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酪農における後継者の存続条件*
－佐賀県の六次産業化に取組む酪農家を事例に－

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Surviving conditions of successors in dairy farming
-A case study of Sixth Industrialization of dairy farmers in Saga Prefecture-

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1. Background and Subject

1) Empirical statistical background

In 1975 there were about 160,000 dairy farmers in Japan, and by 1985 this number had declined sharply to about 82,000 farmers. Since then, an average annual decline of 5% has resulted in the current figure of only 28,800 dairy farmers, approximately one-fourteenth of the number in 1962. On the other hand, the number of dairy cows has steadily increased per farm. Currently, Japanese dairy farming is on par with, or exceeds, dairy farming operations in EC countries, while providing a safe and stable supply of milk and other dairy products.

The total annual raw milk production in Japan is about 8.3 million tons, second only to rice as the country's biggest agricultural product. About 60% of production is used to produce milk for drinking, while the remaining 40% of raw milk is processed into other dairy products such as cheese and butter. This production is supported by approximately 28,800 dairy farms and about 1.69 million dairy cows. The average number of cows per farm was about 58.7 as of February 2004. Japanese dairy farmers operate farms in narrow valleys or on land located on the outskirts of urban areas. Even these small-scale farms have the income potential of all but the very largest rice and dry field farms. Indeed, Japanese dairy farming is a model of agricultural efficiency in Japan. The number of dairy farming households nationwide has dropped almost 60 percent in the last 20 years, according to Agriculture, Forestry and Fisheries Ministry data. The pace of the decline is equivalent to almost three households giving up dairy farming every day. Reasons for the decline include a harsh working environment that allows few days off and a lack of willing successors. Its effects are beginning to be seen, such as in rising retail prices for milk. With most dairy farming households being family-run businesses, labor shortages and the difficulty of securing successors are major factors behind the decline. Successor's keen interest may continue the farm in the long run. But, lack of willingness of young people to continue farming, is a major problem in agricultural sector in Japan. Currently, only about 6.5% of all farms in Japan will be passed down to the next generation. In light of this, almost 93% of Japanese farms will disappear in the near future. As Japanese dairy farms are mainly large in number and the number of households are reducing because of aforesaid problems. In Japan except Hokkaido, most of the dairy farms are small and medium scale in operations.

2) Research historical background

J. Nishitani, 1980, found that compound farming seems to be possible in Saga Plain area. He also found that net returns on land are greater in the compound farming than in the specialized rice farming. Shichinohe, 1983, pointed out that it was extremely urgent to change Hokkaido cow management which was then

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similar to pig and chicken breeding management and to improve the hay and silage making techniques. S. Yamamoto et.al. 1997, Japanese dairy farming under severe conditions caused by low farm gate price of milk and import liberalization for milk products. However, dairy farming not only has food production function but also has conservation function for environment. There are lot of research carried on dairy farming in Japan. But, there are few research on successors of dairy farming in Japan.

That's why, from empirical statistical and research historical background, this study concerns about the successors conditions of dairy farm in Saga prefecture and how sixth industrialization[1] concepts helps farmers to make surviving conditions of successors in the farm.

2. Analytical perspectives and Research method

This research will conduct from the two viewpoints: successor conditions in dairy farming of the study area and surviving conditions of successor through sixth industrialization of dairy farm. The study conducted on dairy farming in Saga prefecture, Japan. There are three main agricultural areas in Saga Prefecture, Japan: Saga Plain Area (SP), Uwaba-Daichi and Karatsu area (UDK), and Other areas (O). The SP area includes Saga City, Tosu city, and other 24 cities and towns. In this area, most of the land area is used for rice and soybean production. The UDK area includes: Karatsu city, and other 4 towns and cities. Most of the land in this area is coastal and upland where grass, tobacco and fruits are being produced. About 800 ha cultivable upland area has been increased in this area through upland development project. Other areas include all the cities and towns in Saga Prefecture outside of SP area and UDK area. This area is mainly mountainous and semi mountainous land area where fruits, tea, groves, etc. are the main agricultural products. Data were collected by a designed survey schedule accomplish to objectives from May to August 2011. The survey schedule was prepared based on the following key items: owner's general information, cattle population, sources of fund, feeds and feeding system, overall management system, future prospects in dairying etc. A total of 25 different scale farms were surveyed. Data were collected through direct interviews and personal visits to the farm of all farmers.

Data were collected from both primary and secondary sources. Primary data were collected from field survey of sampled dairy farmers who

[1] It is the essence of the first, second and tertiary industries merged for transforming the first industry into integrated agricultural industry, added value, farmers and agricultural industrialization enterprises. It is also important to promote initiatives to develop agriculture into the "sixth industry" that can help revitalize rural areas. This effort will encourage regional business development and the creation of new types of business. To support the rapid development of the sixth industrialization, the Japanese government issued a series of relevant laws and regulations and provided legal consultation and policy support for farmers and business entities of the sixth industries. The Japanese government has provided rich financial subsidies for the sixth industrialization, such as agricultural facility subsidies, water conservancy construction subsidies, loan interest subsidies, etc. At the same time, Japan adopts the policy supporting the price of agricultural products to ensure the income stability of workers in the sixth industries. Most agricultural products are supported and protected by the government to varying degrees. There are measures to provide special financial support policies and professional development fund support for workers of the sixth industry. Special funds for integrated industrial development, supporting funds for agricultural development, and funds for risk control have been set up.

were under cooperative society or not under cooperative umbrella in Bangladesh. Field survey has done in all farmers in selected area of Saga prefecture of Japan. We used semi-structured questionnaire for collecting primary information from farmers. Data from secondary sources that includes both published and unpublished documents from Census, Statistical Year Book, and Government Survey findings of both country.

Semi-structured questionnaire used for collecting primary data. Open-ended and close-ended questions were used in the questionnaire based on the nature of the data that had to be collected from dairy farmers. Collected data comprised of farmers' socioeconomic characteristics, production and marketing, farm management practices, income from dairy farming, farmers' perception about loyalty to dairy cooperative, services rendering by cooperative etc.

After preparing the questionnaire, discussed with related personnel to check relevancy. Then, these were pre-tested to ensure validity and reliability of data collected. After getting approval of the questionnaire, face to face interviews were conducted by authors to gather all required data from dairy farmers. Collected data were analysed by Microsoft excel.

3. Analysis and Results

1) General characteristics of responded farmers

ⓐDifferent Scale Households

All the dairy farmers were classified into three groups such as small, medium and large scale. As per classification of scale size, 60% of the responded farmers belonged to small scale households those have 1-30 milking cows or total 2-48 cows. 16% of the responded farmers belonged to medium scale households those have 30-50 milking cows or total 48-80 cows. And households, those have above 50 milking cows or above 80 total cows have belonged to large scale households, are 24% of the responded farmers.

ⓑAge of Farmers

All of the respondents have been categorized into two groups according to age: below 60 years and above 60 years. The average age of the responded farmers is 56 years. Among the respondents of survey, 64% of the farmers belonged to the group of below 60 years and rest 36% belonged to the group of above 60 years. From which, 73% of small holder belonged to the group of below 60 years and 27% of small holder belonged to the group of above 60 years. On the other hand, 75% of medium scale farmers belonged to the below 60 years group and 25% of the medium holder belonged to the group of above 60 years. But, 66% of responded farmers those are large scale farmers belong to above 60 years group.

Table 1: General Characteristics of Farmers

Particulars		All farms (%)	Small (%)	Medium (%)	Large (%)
Owner's occupation	Agriculture	25 (100)	15 (60)	4 (16)	6 (24)
Income source (Dairy Farm)	Main	23 (92)	13 (87)	4 (100)	6 (100)
	Side	2 (8)	2 (13)	0 (0)	0 (0)
Education	Junior High School	8 (32)	6 (40)	1 (25)	1 (17)
	Senior High School	11 (44)	7 (47)	1 (25)	3 (50)
	Specialized College/ Above	6 (24)	2 (13)	2 (50)	2 (33)
Age	21–39	2 (8)	0 (0)	1 (25)	1 (17)
	40–60	14 (56)	11 (73)	2 (50)	1 (17)
	Above 60	9 (36)	4 (27)	1 (25)	4 (66)

Source: Survey Data

ⓒEducation

More than two-third of farm holders have a senior high school or higher degree. Among those, quarter of farmers have completed two-year diploma course from specialized agricultural college. Most of the farmers have keen knowledge to perform dairy farming activities. Medium and large scale farmers have either received training from other farmers or completed diploma relates to livestock practices.

ⓓOther Farming Activities

Most of the small scale farmers have been producing rice with dairy farming i.e. is called compound dairy farming and it was very popular in SP area. Each small scale dairy farmers have produced rice about 1.49 ha of land. But, medium and large scale farmers rarely have done other farming beside dairy activities. They have produced some rice for their personal consumption. Some farmers also produced vegetable for their own consumption. Small scale farmers produced roughage including rice straw (self-rice field and collected from other farmers) to feed the cows.

ⓔSuccessor's Condition of Different Scale Dairy Households

13 out of 15 small scale farmers doesn't have successor to continue their farm into next generation. Among those, 4 farmer's age has crossed 60 years. On the other hand, 1 out of 4 medium and 1 out of 6 large scale farmers doesn't have successor to continue their farm in the next future.

Table 2: Successor's Condition of Different Scale Dairy Households

Farmer's Age	Small Scale		Medium Scale		Large Scale		Total
	Successor		Successor		Successor		
	Yes	No	Yes	No	Yes	No	
Below 60 Years	0	11	2	1	2	0	16
Above 60 Years	2	2	1	0	3	1	9
Total	2	13	3	1	5	1	25

Source: Survey Data

60% of the responded farmers belonged to small scale households those have 1-30 milking cows or total 2-48 cows. 64% of total farmers belonged to the group of below 60 years and 73% of small scale household belonged to the group of below 60 years. More than two-third of farm holders have a senior high school or higher degree. Among those, quarter of farmers have completed two year diploma course from specialized agricultural college. Most of the farmers have keen knowledge to perform dairy farming activities. Most of the small scale farmers have been producing rice with dairy farming i.e. is called compound dairy farming and it was very popular in SP area. Small scale farmers produced roughage including rice straw (self-rice field and collected from other farmers) to feed the cows.

2) Sixth Industrialization of Dairy Farmers in Saga Prefecture

There are 86 dairy farms in Saga Prefecture (2011). Most of the farmers have sold raw milk to the processing company. Only 3 famers have established their own (small) processing unit to do direct sales to customers. These 3 farms were chosen as a sample farm for collecting data with a structured survey questionnaire.

Table 3: General Characteristics of Farm A, B & C

Particulars	Farm A	Farm B	Farm C
Successor	Yes	Yes	Yes
Starting of Direct Marketing	1988	2002	1995
Processing Unit	1988	2012	1997
No of Cows	30 Milking Cows	62 Milking Cows	75 Milking cows
Scale Size	Small Scale	Medium Scale	Medium Scale
Milk Sells to processing Company	No	Yes (other than self-processing)	Yes (other than self-processing)
Setting up cost	100 Million Yen	7 Million Yen	15 Million Yen
Annual Sales Turnover	-	90 Million Yen (Including Milk Sales Turnover)	100 Million Yen (Including Milk Sales Turnover)
Annual Profit	-	20% of sales (Family Labor wage not Deducted)	15 Million Yen (Family Labor wage not Deducted)
Labor	4 Permanent & 6 Temporary (Processing unit) with Family Labor	Family labor only	3 Employees for Farming and 2 employees for processing unit with Family Labor
Initial Products of this channel	Pasteurized milk and Ice cream	Ice-cream (made by fam "A")	Ice-cream (made by fam "A")
Present Products	Non-homogenous pasteurized milk, Plain Yogurt, Drinking Yogurt, Macha and Coffee Milk, Various Kinds of Cheese & Ice-cream.	Cheese and Ice Cream.	Raw material for Soft Ice-cream.

Source: Survey Data, Note: (-) denotes data is not available

Farm "A" is pioneer and influencer in direct selling to end user in this survey area (Table 3). It started as small scale dairy farm and still farm size remain as small scale but holds big processing unit among these three farms. In 1988, he thought that income will not be increased only to sell milk and then he started to produce ice-cream initially and sold it through own restaurant. He also got order from other farmers to produce ice-cream to increase earnings as processing fee. After getting the popularity in ice cream, he started to produce pasteurized milk as per local taste preferences. In 1997, he expanded his processing unit to produce other kinds of milk and milk products such as: Non-homogenous pasteurized milk, Plain Yogurt, Drinking Yogurt, Macha and Coffee Milk, Various Kinds of Cheese etc. This farm possesses its own system to supply in farmer's market, supermarket within the region with a sales commission of 15%~20%. Annual profit of farm "A" can't get for organizational secret but successor worked in the farm and formulate strategy to carry in future.

Farm "A" s strategic objectives to reach the direct marketing channel is intricately linked to a greater satisfaction of end user, providing the maximum in spatial convenience, aligned with minimal wait time, given that product delivery is immediate. Hence, value is added to the product. With this, the action of the farm in this channel was heavily focused on a strategy of overcoming the price perception and convenience of local traditional retail, offering a value proposition (product plus service/convenience) that is more attractive to the consumer. The farm supplied their products through the following channel:

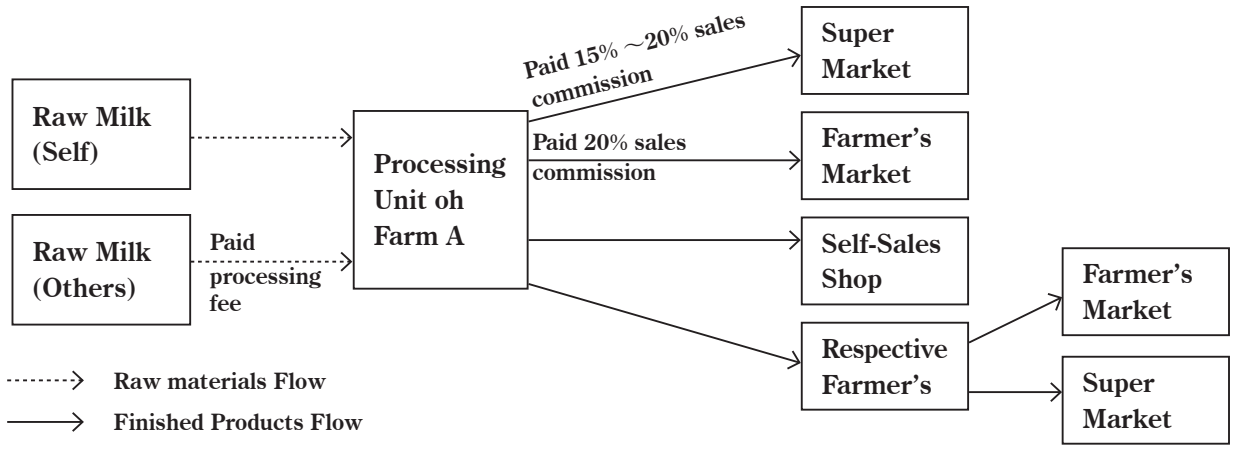

Figure 1: Supply Chain Channel of Farm A
Source: Survey Data

Farm "B" is a medium scale dairy farm in the study area. Its sales turnover (including raw milk) is about 90 (ninety) million in one year. Farm run by family member only and earned 18 (eighteen) million yen (not deducted family labor cost) in a year. In 2002, farm "B" thought to produce some products from his own produced milk. Then he contacted with Farm "A" for producing cup ice-cream for his farm. After that, he was thinking to produce milk products by himself. When his son has returned home after his graduation, he planned to engage his son into farming activities through establishing processing unit of cheese. In May 2012, they have started to produce unique cheese in their farm. Successor has taken the responsibility of cheese processing unit.

Farm B's strategic objectives to reach the direct marketing channel is providing the fresh and unique products to achieve greater satisfaction of end user. The farm has then a strategy to "skip over" the traditional intermediaries of the traditional distribution channels, to offer its products with more added services directly to the end consumer, reducing the number of intermediaries and focusing the channel flows with reliable agent. The supply chain channel of Farm B is as follows:

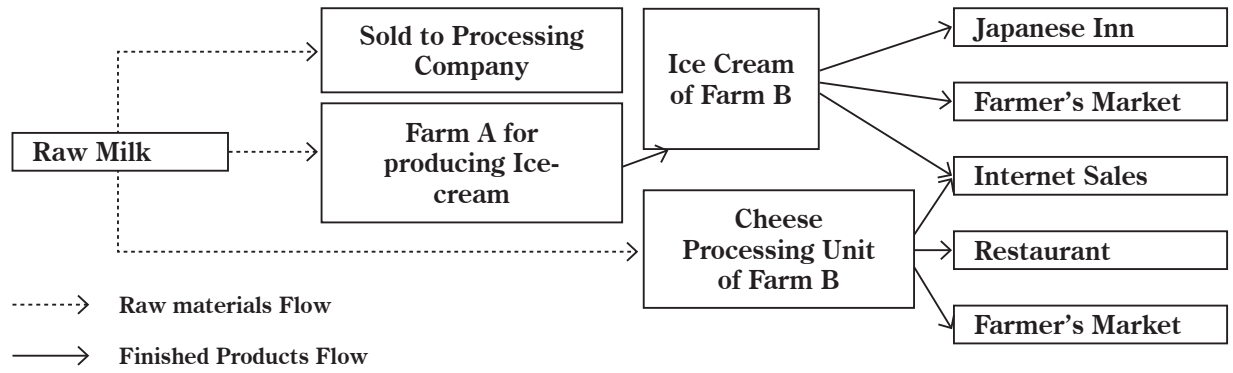

Figure 1: Supply Chain Channel of Farm B
Source: Survey Data

Farm “B” sells ice cream to Japanese Inn and famer’s market with a sales commission but sells through internet directly to end user after his son joined to the farm. It sells cheese to restaurant at negotiable price and to famer’s market with sales commission. It also sell cheese through internet.

Farm “C” also is a medium scale dairy farm in this study area. Its sales turnover (including raw milk) is about 100 (one hundred) million in one year. Farm “C” hired 3 employees for farming activities and 2 employees for processing unit with family labor. It earns 15 (fifteen) million yen (not deducted family labor cost) as profit in a year. Initially it started to sell ice-cream which was produced by Farm “A” with raw milk of its own. In 1997, they started to produce milk (raw material) for soft ice-cream and sold through own sales shop and other soft ice-cream seller’s shop. In 2011, they have established dairy academy for delivering the speech about milk production and care of the animals, also teach how to make butter from raw milk. His son helped during holiday as he worked for prefectural government and take over the farm when current owner will retire.

The supply chain channel of Farm C is as follows:

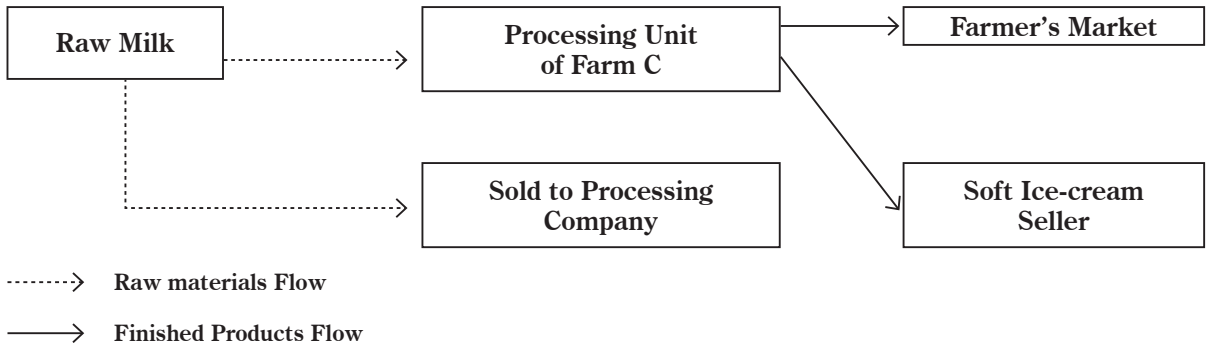

Figure 1: Supply Chain Channel of Farm C
Source: Survey Data

It has own soft ice cream sales shop in farmer’s market. It also sell soft ice cream raw material to local soft ice cream seller shop with negotiable price. Farm C’s strategic objectives to reach the direct marketing channel is providing the good quality raw material for soft ice-cream and sharing knowledge to achieve greater satisfaction of end user. The farm has then a strategy to “skip over” the traditional intermediaries of the traditional distribution channels, so as to offer its products with more added services directly to the end consumer.

From above discussions, it has proved that three farms have successor to carry the farm into next generation as successor have keen interest to processing unit of the farm and to formulate the direct selling strategy to reach end user.

4. Considerations

More than two-third of farm holders have a senior high school or higher degree. Among those, quarter of farmers have completed two year diploma course from specialized agricultural college. Most of the farmers have keen knowledge to perform dairy farming activities. More than 85% of small scale farmers and do not have successor to carry the farm into next generation. The sampled farms have successor though these farms are small

and medium scale in size. These farms must strive to foster the release of agricultural resources, promoting agricultural value-added products, formed through breeding, processing, and marketing of industrial chain. Farmers have to take efforts to integrate production, processing and marketing practices through more effective use of resources available in rural areas, such as agricultural, forestry and fishery products; and promoting integration among agriculture (as a primary industry), manufacturing (as a secondary industry) and retailing (as a tertiary industry). Direct selling can ensures the freshness of the product, ease supply chain channel and farmers can earn additional income for family expenses.

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