial interests to do so. Most commercial piggeries appear to undertake 100 % vaccination for FMD and Swine Fever at their own cost. (Free vaccine is provided to village pig producers only.) However, there is a low rate of vaccination of FMD in village pig production. Pigs do not act as carriers of the disease in the same way as cattle but can multiply its spread because of the large amount of excreta and gas produced by them. It is necessary to eradicate the disease from cattle populations as cattle are the major carriers and initiators disease outbreaks. The small village industry sector contributes largely to the spread of disease. Inefficient disease control in villages, poor hygiene and contact with infected cattle prevents efficient control in both industry sectors.

Thailand also imports significant numbers of pig breeding stock mainly from the European Community members and Australia and New Zealand. Imports of pork and pig products are negligible.

5.1 Recent Trends in the Thai Pig Industry

5.1.1 Pig production levels

Despite constraints on further development of the Thai pig industry the level of production has increased substantially over the 15 year period between 1980 and 1995. As seen in Figure 9, pig numbers increased steadily between 1980 and 1989. Dramatic increases in numbers in the early 1990's were followed by a period of stagnation from 1992 to 1995. Over the 15 year period 1980 to 1995, pig numbers increased from 4.9 m head to 8.6 m head, an increase of more than 75%. This growth reflects the growing commercialisation of the industry over the period.

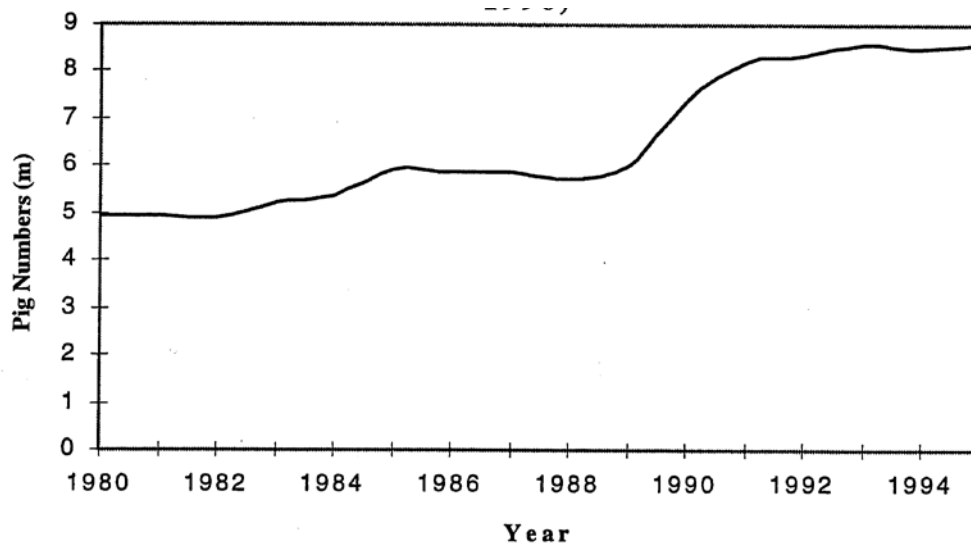


Figure 9: Overall pig numbers, Thailand, 1980 to 1995 (Source: Thai Office of Agricultural Economic Research, 1996)

The number of pigs slaughtered has increased by only 19% over the same 15 year period. Increases in pig numbers have not translated to greater pig production for the various reasons mentioned above. However, this may also reflect the large number of pigs killed for rations or under the continued practice of illegal slaughter. The figures also illustrate the unreliability of official slaughter figures. The trend displayed in Figure 10 shows some variation around a gradually increasing trend.

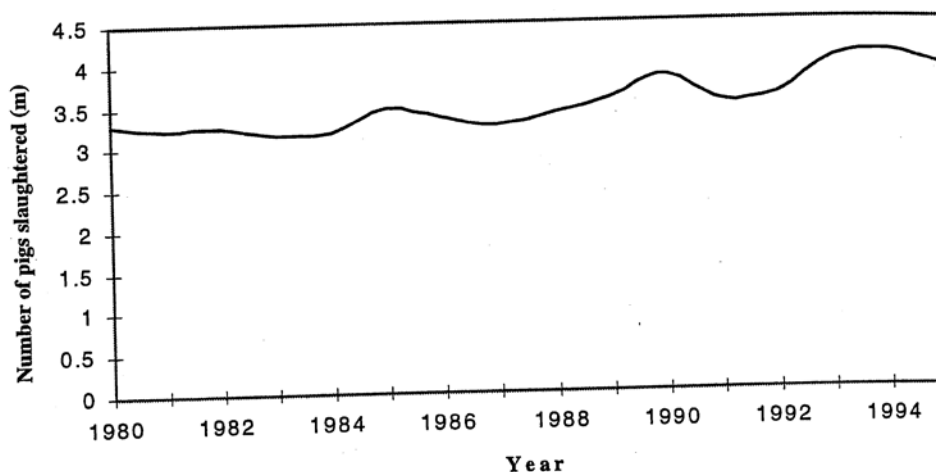


Figure 10: Slaughter of Pigs, Thailand, 1980 to 1995 (Source: Thai Office of Agricultural Economic Research, 1996)

5.1.2 Imports and exports of pigs and pig products

Despite increases in overall production, the constraints on the industry (especially the restrictions imposed on the export of pork because of the FMD), have seen the pig industry remain domestically focussed. The 12 year period between 1984 and 1995 is marked by two distinctive periods in the export of live pigs, illustrated in Figure 10. Between 1984 and 1991, live pig exports rose to 76,600 head in 1985 before falling to zero in 1991. Major importers of Thai live pigs were the neighbouring countries of Vietnam, Malaysia and Myanmar. Since 1991, trade has increased minimally to 2,381 head in 1995.

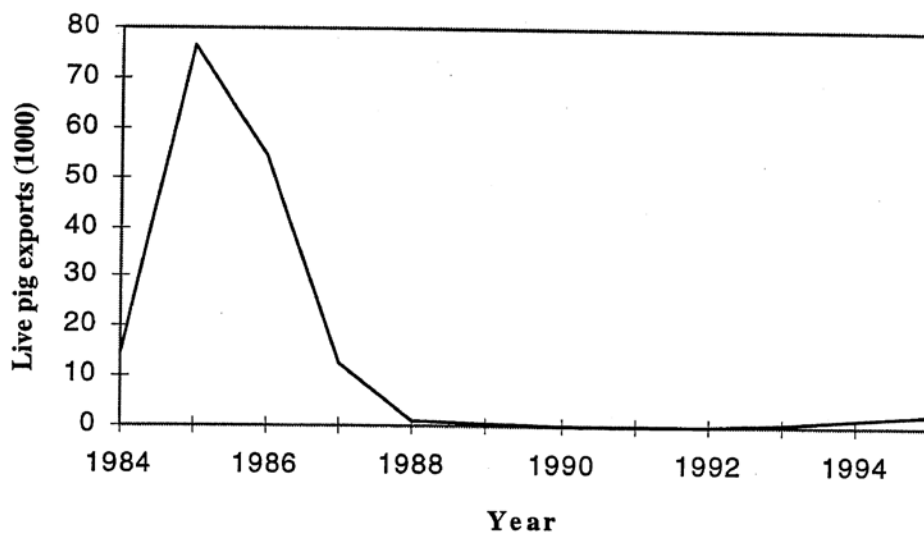


Figure 11: Thai exports of live pigs, 1984 to 1995 (Source: Thai Dept of Livestock Development, 1996)

Exports of fresh pork have shown a different trend. In 1986 negligible exports of 4.05 tonnes of pork were recorded. Significant growth occurred between 1986 and 1990 when exports peaked at 1332 tonnes. A dramatic fall occurred in 1992 and exports remained at around 250 tonnes for the next two years before increasing to 539 tonnes in 1995. Unfortunately, the exact cause of this dramatic reduction in pork exports is not known. However, it was accompanied by a significant fall in the number of pigs slaughtered in the same year. The destination of the vast majority of these pork exports prior to 1995 was Hong Kong. Other importing countries include Cambodia, Laos, Singapore, Japan and Sri Lanka. A switch in focus occurred in 1993 from the importing of whole chilled and frozen carcasses to cuts of pork. There does not appear to be any dramatic increase in values to support this value-adding change. Japanese imports of pork have been sporadic. In 1993, Japan imported 29

tonnes of pork but in 1994 only two tonnes were imported and no imports of pork to Japan were recorded in 1995. If Thailand can improve its export status and increase its capacity to supply lucrative export markets such as Japan, it will still face strong competition for these markets, particularly from China. In 1995, Japan, the world's largest importer of pig meat, imported 0.59m tons or 35% of all international trade in pig meat. Japans imports of pig meat are expected to continue to increase as tariff barriers are removed. However, world pig meat production grew by 4% in 1995 with China responsible for 40% of the total increase (FAO, 1996).

Imports of breeding stock have been low but gradually increasing between 1992 and 1995 with the annual number of imported breeding stock growing from 699 to 982. The number of imported pigs peaked in 1993 with imports of 1985 head. The major importers of breeding pigs to Thailand include western European countries, Canada, Israel, Australia and New Zealand. Imports of pork appear to be minimal.

5.1.3 Input costs and marketing margins

Significant increases in the operating costs of pig producers occurred between 1986 and 1995. Over the 10 year period, total costs per kg rose by 80% from 16.32 bht/kg to 29.16 bht/kg. The largest component of the increase was in the variable costs facing pig producers. Feed prices have made a major contribution to these increased operating costs. Mixed feed prices for pigs rose from 4.94 bht/kg, in January 1991, to 7.08 bht/kg, in 1995, demonstrating a sharp upward trend. During this same period the price paid by farmers for 12 kg weaners averaged 748bht/pig. Values reached a maximum of 1100 baht between May and August 1992 and bottomed out in October 1993 at 350 bht/pig before rising to the value of 970 bht/pig in May 1995. The increasing trend in the mixed feed price for pigs has coincided with the stagnation of overall pig numbers and a reduction in the number of pigs slaughtered.

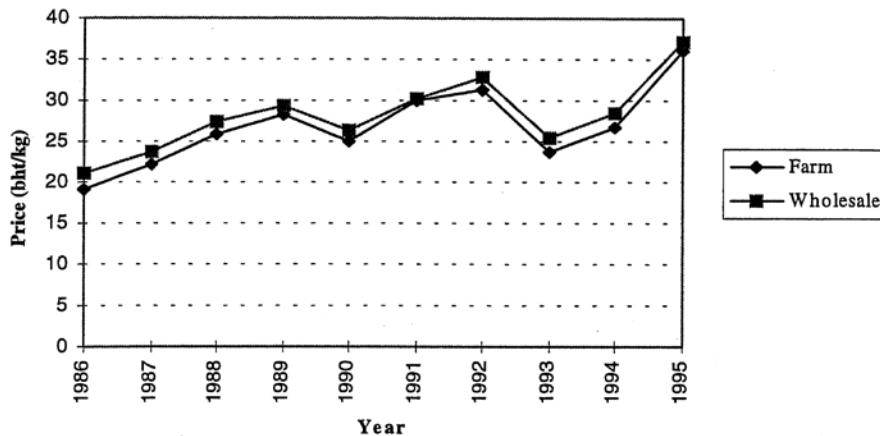


Figure 12: Farm and Bangkok market pig prices, 1986 to 1995 (Source: Thai Office of Agricultural Economic Research, 1996)

As illustrated by Figure 13, there has been little variation in marketing margins between 1986 and 1995. Prices received by farmers followed the slight upward trend in prices received by wholesalers. The farm price averaged 93% of the wholesale price.

6. Conclusions

The Thai economy has undergone enormous growth and development over recent years. Thailand has one of the highest GDP growth rates in the world with GDP increasing at an average of 7% over the last 20 years and above 8% throughout the 1990's. The country's rapid economic development was initially led by the agricultural sector with the contribution of this sector declining only in the 1990's (Sindelar, 1996; Sheehan and Supasilapa, 1992). Thai development and the associated increases in income, population and tourism have stimulated the demand for livestock products.

A number of impediments to future development exist in the beef, dairy and pork industries. Common challenges to increasing production from these industries are the lack of available land, the high cost of imported feedstuffs and the problems associated with infectious livestock diseases, especially FMD.

Those industries with most to gain from the eradication of FMD are the dairy and pig industries. Increases in production of milk and dairy products are necessary to offset continued domestic demand and achieve the government's aims of nutrition improvement and self-sufficiency in milk production. Despite substantial increases in the production of dairy

products in Thailand the country remains one of the world's larger importer of skim and whole milk powders. Continuing expansion of demand for dairy products is expected as Thailand's population becomes increasingly urbanised and continues to develop its middle class (Sindelar, 1996).

The Thai pig industry already produces more than the domestic needs for pork. Disease eradication and the achievement of FMD free status is essential to allow the industry to compete in more lucrative markets, such as Japan, and to boost export earnings to support a developing current account deficit. The Japanese pork market is expanding as tariffs and other protection measures are reduced (FAO, 1996).

However, the Japanese require strict conformity to stringent import regulations to ensure that quality and freshness of its imports are maintained and to prevent the entry of disease (Knipe, 1987). It is unlikely that Japan will allow significant imports of pork from countries that are not declared fully FMD-free given its refusal to allow the importation of Argentinean beef despite the recent International Organisation of Epizootic (OIE) declaration of Argentina's FMD-free status with vaccination (Joseph, 1997).

Although much progress has been made in controlling FMD in commercially oriented industries, with acceptance of control measures in these industries widespread, disease problems still persist. Central to the control of the FMD is the need to eradicate the disease from village cattle and buffalo production systems, the major sources of outbreaks and to prevent reinfection from neighbouring countries.

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