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Beef Demand Trends in Indonesia and the Implications for Australian Live Cattle and Beef Exports¹

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Abstract

Beef supply shortages are a major concern for the Indonesian government. A range of policy measures has been put ⁸⁴ place to increase local beef production and to reduce imports especially from Australia. The objectives of this study were to understand the demand for, and supply of, beef in Indonesia and to draw implications for Australia. The main finding is that per capita consumption of beef in Indonesia as a whole is unlikely to increase significantly in the near future due to disparities in socio-economic development and geographical diversity in dietary preferences across Indonesia, despite the rise of the middle class and Westernisation and urbanisation in some major cities. The implications for Australia are three-fold. Firstly, despite whether and how the Indonesian beef market is likely to grow, to maintain a strong market position, Australia needs to be price competitive in whatever market segments it aims to compete. Secondly, for developing effective marketing strategies, more market research is needed to better understand the demand for beef in different market segments (households vs the food service sector, and high end vs low end segments), at different times (normal vs seasonal peaks) and in different regions (Jakarta vs other). Thirdly, the beef trade is important and beneficial to the Indonesian and Australian beef sectors, and both ⁸ countries can gain from a more open and stable trading environment, which may be improved with the Indonesia Australia Comprehensive Economic Partnership Agreement (IA-CEPA) effective in July 2020.

Key words: export ban, food law, import restrictions, demand seasonality, beef self-sufficiency.

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Introduction

The demand for meats is projected to increase in developing countries in coming decades, as a result of economic growth, population growth and increasing urbanisation (Rosegrant et al., 2001). The demand for beef in Indonesia is said to be following this trend (MLA, 2018a; EY Sweeney, 2018). However, even at a per capita consumption of two kg per annum (OECD, 2020; Hirschmann, 2020), domestic supply is unable to meet demand. Supply shortages were estimated to be around 40 per cent of total demand at the national level, but could be as high as 75 per cent in major urban centres, such as the Greater Jakarta area, East Kalimantan, South Kalimantan, and Riau (Chang, et al., 2020a and 2020b). In the past, the gap between local consumption and local production was filled by the interisland cattle trade, but now it is increasingly being met by live cattle and beef imports from overseas. Although there is no doubt about the gains from trade, it may not be consistent with government policies that place great emphasis on achieving self-sufficiency, which has been the case for Indonesia. A range of policy measures have been put in place aimed at achieving self-sufficiency in beef since 1999, and balancing the two seemingly conflicting objectives of making beef more affordable to the consumers and protecting the local farmers.

One significant policy measure introduced in 2016 was the opening up of the Indonesian beef market to countries that are not Food and Mouth Disease (FMD) free, such as India and Brazil. The new arrivals pose a threat to both Indonesian local production and Australian beef and live cattle exports because of the competition from cheaper alternatives in a highly price sensitive market. However, the real impact of Indian buffalo meat (IBM) imports is unclear three years on. Some reports have found the impact on Australian exports to be minimal (because there is an unlimited demand for beef) (Goodwin, 2019). On the other hand, there are claims that the demand for local cattle and lot-fed Australian cattle have been reduced by as much as 50 per cent (because there is a limited demand for beef) (Nason, 2017; Relph, 2019; Chang et al., 2020a and 2020b). Some even claimed that the impact on the local cattle price is significant enough to hinder the industry growth in Indonesia (IACCB, 2019). To assess the validity of those seemingly conflicting claims will require a good understanding of the working of the Indonesian beef market.

The objectives of this study, therefore, were to better understand the demand for and supply of beef in Indonesia, to assess the demand trends, and to derive implications for Australia. The study is based primarily on existing literature and secondary data, as well as stakeholder consultations and informant interviews. The latter includes cattle traders, slaughterhouse managers, feedlot operators, beef retailers at traditional markets and supermarkets, and government and quasi-government agencies in capital cities such as Jakarta, Banjarmasin/Banjarbaru in South Kalimantan, Balikpapan and Samarinda in East Kalimantan, Pekanbaru in Riau, and Lombok in Nusa Tenggara Barat (NTB).

The paper starts with a brief description of an analytical framework for analysing demand, which is followed by a detailed analysis of factors affecting the demand for beef in Indonesia, and then an analysis of the supply side, focusing on beef supplies from domestic and overseas sources. The impacts on beef supply of key policies, especially the beef self-sufficiency policy and import restrictions, are then discussed. The study ends with policy implications and areas for further research for Australia.

Analytical Framework for Demand Analysis

The Indonesian beef market is dynamic and complex (Hadi et al., 2001; Deblitz et al., 2011; Morey, 2011; Waldron et al., 2013; Chang et al., 2020a and 2020b). Often, several forces are at work simultaneously, making it difficult to understand and predict. This complexity can be unpacked with the help of theory, including making the distinction between demand from the households or consumers for their own consumption and demand from the food service sector for commercial

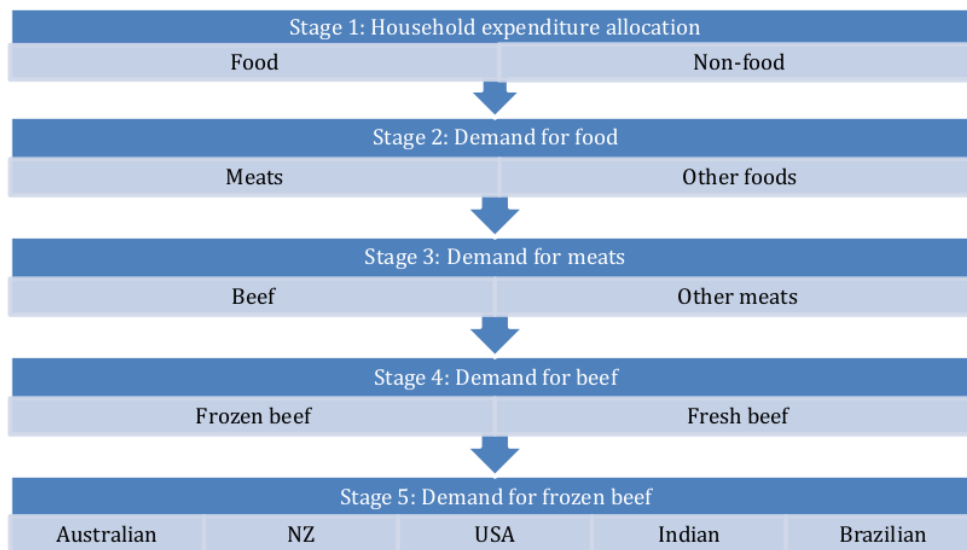
purposes. The latter is an important aspect to consider because the food service sector accounts for nearly 80 per cent of the total demand for beef in Indonesia (Chang et al., 2020a; Morey, 2011).

Demand for beef from the consumer

In consumer demand analysis, the consumer, as opposite to a bakso² maker, is assumed to be attempting to maximise her/his utility subject to a budget constraint, given a particular set of dietary preferences for goods that are currently available and accessible in a perfectly competitive market (Deaton and Muellbauer, 1999). In this basic competitive model, there are many buyers and sellers all buying or selling a homogeneous product, and each with perfect market information. When applied, consumer demand for beef is determined by income and relative prices of available goods, especially close substitutes such as chicken and fish. However, beef may not a homogeneous product in the eyes of the consumer. Rather, it can and may be differentiated based on real or perceived quality differentials. For example, locally produced fresh beef³ may be seen or perceived as different from frozen beef in some way, and frozen beef from Australia is different from that from New Zealand or carabeef (buffalo meat) from India.

The potential competition between other meats and different types of beef can be analysed based on the multi-stage budgeting framework, which assumes that purchasing decisions are made in stages (Deaton and Muellbauer, 1999). This process is illustrated in Figure 1.

Figure 1. The multi-stage budgeting framework



Source: Authors' own illustration

² Bakso are meatballs that are normally served in noodle soup - heavily spiced, delicious and cheap (Ainsworth, 2018). It is the most popular fast food in Indonesia. Bakso is traditionally made from fresh beef. However, due to its high prices, fresh beef has been gradually substituted, at least partially, by cheaper alternatives, such as beef offal, chicken and IBM, with creative recipes.

³ In Indonesia "fresh beef" refers to beef that is freshly cut from a warm carcass that has just been slaughtered. Once refrigerated and sold the next day, it will be discounted.

A similar framework (pertaining to Stages 3-5 in Figure 1) is applied to Indonesian beef demand by Hadi et al. (2001). In the first stage, Indonesian consumers make their decision on what type of meat to consume, e.g., choosing between beef, chicken, pork and fish. If beef is chosen in the first stage, in the second stage, the consumers then decide on what type of beef to purchase, which may involve choosing between fresh and frozen beef. For fresh beef, there is the choice between beef from local cattle and from lot-fed Australian cattle, and for frozen beef there are choices between frozen beef from different sources of supply, such as Australia, New Zealand, the United States, and Brazil, as well as buffalo meat from India. The number and structure of the stages to be considered and the products to be included in each stage will vary, depending on the market situation and research objectives.

Given that Indonesia is geographically and culturally diverse, the basic model can be extended to account for those diversities by including the influences on tastes and dietary preferences of socio-demographic characteristics of the household, such as household size, rural vs urban residence, religion, region and ethnicity. Research has shown that households with different socio-demographic backgrounds also respond differently to price and income changes, as well as market shocks (Hadi et al., 2001). That is, they may have different income and price elasticities, which has significant implications for policymaking aimed at influencing purchasing behaviours.

Demand for beef from the food service sector

While the demand for beef for a final consumer can be analysed based on utility maximisation, the demand for cattle or beef from the market chain operators, such as cattle traders, butchers, beef retailers, bakso makers, or restaurants, is based on profit maximisation. This is because cattle or beef demanded by the market chain operators is used as an input in the running of their business, rather than for their own consumption. In this case, the demand for beef, say from a bakso maker, depends on the sales price and volume of bakso to be sold and the costs of key ingredients, such as beef, chicken, spices, noodles, labour, capital, etc.

Demand theories just described provide a very useful analytical framework for analysing the demand for beef in Indonesia. However, there is one more complication. That is, some segments of the beef market chain may not be perfectly competitive as is assumed in theory. Therefore, beef prices are determined not necessarily by market forces, but influenced to varying degrees by market information, government interventions, and market structure (Chang et al., 2020a).

Putting the theory into practice, factors affecting the demand for beef in Indonesia are examined in detail in the next section.

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Factors Affecting the Demand for Beef in Indonesia

In 2018, per capita total meat consumption in Indonesia, excluding fish and seafood, was estimated to be 11kg per annum, comprising of 2.0kg of beef and veal, 1.0kg of pork, 7.6kg of poultry meat, and 0.4kg of sheep meat (OECD, 2020) (see Table 1). This means meat and beef consumption in Indonesia is both low, compared with the world average of 34.7kg and 6.4kg, respectively, and with other South East Asian countries, such as Malaysia (60.4kg and 5.2kg), Vietnam (52.6kg and 9.3kg) and the Philippines (23.5kg and 3.1kg). According to the World Bank (2016), Indonesia's food consumption pattern and nutritional status is more akin to a low-income country, rather than a rapidly growing and urbanising middle-income country.

Table 1. Annual per capita meat consumption (in kg, retail weight^a), 2018

| Country | Beef and veal | Pork | Poultry | Sheep | Total |
|-------------|---------------|------|---------|-------|-------|
| Indonesia | 2.0 | 1.0 | 7.6 | 0.4 | 11.0 |
| Viet Nam | 9.3 | 29.7 | 13.4 | 0.2 | 52.6 |
| Thailand | 1.3 | 10.0 | 7.9 | 0.0 | 19.2 |
| Philippines | 3.1 | 14.9 | 13.0 | 0.5 | 31.5 |
| Malaysia | 5.2 | 5.4 | 48.7 | 1.1 | 60.4 |
| Korea | 10.9 | 30.1 | 18.0 | 0.3 | 59.3 |
| Kazakhstan | 19.3 | 4.9 | 15.0 | 8.2 | 47.4 |
| Japan | 7.4 | 16.2 | 16.9 | 0.2 | 40.7 |
| China | 3.8 | 30.4 | 11.6 | 3.1 | 48.9 |
| Australia | 18.9 | 21.9 | 44.1 | 7.3 | 92.2 |
| India | 0.5 | 0.2 | 2.4 | 0.5 | 3.6 |
| Brazil | 24.5 | 12.3 | 39.8 | 0.6 | 77.2 |
| Argentina | 39.9 | 10.8 | 38.2 | 1.0 | 89.9 |
| World | 6.4 | 12.3 | 14.2 | 1.8 | 34.7 |

Source: OECD (2020). Note: ^aRetail weight is 70 per cent of carcass weight for beef and veal (OECD, 2020).

Income effect

It has been observed consistently that the demand for meat increases as an economy develops (Rosegrant et al., 2001; OECD, 2020). With the economy growing steadily at around 5 per cent per annum in the past decades, accompanied by a gradual and consistent reduction in national poverty and a growing middle class⁵³ Indonesia is seen to be a huge and growing market for beef. In 2018, the middle class in Indonesia represents about 20 per cent of the population, but accounts for 43 per cent of the total household consumption expenditures (Oxford Business Group, 2019). Table 2 provides a brief description of key macroeconomic indicators in the most recent decade (2011-2018).

Table 2. Macroeconomic indicators of Indonesia, 2011-2018

| | Population (in million) | GDP growth (%) | Inflation (%) | Exchange rate (IDR/US\$) | National poverty gap* (%) | International poverty gap** (%) |
|------|----------------------------|-------------------|------------------|--------------------------------|---------------------------------|---------------------------------------|
| 2011 | 245 | 6.2 | 5.4 | 8,773 | 12.5 | 74.4 |
| 2012 | 248 | 6.0 | 4.3 | 9,419 | 12.0 | 73.5 |
| 2013 | 251 | 5.6 | 8.4 | 11,563 | 11.4 | 71.0 |
| 2014 | 254 | 5.0 | 8.4 | 11,800 | 11.3 | 69.0 |
| 2015 | 258 | 4.8 | 3.4 | 13,389 | 11.2 | 67.0 |
| 2016 | 261 | 5.0 | 3.0 | 13,309 | 10.9 | 62.4 |
| 2017 | 264 | 5.1 | 3.6 | 13,381 | 10.6 | 58.7 |
| 2018 | 267 | 5.2 | 3.1 | 14,250 | 9.80 | 56.0 |

Source: Indonesia Investments (2019); World Bank (2020). Notes: * The national poverty line is defined by the Indonesian government as living below monthly income of Rp.354,386, which is equivalent to US\$25/month or US\$0.83/day in 2018 at an exchange rate of 14,250. ** The international poverty line is defined by the World Bank as living below \$5.50/day/person (in 2011 international price).

The rise of the middle class⁴ has important implications for changes in consumption expenditure⁴⁹ and patterns. As the middle class grows, it is expected that Indonesia, like more industrialised Asian countries (Japan, Taiwan, Korea, Hong Kong, and Singapore) will change its consumption pattern and

⁴ The middle class in Indonesia, with an annual income greater than US\$10,000, was estimated at 30 million in 2012 (Permani, 2013a), 52 million in 2018 (World Bank, 2019a and 2019b), and 60 million in 2019 (Indonesia Investments, 2019).

adopt the so-called Western diet. A Western diet is characterised by decreasing per capita consumption of main staples, such as rice, and increasing per capita consumption of wheat products and animal-source protein (Rosegrant, et al., 2001; Permani, 2013b). Westernisation, as well as urbanisation, also mean possible changes in tastes and preferences for how beef is distributed and purchased (traditional vs modern market outlets) and utilised (in traditional dishes such as bakso and rendang (beef slow-cooked with coconut milk) vs foreign cuisines such as Western steak/burger, Chinese stir fry, or Japanese or Korean-style BBQ), and the type and quality of beef demanded (fresh vs frozen beef). All these changes may have occurred in Jakarta, but will take years, if not decades, to materialise across Indonesia mainly because of the differences in socio-economic development⁵.

While the middle class is growing, in 2018, 56 per cent of Indonesians lived below the international poverty line of \$5.50/day (in the 2011 International price), as defined by the World Bank (column 7, Table 2). With the beef price being close to US\$7-10/kg, it is clear that beef is well beyond the reach of more than half of the Indonesian population.

Geographical diversity

There is a significant difference in poverty levels in relation to geographical location. For example, the population in the eastern provinces (e.g. Papua, West Papua and East Nusa Tenggara) are generally poorer than the western provinces on Java Island, and the population in rural areas are also poorer than that in urban areas (Indonesia Investments, 2017a). These regional differences must be considered in analysing and forecasting demand for beef in Indonesia. Firstly, while beef is culturally significant across Indonesia, about 70 per cent of beef is consumed in the western parts of Java Island, especially the Greater Jakarta region⁶ (MLA, 2018a). Secondly, while per capita beef consumption is estimated at about two kg nationwide (OECD, 2020), it is seven to nine kg in Jakarta (MLA, 2015; EY Sweeney, 2018).

The demand for beef is particularly high in Jakarta because of a large population, higher income, and high levels of Westernisation and urbanisation.⁷ There is no wonder that Jakarta is the target market for all businesses, as well as the focus for researchers and market analysts.⁵⁸ Jakarta is also the most important market for Australia, accounting for 70 per cent of the total live cattle and boxed beef imported from Australia (MLA, 2018a). Therefore, the Jakarta beef market is unique and atypical, and any market research pertaining to it is unlikely to be applicable to other markets or Indonesia as a whole.

Income elasticities of the demand for beef in Indonesia were estimated at 0.60 and 0.79³⁷ the short run and the long run, respectively (Ilham, 1998), and at 1.2 by Tawaf (cited in Whitehead, 2018). That means the demand for beef increases as income increases, but only moderately so.

⁵ The Gini coefficient ratio lingers at around 0.40 from 2011 to 2018. A high degree of inequality in society is a potential threat because not only does it jeopardise social cohesion but it may also spark political and economic instability, which may affect consumer and business confidence (Indonesia Investments, 2019), and hence the demand for and supply of beef.

⁶ Greater Jakarta includes the cities of Jakarta, Bogor, Depok, Tangerang, and Bekasi (JABODETABEK). The region is the centre of government, culture, education, and economy of Indonesia (Wikipedia, n.d.). The population in the Greater Jakarta region is estimated at 32 million in 2015.

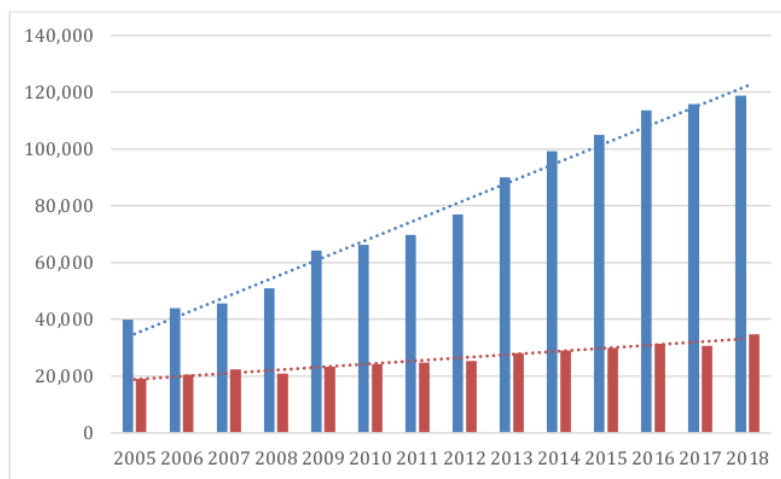
⁷ The population in Jakarta alone is estimated at 10.5 million in 2018, with a GDP per capita of USD\$17,900. The population is forecast to grow to 10.8 million by 2022, with a GDP per capita of US\$21,200 (MLA, 2018b).

Relative prices

The low level of per capita beef consumption (2.0kg) also can be explained by high beef prices relative to fish and chicken (7.6kg). In 2018, a kilogram of beef cost Rp.118,718 (US\$8.33 at the exchange rate of Rp.14,250/US\$), compared with chicken at Rp.34,711/kg (US\$2.44/kg). Fish, which is abundant across Indonesia, is even cheaper than chicken at around Rp.20-25,000/kg (US\$1.40-1.75/kg). Just to put it in perspective, the wage for a casual worker is around Rp.100,000/day.

Price trends for beef and chicken are shown in Figure 2. As can be seen, not only is the beef price much higher than that of chicken, but also beef is becoming more expensive faster than chicken. The annual growth rate in beef price over 2005-2018 is 8.75 per cent while it is 4.75 per cent for chicken. As a result, beef price changes from being twice as expensive as chicken in the mid-2000s to being nearly 3.5 times as expensive in the past few years.

Figure 2. Beef (in blue) and chicken (in red) prices in Indonesia (in Rp/kg), 2005-2018



Source: BPS (2014, 2019)

MLA (2016a) shows that fish is the most consumed meat protein in Indonesia, accounting for 74 per cent of the total meat protein consumption in 2015, followed by poultry (15 per cent), pork (6 per cent), beef and veal (4 per cent) and sheepmeat (1 per cent). The volume share of fish has increased from 58 per cent in 1979 to 62 per cent in 2000, and to 74 per cent in 2015. It is the opposite for beef, whose volume share declined from 13 per cent in 1990 to 12 per cent in 2000, then to 4 per cent in 2015 (Hadi et al., 2001).

Own-price elasticities of the demand for beef in Indonesia are estimated at -1.09 and -1.43 in the short run and the long run, respectively (Ilham, 1998). That means the demand for beef is highly price sensitive, and a one per cent increase in the beef price will lead to more than a one per cent decrease in the quantity of beef demanded. This is so because of the availability of cheaper alternatives such as fish and chicken. These results suggest that the demand for beef is unlikely to increase substantially as has been predicted if it remains significantly more expensive than its close substitutes.

Quality perceptions and product information

There are several types of beef on offer in the Indonesian market, as outlined in Figure 1. Prices for beef from different sources vary substantially. For example, in Samarinda, fresh beef costs between Rp.120,000-130,000/kg while Australian frozen beef is around Rp.98,000/kg and Indian buffalo meat is Rp.80,000/kg or less. As discussed before, the Indonesian market is highly price sensitive. Therefore, IBM may be preferred for the same reason chicken or fish is preferred because of price differentials.

What about quality? Surveys conducted by MLA (2018a) found that the top five important considerations for beef purchases are: Halal, freshness, safety, natural, and value for money. This is consistent with the finding of EY Sweeney (2018) that the majority of the consumers prefer fresh beef⁸ because it is perceived to be Halal compliant, fresher, and of high quality even though it is more expensive. Interviews with bakso makers, the largest beef users, also found that fresh beef is preferred over frozen beef because it is leaner and firmer, and more suitable for making bakso. By comparison, frozen beef was said to be soft and watery. However, quality perceptions of frozen beef have changed since the arrival of IBM in late 2016.

Although IBM is seen as inferior in quality by some, it is favoured in other market segments due not only to its affordability, but also its leanness and texture that resemble local fresh beef, and hence is also suitable for bakso making, as well as other traditional dishes that require slow cooking (Smith, 2018). Therefore, it is considered of good quality in terms of “fitness for use” in traditional Indonesian cooking, although it may not possess the usual eating qualities such as juiciness, flavour and tenderness often required of Western cuts.

Since the bakso making sector accounts for 80-90 per cent of the total beef sales (Ainsworth, 2018; Chang et al., 2020a), the change in quality perceptions and hence the acceptance of IBM has significant implications for the beef sector in Indonesia that supplies fresh beef. There are claims that the switch from fresh beef to IBM by the bakso makers has resulted in substantial reductions (by as much as 50 per cent) in fresh beef sales (Nason, 2017; Ainsworth, 2018). Our interviews with butchers in traditional markets and slaughterhouses support those claims.

Retail outlets

In the past, fresh beef was sold mainly in traditional markets while frozen beef was sold in modern retail outlets (supermarket, hypermarket, and mini-market/convenience store) (Purba, 2009). However, the distribution of frozen beef has changed several times due to policy changes. In 2011, a regulation was put in place to exclude imported beef from entering the traditional markets to protect the locally produced beef (Simanjuntak, 2011), but the ban was lifted by MOA Regulation No. 34/2016 and MOT Regulation No. 59/2016, which allowed imported beef to be sold in modern retail outlets and traditional markets (USDA, 2019). In 2017, modern retail outlets were compelled to offer frozen beef to their customers at no more than Rp.80,000/kg while importers were compelled to supply frozen beef, including IBM, to traditional markets (MLA, 2018a and 2018b). This means that frozen beef has become more accessible to most consumers who conduct their daily shopping at traditional markets. The government also promotes frozen beef as (more) hygienic and healthy to the general public. Overtime, attitudes and quality perceptions have changed, and frozen beef has become

⁸ Fresh beef may come from local breeds (Bali cattle, Madura, Ongole, and PO) and exotic or cross breeds (Simmental, Brahman crosses and Limousin). The majority of the latter are found in feedlots, but they are becoming increasingly popular with smallholders. Research has shown that cattle breed is not an important consideration to beef consumers (Waldron et al., 2013), and most of them are not aware of the fact that fresh beef can come from lot-fed Australian cattle (EY Sweeney, 2008).

acceptable. This development is consistent with demand theory suggesting that the consumer's choice depends on the possibility set (what are available on the market) and product information (what, and how much, is known of the product) in addition to economic considerations.

The majority of the Indonesian consumers prefer to shop at traditional markets because the produce sold there is perceived to be fresher, of higher quality, and cheaper, as well as being more conveniently located (EY Sweeney, 2018). Because of that, only 7-8 per cent of the total grocery sales are made through modern retail outlets. However, the market share of modern outlets is expected to increase quickly as they expand into other cities beyond Jakarta (MLA, 2018a). On the one hand, these market developments may be favorable to Australian beef as it is sold through supermarkets (32 per cent), hypermarkets (30 per cent), traditional markets (20 per cent), butcher/meat shops (17 per cent) and online (2 per cent) (MLA, 2018a). On the other hand, they are not so positive for Australian live cattle exports as 80 per cent of lot-fed Australian beef is sold as fresh beef through traditional markets. E-commerce presents a marketing opportunity for lot-fed Australian beef as a digital marketing company in Indonesia (Sikumis.com) plans on selling Aussie beef directly from feedlots to hotels, restaurants, catering businesses and consumers through its online platform, with a goal to reduce marketing costs in the supply chain and increase profitability for producers (Burton, 2018).

Demand seasonality

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Because of the high price of beef, the majority of Indonesians consume beef only on special occasions, such as Idul Fitri (Lebaran), Idul Adha (Qurban), Maulid, Christmas, and New Year, and birthdays and weddings (Dahlanuddin, 2017; Waldron et al., 2013 and 2016; Nimmo-Bell and ICASEPS, 2007; EY Sweeney, 2018). Chang et al. (2020a and 2020b) also found that the degree of demand seasonality varies among different provinces and locations. They showed that the number of cattle slaughtered during the month of Ramadan/ Idul Fitri increases by up to 85 per cent over a normal month in East Kalimantan, and in Riau, and the number of cattle slaughtered (in three days) for Idul Adha accounts for 85 per cent of the annual total. Ainsworth (2020a) showed the official government figure for the number of cattle slaughtered across Indonesia over the three-day Qurban festival in August 2019 to be 541,171 bulls, which accounts for 20-25 per cent of the annual total. The official figure, as high as it is, could still be underestimated given the reporting difficulties in some areas. Another interesting and important finding is that the demand for beef was found to be less price elastic during high demand periods, especially Idul Fitri and Idul Adha, than at other times (Chang, et al., 2020b). Since beef and cattle play a significant cultural role in those religious events, the consumers are willing to pay high prices. Therefore, they have become a necessary good during the festivities, rather than seen as a luxury good during normal months.

Dietary preferences and social and cultural influences

That beef consumption is also affected by social and cultural factors is best illustrated from a recent household survey of beef consumers⁹ in Jakarta and Medan conducted by EY Sweeney (2018). Responses that are similar in both locations include:

- Beef is an important food culturally, and is used in traditional Indonesian cuisine.
- Beef consumption is relatively low compared to fish and chicken.
- More than 50 per cent of all respondents consider beef as expensive, and is purchased mainly for special occasions.
- Respondents with higher incomes are significantly more likely to purchase beef than those with lower incomes.

⁹ Beef consumers are defined to be respondents who purchase beef for home consumption at least once a week.

- Despite wider access to modern retail outlets, Indonesian consumers still prefer shopping at traditional markets that sell local fresh produce.
- Local beef is perceived to be fresher and of higher quality while imported beef is associated with frozen beef, which is not good tasting and watery.
- IBM is generally considered less appealing than beef, being of a darker colour, tough in texture and having a more pungent odour.
- The large majority of survey respondents claimed that they have never bought IBM knowingly.¹⁰
- There is a lack of knowledge about fresh beef produced from lot-fed Australian cattle.

Some regional differences in beef consumption are also found, including:

- Jakartans tend to prefer chicken for cooking in the home, while the Medanese prefer beef.
- 34 per cent and 28 per cent of respondents in Jakarta and Medan, respectively, purchase beef for home cooking at least once a week.
- Annual per capita beef consumption is 9.77kg and 6.60kg¹¹, respectively, for Jakartans and Medanese.
- Fish/seafood remains the dominant source of protein in meals eaten outside the home, but for some, the inclusion of beef in meals is seen to enhance the dining out experience – with the premium perception and price tag creating a sense of prestige.
- Jakartans, being more exposed to international influences, are more likely to try new food than the Medanese who tend to adhere to traditional values and customs.

The household survey also investigated changes in beef consumption in the past and coming 12 months. It found that for the majority of the respondents, beef consumption has been static over the past 12 months, and is expected to remain so in the coming 12 months. Only a little over 10 per cent of respondents anticipated they would purchase more beef in the next 12 months. Factors which would increase future beef consumption are:

- Better financial conditions;
- More socialising outside the home;
- Increased availability from vendors;
- Penetration of foreign cultures, particularly Western, Japanese and Korean cuisines; and
- Proliferation of social media, which encourage (young) people to try new things and keep up with food trends.

Factors which would hamper future beef consumption are:

- Financial constraints;
- Emerging health concerns over cholesterol and high blood pressures; and
- Reluctance/inertia to break from tradition, especially in areas where fish and chicken are culturally significant.

¹⁰ Our market survey shows that although there are several types of beef on offer in traditional markets, they are not labelled accordingly. In some cases, they are mixed together, and in other cases, frozen beef and IBM are sold as local beef.

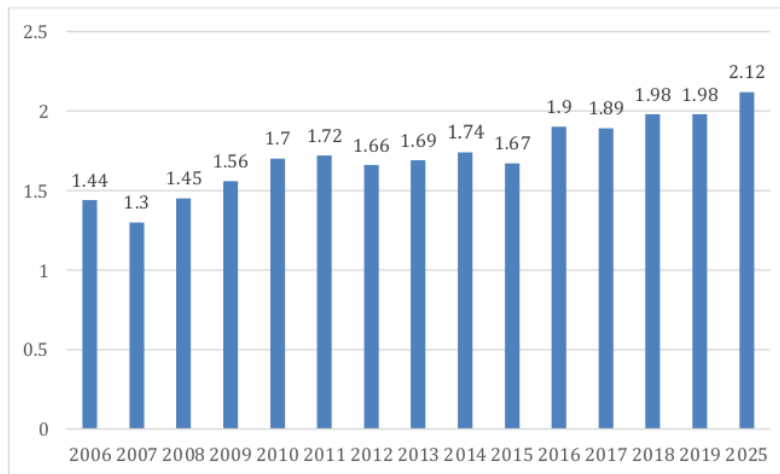
¹¹ These figures are derived by the authors based on the survey results that found average weekly purchases to be 620 grams and 419 grams per week for Jakartans and Medanese respondents, respectively, and an average household size of 3.3 persons.

Demand Trend and Projections

The demand trend in per capita beef consumption per annum in Indonesia is presented in Figure 3. As can be seen, per capita beef consumption per annum was 1.44kg in 2006, 1.98kg in 2018 and 2019, and was projected to reach 2.12kg in 2025. These figures imply an average growth rate of 2.48 per cent per annum.

Official demand and supply projections, and the volumes of imports needed to meet supply shortfalls, are announced periodically by the Indonesian government. The authorities involved in this process are the Ministry of Trade (MOT), Ministry of Agriculture (MOA), and Directorate of Veterinary and Public Health and Postharvest of MOA.

Figure 3. Per capita beef consumption in Indonesia (in kg, retail weight), 2006-2019 and 2025



Source: Hirschmann (2020)

Data for 2017 and 2018, and projections for 2019 and up to mid-2020, including demand, local supply, deficit and import requirements, are presented in Table 3. Although not made specific in official statistics, the total demand for beef appears to be derived from multiplying the estimated per capita consumption by the estimated population, and local supply is derived from multiplying the estimated average carcass weight of cattle slaughtered by the estimated total number of cattle slaughtered. Local supply includes both local cattle and lot-fed Australian cattle (BPS, 2019). Deficit is the difference between demand and local supply while import requirements are the volumes of import deemed necessary to make up the deficit. As can be seen from the figures for 2019 and 2020, the deficit is not necessarily the same as the import requirements. Take 2019 for example, the projected demand is 686,271t, 404,590t of which would be met by the slaughter of 2.25 million head of cattle (Bisnis.com, 2019). The deficit is 281,680t, but only 200,523t¹² would be imported.

Also shown in Table 3 is the decline from 64 per cent in 2017 to 55 per cent in 2020 in the beef sufficiency ratio (SSR), which is the ratio of local supply to total demand in percentage terms. Beef

¹² In addition, the projected import requirements of 200,523t are stated to be met by beef from four sources, which include 80,000t of IBM, 50,000t of Brazilian beef, 62,000t of beef imports (presumably from traditional suppliers such as Australia, New Zealand, and USA), and 8,523t derived from 42,222 head of live cattle imports.

demand and supply projections also vary from agency to agency. An example for 2019 is shown in Table 4.

Table 3. Beef demand and supply projections in Indonesia (in tonnes, carcass weight), 2017-2020

| | Demand | Local supply | Deficit | Import needs | SSR (%) | Population (in million) | Per capita consumption (in kg) |
|--------------|---------|--------------|---------|--------------|---------|-------------------------|--------------------------------|
| 2017 | 729,911 | 468,369 | 261,541 | NA | 64 | 264 | 2.76 |
| 2018 | 662,541 | 403,349 | 259,192 | NA | 61 | 267 | 2.48 |
| 2019 | 686,271 | 404,590 | 281,680 | 200,523 | 59 | 270 | 2.54 |
| Jan-May 2020 | 302,300 | 165,478 | 136,822 | 159,702 | 55 | 273 | 2.66 |

Source: Bisnis.com (2019); Among (2020)

Table 4. Beef demand and supply projections in Indonesia (in tonnes, carcass weight), 2019

| | Demand | Local supply | Deficit | Per capita consumption (in kg) |
|------------|---------|--------------|---------|--------------------------------|
| Gapuspindo | 782,830 | 356,206 | 426,624 | 2.90 |
| MoA | 712,893 | 360,397 | 352,496 | 2.64 |
| BPS | 686,270 | 404,590 | 281,680 | 2.54 |

Source: data derived from interviews with farmers' associations and government and quasi-government agencies

Based on the estimated demand shown in Table 4 and the estimated population of 270 million in 2019, the implied per capita consumption are 2.90kg, 2.64kg and 2.54kg from Gapuspindo (Gabungan Pelaku Usaha Peternakan Sapi Potong Indonesia) (Indonesian Beef Cattle Farming Association), MoA (Ministry of Trade) and BPS (Bureau of Statistics Indonesia), respectively. Although they are higher than that of Hirschmann (2020) at 1.98kg, but could become similar if they were converted and expressed in retail weight.

Several data issues are identified from the official figures presented in Tables 3 and 4. Firstly, different conversion factors are used to convert live weight to carcass weight at different times. Secondly, some estimates are expressed in carcass weight (e.g., local beef production) and some in retail weight (beef imports). Thirdly, demand projections do not take into account seasonal and geographical variations. Inconsistencies in official statistics from different sources are documented in numerous studies on the Indonesian beef industry, for example, Deblitz et al. (2011), Vanzetti et al. (2011), Waldron et al. (2013), Tawaf (2014), and Chang et al. (2020a). There have also been repeated calls from the industry for the government to reconcile the differences in official statistics, as well as provide transparency in the way projections are made.

Beef Supply Structure in Indonesia

Demand for beef in Indonesia is met by supplies from three different sources: local beef production, live cattle imports and boxed beef imports. The total cattle population was 16.43 million head in 2018 (Table 5). Over 2 million head of these were slaughtered, which includes both cattle from the smallholders and lot-fed Australian cattle, producing a total of 497,972t of fresh beef (measured in carcass weight, including bones). In addition, 207,427t of boxed beef was imported, including Indian buffalo meat. This is mostly boneless.

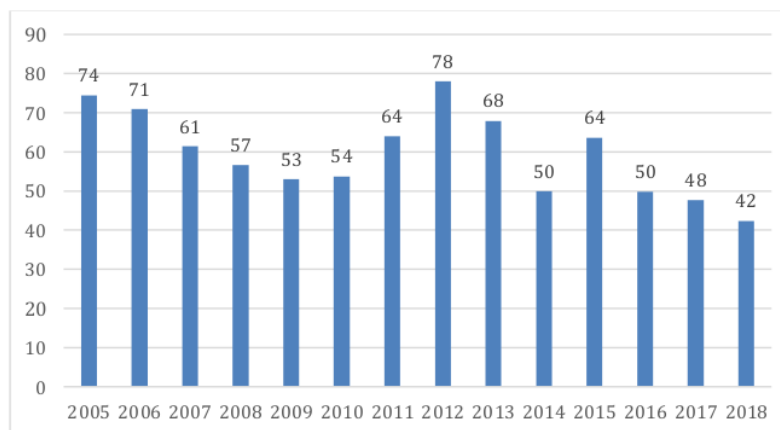
The data presented in Table 5 provide the necessary data to estimate beef SSRs and changes over time¹³. As can be seen from Figure 4, beef SSR ranges from 42 per cent in 2018 to 78 per cent in 2012, with an average value of 60 per cent over the period 2005-2018. Notably, SSR improves from 2010 to 2012 but declines from 2013 to 2018. Those changes reflect mainly the changes in import policies, in particular the large reductions in import quotas in 2010-2012, which is followed by a gradual relaxation of import restrictions to address large price increases as a result of the severe cuts in import quotas. The trade-off between achieving a higher SSR and providing beef at an affordable price is obvious.

Table 5. Beef supply structure in Indonesia, 2005-2019

| | Cattle population (in '000) | No. of cattle slaughtered (in million head) | Local beef production (in t) | Boxed beef imports (in t) | Live cattle imports (in head) |
|------|-----------------------------|---|------------------------------|---------------------------|-------------------------------|
| 2005 | 10,569 | 1.65 | 358,700 | 17,880 | 347,267 |
| 2006 | 10,875 | 1.79 | 395,840 | 30,530 | 384,965 |
| 2007 | 11,515 | 1.88 | 339,480 | 58,770 | 503,536 |
| 2008 | 12,257 | 2.00 | 392,511 | 71,510 | 640,435 |
| 2009 | 12,760 | 2.04 | 409,308 | 78,550 | 751,143 |
| 2010 | 13,582 | 2.05 | 436,450 | 119,070 | 514,935 |
| 2011 | 14,824 | 2.22 | 485,335 | 84,720 | 412,057 |
| 2012 | 15,981 | 2.35 | 508,905 | 41,150 | 276,295 |
| 2013 | 12,686 | 2.26 | 504,819 | 59,510 | 448,950 |
| 2014 | 14,727 | 2.12 | 539,965 | 117,190 | 715,806 |
| 2015 | 15,420 | 2.17 | 506,661 | 50,690 | 608,100 |
| 2016 | 15,997 | 2.15 | 518,484 | 146,672 | 593,881 |
| 2017 | 16,429 | 1.96 | 486,320 | 160,198 | 498,511 |
| 2018 | 16,433 | 2.03 | 497,972 | 207,427 | 577,981 |

Source: BPS (2019 and previous years); MLA (n.d.)

Figure 4. Changes in the beef self-sufficiency in Indonesia (in %), 2005-2018



Source: authors' own calculation

¹³ These estimates are derived based on an improved formula which addresses various data issues, such as carcass weight versus retail weight. More details are provided in Appendix 1.

Smallholder cattle production

Nearly 90 per cent of cattle in Indonesia are raised by about 6.5 million smallholder farmers⁶⁷ living in rural areas, and the remaining 10 per cent by specialised commercial operators, including commercial farmers (< 1 per cent of all farmers) and the feedlots (Agus and Widi, 2018).

Smallholder cattle production systems in Indonesia are often categorised by the type of enterprise (cow-calf, fattening or mixed), by the feeding system (intensive, semi-intensive or extensive) and by the breed (local vs crossbreeds). For a more detailed description, see Deblitz et al. (2011) and Waldron et al. (2013). Traditionally the mixed system dominates whereby calves born on farm are grown out to slaughter weight and sold or for own consumption. Normally, two to three cattle are kept by rural households as part of smallholder farming systems, and very few smallholder farmers specialise in cattle farming (Waldron and Brown, 2014). Furthermore, cattle are used as a savings device, and often sold only when there is a need for cash, e.g., school fees, medical expenses, weddings, religious events, repayment of debts, etc.) (Patrick et al., 2010; Deblitz et al., 2011; Waldron et al., 2013; Chang et al., 2020b). This means that they normally do not aim to maximise profits and therefore are not motivated to improve productivity or quality either to meet market demand or to support government policies. It also means that they are unreliable sources of beef supply.

The traditional smallholder cattle production system is described as low input-low output (Waldron et al., 2013). Productivity is low, characterised by low calving rate, high calf mortality rate, and low weaning weight, while in beef finishing, by low levels of daily weight gains, final weights and dressing percentages (Deblitz et al., 2011). However, in recent years there are smallholder farmers or farmer groups that specialise in cow-calf or fattening operations. Fattening, especially to meet demand for Idul Fitri and Idul Adha, has become popular due to quick turnovers (normally in 4-6 months) and higher profitability. On Sumbawa Island, for example, there are successful "household feedlot production units" that fatten 10-20 head based on home-grown tree legumes, such as leucanea (Dahlanuddin et al., 2017).

There are also farmer groups focusing on cow-calf operations throughout the country, and they often serve as a village breeding centre (VBC) that are promoted and supported by government programs. But the results are mixed, depending crucially on management skills and financial returns. Research has shown that productivity, and profitability, can be improved by adopting simple, low cost and integrated measures, such as supplementary feeding of cows, better detection of oestrus, early weaning and calf management, and improved feed management and pen sanitation (Waldron and Brown, 2014). However, widespread adoption of improved technology, and hence productivity improvements, requires close and on-going technical support to farmers from extension and advisory services, as well as an enabling environment and better integration with the input and output markets (Waldron et al., 2013).

The Indonesian feedlot sector

There are 43 feedlots in Indonesia, located mainly in West Java, East Java and Lampung, serviced by 143 abattoirs (Bulo, 2018). The size of a feedlot operation in Indonesia ranges from less than 500 head to more than 10,000 head (Waldron et al., 2013). Typically, the feedlot operator uses live feeder calves imported from Australia. They weigh around 280-350kg¹⁴, and are fattened for 90-100 days at an average daily weight gain of around 1.0-1.5kg/day to reach around 480kg slaughter weight with a 50

¹⁴ A maximum weight limit of 350kg was imposed on live cattle imports by the Indonesian government (MOT Regulation No. 46/M-Dag/Per/8/2013) in 2013 (InterCAFE and IPB, 2018). It was increased to 450kg in 2017 (MLA, 2018b).

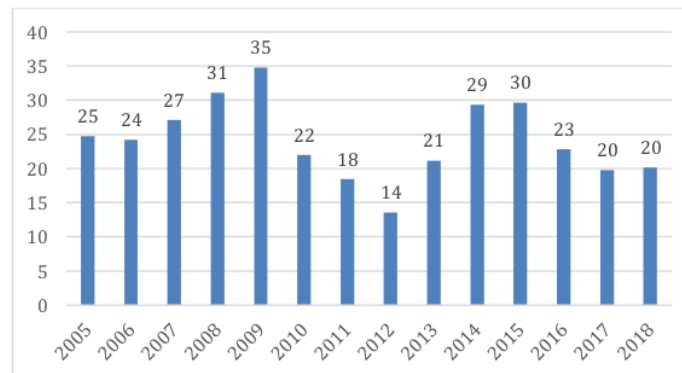
per cent carcass yield (Deblitz et al., 2011).⁸ The majority of beef derived from lot-fed Australian cattle is sold into wet markets as hot carcasses, with about 10 per cent sold into modern retail outlets (MLA, 2018b).

From 2005-2018, on average, beef from lot-fed Australian cattle¹⁸ accounts for 20 per cent of the total beef consumed in Indonesia (Figure 5). This figure is consistent with the estimate from MLA (2018b). As can be seen, the volume shares are variable, at 35 per cent in 2009 and 14 per cent in 2012. The reasons for the variations are discussed later regarding live cattle imports from Australia.

According to Hadi et al. (2001), the Indonesian feedlot sector has a number of commercial advantages⁷ in beef production relative to smallholder producers, such as

- large-scale operations and a low unit cost of production;
- access to large quantities of good-quality forage and concentrate at reasonable prices;
- professional management of livestock nutrition and animal health;
- access to large lines of imported feeder cattle of the right specifications (age, weight, breed) that perform well in the feedlot; and
- access to different market segments.

Figure 5. Volume shares of the feedlot sector (in %), 2005-2018



Source: Authors' own calculation

However, local (male) cattle have a marketing advantage during Idul Adha when they are preferred for their small size (around 250kg) and no damage (not castrated or ear-tagged) (Chang et al., 2020b). Competition from feedlots and beef imports means that the Idul Adha market may be the only market niche for local cattle (Ainsworth, 2019).

Given that Australia has a competitive advantage in feeder cattle production while Indonesia has a competitive advantage in cattle fattening/finishing (due to lower labour cost and an abundant supply of agricultural by-products), they are not only complementary, but also an effective way to improve the beef self-sufficiency ratio presented earlier. This is so when the weight gains from finishing are treated as local production, as suggested by Kusriatmi et al. (2014).

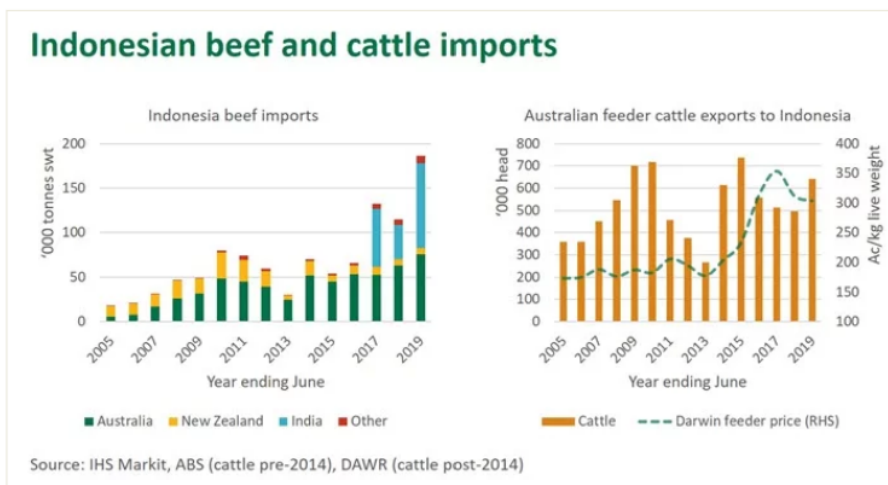
Beef supply from the feedlot sector was found to be highly price elastic (5.03, in the short run and 10.92, in the long run) (Ilham, 1998), but inelastic for smallholders (0.23, in the short run and 0.73, in the long run) (Simatupang et al., 1995). This means feedlots are quick to adjust their operation in response to a change in beef price, but not so for smallholders. This result is not surprising as smallholders are in general terms less profit- or market-oriented. Both demand and supply elasticities³⁷

have significant implications for policy makers in terms of how effective any policy or regulatory intervention can be in affecting the demand for and supply of beef in Indonesia.

Beef imports

Because of the lack of domestic supply of beef in Indonesia, nearly 40 per cent of the total demand is met by boxed beef and live cattle imports. In terms of boxed beef imports, traditionally it was supplied mainly by Australia, New Zealand and the United States that are FMD-free. However, in recent years, FMD-free zones of India and Brazil, which do not have a non-FMD free country status, also have gained access to the Indonesian market. The new policy has resulted in a significant change in the total volume and the makeup of Indonesian boxed beef imports, as shown in Figure 6 (left panel). Live cattle imports supplied exclusively by Australia are shown in Figure 6 (right panel).

Figure 6. Indonesian beef and live cattle imports, 2005-2019



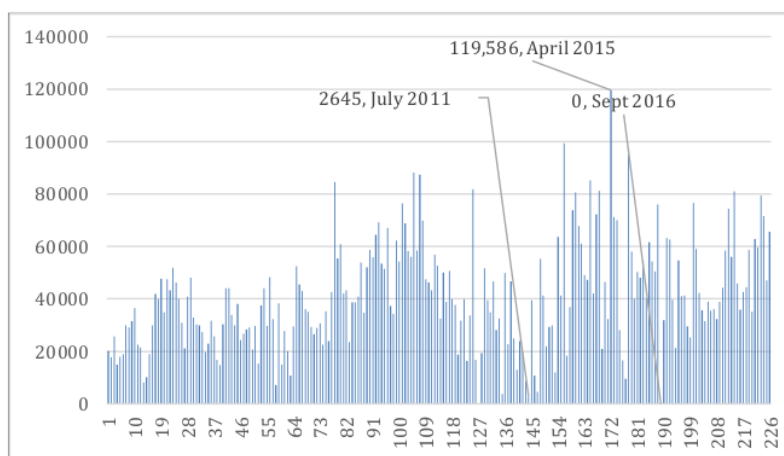
Source: MLA (2019b)

Imports from Australia

In the 2018-2019 financial year, A\$1.12 billion worth of beef products were exported from Australia to Indonesia, including A\$689.8 million of live cattle, A\$274.4 million of frozen beef, A\$48.4 million of chilled beef and A\$105.9 million of beef offal (MLA, 2019b). Between 2005 and 2019, boxed beef exports to Indonesia, averaging around 35,000t a year, account for just 3.32 per cent of the total boxed beef exports from Australia. Live cattle exports to Indonesia, on the other hand, averaging nearly 500,000 head a year, account for 62.45 per cent of the total live cattle exports from Australia (averaging one million head per year).

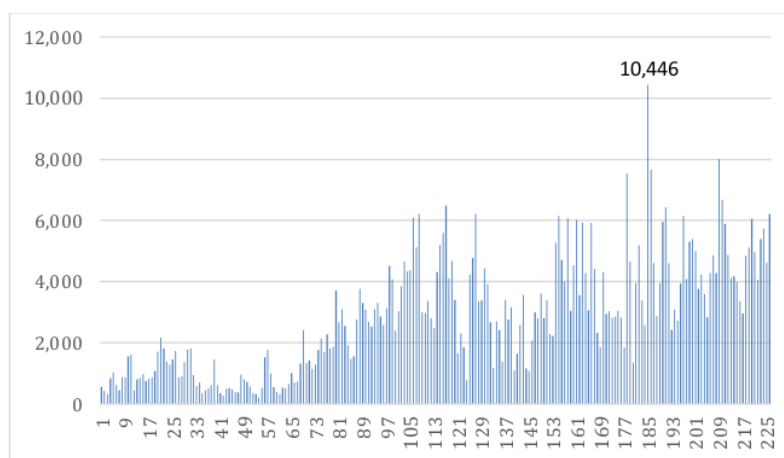
Despite being a major supplier, there are significant fluctuations in Australian boxed beef and live cattle exports to Indonesia (Figures 7 and 8). As presented in Figure 7, a few peaks and troughs in the live cattle exports to Indonesia can be readily identified. The highest peak occurs in April 2015 (119,586 head) while the two lowest points correspond to the live cattle export ban imposed by the Australian government in July 2011 (2,645 head) and the 5+1 feeder breeder policy imposed by the Indonesian government in September 2016 (zero).

Figure 7. Monthly Australian feeder cattle exports to Indonesia, head/month, January 2001-October 2019



Source: MLA (n.d.)

Figure 8. Australian beef exports to Indonesia (in tonnes/month), January 2001- October 2019



Source: MLA (n.d.)

In addition, live cattle and beef exports to Indonesia are much more varied and less stable than Australia’s total exports. As presented in Table 6, the coefficients of variation (CoV) are 0.66 versus 0.19 for boxed beef exports and 0.49 versus 0.39 for live cattle exports. Note also that total beef exports from Australia are more stable than total live cattle exports, with CoV being 0.19 for the former and 0.39 for the latter.

Events and policy changes that have contributed to the variability seen in Figures 7 and 8 and Table 6 are outlined in Appendix 2.

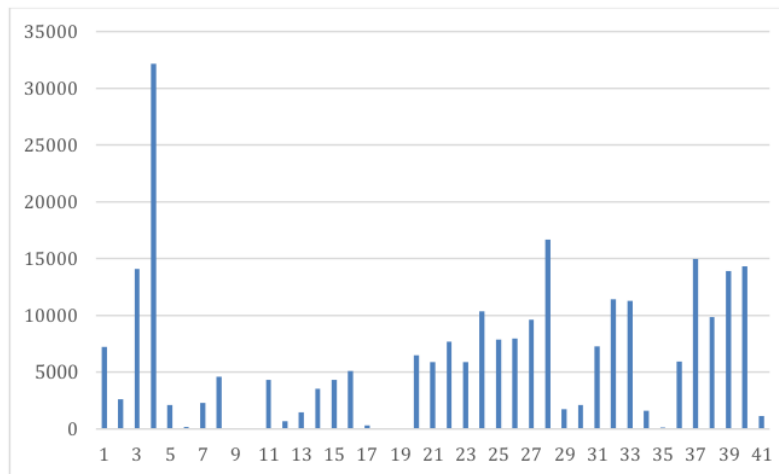
Table 6. Summary statistics of monthly live cattle and beef exports to Indonesia, January 2001-October 2019

| | Boxed beef | | | Live cattle | | |
|--------------------|-----------------|---------------------|-----------------|--------------------|------------------------|-----------------|
| | Total (in t) | Indonesia (in t) | Share (in %) | Total (in head) | Indonesia (in head) | Share (in %) |
| Monthly Mean | 84,012 | 2,842 | 3.31 | 66,374 | 41,067 | 61.16 |
| Standard Deviation | 16,062 | 1,887 | 2.02 | 25,732 | 20,121 | 18.34 |
| Minimum | 39,726 | 212 | 0.24 | 13,896 | 0.00 | 0.00 |
| Maximum | 123,464 | 10,446 | 10.36 | 165,153 | 119,586 | 97.11 |
| CoV | 0.19 | 0.66 | 0.61 | 0.39 | 0.49 | 0.30 |

Source: Authors' own calculation

Buffalo meat imports from India

The first shipment of IBM arrived in Indonesia in August 2016. The volumes of IBM imports from 2016 to 2019 were 58,248t, 26,824t, 80,220t and 93,912t, respectively. The quota for Indian buffalo meat imports for 2020 was set at 100,000t (Ainsworth, 2020b). The monthly import figures for August 2016-December 2019 are shown in Figure 9. Note that there is also a great variation in IBM imports from month to month.

Figure 9. Monthly IBM imports into Indonesia (in tonnes), August 2016-December 2019

Source: APEDA (2020)

Beef imports from Brazil

In October 2019, the Indonesian government made the announcement regarding the importation of Brazilian beef of 50,000t for 2019. Import permits were issued to three state-owned enterprises, including BULOG (30,000t), Berdikari (10,000t) and PT Perusahaan Perdagangan Indonesia (Persero) (10,000t). In December 2019, 3,500t of Brazilian beef were imported by Berdikari to meet the likely increase in demand for Christmas and New Year (Alika, 2019). It was predicted that Brazilian beef imports are likely to be increased to 100,000t per year in the coming years, similar to IBM, and sold at a retail price between Rp.70-75,000/kg. Brazilian beef stands in between Australian and IBM in terms of quality and price, and therefore may pose a greater competitive threat to Australia than IBM (MLA, 2019a).

The potential impact of Brazilian beef on Australian cattle producers was assessed by CIE (2019). The modelling work found that the entry of Brazilian beef into the Indonesian market would have a marginal negative impact on Australian producers as a result of product substitution between competing suppliers and product diversion to other markets. However, these results should be interpreted with caution because they depend crucially on the assumptions regarding the growth rate in beef consumption and whether the Indonesian market is saturated or not and Australia's ability to divert live cattle to other markets, as well as the assumed demand and supply elasticities.

Key Policies Relating to the Supply of Beef

Since its independence in 1945, achieving food security via self-sufficiency for certain agricultural products has been high on the Government of Indonesia's major policy agenda (Limonta and Chandra, 2017). It started with rice, which was followed by soybean, corn, sugar, chilli, shallot and beef. The first beef self-sufficiency program (Program Swasembada Daging Sapi, PSDS-2005) was introduced in 1999 aimed at achieving self-sufficiency in beef by 2005. A second program (Accelerating the Achievement of Self-sufficiency in Beef, PSDS-2010), was launched in 2005 to achieve self-sufficiency in beef by 2010, which was followed by a third program (the Beef Cattle and Buffalo Self-Sufficiency Program, PSDS-2014), launched in 2010 aimed at achieving self-sufficiency in beef by 2014. Like its predecessors, the deadline has been extended twice, first to 2019 (Permani, 2013a; Waldron et al., 2013), and then to 2026 (Whitehead, 2018).

Under PSDS-2014, self-sufficiency in beef is re-defined as reducing import dependency to not more than ten per cent (Limonta and Chandra, 2017). In other words, at least 90 per cent of the total demand is met by local production. Substantial investments have been made to boost local supply, which are accompanied by a variety of trade restrictions to reduce imports (Kusriatmi et al., 2014; Rudatin, 2016; Prahantus, et al., 2017; Limonta and Chandra, 2017).

Beef self-sufficiency programs

Key policy measures to support the beef self-sufficiency policy through extensive programs in breeding, feeding, animal health, transport, marketing and slaughtering are presented in Box 1. More details can be found in Waldron et al. (2013), Morey (2011) and Agus and Widi (2018).

Despite these massive public investments in the cattle sector, PSDS-2014 was said to have failed in improving productivity (Permani, 2013a; Waldron et al., 2013) or achieving the desired level of self-sufficiency (Agus and Widi, 2018; McBeth, 2018; Whitehead, 2018). It also failed to make beef prices more stable or affordable for consumers (Tawaf, 2014) or to make a positive net welfare impact either on the industry as a whole or the smallholder producers (e.g., Hadi et al., 2001; Vanzetti et al., 2010; and Deblitz et al., 2011). The main reason for the poor outcomes is that most programs are production-oriented, aimed mainly at increasing the cattle population, rather than at improving on-farm productivity and the linkages to the market (Waldron et al., 2013). The Ministry of Agriculture on the other hand attributed the lack of success in achieving self-sufficiency to the lack of land and the inefficiency in the market chain.¹⁵

Furthermore, some policies were found to be contradictory and counter-productive (Waldron et al., 2013; Agus and Widi, 2018). For example, while beef self-sufficiency programs were aimed at increasing domestic cattle and beef production and improving farmers' income, the importation of cheaper frozen beef and price ceilings have depressed cattle price for farmers. Another example is the

¹⁵ The latter was addressed, unfortunately, by giving BULOG (Badan Urusan Logistik) (or the National Logistics Agency), a state-owned organisation, more power in beef importation and distribution.

SIWAB program which promotes cross-breeds through AI. However, without additional technical and institutional support, the use of semen of exotic breeds and uncontrolled crossbreeding have resulted in serious reproductive problems, rather than improving productivity. It may also threaten the policy aimed at the preservation of local breeds (Bali and Ongole) if the cross-breeding program is not managed appropriately (Agus and Widi, 2018).

Box 1. Key components of the beef self-sufficiency policy

Cattle distribution schemes. Cattle, mainly breeding cows, are distributed to members of farmer groups as a grant or under some agreements whereby farmers are obliged to return calves to the government for re-distribution within a certain period. Increases in cattle population in Indonesia can be attributed to the cattle distribution schemes that have been running since the 1980s (Waldron et al., 2013). The whole cattle herd of Nusa Tenggara Barat (NTB) and Nusa Tenggara Timur (NTT), two of the major cattle suppliers in Indonesia, and Tanah Laut district, the largest cattle producer in South Kalimantan province, can be traced back to distribution schemes conducted over the last three decades.

Breeding programs. They include promoting the use of artificial insemination (AI) and establishing Village Breeding Centres (VBCs). AI programs were further strengthened in 2016 with the launch of the “Sapi Indukan Wajib Bunting” (UPSUS SIWAB) program, aimed at “getting every cow pregnant”. Specific targets of SIWAB are: achieving pregnancy from AI and natural mating at 70 per cent or more; reducing reproductive disorders by 60 per cent; decreasing the slaughtering of productive females to 20 per cent; and increasing the body condition score (BCS) of cows by one point. Under SIWAB, farmers are encouraged to plant grasses and legumes to improve feed and feeding by, and provided with veterinary medicines and vaccines to improve animal health, in addition to accessing semen from both local breeds (mainly Bali cattle) and exotic breeds (Simmental and Limousin) free of charge (Agus and Widi, 2018).

Slaughter ban and the rescue (buy-back) of productive females for redistribution. The slaughter of productive females (less than eight years old and with less than five calves) is banned by central and local government regulations. Transgressors can be fined or imprisoned. In addition, there are programs to rescue and buy back productive females found in the slaughterhouse or cattle market, and redistribute them to other farmers or farmer groups through cattle distribution schemes. Despite the regulations, significant numbers of females are being slaughtered regularly, and especially during high beef demand periods such as Idul Fitri (Waldron et al., 2013). These programs are difficult to implement due mainly to the lack of human resources to monitor the large number of cattle being slaughtered at various slaughterhouses, and the large capital required for buy-back.

Beef NES (nucleus estate smallholder) programs. Under these programs, the ‘nucleus’ companies (importers, plantations, feedlots, abattoirs, traders, etc) enter either production or marketing contracts in various terms with the ‘plasma’ cattle producers (smallholders and farmer groups). They have existed since 1990, but were significantly reduced in the late 1990s due to the Asian financial crisis, and the involuntary nature of some arrangements. The 5+1 feeder breeder policy, may see the NES program revitalised.

Credit schemes. Bank loans are made to cattle producers for smallholder fattening operations (KUPS) and to larger scale cow-calf operators (KKPE), with interest rates subsidised by government.

Import policies

Food importation in Indonesia is regulated under Law No. 18/2012 on Food (the “Food Law”)(USDA, 2019). Article 14 of the Food Law stipulates that the importation of food products can be conducted only if local production is insufficient, or it cannot be produced domestically, to meet demand. In addition, Article 39 of the Food Law stipulates that food import policy and related regulations do not negatively impact on the production and welfare of local farmers and food businesses. The Food Law is a significant piece of legislature because not only does it ensure that imports are used as the last resort to meet any demand shortfalls, but also it provides the justification for the imposition of various tariff and non-tariff trade barriers to safeguard food sovereignty, food safety, self-sufficiency and food security objectives. The Food Law justifies the increasingly nationalistic and protectionist view of Indonesia’s trade policies on food (Patunru and Rahardja, 2015; Limenta and Chandra, 2017).

However, using imports as the last resort and non-tariff barriers to meet demand shortfalls has created tensions between Indonesia and its trading partners (Limenta and Chandra, 2017). In 2013, the United States, together with New Zealand, challenged those restrictions under the WTO’s dispute settlement procedures. On December 22, 2016, the WTO issued the panel report, finding that Indonesia is applying import restrictions and prohibitions that are inconsistent with WTO rules (USTR, 2019).

In addition to creating uncertainty and instability in the beef market chain, import restrictions and price ceilings have been found to have caused negative impacts on the domestic market, with prices rising and the local herd and beef production dwindling (Limenta and Chandra, 2017; Agus and Widi, 2018). Furthermore, the issuance of import quotas and permits lacks transparency, and seems to be subject to political influences and abuse by corrupt officials and importers (O’Rourke, 2013; Nason, 2016; Limenta and Chandra, 2018). Import licencing and permits might have contributed to the high concentration ratios in the beef market chain (Morey, 2011).

Major events and policy changes that may have contributed to the market instability are outlined in Box 2.

Box 2. Major events and policy changes in the Indonesian beef market

Live cattle export ban in 2011 The Australian government banned all live cattle shipments to Indonesia in June 2011 based on a Four Corners report on ABC which showed Australian cattle being mistreated in Indonesian abattoirs. The ban lasted five weeks but it had severe knock-on effects on the supply chain operators in both countries, which relied on the live cattle trade for their incomes and livelihoods. Trade relationships were strained, and prompted the Indonesian government to re-evaluate its beef import policies. This led to a decision to further diversify its supply sources and reduce its reliance on Australia. Australian live cattle exports dropped off by 42 per cent from 521,002 in 2010 to 278,581 in 2012.

In 2014, Australian cattle producers and related supply chain businesses filed a class action against the Australian government, seeking A\$600 million in compensation for the loss of business and income due to the ban. The export ban was found to be unlawful by the Federal Court on 2 June 2020 (Barbour and Jucker, 2020). The then Agriculture Minister Senator Ludwig who ordered the ban was found to have committed misfeasance in public office as the Ban Order was made without an advice from his Department and despite assurance from the industry that exports could be conducted in a tightly-controlled manner. There was also no attempt to explore solutions with the Indonesian government. **Reference prices.** Import quotas and import licencing were the main tools to regulate live cattle and beef imports soon after the announcement of PSDA-2014 in 2010. However, in August 2013, by the

decree of the MOT Regulation No.699/M-Dag/KEP/7/2013, import quotas were abolished and replaced by a reference price scheme, which significantly changed the trade regulatory framework. Under the scheme, import permits will be issued only if the market price for secondary beef cuts, such as brisket, in traditional markets exceeds the reference price, set initially at Rp.76.000/kg,¹⁶ by more than 15 per cent. Imports would be restricted or stopped if the market price falls below the reference price. There are also changes in the administrative procedures. MOT, rather than MOA, will determine the reference prices and import volumes and issues import permits. The latter requires a recommendation from the Directorate of Veterinary and Public Health and Postharvest of MOA, rather than by the Directorate of MOA. These changes mean that the beef import policy under MOT is likely to be more pro-consumer, rather than pro-producer if they were under MOA. It also means that there will be more variability and uncertainty in beef trade as import volumes are adjusted based on changes in market prices, which like all agricultural products are inherently variable and unpredictable. For this framework to work, it will require very good data and timely forecasts of the Indonesian beef market, as well as quick actions and just-in-time-delivery along the supply chain (Limenta and Chandra, 2017; Indonesia Investments, 2017b).

These reference prices serve as benchmarks for policymakers to allow or halt imports, as well as ceiling prices for retailers. To ensure compliance, market prices are monitored by BULOG, and those who fail to comply may have their business licences revoked (Respatiadi and Nabila, 2017). The scheme has not been received well by farmers and retailers alike because they are too low to cover the cost incurred (InterCAFE and IPB, 2018). There is no transparency in how reference prices are determined.

The 5+1 feeder breeder import policy. Another measure that was put in place in October 2016 to help stabilise beef prices and boost domestic beef production was the 5+1 feeder-breeder import policy. Under the policy, to obtain their import permits, Indonesian importers must agree to bring in one breeder cattle for every five feeder cattle that are imported. The requirement means that the breeders should account for 16.7 per cent of the total shipments of the importer. However, three years after the announcement of the policy, 42,000 breeders were imported from Australia from October 2016 to October 2019, reflecting 2.4 per cent of the total shipments nationwide (MLA, 2019c). It appears that more than 90 per cent of importers had failed to comply with the 5+1 feeder-breeder policy requirement (Ainsworth, 2017).

The policy was difficult to follow mainly because feedlots are set up for fattening, not breeding that will require different investments in physical infrastructure, as well as different skills in animal husbandry, farm management and marketing. In addition, the announcement of the policy coincides with the imports of IBM that have resulted in decreases in demand and reduced profitability (IACCB, 2019). The breeder policy was revised in July 2019, whereby importers are encouraged to include 5 per cent of fertile breeders (18-36 months old and not sprayed) in their shipments.

Beef imports from FMD-free zones. Proposals to import IBM to reduce domestic beef price has been around for decades, but they were defeated in the past when raised (Nason, 2017). The main reason was that an existing Indonesian law prohibited imports from countries that were not free of FMD. Secondly, lobbying groups representing cattle farmers had been able to argue successfully that such imports represented an unacceptable risk to the health and value of the national herd. In late 2014, as beef prices continued to rise and remained unacceptably high, the newly elected President Widodo was able to push the legislation through to allow for the importation of beef and live cattle from FMD-

¹⁶ It was later raised to Rp.80,000/kg. There are reference prices for frozen beef and fresh beef. While one reference price of Rp.80,000/kg is applied to all frozen beef, the reference price for fresh beef differs by cuts and for secondary cuts only. For example, it is Rp.98,000/kg for round steak, Rp.80,000 for brisket and Rp.50,000/kg for frank (InterCAFE and IPB, 2018). There are no restriction on fresh prime beef cuts.

free zones of countries, such as Brazil and India. The stated aim was to reduce high beef prices, making beef more affordable to ordinary Indonesians, as well as to diversify its beef import sources beyond Australia.

Initially, IBM was to be imported exclusively by BULOG, a state-owned enterprise, and distributed by three approved meat distributors. It was supposed to be sold in traditional markets in Greater Jakarta at no more than the reference price of Rp.80,000/kg. However, without close monitoring and enforcement, IBM soon spread through to traditional markets in other regions/cities (such as Medan, Bali, Surabaya, Makassar and Kupang) (MLA, 2016b), and could be sold at around Rp.85,000-105,000/kg (MLA, 2017b). Our own field work revealed that IBM could be mixed with local beef, or even passed as fresh beef and sold at Rp.120,000-130,000/kg. Therefore, IBM competes directly with local fresh beef, derived from domestic cattle as well as lot-fed Australian cattle (80 per cent of which is sold into wet markets in Greater Jakarta as hot carcasses).

⁶
IA-CEPA. IA-CEPA (Indonesia Australia Comprehensive Economic Partnership Agreement) was signed in March 2019. Beef and sheep farmers would be big winners (Beef Central, 2019) because tariffs will disappear, and import quotas will be increased and with greater certainty. Key benefits to the Australian beef and live export industries from the agreement, as laid out in Beef Central (2019), include:

- A quota (with a zero per cent in-quota tariff) for 575,000 head of live male cattle – which will grow by 4 per cent per annum over five years to 700,000 head. Live cattle import permits will be issued automatically on an annual basis and without seasonal restrictions – a welcome improvement on previous administrative procedures. A review of this trade will be conducted after five years to consider future increases in the quota, above 700,000 head;
- Liberalised access for female live cattle exported to Indonesia, with 0 per cent tariff on entry into force of the agreement and no quota or import permit restrictions;
- Immediate or gradual liberalisation of tariffs applicable to boxed beef and sheepmeat exports to Indonesia – whereby those tariff lines not already benefiting from 0 per cent tariffs secured under AANZFTA, will benefit from either a 0 or 2.5 per cent tariff on EIF (down from 5 per cent) with the tariff being eliminated altogether over five years; and
- Similar advantages will be extended to frozen offal, with the 5 per cent tariff eliminated on entry into force of the agreement.

Indonesia is a member of several multilateral and regional agreements to promote trade liberalisation, including WTO (World Trade Organisation), G20, APEC (Asia-Pacific Economic Cooperation), ASEAN (Agreement of South East Asian Nations), and the ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA). However, protectionist policies can be put in place whenever needed. Therefore, the real outcomes from IA-CEPA remain to be seen after it takes effect on 5 July 2020.

The impact of Import Policies on Australian Exports

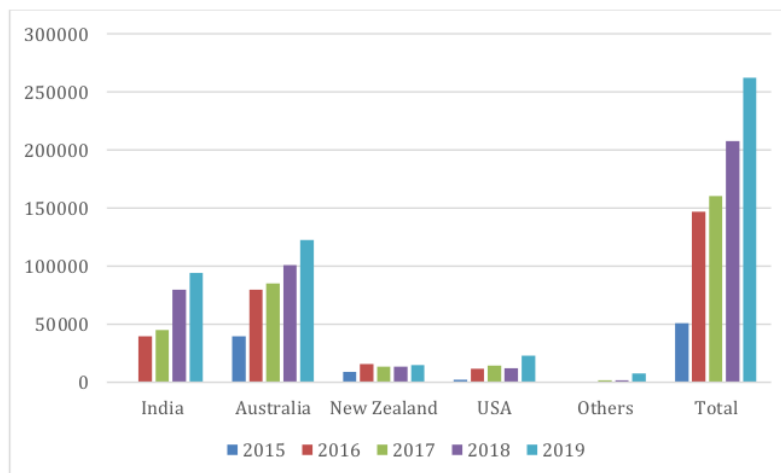
In the months that followed the entry of IBM into Indonesia, the demand for slaughter cattle in West Java, which include both domestic and lot-fed Australian cattle, was said to have declined by as much as 50 per cent (Nason, 2017). Australian live cattle exports to Indonesia declined by 16 per cent and boxed beef exports declined by 19 per cent (Relph, 2019). These claims are supported by our own field work conducted in major cities in East Kalimantan, Riau and South Kalimantan (Chang et al., 2020a and 2020b). However, there are also opposing claims that IBM has had little impact on Australian producers. There are several possible reasons for that. Firstly, lot-fed Australian cattle stands for quality (i.e., fresh, safe and locally produced) while IBM is of the lowest quality (Goodwin, 2019; MLA, 2019b). Secondly, they compete in different market segments. While Australian beef is used mostly

at the medium to high end restaurants in major cities and tourist destinations, such as Bali and Jakarta, IBM is largely used by bakso makers and small to medium food manufacturers (MLA, 2018b). Finally, despite the emerging middle class, Australian beef remains out of reach for the vast majority of Indonesians. Therefore, instead of replacing Australian beef, cheap IBM provides an affordable alternative to low income households, allowing the market to expand (Goodwin, 2019; MLA, 2019b).

However, those claims are true only in terms of volumes because there are significant changes in terms of market shares and product mix, and possibly prices. Beef imported from different sources are shown in Figure 10, indicating increases in Australian beef imports to Indonesia, along with total imports and IBM imports, and some decreases in imports from New Zealand and the United States.

However, the market share of Australian beef has decreased from 78 per cent in 2015 to about 50 per cent in the following years (Figure 11). A declining market share in a growing market ought to be a cause for concern because it may be a sign for losing competitiveness.

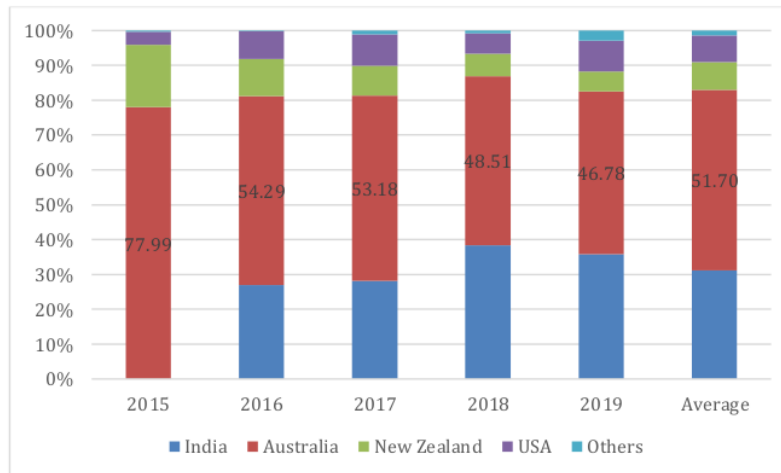
Figure 10. Beef imports in Indonesia by source (in tonnes/year), 2015-2019



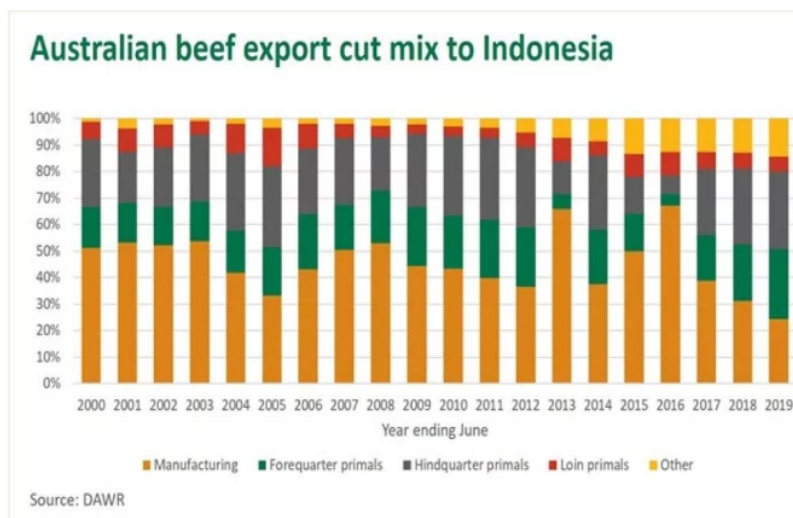
Source: BPS (2020)

In terms of product mix, manufacturing beef, which accounts for nearly 70.54 per cent of the total beef exports to Indonesia in 2015 has declined to about 25 per cent in 2019 (Figure 12). The graph also suggests that Australian beef exports to Indonesia did not always target the high end market as claimed.

Whether the change in the product mix is a concern or not will depend on the relative size and growth rate of different market segments. That is, if Australian beef is moving up market, how fast are the middle class and the tourist sector growing? Will they be big enough to offset the losses in the very large manufacturing sector?

Figure 11. Volume shares in total beef imports in Indonesia by source (in tonnes/year), 2015-2019

Source: BPS (2020)

Figure 12. Australian beef export shares (in %) to Indonesia by beef cuts

Source: MLA (2019b)

Summary of Key Results

- ¹⁶ The aggregate demand for beef in Indonesia is likely to increase as a result of population growth, economic growth and urbanisation. However, demand growth is most likely to be slow and limited to metropolitan areas, such as Jakarta and West Java, because of uneven economic development and geographical and cultural diversity across regions.
- Although the middle class is growing (10-20 per cent of the total population), it does not necessarily mean a change to a Western diet or higher beef consumption on a large scale, and their dietary preferences need to be better understood.

- Overall, Indonesia's food consumption pattern is more akin to a low income country than a rapidly growing and urbanising middle-income country. It means that Indonesian diets, which are dominated by rice, soya-based protein, such as tahu (tofu) and tempeh, fish and chicken, may remain so for decades, especially in regions outside major cities.
- Per capita beef consumption is unlikely to increase as fast as has been predicted as long as beef remains two to three times more expensive than fish or chicken, unless there are significant changes in income and relative prices.
- Frozen beef is gaining acceptance due to low costs, promotion and consumer education. This development will affect the demand for locally produced beef, including that from the feedlot, and hence the demand for live cattle from Australia.
- Demand and supply elasticity estimates are crucial for providing reasonable projections and assessing the impact of changes in market conditions, but estimates that are available in the literature are nearly 20 years old. Therefore, updates are urgently needed.
- Since the Greater Jakarta market makes up 70 per cent of the total beef demand in Indonesia, it seems necessary to separate it from other markets as far as demand forecasts are concerned.
- The foodservice sector utilises 70-80 per cent of the total beef consumed. However, there is little detailed study on the demand for, and utilisation of, beef from that sector. It casts doubt on the usefulness and validity of estimating beef demand based on consumer/household surveys.

Implications for Australia

- Demand for higher quality beef cuts may increase due to income growth, but may be limited to the urban, young population with higher incomes, the tourism sector and the expatriate population. The rest of the population will still prefer traditional beef dishes, which are spicy and full of flavours and much less expensive.
- Although the growth in the middle income class presents an opportunity for higher quality Australian boxed beef potentially, it may not be as influential or reliable as has been predicted. More research is needed to understand the dietary preferences of different age groups in different locations, and the extent and speed of Westernisation if at all.
- Urbanisation can be an opportunity for Australia. However, the majority of capital cities outside Jakarta are not as Westernised or modernised as Jakarta, and may remain quite traditional and conservative in decades to come. Therefore, demand forecasts or results from consumer/market surveys for the Greater Jakarta regions should not be generalised.
- The target market for Australian beef was said to be the top end middle class in urban cities. This strategy if true is quite risky as this market makes up a small proportion of the total population, and is most affected by changes in economic conditions.
- With a market share of 70-80- per cent, beef demand from the food service sector, especially at the lower end, cannot and should not be ignored or played down.
- The impact of IBM on Australian exports is not so much in volume terms, but in terms of product mix and market share. Changes in market position need to be closely monitored in different market segments, as well as in both the long term and short term.

Conclusion

The Indonesian beef market is very important to Australia. However, the operating environment has been challenging, and increasing so, due to the nature of demand and supply conditions as well as changing government policies and regulatory interventions. The lack of quality data and transparency in demand and supply projections, on which policies are based, may have further destabilised the market. Recent policy changes, such as the 5+1 feeder breeder import policy and the lift of import ban on Indian buffalo meat and Brazilian beef, have the potential to substantially reduce the

competitiveness of Australian live cattle and boxed beef exports to Indonesia. The impact will depend on the market to absorb huge increases in beef imports. Our analysis found that the per capita demand for beef in Indonesia as a whole is unlikely to increase significantly in the near future despite the rise of the middle class. This is because the demand for beef in Indonesia varies quite significantly across Indonesia as a result of disparities in socio-economic development and geographical diversity in dietary preferences and affordability and accessibility of beef. Therefore, we conclude that despite whether, and how fast, the Indonesian beef market is likely to grow, to maintain a strong market position, Australia needs to be price competitive in whatever market segments it aims to compete, as well as maintaining good trade relations with Indonesia. More market research is also needed on understanding the demand for beef in different market segments and regions outside Jakarta.

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References

Agus, A. and Widi, T.S.M. (2018), "Current situation and future prospects for beef cattle production in Indonesia — A review". *Asian-Australasian Journal of Animal Sciences* 31(7), 976-983.

Ainsworth, R. (2017), SE Asia Report: Further demand slump puzzles, alarmed Indonesian importers. <https://www.beefcentral.com/live-export/se-asia-report/se-asia-report-further-demand-slump-puzzles-alarms-indonesian-importers/>

Ainsworth, R. (2018), The incredible power of the humble Indonesian bakso ball. 23 March. <https://www.beefcentral.com/live-export/indonesia/the-incredible-power-of-the-humble-indonesian-bakso-ball-2/>.

Ainsworth, R. (2019), August Market Report: S.E. Asian Beef Industry. SE Asia Report, 69th ed., August. <https://seabeefreport.com/2019/09/19/august-market-report-s-e-asian-beef-industry-3/>.

Ainsworth, R. (2020a), A profitable palm cattle grazing model for Indonesia. Beef Central. SE Asia Report. March 6. <https://www.beefcentral.com/live-export/a-profitable-palm-cattle-grazing-model-for-indonesia/> (qurban #)

Ainsworth, R. (2020b), Market Report: Southeast Asian Beef Industry - 75th Edition: February. SE Asia Report. 20 March. <https://www.beefcentral.com/live-export/se-asia-report-jan-2020-3-2/>

Alika, R. (2019), 3,500 tonnes of Brazilian beef imports entering Indonesia this month. 6 December. <https://katadata.co.id/Berita/2019/12/06/3500-ton-daging-sapi-impor-brasil-masuk-indonesia-bulan-ini>

Alim, E.A. (2017), How much has Indonesia achieved in beef sufficiency? <https://food.salaamgateway.com/story/how-much-has-indonesia-achieved-in-beef-self-sufficiency>

AMARTA (2007), A Value Chain Assessment of the Agribusiness Market and Support Activity Livestock Sector in Indonesia. Report presented at the national workshop "Agribusiness Value Chains: Assessments Recommendations and Proposed Interventions", USAID-Indonesia, Jakarta, March 8th.

Among (2020), Bulog commissioner to import 100 thousand tonnes of buffalo meat. <https://bisnis.tempo.co/read/1316568/bulog-ditugaskan-impor-daging-kerbau-100-ribu-ton>

APEDA (2020), India's beef and buffalo meat exports. <https://agriexchange.apeda.gov.in/indexp/reportlist.aspx>

Barbour, L. and Jasper, C. (2020), Federal Court rules in favour of live exporters in landmark class action against Commonwealth Government. ABC Rural, 2 June. <https://www.abc.net.au/news/2020-06-02/federal-court-live-export-class-action-ruling/12308388>

Beef Central (2019), Indonesian trade agreement to benefit beef, live cattle exports. <https://www.beefcentral.com/news/indonesian-trade-agreement-to-benefit-beef-live-cattle-exports/>

BPS (Bureau of Statistics Indonesia) (2018, 2019, 2020), Statistical Yearbook of Indonesia (various issues), Badan Pusat Statistik/BPS-Statistics Indonesia.

Bulo, W. (2018), Insight from Indonesia. Juang Jaya Abdi Alam (PT. JJAA), Lampung, Indonesia.

Burton, L. (2018), Online sales of Australian beef in Indonesia a way to boost live cattle trade, *NT Country Hour*, ABC News, 23 April 2018. <https://www.abc.net.au/news/rural/2018-04-23/digital-marketing-aussie-beef-in-indonesia/9670776>

Chang, H.S., Gloriana, S. and Ilham N. (2020a), "Factors affecting demand for and supply of beef in East Kalimantan". *Australasian Agribusiness Review*. Volume 28, Paper 3, 47-70.

Chang, H.S., Ilham, N., Rukmantara, A., Wibisono, M.G. and Sisriyeni, D. (2020b), "A review of integrated cattle oil palm production in Malaysia, Papua New Guinea and Indonesia". *Australasian Agribusiness Review*. Volume 28, Paper 1, 1-27.

CIE (Centre for International Economics) (2019), Impact of entry of Brazilian product into the Indonesian market. Report prepared for Meat and Livestock Australia, Canberra.

Deaton, A. and Muellbauer, J. (1999), *Economics and consumer behaviour*. Cambridge University Press, London.

Dahlanuddin et al. (2017), "Assessing the sustainable development and intensification potential of beef cattle production in Sumbawa, Indonesia, using a system dynamics approach". *PLoS One*, 12(8), e0183365.

Deblitz, C., Kristedi, T., Hadi, P.U., Triastono, J., Puspadi, K. and Nasrullah (2011), *Benchmarking the beef supply chain in eastern Indonesia*. Final Report SMAR/2007/202, the Australian Centre for International Agricultural Research, Canberra.

EY Sweeney. (2018), *Indonesia's beef consumption and preference trends*. <http://www.redmeatcattlepartnership.org/files/Neqx4-26925-beef-consumption-consolidated-report-final-english.pdf>

Goodwin, S. (2019), Indonesia's taste for beef evolved. *Farm Online*. 6 November. <https://www.farmonline.com.au/story/6478677/indonesia-taste-for-beef-evolved/>

Hadi, P.U., Ilham, N., Thahar, A., Winarso, B., Vincent, D. and Quirke, D. (2002), *Improving Indonesia's Beef Industry*, ACIAR Monograph No. 95, The Australian Centre for International Agriculture Research (CIAR), Canberra.

Hirschmann, R. (2020), *Per capita beef consumption in Indonesia 2009-2019*. <https://www.statista.com/statistics/757351/indonesia-beef-consumption-per-capita/>

4

IACCB (Indonesia Australia Commercial Cattle Breeding Program) (2019), *IACCB Phase One Completion Report*. <http://iaccbp.org/files/Q9LaH-20190304-iaccb-report-pages-low-edt01.pdf>.

7

Ilham, N. (1998), *Penawaran dan Permintaan Daging Sapi di Indonesia: Suatu Analisis Simulasi (Supply of and demand for beef in Indonesia: A simulation analysis)*. Unpublished Master's thesis, Bogor Agriculture Institute, Bogor.

Indonesia Investments (2017a), Poverty and inequality in Indonesia & the Gini ratio. <https://www.indonesia-investments.com/id/keuangan/angka-ekonomi-makro/kemiskinan/item301>

25

Indonesia Investments (2017b), Cartels in Indonesia: Indian beef imports fail to push prices lower. 10 April. <https://www.indonesia-investments.com/id/news/news-columns/cartels-in-indonesia-indian-beef-imports-fail-to-push-prices-lower/item7735> 2017.

35

Indonesia Investments (2019), Indonesian macroeconomic figures. <https://www.indonesia-investments.com/id/keuangan/angka-ekonomi-makro/item16>.

52

InterCAFE (International Centre for Applied Finance and Economics) and IPB (Institute Pertanian Bogor) (2018), *Market study on the food sector in Indonesia*. https://www.kppu.go.id/docs/buku/Market_Study_Report_JICA.pdf

29

Kusriatmi, Oktaviani, R., Syaukat, Y. and Said, A. (2014), "Analysis of the effects of beef import restrictions policy on beef self-sufficiency in Indonesia". *J. ISSAAS*, 20 (1), 115-130.

24

Limenta, M.E. and Chandra, S. (2017), "Indonesian food security policy", *Indonesia Law Review* 2, 245-265.

71

McBeth, J. (2018), Beef grieves as Indonesia fails at self-sufficiency. *Asia Times*. April 20. <https://asiatimes.com/2018/04/beef-grief-indonesia-fails-self-sufficiency/>

MLA (Meat & Livestock Australia) (n.d.), *Market information: Australian live feeder and slaughter cattle exports monthly*. MLA Statistics Database. <https://statistics.mla.com.au/report/>

4

MLA (2015), *Market Snapshot: Beef Indonesia*. *MLA Industry Insights-Indonesia-May 2015*.

4

MLA (2016a), *Market Snapshot: Beef Indonesia*. *MLA Industry Insights-Indonesia-April 2016*.

MLA (2016b), Cattle exports slow amid Indonesian policy shift. *MLA Market News*. 17 November.

4

MLA (2017a), *Market Snapshot: Beef Indonesia*. *MLA Industry Insights-Indonesia-February 2017*.

MLA (2017b), Indian buffalo meat in Indonesia: initial impacts on livestock exports. *MLA Market News*. 11 July.

4

MLA (2018a), *Market Snapshot: Beef: Indonesia*. *MLA Industry Insights-Indonesia-January 2017*.

4

MLA (2018b), *Market Snapshot: Beef: Indonesia*. *MLA Industry Insights-Indonesia-October 2018*.

MLA (2019a), *Global Snapshot: Beef*. *MLA Global Snapshot-Beef, January 2019*.

- MLA (2019b),⁹ What can be expected from Brazil's beef access to Indonesia? MLA Market News. 22 August. <https://www.mla.com.au/prices-markets/market-news/what-can-be-expected-from-brazils-beef-access-to-indonesia/>
- MLA (2019c), Cattle export market dynamics shifting. News and Events. MLA. 28 October. <https://www.mla.com.au/news-and-events/industry-news/cattle-export-market-dynamics-shifting/>
- Morey, P. (2011), Market study: The Indonesian Cattle and Beef Industries. The Australian Centre for International Agriculture Research (ACIAR), Canberra.⁸¹
- Nason, J. (2014), Indonesia releases Q3 permits for 167,000 cattle. Beef Central: Indonesia. June 30. <https://www.beefcentral.com/live-export/indonesia/indonesia-releases-q3-permits-for-167000-cattle/>
- Nason, J. (2016),¹⁰⁶ Corruption in Indonesia: should import quotas be scrapped? Beef Central: Indonesia. 20 September.
- Nason, J. (2017), Why isn't IBM bringing down Indonesian beef prices? Beef Central: Indonesia. 10 April.
- Nimmo-Bell and ICACEPS (Indonesian Centre for Agricultural Socio-Economic and Policy Studies) (2007),⁴⁴ Value chain analysis for SADI agri sectors: The NTT Beef Industry. IFC SADI Agri Sectors
- OECD (2020), Meat consumption (indicator). doi: 10.1787/fa290fd0-en (accessed on 6 January 2020).⁴⁷ <https://data.oecd.org/agroutput/meat-consumption.htm>.
- O'Rourke, K. (2013), Overprotection is not the answer. *Inside Indonesia*, 114, Oct-Dec.
- Oxford Business Group (2019),³⁹ The Report: Indonesia 2019: Indonesia's growing middle class boosts consumer spending. <https://oxfordbusinessgroup.com/analysis/loosening-belt-growing-middle-class-boosts-consumer-spending>
- Pahantus, M., Amruzi, M., Dessy, A. and Didik, S. (2017),¹⁴ "The impact of the policy on the imported beef from Australia and the production of domestic beef". *RJOAS*, 5(65), May.⁵⁵ <https://doi.org/10.18551/rjoas.2017-05.37>.
- Patrick, I.W., Marshall, G.R., Ambarawati, I.G.A.A. and Abdurrahman, M. (2010),² Social capital and cattle marketing chains in Bali and Lombok Indonesia. The Australian Centre for International Agricultural Research, Canberra.
- Patunru, A. and Rahardja, S. (2015),⁴⁵ Trade protectionism in Indonesia, Bad times Bad Policy. Lowy Institute for International Policy, Sydney.
- Permani, R. (2013a),²¹ Rethinking Indonesia's beef self-sufficiency agenda. <http://www.insideindonesia.org>.
- Permani, R. (2013b),²⁷ "Determinants of relative demand for imported beef and a review of livestock self-sufficiency in Indonesia". *Journal of Southeast Asian Economies*, 30 (3), 294-308.¹⁷ <https://www.jstor.org/stable/43264686>
- Purba, H. (2009),¹⁷ The dynamics of beef supply chain in Indonesia. Indonesian Centre for Agricultural Socio-Economic and Policy Studies. Bogor.

- Relph, Z. (2019), Alarm bells ring for Indian buffalo imports. *The West Australian*. 21 March.
- 38
Respatiadi, H. and Nabila, H. (2017), Beefing up the stock: policy reform to lower beef prices in Indonesia. Centre for Indonesian Policy Studies. Jakarta.
- 22
Rosegrant, M.W., Paisner, M.S., Meijer, S. and Witcover, J. (2001), Global food projections to 2020: emerging trends and alternative futures. International Food and Policy Research Institute (IFPRI). <https://www.ifpri.org/publication/global-food-projections-2020>.
- 14
Rudatin, A. (2016), "Analysis on Indonesia's beef imports". *Economic Journal of Emerging markets*, 8(1), 65-72.
- Simanjuntak, Y.H. (2011), Imported beef not allowed in traditional markets. *Bisnis.com*. 27 October. <https://ekonomi.bisnis.com/read/20111027/99/51416/daging-sapi-impor-dilarang-masuk-pasar-tradisional/>
- 19
Simatupang, P., T. Sudaryanto, A. Purwoto and Saptana (1995), *Projection and Policy Implications of Medium and Long Term Rice Supply and Demand. Research Report*. Center for Agro Socioeconomic Research in collaboration with International Food Policy Research Institute. Bogor.
- 83
Sirod, M. (2012), Survey karkas presentasi. <https://www.slideshare.net/msirod/survey-karkas-presentasi-2012>.
- Smith, A. (2018), More buffalo on the menu in Indonesia. *Farm Weekly*.
- 21
Tawaf, R. (2014), "Critical analysis of the unsuccessful of beef self sufficiency program in Indonesia". In the Proceedings of the 6th Livestock Sustainability Conference, Padjajaran University.
- 59
USDA (United States Department of Agriculture) (2019), FAIRS annual country report: Indonesia food and agricultural import regulations and standards report. GAIN Report No. 1841. USDA FAS Jakarta. 18 March.
- 10
65
USTR (United States Trade Representative) (2019), 2019 National trade estimate report on foreign trade barriers.
- 16
Vanzetti, D., Setyoko, N. R., Trewin, R., & Permani, R. (2011), "Home grown: Cattle and beef self-sufficiency in Indonesia". Crawford School of Economics and Government Working Papers No. IDEC10-04. Australian National University.
- 11
Waldron, S., Mayberry, D., Dahlanuddin, Mulik, M., Quigley, S. and Poppi, D. (2013), Eastern Indonesia agribusiness development opportunities – an analysis of beef value chains. Final Report AGB-2012-005, the Australian Centre for International Agricultural Research, Canberra.
- 15
Waldron, S. and Brown, C. (2014), Chinese and South East Asian cattle production. In Cottle, D. and Kahn, L. (eds.) *Beef Cattle Production and Trade*. CSIRO Publishing. P. 135.
- 11
Waldron, S. (2016), *Economic analysis of cattle fattening systems based on forage tree legume diets in Eastern Indonesia*. Final Report AGB/2014/034, the Australian Centre for International Agricultural Research. Canberra.

Wikipedia. (n.d.), Jakarta metropolitan area.

https://en.wikipedia.org/wiki/Jakarta_metropolitan_area

9

Whitehead, R. (2018), Indonesia to beat beef self-sufficiency deadline, says official, but industry sceptical. *Salaam Gateway*. 28 March.

34

World Bank (2016), *Indonesia: Economic Quarterly*, October 2016. <http://www.worldbank.org/en/country/indonesia/publication/indonesia-economic-quarterly-october-2016>.

World Bank (2019a), Data: *Indonesia*. <https://data.worldbank.org/country/indonesia>

60

World Bank (2019b), *World development indicators*. <https://datatopics.worldbank.org/world-development-indicators/>.

World Bank (2020), *Indonesia*. <https://data.worldbank.org/country/indonesia>.

Appendix 1. An improved formula for calculating the beef self-sufficiency ratio

Self-sufficiency ratios (SSR) for beef in Indonesia have been reported many times. Estimates include 71 per cent in 1997 and 91 per cent in 1998, with an average of 80 per cent over 1995-2000 (Hadi et al., 2001), 71 per cent in 2006 (Vanzetti et al., 2011), 70 per cent in 2009 and 75 per cent in 2010 (Permani, 2013a), 60-62 per cent in 2007-2009 (Deblitz et al., 2011), 66 per cent in 2011 (Morey, 2011), 69 per cent in 2014 and 76 per cent in 2015, 68 per cent in 2016 and 59 per cent in 2017 (Alim, 2017; Whitehead, 2018), 68 per cent in 2017 (Bulo, 2018), 55 per cent in 2018 (Agus and Widi, 2018), and 42 per cent in 2018 (EY Sweeney, 2018).

Factors that may have contributed to the discrepancies in reported SSR include:

- whether beef production is expressed in carcass weight or in meat/beef equivalent;
- whether local beef production includes beef produced from imported Australian live cattle or not;
- whether beef imports include beef from all sources or from Australia only, or whether beef offal is included or not;
- the assumptions made regarding the slaughter weight of local and Australian cattle;
- the conversion factors used to translate slaughter weight into carcass weight and to meat/beef equivalent;
- whether the self-sufficiency ratio is calculated based on the estimated demand or estimated total supply (or disappearance); and
- variations in data sources.

Another possibility for the discrepancies is the definition of self-efficiency, as well as the (unreliable) reporting of official statistics (Vanzetti et al., 2011). They compared SSR in volume and value terms, with the results being 71 per cent and 79 per cent, respectively.

In this study, a new formula was developed to improve the consistency and reliability of the estimates. Key features of the new formula are:

- it is calculated based on beef/meat equivalent;
- slaughter numbers are separated into domestic and imported cattle, with different slaughter weights;
- beef produced from live cattle imported from Australia has an import component ("beef on the hoof") and a domestic component (i.e., the weight gained achieved in the feedlot), following Kusriatmi et al. (2014);
- "total local beef production" is the sum of beef produced from domestic cattle plus the weight gained from fattening/finishing in the feedlot;
- "total beef imports" include all chilled and frozen beef imported from all sources ("beef in the box", as well as "beef on the hoof");
- "total beef supply" = local beef production + total beef imports; and
- the self-sufficiency ratio is defined as: $(\text{total local beef production} / \text{total beef supply}) * 100$ per cent.

Further assumptions are made regarding live weight and weight conversions factors for the baseline case, and are presented in Appendix Table 1.1. Note that the slaughter weight of Australian cattle was assumed to average at 480kg/head, which consists of an import component of 350kg/head (the average live weight of imported feeder cattle) and a domestic component of 130kg/head (the average weight gain from fattening).

Appendix Table 1.1. Baseline assumptions regarding live weight and weight conversion factors

| | Slaughter weight | Import component | Domestic component | Dressing percentage* | Meat yield** |
|-------------------|------------------|------------------|--------------------|----------------------|--------------|
| Australian cattle | 480kg | 350kg | 130kg | 0.50 | 0.70 |
| Domestic cattle | 350kg | NA | NA | 0.50 | 0.70 |

Source: Adapted from Sirod (2012), Kusriatmi et al. (2014), Bulo (2018), and OECD (2020). Notes: * Conversion factor from live weight to carcass weight. ** Conversion factor from carcass weight to meat/beef equivalent.

Appendix 2. Import restrictions on Australia’s live cattle and beef exports to Indonesia

Box 3. Events and regulatory changes that may help explain the fluctuations in Australian live cattle and beef exports to Indonesia

- 1990, the start of a feedlot industry in Indonesia and live cattle imports from Australia.
- Mid 1997 - 1998, the Asian financial crisis.
- 1999, the introduction of the beef self-sufficiency policy (PSDA-2005), to be achieved by 2005.
- 2005, PSDA-2010 launched to achieve beef self-sufficiency by 2010.
- 2008, the global food crisis with price hikes.
- 2009, PSDA-2014 was launched to achieve beef self-sufficiency by 2014, by restricting imports to 10 per cent of the total demand.
- 2010, import quotas on live cattle and boxed beef were imposed, with live cattle imports capped at 500,000 head and boxed beef at 50,000t for 2010. Live cattle imported must also be under 350kg (and less than 36 months old) and fattened for at least 60 days in Indonesian feedlots to boost employment in the local industry. Import permits are issued based mainly on feedlots’ holding capacity. Higher import quotas can be granted if the feedlots purchase a minimum of ten per cent of feeder cattle from domestic producers.
- June 2011, the Australian government banned live cattle export to Indonesia for one month due to animal welfare concerns. The Indonesian government retaliated by imposing tariffs and cutting import quotas.
- 2012, the annual live cattle import quota was reduced from 520,000 head in 2011 to 283,000 in 2012, and for boxed beef, from 100,000t in 2011 to 32,000t in 2012. A 5 per cent tariff was imposed on live cattle imports, except “oxen and breeders”. Imported (frozen) beef could only be sold to distributors and the food service sector; selling directly to retailers in traditional markets or consumers was prohibited. The outlet restriction was lifted in 2015.
- 2013, a further reduction in annual live cattle import quota from 283,000 head in 2012 to 267,000 head in 2013, and for beef imports, from 34,000t in 2012 to 32,000t in 2013.
- August 2013, import quotas were replaced by reference prices. Import permits were issued on a quarterly basis.
- October 2013, new import licences or permits for 75,000 head over October-December 2013 were issued.
- 2014, President Jokowi was elected, with the announcement that beef self-sufficiency was to be achieved in five years (2019), which was later extended to 2026.
- 2014, at the start of this year Indonesia announced its plan to import 750,000 cattle. Permits for 160,000 cattle were issued in the first quarter, 286,000 cattle in the second quarter, 167,000 cattle in the third quarter, and 137,000 cattle in the final quarter (Nason, 2014).
- 2015, the live cattle import quota for the July-September quarter was reduced to 50,000 head from 250,000 head for the April-June quarter. Imported beef was to be excluded from entering

traditional markets. The ideal beef price in traditional markets was set by the Ministry of Trade at Rp.85,000-90,000/kg.

- ⁶ 2016, import quotas and permits were issued on a trimester basis.
- ⁶ May 2016, restrictions on the importation of secondary cuts of beef and offal, which were imposed in 2015, were relaxed; subsequently, most beef cuts are allowed to be imported into the market.
- August 2016, IBM was allowed in officially.
- September/October 2016, the 5+1 feeder-breeder ⁷ policy was announced in September and came into effect in October. It coincided with the abolition of live cattle and beef import quotas, and the ⁸⁵ revival of IBM in August 2016. However, all imports were still subject to recommendations from the Ministry of Agriculture and the issuance of import permit by the Ministry of Trade (which was reversed back to be on ⁷⁸ annual basis).
- ⁶ February 2017, weight and age limits of imported feeder cattle were revised. Average weight limit was increased from 350kg to 450kg, with a maximum age being increased from 36 to 48 months. In addition, feeder ⁸ cattle must be fattened for 120 days (MLA, 2017a).
- April 2017, to stabilise beef prices and provide consumers with access to affordable meat, importers and modern ⁸ retailed outlets are required to sell frozen beef, and IBM, at no more than Rp.80,000/kg (MLA, 2018a).
- ⁸⁶ March 2019, IA-CEPA (Indonesia Australia Comprehensive Economic Partnership Agreement) was signed by both governments after years of negotiations.
- October 2019, the 5+1 feeder-breeder policy was replaced by a new policy that requires 5 per cent of the total cattle imports to be productive females.

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