



WORKING PAPER 99.21

**THE IMPACT OF THE ECONOMIC CRISIS ON
INDONESIA'S BEEF SECTOR**

Prajogo U. Hadi, David Vincent and Nyak Ilham

March 1999

A joint research project on

**Linkages Between Indonesia's Agricultural Production, Trade and the Environment
funded by the Australian Centre for International Agricultural Research,**

between

CASER (Bogor) • CIES (Adelaide) • CSIS (Jakarta) • RSPAS (ANU, Canberra)

**Lead institution: CIES • University of Adelaide • Adelaide • SA 5005 • Australia
Telephone (61 8) 8303 4712 • Facsimile (61 8) 8223 1460 • email: cies@economics.adelaide.edu.au
Homepage: <http://www.adelaide.edu.au/cies/>**

**CASER/CSIS/CIES/ANU
joint research project on**



**Policy analysis of linkages
between Indonesia's agricultural
production, trade and
environment**

Rapid economic growth in Indonesia has been accompanied by significant structural changes, including for its agricultural sector and its unique natural environment. Recently questions have been raised about the impact of Indonesia's agricultural, industrial, trade and environmental policies on sustainable rural development. The nature of interactions between the economic activities of different sectors and the environment are such that an intersectoral, system-wide perspective is essential for assessing them. An international perspective also is needed to assess the impact on Indonesia of major shocks abroad, such as the implementation of the Uruguay Round agreements, APEC initiatives, or reforms in former centrally planned economies. There is increasing pressure on supporters of liberal trade to demonstrate that trade reforms at home or abroad affecting countries such as Indonesia will not add to global environmental problems (e.g., deforestation, reduced biodiversity). Again, this requires system-wide quantitative models of the economy and ecology, because typically there are both positive and negative effects at work, so the sign of the net effects ultimately has to be determined empirically.

To begin to address these issues, the Australian Centre for International Agricultural Research (ACIAR) has generously provided funds for a collaborative 3-year project (to mid-1999) involving the University of Adelaide's Centre for International Economic Studies (CIES) as the lead institution, Bogor's Centre for Agro-Socioeconomic Research (CASER) which is affiliated with the Ministry of Agriculture, Jakarta's independent Centre for Strategic and International Studies (CSIS), and the Economics Division of the Research School of Pacific and Asian Studies (RSPAS) at the Australian National University in Canberra. Being based on Indonesia with its rich diversity of environmental resources (and on which there are relatively good data) and its rapid economic growth, the project could also serve as a prototype for similar studies of other developing countries in Southeast Asia and elsewhere.

The key objective of the project is to assess the production, consumption, trade, income distributional, regional, environmental, and welfare effects of structural and policy changes at home and abroad particularly as they will or could affect Indonesia's agricultural sector over the next 5-10 years. Among other things, the analysis will focus both on the effects of economic changes on the environment, and on the impacts on Indonesia's agricultural production and trade of resource and environmental policy changes. The implications of regional and multilateral trade liberalization initiatives and Indonesia's ongoing unilateral trade reforms will be analysed, along with other potential domestic policy changes and significant external shocks such as the entry of China and Taiwan into the World Trade Organization. The analysis will draw on and adapt computable general equilibrium (CGE) models such as the national INDOGEM Model (built as part of an earlier ACIAR project) and the global GTAP Model.

The project is being undertaken in close collaboration with the Indonesian Ministry of Agriculture and ministries involved in trade, planning, and the environment. A Research Advisory Committee has been established to encourage close collaboration of representatives from those and other ministries.

ACIAR INDONESIA RESEARCH PROJECT

WORKING PAPER 99.21

**THE IMPACT OF THE ECONOMIC CRISIS ON
INDONESIA'S BEEF SECTOR**

Prajogo U. Hadi, David Vincent and Nyak Ilham

Senior Agricultural Economist
Center for Agro-Socioeconomic Research
Bogor, Indonesia

Chief Economist
Center for International Economics
Canberra, Australia

Agricultural Economist
Center for Agro-Socioeconomic Research
Bogor, Indonesia

March 1999

Introduction

Although small, the beef sector in Indonesia makes an important contribution to the country. It provides a source of meat protein for consumers, employment and income for millions of rural families, and investment opportunities for private companies. It also provides, through its demands for inputs and through the sales of cattle along the beef value chain, important links to other sectors of economic activity.

Up until the onset of the so-called Asian financial crisis in mid-1997, rising per capita incomes, general economic prosperity and population growth in Indonesia was resulting in steadily increased beef consumption, though from a low base. Because of severe constraints on domestic beef production from a small breeding herd, the increased consumption was being met by:

- imports of frozen boxed beef; and
- imports of live feeder cattle (overwhelmingly from Australia) for fattening in Indonesian feedlots before slaughter.

Considerable investment had taken place in large scale company feedlots and in developing the associated infrastructure such as yards, loading and unloading facilities and dedicated live cattle transport ships to move cattle from northern Australian ports to Indonesia. Some new developments had also taken place in processing facilities.

Imported live cattle were also distributed to small scale farmers for fattening, with farmers paid on a live weight gain basis. This added to farm incomes and regional development. The economic crisis that commenced in mid-1997 has, however, brought about dramatic changes in the beef sector in terms of consumption, production, processing and trade.

This paper analyses the likely impact of the so-called Asian economic crisis in Indonesia on the performance of Indonesia's beef sector. In section 2, the sector's performance up until the advent of the crisis is outlined.

Section 3 looks at the impact of the Asian crisis on the Indonesian economy and the beef industry and the Indonesian government's policy responses. Section 4 considers the challenges and opportunities confronting the beef industry in responding to the crisis.

Precrisis situation

Per capita consumption of meat protein (including seafood, poultry, beef, pig and sheep meat) in Indonesia was very low when compared with industrial countries and many other Asian economies. In fact, Indonesia stands out among South-East Asian economies as having very low per capita consumption of meat protein. Details are in Table 2.1.

Total per capita consumption in 1996 was only 15.72 kilograms per person per year retail weight. Of this, seafood dominated, accounting for 56 per cent. The price of seafood is low relative to prices of alternative sources of meat protein. By contrast, consumption of beef accounted for only 9.5 per cent of total meat consumption.

The table also shows that, since 1990, per capita consumption of all meat protein increased by 32 per cent. Per capita consumption of poultry increased by 68 per cent, while for beef the increase was 21 per cent, though from a much lower base.

Table 2.1 Per capita consumption of meat protein in Indonesia (Kilogram per person retail weight)

<i>Type of meat</i>	<i>1990</i>	<i>1996</i>
Beef	1.23	1.49
Sheep meat	0.45	0.45
Pork	0.54	0.75
Poultry	2.50	4.19
Seafood	7.19	8.84
Total	11.91	15.72

Source: Global Meat Industry Database, Meat & Livestock Australia.

Up until the advent of the crisis, consumer prices of beef in Indonesia had been reasonably stable. The national average price to consumers ranged from Rp 9,028 to Rp11 424 per kilogram during the period of January 1995 to December 1997 (see Table 3.2 later for further details). The average price increase during the period was only 0.45 per cent per month. This was lower than that of rice and vegetable oil of 0.67 and 1.32 per cent respectively (Hadi et al. 1999). Beef is the most expensive meat in Indonesia. Its average retail price is more than twice the price of poultry and nearly four times the price of seafood.

Consumer preferences

Most beef in Indonesia is purchased from wet markets. This reflects a preference toward fresh beef, especially among lower income households. During the pre-crisis period, the consumer preference toward fresh beef was being gradually eroded in favour of increased purchases of chilled and frozen beef through supermarkets. The supermarket sector is underdeveloped relative to the situation in many other Asian economies. This shift in preference reflected the growing incomes of Indonesian households and an increasing awareness of beef quality together with the shopping convenience provided by supermarkets. Between 1990 and 1997 the share of beef purchased from supermarkets is estimated to have increased from 5 per cent to about 10 to 15 per cent. The effect of the Asian crisis is likely to extend the dominance of wet market purchases for a considerable period.

Between 1990 and 1997, the cattle population increased by 2.06 per cent per year (Table 2.2). The dairy cattle population, which provides another important source of beef, experienced a population increase of 2.63 per cent. In the case of buffalo, the population declined by 0.71 per cent. Chicken and goat/sheep experienced a higher population growth rate of 10.27 and 3.89 per cent respectively.

Aggregate meat production increased rapidly by 7.6 per cent per year during the 1990 to 1997 period (Table 2.3). Poultry meat had the highest growth rate (10 per cent), followed by pork (7.8 per cent). Beef production (from beef and dairy cattle) grew by 4.8 per cent. Buffalo and lamb experienced a production increase of less than 1.5 per cent, while production of horse meat declined substantially. The production growth rate of beef, buffalo meat and pork was higher than their respective population growth rates, suggesting high slaughter rates (cattle depletion).

The diverse meat production growth rates have changed the share of the respective type of meat in total production. Only poultry meat experienced an increased production share —from 49.5 per cent in 1990 to 55.6 per cent in 1997 — while the beef production share declined from 25.2 to 21.3 per cent.

Indonesian beef production may be derived from domestic and imported cattle. As shown in Table 2.4, beef production up to 1990 relied entirely on domestic cattle. Since 1991, the government has allowed private companies to import live cattle (feeder cattle). The amount of imported cattle (on a meat equivalent basis) increased dramatically up to 1997 — by 84.5 per cent per year — while beef production from domestic cattle stagnated. The share of domestic cattle in aggregate beef production has declined steadily, reaching 76.6 per cent in 1997. This reflects the limited availability of domestic cattle and illustrates the increasing importance of imported feeder cattle. The major source of feeder cattle has been Australia (CBS, various issues, 1990a–97a), particularly the Northern Territory

Table 2.2 Population of livestock 1990-97

<i>Year</i>	<i>Unit</i>	<i>Beef cattle</i>	<i>Dairy cattle</i>	<i>Buffalo</i>	<i>Goat/sheep</i>	<i>Pig</i>	<i>Chicken</i>	<i>Duck</i>	<i>Horse</i>
1990	'000 head	10 410	294	3 335	17 304	7 136	571 163	25 553	683
1991	'000 head	10 667	306	3 311	17 592	7 612	663 759	25 369	695
1992	'000 head	11 211	312	3 342	18 297	8 135	735 773	27 342	678
1993	'000 head	10 829	329	3 057	17 742	8 704	805 790	26 616	582
1994	'000 head	11 367	334	3 104	19 511	8 858	929 560	27 536	611
1995	'000 head	11 534	341	3 138	20 335	7 720	1 008 444	29 616	609
1996	'000 head	11 816	348	3 171	21 564	7 597	1 095 375	29 959	579
1997	'000 head	12 149	353	3 238	22 503	8 638	1 173 011	31 177	582
Trend	%/year	2.06	2.63	-0.71	3.89	1.41	10.27	2.97	-2.75

Source: DGL (1997) processed.

Table 2.3 Beef production by source of cattle 1990-97

<i>Year</i>	<i>Local cattle^a</i>		<i>Imported cattle</i>		<i>Total production</i>
	'000 t ^b	%	'000 t ^c	%	
1990	259.2	100.0	0.0	0.0	259.2
1991	261.7	99.8	0.5	0.2	262.2
1992	292.9	98.6	4.1	1.4	297.0
1993	338.3	97.7	8.0	2.3	346.3
1994	322.3	95.8	14.2	4.2	336.5
1995	261.5	83.8	50.5	16.2	312.0
1996	268.0	77.2	79.2	22.8	347.2
1997	285.0	76.6	87.2	23.4	372.2
Trend (%)	0.47	—	82.45	—	4.83

^a Including beef and dairy cattle. ^b See table 2.5 for derivations. ^c Calculated as total production minus meat equivalent weight of import cattle.

Production systems and policy incentives

Most beef production: (1) is characterised by a small scale of operation by households (one to three head per household); (2) serves as a moonlighting activity whereby cattle are viewed as a source of animal draft and saving and not for producing meat; and (3) uses traditional technologies such as low quality feeds. The inability of farmers to detect cow libido results in low productivity and output quality.

In an attempt to modernise Indonesia's traditionally weak beef sector, the government set out development paths for beef production

based on the involvement of private companies while paying more attention to improving the managerial capability and welfare of smallholder producers.

Table 2.4 Meat production 1990-97

<i>Year</i>	<i>Unit</i>	<i>Beef</i>	<i>Buffalo</i>	<i>Lamb</i>	<i>Pork</i>	<i>Horse</i>	<i>Poultry</i>	<i>Total</i>
Prodn								
1990	'000 t	259.2	44.3	90.0	123.8	1.7	508.7	1 027.7
1991	'000 t	262.2	47.5	94.4	110.0	1.5	583.5	1 099.1
1992	'000 t	297.0	45.0	99.0	149.9	1.8	646.6	1 239.3
1993	'000 t	346.3	51.2	111.3	169.3	1.6	698.8	1 378.5
1994	'000 t	336.5	48.2	99.7	183.6	2.3	822.6	1 492.9
1995	'000 t	312.0	46.2	94.3	177.8	1.2	875.7	1 507.2
1996	'000 t	347.2	48.7	98.6	189.5	1.2	947.0	1 632.2
1997	'000 t	372.2	51.6	103.0	197.1	1.1	1 024.0	1 749.0
Trend	%	4.83	1.44	1.08	7.82	-5.97	9.99	7.58
Share								
1990	%	25.22	4.31	8.76	12.05	0.17	49.50	100.00
1991	%	23.86	4.32	8.59	10.01	0.14	53.09	100.00
1992	%	23.97	3.63	7.99	12.10	0.15	52.17	100.00
1993	%	25.12	3.71	8.07	12.28	0.12	50.69	100.00
1994	%	22.54	3.23	6.68	12.30	0.15	55.10	100.00
1995	%	20.70	3.07	6.26	11.80	0.08	58.10	100.00
1996	%	21.27	2.98	6.04	11.61	0.07	58.20	100.00
1997	%	21.28	2.95	5.89	11.27	0.06	59.55	100.00

Source: DGL (1997), processed.

The most notable development program has been the introduction of the Beef Nucleus Estate and Smallholder (Beef NES¹). To support this program, the government issued policy packages called PAKJAN 1990 (January Package 1990) and PAKJUN 1991 (June Package 1991), regarding the deregulation of the beef sector. Essentially, this policy allows the private sector to invest capital in cattle fattening and cattle breeding through feedlot construction using imported live cattle mainly from Australia.

A number of private companies such as PT Tipperary Indonesia (TIPPINDO), PT Great Giant Livestock Coy, PT Kariyana Gita Utama, PT Hayuni Mas Lestari and Aroma Cooperative of former PTP XXVI have responded to the development program. They are pioneers in adopting the Beef NES scheme. They established an association called Asosiasi Pengusaha Feedlot Indonesia (APFINDO) the Association of Indonesian Feedlot Company). In 1996 APFINDO contained 37 companies (Adiwoso 1996), which increased further to 47 companies in 1998 (APFINDO 1998).

In the Beef NES scheme, a private company serves as a nucleus (sister), while smallholders serve as plasma. There are three types of

¹ Beef NES = Perusahaan Inti Rakyat Sapi Potong (PIR Sapi Potong).

Beef NES called Fattening NES, Breeding NES and Forage NES². In the Fattening NES scheme, the company provides principal inputs, technical assistance, control and purchase of the output (cattle). Smallholders provide land, labour and forage, and are responsible for cattle feeding and maintenance. The principal inputs include feeder cattle, concentrate, vaccines and other medicines. Cattle can be domestic or imported. The fattening cycle is 60–180 days.

In the Breeding NES scheme, the company provides principal inputs, technical assistance, control and purchase of the output (cattle). Smallholders provide land, labor and forage, and are responsible for cattle feeding and maintenance. The principal inputs provided by the company consist of heifers or cows, semen and equipment for artificial insemination (AI), concentrate, vaccines and other medicines. Smallholders may also provide heifers and cows if necessary. Local heifers or cows may be used. Semen of better quality breeder bulls was also imported for the AI program.

In the Forage NES scheme, the company also provides principal inputs, technical assistance, control and purchase of smallholders output (such as forage), while smallholders provide land and labor, and are responsible for producing forage. The principal inputs include seeds (mostly king grass and corn) and fertiliser.

In all there Beef NES schemes, revenues that accrue to smallholders equal total sales minus total input costs borne by the company. Of these three Beef NES schemes, only the Fattening NES scheme developed successfully. In 1996 the total area of APFINDO member company feedlots was 623,623 square metres, with a total capacity of 249,450 head per cycle (Adiwoso 1996). The corresponding figures for plasma were 411,442 square metres and 164,578 head. In 1998, when the number of APFINDO member companies expanded to 47, both feedlot area and capacity had extended further.

A number of studies concluded that the Fattening NES scheme offered favourable outcomes. Yusdja et al. (1997), for instance, concluded that the NES scheme using domestic and imported cattle:

- increased beef production;
- increased income and employment to smallholder producers;
- mitigated severe pressures on the local cattle population in the producing regions through fattening of imported cattle;
- resulted in higher land use intensity through forage production activities; and
- saved foreign exchange on imported beef.

² Fattening NES = PIR Penggemukan; Breeding NES = PIR Bakalan; Forage NES = PIR Pakan.

Adnyana et al. (1996) also showed that the NES scheme in Lampung, either using credit from the bank or from the feedlot company or self financing by smallholders, was economically favourable.

The Forage NES scheme has developed, though not as rapidly as the Fattening NES scheme. Through this scheme, marginal and idle lands can be changed into fertile lands for more profitable farms. Marginal land may be converted into productive grassland for forage production which generates cash income for smallholders. Young corn plants as forage may be cultivated three or four times a year (higher turnover), depending on the local climatic conditions.

Adiwoso (1996) calculated that the Beef NES scheme had provided additional income to smallholders involved in the Forage NES scheme as follows — Rp 35.10 million from dried corn produce, Rp 4.32 million from corn leaf (forage), Rp 15.90 million from tapioca produce, Rp 38.61 million from grass produce and additional absorption of concentrate amounting to about Rp 75.62 million.

The Fattening NES scheme allocated 32 500 head of cattle to smallholders involving 650 farmer groups and 6500 KUD (Village Unit Cooperative) members. This represents about 10 per cent of the total cattle of 325,000 head included in the Beef NES scheme. The Forage NES and Fattening NES schemes generated employment for 105 managers (S1), 105 staff (D3 and D1), 175 technical staff, and 3500 labourers. Shipping services from Australia to Indonesia generated Rp 76.38 million, trucking from ship to feedlots a further Rp 3.25 million, trucking from feedlots to slaughter houses Rp 16.25 million, feed trucking Rp 4.78 million and beef trucking 11,050 units. A stimulus was provided to input supplying industries through the purchase of machinery, fuel, leather, bone meal, and compost. The stimulus to government revenues amounted to Rp 10.89 million. The scheme generated beef supply for domestic consumers amounting to 55 250 tonnes, valued at Rp 562.50 million. A number of participants exported beef.

Although a detailed analysis of the Breeding NES scheme has not yet been undertaken, the scheme has not been successful. The reason is the lack of profitability of the cattle breeding component. Each calf produced under the cattle breeding AI program earned a price of Rp 0.5 million, but incurred a total production cost of about Rp 1 million. This represents a loss of Rp 0.5 million per calf. In view of the unprofitability of this scheme, a feasibility study is needed of breeding schemes based on a pastoral grazing approach.

Smallholder cattle producers not involved in the Beef NES scheme were assisted through other schemes. Examples are: Inpres Desa Tertinggal (IDT), Bantuan Presiden (Banpres) and Proyek Pembangunan

Pertanian Rakyat Terpadu (P2RT)³. In these schemes smallholders either individually or collectively are provided with a number of cattle. They are responsible for redistributing 50 per cent of calves born by the principal cows to other farmers. This is called a revolving system, whereby there are no interest charges. In addition, development programs are focused on cattle producing regions through the introduction of SPAKU (Sentra Pengembangan Agribisnis Komoditas Unggulan)⁴ in order to achieve more efficient and successful implementation of development projects.

Beef processing activities involve slaughtering, boning, withering, cutting, chilling, freezing and packaging. Slaughtering activities are carried out in Rumah Pematongan Hewan (RPH) or Tempat Pematongan Hewan (TPH)⁵. In principle, permission is required from the local government authority for slaughter of cattle. This reporting procedure provides for registration of the number of cattle to be slaughtered and enables the health of the cattle being slaughtered to be inspected. In reality, illegal slaughtering remains common, primarily because of difficult communication and other social aspects. We estimate that the number of cattle illegally slaughtered is about 5 per cent of the total slaughtered cattle.

Slaughterhouses (RPH) may be classified into three categories (DGL 1997) as follows.

- Type A — with a capacity of more than 100 head per day.
- Type B — with a capacity of 50–100 head per day.
- Type C/D — with a capacity of 5–10 head per day.

In 1996 the number of each type was as follows.

- Type A — 6 units scattered over DKI Jakarta (1 unit), West Java (1 unit), Central Java (2 units) and East Java (1 unit).
- Type B — 19 units situated in 11 provinces.
- Type D — 723 units located in 27 provinces.

Of these, the most modern slaughterhouse is that located in Cakung (northern Jakarta) owned by PD Darmajaya. This slaughterhouse is equipped with automatic machines, withering rooms,

³ Inpres Desa Tertinggal (IDT) = Presidential Instruction for Poor Villages Development Aids; Bantuan Presiden (Banpres) = Presidential Assistance; Proyek Pembangunan Pertanian Rakyat Terpadu (P2RT) = Integrated Smallholder Farm Development Project.

⁴ Sentra Pengembangan Agribisnis Komoditas Unggulan (SPAKU) = Agribusiness Development Center for Superior Commodities.

⁵ Rumah Pematongan Hewan (RPH) = slaughterhouse; Tempat Pematongan Hewan (TPH) = slaughter place.

boning rooms, and chilling and freezing rooms. This slaughterhouse produces quality beef supplying large scale modern supermarkets such as the Hero Supermarket chain. A few feedlot companies have their own slaughterhouses, which are used for slaughtering their own cattle and for leasing.

Beef supplied for supermarkets is well graded, packed and chilled. Consumers have a number of options depending on their preference and income. On the other hand, beef supplied to wet markets is in the form of carcasses or half carcasses which are not graded. Most wet market consumers prefer fresh beef to chilled or frozen beef, and tend to be indifferent to beef quality. The different consumer purchasing habits allows for different pricing strategies between supermarket managers and wet market retailers.

Imports

As noted earlier, Indonesia imports both feeder cattle and beef, with the import of feeder cattle designed to supply more beef of good quality and foster the modernisation of the beef industry. Imports over the period 1990–97 are shown in Table 2.5. The rapid import growth rate of 82.45 per cent per year over the period stems from the government providing the green light to private companies to import feeder cattle and the demands of consumers for more and better quality beef. Live cattle imports from 1995 onward have been further stimulated by a fall in their price.

Table 2.5 Import quantity and price of feeder cattle 1990–97

<i>Year</i>	<i>Quantity</i>			<i>Price^b</i>	
	<i>Live cattle</i>		<i>Meat equivalent^a</i>	<i>Live cattle</i>	<i>Meat equivalent</i>
	<i>'000 head</i>	<i>'000 t</i>		<i>'000 t</i>	<i>\$/kg</i>
1990	0.0	0.0	0.0	–	–
1991	2.3	0.8	0.5	1.251	1.860
1992	19.1	6.1	4.1	1.371	2.039
1993	35.4	11.9	8.0	1.433	2.131
1994	78.2	21.1	14.2	2.068	3.075
1995	186.3	75.0	50.5	1.454	2.163
1996	378.2	117.7	79.2	1.545	2.298
1997	386.6	129.7	87.2	1.362	2.025
Trend (%)	82.10	82.44	82.45	1.81	1.81

^a Calculated as: (269/400) x live weight. ^b In cif US dollars, calculated as import value divided by import quantity.

Source: CBS (1990a, 1991a, ..., 1997a).

Beef has also been imported in addition to feeder cattle. There were six types of imported beef, but only frozen boneless beef was of predominance (Table 2.6). Between 1990 and 1997, frozen boneless beef accounted for 86.5 per cent of beef imports and exhibited a growth

rate of 47.8 per cent per year. The total quantity of imported beef increased by nearly 40 per cent per year.

Table 2.6 Indonesia's imports of beef (quantity and price) 1990-97

<i>Year</i>	<i>Unit</i>	<i>Frozen boneless</i>	<i>Frozen other cuts with bone</i>	<i>Fresh or chilled boneless</i>	<i>Other^a</i>	<i>Total</i>
Quantity						
1990	'000 t	0.83	0.03	0.56	0.00	1.42
1991	'000 t	1.16	0.07	0.62	0.01	1.87
1992	'000 t	1.57	1.20	0.35	0.03	3.15
1993	'000 t	2.41	0.25	0.37	0.02	3.05
1994	'000 t	3.94	0.50	0.36	0.00	4.80
1995	'000 t	5.99	0.67	0.51	0.08	7.26
1996	'000 t	14.49	0.78	0.45	0.05	15.77
1997	'000 t	22.26	0.41	0.43	0.21	23.32
Trend	%	47.77	35.19	-2.68	46.32	39.53
Price						
1990	US\$/kg	4.633	1.788	3.323	2.852	4.057
1991	US\$/kg	3.611	3.454	1.549	5.977	2.938
1992	US\$/kg	3.130	0.959	2.444	2.721	2.223
1993	US\$/kg	1.796	2.454	3.141	1.163	2.009
1994	US\$/kg	1.971	2.720	3.379	2.512	2.154
1995	US\$/kg	1.945	2.269	2.330	1.926	2.002
1996	US\$/kg	2.046	2.070	2.413	1.586	2.056
1997	US\$/kg	1.571	1.689	1.894	0.982	1.566

^a Including frozen carcasses and half carcasses, fresh or chilled other cuts with bone in and fresh or chilled carcasses and half carcasses.

Source: CBS (1990a, 1991a, ..., 1997a).

The increased imports of frozen boneless and other types of beef, to meet the increasing gap between production and consumption, was facilitated by the decline in import prices since 1995. The price decline may be attributed to very large US beef production as the US cattle cycle peaked. As a result, the US import requirement from countries such as Australia and New Zealand was markedly reduced.

The major sources of beef imports were Australia, New Zealand and the US (see Appendix Table 1). At the start of the decade, New Zealand and the US were the dominant beef suppliers to Indonesia. Since then, Australia's share of the Indonesian market increased rapidly to reach 68 per cent of Indonesia's total beef imports in 1997. New Zealand is now the second most important supplier, with the US and a large number of other countries as minor suppliers. Australia and New Zealand enjoy a freight advantage over the US in supplying to the Indonesian market.

Exports

Between 1990 and 1997 the export of live cattle from Indonesia was banned. During this period, Indonesia made very small quantities of exports, as shown in Table 2.7. These exports were, for the most part,

re-exports of imported beef or beef from imported cattle. The major country destinations were Indonesia's neighbours such as Singapore, the Philippines and Hong Kong.

Three important policy settings are tariffs on imports of beef and live cattle, the incentives provided to smallholder schemes and inter-island cattle marketing arrangements.

Import tariffs

Up until the Asian crisis, tariffs on imports were set to provide protection to the domestic beef cattle industry. These tariffs were zero for imported breeding cattle, 10 per cent for imported feeder cattle, 30 per cent for imported fresh or chilled beef and 35 per cent for frozen beef (DGCE 1995).

The zero tariff on breeder cattle imports was aimed at encouraging breeding activities so as to improve cattle productivity and quality. The moderate tariff on feeder cattle was aimed at encouraging feedlot operations by companies in order to increase their quality and quantity of beef production without severe effects on the domestic cattle economy. The high tariff rate on imported beef was aimed at increasing the price of beef on the domestic market. This tariff also provided support for feedlot–company operations.

Table 2.7 Export quantity of beef 1990-97

<i>Year</i>	<i>Fresh or chilled carcasses and half carcasses</i>	<i>Frozen boneless</i>	<i>Frozen carcasses and half carcasses</i>	<i>Fresh or chilled boneless</i>	<i>Frozen/chilled other cuts with bone in</i>	<i>Total</i>
	kg	kg	kg	kg	kg	kg
1990	52 650	0	0	12 024	0	64 674
1991	0	0	0	0	0	0
1992	90 355	0	0	0	0	90 355
1993	0	20 841	0	0	0	20 841
1994	4 059	0	0	300	0	4 359
1995	3 100	0	17 511	0	0	20 611
1996	250	0	0	3 500	515	4 265
1997	5 025	0	0	0	0	5 025

Source: CBS (1990b, 1991b, ..., 1997b).

The tariff rates above represented the 1995 base year tariffs as ratified under the GATT. One of the policy responses of the Indonesian government to the financial crisis was to reduce the tariff on imported beef to 5 per cent and the tariff on imported feeder cattle to zero. This is in line with CEPT scheme for AFTA (Anonymous, 1998a, 1998b).

Smallholder schemes

There have been conditions attached to importing live cattle by feedlot companies, namely a 10 per cent (minimum) of imported live

cattle must be allocated to smallholders under the Beef NES scheme. As indicated earlier, this policy was aimed at attempting to modernise the traditional system of beef production. To some extent, it acts as a tax on the efficiency of feedlot–company operations as the feed conversion ratios achieved by smallholder farmers are considerably below those achieved by feedlot operators.

Inter-island cattle marketing

Up until 1998, there was a quota on the volume of cattle that could be sold from island to island. This was designed to prevent further depletion of cattle from some islands. In particular, it aimed to sustain a sufficient cattle population growth rate in the producing regions of east Java, south Sulawesi, Bali, East Nusatenggara and West Nusatenggara. The quota restriction was removed in March 1998.

Impact of Asian crisis

Origins of crisis

During the first two years (1969-70) of the REPELITA I, the government adopted a managed floating exchange rate regime. Because the exchange rate tended to be overvalued, exchange rate policy then shifted to a fixed exchange rate regime around Rp 420 per US dollar. This regime persisted for the period 1971–77 (Table 3.1). The result, however, was a value for the rupiah that was considered unrealistically high.

Table 3.1 Average official exchange rates: US dollar to Indonesian rupiah

<i>Year</i>	<i>Exchange rate</i> Rp/US\$	<i>Year</i>	<i>Exchange rate</i> Rp/US\$	<i>Year</i>	<i>Exchange rate</i> Rp/US\$
1969	385	1979	630	1989	1 805
1970	382	1980	632	1991	1 905
1971	420	1981	655	1991	1 997
1972	420	1982	697	1992	2 074
1973	420	1983	998	1993	2 118
1974	422	1984	1 075	1994	2 205
1975	420	1985	1 130	1995	2 305
1976	421	1986	1 649	1996	2 385
1977	420	1987	1 655	1997	5 219
1978	632	1988	1 737	1998	10 698 ^a

^a Ranged from Rp 7852 (December) to Rp 15 160 (June).

Source: CBS, *Economic Indicator*, various issues.

In 1978 a managed floating exchange rate regime was reintroduced with the rupiah being devalued to Rp 632. Since then the equilibrium exchange rate has been mostly determined by market forces with an intervention band set by BI (Bank Indonesia, which is the

central bank of Indonesia). The exchange rate then gradually moved upward to Rp 1,130 in 1985. At this level and time, the exchange rate was again considered overvalued. The government devalued the rupiah in 1986 to Rp 1,649. Since then, BI has pursued a cautious policy of gradual managed depreciation against the dollar by allowing the rupiah to fall by approximately 4 percent on average per year. The intervention band was progressively widened, moving therefore to a more flexible exchange rate policy in line with the trend toward liberalisation in Indonesian monetary policy. The exchange rate gradually moved upward, reaching Rp 2,385 in 1996.

Since August 1997 the rupiah has experienced a dramatic depreciation against the US dollar, which has plunged the economy into crisis. The story may be summarised from Lindblad (1997) as follows. On 2 July 1997, the Thai baht in Bangkok was floated and immediately depreciated by 18 per cent, causing severe problems for the Thai economy. An international rescue operation was required two weeks later to pump US\$16 billion into the Thai economy. Indonesia, as a good neighbour, committed US\$500 million. The attack on the South-East Asian currencies then spread to Malaysia and the Philippines. As a precautionary motive, BI widened its intervention band from 8 per cent to 12 per cent so as to avoid having to sell foreign exchange to speculators, as had occurred in Thailand prior to the float. The rupiah continued to move toward the upper limit of the intervention band, but not yet at an alarming rate (up to Rp 2,700). Then, on 21 July 1997, the rupiah lost almost 7 per cent. BI intervened by committing US\$500 million to the forward market. The rupiah recovered somewhat to settle around Rp 2,600.

Attention in South-East Asian markets shifted decisively to the rupiah as the announcement of the rescue plan settled matters for the time being in Thailand. The pressure on the rupiah increased and the currency fell by more than 3 per cent during the first half of the week beginning 11 August 1997, eventually exceeding the upper limit of the intervention band. On 13 August 1997, BI spent another US\$500 million to strengthen the rupiah, but with little success. BI then chose to let market forces rule and, from 14 August 1997, the rupiah was allowed to float freely. The rupiah continued to fall after BI withdrew from the market.

At the end of December the exchange rate reached Rp 5,700. A sudden drop in the exchange rate to Rp 13,518 occurred in January 1998. Between February and April 1998, a continuous recovery took place. But the social unrest between 13 and 14 May which followed the turmoil on foreign exchange markets worsened economic conditions and jeopardised confidence in the rupiah. The rupiah depreciated further from May, reaching its lowest figure of Rp 15,160 in late June.

From July the rupiah appreciated, reaching Rp 11,314 in September. In early 1999 the rupiah appreciated further, reaching around Rp 8,000 in January.

Effects on beef prices

Table 3.2 Average monthly consumer price of beef in 27 provincial cities January 1995 to November 1998

<i>Month</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
	Rp/kg	Rp/kg	Rp/kg	Rp/kg
January	9 028	10 332	11 146	11 434
February	9 559	10 683	11 424	12 283
March	9 677	10 595	11 110	12 678
April	9 695	10 587	11 181	13 735
May	9 955	10 623	11 007	14 019
June	10 054	10 794	10 991	14 376
July	10 031	10 762	10 998	16 016
August	10 080	10 794	10 986	17 137
September	10 080	10 858	11 015	18 037
October	10 125	10 823	10 988	18 770
November	10 192	10 758	10 953	19 245
December	10 211	10 846	10 991	

Note: See Appendix Chart 2 for graphical presentation.

Source: BULOG (1998a, 1998b).

The exchange rate devaluation led to a big increase in the rupiah price of imported beef and imported live cattle. The increased import price was transmitted to the domestic market bringing about a dramatic increase in the domestic price of beef. Table 3.2 (and Appendix Chart 2) depict the average consumer price of beef in 27 provincial cities from January 1995 to November 1998. The per kilogram beef price was stable, increasing gradually from Rp 9,028 in January 1995 to Rp 10,991 in December 1997. The estimated price increase over this period was only 0.45 per cent per month. The impact of the rupiah's devaluation did not come through until the end of 1997. A rapid increase in beef prices occurred between January and November 1998 (from Rp 11,434 per kilogram to Rp 19,245 per kilogram). The estimated price increase was 5.4 per cent per month, which was almost 12 times as rapid as the price increase in the years before the crisis.

Effects on per Capita Incomes

The devaluation of the rupiah increased the price of consumer goods and services. The consumer price index (CPI) of foods increased from 100 in January 1995 to 157.9 in January 1998 and eventually exceeded 300 between September and November 1998 (Appendix Table 3). These CPI increases reduced real per capita incomes and hence the purchasing power of most consumers. The economic crisis also severely squeezed business operations which worsened

employment conditions in the private sector. The reduction in real per capita incomes had an adverse effect on per capita consumption of expensive and highly expenditure elastic foods such as beef (see later).

Effects on credit availability

As a result of the economic crisis, credit availability to companies was dramatically curtailed. Interest rates rose sharply in an effort to defend the currency, effectively choking domestic borrowing and investment activity, and also consumption. Most live cattle contracts are written on 180 day terms and beef contracts on a 30 day minimum term through an irrevocable letter of credit. Importers were faced with large falls in their currency's purchasing power. Few kept significant reserves of US dollars with which to trade. Following the Indonesian government's closure of 16 of its banks, importers were finding it increasingly difficult to obtain confirmation on letters of credit. With companies virtually unable to obtain letters of credit from the banking system, imports of live cattle and beef were dramatically reduced. The result was sharply reduced beef availability on the domestic market even though the tariff on beef imports had been reduced substantially to 5 per cent.

Extent of decline in beef consumption

Although data on the decline in beef consumption are not yet available, estimates suggest a significant reduction of between 20 and 30 per cent. Consumers have reduced their overall demand for meat protein as their incomes have been reduced. There has also been a change in the composition of meat consumption toward cheaper meats. Some guide to the likely changes which have taken place can be obtained by looking at relative price movements between competing meats and the income elasticities for beef, chicken and other meat consumption. Table 3.3 shows the changes in relative prices between beef and chicken meat over the period January 1996 to November 1998. Up until the end of 1997 the relative price between beef and chicken meat was reasonably stable, ranging between 2.2 and 2.4. In February 1998 it began to decrease — that is, the price of beef fell relative to chicken meat. Between March and November 1998, the relative price ranged between 1.6 and 1.75.

The reason for this shift in price relativity is as follows. Chicken meat production fell sharply in response to big increases in the cost of feed (corn, imported fish meal for concentrate and imported antibiotic material). Many small and medium scale chicken growers collapsed because of the crisis. Although the government is attempting to revitalise small and medium scale chicken producers around low cost production technologies, chicken production is not expected to recover

rapidly. While consumers have responded by reducing their consumption of chicken relative to beef, their overall reduction in meat consumption has meant large absolute reductions in both beef and chicken consumption. On the other hand, consumption of fish has probably increased slightly.

A study by Hermanto et al. (1990) provides income elasticities by income class and regions for beef, chicken and other meat consumption (Table 3.4). The higher the per capita income of consumers, the lower the income elasticity in both rural and urban areas. For high income consumers the income elasticity of demand for all meats is quite low. The income elasticity was 0.45 for beef in rural areas and 0.42 for beef in urban areas. This relatively low elasticity suggests that high income consumers will maintain their per capita beef consumption in the face of declining per capita incomes. Hadi et al. (1999) show that the average per capita beef consumption of the high income consumer class in 1996 was 2 kilograms per year, which was ten times that of the lower income consumer class and three times that of the middle income consumer class. The very high income elasticity of demand for beef by low income consumers suggests that these consumers have reduced their beef consumption considerably as a result of the crisis.

Table 3.3. Average monthly relative consumer prices between beef and chicken meat January 1996 to November 1998

<i>Month</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
January	2.24	2.29	2.32
February	2.20	2.32	2.02
March	2.23	2.36	1.69
April	2.31	2.38	1.63
May	2.33	2.38	1.70
June	2.42	2.42	1.76
July	2.35	2.35	1.76
August	2.29	2.32	1.64
September	2.33	2.32	1.60
October	2.36	2.37	1.69
November	2.29	2.35	1.75
December	2.32	2.34	

Note: Nominal price of chicken meat is presented in Appendix Table 4.

Source: Calculated from BULOG (1998b).

Extent of decline in imports of live cattle and beef

Data on live cattle and beef imports in 1998 from CBS (1998a) are available only for January to August. The quantity of imported live (feeder) cattle over this period was 24.8 million kilograms at an average

price of US\$1.21 per kilogram. Imports of beef over the period were 6.4 million

Table 3.4 Income elasticities by income class and regions of beef, chicken and other meat consumption 1990

<i>Type of meat</i>	<i>Low income class</i>	<i>Middle income class</i>	<i>High income class</i>
Rural areas			
Beef	2.09	0.89	0.45
Chicken	3.58	0.94	0.49
Other meat ^a	3.16	1.55	0.79
Urban areas			
Beef	2.45	1.23	0.42
Chicken	2.51	1.19	0.35
Other meat ^a	2.39	2.22	0.80

^a Lamb meat.

Source: Hermanto et al. (1995).

kilograms at an average price of US\$1.07 per kilogram. About 97 per cent of the imported beef was frozen boneless beef at an average price of US\$1.06 per kilogram. These imports of live cattle and beef represented 19.1 and 27.6 per cent respectively of the 1997 imports. It is clear that the Asian crisis has resulted in a dramatic reduction in imports of live cattle and beef.

Data from APFINDO (1999) shows that imports of live cattle and beef by APFINDO members from January 1998 to January 1999 were 27,253 head and 1625 tonnes respectively. These live cattle imports represented only 8.4 per cent of their 1996 imports of 325,000 head. Data from Meat & Livestock Australia show Australian exports of live cattle falling from 387,444 head in calendar year 1997 to 41,000 head in calendar year 1998.

Information received in the second week of February 1999 from a group of feedlot companies including PT Lembu Jantan (PT LJ), PT Pangansari Mitra Industri Ternak (PT PMIT) and PT Perkebunan Nusantara XIV Persero (PTPN XIV)) also provides evidence of a dramatic reduction in live cattle imports (Table 3.5). Interviews with a number of feedlot companies in Jakarta such as PT Tiffindo and PT Kariyana Gita Utama on 11 February 1999 also confirmed the substantial drop in live cattle imports which took place during 1998.

Table 3.5. Import of feeder cattle by three feedlot companies 1996–98

<i>Year</i>	<i>PT LJ</i>	<i>PT PMIT</i>	<i>PTPN XIV</i>
	'000 head	'000 head	'000 head
1996	14.7	5.5	5.2
1997	10.7	8.8	0.0
1998	2.1	5.5	0.0

Effects on smallholder and feedlot company income

As the domestic price of beef increases, the income of smallholder producers not included in the Beef NES scheme will increase in rupiah terms. On the other hand, the income of smallholder producers included in the scheme will be jeopardised as the size of the herd declines or becomes entirely depleted as domestic breeding cattle are used to meet domestic beef consumption requirements.

Because of the adverse effects of the Asian crisis on imported beef and live cattle, the competition between beef from local herds and beef from imported sources has been greatly reduced. Smallholder producers and traders have a big incentive to deplete their cattle herd to take advantage of the high domestic price in rupiah for beef. However, this is endangering the domestic cattle breeding population for the future.

Profits of feedlot companies may be expected to have declined substantially as a result of the big decrease in imports of feeder cattle. Overhead costs become more significant because of a reduction in capacity utilisation. A number of feedlot companies stopped operations. As shown by APFINDO data in early 1999, of the 47 members, only nine members (10.6 per cent) were importing live cattle and only 14 members (29.8 per cent) were importing beef. There were no APFINDO members importing both live cattle and beef.

A report by Wood (1998) showed that feedlot company profits are highly sensitive to changes in the landed price of live cattle and the selling price of beef. The landed price is affected by the imported price in US dollars and exchange rate of the rupiah to the dollar. Companies interviewed by the authors claimed that the current maximum landed price of live cattle must be about US\$1 per kilogram, while APFINDO claimed a price of Rp 7,000 per kilogram for imported cattle would allow for satisfactory feedlot operations.

Effects on processing

The effects of the Asian crisis have been to reduce the income of the processing sector through reduced numbers of slaughtered cattle. The efficiency of processing operations is reduced primarily through underutilised slaughter capacity and high unit charges for slaughtering operations. For example, in the case of the modern slaughterhouse owned by PD Darmajaya located in Cakung (Jakarta), the number of cattle slaughtered during 1998 (450 cattle per day) was 25 per cent below the breakeven throughput of 600 cattle per day⁶. Yet, the slaughtering operations are being sustained because of a charging policy which cross subsidises the slaughter costs of cattle from the slaughter

⁶ Based on interviews with the company staff on November 1998.

costs of pigs. Both pigs and cattle are slaughtered at this abattoir and the costs of slaughtering pigs is cheap relative to cattle.

Effects on trader operations

Prior to the onset of the Asian crisis, trader operations were sustained by imported live cattle and beef. As a result of the crisis and the big drop in imports of live cattle and beef, trader operations (wholesaling and retailing) declined substantially. The crisis has also reduced the demand for trucking services.

Policy responses of government

To date, the major policy response of the government has been to reduce the tariff on imported beef from 30 to 5 per cent. Other things equal, this reduces the cost of imported beef, though this effect has been greatly outweighed by the effect of the devaluation of the rupiah. It can be expected, however, that this policy change will tend to encourage imports of beef relative to live cattle when demand for beef improves as the Indonesian economy recovers from the Asian crisis.

There have also been changes to arrangements for live cattle imports, though these changes have been initiated by feedlot companies rather than the government. Some feedlot companies (for example, PT. Lembu Jantan) stopped allocating cattle to smallholders as they could no longer afford the costs imposed on them by this allocation. Other companies have maintained the partnership with smallholders through the Beef NES scheme, though with smaller numbers of cattle (for example, PT Pangansari Mitra Industri Ternak and PT Kariyana Gita Utama).

Challenges and Opportunities

The Asian crisis has exposed a number of structural weaknesses in the Indonesian beef production and processing industry. The industry faces a number of challenges in overcoming these weaknesses.

Structural weaknesses exposed by the crisis: production

The crisis has exposed big structural weaknesses in the cattle production system as follows.

- Beef production has, over the 1990s, become heavily dependent on imported live cattle, which means that the exchange rate of the rupiah with the US dollar and the import price in foreign currency of feeder cattle in Australia now has a big effect on the volume of domestic

production. Both these factors are subject to substantial shifts and are beyond the control of feedlot operations.

- The reliance on imported live cattle reflects the lack of an effective domestic cattle breeding program. With a low value of the rupiah making imports of live cattle for fattening unprofitable, there is a big incentive to slaughter domestic breeding cattle. Herd depletion through this process will increase the reliance of the industry on imported feeder cattle over the longer term.

- The crisis has also exposed the costs on company feedlot beef production through the requirement that importers of live cattle allocate a proportion of these cattle to smallholders. Since feedlot production is characterised by a high supply elasticity, a small change in costs can have a big impact on production and profitability.

- Constraints on domestic production of beef from domestic breeding stock are severe because of the scarcity of breeding females. This locks domestic smallholder cattle producers into low scale, low productivity and hence high cost operations. Feed conversion rates as measured by average daily gains of smallholder cattle are low (0.5 kilograms per head per day) compared with the rates achieved by company feedlots of around 1 kilogram per head per day. The supply elasticity of these smallholder operations is very low. This means that supply adjustment to changes in demand occur largely through prices.

Processing

The government dominates the slaughtering system, with most slaughterhouses 100 per cent owned by government. Government slaughterhouses lack flexibility to respond to changes in slaughter numbers and lack incentives to achieve efficient, low cost, profit maximising operations. There is also a lack of competitiveness among slaughter facilities. As noted earlier, charges for slaughtering do not reflect the true costs of that slaughtering, as seen by the cross subsidy from the slaughter of pigs to the slaughter of cattle. Labour costs at the slaughterhouses are subsidised by the government and reductions in throughput can lead to big losses, which are in turn borne by government. This continued government ownership and subsidisation of losses prevents the emergence of a modern, privately owned, competitive, profit maximising processing sector.

The challenges

Once economic growth resumes in Indonesia, the demand for beef will resume its upward trend. The challenge for policy makers is to put in place a domestic policy framework which will encourage the

efficient production and marketing of beef to meet the growing needs of the Indonesian population. This framework must ensure that domestic resources such as land; domestic cattle; onfarm, company feedlot and processing capital; feed; etc. are used efficiently, with appropriate reliance on imports of feeder cattle and beef.

There are a number of problems that need to be solved in meeting the challenges mentioned above.

- The first concerns how to overcome the instability of domestic beef production which arises because of the vulnerability of feeder cattle import demand to changes in the value of the rupiah.
- The second concerns how to achieve the maximum efficiency of feedlot operations — small improvements in feed conversion efficiency can have a big effect on profits.
- The third concerns how to put in place a modern, competitive processing facility which sends the correct signals on beef processing costs back to feedlot operators and smallholder producers.

These problems must be solved in an environment of increased competition from imported beef as a result of the big reduction in tariffs announced by the government at the onset of the Asian crisis.

Development of a policy analytical framework

The development of a policy analytical framework (PAF) will greatly facilitate domestic policy analysis of the above and associated issues. We are currently working on such a framework. The framework is to be built around the beef value chain and contains four blocks or systems integrated throughout the chain:

- demand for final product (beef);
- processing;
- production; and
- trade and marketing.

Apart from health issues that apply to all meats, there are no obvious policy issues surrounding the demand for beef. There are also no policy issues in the trade and marketing system now that the tariff on imported beef has been reduced from 30 to 5 per cent, which has virtually eliminated the distortion between importing beef and importing live cattle.

There are a number of important policy issues to do with processing. These are concerned with the efficiency and productivity of government versus private abattoirs and the extent to which the lack of competitive neutrality between the two is preventing the emergence of modern private abattoirs. Key components are:

- the effects of government subsidised labour in government abattoirs;
- the effects of forcing government abattoirs to make a commercial return on their activities to ensure a more efficient processing sector and a level playing field with privately owned abattoirs;
- the cross subsidy from other types of animals slaughtered at government owned abattoirs because of less than full capacity of the cattle slaughter chain; and
- licensing arrangements for new entrants to private abattoirs.

In the production system, key policy issues are:

- efficiency of operations of the Beef NES scheme;
- how to implement a cost effective breeding program to supply domestic cattle into the production system;
- how to improve upon the low scale of operations and high unit costs of smallholder producers;
- the high total taxes (legal plus illegal) imposed on the industry; and
- the appropriateness of incentives to prevent liquidation of the domestic breeding herd as female cattle are slaughtered to sustain current production at the expense of future production.

A system of behavioural relationships will be developed to explain how each of the economic variables (price, quantity and revenue) at each stage of the beef value chain will change as a result of:

- policy changes throughout the value chain; and
- changes in economic conditions throughout the value chain.

The resultant model will provide projections of outcomes for endogenous variables from specified changes in exogenous variables for both short term and longer term adjustment horizons.

Opportunities

It is important that a vision be formulated for the longer term development of the Indonesian beef industry. This vision might encapsulate the following components.

- A focus on fostering beef cattle production in regions with lower population density, where lands are sufficiently available (Hadi 1998; PTNI 1996).

- The provision of credit at appropriate terms for encouraging private investment — for example, the use of KKPA credit⁷ with an annual interest rate of 16 per cent or less such as 10.5 per cent for Farm Credit (KUT).
- Development of an integrated beef industry production chain from gate to plate including cattle production, processing, feed requirements, marketing facilities, and health and safety issues⁸.
- Selection and improvement of the best available genetic resources of domestic cattle.
- Control of the domestic cattle slaughtering rate where appropriate.
- Continuation of imports of live cattle and beef driven by appropriate market signals.
- Continuation of the Beef NES scheme in association with APFINDO.
- Human resource development throughout the value chain (production, processing, marketing).

With a recovery in beef consumption as Indonesian economic growth resumes, a range of opportunities will emerge in beef production, processing and marketing.

An important issue for consideration is the extent to which feedlots and abattoirs should become more vertically integrated. There are advantages in vertical integration such as:

- increased overall efficiency of business operations, especially if feedlot locations are distant from existing abattoirs;
- closer controls on beef quality; and
- better capacity utilisation of abattoirs.

However, these advantages come at a cost in terms of bigger investment outlays, the need to train and employ a private sector workforce at the abattoir and the need for abattoir owners to meet government health standards.

There is also a need to ensure that sufficient infrastructure is in place to cope with the expected growth in demand for beef. This will require adequate feedlot and slaughtering capacity, an efficient port capacity to handle the requirements of live cattle and improved marketing outlets both at wet markets and at supermarkets.

⁷ Kredit Koperasi Primer untuk Anggota (KKPA) = Primary Cooperative Credit for Members.

⁸ Pengembangan kawasan industri sapi potong.

Conclusion and recommendations

The Asian financial crisis has had a major adverse effect on Indonesian beef production and consumption. The collapse in disposable incomes of consumers and increase in rupiah price of beef has dramatically reduced domestic beef demand. And beef production through imports of feeder cattle for company feedlots has become uneconomic with the collapse of the rupiah. The meat processing sector has also suffered through reduced throughput, though the lack of commercial focus of the largely government owned sector has prevented the reduction in profitability emerging as an adjustment problem for the industry.

The crisis has exposed big structural weaknesses in the Indonesian beef cattle production and processing system.

- With much of Indonesia's beef production now heavily dependent on imported live cattle as inputs into company feedlots, the exchange rate of the rupiah with the US dollar and the import price in foreign currency of feeder cattle from Australia, both of which are outside the control of Indonesian authorities, become major determinants of domestic beef production.
- The reliance on imported cattle in turn reflects the lack of an effective domestic cattle breeding program. With the low value of the rupiah making imports of live cattle for feeding unprofitable, there is a big incentive to slaughter domestic breeding cattle. Breeding herd depletion has emerged as a major problem for the industry.
- The crisis has exposed the adverse effects on company feedlot operations through government policies designed to encourage smallholder production. While these smallholder schemes were designed to help modernise the traditional system of beef production, they have to some extent acted as a break on the efficiency of feedlot company operations.

The Indonesian beef industry is facing a number of challenges. Chief among them are :

- how to overcome the instability of domestic beef production through the vulnerability of feeder cattle import demand to changes in the value of the rupiah;
- how to achieve the maximum efficiency of production operations while recognising the special problems faced by smallholder producers; and
- how to put in place a modern, competitive processing facility which sends the correct signals on beef processing costs back to feedlot operators and smallholder producers.

The Indonesian government has recently reduced the tariff on imported beef from 35 percent to 5 percent and the tariff on imported breeder cattle from 5 percent to zero. This policy change will have a significant impact on the future development of the beef industry. Other factors, such as exchange rate changes, in the world price of feeder cattle and beef and changes in the efficiency of domestic beef production and processing, will also impact significantly on the industry's performance.

A policy analytic framework is needed to help Indonesia's policy advisers understand the impact of these events and changes in beef industry developments. The preparatory work to identify the information base and design the scope and detail of the framework has now been undertaken. It is recommended that work in this area proceed to finalise the framework. The payoffs in terms of greater understanding of the factors driving the Indonesian beef industry and the impact of government policy changes and events which affect the industry are likely to be large.

References

- Adiwoso, D.A. 1996. 'Agribisnis ternak sapi potong di Indonesia : peluang dan kendalanya', Makalah dipresentasikan pada Lokakarya Sehari 'Pembangunan dan Pengembangan Permukiman Transmigrasi Bidang Usaha Peternakan', Departemen Transmigrasi dan Pemukiman Perambah Hutan, Jakarta, 10 Desember 1996.
- Adnyana, MO, Gunawan, M., Ilham, N., Saktyanu, K.D., Kariyasa, K., Sodikin, I., Djulin, A.M., Noekman, K.M., dan Hurun, A.M. 1996, Prospek dan Kendala Agribisnis Peternakan dalam Era Perdagangan Bebas, Laporan Hasil Penelitian, Pusat Penelitian Sosial Ekonomi Pertanian, Bogor.
- Anonymous. 1998a, 'Inclusion of unprocessed agricultural products', Paper presented at The Eighth Meeting of the Coordinating Committee on the Implementation of the CEPT Scheme for AFTA, Jakarta, 17-18 February 1998.
- Anonymous. 1998b. 'Economic issues from the Second Informal ASEAN Summit', Paper presented at The Eighth Meeting of the Coordinating Committee on the Implementation of the CEPT Scheme for AFTA', Jakarta, 17-18 February 1998.
- APFINDO. 1998.
- APFINDO. 1999. 'Data import daging dan sapi bakalan sampai dengan 8 Januari 1999', Asosiasi Pengusaha Feedlot Indonesia, Jakarta.
- BULOG. 1998a. *Laporan Kepala Badan Urusan Logistik pada Bakor Bidang Ekuin: April 1998*, Badan Urusan Logistik, Jakarta.
- BULOG. 1998b. *Laporan Kepala Badan Urusan Logistik pada Bakor Bidang Ekuin: November 1998*, Badan Urusan Logistik, Jakarta.
- CBS. 1990a. *Indonesia Foreign Trade Statistics: Imports 1990, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1990b. *Indonesia Foreign Trade Statistics: Imports 1990, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1991a. *Indonesia Foreign Trade Statistics: Imports 1991, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1991b. *Indonesia Foreign Trade Statistics: Exports 1991, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1992a. *Indonesia Foreign Trade Statistics: Imports 1992, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1992b. *Indonesia Foreign Trade Statistics: Exports 1992, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1993a. *Indonesia Foreign Trade Statistics: Imports 1993, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1993b. *Indonesia Foreign Trade Statistics: Exports 1993, Volume I*, Central Bureau of Statistics, Jakarta.

- CBS. 1994a. *Indonesia Foreign Trade Statistics: Imports 1994, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1994b. *Indonesia Foreign Trade Statistics: Exports 1994, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1995a. *Indonesia Foreign Trade Statistics: Imports 1995, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1995b. *Indonesia Foreign Trade Statistics: Exports 1995, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1996a. *Indonesia Foreign Trade Statistics: Imports 1996, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1996b. *Indonesia Foreign Trade Statistics: Exports 1996, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1996c. *Expenditure for Consumption of Indonesia 1996*, National Socio-Economic Survey, Central Bureau of Statistics, Jakarta.
- CBS. 1997a. *Indonesia Foreign Trade Statistics: Imports 1997, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1997b. *Indonesia Foreign Trade Statistics: Exports 1996, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1998a. *Monthly Indonesia Foreign Trade Statistics: Imports, August 1998, Volume I*, Central Bureau of Statistics, Jakarta.
- CBS. 1998b. *Monthly Indonesia Foreign Trade Statistics: Exports, August 1996, Volume I*, Central Bureau of Statistics, Jakarta.
- DGCE. 1995. *Customs Tariff*, Directorate General of Customs and Excise, Ministry of Finance, Jakarta.
- DGL. 1997. *Statistical Book on Livestock*, Directorate General of Livestock, Ministry of Agriculture, Jakarta.
- Hadi, P.U. 1998. *Market Assessment and Investment Opportunity for Agribusiness in Indonesia: Livestock*, Center for Agro Socio Economic Research, Agency for Agricultural Research and Development, Bogor.
- Hadi, P.U., Saliem, H.P., dan Ilham, N. 1999. *Kajian Perkembangan Harga, Konsumsi dan Produksi Daging Sapi*, Pusat Penelitian Sosial Ekonomi Pertanian, Bogor.
- Hermanto, Sudaryanto, T. dan Purwoto, A. 1995. 'Pola konsumsi dan pendugaan elastisitas produk peternakan', *Prosiding Seminar Penelitian Peternakan dan Veteriner*, 7-8 November 1995, Pusat Penelitian dan Pengembangan Peternakan, Bogor.
- Lindblad, J.T. 1997. 'Survey of recent development', *Bulletin of Indonesian Economic Studies* 33(3), 3-33.
- PTNI. 1996. *Identifikasi Agribisnis Peternakan, Laporan Akhir Volume 2 Laporan Utama*, Kerjasama Penelitian antara PT Nexus Indoconsultama dengan Direktorat Jenderal Peternakan, Jakarta.

- Wood, T. 1998. 'Current factors affecting the Indonesian live cattle impor industry', Animal Production Consultant, Australia (November 1998).
- Yusdja, Y., Siregar, M., Ilham, N., Andriati, Prasetyo, B., Tarigan, H., Rosgandha, E., dan Sayuti, R. 1997. *Deregulasi Sektor Pertanian dan Prospek Pengembangan Komoditas Pertanian*, Laporan Hasil Penelitian, Pusat Penelitian Sosial Ekonomi Pertanian, Bogor.
- Various issues of "Peternakan Indonesia" magazine.

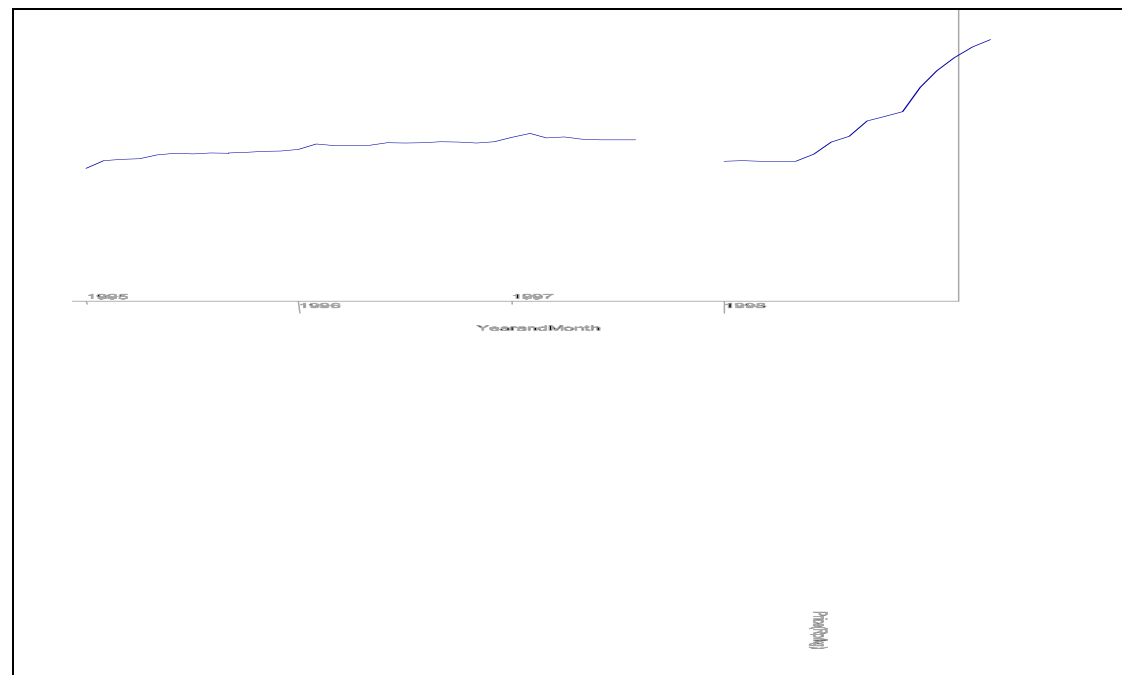
Appendix Table 1. Share of country of origin in Indonesia's beef imports 1990–97

<i>Year</i>	<i>Australia</i>	<i>New Zealand</i>	<i>USA</i>	<i>Other^a</i>
	%	%	%	%
1990	27.54	34.34	32.77	5.34
1991	36.89	30.06	25.04	8.01
1992	24.54	23.02	11.55	40.90
1993	63.15	14.19	12.64	10.02
1994	57.58	23.01	8.03	11.38
1995	45.75	47.73	4.56	1.96
1996	59.46	33.69	4.98	1.87
1997	67.96	27.51	2.67	1.86

^a Singapore, Vietnam, Netherlands, United Kingdom, India, Japan, Canada, Niger, Republic of China, Ireland, Malaysia, Thailand, Hong Kong, Denmark, Batam, Austria, RF Germany, Sweden, other Africa, France, Korea, Taiwan, the Philippines, Bermuda, Italy, Lybia.

Source: Calculated from CBS (1990a, 1991a, ..., 1997a).

Appendix Chart 2. Average monthly consumer price of beef in 27 provincial cities January 1995 to November 1998



Appendix Table 3. Consumer price index of foods in 44 towns January 1995 to November 1998 (January 1995 = 100)

<i>Month</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
January	100.00	117.31	121.27	157.89
February	103.09	122.03	124.29	186.95
March	104.85	119.32	123.86	197.52
April	106.25	116.99	123.87	209.19
May	107.58	116.34	124.25	217.32
June	107.12	115.76	123.34	232.69
July	108.28	116.97	124.69	260.98
August	108.36	116.57	126.00	284.73
September	108.86	115.68	128.41	309.24
October	109.47	115.63	133.05	303.51
November	110.36	117.57	137.92	302.96
December	112.27	119.07	142.82	

Source: CBS, *Economic Indicator*, various issues (processed).

Appendix Table 4. Average monthly consumer price of chicken meat in 27 provincial cities January 1996 to November 1998

<i>Month</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
	Rp/kg	Rp/kg	Rp/kg
January	4 619	4 859	4 932
February	4 859	4 928	6 095
March	4 744	4 714	7 505
April	4 586	4 697	8 409
May	4 564	4 624	8 261
June	4 456	4 538	8 171
July	4 578	4 671	9 102
August	4 717	4 733	10 422
September	4 661	4 754	11 250
October	4 588	4 639	11 138
November	4 702	4 657	10 979
December	4 685	4 693	

Source: BULOG (1998b).