

Dairy Industry Development in Indonesia

Final Report - May 2011

In partnership with:





Report for
International Finance Corporation
on
“Indonesia Dairy Industry Development”
May 2011

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EXECUTIVE SUMMARY

The overall objective of this study is to assist IFC identifying opportunities and roles for it to promote a sustainable and inclusive dairy industry in Indonesia.

In 2010, there were almost 500,000 dairy cows in Indonesia producing about 930,000 tonnes of milk. Ninety seven percent of all dairy cows are located on the island of Java in the provinces of East Java, Central Java and West Java. These three provinces produce 97 percent of Indonesia's milk with East Java being the largest milk producer accounting for 57 percent of Indonesia's milk production.

Over the last five years, Indonesia's dairy cow population and milk production has increased annually by an average of 7.4 percent and 14.6 percent respectively. The province of East Java has shown the largest growth over the last five years with dairy cow population and milk production increasing annually by an average of 14.6 percent and 24.3 percent respectively.

Dairy Cows Population and Milk Output by Main Provinces, 2010

	Dairy Cows Number	Dairy Cows percent	Milk Production Tonnes	Milk Production percent
East Java	232,001	46.8	531,797	57.3
Central Java	123,091	24.9	106,040	11.4
West Java	124,797	25.2	270,616	29.2
Other	15,342	3.1	19,385	2.1
TOTAL	495,231	100	927,838	100

Source: Dinas Pertanian and GKSI

In 2010, the majority of Indonesia's dairy cows (57 percent) and milk production (50 percent) was located in only five regencies as follows:

- Malang, East Java – 63,066 cows producing 146,121 tonnes of milk
- Pasuruan, East Java – 64,394 cows producing 114,014 tonnes of milk
- Boyolali, Central Java – 62,038 cows producing 42.5 million litres of milk
- Semarang, Central Java – 35,451 cows producing 34.6 million litres of milk
- Bandung / West Bandung, West Java – 58,001 cows producing 126,221 tonnes of milk

The majority of cows in Indonesia are owned by individual farmers. For example, in East Java 94 percent of cows are owned by individual farmers. However, corporate dairy farmers are playing a bigger role in East Java with total milk production from cows owned by corporations increasing at a faster rate than individual farmers. Over the last five years milk production from cows owned by individual farmers and corporations has increased annually by an average of 19 percent and 42 percent respectively.

Most individual farmers are members of a local dairy centre known as the primary village cooperative of GKSI - Koperasi Unit Desa (KUD). There are about 220 KUDs in Indonesia involved in the dairy industry with almost 100,000 dairy farmers as members. A "dairy" KUD provides a range of services to farmers including collecting the milk, checking the milk quality and paying the farmer. Price incentives are used to encourage better farm management practices and higher quality milk.

Over the last six years investment in the livestock industry has totalled US\$216.6 million; with 67 percent from foreign investment. In 2009, investment in the livestock industries was less than one percent of total domestic and foreign investment in Indonesia. The average foreign and domestic investment per project was US\$5.6 million and US\$3.5 million respectively. Most of the investment in the livestock industry is in beef fattening operations. There has been minimal new investment in dairying over the last five years however two major dairy processors are planning to expand operations into North Sumatra in 2011 / 2012.

The Indonesian government is keen to encourage the development of the dairy and beef industries in Indonesia and is providing Rp. 145 billion (US \$15 million) of subsidy for the purchasing of dairy cows and beef cattle. Four major Indonesian banks are responsible for managing this subsidy scheme. In 2009, Australia sent 14,835 dairy cows to Indonesia.

There are about 200 veterinary drug companies in Indonesia that are currently active in manufacturing, importing, and/or distributing drugs to the beef and dairy cattle industries. The main dairy cattle diseases are: mastitis (treatment with antibiotics); parasites internal (worms, treatment with drugs and pasture management); parasites external (on the skin and feed, treatment with drugs and insecticides).

In contrast to the small scale of dairy farming, the dairy processing industry comprises major local companies (Indomilk and Ultra Jaya) and multinational companies (Danone, Frisian Flag and Nestle). The Indonesian Association of Milk Processors (IPS) represents the milk processing sector and its five largest members (Frisian Flag, Nestle, Sari Husada / Danone, Ultra Jaya and Indolakto / Indomilk) absorb about 85 percent of Indonesia's milk production.

There are over 30 companies involved in milk processing in Indonesia producing over 870,000 tonnes of milk products in 2009. The major dairy processors by type of dairy product manufactured are as follows:

- Liquid – 13 companies e.g. Ultra Jaya, Indomilk, Frisian Flag, Nestle, Greenfield
- SCM – 4 companies e.g. Frisian Flag, Indolakto
- Powdered – 12 companies e.g. Nestle, Sari Husada, Indomilk and Frisian Flag
- Ice – Cream – 4 companies e.g. Unilever, Indomilk, Campina, Diamond
- Yoghurt – 6 companies e.g. Yakult, Yummy, Danone, Diamond, Cimory

In 2010 Indonesia imported 302,158 tonnes of bulk dairy products (worth US\$925 million); this was an increase from 2009 of 12 percent in volume. The main products imported in 2010 were SMP, WMP and whey. The EU, NZ and USA were the main dairy exporters to Indonesia in 2010 with a volume market share of 32 percent, 23 percent and 21 percent respectively.

Imports of retail packs of powdered milk have been growing steadily over the last five years. In 2008, Indonesia imported almost 40,000 tonnes of retail packs of powdered milk products worth about US\$180 million mainly from the Philippines (39 percent), New Zealand (25 percent) and Singapore (11 percent). Imports of pre-packaged powdered milk products represent about 22 percent of the volume and 29 percent of the value of total powdered milk consumption.

A large number of food supplements are imported, with half of the entire market coming from the United States; it has over 70 percent of the total import market share. The market for health food supplements in Indonesia was worth US\$313 million in 2008. Food supplements

that are sold in Indonesia can be found in many forms such as: powder to be mixed; ready-to-drink; nutritionally fortified foods. Meal replacement products (using fortified milk powders) have been increasing and are used mainly in the body building industry and for healthy lifestyle in Indonesia.

Import duties on milk products is five percent and value added tax is 10 percent. There are a range of documents that are required when exporting food / dairy products to Indonesia including: Sanitary Certificate from Ministry of Agriculture; Health Certificate & Certificate of Free Sale from National Agency of Drug & Food Control (BPOM); Halal Certificate from Indonesia Council of Ulama (MUI). All imports of food / dairy products must be tested by BPOM and be registered with an import number (ML).

Indonesia with over 17,000 islands provides a major challenge to distribute perishable produce to major urban centres in Indonesia's 33 provinces. Most of the distribution of local products is based around seaports and regional depots. Most dairy manufacturers will work with a range of distributors to reach their retail customers spread across Indonesia's 33 provinces.

The modern retail market throughout Indonesia continues to expand rapidly but it is still dominated by traditional grocery stores, according to data from Nielsen Indonesia. This trend is likely to continue as more consumers choose to shop for their daily needs at hypermarkets and other modern retail outlets.

The modern retailers are a major outlet in the distribution of milk powder products, in particular to reach the middle to upper class consumers. Traditional shops / kiosks are more popular for the middle to lower class of consumers. These traditional shops rely on wholesalers for their produce supplies while the larger supermarket and hypermarket chains may buy direct from manufacturers or from distributors.

In 2008 the consumer milk market in Indonesia was worth more than US\$2.6 billion with milk powders (US\$1.5 billion) having almost 60 percent share of the value followed by sweetened condensed milk (US\$760 million) and liquid milk (US\$400 million). In comparison, sweetened condensed milk (SCM) had the largest share of consumption in volume and liquid milk has the fastest annual growth in volume.

Milk Powder

- There are 27 companies operating in the powdered milk industry in Indonesia with a total production of 164,700 tonnes in 2008.
- The three main manufacturers of milk powders in Indonesia (Frisian Flag, Nestle and Sari Husada – all foreign investors) had 58.7 percent of production volume in 2008.
- The market segments for milk powder in 2008 were: children (57.6 percent), baby milk (29.4 percent), adults (8.2 percent) and pregnant women (4.8 percent).
- Consumption is forecast to increase from 179,370 tonnes in 2008 to 252,644 tonnes in 2013, an average annual growth of 7.17 percent.

SCM

- There are four companies (Frisian Flag, Nestle, Sari Husada and Ultra Jaya) operating in the SCM industry in Indonesia with a total production of 429,500 tonnes in 2009.
- Consumption is forecast to increase from 425,060 tonnes in 2008 to 529,077 tonnes in year 2014, an average annual growth of 4.8 percent.

Liquid Milk

- There are 31 companies operating in the liquid milk industry in Indonesia with a total production of 282,100 tonnes in 2009.
- The four largest dairy processors (Ultra Jaya, Frisian Flag and Indolakto and Greenfields) had 85 percent of liquid milk production in 2009.
- Consumption is forecast to increase from 283,810 tonnes in 2008 to 604,970 tonnes in 2014, an average annual growth of 16.3 percent.

Indonesia exported 48,229 tonnes of dairy products in 2010 worth US\$89 million. About two-thirds of the value of exports was sweetened condensed milk. However, the biggest growth in exports is the “milk” (fresh) category which has increased by an average of 50 percent per year. In 2010 Indonesia exported 16,144 tonnes of fresh milk mainly to Singapore and Hong Kong.

There are several issues that impact on dairy industry development in Indonesia including:

- scarcity of forage and high price of dairy cattle feed and concentrates
- small farm size and scarcity of land at suitable elevation for dairy cattle farming
- low dairy cow productivity – with an average of about 10 litres of milk per cow per day
- low farm profitability due partly to low milk yields
- low milk quality with only 12 percent of milk production meeting the minimum standard
- poor farm and herd management practices
- lack of technology for milking and processing of fresh milk
- limited access to high-quality genetics
- limited access to finance and bank loans
- limited farmer education

The research identified an opportunity for IFC to provide advisory services to support the development of Indonesia’s dairy sector with a focus on small holder dairy farmers. Advisory services could be delivered through a major dairy industry development project as follows.

The overall project objective is to improve the efficiency and profitability of Indonesia’s dairy value chain through capacity building and adoption of improved production technology and post farm gate practices.

The approach would involve five key project activities as follows:

1. Improving the performance of milking cows by provision of feed and herd management strategies and access to better genetics
2. Improving young stock management
3. Improving the efficiency of the post-farm gate dairy value chain
4. Benchmarking business performance on Indonesia’s dairy farms
5. Building capacity in Indonesia’s dairy industry

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1. INTRODUCTION

1.1 Background

The International Finance Corporation (IFC) promotes sustainable private sector investment in developing countries as a way to reduce poverty and improve people's lives.

Agriculture industry development is a priority for the Indonesian Government as it aims to achieve self sufficiency in key agricultural sectors. Dairy is an important industry sub sector with over 100,000 Indonesian dairy farmers producing close to 930 million litres of milk. The Indonesian Government has committed resources to support the development of Indonesia's dairy industry with the aim to achieve 50 percent self sufficiency by 2014.

Investing in the dairy industry sector in Indonesia can have significant development impact and create employment opportunities throughout the supply chain. IFC would like to explore the opportunities to be an investor in Indonesia's dairy industry. Given the changing and growing dairy sector, IFC wishes to obtain more current data on the dairy industry's value chain, its growth and investment opportunities, and recommend actions to consider for operating in the sub-sector.

1.2 Aims

The overall objective is to profile the Indonesian dairy farm and dairy processing industry and to identify opportunities and roles for IFC to promote a sustainable and inclusive dairy industry in Indonesia.

Specific issues to be addressed are:

On-farm

- a. The location, size and growth of dairy farming operations.
- b. The dairy farm production issues: the management of water and livestock feeds during the dry season, availability of power for cold chain and water heater, level of nutritive quality of feed, level of standard farming practices covering feed management, farm hygiene management, water and feed supply constraints, level of technical knowledge.
- c. The trends in dairy cow imports and genetics – AI programs
- d. The cost structure and profitability of dairy farming including operational expenses (feed, water and veterinary costs) and level of business profitability.
- e. The financing needs as well as the existing financing models linking dairy farmers to financing sources, both formal and informal.
- f. The producers' response and view on food safety, and quality oriented/customer services focused business.
- g. The supply chain linkages and farmer / industry relationships with milk processors across the key regencies.

Dairy Processors

- a. The main processors across the three market segments – liquid, powder and SCM
- b. The standard specifications for raw milk products set by the processing companies to GKSI and the best incentive system practices that stimulate farmers to adopt the recommended dairy practices.
- c. The milk processing issues: milk quality and characteristics, milk processing machinery and technology, milking tools, and the cooling units.

- d. The opportunities available for farmers or cooperatives to sell directly to processor companies.
- e. The supply of raw milk from farmers/cooperatives versus demand of raw milk by milk processors.
- f. The volume and trends in imports of milk powders.
- g. The inclination of milk quality produced by farmers/cooperatives versus the standard milk quality required by milk processors.
- h. The quantity number of cooperatives selling directly to milk processing companies as well as the cooperatives selling through GKSI.
- i. The dairy industry business models in Indonesia. Describe the partnership model, roles and responsibilities of parties involved, pricing system along the supply chain, price and quality transparency, access to information, access to credit, level of technology and farming system, volume of supply, farmers involved, etc.
- j. The identification of financial services presently available to and needed by dairy smallholders and cooperatives.
- k. The list of updated laws / regulations related to the dairy industry businesses, including laws and regulations related to cooperatives, food and financing.

1.3 Approach

The first stage of the study involved desk research addressing many of the aims (outlined above) and included a literature review of previous studies (which is presented in Appendix One). The desk research was undertaken from mid to late February 2011.

The second stage involved personal interviews with participants along the supply market chain to identify the supply and market chain constraints for dairying industry development and to examine various business supply chain models.

Personal interviews were conducted by Phillip Morey, Director of Morelink, in Jakarta, West Java and East Java from 3rd March to 1st April 2011 and included 20 key stakeholders as follows: input suppliers (4); dairy farmers / co-operatives (6); Corporate Dairy Farmers and Milk Processors (3); Milk processors (4); Government organizations (2); and retailers (1). The interviews were based on an open-ended structured questionnaire (See Appendix Two).

1.4 Report

Section Two provides information on the dairy industry size and location by number of dairy cows and milk production. Section three examines the dairy supply chain and stakeholders including role of farmers, cooperatives, milk processors and milk imports. In section four the marketing channels for dairy products are outlined including distribution, retailers, dairy consumption trends for liquid milk, milk powders and sweetened condensed milk and dairy product exports. Sections five outlines the government regulations impacting on the dairy industry in Indonesia. The major issues from the various meetings are summarized in section six while section seven outlines the constraints and opportunities for dairy industry development in Indonesia. Section eight outlines a project approach for IFC to invest in the development of the Indonesian dairy industry.

Abbreviations used throughout the report are listed in Appendix Six.

2. INDONESIA'S DAIRY COW INDUSTRY AND MILK PRODUCTION

2.1 Indonesia Overview

2.1.1 Dairy Industry Size and Location

According to the Ministry of Agriculture, over the last five years the number of dairy cows in Indonesia has increased from 361,351 in 2005 to 495,231 in 2010, at an average annual rate of 7.4 percent. Dairy cows in Indonesia can be found in 19 of the 33 provinces; however 97 percent of all dairy cows are located on the island of Java in the three provinces of East Java (47 percent), Central Java (25 percent) and West Java (25 percent).

Table 1: Dairy Cattle Population, 2005 – 2010, by Province, number of head

No	Provinces	Year					
		2005	2006	2007	2008	2009	2010 *)
1	NAD	31	28	26	32	35	37
2	North Sumatera	6,521	6,526	2,093	2,290	2,301	2,313
3	West Sumatera	714	608	688	768	826	1,013
4	Riau	0	27	49	82	122	142
5	Jambi	0	12	0	0	0	0
6	South Sumatera	262	188	109	59	51	85
7	Bengkulu	149	128	189	599	688	790
8	Lampung	129	198	230	263	221	229
9	Jakarta	3,347	3,343	3,685	3,355	2,920	2,988
10	West Java	92,770	97,367	103,489	111,250	117,337	124,797
11	Central Java	114,116	115,158	116,260	118,424	120,677	123,091
12	DI Yogyakarta	8,212	7,231	5,811	5,652	5,495	5,551
13	East Java	134,043	136,497	139,277	212,322	221,743	232,001
14	Bali	62	70	105	126	134	134
15	West Kalimantan	33	33	33	173	84	86
16	South Kalimantan	119	133	135	124	96	81
17	South Sulawesi	774	1,398	1,784	1,919	1,826	1,726
18	Papua	69	63	45	30	0	0
19	Bangka Belitung	0	0	40	73	99	109
20	Banten	0	0	7	14	15	20
21	Gorontalo	0	0	12	17	17	21
22	East Kalimantan	0	0	0	0	6	8
23	West Sulawesi	0	0	0	5	8	9
	Total	361,351	369,008	374,067	457,577	474,701	495,231

Source: www.ditjennak.go.id

Note: *) Preliminary figures

2.1.2 Investment in the Livestock Industry¹

Over the last six years investment in the livestock industry has totalled US\$216.6 million; with 67 percent from foreign investment. In 2009, investment in the livestock industries was less than one percent of total investment. The average foreign and domestic investment per project was US\$5.6 million and US\$3.5 million respectively. Foreign investment in the livestock industries has been declining since it peaked in 2005 and in 2007. Most of the investment in the livestock industry has been in beef fattening operations.

Over the last five years, foreign and domestic investment in the “livestock” sector has mainly occurred on the islands of Java and Sumatra.

There has been minimal new investment in dairying over the last five years however two major dairy processors are planning to expand operations into North Sumatra in 2011 / 2012.

¹ BKPM, “Data Perkembangan Penanaman Modal, Statistic of Direct Investment”, Dec 2009

2.1.3 Fresh Milk Production

According to the Ministry of Agriculture, over the last five years milk production has increased steadily from 535,962 tonnes in 2005 to 927,838 tonnes in 2010. This represents an average annual increase in milk production of 14.6 percent. In 2010, the largest dairy production province of East Java, accounted for 57 percent of the total national milk production, followed by West Java with 29 percent contribution and Central Java with 11 percent.

Table 2: Fresh Milk Production 2005 – 2010, by Province, in tonnes

No	Provinces	Year					
		2005	2006	2007	2008	2009	2010 *)
1	NAD	36	43	43	31	34	34
2	North Sumatera	4,695	8,783	1,507	1,324	1,657	1,665
3	West Sumatera	899	930	930	1,053	1,264	1,550
4	Riau	0	0	41	4	125	156
5	South Sumatera	277	401	269	167	15	21
6	Bengkulu	3,262	90	3,381	138	1,055	1,212
7	Lampung	104	197	185	352	178	185
8	Jakarta	5,061	6,365	7,016	6,388	5,723	5,856
9	West Java	201,885	211,889	225,212	225,212	255,348	270,616
10	Central Java	70,693	130,896	70,419	89,748	91,762	106,040
11	DI Yogyakarta	8,812	11,063	6,994	7,083	5,038	5,187
12	East Java	239,908	244,300	249,275	312,270	461,880	531,797
13	Bali	78,12	95	132	0	169	195
14	West Kalimantan	36	39	50	0	0	0
15	South Kalimantan	123	177	310	186	129	123
16	South Sulawesi	90	1,184	1,846	2,857	2,778	3,081
17	Papua	0	96	69	54	0	0
18	Bangka Belitung	0	0	0	61	67	78
19	Gorontalo	0	0	3	25	25	43
	Total	535,962	616,549	567,683	646,953	827,249	927,838

Source: www.ditjennak.go.id

Note: *) Preliminary figures

2.1.4 Seasonality of Supply and Demand

Milk production is dependent on access to an abundant supply of feed for dairy cows. During the dry season (April to September) there is limited availability of feed for dairy cows and hence the supply of milk from the major production centres on the island of Java declines. Central Java has a more severe dry season compared to West and East Java and hence its milk production declines more dramatically.

2.2 East Java

In East Java, dairy cows (0.2 million) represent only two percent of all ruminant animals, with the main livestock being beef cattle (3.6 million), goats (2.8 million) and sheep (0.7 million).² The number of dairy cows in East Java has increased by an average of 14.6 percent per year over the last five years to reach 232,001 cows in 2010 from 134,043 in 2005.

In 2010, dairy cows were located in 23 of the 29 regencies and nine municipalities. Almost 60 percent of all dairy cows in 2010 in East Java were located in the regencies of Pasuruan (64,394 cows) and Malang (63,066 cows).

² www.disnak.jatim.go.id

The majority (93.8 percent) of the dairy cows in East Java are owned by individual farmers while 6.2 percent are owned by corporations. Over the last five years the number of dairy cows owned by individual farmers and corporations has increased annually by an average of eight percent and 34 percent respectively.

In 2010, dairy milk production in East Java reached 531,797 tonnes up from 238,908 tonnes in 2005; an average annual increase of 24 percent over the last five years. Fifty four percent of all dairy cow milk production in 2010 in East Java was from the regencies of Malang (146,121 tonnes) and Pasuruan (114,014 tonnes).

The majority (94 percent) of milk produced in East Java is from individual farmers while six percent is from corporations. Over the last five years milk production from cows owned by individual farmers and corporations has increased annually by an average of 19 percent and 42 percent respectively.³

2.3 Central Java

The number of dairy cows in Central Java has increased by an average of only 1.6 percent per year over the last five years to reach 123,091 cows in 2010 up from 114,116 cows in 2005.

In 2010, dairy cows were located in 28 of the 29 regencies and six municipalities. However, 82 percent of all dairy cows in Central Java in 2010 were located in two regencies - Boyolali (62,480 cows) and Semarang (37,999 cows).

In 2010, dairy milk production in Central Java reached 106,040 tonnes up from 70,693 tonnes in 2005; an average annual increase of ten percent over the last five years. Seventy seven percent of all dairy cow milk production in 2010 in Central Java was from the regencies of Boyolali (42.5 million litres) and Semarang (34.6 million litres).⁴

2.4 West Java

In 2010, dairy cows were located in 17 regencies and eight municipalities. However, 49 percent of all dairy cows in West Java in 2010 were located in Bandung / West Bandung with 87 percent located in six regencies – Bandung / West Bandung (58,001 cows), Garut (16,637 cows), Sumedang (9,839 cows), Bogor (7,131 cows), Kuningan (6,319 cows) and Sukabumi (4,839 cows).

The number of dairy cows in West Java has increased by an average of 6.9 percent per annum over the last five years to reach 124,797 cows in 2010.

In 2010, dairy milk production in West Java reached 270,616 tonnes up from 201,885 tonnes in 2005; an average annual increase of 6.8 percent over the last five years. About 50 percent of all dairy cow milk production in 2010 in West Java was from the regencies of Bandung and West Bandung.⁵

³ Year of Report by Animal Husbandry Services of East Java 2004 – 2010

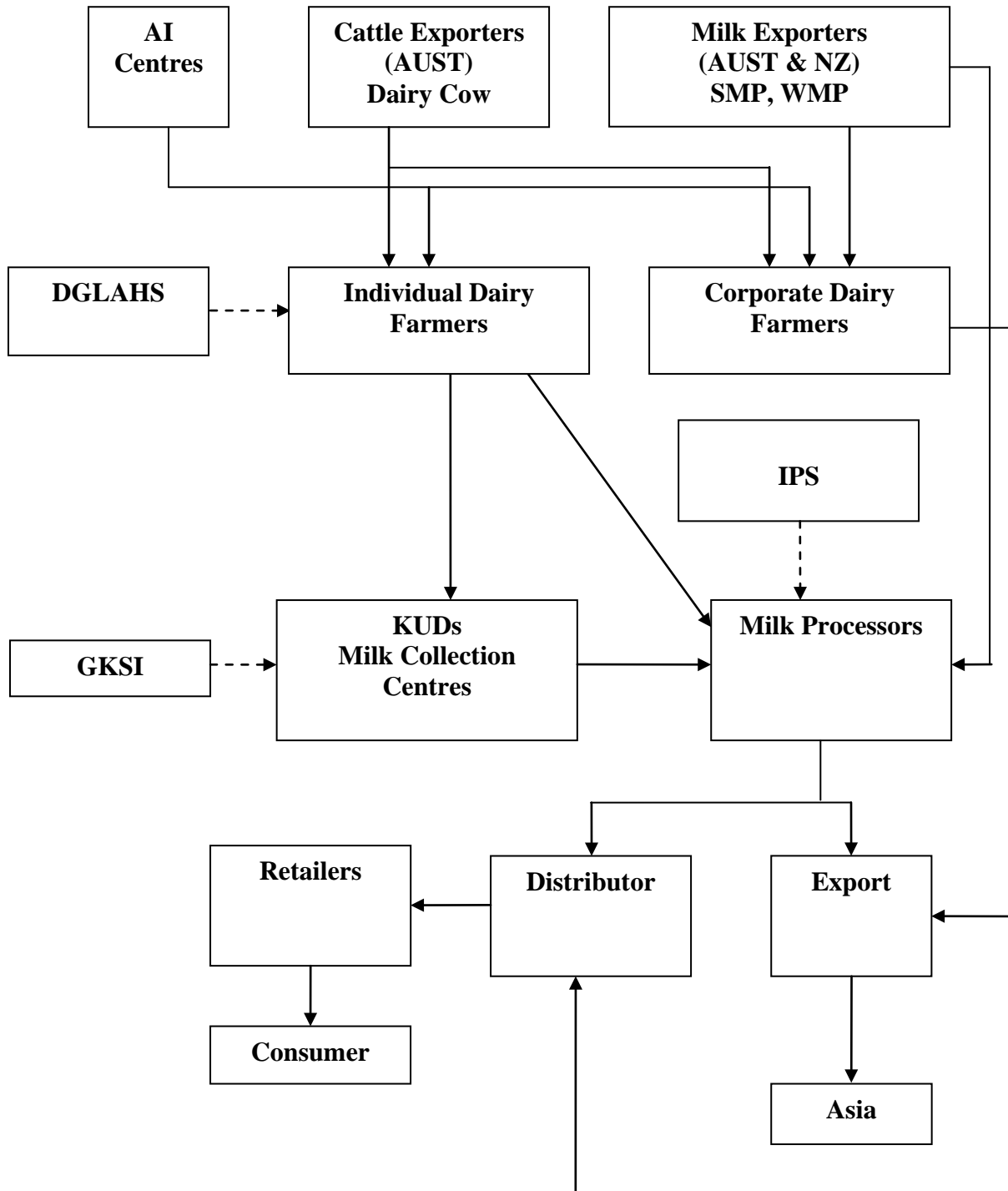
⁴ Dinas Peternakan dan Kesehatan Hewan, Provinsi Jawa Tengah

⁵ Dinas Peternakan, Provinsi Jawa Barat

3. INDONESIA’S DAIRY SUPPLY CHAIN AND STAKEHOLDERS

The major participants in the dairy supply and market chain are presented in the diagram below and discussed in sections four (supply) and five (market) in the report.

Figure 1. Dairy Supply and Market Chain



3.1 Government and Industry Stakeholders

- i) DGLAHS – The Directorate General of Livestock and Animal Health Services at the Ministry of Agriculture oversees the national strategy and Government policy issues affecting Indonesia’s dairy industry. There are five directorates under DGLAHS covering (1) breeding, (2) livestock production, (3) livestock feed, (4) animal health and (5) veterinary public health and post harvest.

DGLAHS dairy priorities and funding issues are outlined in Appendix Three.

- ii) GKSI – The Indonesian Association of Dairy Cooperatives (GKSI) oversees the industry development including policies regarding accessing funding for infrastructure and cattle. The activities of GKSI are mainly handled by branches in East Java, Central Java and West Java.
- GKSI East Java members include 51 KUDs⁶ and around 40,000 farmers.
 - GKSI Central Java members include 21 KUDs in Central Java and three KUDs in Yogyakarta comprising a total of 34,500 farmers.
 - GKSI West Java members include 23 KUDs across West Java with a total of 24,536 farmers.

DGLAHS and GKSI contact details are provided in Appendix Four.

- iii) KUDs – Koperasi Unit Desa (KUD) is the local dairy centre known as the primary village cooperative of GKSI. KUDs supply farmers with advice and services on production, animal health (veterinarian) etc. The KUDs can also act as the local milk collection centre and are the key link between farmer and milk processors. The KUD collects and distributes money to the farmer based on milk quality and volume. There are an estimated 220 KUDs in Indonesia with about 100 in Java. Some of the KUDs have exclusive arrangements to supply a major milk processor and some have established their own milk products and brands for the local market.
- iv) IPS – The Indonesian Association of Milk Processors (IPS) represents the milk processing sector. IPS members buy milk from GKSI members and direct from some large farmers and import milk powders to supplement their needs. There are six milk processors that are a member of IPS – the five major milk processors are Nestle, Frisian Flag, Sari Husada, Indomilk and Ultra Jaya.
- v) AI Centres – Semen for artificial insemination in cattle is domestically produced by two Artificial Insemination (AI) centres located in Malang, East Java and Lembang, West Java.

Further details on dairy industry genetics, AI centres and the Indonesian National standard for semen are provided in Appendix Five.

- vi) Cikole Dairy Training Centre – The Centre is funded by Japan International Corporation Agency (JICA) and provides technology transfer to improve dairy farming and milk production.

⁶ KUDs are the primary Cooperatives of GKSI - local milk collection centres for dairy famers

3.2 Dairy Cow Imports

Indonesia imports dairy cows from Australia. In 2009, Australia sent 14,835 dairy cows to Indonesia.

There are a number of large stock agents in Australia that are active in the export of dairy cattle, including Elders, Landmark and Wellards. There are also smaller private agents who can arrange dairy cattle purchases and freight.

The Indonesian government is keen to encourage the development of dairy and beef industries in Indonesia and is providing 145 billion rupiah of subsidy for the purchasing of dairy cows and beef cattle.

3.3 Veterinary Suppliers

There are about 200 veterinary drug companies in Indonesia that are currently active in manufacturing, importing, and/or distributing drugs to the cattle industry.

The main local manufacturers are:

- Sanbe manufactures more than 200 veterinary products focusing on the poultry industry. For ruminants, they produce vitamins, antibiotic injections, reproductive hormones and dairy and beef cattle vaccines.
- Kalbe Farma produces and markets a wide range of large animal products, such as feed additives, antibiotics, antiparasitics, disinfectant and insecticide, growth promoters, and vitamin and minerals.
- Medion has a limited range of ruminant products, mainly vitamins and antibiotics.
- Vaksindo has a wide range of products: active and inactivated vaccines (for Anthrax and Septicaemia); pharmaceutical products e.g. vitamin mixtures, antibiotics, chemotherapeutics, disinfectants, and herbal feed additives.
- Pyridam produces and imports veterinary drugs.
- Tekad Mandiri Citra produces and distributes veterinary drugs.

The main foreign manufacturers operating in Indonesia are:

- Novus Indonesia focuses on poultry industry with amino acids and minerals.
- Trouw Nutrition Indonesia specialises in premixes with production capacity of 18,000 tons of blends and premixes per year.
- Alltech Indonesia produces yeast strain product, vitamin and minerals, feed solutions and additives, and organic selenium.

The main cattle diseases are:

- Anthrax – bacterial disease, vaccination if confirmed
- Brucellosis – infection in reproduction organs, prevention by vaccination
- Fasciolosis – infection by liver fluke, treatment with drugs
- Mastitis (dairy) – treatment with antibiotics
- Parasites internal – worms, treatment with drugs and pasture management
- Parasites external – on the skin and feed, treatment with drugs and insecticides

There are many options used to distribute veterinary drugs, as follows:

- directly to end users i.e. large sized feedlot companies and animal husbandries
- retailers: pet and poultry shops
- institutions: cooperatives and government institutions

All companies related to veterinary drugs have to be a member of Indonesian Veterinary Drugs Association (ASOHI) before the Directorate General Livestock and Animal Health Services (DGLAHS) could grant the business permit. To import veterinary drugs a company has to apply to DGLAHS for a permit. All drugs have to be registered and tested before they can be distributed to the market.

3.4 Farmers

Indonesian fresh milk production is sourced from 500,000 dairy cattle located mainly in the three major fresh milk production areas of East Java, Central Java and West Java. The majority of cows are owned by individual farmers that are members of a local Dairy Cooperative Union (KUD). The KUD collects the milk and measures the bacteria content of fresh milk to determine the quality and price paid to the farmer.

Average yield is between 10 and 12 litres per cow per day. Fresh milk quality is measured by the bacteria content (TPC=Total Plate Count), which ranges from 500,000 to 1 million. Indonesian fresh milk production with the lower bacteria content is combined with imported skim milk to produce liquid milk and powdered milk. Fresh milk with higher bacteria content is processed into sweetened condensed milk.

Price incentives are used to encourage better farm management practices and higher quality milk. However, milk quality from local cows is still far below the National Quality Standard (SNI) with only 12 percent of milk production meeting the minimum quality standard for milk as follows:

- Total Plate Count (TPC) = maximum of 1 million
- Total Solids (TS) = minimum of 11 percent
- Milk content = protein (minimum of 2.7 percent), fat (minimum of three percent), SNF (minimum of eight percent).

Dairy cow productivity in Indonesia is low by world standards at an average of 3,069 litres of milk per cow per annum (less than 10 litres of milk per cow per day) with cows in West Java being the most productive at 3,891 litres per annum.

Table 12: Milk Productivity by Major Provinces, 2009

Province	Dairy Cattle	
	Productive of Female (percent)	Productivity / head / year (Lt)
North Sumatera	67.69	2,040.00
West Sumatera	50.00	1,920.00
South Sumatera	88.71	2,521.75
Bengkulu	50.00	1,911.00
Lampung	50.00	1,620.00
Jakarta	88.54	2,032.83
West Java	66.93	3,891.45
Central Java	57.02	2,021.62
DI Yogyakarta	68.42	3,336.63
East Java	57.33	2,953.96
South Sulawesi	58.84	2,284.80
Indonesia	60.70	3,069.36

Source : www.ditjennak.go.id

Several issues hinder further improvements in Indonesian dairy cattle productivity including:⁷

- scarcity of forage and high price of dairy cattle feed
- small farm size and scarcity of land with suitable elevation for dairy cattle farming
- poor farm management practices
- limited access to finance and bank loans
- lack of technology for milking and processing the fresh milk
- limited access to high-quality genetics
- limited farmer education

3.5 Milk Processors

Most of the milk produced in Indonesia (90 percent) is absorbed as raw material by the major milk processing industries under IPS and the remaining 10 percent is sold direct by KUDs to consumers as fresh liquid milk or yoghurt drinks. In general, the milk processors buy fresh milk from the cooperatives.

In contrast to the small scale fresh milk producers, there are some large dairy companies which contribute significantly to the dairy production and milk processing sectors. Several new producers are entering the market, and some of the major, established dairy producers and manufacturers are expanding their capacity.⁸

3.5.1 Major Players and Milk Production

There are over 30 companies involved in milk processing in Indonesia producing over 870,000 tonnes of milk products in 2009 (see table below).

Table 4. Production of Powdered Milk (PM), Sweet Condensed Milk (SCM) and Liquid Milk (LM) by Major Dairy Processors by Location, 2009 ('000 Tonnes)

Location	Processor	PM *)	SCM	LM	Total	Percent
East Java	Nestle	40.7	71.6	4.1	116.4	
	Frisian Flag	27.7	-	-	27.7	
	Nutricia	6.5	-	-	6.5	
	Greenfields	-	-	39.8	39.8	
	Sekar Tanjung	-	-	16.3	16.3	
Total East Java		74.9	71.6	60.2	206.7	23.6
West Java	Indolakto	5	164.3	47.8	217.1	
	Ultra Jaya	2.9	6	89.9	98.8	
	Danone Dairy	-	-	13.8	13.8	
	Cisarua	-	-	0.2	0.2	
	Kalbe	6	-	-	6	
Total West Java		13.9	170.3	151.7	335.9	38.4
Central Java	Sari Husada	41.3	-	-	41.3	
	Tigaraksa	4.9	-	-	4.9	
Total Central Java		46.2	-	-	46.2	5.3

⁷ USDA FAS "Dairy Products Annual 2009", GAIN Report No. ID9032, 19th November 2009

⁸ USDA FAS "Dairy Products Annual 2009", GAIN Report No. ID9032, 19th November 2009

Jakarta	Frisian Flag	-	187.6	61.2	248.8	
	Diamond	-	-	0.3	0.3	
Total Jakarta		-	187.6	61.5	249.1	28.4
Other					38.4	4.3
Grand Total		164.7	429.5	282.1	876.3	100.0

Source: CIC Milk Reports, 2008 and 2009

*) 2008 Data

The major dairy processors by type of dairy product manufactured are summarised below.

- Liquid – 13 companies e.g. Ultra Jaya, Indomilk, Frisian Flag, Nestle, Greenfield
- Condensed – 4 companies e.g. Frisian Flag, Indolakto
- Powdered – 12 companies e.g. Nestle, Sari Husada, Indomilk and Frisian Flag
- Ice – Cream – 4 companies e.g. Unilever, Indomilk, Campina, Diamond
- Yoghurt – 6 companies e.g. Yakult, Yummy, Danone, Diamond, Cimory

3.5.2 Quality parameters and payments across milking sheds

The Milk Processing Industry, with input from the industry (GKSI) and Government (DGLAHS), sets the basic price of milk paid to farmers. The price will vary across milk processing companies, districts and milk quality. There can be up to six grades of milk quality based on the total plate count (TPC) and total solids (TS) in the milk. The difference between Grade 1 (best quality) and Grade 6 (worst quality) can be between 30 percent and 60 percent.

3.6 Dairy Imports

In 2010 Indonesia imported 302,158 tonnes of dairy products (worth US\$925 million); this was an increase from 2009 of 12 percent in volume. The main products imported in 2010 were SMP, WMP and whey.

Table 5. Indonesia Dairy Imports (Jan - December), 2007 - 2010

Product	Volume Tonnes 2007 Total	Volume Tonnes 2008 Total	Volume Tonnes 2009 Total	Volume Tonnes 2010 Total	Value US\$'000 2007 Total	Value US\$'000 2008 Total	Value US\$'000 2009 Total	Value US\$'000 2010 Total
Buttermilk / BMP	14,075	6,328	10,017	12,823	43,618	24,597	17,498	31,148
Butterfat	15,686	9,655	13,273	14,642	42,974	41,663	36,547	70,900
Cheese	13,930	10,557	13,971	15,683	46,363	54,609	49,299	69,338
Milk	16,697	16,187	9,775	4,151	19,598	24,532	16,084	11,845
WMP	90,718	83,514	52,929	49,856	300,852	330,572	157,198	221,985
SMP	90,757	81,207	103,801	132,227	316,477	309,893	238,330	405,153
Whey products	53,367	42,239	65,433	72,619	99,772	78,057	74,206	114,138
Yoghurt	1,482	968	356	156	1,500	1,385	668	339
Total	296,712	250,656	269,554	302,158	871,153	865,308	589,829	924,886

Source: BPS

EU, NZ and USA were the main dairy exporters to Indonesia in 2010 with a volume market share of 32 percent, 23 percent and 21 percent respectively. Australia's share of dairy imports in 2010 was 13 percent of the volume down from an average market share of 30 percent in 2002. Table 16 shows a breakdown of imports by major country and product type in 2010.

Table 6. Indonesian Dairy Import (Volume) by Country, 2010, tonnes

Product	Aust	NZ	USA	EU	Other	Total
Buttermilk / BMP	690	2,839	0	6,865	2,429	12,823
Butterfat	2,306	8,779	659	2,699	199	14,642
Cheese	3,906	7,393	2,975	520	889	15,683
Milk	1,657	1,241	156	999	98	4,151
WMP	10,108	15,436	315	5,440	18,557	49,856
SMP	17,487	33,502	40,624	37,413	3,201	132,227
Whey products	4,492	858	17,974	42,526	6,769	72,619
Yoghurt	4	0	77	38	37	156
Total	40,651	70,048	62,780	96,500	32,179	302,158

Source: BPS

Imports of prepackaged powdered milk for the retail market have been growing steadily over the last five years; imports have increased annually by five percent in volume and almost 20 percent in value. In 2008, Indonesia imported almost 40,000 tonnes of prepackaged powdered milk products worth about US\$180 million mainly from the Philippines (39 percent), New Zealand (25 percent) and Singapore (11 percent).

Imports of prepackaged powdered milk products represent about 22 percent of the volume and 29 percent of the value of total powdered milk consumption. There are at least 40 brands of prepackaged imported powdered milk sold through various retail outlets in Indonesia.

4. DAIRY MARKETING CHANNELS AND MILK CONSUMPTION SEGMENTS

4.1 Distributors and Distribution Issues

Indonesia with over 17,000 islands provides a major challenge to distribute perishable produce to major urban centres in Indonesia's 33 provinces. Most of the distribution of local products is based around seaports and regional depots. A major distribution problem for companies is the lack of refrigeration and an inferior distribution system resulting in problems to maintain a cold chain system for perishable products made from milk.

Most dairy manufacturers will work with a range of distributors to reach their retail customers spread across Indonesia's 33 provinces. Distributors include Aidela Jaya Sejahtera, Kalimas Batu, Anugerah Pharmindo, Astri Distribusindo and Mega Medika. Some manufacturers, like Indolakto, Frisian Flag and Tigaraksa, have their own distribution company.

There are a number of large Indonesian companies that provide national distribution services to local and imported dairy suppliers. These companies include:

- PT Sukanda Djaya – beverages, meat, dairy, frozen food, chilled food and fine foods
- PT Indoguna Utama – meat, dairy, small goods and fine foods
- PT Tigaraksa – canned foods and infant formula milk
- PT Wicaksana – snack foods, beverages, milk powders, instant noodles

4.2 Retail Trends

The modern retail market throughout Indonesia continues to expand rapidly but it is still dominated by traditional grocery stores, according to data from Nielsen Indonesia. Nielsen Indonesia data shows that over a five year period (2003 to 2008) traditional stores expanded by only 9.2 percent compared to hypermarkets at 188.4 percent, minimarkets at 162.7 percent and supermarkets at 75.3 percent. This trend is likely to continue as more consumers choose to shop for their daily needs at hypermarkets and other modern retail outlets.

The modern retail sector is now dominated by big businesses that continue to invest and expand with new stores opening throughout Indonesia's 33 provinces. Carrefour leads with 64 hypermarkets nationwide followed by Hypermart (Matahari) with 48 stores and Giant (Hero Group) with 36 stores, according to data from "Nielsen Shopper Trends" annual survey. The Hero and Matahari Groups are concentrating their expansion strategies on hypermarkets development. Hypermarkets are still viewed as offering the lowest prices, widest variety of items and best value for money.

The retail business grew by 12 percent in 2010 and will continue to grow in 2011 according to Nielsen Retail Services Director Yongky Susilo. Retail business in 2011 will grow by 13 to 15 percent due to strong economic growth, GDP per capita above U.S. \$ 3,000, strong consumer purchasing power and inflation of about six percent.⁹

The modern retailers play a major role in the distribution of milk powder products, in particular for the middle to upper class consumers. Traditional shops / kiosks are more popular for the middle to lower class of consumers where they can buy local manufactured milk powder brands such as Dancow (Nestle), Bendera (Frisian Flag), Indomilk and SGM (Sari Husada). These traditional shops rely on wholesalers for their produce supplies while

⁹ detikFinance, January 7th 2011

the larger supermarket and hypermarket chains may buy direct from manufacturers or from distributors. Smaller volumes of milk powder products are sold through pharmacies.

Table 7: Retail Stores by Type, 2008 and 2009¹⁰

Trade Sector	2008	2009
GROCERY STORES		
Traditional Grocery Stores	2,469,465	2,520,757
Convenience Stores	267	358
Minimarkets	10,607	11,569
Supermarket	1,571	1,146
Hypermarkets	127	141
Warehouse Clubs	26	26
TOTAL GROCERY OUTLETS	2,482,063	2,533,997

Source: The Nielsen Company “APAC Retail and Shopper Trends Report 2010”

4.3 Milk Consumption Segments and Trends

In 2008 the milk market in Indonesia was worth more than Rp. 26 trillion (US\$2.6 billion) with milk powders (US\$1.5 billion) comprising almost 60 percent market share followed by sweet condensed milk (US\$760 million) and liquid milk (US\$400 million).

4.3.1 Milk Powders

There are 27 companies operating in the powdered milk industry in Indonesia with a total production of 164,700 tonnes.¹¹ The ten largest producers and their production are as follows:

Table 8: Powdered Milk Processors Location and Production, 2008

Processor	Location	Production '000 tonnes	Production percent
Nestle	East Java	40.7	24.7
Sari Husada	Yogyakarta	41.3	25.0
Frisian Flag	East Java	27.7	16.8
Nutricia	East Java	6.5	3.9
Indolakto	West Java	5.0	3.0
Kalbe	West Java	6.0	3.6
Gizindo	West Java	n.a.	n.a.
Ultra Jaya	West Java	2.9	1.8
Tigaraksa	Central Java	4.9	3.0
Sugizindo	West Java	n.a.	n.a.
TOTAL		164.7	100.0

Source: CIC report on “Study on Industry and Market of Powdered Milk in Indonesia”, August 2009

Powdered milk production in Indonesia has continued to increase over the last few years from 118,260 tonnes in 2004 to 164,730 tonnes in 2008; an average annual increase of almost 10

¹⁰ <http://hk.nielsen.com/documents/APACRetailandShopperTrendsReport2010.pdf>

¹¹ CIC report on “Study on Industry and Market of Powdered Milk in Indonesia”, August 2009.

percent. In 2008 the Indonesian consumption of milk powders reached 179,370 tonnes. This is forecast to increase by 7.17 percent per year and in five years reach 252,644 tonnes (year 2013).

The main companies involved in the powdered milk market and their market shares are detailed in the table below.

Table 9: Market Value and Volume of Powdered Milk by Companies, 2008

Company	Market Value Rp. Billion	percent share	Market Volume '000 tonnes	percent share
Nestle	4,203.6	28.7	58.2	32.4
Sari Husada	2,600.4	17.7	41.3	23.0
Frisian Flag	1,807.1	12.3	26.3	14.7
Kalbe	1,313.0	8.9	8.6	4.8
Nutricia	901.4	6.2	6.2	3.4
Mead Johnson	720.1	4.9	5.4	3.0
Abbott	669.7	4.6	3.9	2.1
Fonterra Brand	613.2	4.2	7.7	4.3
Wyeth	452.9	3.1	2.7	1.5
Nutrifood	379.6	2.6	4.1	2.3
Indolakto	298.9	2.0	4.9	2.8
Produsen	209.8	1.4	1.7	0.9
AB Food & Bev.	82.9	0.6	1.4	0.8
Mirota	63.1	0.4	1.2	0.7
Others	349.7	2.4	5.7	3.2
TOTAL	14,665.8	100.0	179.4	100.0

Source: CIC report on "Study on Industry and Market of Powdered Milk in Indonesia", August 2009

The three main manufacturers of milk powders in Indonesia (Nestle, Sari Husada and Frisian Flag – all foreign investors) had a total market share of 58.7 percent and 70.1 percent of the value and volume respectively.

A number of retail brands are manufactured under contract (toll manufacturing) as follows:

- PT Nutricia Indonesia produces for PT Fontera Indonesia brands including Annum, Anlene and Anchor
- PT Sugizindo produces for PT Mead Johnson Indonesia brands including Enfagrow, Enfamil, Enfapro and Sustagen
- PT Ultra Jaya Milk Industry produces for PT Kalbe Morinaga Indonesia brands including Morinaga

a. Market Segments for Milk Powders

The market segments for milk powder are: children (57.6 percent), baby milk (29.4 percent), adults (8.2 percent) and pregnant women (4.8 percent).

Children - This market segment has grown by an average of 8.9 percent per year (in volume) from 82,590 tonnes (Rp. 4,320 billion) in 2004 to 112,060 (Rp. 8,630 billion) in 2008. The major companies and brands by value are:

- Companies – Nestle (37 percent), Frisian Flag (19 percent) and Sari Husada (9 percent)
- Brands - Dancow (30 percent), Bendera (19 percent) and SGM (8 percent)

Baby - This market segment has grown by an average 6.6 percent per year (in volume) from 37,300 tonnes (Rp. 2,280 billion) in 2004 to 47,140 tonnes (Rp. 4,200 billion) in 2008. The major companies and brands by value are:

- Companies – Sari Husada (38 percent), Nestle (20 percent) and Nutricia (14 percent)
- Brands - SGM (34 percent), Lactogen (19 percent) and Nutrilon (10 percent)

Adults - This market segment has grown by an average of 4.4 percent per year (in volume) from 11,020 tonnes (Rp. 676 billion) in 2004 to 12,980 (Rp. 1,150 billion) in 2008. The major companies and brands by value are:

- Companies – Fonterra (35 percent), Nutrifood (33 percent) and Nestle (14 percent)
- Brands - Anlene (35 percent), Hi Lo (21 percent) and Produgen (13 percent)

Pregnant Women - This market segment has grown by an average of 9.0 percent per year (in volume) from 5,290 tonnes (Rp. 369 billion) in 2004 to 7,190 (Rp. 683 billion) in 2008. The major companies and brands by value are:

- Companies – Kalbe (50 percent), Sari Husada (28 percent) and Fonterra (12 percent)
- Brands - Prenagen (53 percent), Lactamil (28 percent) and Annum (12 percent)

b. Nutritional Milk – Health Food Supplements

A large number of food supplements are imported, with half of the entire market coming from the United States; it has over 70 percent of the total import market share. The market for health food supplements in Indonesia was US\$313 million in 2008. The market consists of over 80 percent imports with some locally manufactured items. Products from the USA accounted for US\$180 million of all health food supplements imported by Indonesia in 2008¹².

Food supplements that are sold in Indonesia can be found in many forms such as:

- powder to be mixed (MuscleTech - Meso Tech, Lactamil, WRP Nutritious drink);
- ready-to-drink (Lactamil, Prenagen, Anlene, Hi-Lo, Nutrive Benecol);
- nutritionally fortified foods such as soups, casseroles, crispy bar (Nulife), chocolate chip cookies (WRP, DiabetaMil), high protein bar (L-Men).

The sale of meal replacement products has increased by 19 percent in 2009 from the previous year to reach Rp. 215 billion¹³. Meal replacement products that are used in body building industry and healthy lifestyle in Indonesia is increasing significantly.

In the *body building industry*, meal replacement product can be found in the form of fortified milk that is used as meal replacement with complete nutrition for people with high activities. The products sold in Indonesia such as Ultimate Carbo Booster, Ultimate Magic Milk, Prolab Lean Mas Complex, Prolab Naturally Lean Matrix.

In the *healthy life segment*, meal replacement products can be found in the form of nutritional milk that is used as a meal replacement for dietary purposes such as Diabetasol, Ensure, DiabetaMil, GoldenMil, WRP, Enercal, and Weight Gain.

¹² Association of Indonesian Health Supplement Companies and the National Agency of Drug and Food Control (BPOM)

¹³ Source: Euromonitor, "Meal Replacement Products in Indonesia", November 2009

4.3.2 Sweetened Condensed Milk (SCM)

There are four companies operating in the SCM industry in Indonesia with a total production of 429,500 tonnes in 2009¹⁴. The main dairy processors, their location and their production are outlined in the table below.

Table 10: SCM Processors Location and Production, 2009

Processor	Location	Production '000 tonnes	Production percent
Frisian Flag	East Jakarta	187.6	43.7
Indolakto	Sukabumi, West Java	164.3	38.3
Nestle	Pasuruan, East Java	71.6	16.7
Ultra Jaya	Bandung, West Java	6.0	1.3
TOTAL		429.5	100.0

Source: CIC report on "Study on Industry and Market of Liquid Milk & SCM in Indonesia", 2010

SCM production in Indonesia has continued to increase over the last few years from 340,940 tonnes in 2004 to 429,520 tonnes in 2009; an average annual increase of 4.7 percent.

SCM consumption in Indonesia has been increasing and over the last five years the volume and value of SCM consumer market has grown by an average of 4.8 percent and 9.7 percent per annum respectively. In 2009 the Indonesian consumption of SCM reached 425,060 tonnes valued at Rp. 7.65 trillion. The SCM market segment is forecast to continue to increase by 4.8 percent per year and in 5 years will reach 529,077 tonnes (year 2014).

The main companies involved in the SCM market and their market shares are detailed in the table below. Frisian Flag and Indolakto dominate the SCM market with a combined market share of more than 80 percent.

Table 11: Market Value and Volume of SCM by Companies, 2009

Company	Market Value Rp. billion	percent share	Market Volume '000 tonnes	percent share
Frisian Flag	3,722.8	48.7	187.6	44.1
Indolakto	2,713.9	35.5	160.3	37.7
Nestle	1,134.8	14.8	71.6	16.8
Ultra Jaya	76.4	1.0	5.4	1.3
Others	2.5	0.0	0.2	0.0
TOTAL	7,650.4	100.0	425.1	100.0

Source: CIC report on "Study on Industry and Market of Liquid Milk & SCM in Indonesia", 2010

4.3.3 Liquid Milk

There are 31 companies operating in the liquid milk industry in Indonesia with a total production of 282,100 tonnes (kilolitres) in 2009.¹⁵ However, the three largest dairy processors had 70 percent of production in 2009. The main dairy processors, their location and their production are outlined in the table below.

¹⁴ CIC report on "Study on Industry and Market of Liquid Milk & SCM in Indonesia", 2010.

¹⁵ CIC report on "Study on Industry and Market of Liquid Milk & SCM in Indonesia", 2010.

Table 12: Liquid Milk Processors Location and Production, 2009

Processor	Location	Production '000 tonnes	Production percent
Ultra Jaya	Bandung, West Java	89.9	32.5
Frisian Flag	East Jakarta	61.2	21.8
Indolakto	Sukabumi, East Java	47.8	16.6
Greenfields	Malang, East Java	39.8	14.1
Sekar Tanjung	East Java	16.3	5.9
Danone Dairy	Bekasi, West Java	13.8	3.9
Nestle	Pasuruan, East Java	4.1	1.6
Diamond	North Jakarta	0.3	0.1
Cisarua	Sukabumi, West Java	0.2	0.1
Other		8.7	3.4
TOTAL		282.1	100.0

Source: CIC report on "Study on Industry and Market of Liquid Milk & SCM in Indonesia", 2010

Liquid milk production in Indonesia has continued to increase over the last few years from 126,923 tonnes in 2004 to 282,080 tonnes in 2009; an average annual increase of 17.4 percent.

Liquid milk consumption has increased with growing awareness of the people of the importance of milk for their health. Over the last six years the volume and value of the liquid milk consumption market has grown by 16.3 percent and 20.6 percent respectively. In 2009 the Indonesian consumption of liquid milk reached 283,810 tonnes valued at Rp. 4 trillion. The liquid milk market segment is forecast to continue to increase by 16.3 percent per year and in five years reach 604,970 tonnes (year 2014).

The main companies involved in the liquid milk market and their market shares are detailed in the table below.

Table 13: Market Value and Volume of Liquid Milk by Companies, 2009

Company	Market Value Rp. Billion	Percent Share	Market Volume '000 tonnes	Percent Share
Ultra Jaya	1,005.9	26.3	84.3	29.7
Frisian Flag	769.4	19.2	60.3	21.2
Nestle	698.6	17.4	17.9	6.3
Indolakto	577.0	14.4	47.8	16.9
Greenfields	256.2	6.4	25.4	9.0
Danone	197.4	4.9	13.8	4.9
Sekar Tanjung	105.0	2.6	10.1	3.6
Fonterra	93.5	2.3	5.7	2.0
Lintang Visikusuma	50.6	1.3	4.9	1.7
Garuda Food	13.1	0.3	1.3	0.4
AB Food	12.6	0.3	0.9	0.3
Diamond Cold Storage	3.1	0.1	0.3	0.1
Cisarua Mountain Dairy	2.4	0.1	0.2	0.1
Sari Husada	1.0	0.0	0.1	0.0
Others	172.8	4.3	11.0	3.9
TOTAL	4,008.6	100.0	283.8	100.0

Source: CIC report on "Study on Industry and Market of Liquid Milk & SCM in Indonesia", 2010

There are many retail brands of liquid milk in Indonesia and the main 20 brands in the liquid milk market and their market shares are detailed in the table below. The top four brands (Ultra Milk, Bear Brand, Indomilk and Frisian Flag) have two-thirds of the market for liquid milk.

4.4 Exports

Indonesian dairy exports have fluctuated over the last five years from a low of 37,000 tons in 2007 to a high of almost 61,500 tons in 2008. In 2010, Indonesia exported 48,229 tonnes of dairy products worth almost US\$89 million. About two-thirds of the value of exports was “other milk” (mainly sweetened condensed milk).

The biggest growth in exports is in the “milk” (fresh) category which has grown by an average of almost 50 percent per year from 3,382 tons in 2002 to reach 16,144 tonnes in 2010. Most of this milk (82%) has been sold into Singapore (7,636 tonnes) and Hong Kong (5,645 tonnes). Franchise coffee shops such as Starbucks in Singapore and Hong Kong now use Greenfields fresh milk from Indonesia replacing supplies from Australia.

Table 14. Indonesia Dairy Exports By Volume (Tonnes), 2006 - 2010

Product	Tonnes				
	2006	2007	2008	2009	2010
Buttermilk / Butter Milk Powder (BMP)	4,847	5,442	5,336	6,018	7,652
Butter / Butteroil	86	19	283	1,127	1,224
Cheese	918	428	541	618	765
Milk	7,972	8,792	11,830	13,330	16,144
Other Milk Preparations	26,449	20,884	41,512	27,854	20,962
Skim Milk Powder	820	1,073	1,159	1,368	847
Whey & Why Powder	1,580	163	445	371	301
Whole Milk Powder	-	-	-	-	-
Yoghurt	155	126	335	507	334
Total	42,827	36,927	61,441	51,193	48,229

Source: Katalog BPS 8202003

Table 15. Indonesia Dairy Exports - By Value (US\$'000), 2006 - 2010

Product	Value US\$'000				
	2006	2007	2008	2009	2010
Buttermilk / Butter Milk Powder (BMP)	3,811	5,538	6,397	6,078	8,596
Butter / Butteroil	125	318	1,232	2,455	5,160
Cheese	2,139	1,281	2,397	2,005	2,589
Milk	4,592	6,220	10,093	9,986	11,755
Other Milk Preparations	65,589	60,196	184,583	64,598	59,072
Skim Milk Powder	1,331	1,819	2,677	2,309	1,192
Whey & Why Powder	1,452	305	844	807	268
Whole Milk Powder	-	-	-	-	-
Yoghurt	223	284	828	687	320
Total	79,261	75,961	209,051	88,925	88,952

Source: Katalog BPS 8202003

5. GOVERNMENT REGULATIONS IMPACTING ON DAIRY BUSINESS IN INDONESIA – INVESTMENT AND TRADE

5.1 Import Tariffs

Despite the very high bound tariff rates on dairy products, applied rates on most products are five percent. The exceptions include some processed products, such as yogurt, and some concentrated milk and cream, which are subject to a higher applied tariff of 10 percent. Dairy imports face a number of regulations in Indonesia. Finished milk products can only be imported by companies appointed by Indonesia's government.

In the Import Duty Tariff Book published by the Finance Ministry, import duties on milk products is five percent and value added tax (VAT) is 10 percent.

5.2 Import Permits and Certificates

5.2.1 Export Certificates Required by Government for Dairy Products

- a. Sanitary Certificate from Ministry of Agriculture
- b. Health Certificate & Certificate of Free Sale from National Agency of Drug & Food Control (BPOM).
- c. Attestation required on Certificate:
 - Fit/safe for human consumption
 - Freely sold in the exporting country
- d. Halal Certificate from Indonesia Council of Ulama (MUI). Attestation required on certificate: product produced according to halal standards.

5.2.2 Specific Requirements on Export Certificates for Dairy Products

- a. The country or part of a country or zone of origin is free from FMD and rinderpest for at least three 12 month periods.
- b. The dairy products originate from herds or flocks that were not subjected to any restrictions due to brucellosis or tuberculosis at the time of milk collection
- c. The milk or cream comes from a processing industry establishment approved by the National Government and implementing a HACCP plan
- d. For the inactivation of pathogens present in milk or cream one of the following procedures has been used:
 - Ultra-High temperature (UHT = minimum temperature of 132 °C for at least one second)
 - If the milk has a pH less than 7.0, simple high temperature short time (HTST) pasteurization
 - If the milk has a pH of 7.0 or over, double HTST
- e. Inactivation of microbiology by radiation is prohibited
- f. The milk or cream is derived from an accredited processing plant and processed in accordance with Islamic procedures and stated with a halal certificate
- g. The milk or cream does not contain preservatives, additives, and/or other substances at levels which may cause a hazard to human health
- h. The milk or cream has been processed in accordance with sanitary and hygiene requirements so that the milk or cream is safe and fit for human consumption
- i. The milk or cream has been government inspected on the day of shipment and is wholesome, safe, and fit for human consumption

5.2.3 Other Certification/Accreditation Requirements

Any entry of animals, materials of animal origin, or products made of materials of animal origin are subject to the following conditions:

- a. Importers must obtain an import permit from the Director General of Livestock and Animal Health Services (DGLAHS), Ministry of Agriculture prior to importing.
- b. Must be accompanied by a Certificate of Origin stating that the animals, materials of animal origin, products of made materials of animal origin came from an area known to be free from quarantine disease in Category I and acknowledged by a Government of Indonesia (GOI) authorized official if originating from abroad
- c. Importation must be made through designated points of entry

5.2.4 Other certificates needed for certain products

- a. Composition analysis certificate from producers (must be original, valid for 6 months)
- b. Original document listing production date and expiration date
- c. Products with short shelf life, such as: milk and milk products, and other high risk foods, should have at least 2/3 of shelf life remaining at time of export
- d. Certificate of Origin Country can be issued by Chambers of Commerce or notary public
- e. Materials of animal origin or products made of materials of animal origin, which include dairy products, intended for human consumption must also be accompanied by a Halal certificate from an accredited Islamic Council

5.3 Product Registration

Imports of dairy products, like all food imports, are tested by the Agency for Drug and Food Control called Badan Pengawas Obat dan Makanan (BPOM), a process that is reported to be complex, time consuming and costly (USTR 2007). Tests require foreign suppliers to provide detailed information on ingredients and processing. The testing fees are expensive, ranging from US\$120 to US\$1,200 per product, and may be borne by foreign food suppliers.

Government Regulation No. 69 (1999) stipulates that the government institution which is responsible for regulating and supervising the safety of foods and drugs in Indonesia is the Food and Drug Control Body (BPOM).

There are three types of registration numbers:

1. Training Certificate (Sertifikat Penyuluhan) – for a small company with limited investment where monitoring is done by Regional Health Service by providing guidance or training
2. MD Number – for local food and beverage manufacturer with high investment which is capable to comply with government regulation
3. ML Number – for imported processed food and beverage products

All processed food and beverage products have to be registered before they can be distributed to the market. The registration process is articulated by the Head of BKPM in decree No. HK.00/05.1.2569, in the document “Criteria and Mechanism of Food Product Evaluation”, Chapter III Article 9.

The applicant must submit as follow: (1) Registration form, (2) Product sample, (3) Labelling design and brochure if available, (4) Laboratory analysis, (5) For product manufactured

locally: copy of permit or registration letter from Industrial and Trade Department, or permit from BKPM, (6) For repackaging product: reference letter from the origin manufacturer, (7) For licensed products: origin manufacturer license letter, (8) For imported products: distributorship letter from the overseas manufacturer, health certificate or free sale certificate.

Approval will be given at the latest 60 days after the registration documents are submitted¹⁶ and BPOM RI MD or ML Number will be given.¹⁷ Final labelling must be submitted not more than three months after the approval is given.¹⁸ All products must be re-registered every five years.¹⁹

5.4 Labelling

Processed food product labelling requirements are governed by Government Regulation No. 69 in 1999. Label requirements are designed to ensure that the consumer can be accurately informed about the ingredients in processed food and its status as halal or non-halal.

Key points of the current labelling requirements include:

- All packaged food products distributed in Indonesia must be labelled exclusively in Bahasa Indonesia language, Arabic numbers and Latin letters.
- The use of any other language, number and letters is permitted only where there are no substitute Indonesian words or if there is a difficulty in finding Indonesian words with a similar meaning.
- The use of stickers was authorised temporarily (until new legislation was enacted).
- Specific wording regarding content is required for labels of certain food items including milk products, baby food, alcoholic beverages, and halal food.
- If the product is halal, it must be certified by an approved authority.
- The expiration date of perishable food items must be shown (and imported products must be landed in Indonesia with at least 2/3 of their stated shelf life remaining).
- Food additives must be identified.
- The name and address details of the manufacturer or importer must be stated.
- There are specific requirements for labelling of products with GMO content greater than five percent and also for irradiated products.
- SNI marks must be shown when relevant compulsory standards exist (these apply to sugar, salt and wheat flour).
- Net weight or net volume has to be stated

5.4.1 Information on Nutrition Content²⁰

1. Food Nutrition labelling shall be stated on the Label for any food which has:
 - a. Nutrient declaration for any food containing vitamins, minerals, and or other added nutrient; or

¹⁶ Head of Food and Drug Control Body decree No. HK.00/05.1.2569 about the Criteria and Mechanism of Food Product Evaluation in Chapter V Article 15.

¹⁷ Head of Food and Drug Control Body decree No. HK.00/05.1.2569 about the Criteria and Mechanism of Food Product Evaluation in Chapter V Article 16.

¹⁸ Head of Food and Drug Control Body decree No. HK.00/05.1.2569 about the Criteria and Mechanism of Food Product Evaluation in Chapter VIII Article 22.

¹⁹ Head of Food and Drug Control Body decree No. HK.00/05.1.2569 about the Criteria and Mechanism of Food Product Evaluation in Chapter VIII Article 21.

²⁰ http://www.pom.go.id/public/hukum_perundangan/pdf/FoodLabelling1.pdf

- b. Required by virtue of the provisions in applicable rules and regulation in the field of the food quality and food nutrition, shall be enriched with vitamin, mineral and or other nutrient.
2. Information on food nutrition content shall be declared with the following order:
 - a. Total energy value, in detail by virtue of energy value stemming from fat, protein and carbohydrate;
 - b. Total amount of fat, saturated fat, cholesterol, total carbohydrate, fiber, sugar, protein, vitamin and mineral.
3. Where nutrition labelling is applied, the declaration of the following is mandatory:
 - a. Serving size;
 - b. Serving amount per package;
 - c. Energy value per serving;
 - d. Protein content per serving size (in grams);
 - e. Fat content per serving size (in grams);
 - f. Percentage of the reference RDA (Recommended Dietary Allowance of Nutrients).

5.5 Specific Requirements for Dairy Products

Milk industry is also required to follow additional regulations as follows:

1. Metal Pollution - Maximum limits for metal content in powder milk as follows: Arsenic (As) 0.1 mg/kg, lead (Pb) 0.3 mg/kg, copper (Cu) 20 mg/kg, zinc (Zn) 40 mg/kg, tin (Zn) 40 and mercury (Mg) 0.03 mg/kg
2. Microbe Pollution - Maximum limits for microbe content for powdered milk are MPN Coliform 10^2 per gram/ml. Salmonella Negative, and Staphylococcus aerius 10^2 and Flat Figure 5.10^5 per gram /ml.
3. Vitamin K not Allowed in Milk Products
4. Addition of Nutrients (Regulation of the Drug and Food Watchdog No. HK 00.05.1.52.3572)
5. Reference for Nutrition Label (The Decision of head of the BPOM No. HK. 00.05.52.6291)
6. ASI (Mothers Milk) Substitutes (Regulation of the Health Minister No. 240/Men.Kes/Per/V/

5.6 Investment Laws

In June 2010 the Indonesian Government published the new Negative Investment List based on Presidential Regulation No. 36 Year 2010 about businesses that are open or closed for investment. The latest Negative Investment List is based on the investment law which was enacted in 2007.

The 2007 law sets out a more comprehensive description of which business sectors are opened and closed to investors. The new list, required under the recently enacted Investment Law, governs a total of 338 business sectors, of which 69 sectors would now be more open than before, with 11 becoming more restrictive. The list increases the number of closed sectors to 25 from 11 previously to protect the national interest in such areas as public health, the environment, culture and natural biodiversity. It also prioritizes 43 sectors for small and medium enterprises. Other sectors will, however, be more open to foreign investors than before. Under the new rules, non-national investors will be allowed to take controlling stakes in agriculture and plantation firms (up to 95 percent).

6. DAIRY INDUSTRY DEVELOPMENT – SUMMARY OF MAJOR ISSUES

6.1 Industry Location, Size and Structure

6.1.1 Dairy Farmers

The dairy industry in Indonesia is concentrated in only three of the 33 provinces – West Java, Central Java and East Java. Over 97 percent of all dairy cows are located in these three provinces which produce 97 percent of Indonesia's milk. In 2010, the majority of Indonesia's dairy cows (57 percent) and milk production (50 percent) was located in only five regencies in Indonesia – Malang and Pasuruan (East Java), Boyolali and Semarang (Central Java) and Bandung / West Bandung (West Java).

Over the last few years, the Indonesian dairy industry has been expanding to meet the increasing demand for milk and dairy products. Dairy cow numbers have increased by an average of 7.4 percent per annum over the last five years to reach 495,231 dairy cows in 2010. Milk production has also increased during this five year period by an average of 14.6 percent per annum to reach 927,838 tonnes in 2010. However, the biggest growth over the last five years has occurred in East Java where dairy cow numbers and milk production increased by an average annual rate of growth of 14.6 percent and 24.3 percent respectively.

The majority of cows in Indonesia are owned by individual farmers with an average of three to four cows each. In East Java, 94 percent of cows are owned by individual farmers where dairying is only a part time business for many farmers. However, for some individual farmers milk is their main income source.

Many of the individual dairy farmers are represented by the Indonesian Association of Dairy Cooperatives (GKSI) which oversees industry development including policies regarding sourcing funding for infrastructure and cattle and milk price negotiation. Some larger size dairy farmers operate outside the cooperative system and sell direct to milk processors.

Corporate dairy farming plays only a small but expanding role in Indonesia; it represents only six percent of dairy cows and milk production in East Java. In Indonesia there are five corporate dairy farms with four located in West Java and one in East Java.

Corporate farming will expand into North Sumatra with two major liquid milk companies planning to establish dairy farms and milk processing plants near Medan in North Sumatra in 2011 / 2012 with a focus on export to Asian markets.

6.1.2 Dairy Processors

The Indonesian Association of Milk Processors (IPS) represents the milk processing sector and has six members as follows: Frisian Flag, Nestle, Sari Husada / Danone, Ultra Jaya, Indolakto / Indomilk and PT Mi Rota (Central Java). The five major companies absorb about 85 percent of Indonesia's milk production. Their main factories are located in the following regions:

- Jakarta – Frisian Flag
- West Java – Indolakto, Ultra Jaya
- Central Java – Sari Husada
- East Java – Nestle

In total, there are over 30 companies involved in milk processing in Indonesia producing over 870,000 tonnes of dairy products in 2009. The majority of the small dairy processing companies have their factories located in Jakarta.

IPS members inform GKSI of their supply needs for a year then enter into individual contracts with the various GKSI members. Each milk processor negotiates its own price. The price is set and agreed to every three months. The price varies depending on the standard of milk quality which is based on: TPC, total solids, fat content and protein content. Milk processors may offer price incentives and penalties to farmers to produce better quality milk.

6.2 Milk Supplies – from Dairy Farmer to Milk Processor

The milk processors buy fresh milk from the dairy farmers via the cooperatives or direct with some large dairy farmers.

Koperasi Unit Desa (KUD) is the local dairy centre known as the primary village cooperative of GKSI. KUDs supply farmers with advice and services on production, animal health (veterinarian) etc. The KUDs are also the local milk collection centres and are the key link between farmer and milk processors. The KUD collects and distributes money to the farmer based on milk quality and volume. There are an estimated 220 KUDs in Indonesia with about 100 located in Java. Some of the KUDs have exclusive arrangements to supply a major milk processor and some have established their own milk products and brands for the local market.

KUDs can make a higher return per litre of milk from manufacturing their own branded milk products for local customers rather than selling direct to the major milk processors as raw milk. However, the local market consumes only a small percentage of the local milk collected by KUDs and therefore the major milk processors are an important customer for the KUDs.

6.2.1 West Java

In West Java there are 23 KUDs with a total of 90,703 dairy cows producing 166.8 million litres of milk annually from 25,375 farmers. There are two large KUDs in West Java that receive 55 percent of the milk produced from 48 percent of the cows in the region – KPSBU Lembang and KPBS Pangalengan.

KPSBU Lembang is one of the largest KUDs in West Java. It receives its milk from 5,178 farmers that have a total of 22,026 cows and produce about 45.4 million litres of milk per year. KPSBU Lembang receives its milk from 100 milk collection centres (MCC). Testing of the farmer's milk occurs at the MCC when the farmer brings the milk. Only five of the 100 MCCs have cooling units; these are the larger MCCs.

The KUD in Lembang has its own trucks that collect the milk twice daily. There are 30 small trucks (2,000 litre tanks) to pick up the milk from the MCCs and 15 large trucks (10,000 litre tanks) to deliver the milk to the milk processors. The factory receives a daily supply of 130 tonnes of fresh milk. The milk is cooled to two degrees and distributed as follows:

- *90 percent is sent to IPS milk processors in Jakarta*
- *Nine percent is sold at the factory gate in 1 litre bags; 10 tonnes per day*
- *One percent is processed into sterilized milk and yoghurt (500 litres' each per day) for local consumers*

Given the close proximity of the KUDs in West Java to many of the dairy milk processors located in Jakarta / West Java there are more options for selling milk. Hence, the relationship and loyalty between KUDs and some milk processors may not be as strong as it is in East Java.

6.2.2 East Java

In East Java there are 51 KUDs with a total of 231,405 cows producing 482,014 tonnes of milk from about 40,000 farmers.

In East Java, Nestle is the main milk processor and receives about 650 tonnes of milk per day from 31 KUDs supplied by 33,000 farmers; this is about 50 percent of the milk produced in East Java. Nestle has agreements with all the KUDs that supply them and has its own product specifications and SOP for suppliers. There is a formal and strong relationship between Nestle and its KUD suppliers. One of the largest KUDs in East Java and a supplier to Nestle is KUD SAE Pujon.

KUD SAE Pujon receives milk from 8,300 farmers that have a total of 26,000 cows. The milk is received by the KUD from 31 milk collection centres located in 10 villages. The KUD receives 112 tonnes of milk per day increasing to 126 tonnes per day in September. The milk is received at the KUD at four to five degrees as all MCCs have cooling units, supplied by Nestle.

6.3 Milk Quality and Prices

6.3.1 Government's SNI Standard for Milk

The Government has a milk quality standard (SNI) which stipulates the quality parameters for fresh milk. There is a new SNI being developed for milk products by the end of 2011. According to industry sources, only 12 percent of all dairy farmers meet the SNI standard while 75 percent of Nestlé's farmers meet the standard. The main problem with milk quality is very high TPC above the SNI level of one million.

6.3.2 Milk Specification

Farmers are required to meet a milk specification and are paid incentives / penalties accordingly. The milk specification varies across milk processors. A typical example from a medium size milk processor is below.

- Fat - a min 3.5 percent
- Total Solid Min 11 percent
- TPC below one million cfu/ml
- No antibiotic
- No carbonate
- PH 6.6-6.7
- Acidity <0.2 percent
- Lactic Acid

6.3.3 Milk Quality Received at Factory

The main issues of concern to milk processors are high TPC levels (higher than the SNI level of one million) and warm milk (need for more milk cooling units). High TPC levels are a concern for milk processors as it impacts on the usage of the milk and it is costly (more energy required) to reduce the milk temperature.

1. TPC Levels

- a. West Java – According to GKSI West Java, the average TPC amongst dairy farmers in West Java is about four million.
- b. Major Milk Processor in West Java – The average TPC of milk quality received from its suppliers is three million. To address the milk quality issue the company has had a campaign by its farm advisors with training on hygiene practices; replacing plastic buckets with metal ones; and installing some milk cooling units.
- c. Major Milk Processor in East Java – The business has reduced TPC levels from an average of four million in 2004 to 700,000 in 2011 through the installation of cooling units at MCCs.
- d. Major Corporate Farmer / Milk Processor - The milk is considered A grade quality with an average TPC of less than 50,000. The milk is cooled to four degrees within eight minutes of the cows being milked.

2. Milk Cooling Units at KUDs and MCCs

- a. In East Java, a major milk processor (Nestle) has been providing milk cooling units (with capacity of 2.5 tonnes each) to MCCs. During 2010 and 2011 the company will provide more than 100 milk cooling units to MCCs in East Java. The milk is cooled at the MCC to four degrees before it is sent to the KUD.
- b. In West Java there are 22 KUDs with 80 percent having cooling units. However, most of the MCCs that receive the milk from the farmers don't have cooling units; only about 20 percent have cooling units.
- c. Only five of the 100 MCCs that supply milk to KPSBU Lembang (West Java) have cooling units.
- d. A major milk processor in West Java has worked with its KUDs to install milk cooling units to improve the quality of milk received. All the KUDs now have milk cooling units whereas two years ago the milk received was warm and therefore expensive to process and to reduce the temperature. If the milk received has a temperature of more than eight degrees the company will give a penalty of Rp. 50 per litre.
- e. The Regional Government of West Java has received a grant from the Central Government to install milk cooling units at MCCs. They installed three units in 2010 and plan to install four units in 2011. This will assist to reduce the TPC by cooling milk quickly when received from the farmer.

6.3.4 Milk Prices along the Supply Chain

1. From Milk Processor to KUD

- a. A large milk processor paid to its KUDs an average price of Rp. 3,600 per litre ranging from Rp. 3,400 to Rp. 3,900 per litre, depending on quality.
- b. Some milk processors may also refuse to accept milk below their minimum standard.
- c. A small dairy processor, PT Cisarua Mountain Dairy (Cimory), in Sukabumi pays the highest prices to dairy farmers in Indonesia and is considered a good benchmark and business model for the dairy industry to adopt. Farmers are paid in the range of Rp. 3,700 to Rp. 4,400 per litre; the difference depends on Total Solids and TPC.

2. KUDs fee
 - a. KUDs take a commission of 10 percent to 25 percent (depending on the KUD) for various services provided.
3. From KUD to Farmer
 - a. In West Java the average price paid to farmers from a KUD depends on quality and ranges from Rp. 2,900 to Rp. 3,700 per litre.
 - b. In East Java, a KUD may receive a payment of up to Rp. 3,900 per litre from a milk processor and pays to the farmer about Rp. 3,500 per litre of milk; this is for the best quality milk.
 - c. In East Java, many of the KUDs provide different prices (penalties and incentives) to farmers for better quality milk.

6.3.5 Break Even Price and Farmer Payment Terms

The break even price for milk to farmers varies depending on the farmer's business approach and farm size. According to GKSI a break even price for milk from a typical small farmer is about Rp. 3,500 per litre and therefore prices paid to farmers are considered to be too low. However, some farmers can return a cash flow profit of Rp. 1,000 per litre based on a milk payment of Rp. 3,000 per litre. Given that most dairy farmers are only part time dairying this is considered to be a good additional income.

Dairy farmers are paid twice per month via the KUD, about two weeks after milk delivery.

6.4 Technical Services to Farmers

There is a wide range of support that is provided to dairy farmers by the cooperatives and milk processors. In addition some training to dairy farmers is also provided by:

1. The various international aid organisations in cooperation with local research institutes.
2. Private companies that supply equipment and products to dairy farmers provide some technical support and advice to dairy farmers.
3. The DGLAHS and Regional Government provide extension services / training to KUD managers, farmer groups and MCC technical managers.

6.4.1 Cooperatives

The cooperatives, which are owned by the farmers, provide a wide range of support to its members including:

- Technical support through training at Milk Collection Centres or KUDs
- Animal health advice and AI services
- Animal feed concentrates at a prices from Rp. 1,500 per kg to Rp. 2,200 per kg
- Health insurance for the farmer and loans to the farmer at no interest

6.4.2 Private Farmers

1. In West Java, a small milk collector has four technical advisors that provide a range of technical support to the 50 farmers in its group. These services include:
 - a. Information on AI, hygiene and animal health information
 - b. Provision of semen straws from Lembang AI
 - c. Supplies a feed concentrate (35 tonnes per day) at Rp. 1,900 per kg
 - d. Provides credit to the farmer for feed and other equipment
2. Large scale corporate farmers provide technical support to the farmers in their region in the form of herd management advice and provision of feed concentrates.

6.4.3 Milk Processors

Each major milk processor has its own agribusiness team. They provide a wide range of advisory services to the farmers and may inspect the farm premises to ensure that it meets the guidelines set by the company. Support may be provided through:

- a. Farmer visits – herd management training and demonstration to farmers in hygiene (cleaning equipment) and how to improve microbes total count etc.
- b. Laboratory testing
- c. Energy audits to minimize energy costs and reduce losses
- d. Loans (no interest) for milking equipment, cooling units to KUDs, MCCs and large farmers

Nestle has a team of 12 agribusiness advisors with seven people in milk procurement and five people in dairy industry development. Nestle provides a range of services to farmers and to KUDs as follows:

- a. Financial loans to KUDs for milk cooling units etc as well as loans to farmers at low interest rates*
- b. Technical support to farmers and KUDs*
- c. The company has also supported the development of biogas for farmers with a target of 8,000 units by 2012. This helps to reduce the farmer's operational costs.*

6.5 Dairy Farm Production Issues

The main problems facing dairy farmers in Indonesia to improve farm income are:

1. Low milk production per cow; average of 10 litres per cow per day. However, some large scale dairy farmers achieve average milk production per cow of 26 litres per day.
2. Quality and affordability of good feed; most farmers cannot afford to pay for higher quality feed as the price paid for milk is too low
3. Low quality milk (high TPC levels) due to poor handling practices and lack of cooling units; hence farmers are penalised and payments are reduced.
4. Low milk prices paid by the major milk processors
5. Herd Management and Herd Health
 1. Need to reduce mastitis through better hygiene practices
 2. Need to reduce cow stress
 3. Need to improve calf rearing systems to reduce calf mortalities to more acceptable levels
6. Quality of cows – need for better genetics

6.6 Marketing and Financial Issues

The Indonesian Government supports the expansion of the Indonesian dairy industry and provides loans to farmers to buy dairy cows. However access to the money is difficult as many farmers don't have collateral to meet the Bank requirements.

KUDs can have cash flow problems if they develop more dairy products to sell locally. KUDs pay their farmers within 10 days of milk receivables but do not receive payment for 40 days from retail customers. Although it can be more profitable to expand into new milk products it is difficult financially to manage the business and to gain access to funds for marketing. KUDs do receive some financial support from various milk processors.

7. DAIRY INDUSTRY DEVELOPMENT – CONSTRAINTS AND OPPORTUNITIES

7.1 Introduction

The Indonesian Government has set a target of achieving 50 percent self sufficiencies in milk supply by 2014; up from about 30 percent in 2010.

To achieve this target, the Government is developing a blue print for dairy industry development in Indonesia with aims to:

1. increase milk consumption from 10 litres per capita to 15 litres
2. improve farmer income
3. increase local milk production to 50 percent of supply needs

The Government's strategy (blue print) for dairy industry development is as follows:

1. Government has provided funds for the import of dairy cows
2. Increase use of AI and Embryo transfer to increase dairy cow population
3. Animal health training – provided now by JICA
4. Feed quality and quantity – develop pasture farms; develop mini feed mills; produce concentrates from local raw materials
5. Farmer Training
6. Fund for supply of equipment (e.g. milk cooling machines) from the Directorate of Processing and Marketing
7. Information system – needs to be co-ordinated. Funds have been given to seven provinces to implement IT systems
8. Support dairy institutional and farm business by setting up a body to represent dairy farmers

The Government is also reviewing its milk quality standard (SNI) which stipulates the quality parameters for fresh milk production.

If the Government's aim is to increase milk production and to improve dairy farm income in Indonesia there are two key priority issues that need to be addressed:

1. Increase milk production per cow from an average of 10 litres per day to 15 litres per day
2. Improve milk quality by reducing TPC levels to the SNI level of less than 1 million

7.2 Low Milk Production

Dairy cow milk production is too low with an industry average of only 10 litres per cow per day with some farmers achieving only 7.5 litres per cow per day. However the best dairy farms can achieve milk production of up to 26 litres per cow per day.

7.2.1 Feed Management

Most of the interviewees (and previous research studies) suggested that milk output per cow can be increased with provision of better quality feed.

Inferior quality and availability of feed can be addressed through:

- identify better forage species (e.g. legumes)
- provision of information on basic silage making and concentrate usage
- utilise marginal land for forages

In 2010, Jeremy Hockin (from Ultra Jaya) undertook a trial with local farmers to show that milk productivity per cow can be increased by providing better quality of feed. The result (details below) showed that better and higher price feed resulted in higher gross milk returns and higher net profits per cow per day.

- *Spending Rp. 10,450 per cow per day on better feeding yielded an extra Rp. 24,300 per cow per day on higher milk returns during early lactation.*
- *The cows each produced 3.8 litres per day extra milk with 0.8% higher total solids, which was worth an additional Rp. 507 per litre (Rp. 3,690 v Rp. 3,183).*
- *The net profit was Rp. 13,870 per cow per day (milk income less feed costs).*

Moran examined and reported on the future directions in feeding management of small holder dairy cows²¹. The following are the major key feeding issues that require further attention at both the research and extension levels:

- As forage supplies are of paramount importance, inexpensive, year-round and sustainable supplies of quality roughages must be developed for most systems of small holder dairy farming
- Because dry season forages are poorer in nutritive value, conserved excess wet season forages often form the basis of most profitable dairy systems
- The high nutrient demands of milking cows negates many of the recommended feeding systems based on chemically treated low quality roughages
- Tropical forages are high in fibre, so farmers will always require concentrate supplements
- Agro-industrial by-products will always form the basis of concentrate supplements, because of increasing demand for land to grow crops for human consumption
- Energy is and is always likely to be the major limiting feed nutrient in small holder dairying. Improving the energy status of milking cows will be of benefit to both the production of milk and milk solids
- Dairying is a business so feeding decisions should be based on logical and appropriate economic information with “milk income above feed costs” being the single most useful measure of success
- Improving the knowledge on basic ruminant nutrition will greatly assist many dairy advisers to formulate more profitable milking rations, because generic recipes are notoriously unreliable
- Farm development is often limited by inefficient (and even inappropriate) technology transfer, in that extension procedures do not always acknowledge farmer skills and adult learning principles.
- With continuing emphasis on increasing the domestic milk production in most SE Asian countries, it is important not to “overstock” any developing dairy region. Feed audits, particularly of “home grown” forage supplies, should be undertaken and adhered to when projecting optimum numbers of dairy stock for any particular region

7.2.2 Low milk price to farmers

IPS members (which control 85 percent of milk supplies) inform the GKSI of their supply needs for a year then enter into individual contracts with the various GKSI members. Each milk processor negotiates its own price. The price is set and agreed to every three months.

²¹ Moran J.B., “Constraints to small holder dairy farming in South East Asia”, Paper delivered to 11th Animal Science Congress, Asian Australasian Association of Animal Production Societies, Malaysia, Sep 2004.

The price varies depending on the standard of milk quality which is based on: TPC, total solids, fat content and protein content.

Returns to dairy farmers is considered low since individual dairy farmers who are part of a cooperative get paid from Rp. 2,700 to Rp. 3,500 per litre; the lower price reflects a penalty of up to Rp. 800 per litre for milk that does not meet quality standards.

There is a need to reduce costs of production, improve milk quality (so more farmers receive incentive payments not penalties) and assist KUDs in dairy market and product development.

A small dairy processor, like PT Cisarua Mountain Dairy (Cimory), in Sukabumi is able to pay higher prices to dairy farmers as its business model is based on the production of higher value added dairy products eg yoghurt drinks, yoghurt, fresh milk and cheese.

As dairy consumption increases and consumers demand more variety in local dairy products there is an opportunity to increase the value along the supply market chain by linking producers more closely with customers.

7.2.3 Herd Management / Mastitis

It has been reported that numbers of dairy cows in lactation is low at only 60 percent. There is a need for greater emphasis on training of farmers in husbandry practices.

7.2.4 Provision of better genetics

Semen for artificial insemination in cattle is domestically produced by two agencies located in Malang, East Java and Lembang, West Java. Obtaining a licence to import semen is complex. It has been suggested that the dairy industry needs to free up and improve the genetic base by importing the best semen. There may need to be a review of the policy on what genetics can be imported to improve the breeding of dairy cattle in Indonesia.

The Government's policy on the imports of dairy cows restricts it to "Holstein Frisian" mainly from Australia, which are only suited for the cooler climate (above 800 meters). There is an opportunity to import cross breeds which are smaller animals and more suited to Indonesia's warmer climate. However, there is no protocol for the import of this dairy cattle breed.

7.3 Low Milk Quality

The quality of raw milk in Indonesia suffers because of poor milking hygiene practices, both on-farm and post-farm gate. Milk Collection Centres and farmers lose considerable money each month through penalties for poor milking hygiene even though the price signals seem sufficient to encourage investments in improving milk quality.

Low milk quality is due to poor management practices and cool chain logistics. There is an opportunity to provide some regular training and information on better operational procedures to farmers to improve their herd management skills and hygiene practices.

There has been a significant increase in the number of milk cooling units that have been installed at KUDs and MCCs resulting in an improvement in milk quality. However, the main issue is to minimize the time from farm to cooling unit and this requires that milk cooling units be placed as close as possible to farmers at MCCs in the farmer villages.

Moran and Miller undertook a number of strategic workshops in East Java and West Java to develop an industry action plan to improve milk quality. The key problems to address are summarised below.²²

The key on-farm problems to be addressed by action plans were as follows:

1. The animal shed: cleanliness, supply of clean water, equipment to heat water
2. The animal: clean and dry teats, subclinical mastitis
3. The milker: human health, clean attire, no smoking while milking, milking techniques
4. The equipment: clean and sterile metal buckets, storage upside down
5. Milk storage and transport: milk filtered prior to bulking, rapid delivery to MCC in covered containers

The key post-farm gate problems to be addressed by action plans were as follows:

1. Platform testing: reliable and repeatable tests (particularly for adulteration of milk)
2. MCC hygiene: provision of sufficient hot water for farmers to wash buckets and for staff to wash MCC plant, "breaking down" plant for effective washing and sanitising
3. Cooling times: rapid delivery from small MCC's to cooling units, maintaining low milk temperatures in transit to processing factories
4. Staff management: incentives for good and disincentives for poor MCC work practices, accreditation courses in milking hygiene for MCC staff
5. Distribution of milk premiums: reward individual farmers for good hygiene
6. National MCC management: bulk purchase and supply of quality detergents and sanitisers, inventory for maintenance and regular upgrading of milk handling equipment, closer collaboration with milk processors for consistent national milk quality standards and payments

7.4 Other

7.4.1 Low Farmer Skills

There is a lack of expertise / interest amongst young people to enter dairy farming. There is a need to develop some joint programs with NZ / Aust dairy farmers involving scholarships / cadets / training / leadership.

Some milk processors do provide formal training at KUDs while some KUDs organise monthly farmer group training at the MCCs in the village.

There is an opportunity to develop a National Centre for Dairy Education (NCDE) in Indonesia (similar to the NCDE model in Australia) linked to a polytechnik in a major dairy region. The vision is to develop the best dairy people in Indonesia. It may involve linking a TAFE provider in Australia of dairy programs (eg GOTAFE)²³ with an Indonesian polytechnic that has a strong agribusiness curriculum.

7.4.2 Industry / Business Structures

In many instances, dairying is only one source of farmer's income as the majority of cows in Indonesia are owned by individual farmers with an average of 3 to 4 cows each. In East Java, 94 percent of cows are owned by individual. The dairying industry is dominated by small farmers in a cooperative system.

²² Moran, J. and Miller, J. (2003). Improved milking hygiene for high quality milk. Report on 2002 workshops in Indonesia and Malaysia, DPI Kyabram.

²³ GOTAFE = Goulburn Ovens Institute of TAFE

An opportunity is to develop private sector “hubs” (centres) which provide professional advisory services to farmers in a specific region. The hubs would act as a milk collection centre with a cooling unit and provide advisory services to farmers. Farmers would supply their milk to the collections centres where the quality is tested and the milk is cooled. There are different grades for quality and penalties for high bacterial counts (TPCs). The company provides training to farmers to reduce bacterial count in milk and address other quality issues. The company could supply milking equipment to farmer groups where more than 10 farmers join their cows in one location.

Another approach recommended by the West Java Regional Government is to set up large scale investments in “cow colonies” (similar to Ultra Jaya’s dairy farm). This would consist of large dairy sheds holding 50 or more cows and development of areas of forage production. Although small holders could still own and manage their own herds in the large sheds, the perceived benefits of cow colonies is in the magnitude of size of the total herd management.

In 2009, Ultra Jaya established a 60 hectare dairy farm near Bandung (1.5 hours away at Pangalengan with 1,300 cows comprising 680 milking cows. The aim is to increase this to 3,500 cows by end of 2012 with cows being imported from Australia. The cows produce on average 26 litres per day with many cows doing 40+ litres per day. The concept involves training 75 farmers for 12 months in all aspects of herd management. Each farmer manages 15 cows, which are housed on the farm.

7.4.3 Import regulations

There are a number of import regulations impacting on dairy market development. These include:

1. Export factory registration – the Indonesian Government has required that all overseas establishments that exported dairy products to Indonesia needed to complete an extensive questionnaire re food quality and safety issues.
2. ML registration – bulk milk powders need to be registered with BPOM; the importer receives a letter that is renewed every five years.
3. Halal certificates – most imported food items have a halal certificate. However it is not mandatory that dairy products have a halal certificate but it makes it easier to import.

7.4.4 Finance

The Government supports the expansion of Indonesian dairy industry and provides loans to farmers to buy dairy cows. However access to the money is difficult as many farmers don’t have collateral to meet Bank requirements.

8. IFC ADVISORY SERVICES – DEVELOPING INDONESIA’S DAIRY INDUSTRY

The research has identified an opportunity for IFC to provide advisory services to support the development of Indonesia’s dairy sector with a focus on small holder dairy farmers. Advisory services could be delivered through a project based on the following objectives and approach.

Objective

The overall objective is to improve the efficiency and profitability of Indonesia’s dairy value chain through capacity building and adoption of improved production technology and post farm gate practices.

Approach

The approach²⁴ involves five key project activities as follows:

1. Improving the performance of milking cows
2. Improving young stock management
3. Improving the efficiency of the post-farm gate dairy value chain
4. Benchmarking business performance on Indonesia’s dairy farms
5. Building capacity in Indonesia’s dairy industry

Project 1 - Improving the performance of milking cows

Objectives:

- To improve feeding management to achieve 25 percent increases in the milk production of lactating dairy cows within five years
- To improve all aspects of herd management, such as environmental, animal health, reproduction and milking hygiene
- Increase the genetic diversity of imported dairy stock

Project 2 - Improving young stock management

Objectives:

- To reduce the wastage of young dairy stock to second calving by 50 percent
- To reduce the average age at first calving from 30 to 27 months

Project 3 - Improving the efficiency of the post-farm gate dairy value chain

Objective:

- To reduce losses in both the amount and the value of milk along the value chain from farmer to cooperative to processor to distributor to consumer

Project 4 - Benchmarking business performance on Indonesia’s dairy farms

Objective:

- To develop and instigate a robust monitoring system to track changes in the business performance of Indonesia’s dairy farmers

Project 5 - Capacity building Indonesia’s dairy industry

Objective:

- To improve the farm management skills of Indonesia’s dairy farmers
- To improve the technical and practical skills of the dairy service providers
- To establish a National Centre for Dairy Education in Indonesia linked to a university / polytechnic in a major dairy region.

²⁴ The approach has been developed in collaboration with Dr John Moran, DPI Victoria

9. REFERENCES

Association of Indonesian Health Supplement Companies and the National Agency of Drug and Food Control (BPOM)

BKPM, "Data Perkembangan Penanaman Modal, Statistic of Direct Investment", December 2009

BPOM, Head of Food and Drug Control Body decree No. HK.00/05.1.2569

Centre for Indonesian Veterinary Analytical Studies, 30th May 2009

CIC Milk Report, 2008 and 2009

CIC Reports on "Study on Industry and Market of Powdered Milk in Indonesia", August 2009

CIC Report on "Study on Industry and Market of Liquid Milk & SCM in Indonesia, 2010

DetikFinance, January 7th 2011

Dinas Peternakan Provinsi Jawa Barat

Dinas Peternakan Provinsi Jawa Timur. Website: www.disnak.jatim.go.id

Dinas Peternakan dan Kesehatan Hewan Provinsi Jawa Tengah

Directorate General of Livestock and Animal Health Services (DGLAHS), "Livestock Statistic 2010". Website, <http://www.ditjennak.go.id>

Euromonitor, "Meal Replacement Products in Indonesia", November 2009

Head of Food and Drug Control Body decree No. HK.00/05.1.2569 about the Criteria and Mechanism of Food Product Evaluation in Chapter V Article 15 & 16; Chapter VIII Article 21 & 22

Interview with Jeremy Hockin (PT Ultra Jaya)

Moran J.B., "Constraints to small holder dairy farming in South East Asia", Paper delivered to 11th Animal Science Congress, Asian Australasian Association of Animal Production Societies, Malaysia, Sep 2004.

Moran, J. and Miller, J. (2003). Improved milking hygiene for high quality milk. Report on 2002 workshops in Indonesia and Malaysia, DPI Kyabram.

Nielsen Indonesia, "Nielsen Shopper Trends", Annual Survey

The Nielsen Company "APAC Retail and Shopper Trends Report 2010". Website: <http://hk.nielsen.com/documents/APACRetailandShopperTrendsReport2010.pdf>

The Indonesian Bureau of Statistics (BPS)

USDA FAS “Dairy Products Annual 2009”, GAIN Report No. ID9032, 19th November 2009

Website: http://www.pom.go.id/public/hukum_perundangan/pdf/FoodLabelling1.pdf

Website: <http://edoc.hu-berlin.de/dissertationen/nugraha-daniel-setiawan-2010-08-27/PDF/nugraha.pdf>

Website: <http://www.publish.csiro.au/nid/220/issue/3363.htm>

Website: http://foodandbeverage.biz/images/National_Dairy_Farming_Industry_SWOT_2005_Bahasa_Version_.pdf

Website: http://www.usdaindonesia.org/public/uploaded/Dairy_and_Products_Annual_Jakarta_Indonesia_10-29-2010%5B1%5D.pdf

Website: <http://bitnak.ditjennak.deptan.go.id/pls>

Website: <http://banksperma.com>

Year of report by Animal Husbandry Services of East Java 2004 – 2010

APPENDIX ONE - LITERATURE REVIEW

This review has examined a range of articles and research reports related to the Indonesian dairy farm and dairy processing industry, in particular those related to industry market development and value chain relationships in the dairy industry. This is not an exhaustive review and many of the reports quoted have detailed references / websites to other relevant studies.

1. “Extending the Concept of Value Chain Governance: An Institutional Perspective. Comparative Case Studies from Dairy Value Chains in Indonesia”, by Daniel Setiawan Nugraha, Phd thesis at Humboldt University of Berlin, Aug 2010.²⁵

This is a comprehensive 255 page study of value chains (VC) in Indonesia’s dairy industry covering farmers, cooperatives and processors.

The VC approach has been widely applied in developing countries to promote economic growth particularly of micro, small and medium enterprises and rural producers. Many cases have shown that VC upgrading is strongly determined by the prevailing governance structure.

In this study three case studies of dairy production centres were undertaken in three different locations: Boyolali in Central Java; Pasuruan in East Java; and Lembang in West Java. In each case, dairy farmers were producing exclusively for one cooperative. The purpose of the study is to explain why some dairy cooperatives thrive (higher performing interaction system) while others stagnate (lesser performing interaction system).

The study found that in the higher performing cooperatives leaders of such cooperatives were aware that the dairy processors (DPI) are and will be their main buyer because the demand for fresh milk on local markets is too low. Furthermore in the long term, as long as they have the capacity to absorb additional milk produced by dairy farmers, DPIs are willing to substitute imported supplies for locally produced milk. It is important for cooperatives leaders to understand and satisfy the requirements of DPIs, particularly milk quality, to establish sustainable business linkage with them.

To comply with DPI requirements, cooperatives leaders need to build the cooperatives capacity to provide collective services required to attain high quality milk production – that is cooperatives are agents of change. Cooperatives reform is then the first and highest priority to expand the dairy business. Cooperatives then need technical advice on how to gradually improve quality standards and what improvement measures to take. They need capacity building for extension workers who will disseminate information, train dairy farmers, and monitor their practices as well as for the cooperatives staff working at milk collection centres. Specific dairy technology is an important issue in installing cooling plants and piping systems. Establishing milk laboratories also requires equipment and know how. Most importantly, financial resources are required to improve plant and equipment at the cooperatives.

²⁵ <http://edoc.hu-berlin.de/dissertationen/nugraha-daniel-setiawan-2010-08-27/PDF/nugraha.pdf>

Good cooperatives leaders perceive that such technical and financial assistance offered by DPIs can provide significant support to build cooperatives capacity to provide collective services.

In the lesser performing cooperatives DPIs hesitate to offer technical and financial advice to lesser performing cooperatives because of their high risk in misusing such support. Such cooperatives leaders may be less enthusiastic in accepting the strict conditions imposed by DPIs, such as transparent information and rigorous control.

Leaders in lesser performing cooperatives often consider the short term benefit of the price margin to be more important than the mid to long term benefit of utilising the technical and financial support offered by the DPIs to build their dairy business.

Rather than provide capacity building directly to the farmers, DPIs need to support the cooperatives to establish services required by the members. In lesser performing systems, value chain upgrading had not taken place, but this was due as much to farmers choosing to maintain traditional farming systems as to poor cooperatives management and leadership. Of the cooperatives surveyed, all the lesser performing ones were multipurpose whereas the higher performing ones were all single purpose, specialising in dairy businesses.

2. “Tropical Dairy Farming in SE Asia”, by Dr John Moran (Senior Dairy Adviser, Department of Primary Industries, Victoria Australia), 1999 to 2011^{26 27}

Dr John Moran has conducted 30 consultancies and about 50 reports on tropical dairy throughout South East Asia, including 11 study tours / workshops in Indonesia, over a ten year period. Each of the consultancy studies involved conducting training workshops in tropical dairy farming and/or advising government, agribusiness and dairy cooperatives on dairy production technology and farm business management. A total of 99 workshops²⁸ have been presented to over 2,700 participants, with visits made to 240 farms and to 116 milk collection centres or dairy processing plants.

²⁶ <http://www.publish.csiro.au/nid/220/issue/3363.htm>

²⁷ Dr Moran has written several reference text books for Asian dairy industries.

- a. Moran, J. B. (2005). *Tropical Dairy farming. Feeding management for small holder dairy farmers in the humid tropics.* (290 pp). CSIRO Publications, Melbourne.
- b. Moran, J. (2009). *Business management for tropical dairy farmers.* (280 pp). CSIRO Publications, Melbourne.
- c. Moran, J. (2010). *Managing high grade dairy cows in the tropics (in press).* CSIRO Publications, Melbourne.
- d. Moran, J. (2010). *Rearing young stock for tropical dairy farms in Asia (in preparation).* CSIRO Publications, Melbourne.

²⁸ There was a wide range of technical topics covered at these workshops.

- a. Forage production – “Growing quality forages for S & E Asian small holder dairy farmers”
- b. Forage conservation – “Making quality silages on S & E Asian small holder dairy farms”
- c. Dairy nutrition – “The principles of dairy nutrition”
- d. Feeding management – “Feeding management on SE Asian dairy farms”
- e. Young stock management – “Improved rearing systems for replacement dairy calves and heifers”
- f. Reproductive management – “Reproductive management for small holder dairy farmers in S & E Asia”
- g. Environmental management – “Managing heat stress on small holder dairy farms in S & E Asia”
- h. Milking hygiene – “Improved milking hygiene and feeding practices to produce quality milk on small holder farms”
- i. Farm business management – “Improving business skills in S & E Asia's small holder dairy industries”
- j. Importing Australian dairy stock to overseas dairy industries – “Post arrival herd and farm management for imported dairy stock”
- k. Strategic Plans for East and West Java dairy industries.

3. “East Java Dairy Industry Scoping Study” by John Lucey, Western Australia Department of Agriculture and Food (DAFWA), 17th to 27th August 2009

This report presents the results of a visit to East Java for a 10 day scoping study of the needs of the East Java dairy industry.

The main issues identified were:

- Infrastructure is a limiting factor e.g. size of cooling plant at the different collection points plus electricity problems.
- Milk price received varied by up to Rp. 900 (US\$0.10) per litre between different cooperatives depending on milk quality based on Total Plate Count (TPC) and Total Solids (TS).
- Price of concentrate varied from Rp. 1,200 (US\$0.13) to Rp. 1,800 (US\$ 0.20) per kg with higher price not always reflecting higher quality.
- East Java Government is providing US \$1.7 million in 2010 to KUDs to assist productivity
- The Government is already proving support for regions they believe have good dairy potential eg KUD Maju Jaya Makmur, Bendungan (NW of Tulungagung), has received Rp. 2 billion from local and Rp. 5 billion from Province under “White Revolution” development plan for region
- The East Java Cooperative model reflects the very strong cultural history of “Gotong Royong (Mutual Self Help) - where small farmers all help each other.
- The Dairy Cooperatives use a Social Model, where everyone trust each other and full transparency in joint activities

The author of the scoping study recommended a training program to be implemented by DAFWA in five KUD districts in East Java - KUD Maju Jaya, Makmur; KUD Setiakawan, Nongkojajar; KUTT Suka Makmur, Grati, Pasuruan; KOP SAE, Pujon; KUD Semen, Blitar.

4. “Indonesia’s Dairy Farming Industry SWOT Analysis - 2005”, by Stanton, Emms & Sia, September 2005²⁹

This objective of this research study was to produce a detailed study of the strengths, weaknesses, opportunities and threats (SWOT) regarding the commercial development of Indonesia's dairy farming industry in the post-1998 environment for trade in dairy products.

The report covers a range of issues impacting on the Indonesian dairy industry with a focus on Java and North Sumatra including: physical resources (the climate and water resources; feed resources); human resources; knowledge resources; capital resources and investments; business and related infrastructure resources; cooperative business structures; road network; cool chain facilities; energy supplies; market for beef cattle and calves; dairy cattle breeding and supply; dairy farming education, training and extension services; feeding practices; clean milking, processing, handling and distribution techniques and technology.

The report recommends the development of a 10-year plan focussing on the following modules.

1. Dairy farm management and animal husbandry;
2. Fodder development and feeding practices;

²⁹ http://foodandbeverage.biz/images/National_Dairy_Farming_Industry_SWOT_2005_Bahasa_Version_.pdf

3. Clean milk production and handling;
4. Milk quality and testing;
5. Co-operative leadership training, including relationships with co-op members;
6. Business and financial management and control for co-operatives;
7. Marketing and distribution of the co-op's products;
8. Training the trainers (because of changes in Indonesia's regulatory environment);
9. Renewable and alternative energy systems for rural area industries; and
10. The new food regulations and their future impact on dairy farming businesses and their customers.
11. Co-operative members' rights and the duties and responsibilities of co-op management.
12. Independent audits and their benefits to co-op members.

5. “Central Java Dairy Farming Industry SWOT Analysis – Indonesia’s Dairy Farming Industry in 2005 Supplementary Report”, by Stanton, Emms & Sia, 29th August 2005

This is a supplementary report prepared for the Directorate General of Livestock and Animal Health Services (DGLAHS), Ministry of Agriculture Indonesia, and Dairy Australia. This report focuses specifically on a SWOT analysis for Central Java's dairy farming industry. It should be read in conjunction with the main report containing the Indonesian national SWOT analysis because many of the challenges that face the Indonesian dairy farming industry on a national basis also exist within the Central Java region.

The report says that cooperatives and dairy farmers have been abandoning their membership of GKSI and GKSI owned cooperatives in Central Java because (1) some cooperatives and farmers have become frustrated with GKSI's past management team and its efforts to develop the dairy farming industry in Central Java, and (2) some cooperatives and members have found that they can obtain better returns for their milk from direct sales agreements with milk processors and cooperatives that are not members of GKSI.

A review was undertaken of the most recently available annual reports and financial statements of the major cooperatives in Central Java and found that many cooperatives have a balance sheet that contains: (1) large sums of money due from the cooperative's members; and large sums of money due to the cooperative's bankers and other credit providers. It was recommended that the Ministry of Agriculture review financial management practices.

In conclusion there is very clear evidence that a free market is working in Central Java as businesses, cooperatives and individual farmers are making strategic decisions on (1) what products they produce to maximise their incomes (net profit); and (2) where they sell their products to maximise their incomes (net profit).

6. “Indonesia Dairy and Products Annual Report 2010” by Jonn Slette & Sugiarti Meylinah, USDA Foreign Agricultural Services, Gain Report No. ID1029, 29th October 2010³⁰

The report provides data on total dairy imports for 2010 and USA’s market share and opportunities. In year ending 2010, U.S. exports of non-fat dry milk to Indonesia more than doubled over 2009.

³⁰ http://www.usdaindonesia.org/public/uploaded/Dairy_and_Products_Annual_Jakarta_Indonesia_10-29-2010%5B1%5D.pdf

A summary of the report is as follows: “The Government of Indonesia (GOI) estimates that the Indonesian economy will grow by 6.3 percent in 2011. This, combined with a stable political outlook, room for increased per capita consumption of milk, and a growing awareness of the health benefits from dairy products will continue to provide opportunities for the Indonesian milk processing industry. Several new dairy farms and new producers are entering the industry and some of the major dairy manufacturers are expanding their capacity. Per capita consumption of milk will remain below consumption rates of neighboring countries due to the increase of retail prices for dairy and dairy products. Growth in domestic fresh milk production will remain limited because of several fundamental factors. Whole fresh milk is mixed with imported milk powder, with Oceania being the preferred supplier due to closer proximity. Competitive prices and available exportable supplies have driven the United States to set another record for U.S. non fat dairy milk exports to Indonesia. Higher use of whey by Indonesian food manufacturers drives higher imports of whey from the United States.”

APPENDIX TWO – QUESTIONNAIRE

IFC Dairy Industry Development Study - Milk Processor Company Interview

Date: March 2011

Business Type :
Company Name :
Head Office Address :
Phone :
Contact Person :
Email :

The IFC World Bank has engaged Phillip Morey of “Morelink” to assist IFC in identifying opportunities and roles for IFC to promote a sustainable dairy industry in Indonesia. IFC is interested to know more about the business models used by companies with suppliers and any constraints that need to be addressed.

Factories and Location

- Q. 1. How many milk processing factories do you have?
- Q. 2. What is the capacity and current production at each factory?
- Q. 3. Where are the factories located?

Local Milk Supplies

- Q. 4. From whom do you source your local milk supplies?
- Q. 5. Do you have formal contracts with each supplier?
- Q. 6. How many farmers in total supply your factories?
- Q. 7. What quantity of local milk did you buy / use last year (2010)?
- Q. 8. What volume of milk powders did you import last year?

Technical Services

- Q. 9. Do you provide technical services, advice to your supply chain players?
 - a. What kind of technical services and advice?
 - b. How do you deliver the technical service (outsourced or your own field staff)?
 - c. Any improvement in farmers practices to technical services activities?

Product Quality and Prices

- Q. 10. What is the product specification that you require from your suppliers?
- Q. 11. What is the price ranges paid to your farmers for various milk quality?

Q. 12. Are there any quantity, quality, continuity issues of the supplies?

Q. 13. How do you communicate your purchasing/product quality criteria to farmers?

Q. 14. Do you have any quality incentive program and how response from farmers to the program?

Financing Arrangements

Q. 15. How many days after receiving milk supplies do you pay the KUD / farmer? How does the KUD / farmer know the price?

Q. 16. How do you finance the purchase of local milk supplies? (overdraft, bank loan, internal company funds)? – do you use any intermediaries to facilitate this?

Q. 17. Do you have any problems in financing local milk supplies? If yes, please explain.

Production Issues (for dairy farmers)

Q. 15. What are the main problems facing farmers?

- the management of water and livestock feeds during the dry season
- availability of power for cold chain and water heater
- level of nutritive quality of feed
- level of standard farming practices covering feed management
- farm hygiene management
- water and feed supply constraints
- purchase of dairy cows
- costs and profitability
- others

Thank you

APPENDIX THREE – GOVERNMENT DAIRY PRIORITIES AND FUNDING ISSUES

DGLAHS priorities for 2009-2014 for the development of Indonesia's dairy industry are based on the following 5 strategies:

1. Increasing the population and productivity of dairy livestock
2. Developing new centres of dairy production outside Java
3. Improving milk quality and product diversification
4. Facilitating increasing investment in the dairy industry
5. Promoting fresh milk consumption

DGLAHS has strategies aimed at addressing these issues, including:³¹

- (1) improve quality of human resources, especially to dairy farmers, extension workers, inseminators, veterinarians, milk processors, and other related workers through conducting various training and courses
- (2) introduce and implement Good Dairy Farming Practices / GDFP
- (3) increase milk production by means of both quantity and quality at reasonable prices through improve quality breeds of dairy cattle and use of local or native dairy cattle
- (4) research and development on appropriate management and technologies of dairy cattle and milk products
- (5) promote better cooperatives among all stake holders from up stream to down stream of agribusiness system
- (6) develop and strengthen dairy farmer's institutions
- (7) introduce and develop Integrated Farming System
- (8) provide access to get capital for dairy farming activities
- (9) create better or conducive situation to do business and investment
- (10) prepare procedures, norms and standards related to dairy cattle development.

The GOI hopes to become self sufficient in beef and to meet 50 percent of the domestic demand for milk from domestic production by 2014. Therefore, the GOI supports the procurement of 800,000 beef cattle and 200,000 dairy cattle within the next five years by issuing the Ministry of Finance Decree no. 131/PMK.05/2009 on Loan for Breeding Cattle. This decree provides a five percent loan subsidy given from the government to any businessman who expects to purchase beef or dairy cattle. To become eligible for the subsidy the businessman must partner with dairy or beef cattle farmers. Four national banks, namely Bank Mandiri, Bank Rakyat Indonesia (BRI), Bank Negara Indonesia (BNI), and Bank Bukopin are involved in this program.

The government is providing direct support for the development of domestic dairy farms and milk industries by providing 145 billion rupiah of subsidy for the purchasing of calves for dairy cows and beef cattle.³² A protocol for the import of dairy cows from Australia has been established and is managed by DGLAHS.

³¹ Source: USDA FAS "Dairy Products Annual 2009", GAIN Report No. ID9032, 19th November 2009

³² Centre for Indonesian Veterinary Analytical Studies, 30th May 2009

APPENDIX FOUR – DGLAHS AND GKSI CONTACT DETAILS

DGLAHS – Jakarta (Head Office)

Gedung C Lt.6, Jl. Harsono RM 3 Ragunan Jakarta - Selatan
Telp: +62 21 782 7912, Fax: +62 21 781 5581
Email: webmaster@ditjennak.go.id

DGLAHS – West Java

Jl. Ir. H. Juanda No. 358, Bandung
Ph: 022 250 1151/ Fax : 022 251 3842
Contact Person: Ms. Hani
Website : <http://www.disnak.jabarprov.go.id>

DGLAHS – Central Java

Jl. Gatot Subroto, Ungaran 50501
Ph : 024 692 1023
Contact Person : Mr. Deni (Ph. 024 692 1107)
Website: <http://www.disnak.jawatengah.go.id>

DGLAHS – East Java

Jl. A. Yani 202, Surabaya
Ph : 031 829 2545
Contact Person: Mr. Jeremy
Website: <http://www.disnak.jatim.go.id>

GKSI National (Head Office)

Jl. Prof. Soepomo No. 178, Jakarta Selatan
Ph. 021 – 8305849
Contact Person : Drs. Dedi Setiadi SP (Hp. 081 3220 21 021)

GKSI - West Java

Jl. Rumah Sakit Gedebage No. 114
Bandung 40601
Ph: 022 780 1683 or 022 780 9937
Fax : 022 780 3956
Contact Person : Mr. Ajat / Ms. Tirin (Mob. 08122396183)

GKSI – Central Java

Jl. Cendana No. 8, Winong, Boyolali
Ph: 0276 321 132 / Fax : 0276 322 014
Contact Person : Mr. Dayat (0811 263 0132)

GKSI – East Java

Jl. Raya Ngijo No. 688
Kec. Karang Ploso, Malang 65152
Ph : 0341 465 277 / Fax : 0341 465 279
Contact Person: Mr. Sulistyanto (0811 366 434)

APPENDIX FIVE – DAIRY INDUSTRY GENETICS

Semen for artificial insemination in cattle is domestically produced by two Artificial Insemination (AI) centres located in Malang, East Java and Lembang, West Java.

Lembang Artificial Insemination Center (LAIC)³³

LAIC was established in 1975 with the main task to produce and to distribute frozen semen of superior livestock such as dairy cattle and beef cattle in order to fulfil semen required for AI servicing in Indonesia. Up to now, LAIC has produced more than 20 million doses frozen semen, which has been distributed to AI servicing areas in Indonesia. In 2009, the AI Centre in Lembang produced 1.5 million straws with about 250,000 straws sold to the dairy industry at a cost Rp. 6,000 per dose at LAIC (cost of liquid nitrogen and cost of delivery not included).

AI Centre Malang³⁴

Currently it has 41 dairy cattle from Australia to produce semen. AI Centre Malang has built relationship with Greenfields Indonesia. Greenfields imports some frozen semen from USA, then AI Centre selects the male calves resulting from the injection. The centre produces 3 million straws per year, with 500,000 straws for dairy cattle. The selling price is Rp. 6,000 per straw. Currently they export straws to Malaysia and Sri Lanka, and looking for prospects in Vietnam, Laos, Myanmar, Cambodia, East Timor, and Muslim countries.

The Indonesian National Standard (SNI) requires that mini semen straws with 0.25 ml volume contain a total of at least 25 million sperm cells, while medium semen straws with 0.5 ml volume contain at least 30-50 million sperm cells. The Dairy Cooperatives Union coordinates all its member farmers to buy semen from the local artificial insemination (AI) stations with the price of Rp. 6,000 per straw (\$0.62 per straw). Reportedly, the semen quality is sufficient to meet farmers' demand. However, some major dairy manufacturers demand higher quality, imported semen to increase yields. The Indonesian government currently does restrict imports of semen, declaring there is sufficient supply from the local AI stations.³⁵

There are a number of research / breeding centres involved in improving the processing and production of semen for artificial insemination.

- Centre of Artificial Insemination in Singosari, East Java
- Centre of Artificial Insemination in Lembang, West Java
- Centre of Embryo Transfer in Cipelang, West Java
- Livestock Breeding Centre in Cipelang, West Java
- Livestock Breeding Centre in Baturraden, Central Java

³³ <http://banksperma.com>

³⁴ Web://bitnak.ditjennak.deptan.go.id/pls

³⁵ USDA FAS "Dairy Products Annual 2009", GAIN Report No. ID9032, 19th November 2009

APPENDIX SIX – ABBREVIATIONS USED IN REPORT

AI	Artificial Insemination
Aust	Australia
BPOM	Badan Pengawas Obat dan Makanan (National Agency of Drug & Food Control, Indonesia)
DGLS	Directorate General Livestock Services (Indonesia)
ESL	Extra shelf life milk
EU	European Unions
GKSI	Gabungan Koperasi Susu Indonesia (Union of Indonesian Dairy Cooperatives)
G to G	Government to Government
IFC	International Finance Corporation
IPS	Industri Pengolah Susu (Indonesia Association of Milk Processors)
IT	Information Technology
JICA	Japan International Corporation Agency
kg	Kilogram
KPSBU	Kelompok Peternak Sapi Bandung Utara
KUD	Koperasi Unit Desa (Local village cooperative)
LAIC	Lembang Artificial Insémination Center
MCC	Milk collection centre
ml	Millilitre
ML	Makanan Luar (Food Import)
NGO	Non Governmental Organization
NZ	New Zealand
OC	Operational Cooperation
QA	Quality Assurance
Rp	Rupiah (Indonesian)
SNI	Indonesian National Standard
SOP	Standard Operation Procedure
SP	Selling Price
TPC	Total plate count
UHT	Ultra high temperature treated milk
USA	United State of America

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