

Drink More Milk

Policies Supporting the Indonesian Dairy Industry

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Abstract

The Indonesian Government believes that milk is good for health, particularly infant health, and has a campaign to encourage consumption of fresh milk. At present per capita consumption of fresh milk, at 12 litres per head per annum, is very low and the Government hopes to double it. Fresh milk is little traded internationally so one of the consequences of encouraging consumption is to support the local dairy industry at the expense of domestic and imported suppliers of milk powder and other substitutes.

On the supply side milk production per cow is also low by international standards, at 3,070 litres a year. The Government has policies to increase both the number of dairy cattle and productivity, and ultimately to achieve self-sufficiency. There are also in place tariffs of 5-10 per cent on dairy product imports, but some of these are scheduled to be removed under existing free trade agreements.

A computable general equilibrium model, GTAP, is used to estimate the impact of the fresh milk campaign, the removal of tariffs, and increases in production and productivity. The fresh milk campaign is modelled as a consumption tax to bring about a given change in domestic demand. The closure is switched to endogenise the tax. A production shift is modelled as an output subsidy, and a productivity shift as an exogenous output enhancing productivity shock. No attempt is made to measure the benefits of drinking fresh milk, although these are presumed to be positive.

The results suggest supply side policies predominantly benefit consumers and demand side shocks benefit producers to a greater degree. Faced with constant and inelastic demand, a production increase drives down prices by more than the change in output. The removal of tariffs on dairy products would not be beneficial for Indonesian producers.

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However, producers would benefit from a shift in demand brought about by the fresh milk campaign and from a taxpayer funded output subsidy.

From a consumer perspective, the fresh milk campaign would drive up the price, so existing fresh milk consumers would be worse off. However, supply side policies would provide benefits to consumers. Both a subsidy on milk producers and a productivity improvement would result in lower prices to consumers. Likewise, the elimination of tariffs benefits consumers, although not those who wish to drink fresh milk.

The fresh milk campaign is likely to prove beneficial but it remains to be seen how effective it may be, the cost involved, and the magnitude of the health benefits.

Introduction

The Indonesian Government has several policies in place to assist the domestic dairy industry. While the industry has been highly regulated for many years, a recent addition to the policy mix is a campaign to drink fresh milk. This will supposedly improve infant health, but as fresh milk cannot readily be imported, domestic producers will also benefit at the expense of foreign suppliers of milk powder and other substitutes. This form of support for producers is in addition to tariffs on imports of dairy products.

The purpose of this paper is to provide an assessment of the various policies affecting the dairy sector. Specifically, we examine the potential impacts of increasing consumption of fresh milk through a promotion campaign. In addition, we look at the removal of the existing tariffs on dairy products and at policies to increase production and productivity on the supply side. A computed general equilibrium (GTAP) is used to estimate the potential impacts of these policies.

This paper is structured as follows. Milk consumption and production in Indonesia are described next. The second section will describe the various policies. The third section outlines the methodology and scenarios and the results are presented next. The final section presents policy implications and conclusions.

Milk consumption

Erwidodo and Trewin (1996) asserted some time ago that milk is a luxury good for Indonesians. This remains the case today, although less so. Per capita consumption is still very low in both the rural and urban areas. Annual milk consumption per capita in Indonesia is low compared with other ASEAN countries and other developing countries, at around 12 litres per person per year. This is equivalent to Vietnam but well below Thailand (32 litres) and India (70 litres). However, the trend is increasing in recent years (Jakarta Post 2010).

However, most of the milk consumption is not fresh. The liquid ready-to-drink UHT milk has a quarter of the market share, but sweetened condensed milk (35 per cent) and powdered milk (39 per cent) have greater shares (Slette and Meylinah, 2012). The liquid market is growing strongly, thanks to the greater availability of refrigeration.

The development of a processing sector (for example Cisarua Mountain Dairy-Cimory) has increased the availability and consumption of fresh milk in Indonesia. The Government's 'drink-more-milk' campaign is intended to encourage consumption to double the current levels. Because fresh milk is not readily traded internationally, this requires the expansion of the domestic dairy sector.

Infants and children are the most prominent consumers of milk. Parents, especially urban parents, put their best efforts into feeding their young children with milk. The most popular form of consumption of milk is sweetened condensed milk (SCM) and milk powder. Parents usually reconstitute SCM or powdered milk with water for their children.

The emergence of mini-markets and supermarkets in Indonesia has fostered milk consumption. Traditional stores have been the main destination for SCM and powdered milk for lower-middle and upper-middle class consumers (table 1). The more sophisticated markets are more likely to have refrigeration, which is necessary for the storage of fresh milk.

Table 1 Retail stores by type, 2009

| | Number |
|---------------------|-----------|
| Traditional grocery | 2,520,757 |
| Convenience | 358 |
| Mini-market | 11,569 |
| Supermarket | 1,146 |
| Hypermarket | 141 |
| Warehouse clubs | 26 |

Source: The Nielsen Company, cited in IFC (2011).

Production

In 2012, Indonesian fresh milk production reached an estimated 1.6 million litres per day and it is expected to increase to 1.68 million litres per day in 2013. Indonesia's dairy farmers are predominantly subsistence farmers with low productivity. There is considerable variation between regions, with several averaging little more than half that of the best region (West Java). In 2009 each dairy cow produced an average of 3,069 litres of milk per year (less than 10 litres of milk per cow per day). In addition, in some areas, such as West Sumatra, the proportion of cows that are producing at any one time is as low as 50 per cent (table 2). This is well below the share in regions such as South Sumatra. Nonetheless, productivity has increased substantially since 2000, when the national average was only 1,400 litres per year. Some of this increase is due to a government program to increase productivity by introducing new breeding techniques and new breeding cows (Slette and Meylinah, 2012).

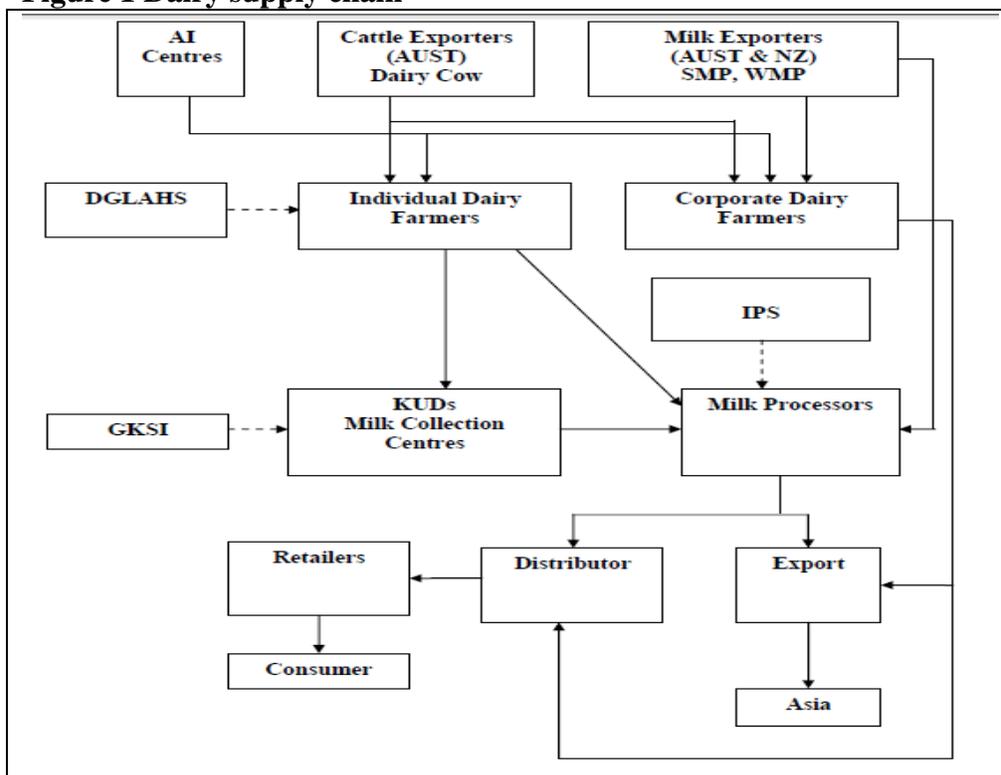
Table 2 Milk productivity by major province in 2009

| Province | Dairy Cattle | |
|------------------|--------------------------------|---------------------------|
| | Cows producing milk (per cent) | Productivity It/head/year |
| North Sumatra | 67 | 2,040 |
| West Sumatra | 50 | 1,920 |
| South Sumatra | 88 | 2,521 |
| Bengkulu | 50 | 1,911 |
| Lampung | 50 | 1,620 |
| Jakarta | 88 | 2,032 |
| West Java | 66 | 3,891 |
| Central Java | 57 | 2,021 |
| DI Yogyakarta | 68 | 3,336 |
| East Java | 57 | 2,954 |
| South Sulawesi | 58 | 2,285 |
| Indonesia | 61 | 3,069 |

Source: Ditjennak in IFC (2011)

The dairy supply chain is shown in figure 1. Most individual dairy farmers supply their milk to milk processors through KUD (milk collection centres or cooperatives) (IFC 2011; Erwidodo and Trewin 1996). One cooperative might count as many as 100,000 farmers as regular suppliers. The quality of milk is controlled by these centres. The processing industry process the milk into sweet condensed milk and powder milk for distribution to retailers and consumers. Milk processors also take supplies of powder from exporters.

Figure 1 Dairy supply chain



Source: IFC (2011)

The development of the dairy sector over the past ten years was quite rapid. The number of processing companies is increasing, offsetting a fall in cooperatives (table 3). State owned enterprises have only a limited role. There are numerous small individual processors, although data on these were not collected after 2007. However, foreign investment is not a dominant player in the sector. The reason for this is that foreign investors must form a partnership with a domestic firm.²

Table 3 Number of milk processors by business type from 2000-2011

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Firm | 12 | 12 | 13 | 12 | 11 | 12 | 9 | 10 | 27 | 26 | 29 | 34 |
| State owned enterprise | | | 1 | 1 | | 0 | 2 | 2 | 2 | 2 | 4 | 5 |
| Cooperative | 77 | 69 | 65 | 78 | 49 | 29 | 17 | 28 | 31 | 29 | 26 | 22 |
| Individual | 289 | 309 | 308 | 261 | 268 | 290 | 381 | 387 | na | na | na | na |
| Foundation | - | - | - | - | - | - | - | - | - | - | 30 | 30 |
| Others | 27 | 32 | 30 | 33 | 25 | 29 | 81 | 90 | 39 | 37 | - | - |

Source: CBS. 'na' denotes not available.

² Presidential Regulation of the Republic of Indonesia Number: 36 of 2010.

Development of local manufacturer of dairy products is a new feature of the industry. For example, the processor Cisarua Mountain Dairy or Cimory was established in 2006 as a subsidiary of Makro Group which aims to provide high quality dairy products using local content. Up until now, Cimory is still considered as a fully domestic dairy processor in Indonesia. The company has a specific focus to use domestic milk. They are able to process milk into yogurt. However, the share of this manufacturer is relatively small at less than 1 per cent of production. Its share of the liquid milk market is 0.1 per cent (IFC, 2011).

Processors provide fresh milk through retailers to the consumer. There is scope to increase this supply, but this would require increased supplies of raw milk or switching away from processed products. Raw milk supplies are limited by supplies of fodder. Quality is also a limiting factor (Nugroho, 2012). If raw milk supplies do increase, consumers are likely to switch away from powder rather than butter, cheese or yogurt.

The major processing industry is still dominated in Java (see table 4). West Java remains the highest supplier and manufacturer of milk with 38 per cent of production. East Java, where Nestle is the largest processor, accounts for 24 per cent. Many firms appear to specialise in one product, such as powder (Nutricia), or liquid milk (Danone). The major companies, Nestle, Indo Lakto and Frisian Flag, produce all three products. The major producers of liquid milk are Ultra Jaya, Frisian Flag, Indo Lakto and Green Field.

Table 4 Production of by major dairy processors by location, 2009 ('000 tonnes)

| Location | Processor | PM | SCM | LM | Total | Production Share |
|--------------|---------------------------|-------------|--------------|--------------|--------------|------------------|
| East Java | Nestle | 40.7 | 71.6 | 4.1 | 116.4 | 13.28% |
| | Frisian Flag | 27.7 | | | 27.7 | 3.16% |
| | Nutricia | 6.5 | | | 6.5 | 0.74% |
| | Green Field | | | 39.8 | 39.8 | 4.54% |
| | Sekar Tanjung | | | 16.3 | 16.3 | 1.86% |
| | Total East Java | 74.9 | 71.6 | 60.2 | 206.7 | 23.59% |
| West Java | Indo lakto | 5 | 164.3 | 47.8 | 217.1 | 24.77% |
| | Ultra Jaya | 2.9 | 6 | 89.9 | 98.8 | 11.27% |
| | Danone Dairy | | | 13.8 | 13.8 | 1.57% |
| | Cisarua | | | 0.2 | 0.2 | 0.02% |
| | Kalbe | 6 | | | 6 | 0.68% |
| | Total West Java | 13.9 | 170.3 | 151.7 | 335.9 | 38.33% |
| Central Java | Sari Husada | 41.3 | | | 41.3 | 4.71% |
| | Tiga Raksa | 4.9 | | | 4.9 | 0.56% |
| | Total Central Java | 46.2 | 0 | 0 | 46.2 | 5.27% |
| Jakarta | Frisian Flag | | 187.6 | 61.2 | 248.8 | 28.39% |
| | Diamond | | | 0.3 | 0.3 | 0.03% |
| | Total Jakarta | 0 | 187.6 | 61.5 | 249.1 | 28.43% |
| Other | | | | 38.4 | 4.38% | |
| Total | | 135 | 241.9 | 211.9 | 876.3 | 100.00% |

Source: CIC Milk Reports, 2008 and 2009 quoted from IFC (2011)

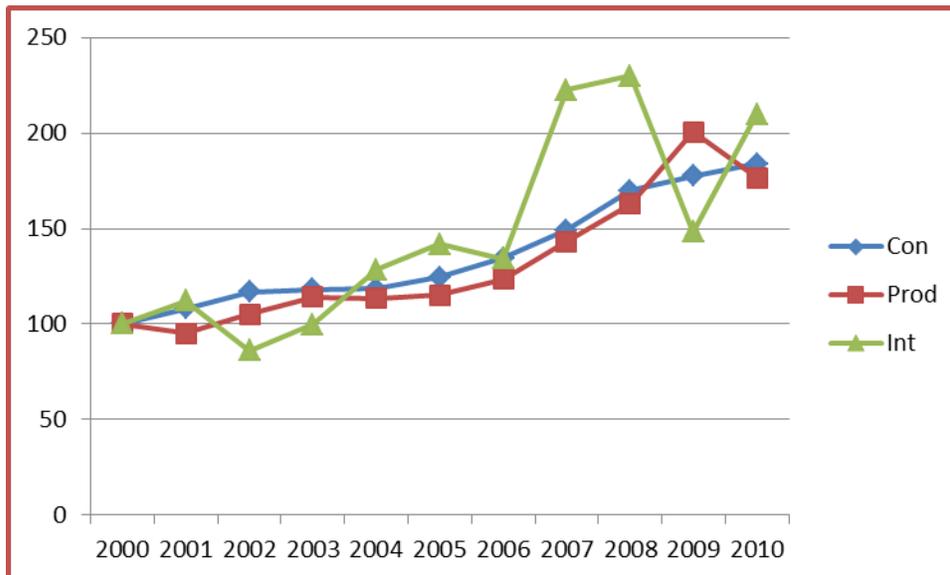
* PM=Powdered Milk, SCM=Sweet Condensed Milk and LM=Liquid Milk. Production share is computed by author.

Prices

Prices for imported dairy products have fallen from the highs of 2007, preceding the global food crisis of 2008, but the trend is well above the levels of ten years ago (see figure 2). In Indonesia, consumer prices of fresh milk have risen substantially in recent years, from 4,884 Rp per litre in 2008 to 6,714 Rp in 2011.³ Nugroho (2012) reports that UHT milk sold in supermarkets sells for around 12,000 Rp per litre, similar to prices in Australia. Farm prices are about a quarter of this, around 3,200 Rp per litre. The fourfold spread between farm gate and consumer prices points to the scope for improving the efficiency of transport and collection. Prices of powder and SCM have been more stable, but nevertheless nominal prices for these products have almost doubled since 2000.

Domestic prices have followed the trend of international prices, with the exception of the dairy price spike of 2007-08 (figure 2). Consumers were protected from this price rise, and producers failed to gain from it.

Figure 2 Producer, consumer and international prices



Index 2000=100. Consumer price is for sweetened condensed milk. Producer prices for whole, fresh cow's milk, reported by FAO. International price is FAO's dairy price index. Sources: FAOstat (2013), Statistik Harga Konsumen Pedesaan di Indonesia.

Policies relating to the Indonesian dairy sector

The Indonesian dairy sector remains highly regulated in spite of several reforms (Erwidodo and Trewin (1996), and IFC (2011)). The purpose of this regulation is mainly fostering the development of the local industry. In addition to a fresh milk campaign, the policies include import licensing; import tariffs; and restrictions on investing in milk processing. A local content requirement was eliminated in 1998 as a precondition for obtaining a loan from the IMF.

³ Statistik Harga Konsumen Pedesaan Di Indonesia.

The Indonesian Government recognizes that awareness of milk consumption as a main source of protein is very low (IFC 2011; Unilever 2011). To foster the development of dairy industry in Indonesia, the Government pursues a “Fresh Milk Campaign” by giving subsidized and free milk to primary students (Ditjennak 2011) and to cooperate with dairy firms in promoting the health benefits of fresh milk. The government aims to double consumption of milk by 2024. The first of June was declared the National Milk day by the Ministry of Agriculture in 2009.⁴

The trade costs of fresh milk are high, so very little fresh milk is traded. There is some trade in UHT milk, which can be stored without refrigeration. Therefore, a policy to encourage fresh milk consumption is likely to assist local producers because almost all of the milk will need to be domestically produced. This policy is consistent with the objective to reach self-sufficiency in the long term.

The Government is aware that to reach self-sufficiency in the dairy sector a long term approach is needed. Nonetheless, it attempts to reduce imports of milk and dependency on imports of milk as an input into production. Import tariffs on raw milk are 5 per cent and on the end-product 10 per cent. Indonesia is importing skimmed milk powder from Australia, New Zealand and the USA. Dependency on imported inputs by Indonesian milk processors is high. Indonesian milk supplies only 30 per cent of domestic needs and processors still depend on imports for 70 per cent of their supply (IFC 2011). However, the schedule of the ASEAN Australian New Zealand Free Trade Agreement tariff reductions has tariffs at zero by 2024. Although this tariff is low, its removal will not assist domestic milk producers.

Reform of the dairy sector is an on-going process. As noted, an import rationing policy was removed during the financial crisis, following the suggestion of the IMF. A value added tax on primary imported or raw imported milk was removed in 2008. The Government paid the import duty of raw materials imported by milk manufacturers in 2008. Income tax is also reduced for milk manufacturers. These tax holidays are aimed at encouraging the development of milk manufacturer sector in Indonesia. However, this aim is not helped by restrictions on foreign ownership.

A credit facility for funding is being endorsed by the Government. The Ministry of Agriculture has given KUPS (Kredit Usaha Pembibitan Sapi or Credit for Cattle Breeding) to help farmers obtain access to funding. This is a soft loan program. The Government subsidizes the interest on the loan. The Government target is to have a national herd of 1 million cows, double the 2009 level of 475,000. The Government set a target of 15 litres of milk per cow each day, up from the current level of 8-10 litres. The soft loan scheme was established in 2009 (Ditjennak 2009). This policy is expected to increase domestic supply and quality of milk. The government has set a target of increasing self-sufficiency from the current 30 per cent to 50 per cent. It also hopes to establish a minimum farm gate price of 80 per cent of the world market price (Nugroho, B.A, 2012).

⁴ Ministry of Agriculture decree No. 2182/KPTS/PD.420/5/2009.

On the supply side the Government introduced a new breeding program to produce cows that are more resilient to pests. The adoption of this technology will help increase productivity (Ditjennak 2011). The Ministry of Agriculture endorses the adoption of cattle production that is more suitable for subsistence farming in Indonesia through cooperation with ACIAR in Sulawesi. The projects successfully developed and tested an approach that combined the principles of participatory, on-farm engagement with farmers, and farming system analysis and modelling to encourage the uptake of technologies that improve the productivity and welfare of smallholder households (Lissonm et al. (2011). Progeny tests to produce prime quality dairy cattle genetics suitable for the Indonesian climate has been provided by The Directorate General for Livestock and Animal Health Services within the Ministry of Agriculture (DGLAHS) since 2003. This policy is to provide better productivity for dairy farming in Indonesia.

The Indonesian government imposes several non-tariff measures restricting dairy imports. Importers need to be registered, and import licensing is necessary. Imports of dairy products are subject to recommendation from BADAN POM and Ministry of Industry. A Halal certificate is also required for importers.

The methodology

The well-known computable general equilibrium model GTAP is used in this analysis to analyse several scenarios relevant to policy changes in the dairy sector. GTAP assumes constant return to scale and perfect competition in production (see Hertel 1997). Constant return to scale is expressed as a constant elasticity of substitution (CES) production function. The model also assumes Constant Elasticity of Transformation (CET) on the movement of resources across sectors. Endowments are assumed immobile between regions.

However, the demand side assumes that the consumer utility function is a Cobb Douglas function which allows expenditure to be allocated to private consumption, government, and savings (Hertel 1997). Private household demand is captured by the assumption of Constant Difference of Elasticity (CDE). This allows users to calibrate the model to a specific own-price elasticity of demand.

The year of the GTAP version 8 databases is 2007. The database is aggregated in 18 regions and 21 sectors including cattle, raw milk, dairy products and beef. Factors of production include land, labour (two types), capital and natural resources.

In the database, Indonesia raw milk production is valued at \$159 million, of which \$110 million is sold to processors and \$49 million is sold direct to consumers. There are no exports or sales to government. Imports of raw milk amount to \$2.4 million. For dairy products, \$2,151 million are produced domestically and \$970 million are imported. Self-sufficiency is 70 per cent. GTAP has no direct means for modelling a change in tastes, but the switch can be modelled by increasing consumer demand for fresh milk. This variable is endogenous in the model, but can be swapped with another variable, such as a consumption tax or productivity change, to make it exogenous and able to be shocked. In this case the \$49 million is exogenously increased by 50 per cent. Consumers drinking

more fresh milk will presumably switch away from milk powder, and hence there will be a decrease in demand for domestic milk for processing, and for imported milk powder.

The scenarios are as follows:

Scenario 1. Fresh milk campaign. We assume a change in tastes results from consumers becoming aware that fresh milk has greater nutritional value. This is modelled as a 50 per cent increase in demand by consumers for raw milk.⁵ The results will show the upstream effects on raw milk production and the negative effects on other consumer goods. However, the welfare measure equivalent variation ignores the benefits of this scheme which are the enhanced nutrition from drinking fresh milk.

Scenario 2. Increase in number of cows. This is modelled as an output subsidy to increase production by 15 per cent, the same as the increase in milk production as in scenario 1.

Scenario 3. Productivity increase. A ten per cent increase in productivity in raw milk production is assumed. There is no cost associated with the productivity increase.

Scenario 4. Trade liberalisation. The tariffs on imports of dairy products into Indonesia are eliminated.

The results

The impacts of the various policies are assessed in terms of output, imports, domestic prices and national welfare.

The fresh milk campaign

The impact of the fresh milk campaign is shown in table 5. If successful, the 50 per cent increase in demand for fresh milk drives up the domestic price by 4 per cent and increases domestic production of milk by 15 per cent. The increased demand for milk has little impact on the demand for imports of dairy products. The increase in imports doesn't quite offset the fall in domestic production brought about by the fall in consumption of dairy products as fresh milk is substituted for powder.

GTAP calculates welfare (equivalent variation) gains, but these are not very meaningful when the change is driven by a shift in consumer preferences (Sandrey et al. 2011), as the welfare analysis is based on the assumption that preferences are fixed.⁶ In addition, the analysis does not take into account the gains from improved health.⁷ However, if the government provided a consumer subsidy to encourage the 50 per cent increase in fresh milk consumption, the required subsidy would be 94 per cent, the outlay would amount to \$74 million and the welfare loss would be \$15 million per year.

⁵ To do this, we swap private household demand ('qpd') for raw milk for consumption tax ('tpd') in the closure then shock qpd("RMK","IDN") by 50 per cent.

⁶ Sandrey et al. (2011, pp. 148-51) model a change in taste by adding a shift variable to a country's demand for imported commodities. This has the advantage of inducing a shift without any tax implications, similar to a productivity shift.

⁷ We do not account for the government expenditure needed to persuade consumers to drink fresh milk, although presumably some outlay is necessary.

Table 5 Impact of fresh milk campaign

| | Output | Imports | Price |
|----------------|---------------|----------------|--------------|
| | % | % | % |
| Milk | 15.5 | - | 4.1 |
| Dairy products | -0.3 | 0.4 | 0.2 |

Source: GTAP simulation.

Increased number of cows

If the aim is to increase domestic milk production and move closer to self-sufficiency, a production subsidy would be the most direct means. However, a subsidy of 93 per cent of the value of production would be required to increase production of raw milk by 15 per cent, the same level as the consumer subsidy. This would increase producer prices by 3 per cent but reduce market prices substantially, by 46 per cent, so most of the benefits would flow to consumers through lower prices. This is because we have assumed the demand curve is fixed, and the additional supply drives down prices. Raw milk is traded only to a limited extent, so the excess cannot easily be exported. Dairy processors would benefit, and the three per cent increase in output would displace imports. Cattle producers as a group and beef producers would be largely unaffected. The national welfare loss would amount to \$4.3 million per annum, less than a third of the consumer subsidy. This is because the subsidy is much more direct, paid on all production not only that which is consumed as fresh milk.

Table 6 Impact of subsidy to increase number of cows

| | Output | Imports | Price |
|----------------|---------------|----------------|--------------|
| | % | % | % |
| Milk | 15.5 | - | -46.6 |
| Dairy products | 2.9 | -4 | -1.8 |

Source: GTAP simulation.

Productivity increase

A productivity increase in the raw milk sector does little to benefit producers because the increase in supply reduces prices in the absence of any shift in demand (table 7).⁸ Producers respond to lower prices by cutting back their output to well below the ten per cent increase in productivity. Nonetheless, the welfare gains are significant, \$15 million. This is because prices to fresh milk consumers and dairy processors are reduced. However, these welfare impacts rely on the productivity gains being generated without costs. This might be the case if Indonesia were able to import more suitable breeds, or receive external funding from aid agencies such as ACIAR. However, the scope for productivity gains at zero cost would appear to be limited, so the welfare gains are an overestimate.

⁸ In reality, a productivity shift would take time and the demand curve is likely to shift outwards over time, disguising the effect of the shift.

Table 7 Impact of productivity increase

| | Output | Imports | Price |
|----------------|---------------|----------------|--------------|
| | % | % | % |
| Milk | 1.37 | - | -11.15 |
| Dairy products | 0.7 | -0.97 | -0.45 |

Source: GTAP simulation.

Tariff elimination

An alternative policy to aid consumers would be removal of the existing 5-10 per cent tariffs on dairy products⁹. This provides benefits to consumers, although some imported dairy products might not be considered as health food. Nonetheless, consumers would have enhanced choice. The impacts are shown in table 8. Reduced tariffs would increase imports by 10 per cent. There would be a negative effect on domestic production, although by only modest amounts. The annual national welfare losses amount to \$4.8 million. There are allocative efficiency gains in the dairy sector but negative terms of trade effects in other sectors.

Table 8 Impact of elimination of tariff

| | Output | Imports | Price |
|----------------|---------------|----------------|--------------|
| | % | % | % |
| Milk | -2.4 | - | -0.7 |
| Dairy products | -4.7 | 10 | -0.3 |

Source: GTAP simulation.

Implications and concluding comments

The advantages and disadvantages of each policy can be assessed from the viewpoint of consumers, producers and taxpayers.

From a consumer perspective, the fresh milk campaign may see improvements in infant health. The benefits of drinking fresh milk are not assessed here. Dairy processors claim that UHT milk, which does not need to be refrigerated and can be stored for months, is nutritionally identical to fresh milk and so the perceived benefits are overstated. The campaign would drive up the price, so existing fresh milk consumers would be worse off.

Supply side policies would provide benefits to consumers. Both a subsidy on milk producers and a productivity improvement would result in lower prices to consumers. Likewise, the elimination of tariffs benefits consumers, although not those who wish to drink fresh milk, a little-traded commodity.

The Government has a policy of moving towards self-sufficiency. A fresh milk campaign has two beneficial effects, with domestic producers being helped by a policy that also improves the health of consumers. A taxpayer funded subsidy is a more direct approach to self-sufficiency, but some of the benefits inevitably leak away as increased supply

⁹ We ignore various non-tariff barriers, such as import licensing and other restrictions. These may well play a more important role than the tariff, but are difficult to quantify.

leads to a fall in prices. Likewise, a productivity improvement would increase output but this would be more than offset by a fall in prices in the absence of any demand shift. In reality a productivity improvement would take time during which demand would increase and the negative price effects would be offset somewhat. The removal of tariffs on dairy products would not be beneficial for Indonesian producers.

From the perspective of the taxpayer, a subsidy to producers would be expensive, and tariff revenue would be lost if tariffs were removed. A productivity improvement would be beneficial if it came at minimal cost. A consumer campaign would presumably come at a cost, although there may be long term benefits if the campaign proves effective. These benefits are not estimated here.

Part of the cost of a fresh milk campaign would fall on suppliers of fresh milk substitutes, such as skim milk powder. Some of these products are imported, but some two thirds of the domestic milk supply goes into the processing sector. A switch to fresh milk would reduce demand for these products.

The Ministry of Agriculture is pursuing several policies to move toward self-sufficiency in the dairy sector. These include a fresh milk campaign and an increase in farm level productivity by increasing average milk production to 15 litres/day and farm size to 7-10 head/household. In the processing activity, the policy is to improve milk quality according to the National Standard. Dairy products tariffs on imports within AFTA and Australia and New Zealand will be removed by 2024 under existing agreements. The analysis undertaken here demonstrates that policies aimed at helping producers inadvertently benefit consumers unless the demand curve shifts out. Likewise, a campaign to improve consumer health has indirect benefits to producers because it encourages a switch to a product that is scarcely traded. A productivity increase, assuming it comes at a modest cost, or is externally funded, will prove beneficial to all groups.

The Government could focus on making producers more productive. There is a wide range of productivity levels across regions. National productivity would increase if the average in some of the lesser regions could be improved. This would involve improving the feed supply and improving collection and transport.

Increased research and development spending would be useful, as this usually has a good return in the long run. The supply chain could be improved by removing barriers to investment. Licensing requirements should be relaxed to encourage more competition in the various provinces. At present there is only one major supplier in each province. Improved infrastructure and the spread of markets with refrigeration would increase availability of fresh milk to a wider market. These factors would reduce prices and encourage consumption.

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