

**Livestock Industries of Indonesia prior to
the Asian Financial Crisis**

**Food and Agriculture Organization of the United Nations
Regional Office for Asia and the Pacific
December 1999**

2. NUCLEUS SCHEME FOR SMALLHOLDERS (PIR) IN THE BEEF CATTLE INDUSTRY OF INDONESIA

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The concept of the partnership model under a Nucleus Smallholder Scheme (Pola Intirakyat, or PIR) in the beef cattle industry was inspired by a successful similar programme in the estate crop sub-sector. The main objective of the programme is to minimize the burden of farmers as partners, with the assurance of the nucleus to supply raw materials and market the final products. A partnership, as the basic programme to develop agribusiness in villages, is considered very promising to farmers in many aspects of life.

The concept of PIR has attracted government attention because of competition between the subsistence farmers and large-scale enterprises in the production and marketing of final products. The bargaining position of subsistence farmers is very weak because they cannot guarantee product supply. This weakness could be reduced if subsistence farmers could organize themselves under a co-operative scheme and could find a business partner who shared their objectives. On the basis of such an agribusiness-oriented approach, it is expected that the performance of the farmer could be improved and this would create more employment opportunities in the villages. As a result, it is also expected that the farmers, through development under the programme, could become the backbone of the industry in meeting the demand for meat.

Most cattle farmers are subsistence farmers as judged by the ownership status of cattle. They only raise cattle to obtain the benefit of having offspring and the increase in body weight when the animal is fattened. Theoretically, the number of feeder cattle produced from the offspring has the potential to support a long term fattening programme in Indonesia. Therefore, it is expected that, given the opportunity, the economic development of villages could improve, because the type and characteristics of this business are closely linked to farmers' daily life.

Soekartawi (1994) shows that there has been excellent growth, by up to 5-6 percent per year, in the estate crop, livestock and fisheries sub-sectors. This development has given the government an incentive to develop these sub-sectors further. However, there are also negative issues that can hamper the approach. According to Simatupang *et al.* (1995), any report that focuses on the

development of livestock PIR generally arouses heated discussion on the relationship between the nucleus and partners, mainly in terms of investment and profit sharing. Some policies that were designed to help the farmer in financial and managerial matters in many cases have turned out to corner the farmer.

The village co-operative unit (Koperasi Unit Desa, KUD), as a motivator and agent for farmers, should take a more proactive role in planning and implementing the programme. A harmonious partnership can be achieved if both parties are responsible and functioning well, with the involved government official providing sufficient supervision of the business pattern, so that complaints from both parties are prevented.

DEVELOPMENT OF THE CATTLE FEEDLOT INDUSTRY AND PRODUCTION CAPACITY

In Indonesia, the fourth most populous country in the world after China, India and the USA, the beef market provides an excellent opportunity for marketing agricultural products. Over the five years beginning in 1992, the demand for beef products grew significantly, reflecting the increasing income per person and strong urbanization. Because of these factors, consumption of red meat increased between 1995 and 1997 (Table 2.1).

Table 2.1. Demand for and supply of beef products, 1995-1997

Description	Year		
	1995	1996	1997
Beef demand (t)	381 000	450 702	498 000
Supply of beef (t)	359 000	437 181	468 000
Imported beef (t)	22 000	13 521	30 000

Source: APFINDO (1997)

In 1997, 358 000 t of the 468 000 t of beef were produced by traditional farming systems with indigenous breeds such as Bali, Ongole (Peranakan Ongole, PO) and Madura cattle. The feedlot industry contributed 80 000 t and another 30 000 t was supplied by imported beef. The demand for meat over the next five years will increase. However, a constraint is that the population of cattle in Indonesia has been increasing only 2 to 3 percent annually, while the demand for beef is likely to increase by up to 8 percent per year.

The increase in beef demand in the last few years has been anticipated, as shown by the number of cattle feedlots. In 1992, there were only five cattle feedlot companies located in Lampung, West Java and Central Java. By 1996, Sitepu *et al.* (1996) reported that the number of cattle feedlot companies had increased to 32, spread over 12 provinces. Most of them are located in the western part of Indonesia, such as West Java (8), Central Java (6), Lampung (6) and East Java (4). Yogyakarta, East Kalimantan, South Kalimantan, NTB, Riau, South Sulawesi, North Sulawesi and Irian Jaya each have one feedlot. In 1997, the number of cattle feedlots increased to 41 companies distributed through 13 provinces. All cattle feedlot companies in Indonesia are

under the Indonesia Beef Producer and Feedlot Association (APFINDO), an organization that was established in 1992.

Based on a survey of 14 cattle feedlots, Sitepu *et al.* (1996) also reported that production capacity of these feedlots varied between 1 000 and 60 000 head per year. Most of the cattle feedlot operations use imported breeds with a high preference for Brahman Cross (BX), Australian Commercial Cross (ACC) and Shorthorn Cross (SHX). The age of the imported cattle is around 1.6 to 2.5 years with an average body weight of 350 kg. The fattening period depends on the initial body weight and it varies between 60 and 90 days. The total number of feeder cattle imported by feedlot companies increased very sharply from 12 591 head in 1991 to 367 000 in 1996. Between January and July 1997, 235 658 head were imported (Table 2.2).

Table 2.2. Number of feeder steers imported by APFINDO members

	Year							Total
	1991	1992	1993	1994	1995	1996	July '97	
Feeder cattle	12 591	24 867	58 200	118 200	246 890	367 000	235 658	1 063 406

Source: APFINDO (1997)

The distribution of feeder stock is as follows: West Java 34 percent, Lampung 24 percent, Central Java 12 percent, East Java 6 percent and the remaining 24 percent in other provinces. Thus, 76 percent of feeder stock are fattened by feedlots in the western part of Indonesia.

DEVELOPMENT OF CATTLE FEEDLOTS UNDER THE NUCLEUS SCHEME

The operation of the PIR (nucleus scheme) with feedlot cattle in villages has been implemented in varied forms, using the experience of Lampung as a guide. The significant increase in the role of the nucleus scheme in assisting farmers is indicated by the willingness of farmers to join the scheme. The farmers have built cattle pens at their own expense. The total pen capacity built by the farmers in 1997 was 38 017 head, while the pen capacity of cattle feedlot companies was 197 339 head. Allowing for a 14 day quarantine period and a 60 day fattening period, the number of cattle able to be fattened by the farmers reached 171 076 head per year, and 888 025 head per year by the cattle feedlot companies.

The Great Giant Livestock Company (PT GGLC) carries out the nucleus scheme with available pineapple waste, sufficient to feed 7000 head of cattle throughout the year. This means that 21 000 head of cattle could be fattened each year, in three periods of four months. Apparently, the company only raises 2400 head of cattle. Hence, 18 600 head could in theory be raised by farmers. The GGLC has established two kinds of nucleus scheme, namely a “credit PIR” and a “self-supporting PIR” (SS-PIR).

The credit PIR scheme began in 1989 with an initial 20 head of cattle distributed to 20 farmers. Thus, each farmer received one animal. An economic farm size demands a certain number of cattle be raised by each farmer. In 1991, PT GGLC developed a co-operative arrangement with the KUD as the organizer of farmer activity.

The production target was 12 000 head of feeder cattle which were either imported or Ongole Grade (Peranakan Ongole, PO) feeder stock. The cattle were fed on pineapple waste to reduce feed cost. However, the operation only reached 2320 head of cattle, which was far below the target. In the five years 1991-1995, the number of animals in each farmer's package was increased to three, over the four months fattening period. The Brahman Cross cattle, chosen by the company, and all feed, production inputs and capital were provided by the company – the nucleus. The credit provided by the company is repaid at the end of the fattening period through the farmer selling the fattened cattle to the company.

The SS-PIR nucleus scheme developed by PT GGLC initially included only 20 farmers. The difference between the two kinds of PIR lies in the provision of capital: in the SS-PIR the capital was provided by the farmers themselves, while the raw materials were supplied by the company. The average farm size was 7 head of cattle per farmer, for a six month fattening period.

The feed, in the form of pineapple waste, is provided by PT GGLC on the agreement that at the end of the fattening period the farmer will sell the cattle to the company with the selling price being settled in advance. There is no interest applied to the value of the feed. Therefore farmers can get higher profits.

Another nucleus scheme for feedlot cattle was established by PT TIPPINDO (located in Central Lampung). This involved more than 35 farmer groups with 11 500 head of feeder cattle. In implementing the nucleus scheme, PT TIPPINDO selected as participants farmers who satisfied certain criteria. This was done in order to get better results. Before the start of the programme both parties would sign a contract or memorandum of understanding which specified that the farmer, as a member of the KUD, would provide corn forage (72-day corn plants), animal pens and labour. The memorandum of understanding required that the company would provide the feeder cattle and feed supplements such as concentrate, molasses and medicine, as well as technical supervision during the fattening period. Another nucleus scheme carried out by TIPPINDO is a corn planting programme to make corn silage. The company provides inputs such as corn seed, fertilizer and technical supervision, while the farmers provide land and labour. At the end of a 72-75 day period, the farmers sell the corn plants to the company at an agreed price.

PT Hayuni Mas Lestari (HML), which was established in 1989 and which is located in North Lampung, has been specializing in fattening Bali cattle with an initial body weight of less than 200 kg. Production capacity of 2400 head per year was not achieved. This company acts as a nucleus in the area and works together with farmers to do the fattening. In the province of Bali, a nucleus scheme was initiated in 1984. At the beginning, the programme showed good productive performance as indicated by an increase in the cattle population of around 38 percent per year. Also, the number of farmers involved in this programme increased by about 31 percent per year. However, in 1988 the productive performance declined because of a change in policy applied by the local government. This change shifted the performance of the nucleus scheme, so that the population of cattle raised by farmers dropped by 69 percent per year and the number of farmers involved also declined by 66 percent per year. According to Simatupang *et al.* (1995), this drastic reduction caused a change in local incomes and the policy resulted in an uncertain supply of feeder cattle from the nucleus company to the farmers. At the beginning of the scheme, feeder cattle were transported by the company. However, after a change in management policy, the feeder steers were transported by the Indonesian Animal and Product Trade Association (INDAPTA) which charged a fee.

A nucleus scheme in Lombok (West Nusa Tenggara) has been set up to enhance the supply of slaughter cattle for inter-island trade. In this particular scheme, it is the trader who is the nucleus, and the trader works hand-in-hand with local farmers. The nucleus provides feeder stock, and the farmers provide feed and raise the cattle to a certain body weight (300 kg). To achieve the desired body weight target, farmers raise the cattle for about 4-8 months, depending on the condition of the animals when they arrive at the farms (Sarwono, 1995).

THE ROLE OF GOVERNMENT POLICY IN THE NUCLEUS SCHEME

In 1992, when the nucleus smallholder scheme was approved by the President of the Republic of Indonesia in Lampung, the scheme became a government policy that had to be implemented by any cattle feedlot operator who used imported feeder cattle. Government officers, through the Directorate General for Livestock Services (DGLS), issued a regulation that at least 10 percent of imported cattle had to be distributed to local farmers under the PIR. The objectives of this programme were:

- to give local farmers a chance to increase their income;
- to improve the capability and skill of the farmers in managing small-scale cattle feedlots;
- to stimulate villages to take up activities that promote economic growth; and
- to improve sales of agricultural product(s) and by-products used by the feedlot companies.

Since 1997, the government, through the Directorate General for Livestock Services, has instructed all cattle feedlot companies in Indonesia using imported feeder cattle to increase the proportion of their PIR schemes with local farmers from 10 percent to 20 percent of the total imported feeder steers. This must be done by all cattle feedlots, whether run by foreign investment (PMA) or domestic investment (PMDN). In addition, the government has introduced a PIR for cattle breeding, to produce calves or feeder cattle and to substitute these for imported feeder cattle.

The nucleus scheme, a business based in the agricultural sector, should be considered as a system where all parties have mutual interest in all aspects of production, including management, marketing, and post-harvest processing. These linkages can be differentiated as forward linkages and backward linkages.

A linkage analysis has been done, separating the inputs and the outputs. The coefficient of forward linkage for the livestock sub-sector, especially ruminants, is more than one (1.108), while the coefficient of backward linkage is 0.776. This indicates that the cattle business puts emphasis on the consumer, in those cases when the product goes directly to the consumer without any post-harvest processing. This is different from the feed industries because the coefficient of forward linkage is smaller than the coefficient of backward linkage (0.766 versus 1.158). The implication is that the product is not delivered directly to the consumer but to other downstream industries (Soekartawi, 1994).

These results indicate that while upstream relations were maintained, the same could not be said of downstream relations. For example, it could happen that during some fattening periods the farmers did not make any profit because they did not receive the feed they needed because the feed was used by the nucleus for its own cattle. This did not happen in the poultry business, since there was not so much difference between the coefficients of forward linkage and

backward linkage (0.748 versus 0.768). The arrangement was therefore apparently beneficial for both upstream and downstream industries (Soekartawi, 1994).

Rahman and Erwidodo (1995) stated that a policy based on the use of tariffs and non-tariff barriers in milk production affected the allocation of production factors and benefits. Further, the level of nominal protection for milk – the difference between the price of the output in the country and the import price of the same commodity – was 32 percent at the consumer level at the time of their study. This shows that domestic consumers paid more than they would have paid without protection at the farmer level. At the industry level, the nominal protection was 38 percent. In the credit PIR, farmers with less than 4 head received the smallest nominal protection (only 24 percent) while farmers with 7 to 10 head received 34 percent. Those farmers with at least 13 lactating cows received 38 percent.

The level of effective protection (tingkat proteksi efektif, TPE) at the farmer level was 8.3 percent. This means that the producers of fresh milk got protection from the government in the form of higher output prices. At the level of the milk processing industry, Rahman and Erwidodo (1995) found there was a TPE of 20 percent.

The absence of a tariff on imported feeder cattle from Australia led to some operators reducing the scale of their fattening business, both at the nucleus and at the farmer level. This was based on the calculation that without fattening for three months, feeder cattle imported from Australia could be sold directly at a competitive price in the local market, and still provide a profit.

It is clear that farmers who raise local cattle, and also the consumers of meat produced from local cattle, do not get any benefit from the government policy of no tariffs for imported cattle. The impact of this policy on the fattening process in the PIR programme has not been evaluated yet. With the coming era of free markets and globalization, it is hoped that all policies can be re-evaluated.

In the last few years of implementation of the PIR in the cattle feedlot industry, a number of constraints have appeared at both the company and the farmer level. These include:

- the provision of finance at a low interest rate for the development of cattle feedlots under the PIR;
- the inability of farmers to receive feedlot management technologies from the feedlot companies;
- the restricted area of land for growing roughage for fattening purposes;
- the long dry season which is a major restriction to the supply of roughage for cattle feed; and
- the distance separating the cattle feedlot companies and the animal pens set up by farmers, which increases operating costs during the fattening period.

Additionally, the operators' limited education and capability in all parts of the nucleus scheme in the beef cattle industry hamper their adoption of new technology and management and limit their ability to make use of information. These factors, in turn, limit the ability of scheme participants to do business. Therefore, the smallholder farmers require guidance for success in the nucleus scheme. The concept of guidance has to be able to accommodate all levels of the nucleus scheme. At the farmer level, guidance should demonstrate how to increase the scale of operation. For problems related to husbandry, the guidance should focus on product quality, marketing, investment and management, so that farmers become aware of the economic aspects of the business.

FINANCIAL PERFORMANCE OF THE NUCLEUS SCHEME

The nature of PIRs being implemented in the villages varies greatly, so there is a need to evaluate the financial performance of the PIR. An analysis of the financial performance of the PIRs in Lampung was carried out for PT GGLC and PT TIPPINDO. The PIR from PT GGLC uses two-year old feeder cattle with an average body weight of 250 ± 28 kg. All cattle are fed mixed concentrate and pineapple waste sent by the company to the farmers at two-weekly intervals. The amount of feed offered (on an air dry basis) is about 2 to 3 percent of body weight. Concentrate and pineapple waste are mixed together before being offered to the animals and feed is offered one or two times a day. Each animal receives as much as 30 to 50 kg pineapple waste and 2 to 3.5 kg concentrate per day.

Total production cost in the credit PIR was Rp. 2 799 138 per farmer per period, while the SS-PIR spent Rp. 6 580 120 per farmer per period. Apparently 77 or 78 percent of this total production cost was for buying the feeder cattle. The second largest part of the total cost (12.1 percent) was the feed component for both credit PIR and SS-PIR. Expenses for concentrate dominated the variable cost (6.8 percent for SS-PIR and 7.4 percent for the credit PIR), while the cost of pineapple waste reached 5.3 percent in the SS-PIR and 4.7 percent for the credit PIR.

The calculation of loss and benefit values shows that the farmers in the SS-PIR arrangement get Rp. 1 086 233 per head per period. This is higher than the profit of Rp. 984 328 per head per period made by farmers in the credit PIR. The profit difference arises because SS-PIR farmers bought the feeder cattle themselves, while for the credit PIR farmers the feeder cattle were bought by the nucleus. In this latter case, the price and animal performance were not as expected by the farmer. In addition, there was a difference in selling price between the SS-PIR and the credit PIR. Farmers in the SS-PIR scheme sold cattle at the higher price of Rp. 2650-3000 per kg of body weight while farmers in the credit PIR scheme sold cattle at Rp. 2500-2800 per kg body weight (Santoso *et al.*, 1995).

For the PIR of PT TIPPINDO, 90 percent of feeder cattle raised by the farmers were imported from Australia, with shipments arriving more than twice a month depending on market demand. The capacity of the feedlot plant was 12 000 head and it was expected to market 100 head per day. The fattening period was between 74 and 90 days with a quarantine period of two weeks. Green corn forage was given *ad lib*, and the forage originated from the nucleus scheme for cattle feed (Feed-PIR). The cattle were fed mixed feed and feed supplemented with molasses as an additional energy source. The body weight gain in this fattening programme was up to 0.8-1.2 kg per head per day.

The farmers who are members of KUDs near the nucleus were involved at first intake for the Feed-PIR. The area in the first stage reached 156 ha with a credit value of Rp. 22 477 000. In the second stage the area was expanded to 761 ha with a credit value of Rp. 73 140 000. The harvest time of the corn leaf is at 70 days, or five times in one year. At the initial stage of collaboration, the farmers earned a profit of Rp. 119 000 per month, if they had two harvests.

CONCLUDING COMMENTS

The PIRs between the nucleus (company) and farmers in the villages have a variety of forms, related to the economic, social and cultural conditions of the farmers. The advantage of the PIR for beef cattle is that better use is made of available resources for the production of beef cattle.

On the other hand, the negative side of this programme is that profit is not equally distributed between the farmer and the nucleus, and farmers accept a higher risk in the production process.

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