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**Food vs feed:
The livestock equation in food security**

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Abstract



The world's population of 7.2 billion is projected to increase and reach 9.6 billion by 2050. FAO-predicted demand for food, fuel and fibre will thus increase 60% by the year 2050. Demand for beef and milk will increase significantly, and create global concern over the level of feed required to meet the projected levels of demand. Indonesia is the fourth largest populated country in the world with almost 240 million people in 2010 and a predicted population of about 320 million in 2050.

The high population, together with economic growth and increased public demand for high quality protein sources such as beef and milk will result in a significant increase in demand for these food products. Increasing livestock and dairy production to secure food availability to feed the population is a high national priority. Need for food, feed and fuel, along with factors including climate change and massive land clearance for housing and industries, have encouraged Indonesia to improve the competitiveness and efficiency of its livestock and dairy production systems. Recent public awareness of ethical and environmental issues in animal production means these matters require greater attention to avoid public distrust in these industries. As feed and feeding contribute to more than 70% of the cost of livestock or dairy production, utilising alternative cheaper feeds which do not compete with food is a commercial necessity. Fortunately, there are by-products of agro-industries in Indonesia that can be used as alternative feeds: for example, cassava meal, rice straw, copra meal and palm oil by-products such as palm kernel cake and palm fronds. The nutritive value of these by-products can be improved by physical or biological treatment. Among these, palm oil by-products have the highest potential as feed alternatives because Indonesia is one of the largest palm oil producing countries in the world. Consequently, integrating livestock, dairy and palm oil plantation systems is seen as a preferable way forward to deliver better efficiency and zero-waste agricultural systems and add more value for the local communities. Also grazing management under palm oil plantations may improve the cost-efficiency of cattle breeding systems.

The focal point of this conference is the year 2050 and the approximately 9 billion people in 2050, and that we have to increase food production by about 70%. As well, there is the problem that even if population increases only 35%, we still need to increase food supplies by 70% because people are moving from poverty to middle class. About 3 billion people are moving to middle class

incomes now, and that number will grow to 4.8 million people in 2050. An impact of this middle class income group will be a huge demand for animal food sources. There will be a big demand for meat. Everybody will be asking for meat, for more milk, for more eggs. This is, I think, the challenge for all of us. That will create other issues. Will there be enough land or water or biological diversity to meet the demands?

Another issue is food versus feed. When the energy prices increase we talk about using grain instead of fossil fuel, but another issue is that people go hungry because so much arable land is needed to grow grain to feed animals rather than humans. Half of the world's population today lives in only six countries. About 3.6 billion people live in China, India, USA, Indonesia, Pakistan and Brazil. This paper is not about global issues but instead about how Indonesia and Australia have important roles in food security, and about alternatives for feeding livestock.

Indonesia is the fourth most populated country in the world. About 250 million people now live in Indonesia, the closest neighbour to Australia. Also, according to recent data from the McKinsey Global Institute (2012), Indonesia in 2012 was the 16th largest economy in the world. It had 45 million people of 'consuming class'¹ incomes generating US\$0.5 trillion worth of market opportunities in consumer services, agriculture and fisheries, resources and education. McKinsey projected that in 2030 Indonesia will be the seventh largest economy in the world, with a consuming class of about 135 million people and US\$1.8 trillion in market opportunities in consumer services, agriculture and fisheries, resources and education. This is a big market, and it is Australia's closest neighbour.

Beef demand in Indonesia

The Indonesian market needs to import live cattle more than beef, because the Indonesian culture requires fresh beef prepared in the local market. It is well known that Indonesia imports a large number of live cattle from Australia and feeds them in Indonesia. There are around 14.5 million head of cattle in Indonesia.

The industry depends on two groups of smallholders (Figure 1). All the cattle belong to smallholders. One group comprises the very intensive smallholder farmers in Java and Bali. This group is relatively small in number, with relatively few cattle, and the feed base is from the rice fields and native grasses. In the second group are the extensive farmers in eastern Indonesia, in East and West Nusa Tenggara.

The high population and economic growth are increasing the already large demand for beef in Indonesia. In the 1980s Indonesia formed a strategic policy about beef availability, beef accessibility, supplying Indonesian countrymen with high quality beef, and sustainable production for cattle locally, because we understand that Indonesian demand for beef will grow faster than Indonesian

¹ McKinsey Global Institute (2012) defines consuming class as 'those individuals with an annual income of more than \$3600 or \$10 per day at purchasing power parity (PPP), using constant 2005 PPP dollars'.



Figure 1. Cattle production systems in Indonesia: (left) intensive farming in Java, using native grass, rice straw, etc., as feedstuffs; (right) extensive farming in West and East Nusa Tenggara where the cattle graze pastures.

cattle production. Between 1980 and 1990 Indonesia started introducing cattle fattening systems into the production chain. We want to increase the liveweight of cattle before slaughter so we can produce more beef from fewer cattle – more beef with fewer cattle slaughtered.

We start feeding cattle on feed grain, as we have learnt from the United States and from Australia. We have to import this grain for animal feed. At the same time our poultry industry has grown, and we import a large amount of grain also for the poultry. The result has been very high beef prices in Indonesia; the digestive systems of ruminants such as cattle are less efficient in using grain than the digestive systems of monogastric animals such as pigs or poultry.

Food demand and feed competition and demand for land for housing and industry have encouraged Indonesia to improve the competitiveness and efficiency of livestock production systems. Having done a great deal of research into agricultural by-products, we encourage the cattle industry to implement innovations from the research and to feed cattle using these by-products. In the early 1990s a range of agricultural by-products were available in Indonesia, such as cassava chips, copra meal, palm kernel cake, rice bran, cassava onggok (a source of energy and protein) and rice straw (Figure 2).

We started importing feeder cattle from Australia in the early 1990s because we needed a large supply to meet the growing demand from Indonesian consumers. In the early 1990s Indonesia was not the biggest market for Australian live cattle exports: Asia and the Philippines were larger. But Indonesia has built



Figure 2. The Indonesian feedlot industry uses agricultural by-products as feed for the cattle.

and developed one of the best livestock industries; it is very efficient. We fed the cattle with the cheapest feed using agricultural by-products so they were not competing with humans for food. It was very competitive, efficient and sustainable. Indonesia became the biggest market for Australian live cattle exports after the economy crashed in 1998 when other Asian markets shrank.

In 2009 and 2010 Indonesia imported more than 750,000 head of feeder cattle, and the Indonesian fattening feedlots produced about 30% of the total Indonesian beef production. But in 2011 the Australian supply to Indonesia was stopped because of concerns over animal welfare. Indonesia worked very hard, hand in hand with Australian sectors, and through a great deal of research, innovation, changes to cattle handling in land transport, field management, watering and feeding systems and the slaughtering process, Indonesia became the first Australian live cattle export destination to fully implement, discuss and comply with Australian animal welfare requirements by the end of 2011.

In 2012 and 2013 the Government of Indonesia put a quota on the live cattle trade, interrupting it and reducing our imports from Australia to fewer than 300,000 head per year. This affects Indonesian consumers. In Indonesia beef is very expensive and that situation is worsened by inflation. On top of that there are 2.5 million fewer head of cattle now. If each farmer has about three head of cattle on average, 600,000 farmers lost their livestock through trade stoppages.

This shows that food security also relies on trade policy between countries, and how freely food flows from one country to another. When the trade is interrupted it creates problems with food availability, accessibility and sustainability.

In 2014, it is projected we can import about 750,000 head of cattle; the capacity of our industry is about a million head per year. There is a cooperative spirit between Indonesia and Australia: Australia breeds, Indonesia feeds – that is the tag line.

At this moment, there are about 250,000 head of Australian feeder cattle feeding in Indonesia without competing with Indonesian food supply and welfare, and also supplying beef for 250 million Indonesian people. Under current conditions I think we could take a million head in the next few years, but recent discussions have suggested that there are limits on the Australian supply. We know that Australia is also open to marketing to other countries. Live cattle exports to Vietnam have improved significantly in the last two years, and China will be 'joining the club'. When China joins the club everything will be more expensive!

Integrating cattle breeding with palm plantations

Now Indonesia is facing a new challenge. We have to start breeding cattle on Indonesian land. Yes, that will be more expensive than importing from Australia but, as I said, when China joins the market everything will cost more. We have to make a start. Indonesia has the biggest palm plantation in the world: more than 10 million hectares of palm plantations. We have enough rainfall and sunlight, and among the palm trees we can grow a great deal of grass and cover-crops or weeds. At the moment the plantation companies use large amounts of herbicide and labour to control weeds, but by integrating palm plantations with the cattle we can reduce the costs of weed control. This will be a very good outcome and potentially very efficient.

However, we still have to do a lot of research and innovation, and have the technology adopted by the industry. We have to support research and development – and encourage the cattle industry to start breeding in the



Figure 3. Palm plantations require periodic applications of fertiliser and herbicides and labour to control the cover-crops or weeds that flourish in the equatorial sunlight and rainfall (left), but cattle grazing the plantations can control the weeds, saving costs and labour and contributing manure and urine as fertiliser (right).

palm plantations. This will be similar to the way it was 25 years ago when we encouraged feedlotting in Indonesia using agricultural by-products as feed. I think this is what we have to do.

Indonesia and Australia can work together on this very important research and development, to improve production efficiency and create opportunities for using agricultural by-products as feed for cattle, and in ways of growing and supplying beef, and other meat, for the consumer.

Reference

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Yudi Guntara Noor comes from Bandung, West Java, Indonesia. After graduating from the Animal Husbandry Faculty at the Padjadjaran University he worked in the feedlot industry for two years as a cattle selector before starting his own business 19 years ago. He now runs PT Agro Investama which owns the PT Citra Agro Buana Semesta (CABS) feedlot in Garut West Java, which has a capacity of approximately 12,000 head. Yudi Guntara Noor is a former Chairman of Indonesian Cattle Feedlot and Beef Producers (APFINDO) and Vice Chairman of Indonesian Cattle and Buffalo Farmers Association (PPSKI). He also holds the following positions: President, Asian–Australasian Association of Animal Production Societies; President, Indonesian Society of Animal Science; Head, Permanent Committee for Dairy and Beef Cattle, Indonesian Chamber of Commerce; Chairman, West Java Sheep and Goat Farmers Association; Member, Trustees Committee in Padjadjaran University.

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