Livestock

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Livestock policy in Indonesia: Case of the dairy subsector

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HISTORY OF THE DAIRY SUBSECTOR IN INDONESIA

Historically, dairying came from the Middle East and spread to the Mediterranean and Europe, the Indian subcontinent, West Africa, East Africa, and South and Central America (Moran, 2005). According to Moran (2005), milk is not a main component in the diet in Southeast Asia. People prefer consuming 'milk' from coconut than from cows. Nevertheless, milk products have also been necessary to the nomads of Asia and Africa.

In Indonesia, the history of the dairy subsector is divided into three main periods: the development period (before 1980), the rapid population increase period (1980–1997), and the stagnancy period (1997 until present) (Sudaryanto and Hermawan, 2014). Subandriyo and Adiarto (2009) refer to a period before 1997, including the Dutch colonization period (before 1942), the Japanese colonization period (1942–1945), the rehabilitation period (1945–1961), the national development period (1961–1969) and the new order period (1969–1998).

Dairy production started in the 17th century (Subandriyo and Adiarto, 2009), long before the independence of Indonesia (1945). The dairy subsector was introduced by the Dutch authorities which imported 150 Holstein-Friesian bulls from the Netherlands (1891–1893) and before that some cows of the Ayrshire, Milking Shorthorn, and Jersey breeds had been imported from Australia (Subandriyo and Adiarto, 2009). The aim was to meet the domestic demand for dairy products, especially that of Dutch workers (Nurtini and Muzayyanah, 2014; Subandriyo and Adiarto, 2009).

Since the beginning, the dairy subsector has been mainly located in Java Island where farmers manage more than 95% of dairy cows (Figure 1). Developing dairy cattle started at the beginning of the 20th century in the mountain area of Central Java (Boyolali, Salatiga, and Ambarawa), then extended to West Java (Bandung area)

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and East Java (Nongkojajar, Malang and Batu) (Nurtini and Muzayyanah, 2014). Subandriyo and Adiarto (2009) report that by the end of the 19th century, dairy cattle (Holstein-Friesian) had already been mated with local breeds in Pasuruan, East Java.

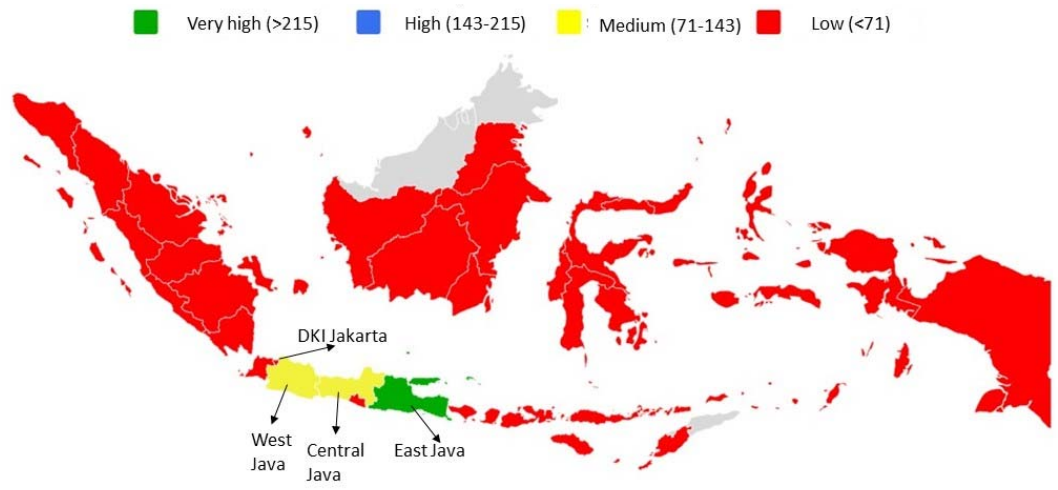

Figure 1: Dairy cattle population (x 1000 head) in Indonesia in 2019; Source: https://ditjenpkh.pertanian.go.id/

At the beginning of the 20th century, dairy cattle were mainly managed by Dutch enterprises. However, in Jakarta and surrounding area there were also local dairy producers (Subandriyo and Adiarto, 2009). The situation was difficult for these producers because they managed dairy cattle traditionally, which resulted in low quality milk. The strict regulation from the Dutch authorities made it difficult for the local producers to develop.

During the Japanese colonization period (1942–1945) and the revolution period (1945–1950), the dairy subsector was in an emergency. The milk output drastically decreased and the concentrate feed price was very expensive (Subandriyo and Adiarto, 2009). Some owners gave up their dairy enterprises. Consequently, some dairy cattle were slaughtered and others were distributed to the local farmers. It was a starting point for smallholder farmers' dairy units (Nurtini and Muzayyanah, 2014; Subandriyo and Adiarto, 2009).

In the rehabilitation period (1945–1961), the government made a plan called 'Rencana Kemamkuran Istimewa' to meet people's minimal needs. The food subsector was a priority. Developing the agricultural sector including the dairy subsector was the main concern (Nurtini and Muzayyanah, 2014; Subandriyo and Adiarto, 2009) although it faced a blockade from the Dutch. The government helped the dairy subsector through increasing the calving rate, decreasing illegal slaughtering, and promoting milk consumption (Subandriyo and Adiarto, 2009).

In the national development period (1961–1969), called 'Rencana Pembangunan Semesta', the government focused on people prosperity. Increasing food production and purchasing power became a priority. Dasuki (1983) reports that the aim for the dairy subsector was a 7.9% increase of milk production per year. However, the political situation was not conducive and the government did not achieve that goal.

In the new order era called 'Repelita' (1969–1998), the agricultural sector gradually improved (Nurtini and Muzayyanah, 2014; Subandriyo and Adiarto, 2009). In the dairy subsector, regulations were written to increase the cattle population, improving farmers' productivity and increasing the domestic output to fulfill the demand.

Today, the dairy subsector faces a stagnancy period (since 1998). Sudaryanto and Hermawan (2014) indicate that this period is influenced by the economic and political crisis, which began in 1998. In addition, the government issued Decree No. 4/1998 about removing milk ratio between imports and local milk because of the international pressure (free trade). In other words, the local producers were no longer protected. In 2017 the Government of Indonesia (through Ministry of Agriculture) made a regulation (Permentan No. 26/2017 revised to Permentan No. 33/2018) to bring the dairy subsector back into the golden era.

IMPORT AND DAIRY DEVELOPMENT POLICIES

In Southeast Asia, because of the high population pressure and changes in consumption habits, the demand for dairy products has increased (Moran, 2005). The rapid economic growth and awareness to consume nutritious food become important factors to boost milk consumption. Consumption of dairy products per capita in Indonesia tends to increase (Table 1), but it remains relatively low, as the national production cannot cover the demand. In 2015, the national production only amounted to around 835,000 tons (Figure 2). Imports became a necessity.

Table 1: Consumption of dairy products in Indonesia from 2009 to 2014

Product	Unit	2009	2010	2011	2012	2013	2014
Fresh milk	L	0.002	0.002	0.003	0.003	0.002	0.003
Preserved milk	250 ml	0.016	0.018	0.022	0.028	0.028	0.031
Sweet canned liquid milk	397 g	0.058	0.064	0.063	0.052	0.058	0.059
Canned powder milk	kg	0.014	0.015	0.014	0.007	0.014	0.015
Infant powder milk	400 g	0.023	0.023	0.026	0.027	0.027	0.028
Cheese	oz	0.001	0.001	0.002	0.002	0.001	0.002
Other dairy products	oz	0.006	0.007	0.007	0.008	0.004	0.006

Source: Ditjen PKH, 2016

Starting at the beginning of the introduction of the dairy subsector, hundreds of cows had been imported from the Netherlands and Australia (Subandriyo and Adiarto, 2009). Since the end of the 20th century, milk import tends to increase (Figure 3) and reached 2.4 million tons milk equivalent in 2012 (FAO, 2017).

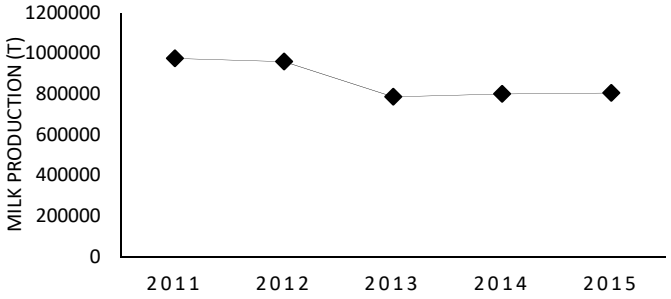

Figure 2: Milk production in Indonesia from 2011 to 2015; Source: Ditjen PKH (2016)

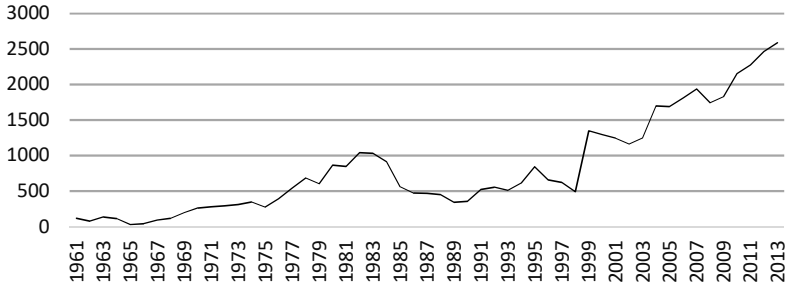

Figure 3: Import of dairy products from 1961 to 2013 (× 1000 tons); Source: FAO, 2017

In the development period (before the 1980s), the government imported cows mainly for genetic improvement. More than 1000 Holstein-Friesian cows were imported from Denmark in 1962. Two years later, another 1300 cows were imported (Sudono cited in Subandriyo and Adiarto, 2009). Another breed (Red Danish) had been tested but proved to be unadapted to the local conditions (Sudono cited in Subandriyo and Adiarto, 2009). High genetic breeds as well as frozen semen were imported from New Zealand, Australia and the United States of America to improve the dairy herd (Subandriyo and Adiarto, 2009).

In 1980–1997, previous policies were continued and improved. It was a golden period for the dairy subsector. The government focused on enhancing the cow population, improving the genetic merit of cows, and improving management. More than 125,000 cows were imported early 1980s. The cow population almost tripled (Sudaryanto and Hermawan, 2014). In 1985, Presidential Instruction No. 2/1985 was issued to boost dairy farms and improve milk consumption at an appropriate price. The government controlled the farm gate milk price and consumers' price and set a milk ratio for the dairy industry. Based on this policy, the dairy industry had to purchase the local milk as the main ingredient and the rest from imports. Consequently, the ratio of imported milk to local milk drastically dropped from 20:1 to 3.5:1 (Tawaf et al., 2009) or even 2:1 (Subandriyo and Adiarto, 2009; Sudaryanto and Hermawan, 2014). This policy was also known as 'Bukti Serap-BUSEP' (Nugroho, 2010; Sudaryanto and Hermawan, 2014). To improve the dairy herd, an artificial insemination center was created in Lembang (Subandriyo and Adiarto, 2009). High quality semen

was produced and aimed to reduce dependency on imports. The government also focused on improving management. Based on the 1985 Presidential Instruction, the dairy-related subsector was led by the Minister of Agriculture of Animal Husbandry and Fisheries Products, and helped by the Minister of Youth Development and other related ministries.

The golden era of the dairy subsector met a turning point in 1997-998. The global economic crisis impacted negatively almost all the sectors, including the dairy (Sudaryanto and Hermawan, 2014). It was aggravated by Presidential Instruction No. 4/1998, which ended the milk ratio because of international pressure and thus left the farmers unprotected. The milk industry no longer had the obligation to absorb the local milk and the local producers had to compete with imported dairy products.

ROLE OF COOPERATIVES

Milk cooperatives have become a key player in the dairy subsector. In Indonesia, they have a long history of boosting the dairy production to enhance dairy farmers' livelihoods and to improve the economic growth of rural areas (Subandriyo and Adiarto, 2009). Tawaf et al. (2009) mention that cooperatives and private collectors had direct relationships with farmers in the dairy agribusiness. Groups of farmers join other groups; together they build a dairy cooperative.

In 1949, during the national development period, 'Gabungan Petani Peternak Sapi Perah Pangalengan' (GAPPSPP) was created in the south of Bandung (West Java Province). It was the first dairy cooperative in Indonesia. However, fourteen years later, due to the unfavorable economic-political situation and the increase in milk processing enterprises, GAPPSPP was closed. In 1969, a milk cooperative, 'Koperasi Peternak Bandung Selatan' (KPBS), was created and replaced it. Two years later in North Bandung, 'Koperasi Peternak Sapi Bandung Utara' (KPSBU), was established (unpubl. KPSBU, 2012). In East Java Province, SAE Pujon was founded in 1962 (Sulastri and Maharjan, 2002). It was then followed by other milk cooperatives including 'KUD Batu', 'Koperasi Setiakawan', and 'Koperasi Sukamakmur' (Subandriyo and Adiarto, 2009). In 1978, there were 11 milk cooperatives, with 2800 members (Nurtini and Muzayyanah, 2014).

An association of dairy cooperatives, 'Gabungan Koperasi Susu Indonesia' (GKSI), was created at national level in 1980. The initial members were 17 dairy cooperatives. Its role was to enhance the communication between members and to build a supporting system for the dairy business (Subandriyo and Adiarto, 2009). It also helped with supplying cows, with milk marketing, training, feed production and supply, veterinarian services, and technical support (Sulastri and Maharjan, 2002).

During the years 1980–1997, the government supported the dairy subsector through policies. New farmers enthusiastically entered the dairy business. The policies also had a good effect on the development of dairy cooperatives. The amount

of cooperative milk drastically increased (almost 20 fold) (Subandriyo and Adiarto, 2009; Sudaryanto and Hermawan, 2014). They played a major role in boosting dairy production, improving milk quality and increasing the cow population.

In West Java, a secondary cooperative, 'GKSI Jawa Bara', was established in 2000. There are 22 primary cooperatives which members include KPSBU and KPBS Pengalengan. Their functions consist in coordinating, monitoring and evaluating the members' activities. In addition, training for good dairy farming practices, processing milk, enhancing milk quality and cow population is provided. GKSI Jawa Barat has a main plant (PT ISAM), which processes around 10% of fresh milk in West Java (http://gksi-jawabarat.co.id/).

The main role of a cooperative is to provide services to its members (e.g. credit, veterinarian service, feed supply) and to improve farmers' know-how in dairy practices (Nurtini and Muzayyanah, 2014; Sulastri and Maharjan, 2002), enhancing thus farmers' livelihoods. This may be so but the role of a cooperative still needs improving. Tawaf et al. (2009) indicate that four strategies can develop a dairy cooperative: i) maximize potential resources to access market opportunity; ii) improve human resources to reach economic efficiency; iii) enhance professionalism in terms of asset management and collaboration with the cooperative; and iv) increase services to the members. Furthermore, improving the role of a cooperative is emphasized. Cooperatives should in particular have the skill to improve the bargaining position of farmers vis-à-vis the dairy industry.

CONTRIBUTION OF THE DAIRY SUBSECTOR TO THE ECONOMY

Indonesia has a rapid economic growth which reached on average more than 5% a year from 2011 to 2014 (Ditjen PKH, 2016). The agricultural sector plays an important role in this growth. Ditjen PKH (2016) reports that in 2015, the crop, fishery, and forestry subsectors had the second-highest gross domestic product after the manufacturing industry. It contributed by 13.5% to the total GDP. The livestock subsector in particular was important as it accounted for around 15% of the agricultural GDP (Ditjen PKH, 2016). In addition, over five years (2011–2015), this subsector GDP increased by more than 56% (Ditjen PKH, 2016).

Ditjen PKH (2016) reports that the three main provinces in the livestock subsector, East Java, DKI Jakarta and West Java, accounted for around 47% of the total GDP from livestock. Furthermore, in West Java, from 2011 to 2014 the livestock GDP increased by 8%. The livestock subsector is an important contributor to growth as it generated around 167 trillion Indonesian rupiahs (IDR) in 2014.

The agricultural sector makes an important contribution through employment. Of all sectors, it absorbs the highest numbers, accounting for more than 40 million workers (Ditjen PKH, 2016). Furthermore, the livestock subsector is an important

contributor with 10% of total labor in the agricultural sector, the majority being unpaid workers as family members. Ditjen PKH (2016) reports that during three years (2013–2015), the number of workers however decreased by around 10%.

The livestock subsector is important to enhance economic development, rural livelihoods, to alleviate poverty, and to meet people's needs for animal protein (Moran, 2009). At global scale, the livestock contributes more than half the value of the agricultural output. Furthermore, it has been observed that by integrating crops, the livestock subsector plays a role in enhancing rural livelihoods.

The dairy subsector has become an income-generating activity for crop farmers in South and East Asia (Moran, 2009). Crop farmers can generate enough income and even start saving when they add a small-scale dairy activity. According to Moran, (2009), in the livestock subsector, the dairy business brings in among the fastest returns in developing countries. In Indonesia, it also has a good economic potential: around 518,000 cows in 2015 produced 835,000 tons of milk (Ditjen PKH, 2016).

Generally, there are two types of milk producers: dairy enterprises and smallholder dairy farms. Badan Pusat Statistik (2015) reports that there were 35 dairy enterprises in 2015. Smallholder farms play an important role in the dairy subsector; they kept more than 90% of the total dairy cattle in 2013 (Badan Pusat Statistik, 2013). Both types are important to enhance rural income and to meet the needs of the fast growing urban population (Moran, 2009).

The dairy enterprises employ together around 1300 workers (Badan Pusat Statistik, 2015). They are mostly (65%) located in East Java and West Java. Their performance is higher than that of smallholder farms. With a population of 18,500 cows in 2015, they produce around 70,700 tons of milk. The average milk yield per cow and per day is 16.4 liters. In terms of economic performance, they generated 431 billion IDR in total revenue in 2015, which increased by 22% since 2013.

DAIRY MARKETING

Moran (2009) explains that there are several ways to market milk through the dairy value chain. He defines this chain as stages of milk and dairy products from farmers (producers) to consumers. The author adds that milk marketing can be divided into two groups: informal markets which are usually small scale and involve few actors; and formal markets which are medium to large scale, involve more actors and the milk is processed into final products. In Indonesia, the milk trading system is divided into three models. Tawaf et al. (2009) explains that East Java and West Java have the same dairy value chains, whereas Central Java and Yogyakarta have different models, as follows:

- farmer – group of farmers – milk cooperative – milk industry (West Java and East Java)

- farmer – private collector – milk cooperative – milk industry (Central Java and Yogyakarta)
- farmer – private collector – milk industry (Central Java and Yogyakarta)

In West Java (in particular Ciater area), Duteurtre et al. (2016) report that there are two main models of the dairy supply chains, cooperative and non-cooperative (Figure 4). With regard to the milk flow, milk from dairy farms is distributed to cooperatives. Then, milk batches are sold to dairy enterprises that process them into final products, which in turn are distributed to retailers and or direct consumers. Cooperatives like KPSBU have final products such as pasteurized milk and yogurt that are sold directly to retailers or consumers. Non-cooperative farmers sell the milk to private collectors. Tawaf et al. (2009) write that the non-cooperative model is developed in areas with inactive dairy cooperatives. It may also be an extension of dairy enterprises.

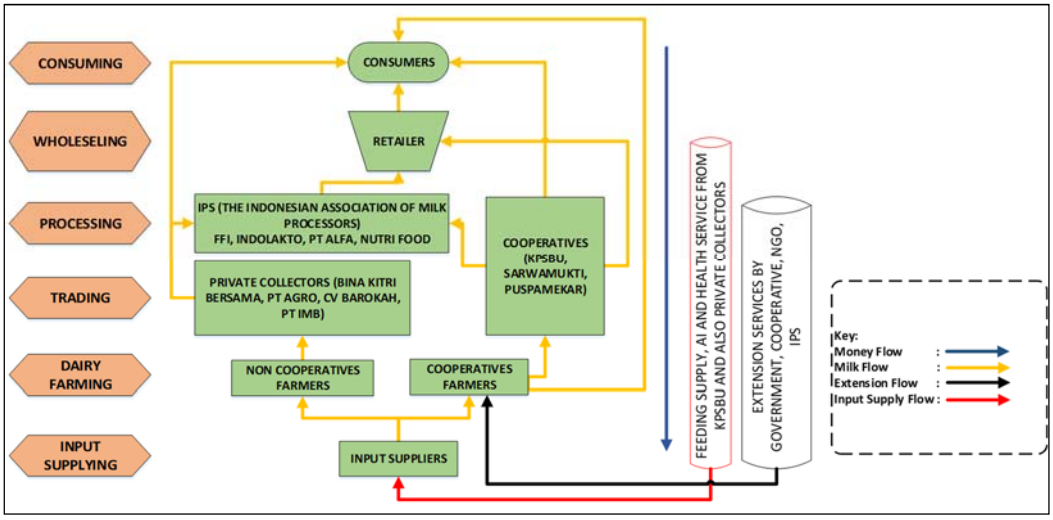

Figure 4: Value chain in Ciater, West Java Province; Source: Duteurtre et al., 2016

CHANGES AND THEIR DRIVERS

Three main changes exist in dairy farming in Indonesia: i) from large farms (milk enterprise) to smallholder units; ii) from smallholder dairy farms with off-farm activity (multiactivity) to specialized farm; and iii) from smallholder specialized farms to multiactivity farms. Each change had different drivers.

The change from the milk enterprise to the smallholder farm mainly occurred in 1942–1950. The drivers of this change were mainly external. The Japanese came to Indonesia and took over the power from the Dutch (1942–1945). After Independence in 1945, the revolution broke out to defend Indonesia's independence against the Netherlands. It resulted in an emergency for milk enterprises which were run

mainly by Dutch people. The price of feed soared and affected milk production which sharply dropped. As a consequence, the owners gave up their dairy business. Many dairy cows were slaughtered, some were distributed to local smallholder farmers. It was a turning point from milk enterprises to smallholder farms.

In the change from smallholder specialized farms to multiactive farms, farmers added off-farm activity as a complement to their dairy farming income. Discussions with farmers revealed that the drivers of change derived from internal and external factors. Internal drivers are limited capital, limited farm income, off-farm income, limited access to land, and risk from the dairy business. These farmers have limited capital, i.e. not only physical capital such as cows, barn, and owned land, but also human capital (know-how). It results in limited incomes from the dairy business. Farmers have difficulties to cover their daily expenses if they only depend on this activity. In addition, land opportunities to grow forages are generally limited. Some farmers live in the center of a district where the land is mostly used for housing. Some others who are located near a forest or a tea plantation can have access to forest land or unused land in tea plantations to grow forage. However, this situation is uncertain because in the future Perhutani or PTPN will probably use these lands for their business. By practicing a multiactivity, farmers can reduce the risk from the dairy business such as the uncertainty in milk and input prices, and the limited access to production factors. Some farmers even state that off-farm activity such as trading and being hired as wage workers generate more income than the dairy business.

The external drivers explaining why farmers add an off-farm activity are job opportunities and land conversion. This is often the case in areas located in touristic resorts, which present job opportunities such as souvenirs trading, food selling and being hired as wage workers. In Subang, tea plantations offer job opportunities to smallholder farmers as wage workers. Land conversion from agricultural land and unused land to housing is also a major external driver. It reduces the access to land with forage. Reduced land access and forage access generate a low income in the dairy business. As a consequence, farmers add another income-generating activity as a complementary income.

In the change from multiactivity farms to specialized farms, an in-depth interview with farmers indicate that some farmers give up off-farm activity because of five drivers. The three internal drivers of change are limited family manpower, improved dairy business, and increased dairy income. Two external drivers are subsidies or grants from a dairy development project and easy access to credit. In families with a limited number of workers, considering a change in the activities is a central issue. One farmer mentioned that after a family worker had passed away years ago, they gave up the multiactivity and focused on the dairy business. This farmer had difficulty managing two activities at the same time. On the other hand, the physical capital increased and improved the dairy business. Since the number of cows increased, the farmer needed more time to focus on managing the dairy business. It boosted

the milk production and farm income. Giving up the multiactivity was a solution to keep his dairy farm well managed.

With regard to the external drivers, the government, milk enterprises, cooperatives and stakeholders supply cows to the farmers to boost the dairy cow population and milk production in Indonesia. For example, a dairy development project in 2007 helped new dairy farmers to purchase pregnant cows through a credit scheme. In 2012, this project also provided 'revolving cows' to selected farmers: these farmers were given a cow and after two calvings each gave the cow to another farmer. Each selected farmer thus obtained milk and two calves. This model of grant has existed for a long time in Indonesia. As it increases economic performance, the farmer only focuses on his/her dairy business and gives up off-farm activity.

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