# PROBLEMS IN DAIRY FARMING IN HOKKAIDO AS RELATED TO THE NATION

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Hokkaido has a dairy farming area which raises 35% of the nation's total of milk cows and produces 31% of the milk, 81% of the butter and 82% of the dried skim milk in Japan. Dairy production there originated when crop cultivators began to keep dairy cows and developed under peculiarly Japanese internal and external conditions.

First I will discuss dairy farming in Japan as a whole, then the special characteristics of the structure of dairy farming in Hokkaido.

## 1. The place of Dairy Farming within Japanese Agriculture

Japan's Dairy Farming began to develop only after the begining of the Meiji era. There were ranches in various parts of the country in the Edo period but they were for horses for draft or military use. Even after the beginning of the Meiji period there were almost no ranches for beef cattle and except in Iwate Prefecture and Hokkaido there were no dairy farms. Dairy farming only came into its own after 1968 when intensive dairy farming districts were established. The land reform after the Second World War only went as far as freeing land for agriculture and it is natural to point out that the land reform was not one intended for making the development of livestock farming possible.

Here it should be noticed that though there had been some breeding

of work animals in the past, most of them were used for hauling. In contrast to the plow uses in Europe and America, Japan was a hoe and sickle culture.

In essence, this is the reason why the former cultures proceeded from the use of these animals in agriculture to the use for food while the latter proceeded from cultivation of crops, that is rice production, along with the effect of the Buddhist religion. In other words, it is the reason that though there was some dairy farming in the past, the diet of the average Japanese was fish and vegetables and the general introduction of dairy products into the diet did not come until after the beginning of the 20th century.

The fact that though Japan is 80% mountainous having much forest land and almost no grassland underlies the lack of a livestock farming environment in Japan.

Naturally, instead of transhumance it is well known that until recently the slash and burn method of agriculture away from the home village was practiced. On the other hand, until very recently, although there was some introduction of and research into feed grasses, there was only grazing in wild grass lands or cutting of the wild grass for feed in most parts of Japan. It was only very recently that lands were seeded with grass or that feed grass was put into the crop rotation. Of course, the commercial crops of rice, wheat, potatoes etc. were carried over from the Edo period into the Meiji era when land development brought rice paddy agriculture even to cold climate areas, and produced double or even triple yearly rice crops in other areas, highly efficient truck gardening and in general, produced an extremely intensive high level agriculture in Japan.

Livestock takes up a very small percentage of the grain-centered agriculture of Japan and also in the livelihood of the people where it does

not come up to the levels of Europe and America. Under these conditions, modern dairy farming began in 1968 when the policy of the government was to promote farms having cattle. This began with farms having one or two milch cows.

There is no way, however, that this could fall within the limits of the concept of mixed farming. Japanese agriculture had been developed to that extent, on the principle of grain crop cultivation. For that reason dairy farming took two different directions in development. One was in the milk dealers who had the purpose of milk production in the areas around the cities; the other was the forming of the outlying districts such as Tohoku, Hokkaido or Kyushu as special areas of dairy farming. However, this only extends to small businesses in Tohoku and Kyushu where dairy products are weak compared to the profits obtainable from other crops.

I would like to explain the change in agricultural land use from the point of view of dairy farming and crop farming in Hokkaido, especially in the Konsen plateau of eastern Hokkaido.

## 2. The beginning of the maintenance of Milch Cows as a sub or side business

The beginnings of dairy farming in the beginning of the Meiji era can be found in the Tokyo-Yokohama area where dairies specializing in milk production raised milk cows chiefly with purchased feed, produced milk for marketing and sold it to the people of the city. Most of the milk cows were Ayreshire, Shorthorn, Guernsey, etc., but later the Jersey, and in 1885, the Holstein were imported. After that the Holstein breed increased. The milk producers placed the calf or the dry cow in a farming area for a year or for a few months; as a result an area for boarding cows

developed in the areas around the cities, (for example, in Chiba Prefecture, Awagun; in Shizuoka Prefecture, the Mishima district; in Hyogo Prefecture, Awaji Island; in Kumamoto Prefecture, Goto, etc.). Next, after the First World War the farmers in these boarding areas who boarded the cows began to milk, process and sell the milk themselves, but until the beginning of Showa (around 1930) the majority of the milk cows belonged to the city milk producers.

The dairy business of the farmer was carried on the side of rice crop or other farming and was a subsidiary business where one or two milk cows were kept. Japanese dairy farming and its origins are different from those of Europe and America. This had a great affect on the later development of Japanese dairy farming, resulting in the monopolizing of the largest part of the processing, distribution and marketing system by three giant dairy product manufacturers.

### 3. The Beginning and Development of Dairy Farming

Dairy farming in the real sense began after World War II with the promotion of increase in cows by the government, the leasing of cows, the establishment of a capitalizing system, the policy of concentrated dairy districts, the policy of optional enlargement of stock farming under the Basic Agriculture Law (1961) and so on, so that the dairy farming business was mainly taken over by the farmer. However, up until the early 60's, Japanese agriculture was characterized by very small, family operated farms using lots of human labor and lots of fertilizer, slanted heavily toward a main crop system focused on rice production from which dairy farming could not be freed. With economic development in the 60's, massive industrial employment caused a scarcity of labor in farming regions, so that there was a big change in both crop and stock

farming. Tendencies that appeared included more business-like management, increased numbers of livestock, and greater conservation of energy. There was some increase in feed crops, but efficient rotation was not very widespread, so that the tendency was to rely on imported feed.

The number of "dairy farms" (so classified by the Japan Bureau of Statistics) in all of Japan which had increased yearly until 1963, began to decrease from that point until, in 1978, the number stood at 129,400 farms, (only 31% of number in 1963). On the other hand, the number of cows per farm averaged only 1−2 head in the 50's, 2−3 head in the first half of the 60's, but increased to 4−5 head in the second half of that decade. The increase became even more rapid with the advent of the 70's. In 1975 the average was 11 head per farm, and in '78, 15 head, (the total number was 1,979 million head), and this trend toward larger herd size is continuing.

Raw milk produced in 1956 totaled 1.15 million tons; in '61 − 2.11 million tons; '64 − 3.02 million tons; '68 − 4.01 million tons; '76 − 5.26 million tons; '78−6.12 million tons. The factors behind this rapid increase in the number of head per farm from the latter half of the 60's were 1) the efficient system of lending capital, 2) modernization of machinery and equipment, 3) the establishment of a technically sound system of feed crop production, 4) the establishment of a system of subsidies for producers of milk used for purposes other than drinking, 5) the diffusion and reliance on foreign-produced beet pulp, haycube and other imported roughage, 6) technical advances coming from an increase in scale of management, and 7) the increase in productivity arising from more efficient methods, etc.

## 4. The Importance of Hokkaido in the Dairy Farming of Japan

In order to understand Hokkaido's place within the nation's dairy industry, selected data are presented as follows. (Table 1)　After 1955 the greatest number of dairy farms was recorded in 1960.

| | No. of Hokkaido dairy farms | No. of Hokkaido dairy cows | No. of Hokkaido dairy cows / Japan | No. of dairy cows /farm Hokkaido | No. of dairy cows /farm Japan |
|---|---|---|---|---|---|
| 1950 | 25,144 | 53,182 | 26.84 | 2.11 | 1.49 |
| 1951 | 27,540 | 59,520 | 26.36 | 2.16 | 1.50 |
| 1952 | 34,614 | 71,648 | 26.00 | 2.16 | 1.50 |
| 1953 | 39,000 | 86,400 | 26.74 | 2.22 | 1.56 |
| 1954 | 40,000 | 90,100 | 25.31 | 2.25 | 1.58 |
| 1955 | 39,200 | 88,950 | 21.12 | 2.27 | 1.66 |
| 1956 | 44,030 | 102,670 | 20.64 | 2.33 | 1.76 |
| 1957 | 50,630 | 124,000 | 21.13 | 2.45 | 1.74 |
| 1958 | 53,800 | 142,900 | 21.60 | 2.66 | 1.81 |
| 1959 | 58,080 | 162,990 | 21.70 | 2.81 | 1.93 |
| 1960 | 63,690 | 182,810 | 22.20 | 2.87 | 2.01 |
| 1961 | 60,900 | 201,490 | 22.77 | 3.31 | 2.14 |
| 1962 | 59,500 | 218,740 | 21.84 | 3.67 | 2.41 |
| 1963 | 54,900 | 249,180 | 21.76 | 4.54 | 2.74 |
| 1964 | 51,610 | 282,320 | 22.80 | 5.47 | 3.08 |
| 1965 | 49,630 | 317,690 | 24.65 | 6.40 | 3.38 |
| 1966 | 46,080 | 321,710 | 24.56 | 6.98 | 3.63 |
| 1967 | 43,260 | 339,400 | 24.67 | 7.85 | 3.99 |
| 1968 | 41,100 | 374,000 | 25.12 | 9.10 | 4.42 |
| 1969 | 40,970 | 435,340 | 26.17 | 10.63 | 5.13 |
| 1970 | 39,290 | 489,200 | 27.12 | 12.45 | 5.86 |
| 1971 | 36,480 | 520,200 | 28.03 | 14.25 | 6.65 |
| 1972 | 33,930 | 550,200 | 30.25 | 16.21 | 7.49 |
| 1973 | 32,070 | 567,940 | 31.96 | 17.70 | 8.38 |
| 1974 | 29,050 | 577,000 | 32.99 | 19.86 | 9.80 |
| 1975 | 27,380 | 614,800 | 34.40 | 22.45 | 11.16 |
| 1976 | 25,200 | 623,750 | 34.44 | 24.75 | 12.31 |
| 1977 | 23,620 | 656,700 | 34.78 | 27.80 | 13.83 |
| 1978 | 22,900 | 694,300 | 35.08 | 30.31 | 15.29 |
| 1979 | 20,971 | 684,157 | | 32.62 | |

**Table 1. Ratio of Hokkaido dairy farming in Japan**

Afterwards it decreased rapidly, so that it totaled just 22,900 farms in 1978. This number, only 36% of that in 1960, is 17% of the national total. In spite of the decrease in the number of farms, the number of cows continued to increase, reaching 694,300 head in 1978, an average of 30 head per farm; in 1979 the number reached 32.6 head per farm. The total in Hokkaido was about 20% of the national total in 1955, 32% in 1972 and 35% in 1978. Also, Hokkaido's share of the national production of raw milk, 20% in 1955, reached 31% in 1978.

Hokkaido milk is used chiefly for the production of dairy products other than drinking milk: dairy products – 86%; drinking milk – 12% (in the other prefectures the ratio is dairy products – 17%; drinking milk – 82%), so that Hokkaido supplies milk for 70% of the nation's dairy products other than drinking milk. Hokkaido's proportions of various dairy products are as follows: 81% of the butter, 82% of the dried skim milk, 68% of the powdered milk, 42% of the condensed milk and 39% of the evaporated milk. Moreover, 60% of the factories which can process over 1,240 tons of milk are located in Hokkaido.

If we examine the difference in the number of cows per farm in the other parts of Japan and in Hokkaido, 84% of the farms outside Hokkaido have less than 20 head, while in Hokkaido 45% of the farms have over 20 head, and Hokkaido has 45% of the nation's dairy farms which have over 30 head. If we look for regression lines between the average number of milk cows and the percentage of farms having cows in the various districts of Hokkaido for selected years, we find in 1978, $Y = 24.4X + 18.87$; in 1960 $Y = 2.21X + 2.387$; and in 1970 $Y = 6.45 + 8.12X + 3.39X^2$, which shows that the tendency toward increases in the number of head is very pronounced.(Fig.1)

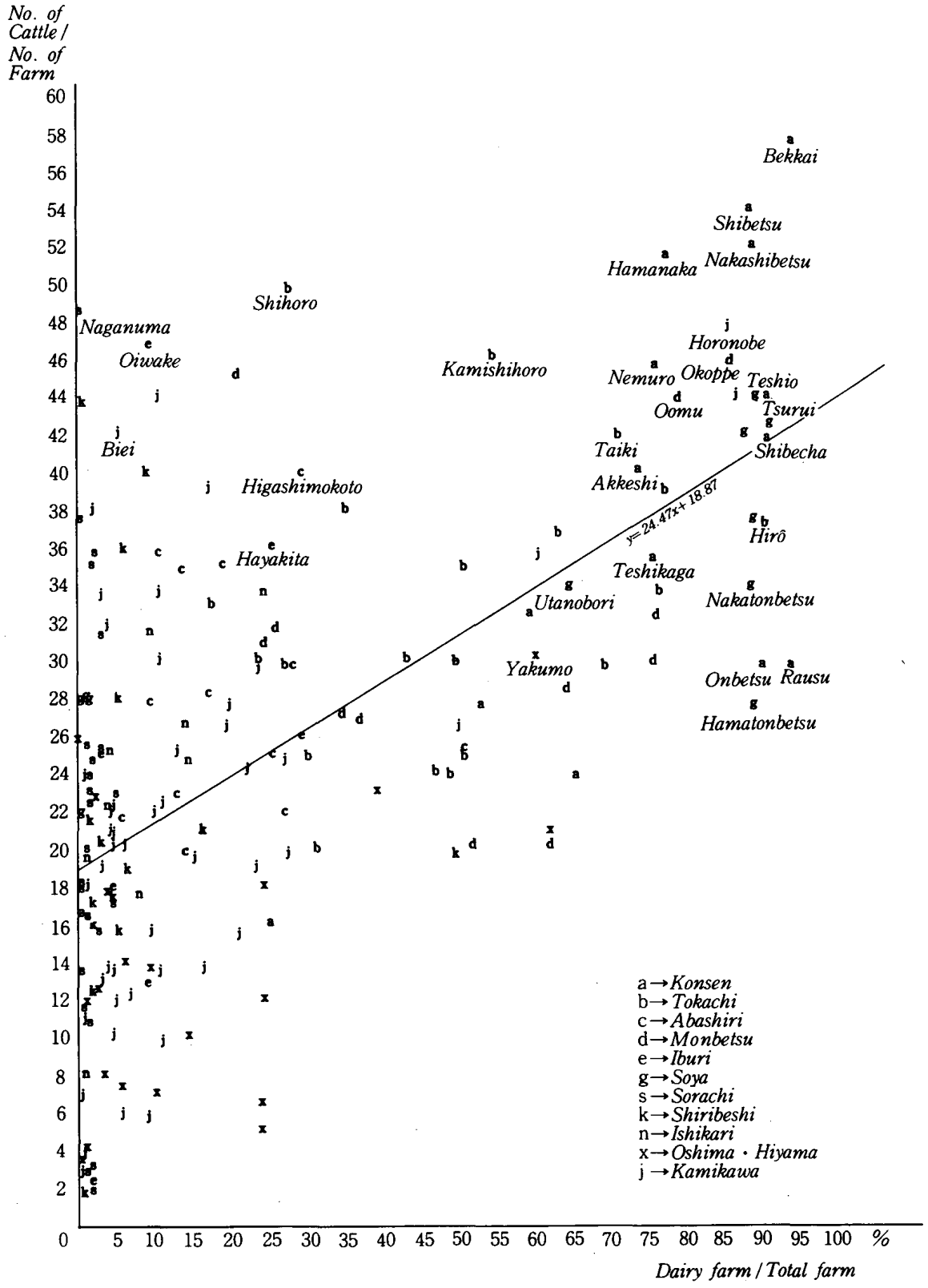


**Fig. 1　Ratio cattle and farms**

In Hokkaido, district characteristics are very clear. In the rice paddy area of central Hokkaido and the the paddy and dry field farming area of southern Hokkaido, some dairy farms having few head of cattle can be found, but in the area around Sapporo, while there is not a high percentage of dairy farms, the number of head per farm is high. The eastern and northern parts of Hokkaido specialize in grassland dairy farming. Thus, Hokkaido is entirely different from the areas using concentrated feed near the cities in the Kanto and Tokai areas, or from the farms in Tohoku where the number of cows per farm is very low.

Hokkaido lies in a low temperature area and the soil frost in winter is very pronounced, lasting from the middle of November until the end of March, and sometimes until April in the central and eastern parts of the island. Soil frost differs with the amount of snow which remains on the ground throughout the winter. This freezing of the soil hinders the growth of alfalfa, so that, though it may be used as a trial crop, it is not put into regular use. Also, there is a lack of sunlight hours stemming from ocean fog in the eastern Hokkaido Konsen plateau, making the raising of maize difficult. (Fig.2) Crop damage from cold weather which occurs every few years not only hurts the bean crops of eastern Hokkaido very much, but the damage extends to all of the crops. For that reason, paddy rice has disappeared from eastern and northern Hokkaido. There has been an improvement in species and crops to bear the cold better, and the farmers are being advised to grow potatoes and sugar beets rather than the more attractive but speculative bean crops. Thus, the north and east Hokkaido areas have had to turn to grass silage and grassland-type dairy farming. In central and southern Hokkaido maize, corn silage and grasslands are found also.

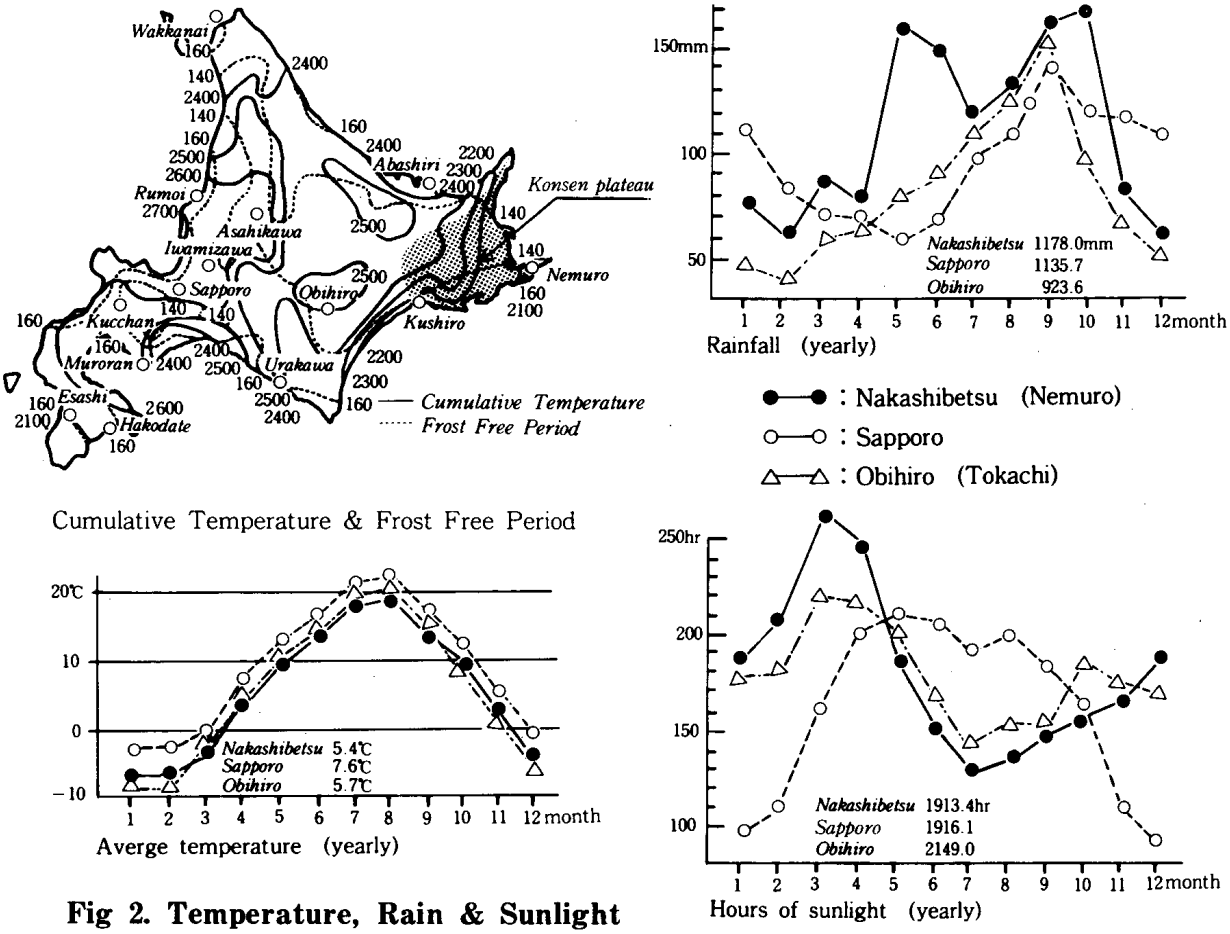


**Fig 2. Temperature, Rain & Sunlight**

Volcanic ash, clay and peat, making up the peculiar soil content of Hokkaido make the soil acidic and marshiness tends to invite water damage. For that reason, soil improvement has taken place in both paddy and field crops and there has been success in producing large scale grasslands as grazing land for raising young cattle.

From the point of view of earning power, income diminishes from rice, onions, sugar beets to milk; and from the point of view of degree of intensity of crops, income decreases from onions, wheat, beans to feed grass. In either case, grass is lowest on the list. In spite of this, it makes up 66% of the crops in Hokkaido.

The debts incurred by Hokkaido's dairy farmers from the costs of changing to large machinery, barns and equipment, plus purchases of superior breeds of cattle and so forth for the purpose of raising

productivity and modernization accompanying the increase in the number of cows per farm averages 17 million yen; for those farms having 30 or more head, the debt averages 23 million yen. Compared to the rice farm where the average is 5 million yen, this average debt is very high and is a major cause of difficulties in management.

The stable dairy farms of Europe and America have goals commensurate with the situations within their countries. Dairy farm management is based on the premise of seeking profit through increased size but a size wherein the productivity is increased without astricting management. The service life of the equipment and machinery is long, and the management capital debts of the farms are small. Demand is also stable. As opposed to this, the dairy farms in Hokkaido, because of the sudden increase in the number of cows per farm, had to replace all of their machinery and equipment. On the surface, very nice-looking farms are the result, but inside there are still many problems for which solutions are needed.

## 5. Dairy Farming in the Nemuro District

It has been 100 years since the Konsen plateau first began to be cultivated. A great number of farmers came in to farm and then left. Various crops were tried, but with repeated frost damage and cold summers, the crops were often lost or greatly reduced. For a long time extensive farming remained at a low ebb. Around the time of World War I soybeans were tried as a crop but the results were very poor. Even though there was progress in farming techniques and land improvement, it was impossible to overcome the adverse natural conditions. So it remained the lowest area in agricultural production in Hokkaido.

The spotlight did not focus on the agriculture of the Konsen

district until after the development of dairy farming. The beginning of this was the government directive in 1956 concerning intensive agricultural districts which provided an improvement in grassland, self-support in feed, organization of milk collection and capital for construction. A development project known as the Konsen Pilot Project was begun. Preparation of land by machinery was carried out with money borrowed from the World Bank and, beginning in 1956, new farmers were brought into the area. It was planned that there be 18 hectares per farm with one third of the area used for pasture and growing feed and was planned to support about ten head of cattle. Jersey cattle were imported from Australia at first but in the end this changed to Holsteins. As of 1964, 361 farms had been started in the area, and it was planned to have mixed ranching with dairy cows, horses, pigs and chickens. However, at this time, because of various changes in conditions connected with the national boom economy of the period, it became difficult to maintain stable management along the lines of the original plan. Therefore, in 1965 the plan was changed to concentrate on grassland dairy farming with 30 hectares of grassland per farm. As of this time, 166 farms had been closed, leaving 195 still operating.

At the same time there was another pilot project in the Shumbetsu district in the Chashikotsu plain which spreads over the boundaries of both Shumbetsu and Nakashibetsu townships. Here 3,536 hectares were prepared as grassland and a plan was made for farms, each with 20−30 head of cattle and 30 hectares of land. In 1971 when preparation for the project was completed, 64 farms opened, of which 60 remain. The average number of cows per farm is 54 head, well above the original plan. This was called the No.2 Pilot Project. The No.3 Project is called the New Dairy Village Construction Project. (Nemuro District Large Scale Agricultural Management Development Project). The transition over

twenty years in government-managed development projects is shown in Table 2.

| name | team | settler plan | area (ha) cultivated field | total | livestock CA | CL | TO |
|---|---|---|---|---|---|---|---|
| 1st Konsen PF basic plan | '56-64 | 459 | 14.4 | 18.8 | 10 | 2 | 12* |
| changed plan | '65-67 | 361 | 20.5 | 30.3 | 16 | 4 | 20 |
| 2nd Shunbetsu P | '65-71 | 64 | 29.8 | 37.2 | 15 | 12 | 27 |
| 3rd New Dairy Villge Proj. | '73-80 | 250 | 50.0 | 63.0 | 50 | 18 | 68 |

* Other : Horses 2, Hogs 2, Sheep 2, Chickens 50.
CA : Cattle, CL : Calves, TO : Total. PF : Pilot farm.

**Table 2. Reclamation of Government Enterprise in Konsen**

## 6. The New Dairy Village

The New Dairy Village Construction Project is one in which 6,877 hectares of grassland was provided, with 50 hectares per farm and 50 head of milk cows. By around 1980 it is planned to have a total of 250 ranches including 113 ready-built dairy farms plus others built by families moving to the area. To this purpose studies were done from 1969 to 1972 and costruction carried out from 1973 to 1975. The cost of the project is 92,000 million yen, of which the National Government provided 74%. The Hokkaido Government funded the loans, which were partly the responsibility of the farmers also. The loans were for twenty years with a regular set payment commencing after three years. The project was carried out by a third sector, that is The Agricultural Land Development Public Corporation.

As of 1979 the project had cost 57,200 million yen, prepared 11,000 hectares of agricultural land and 870 kilometers of agricultural waterways, opened 84 farms, and reached a 62% completion level.

In the ready-built dairy farms, 16 have free-stall barns and 68 have

stanchion-stall barns: the stanchion-stall barns are 620−700m²; the silo is an air-tight steel silo of 840m³. For each there is a bottom-unloader, bunk feeder; in the free-stall barns there is a four-head, double-type, milking parlor whereas in the stanchion-type a pipeline milker is used. There is a bulk cooler of 2,500 liters capacity in the milk room; for processing the droppings there is a barn cleaner or scraper and 630m² slurry store. The storage garage for agricultural equipment is of steel-reenforced concrete, one story high and 100m² in area. The paddock, of asphalt, is 500m² in size and there are 7,500 meters of fence. The greatest number of the farmers who have opened new farms in the project came

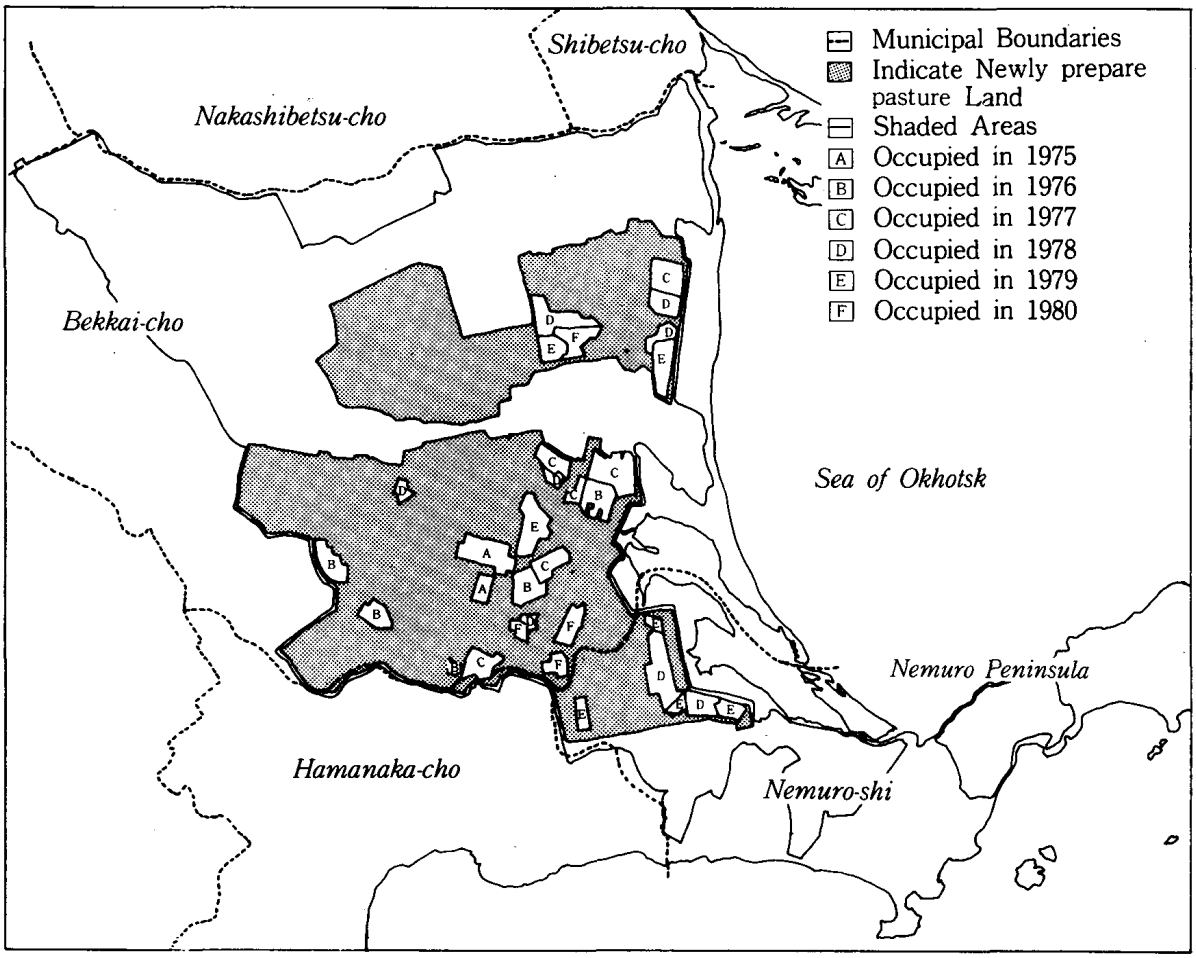


**Fig. 3 Map of Nemuro District New Dairy Village**

from the local Bekkai Township, while six came from Nemuro, one from Nakashibetsu, three from Shibetsu and one from Hamanaka. The numbers of families moving in each year from 1975—1980 was 8, 16, 20, 20, 20, and 10 respectively, for a total of 113. (Fig.3)

## 7. Change in Crops

From after World War II up to the present, we can see the transition from non-rice farming raising varied crops, to specialization in dairy farming. In 1950 miscellaneous cereal, barley, oats, wheat, potatoes, pulses and industrial crops accounted for more than 60% of the cultivated land area in the Konsen district. Pulses, a type of bean that withstands the full brunt of cold weather, seem to have remained long in the Konsen area, still being present ten years later, though somewhat diminished.

When the increase in milk cows became evident in the Nemuro area, milk production increased by ten thousand tons each year, and after 1962, various feed crops, especially grasses, increased.(Table3) In the same way, the changes in milk production and number of milk cows for the cities and towns of the Nemuro area are shown in Fig. 4 and Fig. 5.

If we take a closer look at Bekkai Township which has the largest number of cattle in the Nemuro area, we can see that it is very large, about the size of Kagawa Prefecture on Shikoku Island in southen Japan.

| | '50 | '60 | '65 | '76 |
|---|---|---|---|---|
| Miscellaneous cereals & Barley & Wheat | 34.0 | 19.2 | 3.4 | 0.03 |
| Pulses | 6.7 | 3.9 | 1.6 | 0.04 |
| Potatoes | 15.6 | 7.3 | 5.1 | 1.4 |
| Vegetable | 7.0 | 3.3 | 1.7 | 0.3 |
| Industrial crops | 4.4 | 8.9 | 3.8 | 0.5 |
| Feeds & Forage crops (grasses) | 32.2 | 57.3 | 81.0 | 96.8 |

**Table 3. Planted ratio of main Crops in Konsen**

Examining the field crops we see that: barley disappeared in 1966, wheat in 1965 and naked baley in 1963. The feed crop oats has only two hectares remaining while soybeans and red beans disappeared in 1965. Kidney beans lasted until 1974, but then these too disappeared. Even potatoes and sugar beets, which are not too affected by the weather, dropped to nothing from their high in 1958-61. Compared to this there was an increase in grass, which can be understood when the increase in milk production is noted.

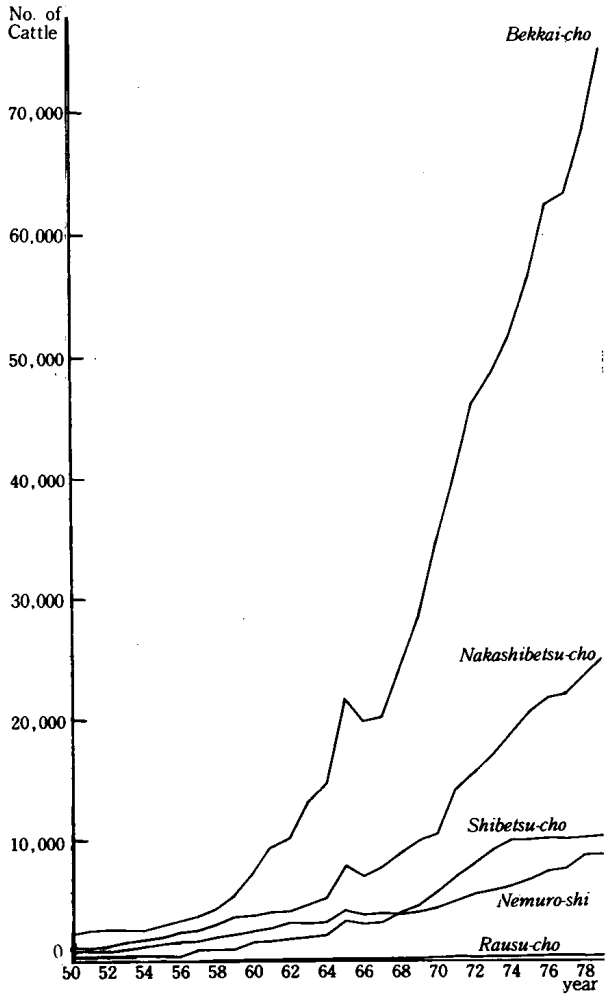


**Fig. 4 Number of Milk cows in Nemuro area**

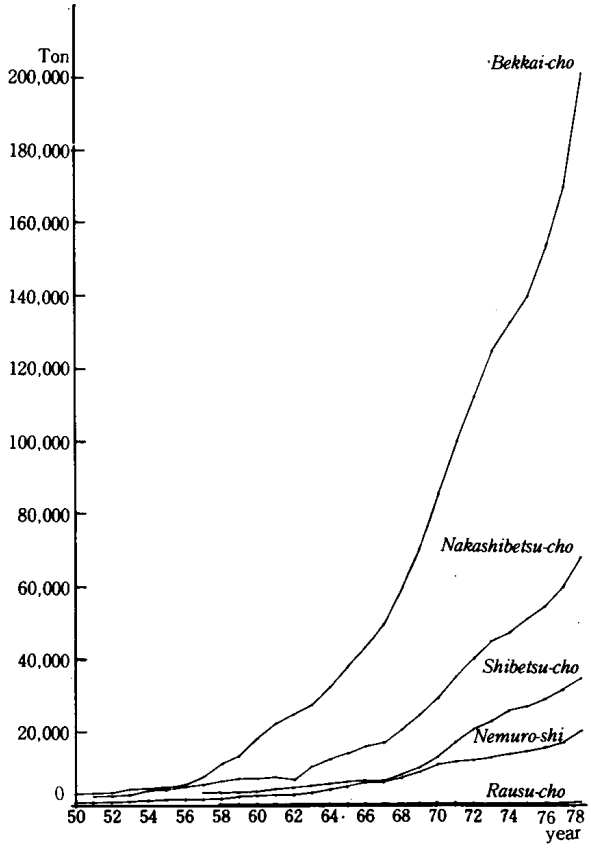


**Fig. 5 Milk Production in Nemuro area**

Also, the number of dairy farms reached a peak in 1960 and have now diminished to 65% of that figure. This is true not only of the Konsen plateau, but a common phenomenon throughout Hokkaido.

## 8. Various Problems in the Future for Dairy Farming

This vision of large-scale development of new grasslands and the building of a New Dairy Village could only have been achieved with the influx of a tremendous amount of capital which could never have been raised by the individual farmer or by the local government. However, with the overproduction of milk, a move to limit production has developed. On the other hand, milk produced in Japan is higher-priced than that in other countries. But since, at present, it is impossible to increase the number of cows without increasing overproduction, many complaints have been forthcoming from the dairy farmers who have been farming since before the above projects began.

Also, since the Konsen district changed to a grassland type of dairy farming only after 1960, the grass silage base for dairy-cow raising only got started in 1964 and is thus a very new method of management there.

Also, the amount of milk per cow was 3.000—3.500kgs. ten years ago but has increased to over 5,000 kgs. today. This is because, with the yen getting stronger internationally, the farmers have been able to import and use large amounts of foreign feed cheaply. However, there is no way of knowing how long this situation will last. In other words, the increase in the number of cattle added to the importation and use of large amounts of grain creates the problem of overproduction. Further, even in dairy farming areas outside the New Dairy Village project, large amounts of government subsidies are being used for new mechanization (buying new and larger machinery, etc.) as well as the introduction of silos and bulk

coolers. This is fine for the farmer in terms of saving labor, but it also increases his debt, and so it cannot be denied that there is a minus effect in terms of dairy farming management. Certainly, dairy farming in Hokkaido has advanced greatly in the last ten years; the cows are better, so they naturally give more milk, and the equipment has become very high class. Along with this, management expenses have also climbed. Income has increased but so has debt, which perhaps shows a rise in intensity of management.

But there are worries in all of this. Within the supply and demand cycle in Japan, the Japanese generally drink relatively little milk. And when Japan, which doesn't consume that many dairy products, doesn't raise the ratio of milk to feed (price of concentrated feed/price of milk) in competition with imported dairy products and the amount of imported feed depended upon is far greater than the total of domestically produced rice, we must be warned that there is danger of a complete collapse of the self-dependency of Japanese agriculture.

If that is the case, what is a better road to better dairy farming management? An area such as Hokkaido with its cold climate, should grow maize and root crops, making silage of the former; in the north and east, farmers should stick mainly to grassland and grass silage. And through an increase in efficiency and labor-saving productivity, stable management must be striven for. Further, with the relatively short history of dairy farming management here, there certainly must be many things that can be learned from Europe, America and New Zealand.

The time has come for a change in the way of thinking about dairy farming. To express this in one sentence we would say that there is a need for developing the capacity to withstand international competition and the capacity to bear low prices, for establishing good management techniques, for making efficient use of high quality feed resources and

adopting proper land uses.

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