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A GEOGRAPHICAL STUDY ON THE PRODUCTION AREA FORMATION
OF THE BROILER INDUSTRY IN JAPAN

BY

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CHAPTER I

INTRODUCTION

1. The purpose of this study

This study is a geographical study on the production area formation of the broiler industry in Japan.

The broiler industry of Japan, a newly-risen livestock industry, started from the 1960's in the full-scale, and has achieved the most remarkable development in the agricultural and livestock histories of Japan.

The broiler¹ is generally not shipped to the market as live bird, but is transformed into processed goods before shipment through several manufacturing processes including treatment and processing. Owing to this situation, the management of the broiler raising can't stand independently. In addition, the broiler raising can be recognized as a typical case of the livestock raising in facilities, thus being unable to be classified into the category of the land utilizing livestock production. Further, mass production of broilers satisfying a definite standard has been able to be carried out in a short period by modernized facilities. Accordingly, the broiler industry may be termed a technological or a processing stock industry that has mass distribution systems. Thus, it should be defined as the assembly of the broiler raising, the treatment and the processing.

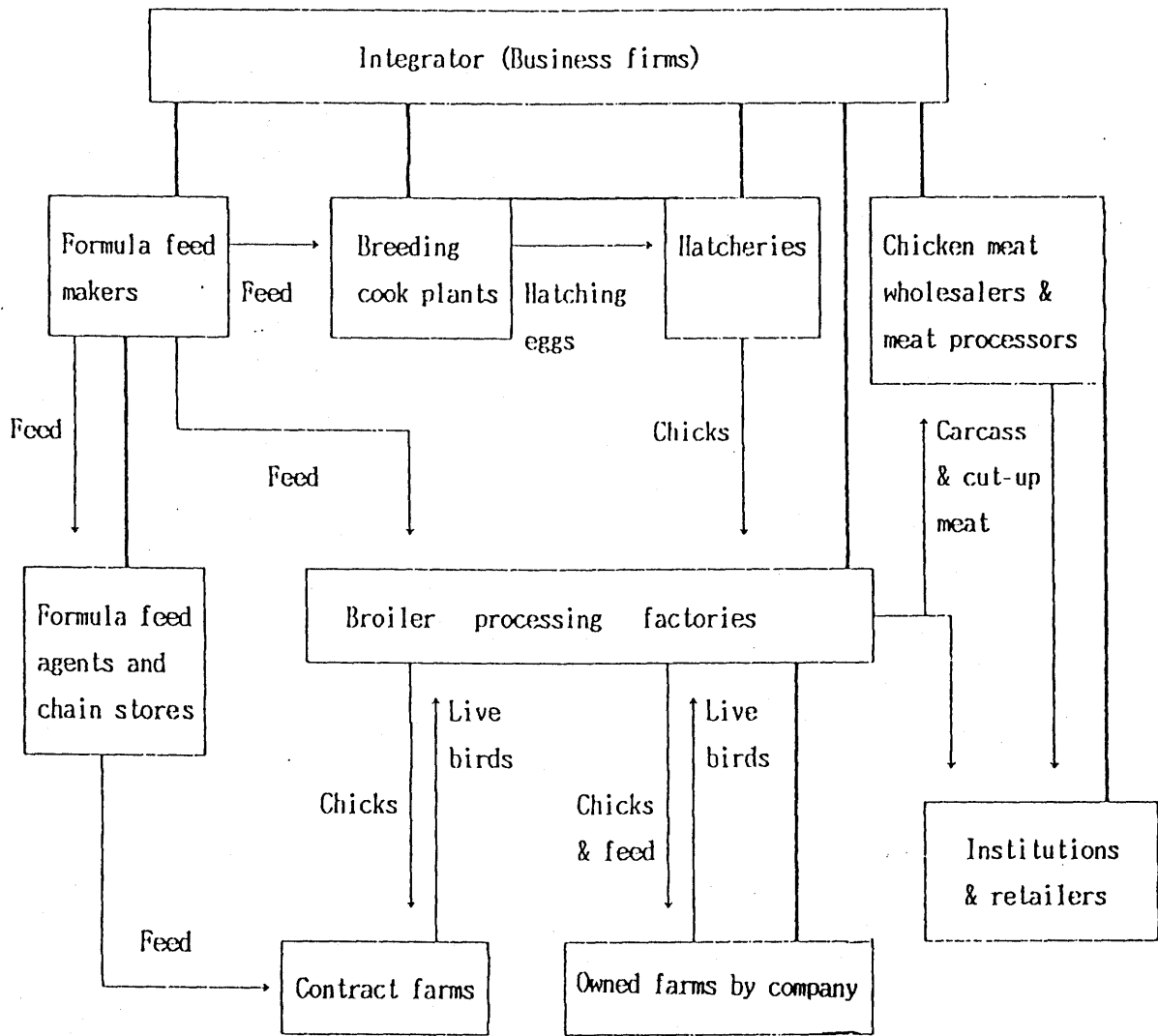
The integration system² in the livestock industry of Japan originated from the broiler raising section in the 1960's and promoted by Shoshas (business firms), their related feed firms and by the meat processing firms. This situation came from dependence of this industry on the imported feed of the foreign materials. A large portion of the

feed and the feeder chicken were imported. Shoshas conducted the importing businesses, and, at the same time, advanced to incorporate the broiler enterprises from production and processing to distribution with the purpose of expanding the range of the profit.

Meanwhile, the economical situation of Japan changed into the stage of rapid growth, which also changed Japanese dietic habits into the westernization, and increased stock raising farms in anticipation of an expanding demand for meat. Under these circumstances, farm households were promoting the merchandise production according to the Agricultural Foundation Law. This trend and the campaign of Agricultural Structure Improvement Project boomed the livestock business, which brought about an increasing number of the farm households that participated in the stock raising. Farm households made a raising contract of broilers with the integrator, and joined in the integration system for stabilization of its management. As a result, the vertical integration system which basically consisted of the Shosha as its summit, processing factories set up by the Shosha-related and non-agricultural capital and farm households were established as shown in Figure 1.

In regard to the regional aspect of the integration system, the units of the broiler industry, i.e. raising households, a hatchery, a procesing factory and a feed plant, formed the regional production group or the regional production structure. In addition, the regional development of the broiler industry proceeded in the following. The production regions were expanding gradually from the environs of the metropolitan regions to the remote areas, in which the main production areas came to be fixed in the 1970's.

Today, the study of the formation of stock raising regions and, in particular, of small-to-medium-sized livestock regions may be one of the most important themes in agricultural geography. One may find several noteworthy studies on the regions of swine and poultry raising,



—— Relation of capital investment ———> Flow of goods

Fig. 1 Organization of integration system in broiler industry

but only a limited number of researches on the production area formation in the broiler industry has been done up to the present. Study on the area formation of the broiler industry from the stand point of agricultural geography scarcely has been carried out.

This study will investigate firstly the processes of the production area formation, and will clarify its regional conditions. Secondly, a discussion will be done on the general conditions for the formation of the production area in the broiler industry.

2. The methods in the former studies and the one in this study

1) The former studies and their problems

In connection with the purpose of this study to investigate the various conditions for the production area formation of the broiler industry, a survey over the previous researches will be given on each of the categories : the formation process of the production area, the regional structure of the broiler industry and the regional character of the production area. Through this survey several problems will be pointed out.

a. Studies on the production area formation

Concerning the formation of the production area in the case of the poultry raising, several previous researches were carried out in agronomy (Midoro et al.,1963; Takenaka,1963; Usui and Yoshida,1965). Takenaka, focussing on the broiler raising farm households in the environs of Tokyo and Osaka, considered the formation of the production area of the broiler raising. Usui, in a case study on the two prefectures, i.e. Gunma and Ibaraki, discussed the formation of the production area in terms of the processes of the regional development of the integration system that the broiler processing factories promoted. Yoshida made a similar discussion using an example of Hyogo prefecture. All these researchers discussed the formation of the production area by placing their emphasis on the structure of the production. On the other hand, Midoro et al. analyzed the formation of the egg markets in Japan from the Meiji era to the 1960's through investigation of the transition of the markets and the characteristics in the egg price formation. They laid emphasis on the structure of the production , thus offering a useful viewpoint for development of the theory on the production area formation.

In the next place, Nagashima (1969) and Kitamura (1986a, 1986b and

1987) have published the reports on the geographical study of the broiler industry. Nagashima pointed out three forms of management in layer raising in Japan, i.e. specialized forms, enterprises and cooperatives or groupes. Further, he made clear the regional characteristics in the distribution of these forms. While this research noticed the regional difference in the management scale of the poultry raising farm households, it examined neither integration by the non-agricultural firms nor contents of the management by farm households.

Kitamura, first, discussed the region formation of poultry in Takahama city of the main production area of the poultry raising kingdom in Aichi prefecture, and considered the subjects of the management conducted by the farm households and of the poultry raising. He derived from the result the factors that brought about the region formation of poultry raising in Aichi prefecture by use of cluster analysis. He, further, analyzed the trends in the whole country from the Meiji era to 1980 by a similar method. He laid, however, emphasis on the structure of the agricultural management, and did not refer to the egg market. Through the series of his researches, he attempted to find the general conditions in the formation of the poultry raising region and to explain the phenomena systematically. This may be a significant contribution to the geographical study of this problem.

Besides, studies on the movement of the production area in the broiler industry were carried out by Saito (1984) and Gillmore (1968). Saito discussed the mechanism of the changing location of the broiler production area from the North west to the South in the U.S.A. in terms of competitions among the enterprises. Gillmore gave his consideration to the changing location of the fowl production in the Republic of Ireland. He made clear the factors affecting the shift from the aspects of the management scale, the self supply of feed and the market.

In these studies, both authors concluded that the decline of the

advanced production area and the development of the newly-risen and remote one might originate from the economical and social conditions rather than from the regional conditions.

The author of this thesis has been carrying out a series of studies on the production area in the broiler industry (1983, 1988a and 1989). In the first place, he analyzed the production area formation through examining the processes of the regional penetration of the integration system by activity of the processing factory in Miyazaki prefecture whose broiler industry succeeded in formation of the main production area. He, further, advanced to analyze the primary factors and the regional conditions for establishment of the production area in connection with the processing factory and its affiliated raising farm fouseholds through investigating the process in the development of the integration system in the case of the broiler industry in Iwate prefecture. He analized the requirements for the production area formation in the broiler industry in the case of Tajima district as well.

However, in the study of Miyazaki prefecture, the regional character could not be made clear satisfactorily because of his insufficient consideration on the management of the raising farm households. As for the study of Iwate prefecture, while examination of the agricultural management of the raising farm households was conducted, it was not able to disclose the regional character of the production area owing to the limited number of the farm households studied.

In the studies on the production area of the poultry raising so far, no consideration has been given on the physical characteristics in the production area. Further, the definition of the production area has been made indistinctly. Namely, the production area has been generally described merely as the region that holds a high level of the raising number in the whole country. Clarification of the production area

formation would require investigation of the integration system in terms of both the processing factory and its affiliated raising farm households. It would be further suggested that one should analyze not only the production structure in the production area but also the marketing structure collectively.

b. Studies on the regional structure

The studies that analyzed the regional structure of the livestock industry including the broiler raising were conducted by Shindo (1973) and Miyata (1976). Shindo considered the function of the integrator and its relationship with the management of the raising farm households in the stock industry in Hokkaido and examined whether integration system existed or not. Miyata investigated the background of the integrator's advancement and the actualities of the raising system in Kagoshima prefecture.

The regional structure of the broiler industry have been studied by Ito and Watanabe (1979) and by Katsura (1980).

They laid emphasis on the type and the role of the raising contract system that the processing factory or the integrator made with the farm household. These results, which attempted to understand the impact brought about from promotion by the integrator to the regional farm households, have offered an indispensable analytical method to the study of the regional structure of the broiler production. Katsura, in particular, made a comparative examination on the contract system and the management from of the farm households affiliated with plural integrators. This study in which he tried to understand the regional structure through the analysis both sides of the capital and the farmer may be a significant contribution. However, he showed little concern to the subjects on how the integrators led the farm households to raise broiler and on where they found the raising farm households.

c. Studies on the regional character of the production area

The studies by Yoshida (1975, 1978 and 1983) and by Nagasaka (1988b) aimed clarification of the regional character through the comparative study on the production area in the broiler industry. Yoshida studied the function of the integrator in the advanced production area and the newly-rising ones, and found both common and the different features in the two regions. He showed that the different features in the broiler raising and the distribution system might be attributed to the economical factors, but he referred neither to the physical conditions of the region nor to the regionality of the agriculture. On the other hand, Nagasaka compared the features among the advanced production areas, and considered both common and different regional conditions which supported the existence of the broiler industry.

These studies might give effective measures to elucidate the regionality or the regional difference, but they did not completely clarify the locational conditions of the broiler raising farm households. Thus, these studies might not identify the regional conditions for formation of the production area.

One of the basic characteristics of the broiler raising management may be its independence from the land area and from the land fertility³. However, no research can be found on the regional conditions that may influence the farm household in selecting the location of broiler houses. Besides, there have been developments in the facilities of broiler houses. The open type broiler house, which is equipped with the side windows for purpose of the natural control of temperature and ventilation, has been popular in the warm areas. On the other hand, since the latter half of the 1960's, the windowless house, which have an automatic air regulation system to control its temperature and ventilation to the cold winter weather and to the broiler pollution, has been diffused in the cold areas and in the city areas (Figure 2). Such regional differences has been insufficiently investigated .

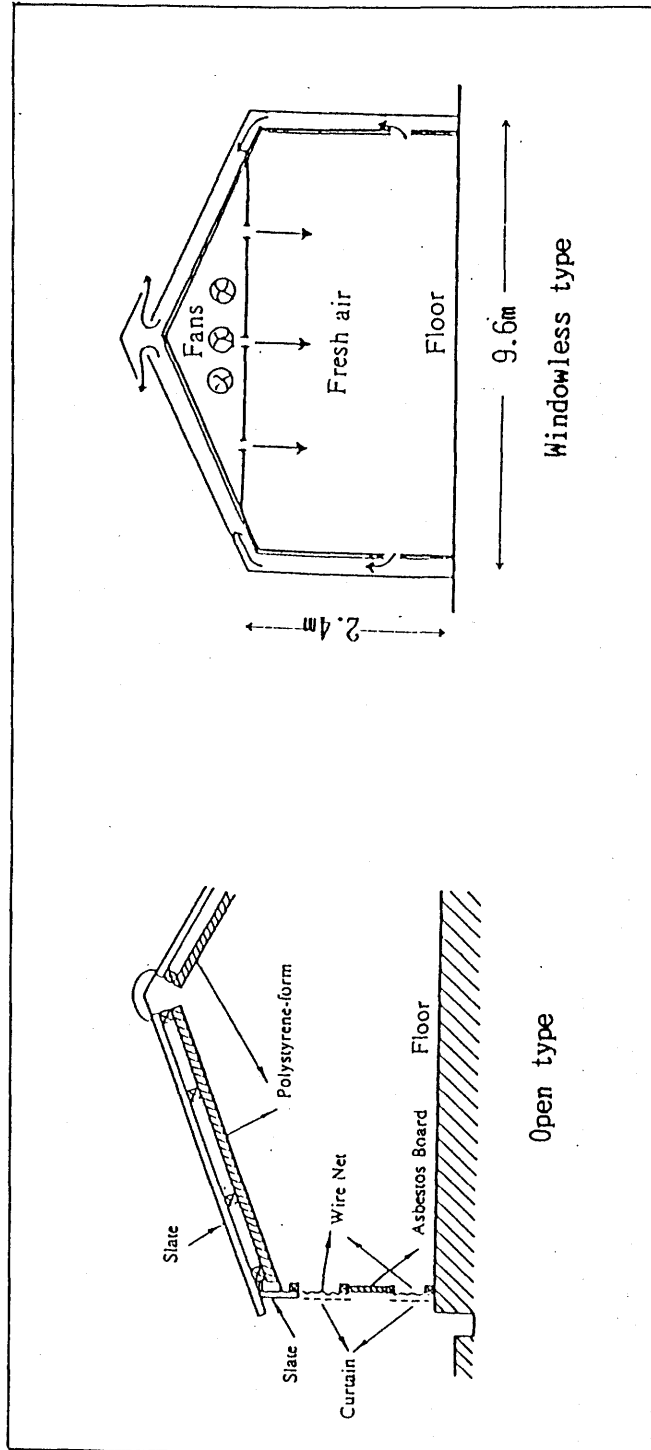


Fig. 2 Two types of broiler houses

2) The method used in this study

The purpose of this study is to elucidate of the processes of the production area formation in the broiler industry in terms of the regional structure of the integration system, to do this an appropriate research procedure should be applied.

In the first place, consideration of the processes in the formation of the production area may require investigation of its relationship with markets and the structure of markets as well as analysis of the broiler producing structure in the region. The research by Midoro et al. (1963) considered the poultry production area formation and the transformation of market, and his procedure seems to be useful for the systematic elucidation of the production area formation. Moreover, in order to study the regional structure of the broiler industry, the integration system should be analyzed through the contract system and the management form from the both sides of the integrator and the farm household, and the characteristics of the producing group in relation to the locality of the farm households. Katsura's method (1980) in the case study of Tajima district in Hyogo prefecture and Saito's research technique in his report (1968), which elucidated the structure of the agricultural district from the standpoint of the agriculture related industry (the agri-business), may be quite useful to advancement of this study.

Moreover, the research method applied by Yoshida (1975, 1978, and 1983) in his comparative study of the regions in different stages of development may be quite useful for the purpose of this study which aims to identify regionality of the broiler industry by elucidating both the general and the regional conditions in the formation of the production area. Further, Yamamoto et al. (1967), Yamamoto and Tezuka (1977) and Yamamoto and Bito (1986) derived the regional types that could correspond to the different local environments. The procedure to

determine the representative production areas in their studies may be useful for examination of the regional character of the production area.

Thus, both the techniques cited above will be required in clarification of the processes in the broiler production area formation. Namely, the study must cover the following stages : (1) construction of the regional models for the regions with environments and with various stages of development, (2) based on this model, selection of suitable study areas, and (3) investigation and analysis of the selected regions. Besides, Kitamura's method (1986b, 1987) which derived the general conditions of the region formation in the poultry raising must be taken into consideration in this study.

According to the procedures discussed above, an analysis will be given, in the first place, to the characteristics of the regional development in the broiler industry of Japan from the three aspects of the industry, i.e. production, processing and distribution. In the next step, based on the result of the analysis, the core areas in the production areas of the broiler industry will be examined. For this purpose, the production area is defined here as the region that satisfies two requirements, i.e. (1) the broiler sector holds high positions in the total agricultural production (its gross broiler production has been ranked above 20th in the whole country), and (2) the broiler sector holds defined numbers of broilers and raising farm households (having ranked above 20th in the whole country).

The extracted regions are comprehensively classified into the two types i.e. the production area in environs of a metropolitan region and the one in the remote area.⁴ Two types of production areas are further divided into four types with different climatic conditions, and four areas are taken out as the study regions. The regional structure of these four areas are analyzed in terms of the development of the

broiler industry. Actual analysis of the broiler industry will be done in the production area in terms of : (1)the activities of the integrators of the processing factory as the center, and (2)the movements of the affiliated farm households.

In addition, a term⁵ -broiler collection region- is used here to indicate the territory through which broiler chicken are introduced and live birds are shipped. By use of this term the production area of the broiler industry will be understood as a functional region where the processing factory and its affiliated farm households hold a definite cooperative space. Following the analysis of the actual structure of the production area, the regional characters of the broiler industry will be derived from four core areas in the production areas, and the regional conditions for formation and existence of the production area will be identified.

Finally, three important factors for the production area formation in the broiler industry, i.e. the function of the integrator, the management and the location of the raising farm households, and the regional structure of the integration system, will be examined to disclose regionality of the broiler industry. In this connection, the regional conditions of the production area formation will be elucidated through extraction of the common conditions from the study areas.

Notes

- 1) The word of "broiler", a term imported from the U.S.A. after World War II, means chicken for whole roasting, and it indicates usually the one holding weight less than 4 lb. (about 1.8 kg) and age less than 14 weeks (Naito, 1978). In the statistics by Ministry of Agriculture, Forestry and Fishery, "broiler" is defined as "cock or hen with age less than 3 months, namely chick or chicken for meat", and carcasses are classified into six groups according to the growing stage.
- 2) According to Sugiyama (1975) and Miyazaki (1977), this word corresponds to "togo" in Japanese, but its concept has not been defined precisely. It may generally indicate the vertical integration system organized by the non-agricultural capital, such as Shosha, fishery capital and meat processing capital. They control the whole stages from production to distribution to pursue profits (see Figure 1).
- 3) According to Saito (1969), the area of a broiler house (with accommodation capacity of about ten thousand broilers) may require land of 5 are, with the total area amounting to about 1.5 times the one occupied by the house itself. It needs about one half of the area of the poultry raising house. Further, broilers can be shipped four or five times a year from the same house because of the short raising cycle of 50 to 70 days. Besides, one person can manage about twenty thousand broilers because of the relatively easy raising technique. However, as Saito pointed out, the specific character of the management is to feed the living objects, and thus profits fluctuate mainly by the following factors: capacity of the facility, grade of the chicken, selection of the effective feed and possession of the proper chick raising technique in the period of about 20 days after its arrival.

- 4) According to the regionalization by Ministry of Agriculture, Forestry and Fishery and that by the Economic Planning Agency, the following areas were made. In the environs of the metropolitan regions (the areas existing within 150 km from the three metropolitan areas) 23 prefectures are located (along the Pacific Ocean): These are Tokyo, Osaka, Aichi, Ibaraki, Tochigi, Gunma, Saitama, Chiba, Kanagawa, Shizuoka, Yamanashi, Gifu, Mie, Shiga, Kyoto, Hyogo, Nara, Wakayama, Okayama, Hiroshima, Yamaguchi, Fukuoka and Oita. In the intermediate areas (within 150 to 300 km from the said areas), 14 prefectures exist: These are Miyagi, Yamagata, Fukushima, Nigata, Toyama, Ishikawa, Fukui, Nagano, Tottori, Shimane, Tokushima, Kagawa, Ehime and Kochi. In the remote areas (beyond 300 km), Hokkaido and other 9 prefectures are located.
- 5) This concept is an application of the "milkshed" defined by Fielding (1964), Durand (1964) and Saito (1968) to express a functional region in which a milk plant collects fresh milk. In addition, the raising farm households are likely to be located close to both the hatchery and the processing factory to shorten the transporting time of chicken and to prevent weight loss of live birds through rapid treatment after collection. On the other hand, however, a minimum separation of 500 meters among the raising farms is hopefully required to prevent the infectious chicken disease, and simultaneous practice of chick arrival and broiler shipment is also needed.

CHAPTER II

THE REGIONAL DEVELOPMENT OF THE BROILER INDUSTRY IN JAPAN

The development of the regional development of the broiler industry in Japan, if surveyed from standpoints of production and management, treatment and processing, and selling and consumption, may be divided roughly into the following four periods.

The first period is up to the first half of the 1960's, when the production area was limited to the urban fringes of metropolitan areas. The second period is the stage of expansion and enlargement of the production area, from the second half of the 1960's to the beginning of the 1970's, when the extension of the advanced area and the formation of the remote production areas were promoted. The third is the stage of production area shift after the first oil crisis, when the remote regions became special production areas. The fourth can be characterized by the competition and the stabilization in the 1980's. With the rising yen trend, import of foreign made broilers has increased, and it has been in competition with the domestic product. The remote special production areas have been established in the three prefectures, and the production in the metropolitan regions has declined. In the succeeding sections, some analyses on the regional development processes of the broiler industry in Japan will be given, by considering the regional trends mentioned above.

1. The first period (the stage of production area formation)

From the prewar period to around the 1950's, the chicken production was a subsidiary sector of the poultry raising management throughout the country. The chicken meat was obtained from either the male chick of

the layer or the culled chicken. Exceptionally there were some special production areas such as the outskirts of Yamato-koriyama city, and Naka gun and Katsuura gun of Tokushima prefecture, which shipped "Yamato cokereel" and "Shamo" respectively to the markets in Osaka and Kyoto cities (MAF, 1967).

Around 1950, a new broiler poultry farming started to meet the demand from foreigners and the stationed American military men. The upland field zone in the Kanto district and the paddy field belt in the Kansai district were used for raising broilers. The raising farmers used the battery type broiler houses and the home-made formula feed. Many farmers raised about 100 broilers per household every month, but they confined themselves to subsidiary work. Most of them speculatively made shipment at the end of year when the chicken price rised up to 300 yen per 1 kg (Yoshida,1970). The product was sold by subscription by the producer to the special collection agent (middle man), who distributed live birds to meat wholesalers, major meat merchants or restaurants, and they processed to pieces.

Until the 1950's chickens had been consumed little, playing a supplementary role to pork and beef, for it had been used for business by restaurants, and had been taken as high-quality goods.¹ Owing to this situation in distribution and consumption, the time and the cost of transportation had restricted the predominant production area to be in the vicinity of the market. As a result, the distribution of the broiler production area had covered a relatively narrow range.

For instance, Toriichi Corporation at Senju of Tokyo city, which had been the largest chicken meat wholesaler in the consumption area in the Tokyo market, tried to develop mass consumption of the broiler. It started a cooperative enterprise with Nokyo (Agricultural cooperative) of Minami-tachibana village (present Maebashi city) in 1955.² They contracted with seven farms in Taguchi and Sekine settlements to raise 3

thousand broilers under their direct instruction, but they failed in the attempt. Mr. Eiichiro Nakamura, the president of Toriichi, went to U. S. A. in 1956 to inspect the real situation of the American broiler industry. He made a revolution in automation of the broiler processing of Japan through import of the scalding and the picker in 1959. He also introduced the contracted production system into Japan after the American system.

Under these circumstances, Toriichi gave up to enter directly the production processes, and made a broiler raising contract with Keizai-Ren (Prefectural federation of agricultural cooperative associations) of Gunma prefecture through the medium of Nokyo in 1957. Keizai-Ren constructed the broiler production houses (raising ability of 120 thousand broilers) next year, and led the farmers in the vicinity of Maebashi city to join raising. Further, they built a processing factory in joint investment with Toriichi in 1961. This was the beginning of the contract raising system of large scale by the commercial capital in Japan.³ Subsequently, this system spread to various districts together with formation of the broiler production areas.

In western Japan, on the other hand, a farmer (Mr. Kitamura) at Hidaka town of the Tajima district in Hyogo prefecture was persuaded by someone to raise meat chickens. He introduced male chicken as feeder chicken, and he made a transactions contract with a chicken meat wholesaler in 1954. This is the beginning of the contract raising of chickens in the western part of Japan. Mr. Kitamura, as a wholesaler by himself, set up a regional processing factory, and led the regional farmers to join the broiler production, and founded basis of development of the broiler industry in this district.⁴

In 1960, the Japanese government put the free import policy for broiler in practice, and started the same treatment for the breeding cock and the hatching egg. Then Shosha started a full-scale

introduction of the exclusive breeding broiler and the formula feed, preparing the feasible conditions for establishment of the processing and technological livestock industry by the broiler production. As broiler consumption became gradually popular, a large quantity of product collection was getting required and meat and chicken meat wholesalers in the markets actively promoted growth of the production areas. Further, in order to increase the sale of feed, Shoshas, subsidiary companies of the fishery firms and the feed firms newly set up feed agencies or feed special agencies in the outskirts of the broiler production area. Then they became wholesalers by building processing factories, organized the farmers to carry out the contract production, and offered to them the affiliated feed sales and chicken from the related hatcheries. For this sake, farms began to raise throughout the year according to the plan. Consequently, the production of broiler in Japan rapidly increased from 17 thousand tons in 1960 to a little less than 90 thousand tons in 1965 (Figure 3).

The shipment numbers of broilers classified by districts (Figure 4) were prominent in the regions from North kanto to Tokai district, of Hyogo and Tottori prefectures, of East Shikoku and of North Kyushu surroundings. These regions had access to metropolitan markets, where the mass consumption had been developing. At the same time, the raising could get a rough profit of 35 to 50 yen per broiler, and had the relative advantage of profitability. For these reasons, the conversion from other crops, and the participation by the non-cultivating people in the hope of higher income prevailed in these regions. The part-time farm households raising one thousand broilers per month (The average over the whole country was 400) also increased in number. The cage feeding method had been wide spread since about 1960. However, because this utilized two to three stairs, broiler had to be moved, as it grew up. Also the time of arrival and shipment fluctuated. Furthermore, the

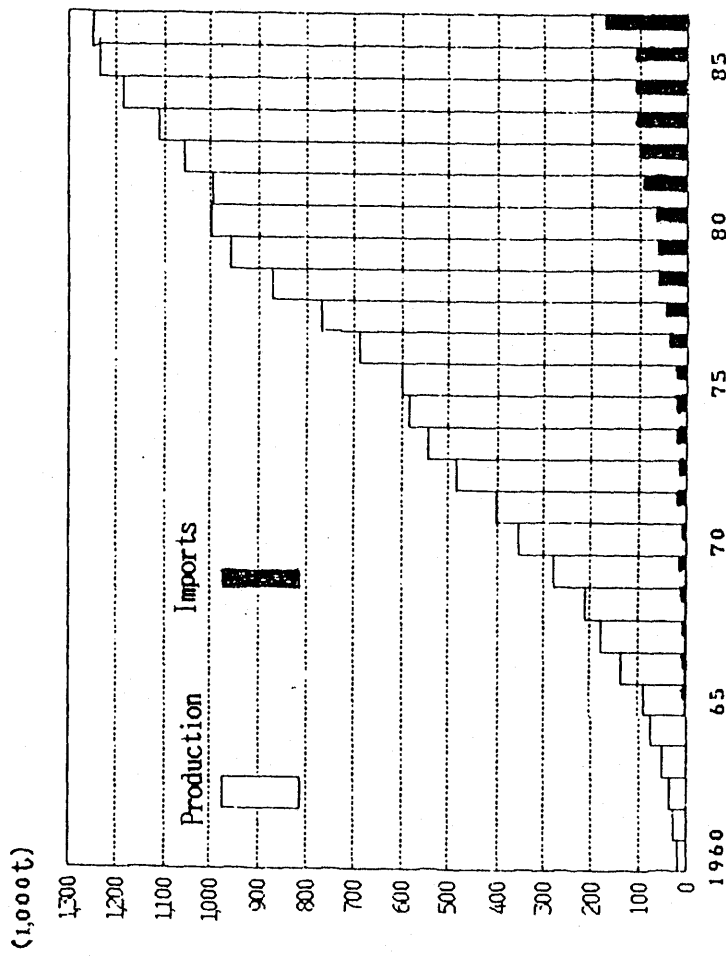


Fig. 3 Changes in broiler production and imports in Japan

Notes: Excepting meat of layers

Source: Egg and broiler distribution statistics

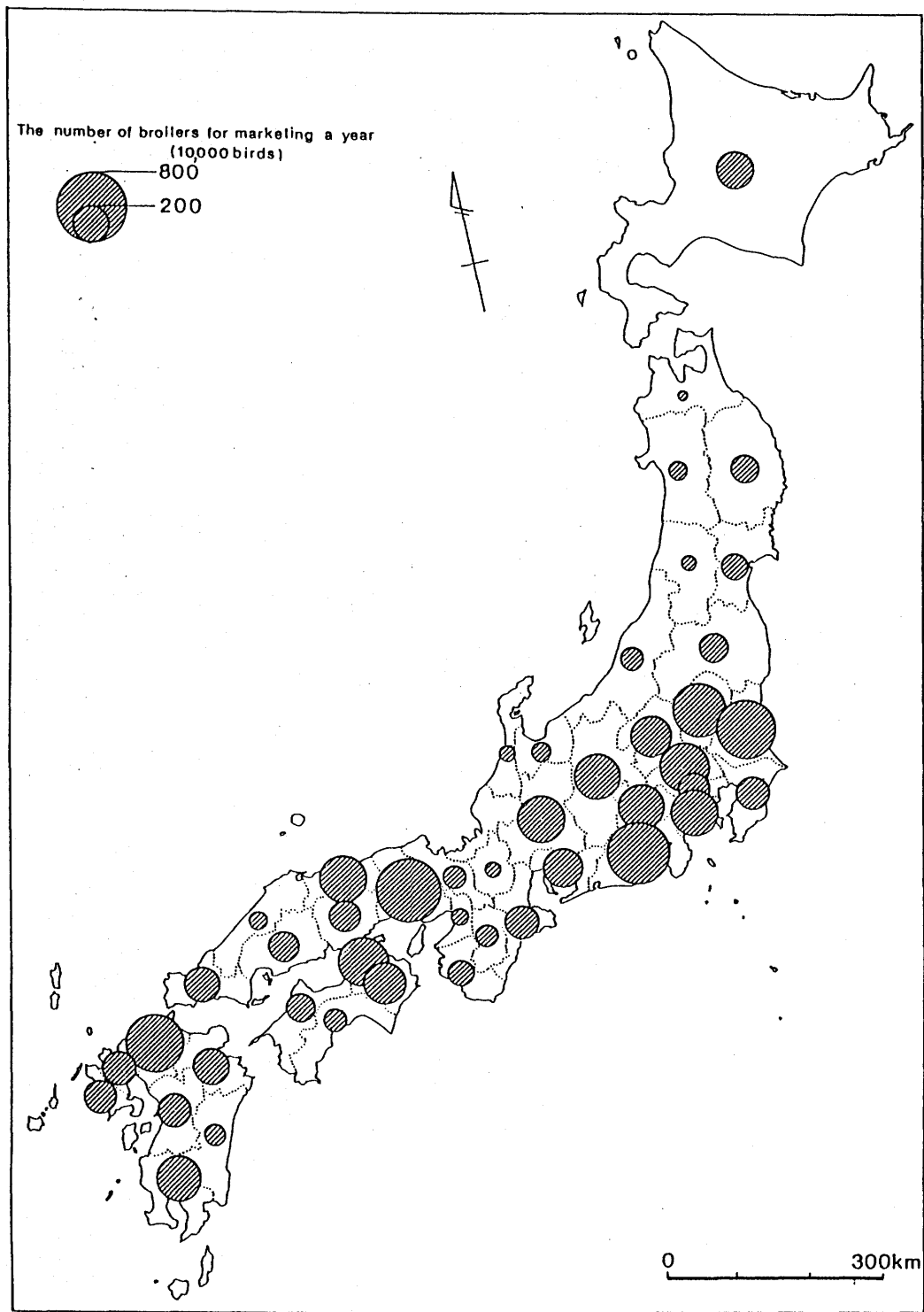


Fig. 4 Distribution of the number of broilers for marketing by prefectures, 1965

Data source : Census of livestock products

increase in the broiler production confronted a limit, for the work load input was restricted by other competing agricultural sectors. Therefore, the farm households shipping less than 3 thousand broilers accounted for 55 %, while those shipping more than 10 thousand stayed around 10 % in the whole country. The large scale raising farms located mainly in the vicinities of metropolitan cities: 160 households in Hyogo prefecture, about 100 households in Saitama, Gifu and Shizuoka prefectures respectively. In addition, many farmers changed to broiler raising in Kagoshima prefecture, the traditional poultry raising district, where the farm households holding more than 10 thousand broilers numbered over 143. This area had exceptionally large numbers of farm households and broilers in a remote production area (Table 1).

The consumption trend will be surveyed in the next section. With the rapid economic growth and increase of national income, the dietary lives of people improved, and the diet habits changed. This caused broiler to join in the menu of home cooking. As a result, in 1965, the amount of its consumption reached 4700 grams per household, and exceeded that of beef for the first time. However, there was a regional difference in the tendency. Consumption is larger in the regions west of Tokai than in other regions, and especially in the west of Kinki, the broiler occupied the second rank next to the beef, while in other regions, it was ranked next to the pork and the beef (Table 2). This regional trend in consumption corresponded fairly well with that of production shown in Figure 4 indicating large distribution volume both in the metropolitan and the western Japan regions.

To summarize, the broiler production, in general, was not performed in an independent territory in the first period. It was conducted in the poultry raising farmland, or in its surroundings. Exceptionally, the broiler production areas were born as the non-poultry raising ones in

Table 1 Size of broiler farms for marketing in selected prefectures, 1965

Main production prefectures	The number of broiler farms for marketing	0~	1,000	3,000	5,000	10,000
		birds (%)	birds (%)	birds (%)	birds (%)	birds (%)
Advanced production areas	Hyogo	19.7	16.9	22.5	18.3	22.6
	Shizuoka	21.2	17.7	9.8	38.6	12.7
	Ibaraki	46.5	25.2	6.3	19.4	2.6
New production areas	Kagoshima	35.9	31.9	10.8	5.5	15.9
	Miyazaki	54.2	27.1	16.3	1.0	1.4
	Iwate	21.5	30.1	16.1	18.8	13.5

Source: Census of livestock products

Table 2 Changes in consumption of chicken meat per household in Japan

District	Hokkaido	Tohoku	Kanto	Hokuriku	Tokai	Kinki	Chugoku	Shikoku	Kyushu
	g	g	g	g	g	g	g	g	g
1965	1,372	1,811	3,989	1,566	5,682	5,981	4,822	6,205	7,282
1970	4,190	4,036	7,595	3,924	9,485	9,506	10,068	9,311	15,213
1975	8,111	6,791	10,289	6,016	11,218	11,571	11,698	11,216	18,423
1980	12,030	10,773	13,551	8,939	14,403	14,296	15,709	15,107	22,695
1985	11,637	10,247	13,715	9,194	14,793	14,776	15,190	14,493	21,864

Source: Annual report on the family income and expenditure survey

the Tajima district, the western part of Tottori prefecture and the eastern part of Shikoku. Consequently it might be a germination period of extending and spreading in the broiler production regions.

2. The second period (the stage of production area enlargement)

In the latter half of the 1960's when the foreign breed had overwhelmed the native one Shoshas proceeded to affiliate with the hatchery, the product sale, and the wholesalers in the consumption area, controlling import of the feed, the hatching egg and the breeding cook. Further, they helped to connect such mass salers as supermarkets with the production area, and advanced to the establishment of the integration systems which control the production, processing and selling. In addition, Shoshas, responding to the rapidly increasing demand and with a purpose of reducing risk in their dependence on the unstable proportion by farmers, intended stable increase in the volume of shipment, and established the owned farms⁵ by company in remote areas such as in South Kyushu. The new territories were advantageous both in high feed efficiency and in low cost of the facility such as the broiler house because of the warm climate there. In addition, the land and the labor cost were also low, for they were favored neither with good farming bases, nor with other industries.

By contrast, the broiler industry management in the metropolitan surroundings was gradually becoming difficult, owing to the arising problems. The proceeding urbanization produced aggravation of the chicken raising environment. The broiler production generated the animal waste pollution problems⁶ such as the maloder and foul waste treatment. Besides the issue of the broiler litter treatment, the land price jumped up, and farmers tended to abandon farming because of their orientation to the manufacturing sectors.

More than eighty % of the large scale farms which ship more than 30 thousand broilers utilized the national loan facilitation system. And the farms which depend on the loan account for more than 70 %. Almost all of the funds were used to build broiler houses, but the small

proportion was used to the facilities and the machinery.⁷

Meanwhile, the broiler industry experienced various technological innovations including increase in processing volume by the modernized broiler processing facility, diffusion of the freezing and refrigerating facilities and improvement of broiler house through transformation from the solid cage raising type to the floor feeding method.

Besides, development in the transportation system decreased the transport time. As a result, enlargement of the broiler shipment area became possible. The outskirts of the metropolitan region and the intermediate districts were rapidly transformed into the production areas. Even in remote areas the conditions for establishing the new production areas were prepared by the local feed dealers, the farmers and also the Shoshas. Consequently, Miyazaki and Kagoshima prefectures appeared among the top 10 of the shipment in 1970, while the contribution relative proportion of the production areas in the metropolitan environs decreased.

In the broiler industry, which had been led by the non-agricultural capitals up to this time, the related Nokyos (Agricultural cooperatives) came to join by request from the local farmers, and they set up the broiler houses and the processing factories. MAF (Ministry of Agriculture and Forestry), from 1962 to 1968, practiced the subsidiary project on the chicken shipment rationalization promotion facility foundation, and the broiler processing factories were built by twenty seven Keizai-Ren, by nine special Nokyos and by three synthetic Nokyos. The broiler processing factories were located mainly in the outskirts of the metropolitan areas from Kanto to Kinki. Along with this movement, the comprehensive facility fund system started in 1968 to promote further development of the broiler industry. From 1969, MAF practiced the subsidiary project on chicken treatment and processing, and distribution rationalization promotion facility foundation until 1973,

and the processing factories were set up, expanded, and rebuilt by Keizai-Ren in fifteen prefectures, by fourteen special Nokyos and by three synthetic Nokyos. Especially Kyushu and Tohoku districts occupied the half of the newly established facilities, and this accelerated production in remote regions. In 1970, the standard for the frozen chicken meat was laid down, and this promoted distribution of the cut up meat.

Under these circumstances, the shipment of broilers showed a great increase from one hundred million of 1965 to 3 hundred million of 1970. The shipment per household also increased from 5 thousand to 15 thousand. On the other hand, the number of raising farms in the whole country showed declining tendency owing to withdrawal of the small raising farms in the metropolitan surroundings. The stratum differentiation proceeded through shifting of the raising to the principal or the specialized farms (Table 3). The floor feeding method occupied 49 % in the whole country, which had been spreading with enlargement of the raising scale and which reduced labor exceeded the cage and the battery type method in 1970 for the first time.

Next, Table 4 shows the trend in the broiler production region in terms of the gross broiler production.^a It is shown that many production areas were located in mountains and hills of the metropolitan vicinities, and that the production areas tended to be in the western Japan except for the production area of Kobayashi. Kobayashi Poultry Cooperative affiliated with Nippon Formula Feed MFG Co., Ltd. in 1965 and set up the first processing factories in Kobayashi in Miyazaki prefecture. Further, it shows the situation of the broiler distribution. The main characteristics reflecting the regional consumption difference (see Table 2) are: (1) a large distribution volume in the western Japan where orientation to the chicken meat had been historically prominent. (2) the distribution pattern could be characterized by the neighboring

Table 3 Size of broiler farms for marketing in selected prefectures, 1970

Main production prefectures	The number of broiler farms for marketing	0 ~	5000	10000	30000	50000	100000
		birds (%)	birds (%)	birds (%)	birds (%)	birds (%)	birds (%)
Advanced production areas	Hyogo	22.8	23.6	39.2	9.1	4.0	1.3
	Shizuoka	9.6	23.4	45.9	13.7	5.2	2.2
	Ibaraki	39.4	25.9	28.2	4.1	2.0	0.4
New production areas	Kagoshima	70.5	15.7	9.2	3.2	1.1	0.3
	Miyazaki	57.8	16.8	17.9	3.4	2.1	2.0
	Iwate	12.6	26.5	44.5	8.2	6.0	2.2

Source: Census of livestock products.

Table 4 The 20 biggest municipalities in gross broiler production, 1968

Rank	Broiler production area	Prefecture	Gross broiler production (million yen)	The ratio of gross broiler production in gross agricultural production (%)
1	Hidaka-Cho	Hyogo	708	33.1
2	Waki-Cho	Tokushima	703	35.1
3	Ogaki-Shi	Gifu	561	13.3
4	Mima-Cho	Tokushima	519	35.4
5	Miyama-Cho	Gifu	451	47.0
6	Yabu-Cho	Hyogo	409	37.1
7	Izushi-Cho	Hyogo	404	28.4
8	Yasato-Machi	Ibaraki	342	7.1
9	Imaichi-Shi	Tochigi	330	10.0
10	Nawa-Cho	Tottori	325	23.6
11	Awa-Cho	Tokushima	311	15.4
12	Amaki-Shi	Fukuoka	311	7.5
13	Yodoe-Cho	Tottori	279	26.7
14	Kobayashi-Shi	Miyazaki	259	7.9
15	Fujinomiya-Shi	Shizuoka	254	5.6
16	Kosei-Cho	Shiga	250	23.9
17	Tachibana-Cho	Yamaguchi	248	20.9
18	Misato-Cho	Wakayama	238	34.0
19	Tohaku-Cho	Tottori	234	13.0
20	Shirane-Machi	Yamanashi	231	12.2

Source: Statistics of net product of agriculture.

areas mainly among the production prefectures and the metropolitan cities.

A clear example in 1970 shows that the Kyushu area consumed about twice of chicken meat compared with the whole country average, and further that broiler was the top in meat consumption there. Owing to wide diffusion of the carcass distribution, consumption expanded to the cold areas as in north Japan. However, the regional difference was still existing.

To summarize the second period, along with the formation of the production areas in the metropolitan surroundings, conditions for the formation of those in remote areas were prepared, and the broiler raising territory enlarged further.⁹

3. The third period (the stage of the main production area formation)

Having been developing favorably until the beginning of the 1970's, the broiler industry was influenced directly by the first oil crisis in 1973. It caused price jumping of the formula feed and the production materials. The production cost rised, and the broiler price was forced to rise. Because of this price rise, demand for broiler was confronted with a big wall of stagnation (Figure 5). Promotion of consumption and production adjustment were urged. However, integrators proceeded to promote throughly efficiency improvement and rationalization of the production and the sale in the affiliated systems. On the other hand, producers, for the sake of survival, intended to increase their income by the enlargement of production rather than by the improvement of profit efficiency.¹⁰

The number of farms in broiler shipment classified by production scale in the main production areas in 1975 (Table 5) shows that the number of broilers had increased in both the regions contrary to reduction of the farm numbers in these regions. Especially, the scale enlargement in Kagoshima prefecture was distinctive. Generally, in comparison with the advanced production areas, increase in the broiler number was remarkable in the remote areas, where the shipment per farm was two times or three times of the whole country avarage (35 thousand). As the contract production which operates in a large scale rapidly developed in this way in the remote areas, a large volume of broiler from these areas are shipped to big consumption territories. The wholesalers holding big stocks coped with this situation by the bargain sales regardless of prices. As a result, their price determination capacity and their regulating function on product selling opportunity had to be weekened. On the contrary, the large scale processing

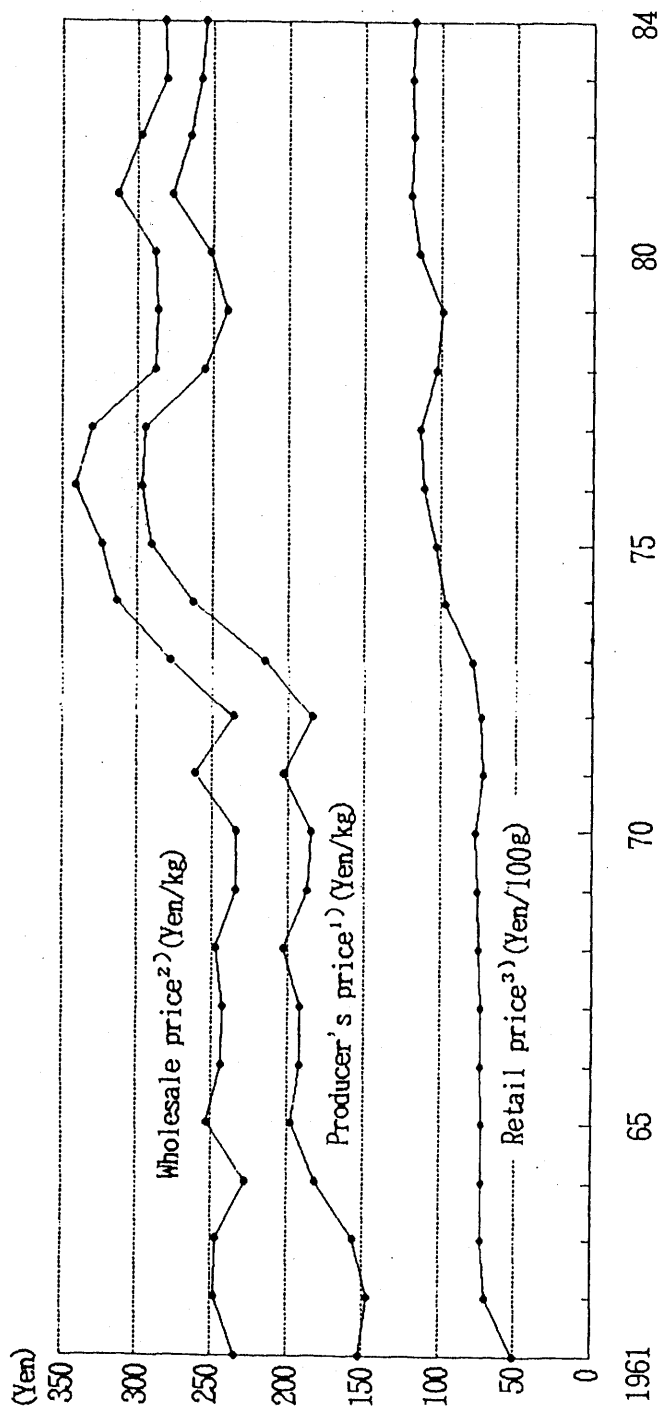


Fig. 5 Changes in broiler prices in Japan

Notes: 1) Price of layers until 1964, price of broilers after 1965

2) Carcass price of medium chicken in Tokyo market

3) Price of Tokyo market first grade until 1970, drum stick from 1971, boneless broilers after 1980

Source: Egg and broiler distribution statistics

Table 5 Size of broiler farms for marketing in selected prefectures, 1975

Main production prefectures	The number of broiler farms for marketing	0 ~ 5000	5000 ~	10000 ~	30000 ~	50000 ~	100000 ~
		birds (%)	birds (%)	birds (%)	birds (%)	birds (%)	birds (%)
Advanced production areas	Hyogo	11.7	13.4	43.6	17.8	9.0	4.5
	Shizuoka	9.5	11.3	33.3	19.1	19.1	7.7
	Ibaraki	24.3	29.9	34.4	6.3	4.5	0.6
New production areas	Kagoshima	1.9	7.2	27.4	10.9	33.3	19.3
	Miyazaki	9.1	8.6	22.9	13.4	34.2	11.8
	Iwate	5.4	9.5	26.2	17.0	24.3	17.6

Source: Census of livestock products.

factories in the remote areas gained power as the local integrators.¹¹ At this time, while the small scale processing factories dealing less than 500 thousand broilers in a year had diminished tremendously, the big scale ones dealing more than one million broilers had doubly increased in number, and they occupied 62 % of the processing number. In the background of this movement, there were a few factors besides an attempt to stabilize the processing in the broiler production. They were: (1) response to enlargement in the scale of the number of the affiliated farms through preparation of the broiler production houses. (2) necessity for securing a certain number of broilers for large-sized truck transportation in an age of cut-up meat distribution.

Next, with the diffusion of chilled broiler, freezing facilities had been equipped to wholesalers in consumption areas and to transport cars since 1973.

Regional differentiation in the product forms started with the increasing demand from mass salers in big cities and restaurant businesses. While cut-up meat such as boneless meat and bone in meat became the leading goods in remote areas, meat such as carcass and meat without the internal organs were produced and sold for their freshness in the metropolitan surroundings. Besides the consumption style, the regional difference was seen in the consumption volume (see Table 2).

With a increasing distance between the production and the consumption areas, the distribution distance also extended. The broiler price had fallen down by 1975 to the half of beef and to 70 % of pork. Broiler had taken root as a popular meat, and its consumption volume had more than doubled in these ten years. In the west of the Kinki district, however, consumption was twice to three times larger than in the Hokuriku and the Tohoku districts. Especially in Kyushu, it was close to double the whole country average. Kinki district had other regional features that people bought chicken meat at the highest price

in the whole country.

In contrast with the orientation to large scale raising in remote production areas, a number of small-to-medium-sized processing factories in the advanced production regions suffered from a low price. They confronted difficulties in maintaining the guaranteed price to the affiliated farms, which suffered from worsen management, and which began to change or quit from their trades. The situation influenced the affiliated raising farmers, and the farms of small raising scale were forced to quit, except for the specializing ones. As a result, the broiler production declined in the metropolitan regions in south Kanto and Kinki areas. On the other hand, it showed a distinctive growth in the two prefectures of Kyushu and in Iwate prefecture. These areas gradually established thier position as the production regions, and the three prefectures came to occupy 27 % of the total number of broilers in the whole country (Figure 6)¹². The real state of shift of the broiler production region is represented in the gross broiler production clearly (Table 6). The gross broiler production was almost occupied by main production regions in the three prefectures except for those at Hidaka town and Yabu town in the Tajima district and at Mima town and Waki town in the upper part of the Yoshino River in Tokushima prefecture. These districts did not have competitive relationship with other agricultural and cattle breeding sectors, but they had changed their management from sericulture and leaf tobacco to the livestock industry. In addition, the ratio of the gross broiler production to the agricultural ones and the sum of the broiler production were rapidly increasing in these regions indicating production region shift as well. Several processing factories proceeded into the regions shown in the Table 6. They affiliated many raising farms under their system. They played a role in fixing the broiler industry in these regions through the utilization of competitive relationship among the integrators, the

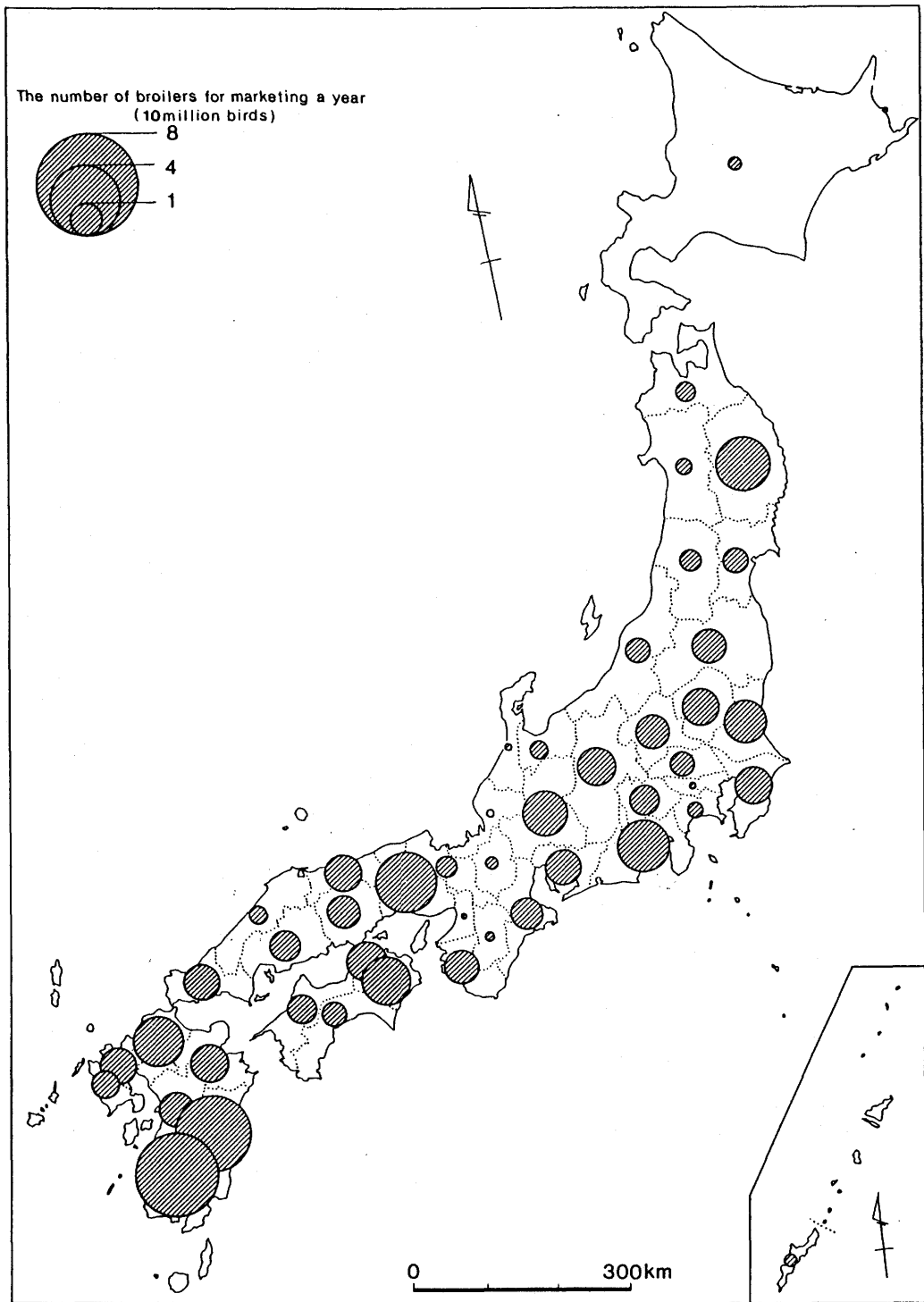


Fig. 6 Distribution of the number of broilers for marketing by prefectures, 1975

Data source : Census of livestock products

Table 6 The 20 biggest municipalities in gross broiler production, 1975

Rank	Broiler production area	Prefecture	Gross broiler production (million yen)	The ratio of gross broiler production in gross agricultural production(%)
1	Osaki-Cho	Kagoshima	5,730	57.4
2	Kawaminami-Cho	Miyazaki	3,337	23.5
3	Hyuga-Shi	Miyazaki	3,125	49.7
4	Miyakonojo-Shi	Miyazaki	2,961	13.6
5	Takanabe-Cho	Miyazaki	2,751	40.4
6	Hidaka-Cho	Hyogo	2,419	54.9
7	Tsuno-Cho	Miyazaki	2,347	37.3
8	Mima-Cho	Tokushima	2,283	50.6
9	Waki-Cho	Tokushima	2,263	43.3
10	Kagoshima-Shi	Kagoshima	2,219	26.5
11	Ninohe-Shi	Iwate	1,938	25.1
12	Yabu-Cho	Hyogo	1,820	54.6
13	Kokubu-Shi	Kagoshima	1,596	31.9
14	Iriki-Cho	Kagoshima	1,573	57.5
15	Chiran-Cho	Kagoshima	1,468	15.8
16	Sumita-Cho	Iwate	1,410	42.8
17	Kunohe-Mura	Iwate	1,371	29.7
18	Chiba-Shi	Chiba	1,330	10.8
19	Izushi-Cho	Hyogo	1,309	44.4
20	Izumi-Shi	Kagoshima	1,294	13.9

Source: Statistics of net product of agriculture.

Shosha affiliations and the Nokyo systems.

In regard to broiler houses of the farms, the open type of floor feeding broiler houses was prevailing in the advanced production regions and the warm areas in remote areas, and the windowless broiler houses were generally spread in cold areas because of feed efficiency. However, with the enlargement of raising scale and for the measures to the animal waste pollution, the farms were converting the broiler houses to the windowless ones in the advanced production regions in general. Further, for the purposes of labor efficiency with scale enlargement and chicken disease prevention, the all-in and all-out method in which coming of chicken and shipment of live birds occurred at every raising farms was taking root. As far as the facilities concerned, the specialized farms have been intending expansion of accessory facilities such as the automatic hopper and the automatic waterer. Especially, perfect automation of the broiler house had been spread in the advanced production regions such as Hyogo prefecture and the Tokai area. For the measures to the pollution, removal of the broiler houses in the advanced production region and preparation of a large scale broiler production house were particularly observed in south Kyushu.

This trend led the broiler production houses and the large scale specializing farms to introduce the hot air dryers for broiler litter treatment. Sale of broiler litter increased, but the non-specializing farms disposed it either by themselves or by offering the extra to neighbors for nothing.¹³ Besides the ratio of specializing farms gaining above 70 % of their income by broiler amounted up to 47 %. Regionally, Hyogo and Kagoshima prefectures reached 79 %, and the three prefectures, i.e. Miyazaki, Aomori and Okayama, exceeded 70 %.

To summarize the third period, development of the broiler production regions in remote areas and stagnation of those in the metropolitan surroundings took place. Advantages of the good access to the

metropolitan cities disapeared, and the remote areas made a large volume distribution possible, owing to their low production cost, high motivation, less working opportunity and improvement of transportation networks. It was an age of production area shift as exemplified by the formation of the specific broiler production territories.

4. The fourth period (the fixation stage of the main production area)

In Iwate prefecture, the last joiner in the new production areas, raisers made an effort to overcome the environmental conditions of broiler raising in the cold place. Then they made technical development in improvement of the feed efficiency in the open type broiler house, and this gave the results comparable to those in the windowless house which required facilities of high cost. They succeeded thereby in reduction of the production investment. In addition, competition originated in production by participation of the processing factories under the Shosha affiliation and the Nokyo systems. From these factors and being sustained by strong motivation of the raising farmers, majority of the producers came to ship more than 100 thousand broilers in a year. This area thus became the region that accomplished the highest growth rate in the whole country. In the background of that opening of the Tohoku Expressway down to Morioka at the end of 1978 reduced the transport time by 4 hours. Thus they could supply the broiler produced in the north of Iwate prefecture to the markets in Tokyo in 8 hours. The feed base at the Hachinohe Port started its operation in 1982. These situations further enhanced the marketing strength of Iwate prefecture in broiler production.

On the other hand, in the two prefectures of south Kyushu, Keizai-Ren and the special agricultural cooperatives prepared large scale production houses and processing factories in various parts. They led the existing regional orientation to the livestock industry to the broiler production. Shoshas adopted the contract production system as well as their owned production one to enlarge the production scale. Consequently, the production regions expanded, and some areas became so overcrowded to make worsened raising environment. In these two

prefectures, they came to form the areal connection and the blood relationship as the bases of production, and strengthened management by the successors. Thus they completed the rigid integration system, and they established their positions as the main production regions.

When the 1980's started, the formula feed price was cut down owing to the good harvest in abroad and the increasing appreciation of yen. In this connection, both the broiler production price and its wholesale market price were cut down. However the retail price was kept frozen, because: (a) the purchase volume differed in different cut-up parts, (b) the wages of the operators rose, and (c) the distribution margins went up. Now the broiler industry was confronted with a new aspect which might threaten its existence.

However, the new production areas in the north and south three prefectures expanded their share of broiler sales to the metropolitan markets, and thereby gained enhanced strength in the market competition, resulting in the continuing increase of their raising numbers. On the contrary, the conditions were different for the broiler raising farms and the processing factories in Hyogo, Shizuoka, Ibaraki and Gifu prefectures of the advanced production areas. They fell behind in reduction of the production cost and in rationalization step to the product shipment, and could not stop outflow of the agricultural successors to big cities, thus leaving seniors to engage in operation of raising. Moreover, reduction in the tax of chicken and rising yen effect were brought about a great increase of the imported chicken meat, which began to compete severely with the domestic products. The structural surplus production was accordingly proceeding in the broiler industry in a new age of the real international competition. The broiler import was liberalized in 1960, and the 20 thousand tons of chicken were imported annually until the middle of the 1970's. Afterwards, corresponding to the expansion of the restaurant industry and demand for

the foreign broilers, it reached to the level of 100 thousand tons in 1982, and it occupied 8 % of the domestic distribution volume (see Figure 3). The U.S.A. and Thailand, in particular, accounted for a large proportion of imported chicken. Legmeat was from the former, and the more processed boneless meat was from the latter. Imported meat was shipped to the restaurant industry and to the mass sale stores for the purposes of fry and grilled chicken. Thus, with the fixation of the main production regions in remote areas and the decline of those in the metropolitan environs, the percentage of broiler shipment by the main three production regions in 1985 reached to 40 % and that of Hyogo, Shizuoka and Gifu which had been ranked as the top 3 in the 1960's declined to 9 % (Figure 7). The gross broiler production in the cities, towns and villages in the three main production regions showed their large shares in the total production, they occupied determined positions (Table 7). On the other hand, cities, towns and villages in the metropolitan environs had disappeared completely from the higher ranks, and only three towns of Tokushima and Tottori prefectures located in the intermediate districts remained in the ranking.

The number of broiler shipping farms classified by scale in the main production regions in 1985 (Table 8) shows that only broiler farms increased in Iwate prefecture, in this area the shipment number per farm became the largest also, and that south Kyushu followed it. These new production regions were favored by the employment labor, and were proceeding toward the regions of the broiler production enterprises which intended to a modernized management with the automated broiler houses.

Cut-up meat distribution exceeded that of carcass and meat without the internal organs in 1979, and orientation to cut-up meat accelerated afterwards. The competition with the foreign product was getting more severe accordingly. To cope with this situation, the production regions

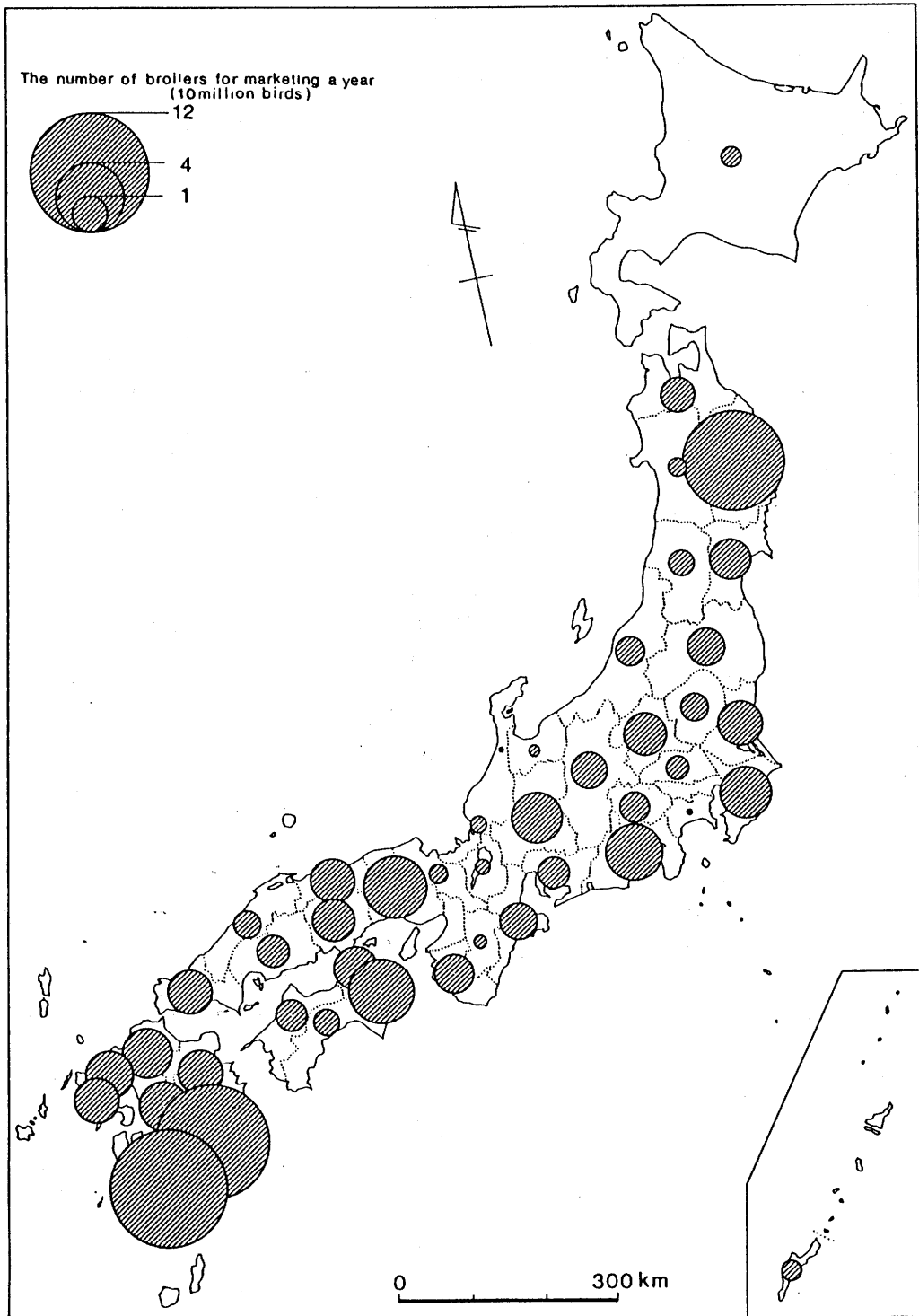


Fig. 7 Distribution of the number of broilers for marketing by prefectures, 1985

Data source: Census of livestock products

Table 7 The 20 biggest municipalities in gross broiler production, 1985

Rank	Broiler production area	Prefecture	Gross broiler production (million yen)	The ratio of gross broiler production in gross agricultural production(%)
1	Osaki-Cho	Kagoshima	9,936	51.6
2	Kunohe-Mura	Iwate	8,277	64.5
3	Miyakonojo-Shi	Miyazaki	7,652	22.5
4	Kawaminami-Cho	Miyazaki	6,553	23.0
5	Tarumi-Shi	Kagoshima	6,364	47.8
6	Tsuno-Cho	Miyazaki	6,083	49.3
7	Hyuga-Shi	Miyazaki	5,375	58.8
8	Ninohe-Shi	Iwate	5,145	40.3
9	Karumai-Machi	Iwate	4,902	45.0
10	Togo-Cho	Miyazaki	4,463	73.1
11	Takanabe-Cho	Miyazaki	4,261	38.0
12	Izumi-Shi	Kagoshima	3,372	23.1
13	Kokubu-Shi	Kagoshima	3,344	49.6
14	Waki-Cho	Tokushima	3,284	47.2
15	Takajo-Cho	Miyazaki	3,269	33.7
16	Tohaku-Cho	Tottori	3,222	30.9
17	Mima-Cho	Tokushima	3,151	55.0
18	Takasaki-Cho	Miyazaki	3,040	29.1
19	Chiran-Cho	Kagoshima	2,696	19.5
20	Iriki-Cho	Kagoshima	2,624	68.1

Source: Statistics of net product of agriculture.

Table 8 Size of broiler farms for marketing in selected prefectures, 1985

Main production prefectures	The number of broiler farms for marketing	0~	10000	30000	50000	100000	300000
		birds (%)	birds (%)	birds (%)	birds (%)	birds (%)	birds (%)
Advanced production areas	Hyogo	16.8	22.8	18.7	20.6	17.0	4.1
	Shizuoka	14.6	21.8	16.2	24.0	21.1	2.3
	Ibaraki	18.0	33.3	18.0	16.1	13.5	1.1
New production areas	Kagoshima	2.8	6.4	5.5	27.2	55.8	2.3
	Miyazaki	0.4	5.3	7.3	31.4	54.7	0.9
	Iwate	2.3	5.8	7.9	16.0	55.0	13.0

Source: Census of livestock products.

in south Kyushu further strengthened the control on the large markets in Tokyo, Osaka, Fukuoka and Nagoya etc, and fixed firmly the selling networks which they had already established. In the production regions of Iwate prefecture, being behind those of south Kyushu in competition in the metropolitan markets, they laid emphasis on the shipment to Hokkaido and Tohoku areas where market expansion would be expected, and they advanced to the secondary products such as the prepared frozen food. In the production areas neighboring to the metropolitan cities, integrators tried to seek selling routes in the metropolitan vicinities, began to raise the big broilers with high finishing ratio to or intended to increase the number of broilers raised all the year round by the rotation of the broiler houses without changing other conditions.

The number of processing factories in the whole country was reduced to 608 by 1985, the lowest figure up to this time. The medium-to-large scale factories processing more than 500 thousand broilers per year reached 46 % of all factories, and large plants treating more than 3 million broilers numbered 61 which corresponded to 10 % of all the factories. The large scale processing factories treating more than 10 thousand broilers per day numbered 79 of 50 companies (Figure 8). These large scale factories were concentrated mainly in the three main production regions, and were also distributed in the production regions in the vicinities of big cities such as the west of Gunma prefecture, Shizuoka prefecture, Tajima area and east Shikoku. In the three metropolitan surroundings, however, only three large scale factories existed. Naturally, there was no large scale processing plant in Hokkaido and in the Japan Sea coast, where the broiler raising farms were few. Further, the farmer capitals owned seven companies and 10 factories, Keizai-Ren and the agricultural cooperatives did 14 companies and 24 factories, the local merchant capitals did 13 and 19,

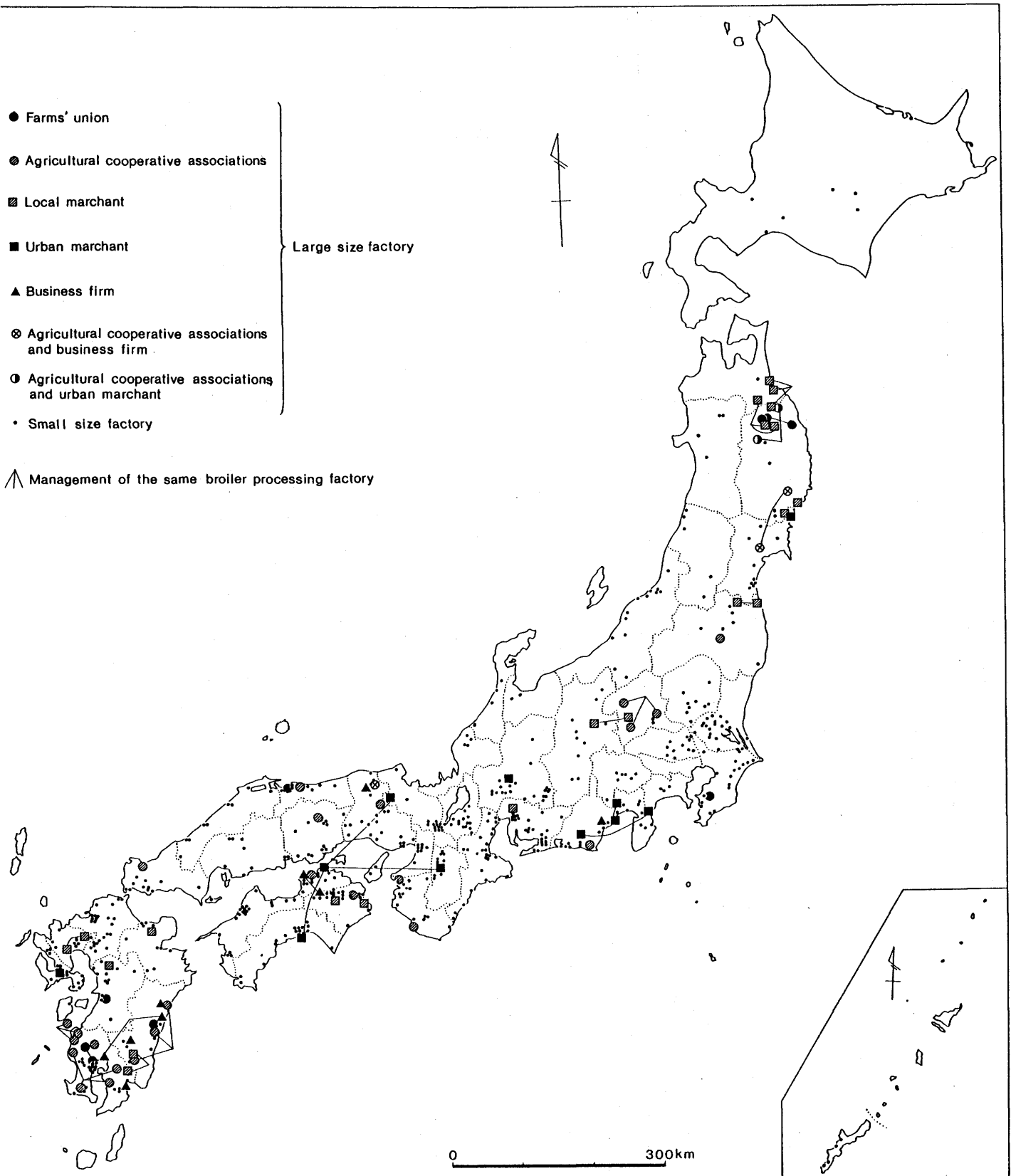


Fig. 8 Location of the broiler processing factory, 1985

Data sources: The July 30, 1986, issue of "The Zenkoku Shokuchō Shinbun"
 The author's field survey

the urban merchant capitals did 7 and 12, Shoshas did 7 and 9, and the joint ventures did 3 and 5.

As for the opening time of the processing factory, 19 companies opened in the first period, 25 did in the second period, 5 did in the third period, and one did in the fourth period. Namely, nearly all the factories started their operation in the first half of the 1970's. As for the processing volume, the large factories were particularly distributed in south Kyushu and in Tohoku areas. Besides the regional difference in processing, regional difference in the capital forms was not clearly seen. Many of these factories owned their direct farms or hatcheries. They further proceeded to play a role as the foods industry which integrated the sectors from the wholesaler and the direct sale store to the restaurant, that is to say, from the production and the processing to the selling.

As for the broiler consumption, it hit the peak mainly in the metropolitan regions in the latter half of the 1970's. The consumption, however, trended toward the cut-up meat, and it expanded in volume in other areas. In Tohoku and Hokuriku areas where the consumption level had been particularly low, the broiler consumption increased prominently, and Hokkaido also showed a marked increase. The broiler consumption thereby was coming to a similar level in the whole country (see Table 2).

To summarize, the main production regions were established in the fourth period. At the same time, the competitive relationship with the foreign product was further deepened. In the metropolitan surroundings, in particular, the processing factories were rapidly united for their existence or closed, and the raising farmers also proceeded to change or to close their trades. Thus the these production regions was declined.

5. Selection of the study areas

Results of the investigation on the processes of the regional development in the broiler industry of Japan has disclosed that the formation of the broiler production area can be observed in the environs of the metropolitan regions, in the remote areas and in the intermediate districts (Table 9). The broiler raising areas with the smallest number of broiler raising farms are scattered in the environs of the metropolitan regions. Only two production areas exist in the intermediate districts. On the contrary, the production areas in the remote areas are concentrated in the three prefectures, i.e. Iwate, Miyazaki and Kagoshima. One may observe that these three prefectures are forming the main production areas of the broiler industry in Japan.

In determining the production areas to be studied, the selection of the two types with different formation periods, the advanced and the new production areas, should be appropriate. Then, the following conditions were to be satisfied in the selected regions: (1) the locations with different environment, (2) even distribution of the broiler raising farms, (3) broiler raising farms distributed in a limited area and (4) continuation of a production area for a certain period.

Thus, in the case of the advanced production areas, i.e. the region in the environs of a metropolitan region, the two districts from western and eastern Japan, respectively were chosen. Actually, Tajima district in Hyogo prefecture and Fuji district in Shizuoka district were chosen, because they appeared to be most satisfactory in requirements. The broiler industry in the Tajima district, which was born for the first time in western Japan, has been standing at a high position in the agriculture of the district up to the present. In the latter, the development of the broiler industry has been promoted since the early

Table 9 Regional types of main broiler production areas in Japan, 1985

Areal patterns	Main production areas (Core areas) As for the core areas, Place name---Shi (City), No underline---Machi or Cho (Town), · mark---Mura (Village)	Climatic environment ¹⁾	Landform ²⁾	Land use ³⁾		Structure of employment ⁴⁾	No. of broiler farms for marketing	No. of broilers for marketing a year (1000 birds)	The ratio of gross broiler production in gross agricultural production	
				Paddy field	Upland field					
Metropolitan areas and their outskirts	Tajima (Hidaka, Yabu)	cold	H	○		△	76	4,725	48.5 %	
	Kasama (Yasato)	cool	L	○		○	41	1,298	7.5	
	Nikko (Imaichi)	cool	H	○		△	13	286	8.9	
	Chuno (Miyama)	cool	H	○		×	15	808	37.1	
	Fuji (Fujinomiya)	warm	H		△		×	21	1,594	10.1
	Kihoku (Misato)	warm	H		△		○	18	958	31.9
	Kita-chikugo (Amaki)	warm	L	○		○	26	970	6.2	
Transitional areas	West of Tottori (Tohaku, Nawa)	cool	L	○	△	○	55	5,911	29.6	
	Upper part of the Yoshino River (Waki, Mima)	cool	H	○		○	244	6,417	50.7	
Remote areas	North of Iwate (Ninohe, karumai, · Kunohe)	cold	H	△	△	○	91	12,044	50.2	
	Southeast of Iwate (Sumita, Ofunato)	cool	H	○	△	○	36	6,064	43.8	
	Koyu (Takanabe, Tsuno, Togo, Kawaminami, Hyuga)	warm	L	△	△	○	264	30,152	39.7	
	Morokata (Miyakonojo, Kobayashi, Takasaki, Takajo)	warm	H	△	○	○	171	17,203	22.2	
	Osumi (Osaki, Tarumi)	warm	L		○	○	11	1,186	50.0	
	Aira (Kokubu)	warm	L	○		△	8	706	49.6	
	Izumi (Izumi)	warm	L	○		△	32	2,872	23.1	
	Satsuma (Iriki)	warm	L	○		○	23	2,980	68.1	
	Ibusuki (Chiran)	warm	H		○	△	37	4,078	19.5	

Notes; 1) The average temperature of the coldest month less than 0° is defined to be "cold", less than 5° to be "cool" and more than 5° to be "warm".

2) The high less than 100m is defined to "lowland" and less than 500m to "hill".

3) ○: more than 50% of cultivated acreage, △: more than 30% of cultivated acreage.

4) ○: the population rate of the primary industry to be more than 20%.

△: to be more than 10%, ×: to be less than 10%.

Sources: General surveys of competent community, Agricultural census, Statistics of net product of agriculture and Topographical maps.

period, particularly in the specific village, and it holds the largest number of the broilers being shipped through a year in eastern Japan.

Among the new production areas located in the remote areas, Iwate prefecture and south Kyushu were selected first. From the former, northern district of Iwate holding the highest raising density in the prefecture was selected. And from the latter, Koyu district of Miyazaki prefecture holding the highest density of the broiler raising farms was chosen.

Further, the detailed studies of the regional characteristics of the broiler industry was carried out on the core areas in the four production areas: Hidaka town in Tajima district, Kitayama area in Fujinomiya city, Ninohe city in northern district of Iwate prefecture and Takanabe town in Koyu district of Miyazaki prefecture.

Notes

- 1) The retail chicken price fell below that of beef in 1962 and pork in 1966.
- 2) This district has been the traditional production area of the Joshi egg. The buyers in the villages used to collect culled layer chicken and ship it to Toriichi Co. Thus the shipment route had been established from old times. (Usui and Yoshida, 1965, pp.23~25.)
- 3) It was a contract raising system called "Gunma method", but it was abandoned as a result of the Broiler Price Stabilization Fund which started in 1971. Zen-Noh (National federation of agricultural cooperative associations) and Toriichi Co. joined in 1972, and management of the processing factory was thereby transferred to Zen-Noh & Toriichi Co.,Ltd. In addition, Keizai-Ren of Gunma prefecture established the processing factories with treating capacity of 10 thousand broilers per day by themselves in Tomioka city (in 1965), in Agatsuma town (in 1970) and in Kasakake village (in 1972). (Interview at the head office of Zen-Noh & Toriichi Co.,Ltd..)
- 4) Usui and Yoshida, 1965, p.70.
- 5) Marubeni Co.,Ltd. established Minami Kyushu Food Products Co.,Ltd. at Tsuno town in Miyazaki prefecture in 1967. Mitsubishi Corporation set up Nihon Broiler Corporation at Hyuga city in 1968, and next year Japan Farm Corporation at Osaki town in Kagoshima prefecture. Nissho Iwai Corporation set up Osaka Suehiro Broiler Corporation at Yoka town in Hyogo prefecture in 1969. These companies established processing factories at the same time. (Yoshoda, 1979)
- 6) In the litter treatment 54 % of farm households restored litter to cultivated farmlands, 38 % of them sold it, and the rest of them abandoned it in forests or wildernesses. (MAF, Census of livestock products-Showa 43 edition-, pp.310~311.)

- 7) Transportation vehicles were owned by 25 % of farms, but the utilization ratio of the automatic hopper, the automatic waterer and the feed tank was 7 %, 4 % and 4 % respectively. Further, use of the broiler dropping dryer was extremely low proportion of only 1 % in the whole country.
- 8) If one takes the raising number of broilers from Agricultural Census as the basis, the raising number of broilers in non-agricultural sectors including company management will be missed. Census of livestock products uses the raising number and the shipment number of broilers in each district, but there are discrepancies. Then author uses Statistics of net product of agriculture which deals the broiler sector separately from the poultry sector since 1968 in the statistical treatment.
- 9) Yamamoto and Tezuka, 1977, p.182.
- 10) Owing to the National Broiler Price Stabilization Fund which Zen-Noh established in 1970, the producer was guaranteed for a certain production price. He did not have to reduce the raising number of broilers, if the market price had fallen down seriously. At that time, the burden of 6 yen per 1 kg was shared among the producer by 3 yen, Keizai-Ren and Nokyo by 1.5 yen and Zen-Noh by 1.5 yen. The burden fee had been raised up to 10 yen till 1986, and it reached the bottom because of the sluggish market price. Accordingly this system was abandoned in 1988. In many Shosha affiliations, the processing factories and the producers still set up the broiler price stabilization funds. (Interview at Keizai-Ren of Hyogo prefecture.)
- 11) Yoshida(1987,p.188) and Okuda(1979,p.10) defined them as the enterprises, including the subsidiary company under the Shosha affiliation and the feed agency or the feed special agency, that established processing factories in production areas and conducted the vertical integration by themselves from the production in the

specific territories to the shipment.

- 12) Four carferry routes, i.e. Hyuga-Kawasaki, Kobe and Osaka and Kagoshima-Osaka, entered service in the period from 1971 to 1974. The feed base center at Kagoshima Port, in addition, started operation in 1972. In consequence, the broiler industry in south Kyushu made a rapid progress.

As for Iwate prefecture, farms had to overcome such difficulties as the reduction of rice acreage in the 1970's, the diminishing employment opportunity by economic depression and the reduction in income of them. They, consequently, took up the livestock industry promotion as their regional policy, and the broiler raising diffused mainly in north region of the prefecture. (Nagasaka, 1983, pp.66 ~70, *ibid.*, 1988a, pp.242~245.)

- 13) MAF, Census of livestock products (Showa 52 edition).
- 14) Japanese Shoshas advanced to Thailand in order to carry out the development and import of corn in about the 1970's. This triggered settlement of the joint ventures on the broiler industry there from 1976, and the export to Japan started. (Sugiyama, 1986, pp.37~39.)
- 15) The volume of 10 thousand broilers treated in a day amounts to filling almost a 10 tons truck. This is considered to be a measure for the minimum processing plant scale. The factory with capacity less than this usually ships to neighboring consumption markets. (Interviews at Japanese Broiler Science Association and at various processing factories.)

PRODUCTION AREA FORMATION OF BROILER INDUSTRY
IN METROPOLITAN AREAS AND THEIR OUTSKIRTS

1. Production area formation of the broiler industry at Tajima
district in Hyogo prefecture

Tajima district (one city and 18 towns) is located in the metropolitan outskirts or at a distance of 100 km from Osaka city (Figure 9). This district may be characterized by the following three statements.

(1) A number of integrators proceeded into this territory from the 1960's to develop the broiler industry, and many raising farms accepted broiler as a key and regional industrial sector.

(2) It was the largest broiler production area in Japan until the beginning of the 1970's. Afterwards and up to now it has been still the largest among the production areas that are locating in the metropolitan regions and their outskirts.

(3) The broiler industry has occupied a prominent position in the agricultural sectors of this district.

1) Development of the broiler industry

a. The stage of development of the production area

(until the first half of the 1960's)

Since the agriculture in Tajima district was performed in such a small scale that the average arable land per farm was around 50 are, farms were dependent till the 1950's on the diversified management that involved Japanese cattle, sericulture and charcoal production besides rice growing. Their living was accordingly poor, and they had to work

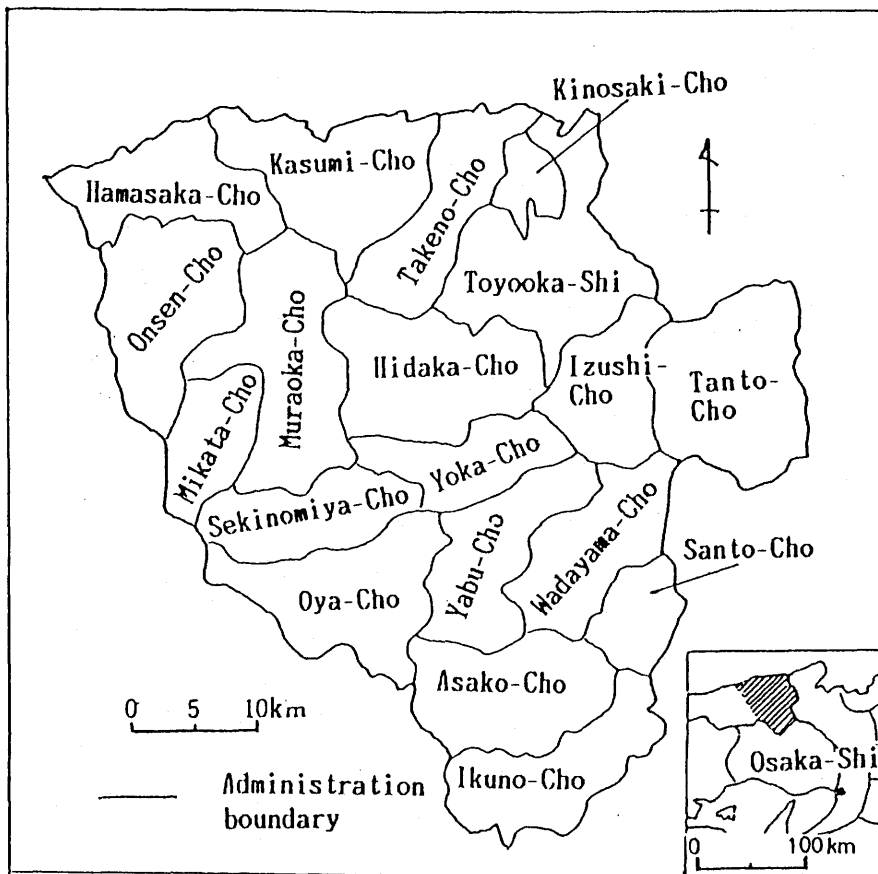


Fig. 9 Study area (Tajima district)

away from home as the sake brewers and the constructive workers in winter. Mr. Kazuo Kitamura, a farmer of Hidaka town, was advised to raise chicken by his cousin in 1954. Then he introduced male chicks of layer as breeding chicken, and he shipped the broiler to an introduced meat wholesaler in Kyoto city. This is said to be the beginning of the broiler industry¹ in Tajima district.²

Since the 1960's the walking tractor had been introduced, and the chemical fibers had widely diffused, thus resulting in drop of the prices of the Japanese cattle and the cocoons. The farmers were shocked by the decline of the cattle raising and the sericulture, and their income diminished rapidly. They did not have other profitable farm produce, and had to search after a new one of high labor efficiency. The broiler raising, which appeared to have relative advantage of profitability, was thereby adopted mainly by the small scale farms.

The farmers of the district set up at the corners of their gardens and upland fields the cage or the battery type broiler houses of three stairs. The most general case was a small scale subsidiary raising keeping around 500 broilers in one house (160~200 m²). This raising method, however, forced the raisers to stop raising in the winter season owing to the physical condition such as snowfall and coldness in the district.³ Besides, they had to reduce the raising broiler density in summer from that to prevent the broiler perosis caused by the heat and the humidity. The cage feeding method held the inherent problems. Namely, the commercial value deteriorated owing to the attachment by breast swelling, and scale enlargement in the garden was limited. The broiler raising in Tajima district, therefore, was favored neither by the natural environment nor by aspect of the facility. The district, on the other hand, had several advantages. These are the low land price and ground rent, seldom animal waste pollution problems and the access to Kei-Han-Shin (Kyoto, Osaka and Hyogo prefectures) markets.

Having taken these agricultural circumstances into consideration and convinced that the broiler production could be a profitable management sector, Kitamura set up a processing factory at Hidaka town in 1958 for the first time in Tajima district. Then he organized tens of raising farms in the north of Tajima district. He further advanced into feed dealing by himself through cooperation with San-in Nogeï Co., Ltd. in Toyooka city, a wholesaler of fertilizer and feed, pesticide and farm machines and implements. After treating Hinomaru Feed by Nihon Hikaku Co., Ltd. he ended his dependence on others. He established Hinomaru Corporation in 1963 (Figure 10). Kitamura's activity stimulated San-in Nogeï Company to advance into the broiler industry. The company made the production contract with 20 farms in Toyooka city and 10 ones in Yoka town in 1958, and opened a processing factory in Hidaka town in 1962.⁴ Moreover, Fujino Broiler Co., Ltd. that had been a rice dealer in Yabu town from the prewar and started trade with Ryowa Shiryo Co., Ltd. under the affiliation of Mitsubishi Corporation in 1951, opened a processing factory in Yabu town in 1959.

When the 1960's started, the broiler industry of Tajima district attracted attention of Shoshas and the feed capitals that were aiming enlargement of the feed trade. One after another, they came into the broiler industry through setting up feed agencies or feed special agencies. In addition, Keizai-Ren of Hyogo prefecture and Mikata Nokyo in Hidaka town advanced into this business by request from the regional Nokyo members and for the purpose of promoting regional orientation to the livestock industry. The district, in consequence, was flooded with as many as 10 processing plants in less than 10 years.

These processing factories adopted the contract production system, by which they offered to the producers the specific feed and chicks, and purchased the raised broilers from the producers. For the price condition, it was arranged to be fixed through the year.⁵ This condition

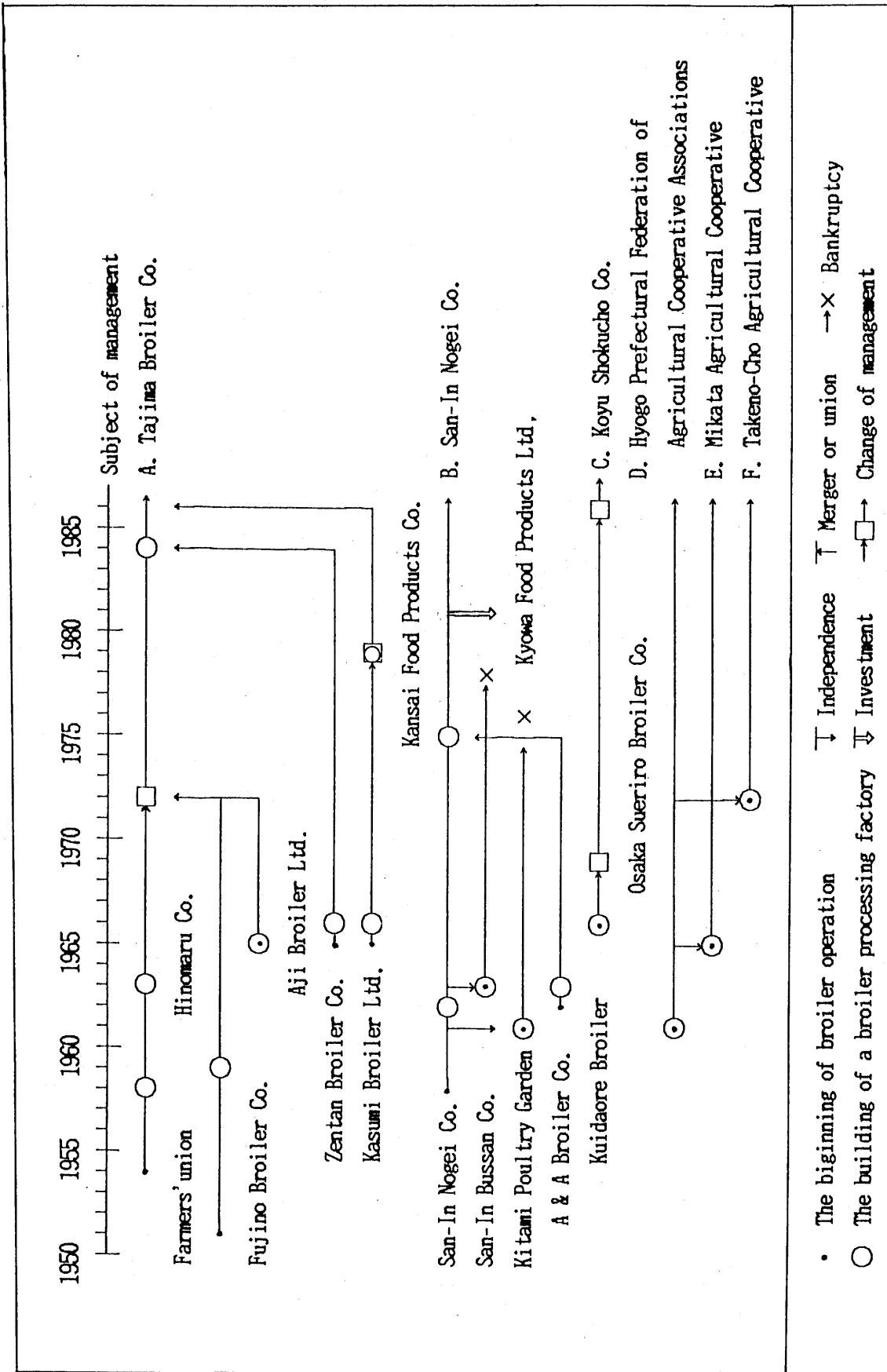


Fig. 10 Changes of broiler processing factories in Tajima district

Source: The author's field survey

had the several backgrounds:(1) the severe competition in securing producers by the crowded processing factories,(2) the purpose of promoting farm households' participation in broiler raising,(3) the farmer capitals trending to the wholesalers,(4) participation of Nokyo. The price condition accordingly gave a certain guaranteed income to the raising farms, and originated stabilization of their profit and their motivation to production. As a result, in Tajima district, the non-agricultural households came to join broiler production, thereby promoting the regional orientation to the broiler industry. The scale enlarged in 1965 to 255 households, 650 thousand raising broilers and shipment of 4 million broilers.

Accompanying the broiler production development in the district, hatcheries were opened in 11 places in the 1960's. The setting up locations concentrated mainly in the northern extremity. Namely, three companies were located in Toyooka city and Izushi town, and two were in Hidaka town where the broiler raising prevailed. The relatively large scale hatcheries, their number being several, were invested from each integrator, and held fixed dealing relationship.⁵ The rest were, on the contrary, small-to-medium-sized hatcheries which were independent from any capital affiliation.

As for broiler shipment, the majority were shipped in the carcass from mainly to the wholesalers and the big chicken dealers in Kei-Han-Shin markets, then the cut-up treatment was conducted there. From around 1963, the large scale chicken dealers holding their direct and affiliated retail salers were formed in Kyoto and Hyogo prefectures, and Osaka Prefecture Chicken Meat Marchant Cooperative Society was organized in Osaka prefecture. Thus the processing factories in Tajima district and the fixed shipping routes had been established. The broiler produced in Tajima district circulated merely through these organization routes.

b. The stage of the production area formation

(until the first half of the 1970' s)

In the latter half of the 1960' s, Osaka Suehiro Broiler Corporation opened two farms under its direct management (270 thousand raising number) and a processing factory in Yoka town. This triggered a prominent uprise of the shipment number, i.e. shipment of 94 thousand broilers per farm, which fact showed that the broiler production had grown up to the principal management. Moreover, the district government and Nokyo also promoted the regional development of the livestock industry. They encouraged the farmers to outgrow their dependence on the agronomical agriculture, and they promoted preparation of the livestock housing. As a link in the chain of Agricultural Structure Improvement Project a broiler housing was prepared at Okutakeno district of Takeno town in 1971, and 7 households moved into it. Next year, with aids of Agriculture Modernization Fund and Regional Public Racing Association, the broiler housing was also built at Izushi town, and 5 households moved into it. Further, the farms with poor own funds became able to borrow from National Loan Facilitation, and they received the guidance on the raising technique through the individual Nokyo. They participated in broiler raising, thus increasing the number of the raisers. Accordingly, the broiler raising developed tremendously, and in 1971 it reached a peak, i.e. 639 farms and 3.93 million raising broilers (65 % in Hyogo prefecture, and 9 % in the whole country)(Figure 11). The broiler industry hence came fixed in this district as a kernel agricultural sector, standing comparison with the rice growing (Figure 12). In the east of Tajima district, e.g. in the towns of Hidaka, Izushi, Yabu and Takeno, the broiler raisers were concentrated in particular. The diffusion ratio was low, on the contrary, in the mountainous west district (Figure 13). Hidaka town particularly kept the top rank from 1967 to 1972 in both the shipment number of broilers and the gross

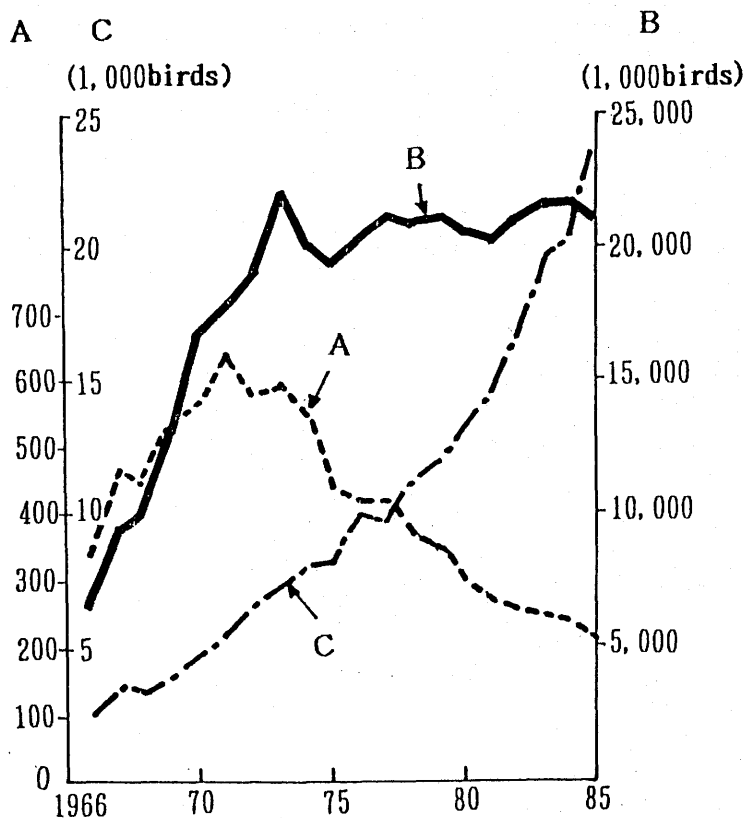


Fig. 11 Changes of broiler raising in Tajima district

Notes: A) Number of farm households raising broilers

B) Number of broilers for marketing

C) Number of raising broilers per farm household

Source: Annual report of agriculture, forestry and fishery
in Hyogo Prefecture

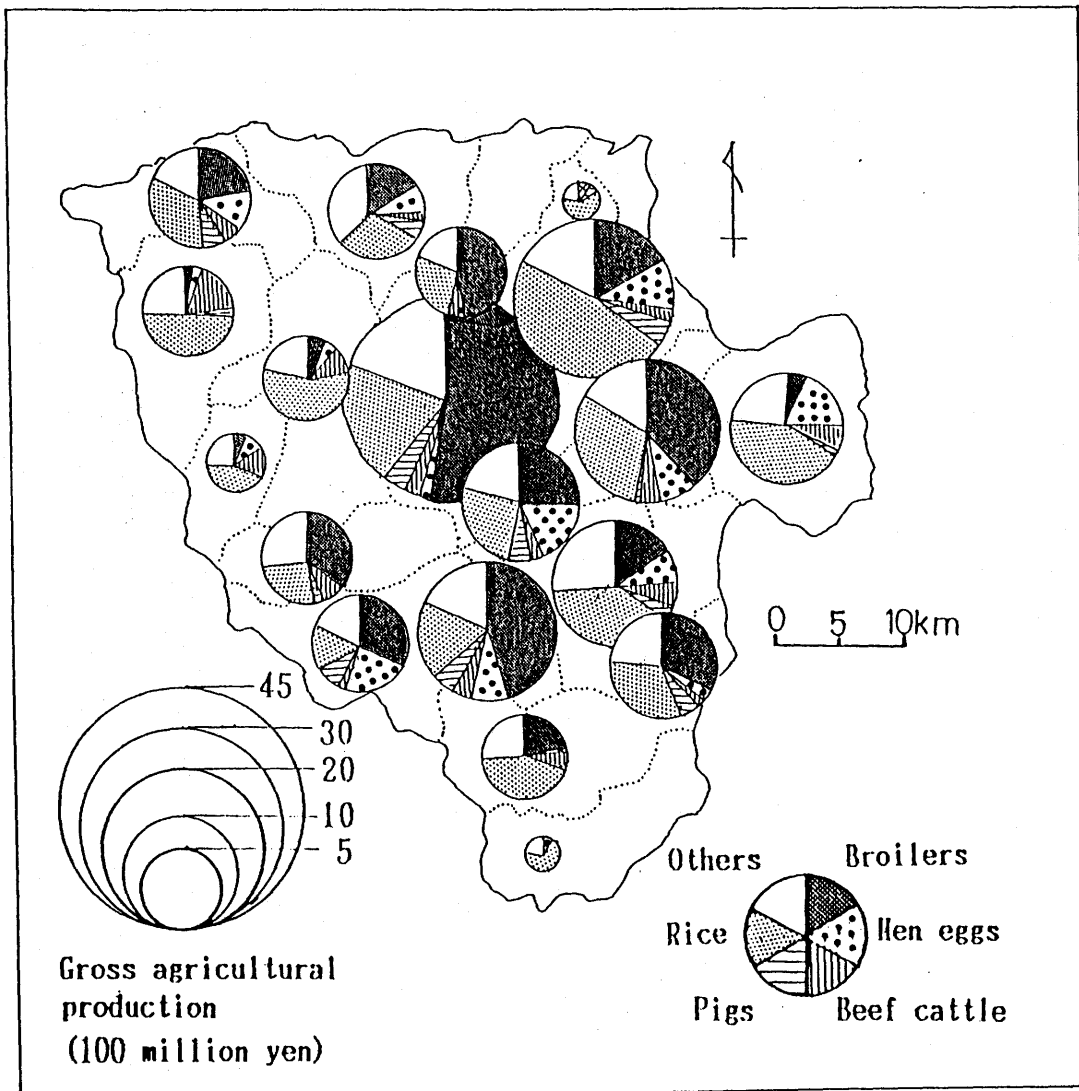


Fig. 12 Proportion of main agricultural sections by cities and towns in Tajima district, 1970

Source: Statistics of net product of agriculture

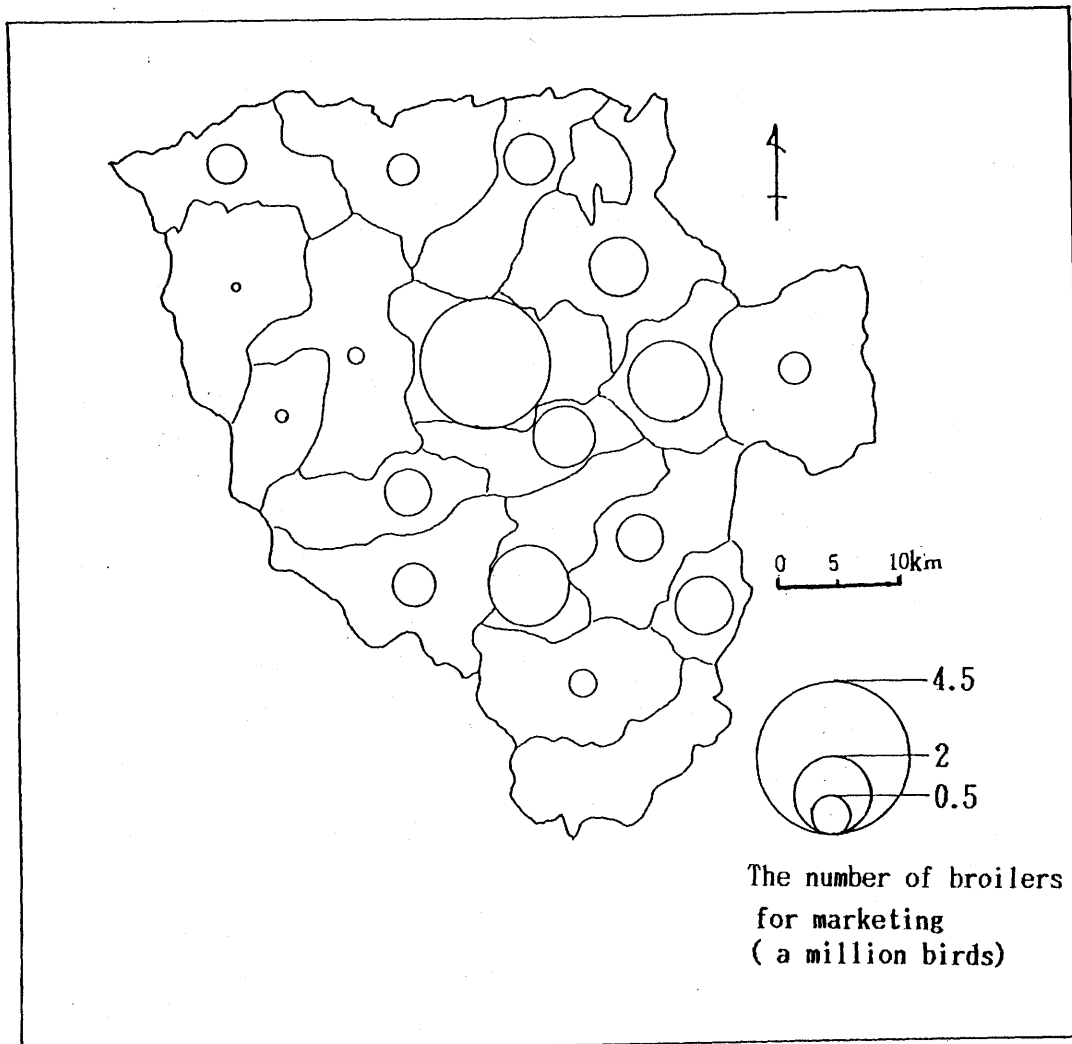


Fig. 13 The number of broilers for marketing by cities and towns in Tajima district, 1971

Source: Egg and broiler distribution statistics

broiler production among cities, towns and villages of the whole country, showing that this town had been promoting the broiler industry in Tajima district.

Development of the broiler industry in the district promoted the farms to shift their raising activity to the part-time or the specialized and further to the full-time management. Some farms came to conduct shipment of more than 100 thousand broilers, and the average shipment number household amounted to 28 thousand (the whole country average was 19 thousand). In Tajima district, however, the broiler houses stood adjacent to people's houses. Moreover, raisings were conducted in the gardens facing the main roads. The animal waste pollutions including the maldor generated by the solar drying treatment of the broiler litter and the contamination of rivers by the drain from processing factories became the serious problems in this district from the latter half of the 1960's. Hidaka town, the largest production area, was most deeply confronted with this problem.

The town authorities concerned and Hidaka and Mikata Nokyos took leadership in investigation of the measures. They studied on the windowless broiler houses which would promise a proper litter treatment and improvement of the raising environment together with scale enlargement. They also examined on feasibility of the broiler house movement through preparation of the broiler production housing. In 1970, Hidaka Organic Fertilizer Production Agriculture Cooperative Association was organized through investment by Nokyos, the processing factories and the raising farms. This plant treating the broiler litter was built in Mikata district of Hidaka town, thus changing the individual treatment in the house garden to the concentrated regional plant treatment. The dried broiler litter was sold to the farmers producing the cold upland vegetables such as cabbage and water melon mainly at Kannabe plateau and to other upland field crop farms in the neighboring cities, towns and

villages.

Further, Hidaka town office was appointed as a agriculture developing area in Japan in 1971. Then by using the subsidies of Broiler Houses Preparation Project and Regional Public Racing Association, it was started preparation of the complex livestock housing including the broiler as its core at a corner of the town forest in the north of town. The housing furnished with a cowshed for 29 heads, 19 broiler houses with a unit capacity of 5 thousand, a feed storing tank and a manure treating plant was completed in 1974,⁷ and the tenant movement started. The building site possessed farms, and was destined a pastoral housing covered with grass. In consequence, 4 broiler raising farms and one dairy farm were chosen finally. The windowless broiler house adopted in the housing was equipped with the floor heating system for the winter season, thus being pioneering in this district. The raisers in the northern extremity thereby proceeded to transformation to the floor feeding broiler house corresponding to both scale up of the raising number and control of the pollution. This improvement in the raising form would promise them the stabilized raising management, high density raising and a rise in labor efficiency.

Meanwhile, owing to uprise of the new production areas, rationalization of the flooded processing factories became unavoidable. Mr. Kitamura, the president of Hinomaru Corporation, sold his holdings to Amino Feed Corporation (present C. Itoh & Feed Co., Ltd.), following which he retreated from the broiler industry in 1969. This gave the impetus. In 1972, Amino Feed Corporation incorporated Aji Broiler Ltd. (in Takeno town) of its own affiliation and Fujino Broiler Co., Ltd. that was under Mitsubishi Corporation's affiliation and in financial difficulties, and founded Tajima Broiler Co., Ltd. The company, which occupied about 40 % of the broiler produced in Tajima district, restarted with the largest scale in Japan. It further opened a direct hatchery in Izushi town in

1966, and utilized as its direct farms⁸ three livestock farming houses in which they abandoned raising.

Unification and closing of processing factories proceeded afterwards, which situation influenced movement of hatcheries and feed plants as well. Thus, the broiler industry was reducing the regional scale in Tajima district.

c. The stage of the production area reformation

(after the latter half of the 1970's)

After the first oil crisis in 1973, the feed price and those of the production materials in general jumped up,⁹ and the production cost rose as well. The broiler price became dull since about 1975 reflecting the stage of surplus broiler production. Cut-up product extended in the broiler distribution. With these factors in the background, the product from south Kyushu and Iwate prefecture concentrated in the metropolitan markets.¹⁰ The Tajima product, having been shipped in the form of carcass to the chicken wholesalers and the specializing stores firmly connected to the district in Kei-Han-Shin markets, was getting obliged to be in a minor marketing position, because: (1) the production cost was higher than those of the new production areas,¹¹ and (2) they could not respond to the increased demand for the cut-up meat.

Owing to this situation, they could not expect high profitability as before in the district. While the full-time raising farms aiming larger profit increased in number, many farms made management reduction, and closed their trades suffering from repayment to the national loan, aging of the specializing workers and separation of the successors from farming. Thus, the bipolarization of the raising farms proceeded. In particular, the small-sized farms, about 200 in number and including the participants from non-agricultural sectors at the time of the high profitability in the broiler production in the middle of the 1960's, gave up raising, and disappeared from this business after working for a

few years of the 1970's. In Mikata district of Hidaka town, where the number of raising farms was largest at that time, Mikata Nokyo, aiming modernization of the regional agricultural management and pollution prevention, prepared two broiler production housings through getting the appointment of the Secondary Agricultural Improvement Project.¹² Inokogaki housing, construction of which started in 1977, was completed in 1979, and 8 farms entered into 16 houses. Then, Chimi housing was started in 1978, was completed in 1980, and accommodated 3 farms in 6 houses. Mikata Nokyo adopted the commission contract system, by which it took from the tenant the rent for the broiler facilities, and paid him the raising charge in turn.¹³ Four farms, however, failed in raising management owing to their unfamiliarity to the new facilities, and were forced to give up raising by the cumulated deficits after two years. The vacancies were recruited by other 4 tenants. Mikata Nokyo, corresponding to the situation, adopted a revised contract system to set the housing management to run on the line. The system was characterized by the monthly-salary system, by which expenses including repayment to the national loan were substructured from the raising charge.

On the other hand, the integrators under the Shosha affiliations, having been unable to gain profit in the processing and selling departments before the first oil crisis, they had been actually dependent on the returns from selling feed. After the jump of the feed price, the profitability range was reduced. Then, the deficits in the broiler sector could not be covered by selling feed, which also increased the cumulated deficits in turn. In consequence, rationalization and reformation of processing factories through unification and closing inevitably proceeded in the storm of the competition among the production regions (see Figure 10).

Tajima Broiler Co.,Ltd., for instance, incorporated Zentan Broiler Co.,Ltd. under the affiliation of Kyodo Shiryo Co.,Ltd. and Kansai Food

Products Co. in Hidaka town freed from the affiliation of Marubeni Co., Ltd. Further, intending modernization and enlargement of the facilities in the processing plants, Tajima Broiler Agricultural Cooperative¹⁴ was organized by the producers belonging to Tajima Broiler Co. planned a new processing plant by transferring the existing processing factory through the aid as a link in the chain of Livestock Composite Measures Project (Chicken Egg and Meat Distribution Improvement Project) enterprised by the country and Hyogo prefecture in 1983. The broiler shipment was conducted through the following four companies, and the products were sold in various ways. The four companies are: Toriharu Industry Co.,Ltd in Osaka city, the affiliated wholesaler; Amagasaki Broiler Co.,Ltd in Amagasaki city; Kyoto Hinomaru Broiler Co.,Ltd. in Kyoto city, chicken specialty store; and C.Itoh & Proma Broiler Co. in Settu city, the wholesaler. Around 60 % of the shipment was in the form of carcass, which was circulated mainly in the following manner. The specialty stores cut-up the carcass laid in pieces, and sold them to the chain stores in the cities.

San-in Nogei Co.,Ltd., corresponding to purchasing the processing factory of A & A Broiler Co.,Ltd in Yabu town which was invested by Mitsui Co., closed their existing one in Hidaka town, and conducted rebuilding and expansion of the processing factory in Yabu town in 1975. The factory gained a producing capacity of 400 thousand broilers per month which was four times larger than that of the former plant, and it was renamed as Sanki Food Products Co.,Ltd. for the purpose of its independent management. San-in Nogei advanced to unification and enlargement of the production department through acquisition of a hatchery at Oya town in 1982. The company started the development department to promote selling in 1985. It corresponded well to the consumers through realization of new products such as chicken steak and confectionery containing chicken meat. Sanki Food Products Co.,Ltd.

consequently set a ratio of 67 % on the cut-up meat in processing treatment, and shipped 90 % product to cooperative and mass sale stores in Kei-Han-Shin district through wholesalers. Further, San-in Nogeï invested a processing factory which Kyowa Food Products Ltd. had managed in Kasuga town.

Besides, Osaka Suehiro Broiler Co., advancing into this district through purchasing a processing factory, intended market expansion, and found a way out in the carcass shipment which laid emphasis on the broiler shipped in the early morning.¹⁵ This company, however, failed to respond to the varying distribution system, and it finally transferred its management privilege to Koyu Shokucho Co.,Ltd. which indicated distribution center in the Kinki district in 1986.

Keizai-Ren and Nokyos, on the other hand, meeting the simultaneous shipment from each production housing, arranged the businesses in the processing among the factories of Keizai-Ren of Hyogo prefecture and two Nokyos, thus succeeding in stabilization of the efficient factories. Around 30 % of the products from these processing factories was shipped to Zen-Noh (National federation of agricultural cooperative associations) & Toriichi Co.,Ltd., and the rest was sold directly to cooperative and retail stores in Kei-Han-Shin district. Their cut-up meat distribution had risen up to 40 %.

The cut-up meat shipment ratio of the processing factories in Tajima district, having risen up to about 42 % (the whole country average is 71 %), still kept a relatively low level, which situation was believed to be directly related to the worsening management of the factories. They had been offering carcass stably to Kei-Han-Shin markets for its freshness as a trade point, but they had been behind in responding to the cut-up product probably from the following three reasons. In the first place, the specialty store, through laying in carcass, conducting cutting-up treatment on it by the cut-up workmen and selling the

products, gained the margin. The specialty store accordingly had to hold its specialization, because the cut-up process by the processing factory might threaten its management. Secondly, the number of women as the cut-up workers was short in the Tajima district.¹⁶ Finally, the processing factories in the Tajima district, having held the fixed distribution connection with the Kei-Han-Shin markets, had not been trying to develop new markets.

As for the processing factories in the Tajima district, 12 plants operated in their highest prosperity stage, but the number of the factories operating at present has been reduced to 6 (Table 10). The existence of the hatcheries has been connected to this reorganization of the processing factories. The large scale hatcheries have proceeded to fix the capital relationship with the integrators and the receivers, and to make a long-term supply contract, thus establishing the management bases. The small-to-medium-sized hatcheries, on the contrary, have been driven to discontinuation.¹⁷

In addition, accompanying the movement of the main production regions in remote areas, closing of the formula feed plants have advanced in the metropolitan surroundings. Since the 1980's started, 7 plants have retreated from the seaside region of Hyogo prefecture, and the total of 12 plants, i.e. 7 at Kobe Port, 2 at Himeji Port and other 3, have remained through the rearrangement.¹⁸

The broiler shipment number in the Tajima district has stayed at the level of 20 million since the latter half of the 1970's. Moreover, the expansion of production (1.7 times larger) and the shipment number per farm (104 thousand broilers) of the whole country go over those of the Tajima district, which fact really reflects the decay of its regional position in the broiler production. As for the regional trend, the reduction of the raising number at Hidaka town, where the was prominently high, is remarkable, but in the towns of Yoka, Wadayama and

Table 10 Broiler processing factories and their systematization in Tajima district, 1986

No	Name of broiler processing factory	1) Year	Investors	Location	2) No. of broilers (10,000)	3) No. of processed broilers per year	Breeding type 4)		The hatchery for buying most chicks () Location	Main suppliers of formula feed	Main distributors of broilers
							Owned	Commission Contract			
A	Tajima Poultry Agri. Coop.	1984	Tajima Broiler Co. Tajima Poultry Agri. Coop.	Hidaka-Cho	1,020	56 (5)	24 %	76 %	Ichimiya Hatchery Co. (Izushi-Cho)	C. Itoh & Feed Co.	C. Itoh & Prima Bro Kyoto Hinomaru Bro
B	Sanki Food Products Co.	1975	San-In Nogei Co.	Yabu-Cho	300	26 (1)	20 %	80 %	Oya Hatchery Co. (Oya-Cho)	Marubeni Feed Nisshin Feed	Taiyo Chikusan Co. Osaka Nichirei Co.
C	Osaka Suehiro Broiler Co.	1969	Nissho Iwai Delica Foods Co. Koyu Shokuchō Co.	Yoka-Cho	360	22 (2)	28 %	72 %	Inoue Hatchery Co. (Hamasaka-Cho)	Nichiwa Industry Co.	Direct sale
D	Hyogo Prefectural Agri. Coop. Broiler Center	1961	Hyogo Prefectural Federation of Agri. Coop. Associations	Santo-Cho	260	38 (1)	10 %	90 %	Nakashimaya Hatchery Co. (Wadayama-Cho)	Kinki Kumiai Feed Co.	Zen-Noh & Toriichi Co. Direct sale
E	Mikata Agri. Coop.	1965	Mikata Agri. Coop.	Hidaka-Cho	105	8	100 %				
F	Takeno-Cho Agri. Coop.	1972	Takeno-Cho Agri. Coop.	Takeno-Cho	140	19	100 %				

Notes: The marks from A to F corresponds to that of Figure 10

1) The beginning year of operation 2) No. of processed broilers per year 3) No. of affiliated farms, () no. of directly managing farms

4) The rate to total breeding birds

Source: The author's field survey

Takeno the numbers show increasing tendency, indicating thereby an aspect of leveling off in the regional raising numbers (Figure 14).

Finally, the broiler production occupies 35 % in the gross agricultural production in comparison with 31 % of the rice occupation, indicating the top position of the broiler sector still in the Tajima district. The occupation ratio of the Tajima district in the gross broiler production of the whole country, however, has widely reduced to 3.6 % from 6.6 % in 1970, thus bringing the decline of this production region into relief.

2) The regional structure of the broiler industry

a. The regional structure of the integration system

The three processing factories under Shosha affiliations have been competing with each other in corporation of firms in a severe production competitive circumstances of the Tajima district and the new production areas. Aiming to establish a stabilized production system, they possessed the farms with the scale larger than the average raising number of the affiliated farms to meet always discontinuance of the raising farmers. They owned their hatcheries in the areas for the chick supply. They distributed to each farm the feed which was transported directly from the affiliated feed plants at Kobe Port or Himeji Port to the feed bases in the region. Beside the above distribution system, they have tried for the purpose of feed charge reduction direct distribution from the port to the large scale raising household.¹⁹ They conducted broiler selling through their own and affiliated wholesalers, emphasis being laid on their own ones. These processing factories accordingly have played roles of the local integrators.

On the other hand, the three processing factories under Nokyo system are scattered separately in the district, and occupy only the share of 23 % in the processing volume of this district. They hold less

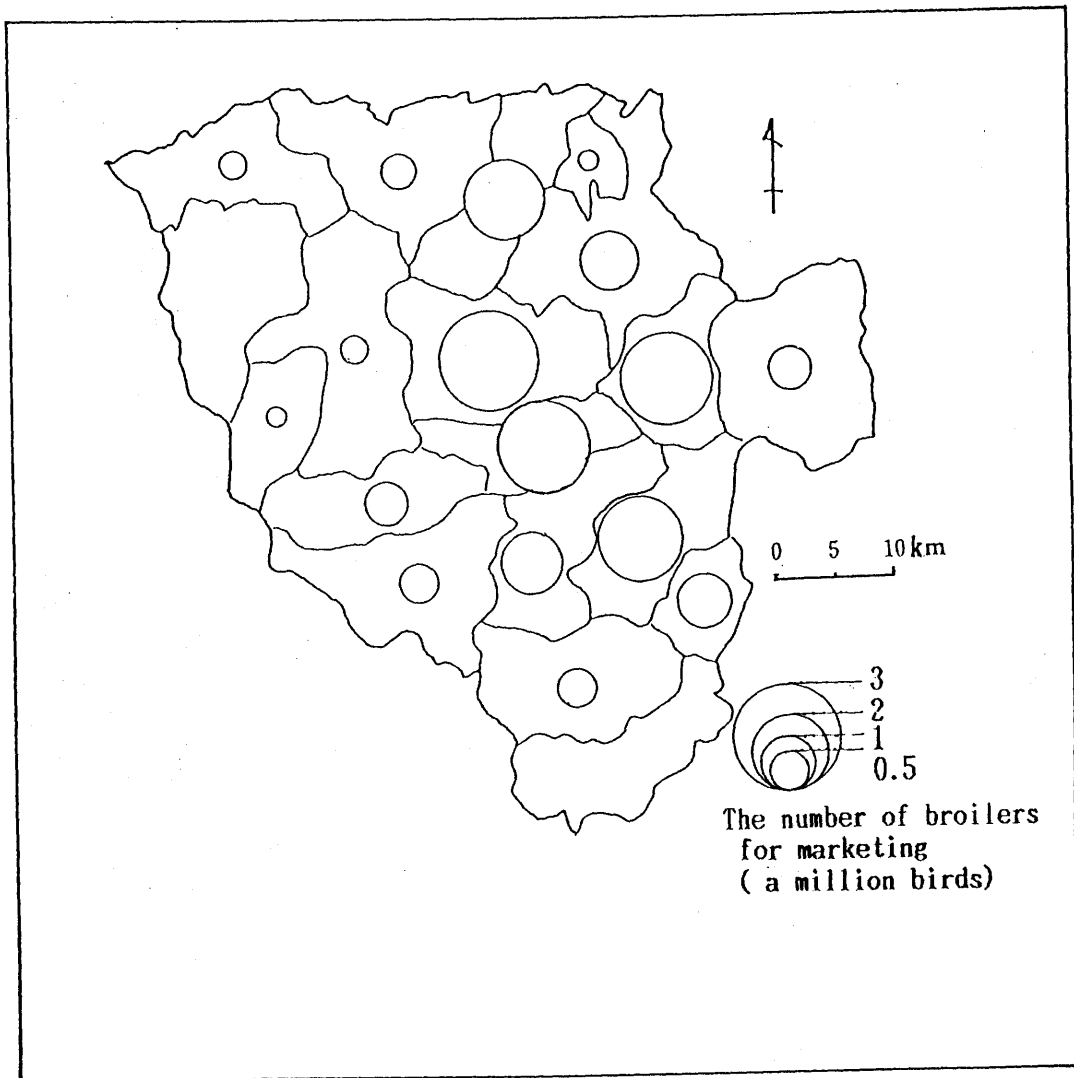


Fig. 14 The number of broilers for marketing by cities and towns in Tajima district, 1985

Source: Egg and broiler distribution statistics

affiliated farms in comparison with the Shosha affiliations, thus coming from behind. Since Agricultural Cooperative Regulations have banned production in the farms directly operated system, Nokyo made the long-term trade contracts with the hatchery that opened in the vicinity of Keizai-Ren's processing factory in 1964. Owing to this fact, processing factories of Nokyo system have not been able to have the function as the local integrator. However, Keizai-Ren, holding the broiler houses of the farms, who changed their trades, as the mortgages, utilizes them as its owned farms (shipment of 260 thousand broilers per year and salary contract system). Keizai-Ren has made with the affiliated farm a contract based on a payment guarantee system, which has some differences from the commission contract system by the two Nokyos. Keizai-Ren has taken always leadership from production to selling, and has promoted planning on raising, processing treatment and selling.

The processing factories of Nokyo system, with their main consideration existing in establishment of the agricultural management basis of farm, have proceeded to reinforce the weakening marketing in the 1980's, and have advanced toward market development, through separating from the one-side Zen-Noh system and shifting to direct selling. In addition, the ratio of the cut-up meat, though rather late, has increased in the processing factories of the Tajima district since 1980. Responding to this, Labor saving and the product of high profitability have become the objects. Thus, the factories requested the farmers to ship the large-sized broiler with 2.7 kg of weight, and took measure for enhancing shipment volume without actual rebuilding or expansion of the broiler house by changing the chick raising cycle from 4.2 to 4.6 times per year.

b. The regional distribution of the raising farm households

The broiler collection regions of the processing factories under Shosha affiliations were compared with those of Keizai-Ren (Figure 15).

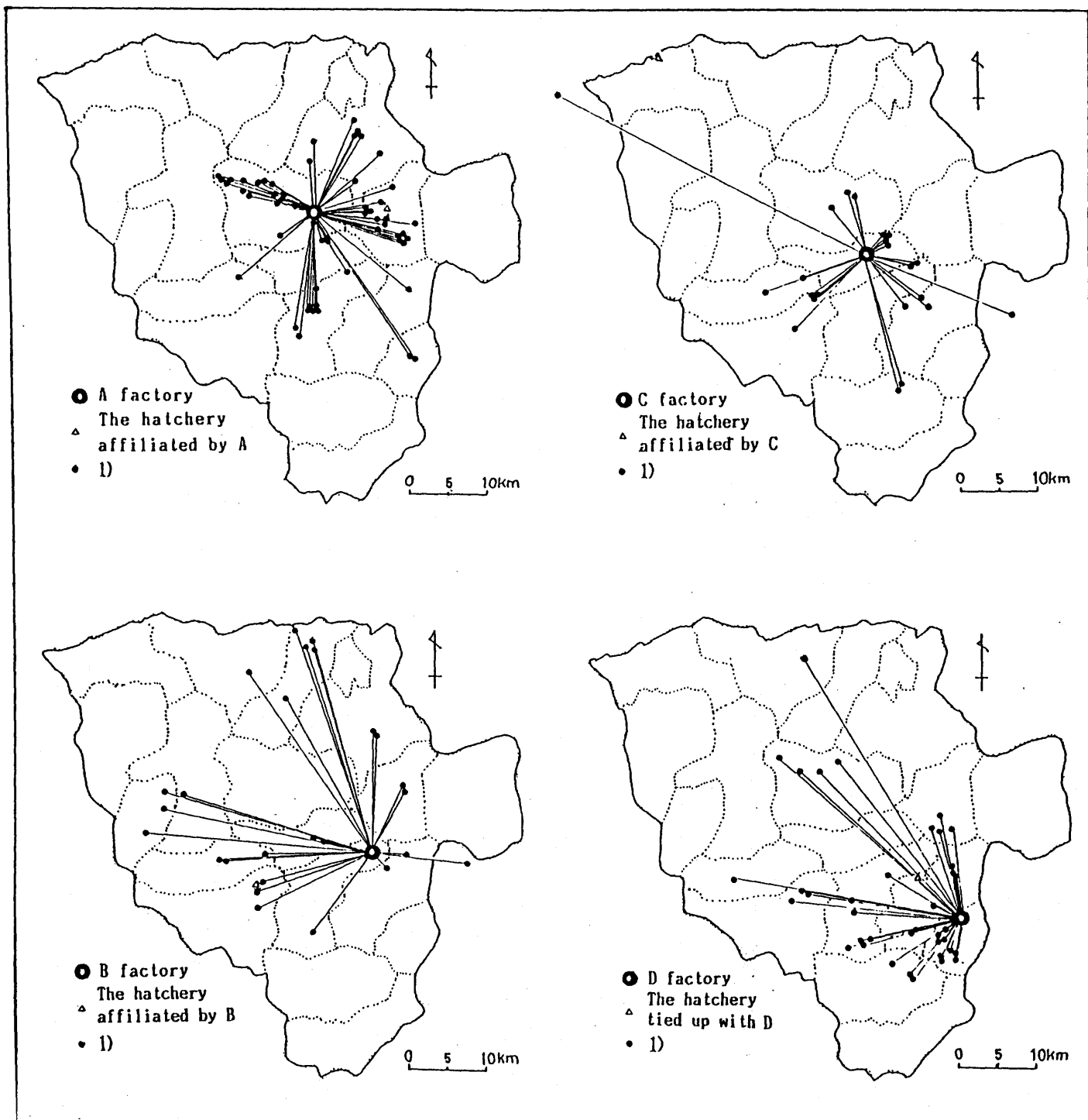


Fig. 15 Distribution of broiler processing factories, contract farms raising broilers and hatcheries in Tajima district, 1985

Note: 1) Contract farm (including owned farm by company)

Source: The author's field survey

The processing factory A (corresponds to Figure 10 and from A to F in Table 10) gathers from 72 % of the raisers in Hidaka town, the location of this factory, and neighboring Izushi town and Toyooka city. The broiler collection region ranges about 23 km, the narrowest among the factories, which fact shows the closer regional access of this factory than those of others. This is because the factory A was opened for the first time in the Tajima district, and accordingly it could secure many affiliated raising farms in its vicinity.

The processing factory B arranges raising farms in a diffused manner in the around of the broiler collection region of A. The broiler collection region of B, in consequence, extends to about 33 km. The factory B was moved afterwards in 1975, but it could seldom secured the raising farms in the environs of the plant.

The processing factory C constructs relatively concentrated broiler collection region through securing its direct farms and the affiliated farms in its vicinity. However, the actual broiler collection region is enlarged to 40 km range, because the factory C holds two separated producers outside of the territory, i.e. one in Yakuno town in Kyoto prefecture and the other at Iwami town in Tottori prefecture. In addition, the hatchery is located independently in the northern part, indicating the problem of eccentric locality.

The processing factory D is located in the south of the district, and thereby holds many affiliated farms in its environs. The broiler collection territory of D, however, ranges to 40 km, because it holds producers in the north of the district as well. According to operating conditions of the three processing factories including other two of Nokyos, forwarding of the products is actually conducted. In consequence, the factory D has a problem of its complicated and fluctuating broiler collection region.

To summarize, the broiler collection regions of the forerunner

processing factories tend to concentrate on the specific districts or hamlets. On the other hand, those of the late runner tend to be distributed in wide ranges, because they have exploited their collection regions through affiliating the raising farms at the opportunities of unification and closing of the processing factories which accompany changing the transaction contracts.

3) The regional character of the broiler industry in Hidaka town

a. The position of the broiler industry in the agriculture

The households in Hidaka town numbered 3,023 in 1960, the number lost its 29 % in 1985. Reduction in the number of farmers with a side job and increase in that of farmers doing farming on the side are observed remarkably. Small-sized farms with less than 1 ha arable land occupy the large majority. In addition, the majority of householders had side businesses until the 1970's, but in 1985 farmers with side jobs, who were mainly in severe other than farming, came to occupy 59 % of the total farms with side jobs.²⁰ This percentage surpassed 10 % of the householder farm specialized farms with side jobs and 15 % of the self-employed farms with side jobs (Table 11). Moreover, with increase of the farmers with side jobs, the medium-sized farms became short of agricultural labor. They proceeded to lend the cultivated land or stop farming, thus separating into the farms with small-sized farming management and those who intended large scale management with more than 3 ha by acting farming work and borrowing land. The agricultural labor, however, has been lowered both in quality and quantity. The age stratum of the full-time agricultural workers comprises men and women over 60 years of age in the ratio of 30 to 40 %, thus indicating the aging agricultural population and shifting to women and seniors farming prominently.

The ratio of the livestock laising farms shows that about 80 % of

Table 11 Changes in farm structure at Hidaka-Cho of Tajima district

Items	1960	1965	1970	1975	1980	1985	
Total farm households	3,023	2,877	2,753	2,602	2,525	2,393	
Full-time farm households ratio	28.6%	7.6	7.1	5.8	6.3	7.2	
Part-time farm households ratio	Mainly farming	43.3%	41.9	36.5	22.3	15.3	11.5
	Mainly other jobs	28.1%	50.5	56.4	71.9	78.4	81.3
The ratio of livestock farm households	100 %	58.5	45.8	18.4	10.5	6.6	
The ratio of farm size by cultivated land							
Under 0.5ha.	39.0%	40.3	42.0	48.8	51.1	51.6	
0.5 ~ 1.0ha.	46.9%	45.5	41.6	37.9	36.1	35.7	
1.0 ~ 1.5ha.	13.0%	12.8	13.5	10.3	9.6	9.5	
Over 1.5ha.	1.1%	1.4	2.9	3.0	3.2	3.2	
Agricultural land (ha)							
Paddy field	1,333	1,324	1,290	1,131	1,125	1,088	
Upland field	408	351	315	337	276	257	
Land under permanent crops	142	97	87	71	41	71	
Permanent meadows & pastures	0	6	19	7	19	7	
The best 5 sectors in gross agricultural production	R (60.9)	R (41.0)	Br(53.0)	Br(45.3)	Br(47.6)	Br(38.1)	
	Co(10.9)	C (24.7)	R (19.8)	R (24.0)	R (22.3)	R (26.3)	
	():The rate in total gross	D (6.2)	P (5.8)	P (4.3)	P (4.7)	Ca(3.6)	Ca(6.5)
	agricultural production(%)	M (2.5)	B (4.8)	Ca(2.8)	Ca(4.0)	P (3.3)	M (4.6)
		S (1.8)	Co(4.6)	B (2.3)	B (3.0)	M (3.2)	P (3.2)

R:Rice Co:Cocoon D:Draft cattle M:Fresh milk S:Sweet potatoes C:Chicken P:Pigs B:Beef cattle
Br:Broiler Ca:Cabbage

Sources: Agricultural census, Statistics of net product of agriculture in Hyogo Prefecture

them had engaged in the layer and the beef cattle sectors until the 1960's, and that afterwards the ratio diminished and reached down to 68 % in 1985. Their raising number per farm was low, for it was conducted as a side business. On the other hand, 12 farms doing dairy farming in 92 %, 23 ones raising broiler in 88 % and 9 ones raising pig in 82 % were assigned to the specialized farms. The number of the specialized farms increased since the 1970's, and has leveled off in the 1980's, being occupied by the rice growing ones in majority on the whole. The gross agricultural production is most largely occupied by the broiler sector. The ratio hit a peak in 1970, and has been diminishing afterwards.

As for the regional characteristics (Figure 16), the service forms of the guesthouse or the sight-seeing relations composite with the vegetable raising have been prominently diffused in Kannabe plateau and the surrounding mountainous area. The combined occupational form of the rice growing composite with a non-agricultural income is prevailing in the Maruyama river valley and the surrounding flat district of the eastern part. In addition, the most farms, i.e. 623 farms, exist in Mikata district, which occupies about 23 % of the managed cultivated land area of Hidaka town, and grow rice together with side jobs.

b. The location and the agricultural management of the farm households raising broilers

In Hidaka town, the number of the broiler shipping farms reached the peak of 198 in 1970, and it continues to diminish afterwards. It was lowered to 18 in 1986 (Table 12), and the shipment was reduced to 65 % that in the height of prosperity. The shipment number per farm, however, increased in scale from 29 thousand at that time to 80 thousand. The regional movements of the raising farms in 1975 and 1987 show the drops of the numbers; from 72 to 9 in Mikata, from 38 to 3 in Kiyotaki, from 13 to 1 in Nishiki, from 10 to 5 in Hidaka, from 3 to 1 in Yashiro and

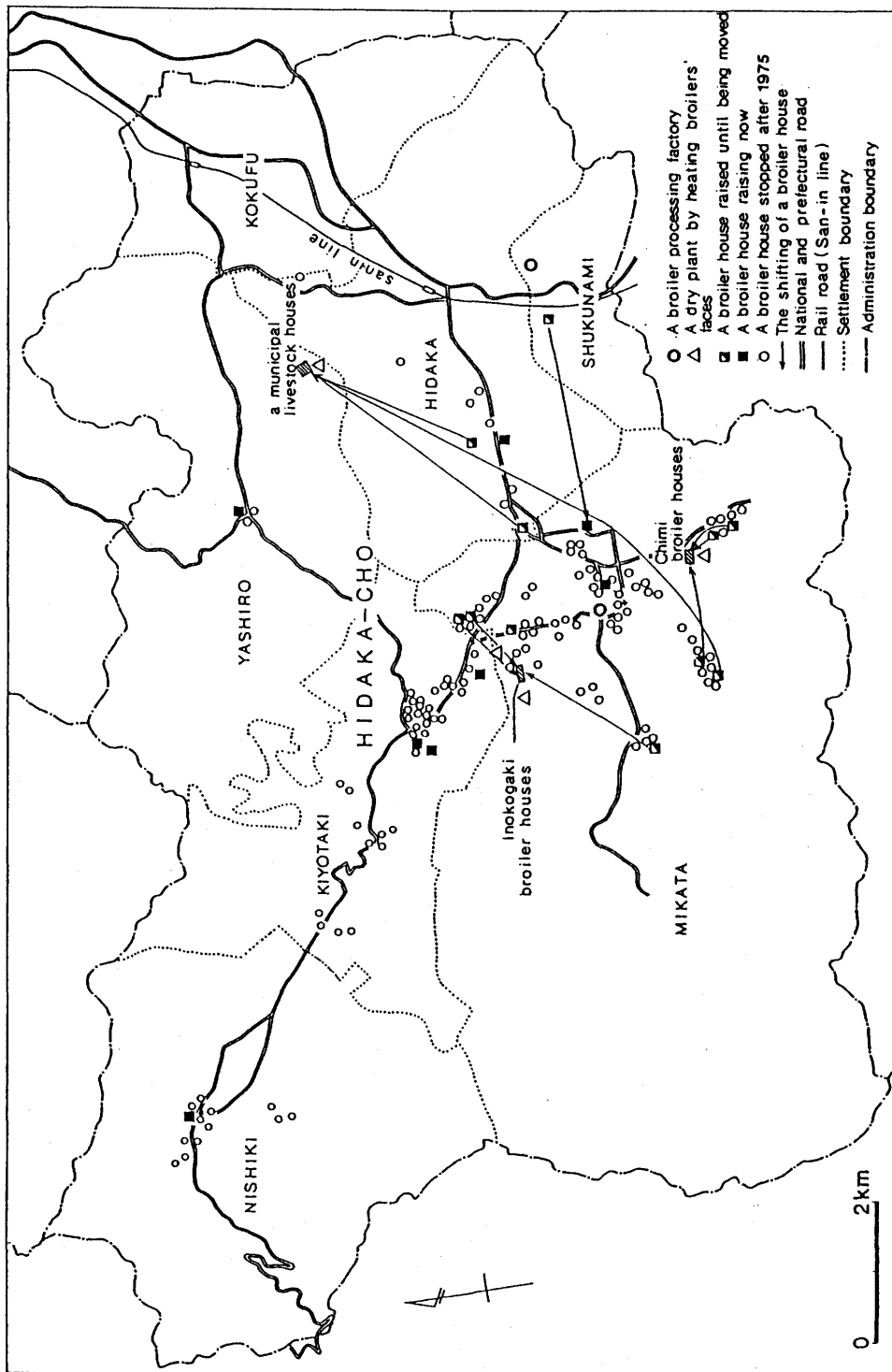


Fig. 16 The locational changes of the broiler houses in Hidaka-cho, 1986
 Data source : The author's field survey

Table 12 Management of farm households raising broilers in Hidaka-Cho, 1986

Farm number	No. of broilers raising per year (10,000)	Acreage of cultivated land (a.)		Forest land (a.)	The ratio of broiler income to total one (%)	Other sources of income	Family worker ¹⁾		The beginning year of raising broilers	The changing year from opening house to window less one ²⁾	The greatest reason of beginning ³⁾ raising	Works before raising broilers
		Land (a.)	Paddy/Upland field				H	W S w				
1	18	65		100	100	Rice, Japanese cedar seedlings	○	○	1960	(1970)	A	Rice, Dairy cattle
2	14	40			80	Rice	○	○	1959	(1972)	A	Rice, Japanese cattle
3	12	45			95	Rice	○	○	1963	(1980)	A	Rice, Sericulture, Japanese cattle
4	10	30	40		90	Rice, Vegetables	○	○	1953	(1979)	A	Poultry raising
5	10	60			90	Rice	○	○	1962	(1979)	A	Rice, Vegetables
6	10		20		100		○	○	1963	(1979)	A	A quarry man
7	9	75		200	85	Rice	○	○	1963	(1980)	A	Dairy cattle, Sericulture, Rice
8	9	20	8		90	Rice, Pulse	○	○	1964	(1980)	A	Rice, Vegetables
9	9	50			80	Assembly-man, Rice	○	○	1966	(1979)	A	Assembly-man, Rice
10	6	170	30		60	Rice, Vegetables	○	○	1967	1972	A	Japanese cattle, Rice
11	6	110	7	310	60	Beef cattle, Rice, A guest-house	○	○	1969	1972	B	Poultry raising, Japanese cattle
12	5	50			95	Rice	○	○	1957	(1972)	A	Rice, Grapes
13	5	30			40	A stuff of agricultural coop.	△	○	1962	1972	A	A stuff of agricultural coop.
14	5	50			70	Rice, A midwife	○	○	1967	1971	A	A day laborer
15	4.5	100		30	60	Rice, Tourist farm	○	○	1968	—	A	Rice, Vegetables, Dairy cattle
16	4	70	5		60	An office man, Rice	△	○	1961	1976	A	Rice
17	3	30	7		100	Rice, Vegetables	○	○	1963	(1972)	A	Rice, Vegetables
18	3	70	20		40	Rice, Vegetables	○	○	1970	—	A	Rice, Sericulture, Japanese cattle

Notes: 1) H: Householder W: Wife of householder S: Successor W: Wife of successor
 2) (): When location of the broiler house was moved
 3) A: Profitability B: Promising feasibility
 Source: The author's field survey

from 1 to 0 in Kokufu and Shukunami. The present raising farms, thus, exist in the dispersed locations. However, 10 farms are resident in the housings at three places, and other 8 farms are located independently (see Figure 16). In addition, all raisers had begun the broiler raising management until 1970, and have been conducting it by the labor of their own families. The farms numbered 6, 13 and 14 have transferred from non-agricultural sectors, and the rest have shifted their occupations from the composite agriculture to the broiler raising. Management of only two farms changed from the poultry sector to the broiler one.

The raising farms may be classified into the following three types in view of location and management.

The first type : this is for the full-time farm whose income from broiler raising amounts to more than 80 % of the household's incomes. These specialized farms from No.1 to 9, 12 and 17 have achieved scale enlargement through transference of the broiler houses. These farms, holding narrow arable lands, used to conduct raising in the open broiler houses (facing roads, or standing at backyards or back upland fields) in a small scale. Owing to worsening raising environment and generation of the animal waste pollution, they had to move the broiler houses. In the case of farm No.1, the successor became independent from the householder's broiler management through purchasing new land in 1972. The householder (53 years old) is managing 10 thousand broilers in a house, and the son (26 years old) is raising 35 thousand broilers in 3 houses. Farm No.2, having committed the management to the successor (37 years old), manages such a high motivation as to hold a prominently larger housing than other farms.

The second type: the farm of this type dose not move the broiler house, and conducts the broiler raising as a semi specialized management (the gains from broiler occupying from 60 to 80 % of the total farm's income). It is characterized by its relatively wide

cultivated land area. Farms No.10, 11 and from 14 to 16 belong to the second type, and obtain their income from such as rice growing and non-agricultural sectors.

The third type: the farm of this type earns less than 60 % of its total income from broiler raising. Two farms of No.13 and 18 belonging to this type conduct subsidiary management, and obtain a large part of income from other sectors. The farms of the third type were most popular in the Tajima district until the 1970's, but have almost disappeared today.

A typical example of the first type may be observed in the management of farm household No.3 (Figure 17). This farm exists in a valley of south Mikata district. The village extends along a road passing from north-east to south-west, and a forest approaches behind the village. The family comprises the householder (54 years old) and his wife. Their son (27 years old) and daughter (24 years old) work at the companies in Kobe and Osaka city. From the prewar, the householder's parents had been growing rice (45 are) principally, subsidiary raising a Japanese cattle (for calf production) planting and feeding cider in the backyard forest besides. After the war, the household developed a part of the forest into a mulberry farm, and took up also sericulture responding to the advance of the Gunze silk mill into the Hidaka district. Having been advised by Hinomaru Co. (the predecessor of Tajima Broiler Co.) to raise broiler for its high profitability, the household built a cage type broiler house (90 m²) in the backyard, and raised 200 broilers per month. The eldest son (present householder) conducted its management, after the householder gave up sericulture and cattle raising which did not seem to promise it high income at that time. When the 1970's started, the householder was increased the raising number up to 3 thousand per month. To meet both the raising scale enlargement and the measures for pollution, Mikata

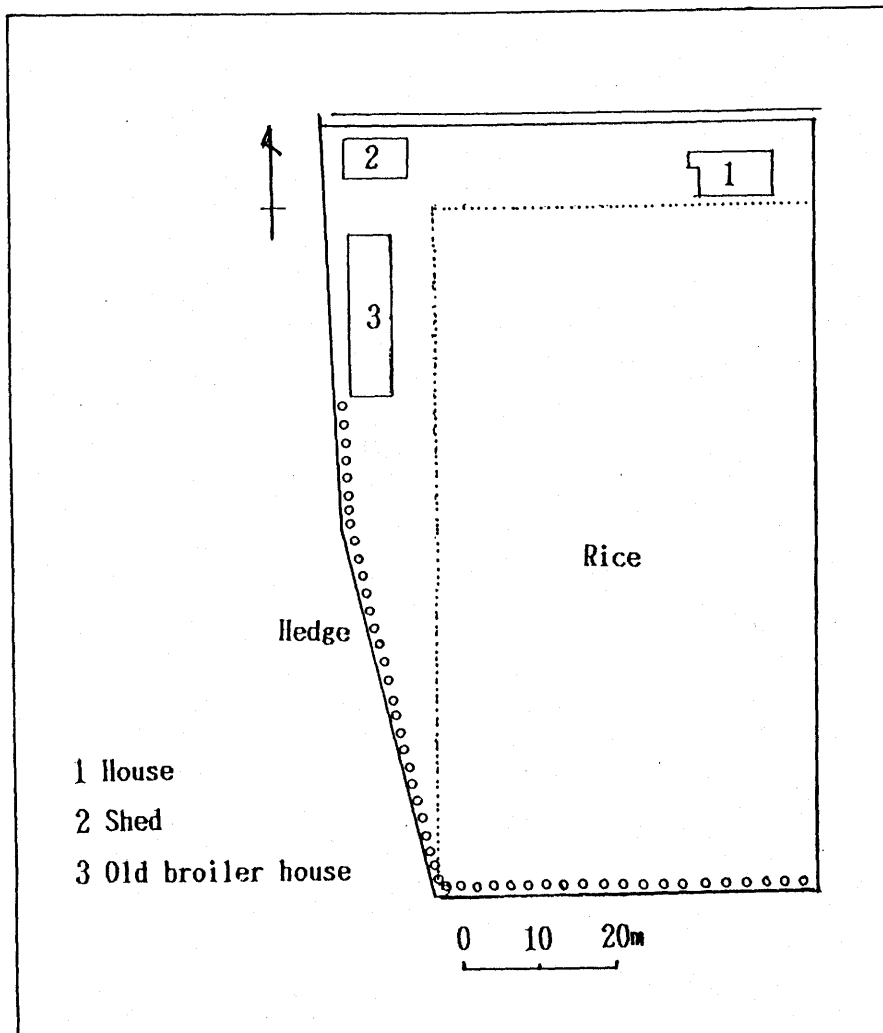


Fig. 17 Land use of a farm raising broilers, 1986
Source: The author's field survey

Nokyo recommended the households to enter into broiler houses which Nokyo was intending to prepare. The householder stopped raising at home, and entered into the new housing in 1980. The householder and his wife managed two houses (raising constantly 30 thousand broilers). In addition, owing to death of the parent, the householder could not take good care of the forest, and then he sold it. However, he kept rice growing for his own use. The farm has been conducting the broiler management perfectly under the Mikata Nokyo affiliation since 1975.

An example of the second type can be observed in the management of farm No.10. This farm exists in Kiyotaki district close to the border with Mikata district, and is located at the level ground of 100 meters altitude. The family consists of two members, the householder (50 years old) and his wife (47 years old). The eldest son, their only one child, attends a private college in Osaka prefecture, and he has no intention to succeed the family job in future.

When the householder was born, his father was growing rice (1.7 ha), and also raising Japanese cattles (5 fertilized cattles) together with cultivation of 30 are land as a pasture. He made a broiler raising contract with Keizai-Ren of Hyogo prefecture in 1967, set up a open type broiler house (150m²) in the territory, and introduced 8 thousand broilers. Having been requested by Keizai-Ren through the usual relationship with Hidaka Town Nokyo, he anticipated a large profitability from broiler production in which the production price would be guaranteed. In addition, his son (the present householder) grew up as the successor. Thus, he made up his mind to enlarge the scale of his agricultural management. To cope with his death in 1972, the reduction of income from cattle raising and the planted acreage reduction by the rice production adjustment, the present householder aimed enlargement of the broiler raising scale. He constructed three windowless floor feeding broiler houses (450 m²) and a feed tank in the

former pasture, and rebuilt the old open type broiler house. These facilities had in total a constant capacity of 60 thousand broilers. The expenditure was about 10 million yen, 70 % of which depended on Comprehensive Facility Fund by the government, and he bore the rest by himself. Further, responding to 30 % decrease in rice growing by the rice acreage reduction policy, he assigned 30 are to vegetable farming (10 are for cabbage, 10 are for radish and Chinese cabbage), and left the residue of 20 are as a fallow.

As an example of the third type, the management of farm No.18 will be surveyed. This farm house is located at the flattest and most cultivated north region of the Mikata district, the farm possesses a upland field of 20 are and a paddy field of 70 are in the northern part of the territory. The family consists of seven members, i.e. the householder (65 years old), his wife (65 years old), father of the householder (88 years old) and his wife (82 years old), the eldest daughter (35 years old), her husband (38 years old) and their child (5 years old). Both parents have retired, and the daughter's husband works at a company in Toyooka city. The agricultural management has been carried out by the householder and his wife, being occasionally helped by their daughter in the busiest season.

They had engaged in rice growing, sericulture and Japanese cattle (a head for calf production) until about 1960. They abandoned sericulture in 1961, and introduced three milk cow, which they kept to raise till 1965. Having been requested by Nokyo to raise broiler, they sold the cattle for a fund. Then they constructed two cage type broiler houses in the upland field, and introduced 3 thousand chicks. At present, they raise 8 thousand broilers in the same houses. As for the feed, they altered the supplier to Nihon Nosan K.K. in the respect of price and efficiency in 1971. They laid in the feed from its special agency in Yoka town and shipped live birds to San-ei Broiler Sale Co.,Ltd. the

contracted processing factory of Nihon Nosan Kogyo K.K. at Yakuno town in Kyoto prefecture. Further, they changed the chick dealer to Amada Industry Co.,Ltd. in Yakuno town cooperating with San-ei Broiler Sale Co.,Ltd.. Thus, they have eliminated the contract connection with Mikata Nokyos, and have entered into the affiliation of the merchant capitals.

4) The regional conditions for production area formation of the broiler industry

Tajima district holds arable land area amounting only to 10 % of total land area, and is a basin in the mountainous zone, which has the climate characteristics, i.e. coldness and snowfall in winter and high temperature and high humidity in summer. In consequence, the district had not been considered to be appropriate to broiler raising. When the 1960's started, sericulture and Japanese cattle raising met financial difficulties. However, farmers could not find an alternative crop of high profitability easily. On the other hand, the expectations for demand increase of meat made them intended to do the small and the medium sized livestock production. The broiler production, which would required only small land and fund, and which could be dealt with a standardized technique, would give a large production. Thus, the broiler raising attracted attention of the local farmers, who started its management for the first time. Hatcheries and processing factories were gradually set up, and the raising farms spread regionally. Thus, a regional connection from production to distribution came to be established, being backed by the access to Kei-Han-Shin markets. Particularly, in the latter half of the 1960's, strict competition took place among the wholesalers and Nokyos in securing producers to stabilize production, which also contributed to formation of the producing area.

Since the latter half of the 1970's, the broiler industry has become

more advantageous in remote areas than in ones neighboring to the consumption districts, because:(1) the production techniques have advanced, (2) the distribution system and consumption trends have changed, and (3) the pollution problems has generated through urbanization and industrialization of the metropolitan environs. In the Tajima district, coping with the situation, alternation to the windowless broiler house and movement into the housing furnished with modernized and enlarged facilities have been carried out mainly by a small number of the farms that conduct the specialized management.

Since the 1970's, the processing factories also have proceeded to mutual unification and closing, and modernized their facilities to increase processing volume and to raise profitability. Further, responding to the market, they have promoted the ratio of the cut-up meat, have reinforced direct selling through reducing dependence on wholesalers, and have promoted selling route diversification.

On the other hand, the mobile contracting connection between the producer and the processing factory was observed till the first half of the 1970's, but has disappeared afterwards. The four trades including a hatchery and a feed plant have been trying to survive through continuation of the fixed mutual contracting relations. In consequence, the broiler industry in the Tajima district, finds its possible existence in the reinforcement of the regional organization in the production sector and in the widely ranged diversification in the selling sector.

2. Production area formation of the broiler industry at Fuji district in Shizuoka prefecture

Fuji district (Fujinomiya city, Fuji city and Shibakawa town)²¹ is located in the metropolitan environs, and is 120 km distant from Tokyo. In the first place, since the 1960's, several processing factories were advancing into this district, and accelerated development of the broiler industry. The broiler industry has taken root in the basis of diversified management with crops cultivation in this district. In the second place, it has not stood a high rank in the agricultural occupancy of the district. However, the district has been the central production area of Shizuoka prefecture up to now, and it holds the largest raising scale in the metropolitan environs of eastern Japan.

1) Development of the broiler industry

a. The stage of development of the production area

(until the first half of the 1970's)

The broiler raising farms of Fuji district are most accumulated in Kitayama area (former Kitayama village)²² which is located at the slope of from 300 to 400 meters altitude in the middle of Fujinomiya city. The broiler industry started here. The story of its introduction will be described subsequently.

In Kitayama district, the farmers used to conduct the double cropping of rice and wheat in general on the cultivated volcanic ash land and in a small management scale of from 50 to 100 are. Following an advice of a local representative, around 20 farms gave up their farming, and organized Kitayama Mura Fruit and Livestock Association. Financially aided by Kitayama Nokyo, they set tangerin (Satsuma orange) cultivation as a base cropping, and introduced layer as the easiest livestock sector and as fertilizing the cropping land. Actually, 50 layers on the

average were raised by a farm. Contrary to their expectation, the fruit cropping did not get under way so easily, and they changed their line to the specializing layer raising management accordingly. Then they reformed the association to Kitayama Layer Association in 1955, and they advanced to a full-time and collective layer raising management by means of the cooperative feed purchase and egg shipment through Kitayama Nokyo. This movement gradually spread to the surrounding villages.

From the beginning of the 1960's, they started meat chicken raising in parallel by using male chicks to meet the demand from the local meat stores. Fujinomiya City Nokyo established a processing factory in this area for culled chicken treatment in 1964, and proceeded to processing of broiler as well. This gave an impetus to the broiler industry in this area. A meat wholesaler, Asahi Broiler Co., Ltd., anticipated its development here, and advanced into Fujinomiya city to collect broilers here and to ship them to Kei-Hin (Tokyo and Kanagawa prefectures) markets (Figure 18). In consequence, some farms intended to change from layer raising to broiler raising mainly in Kitayama area, in eastern part of Fujinomiya city and in northern part of Fuji city, thus a regional basis for development of the broiler industry being established.²³

The broiler producers formed a small group organization²⁴ of several farms through the regional connection and the blood connection that had been existing from the stage of the layer raising management. They laid in the chicks and the feed from Nokyo and dealers of Fujinomiya city through this organization, and they, in each group, conducted the quotation deal with the processing factory in the area. Further, the factories adopted a system that they performed the trusted treatment and the carcass sale in place of the farms. Neither hatchery nor feed plant existed in Fuji district. In consequence, the integration system

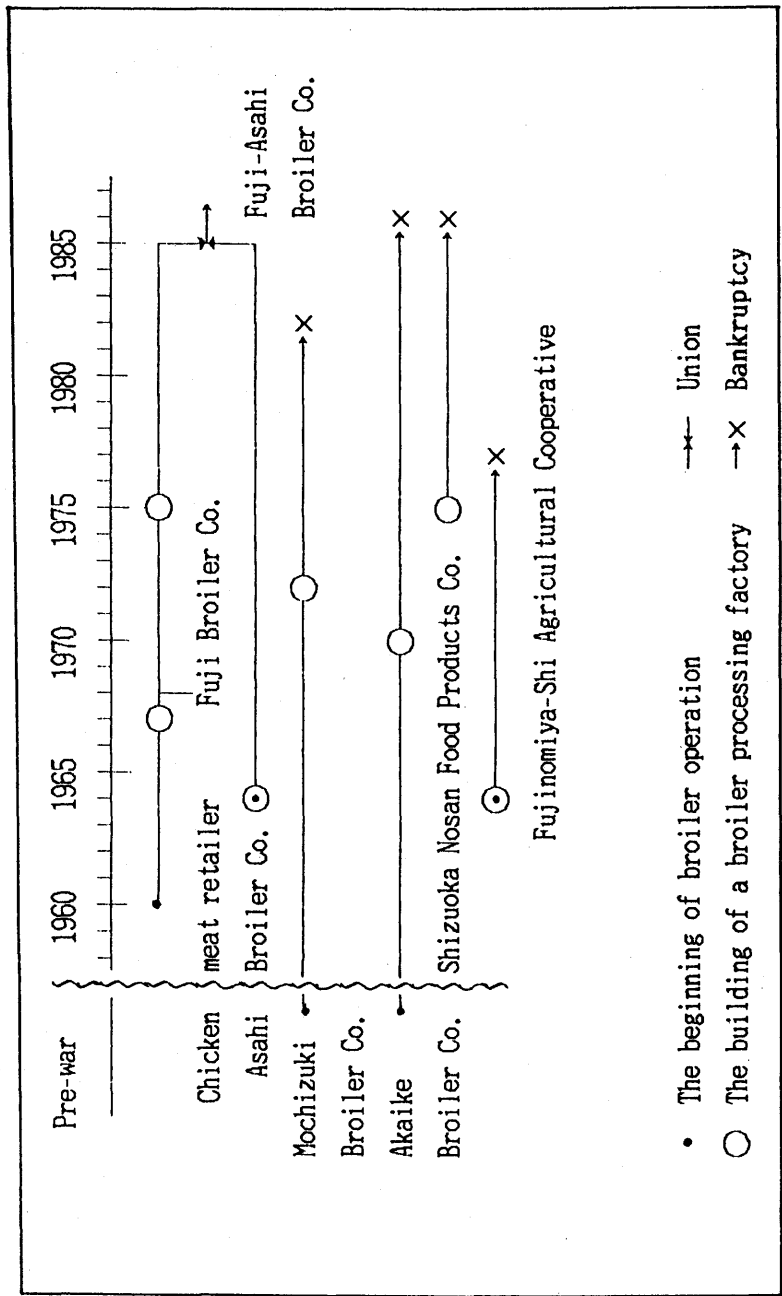


Fig. 18 Changes of broiler processing factories in Fuji district
 Source: The autor's field survey

was not practiced in this district at that time. The producers thereby laid in the feed from the dealers in the Fuji district and Shimizu city.²⁵ They laid in the chicks from Fuji farmland of Arber Acres Japan Co., Ltd. which was opened at Fujikawa town in 1965 and from other regions, i.e. Izu and Totoumi (from Hamana to Iwata) districts in the same prefecture and neighboring ones such as Yamanashi and Aichi. The purchase route was different for the different group, was multiple, and through other districts, thus forcing relatively high price to the farmers.

Until the beginning of the 1970's, three local special agencies of feed capitals and a chicken dealer²⁶ of Shimizu city had advanced into Fujinomiya city and Fuji city; two companies in each city, and they had constructed processing factories there. The number of the producers increased accordingly. However, the broiler industry in the Fuji district was still lacking in the regional consistency, and held the subjects that the raisers should reduce the production cost, and that the processing factories had to enhance their profitability. Moreover, since the latter half of the 1960's, the two problems had generated in this district. In the first place, accompanying industrialization of Gakunan (the south foot of Mt. Fuji) region, the transfer of the farmland to the housing land and the turnover of the expectant agricultural successor to the industrial worker came to be prominent phenomena (Ota, 1967). The second problem the battery or cage type raising, which lowered raising efficiency and generated malodor from the broiler litter. As the countermeasure to both the pollution and the labor saving, rebuilding of the former broiler houses into the windowless ones had been practiced since the beginning of the 1970's.

Consequently, some raising farms tended to alter the diversified management till that time to the principal or the specializing one. The others came to be separated into two classes: (1) other jobs farm

household with the householder of which had mainly other jobs, and (2) the one that closed its trade and gave up farming from the respects of the financial burden of the new broiler house and the facilities and the insufficient profitability of the broiler raising.²⁷

Thus, the number of the raising farms in the Fuji district, after having reached the peak of 89 farms and 860 thousand broilers in 1973, tended to diminish afterwards. The shipment number per farm is 36 thousand broilers, which had been once 1.4 times larger than the whole country average, also came to level off (Figure 19). In Shizuoka prefecture, which stood higher than the third rank of whole country in broiler shipment till 1971, Fuji district occupied the largest shipment volume of 14 % in the prefecture, but other production regions, i.e. Seishin district (from Shizuoka city to Shimizu city), Totoumi district and Izu district, also made shipment comparable to that of Fuji district. The production regions thus were diffused widely, and none of them came to from the main production area (Figure 20).

The position of the broiler sector in the gross agricultural production of the Fuji district in 1973 is shown in Figure 21. In Fujinomiya city, the livestock sector occupied 65 %, which surpassed the crop cultivation sector: pork (18.0 %) came first, the others, i.e. fresh milk (15.3 %), egg (15.2 %) and broiler (8.9 %) held higher positions, and rice (7.6 %) followed them. The fresh milk and broiler had the largest gross production among cities, towns and villages in the prefecture, and pork and egg stood the second and the third respectively, which fact showed formation of the largest scale livestock industrial region in Fujinomiya city. As for Fuji city, tea (19.2 %), in particular, rice, pork and egg occupied higher ranks, but the broiler stood eleventh on the contrary to Fujinomiya city. The cropping sector, occupying 65 %, surpassed the livestock one, which indicated its agricultural characteristics remarkably different from

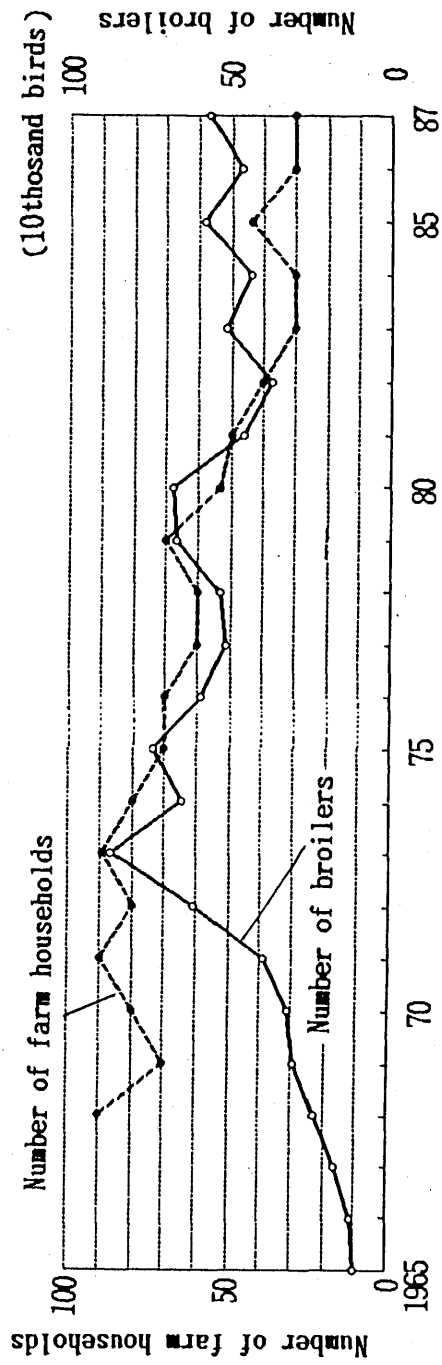


Fig. 19 Changes of broiler raising in Fuji district
 Source: Statistics of livestock products by cities, towns and villages in
 Shizuoka Prefecture

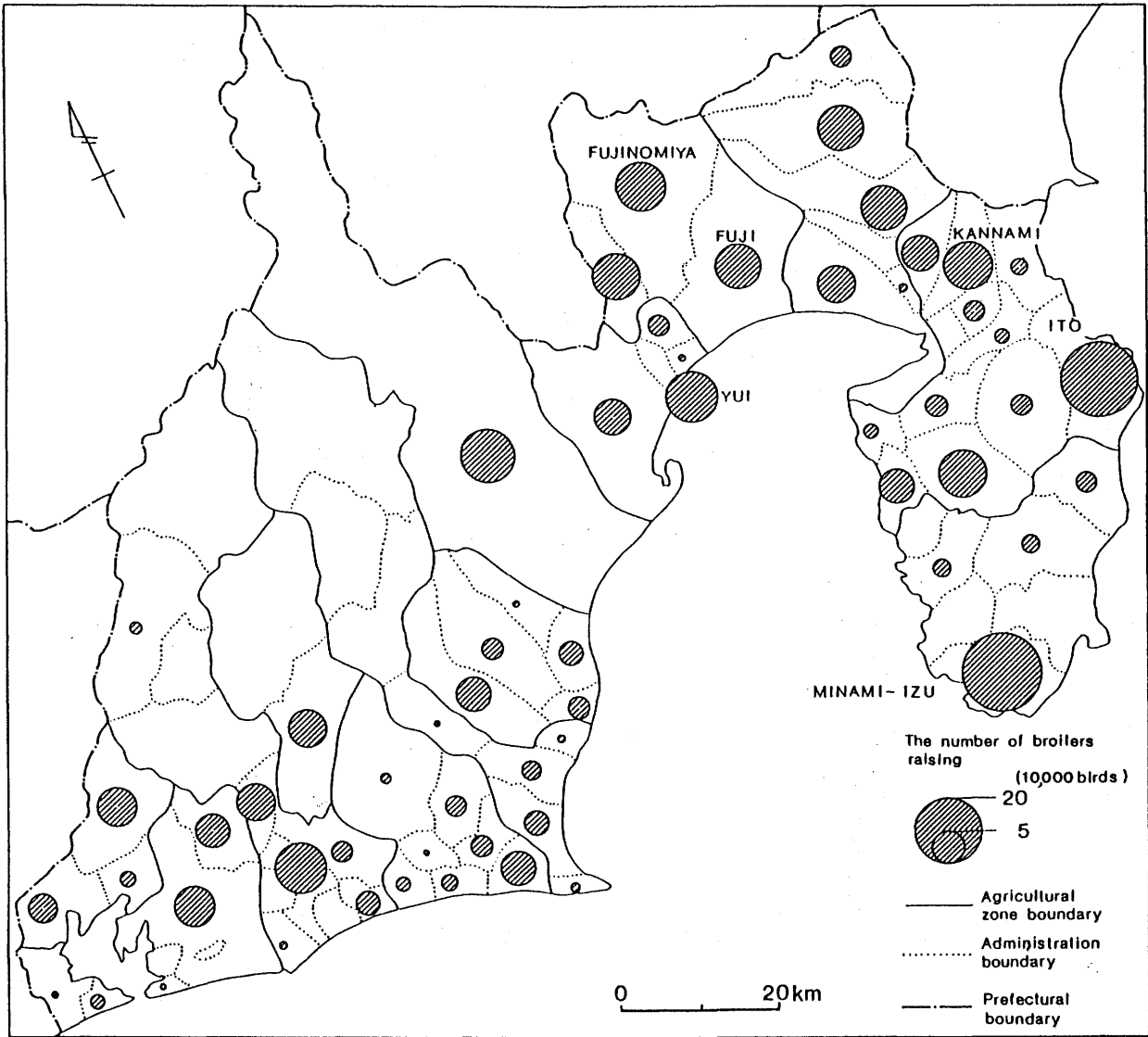


Fig. 20 Distribution of the number of raising broilers by cities, towns and villages, Shizuoka Prefecture, 1970

Data source: World's agriculture and forestry census

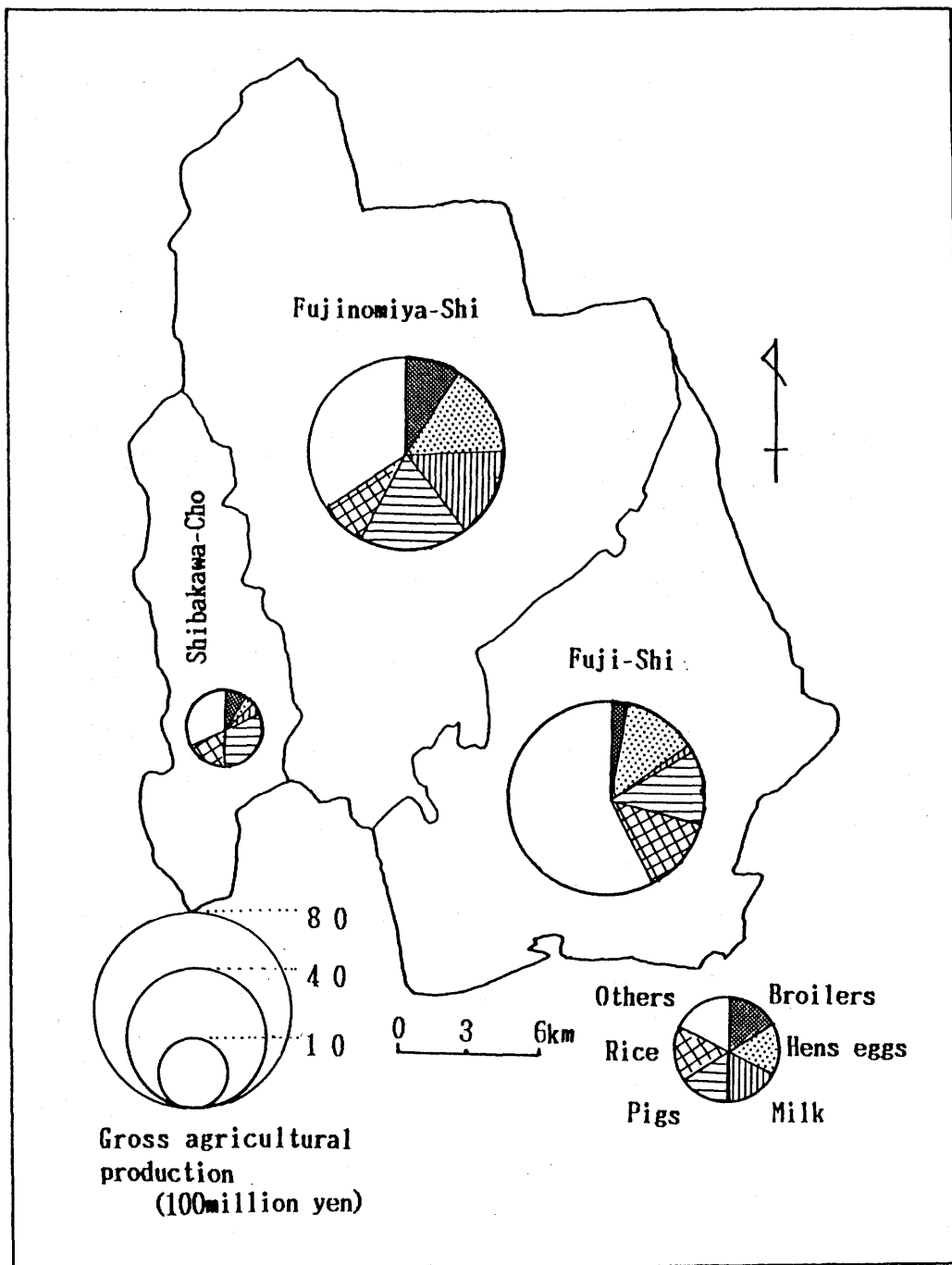


Fig. 21 Proportion of main agricultural sections in Fuji district, 1973
 Source: Statistics of net product of agriculture in Shizuoka Prefecture

that in Fujinomiya city. Shibakawa town stood intermediate of the two cities as shown by the order: pork (33.3 %), rice and broiler (8.3 %).

In consequence, the gross broiler production of Fuji district stayed sixth (5.8 %), which indicated a lower degree of its specialization compared with the first ranked pork (16.7 %) and the second ranked egg (13.1 %). The diffusion level of the broiler production in the small-to-medium-sized livestock industry of the district was in its developing stage.

b. The stage of the production area reformation

(after the latter half of the 1970' s)

In 1974, when the broiler industry was in the most severe market environment, 52 farms (out of the total households' number of 80) except the small scale ones in the Fuji district started Broiler Council of North Fuji District^{2*} with the object of maintenance and development of broiler raising through information interchange on the raising technique, the management and the selling prices etc. The council intended to establish its stabilized and reinforced management by getting the nine organizations, which had been formed by the participating farms, regionally together.

Infrastructure Arrangement Project as a link in the chain of Comprehensive Development Project of Fujinomiya city started to develop the livestock industry in 1974, and construction of the housings for the dairy, the swine and the layer raising began. The broiler housing plan had been incorporated at first, but it was discarded because: (1) the simultaneous chick raising and broiler shipment mechanism was impossible, (2) they found difficulties in the measures to the chicken disease, (3) the broiler price was sluggish at the time, and accordingly (4) little investment was expected in future.

The processing factory of Fujinomiya City Nokyo withdrew in 1977,

since it could not cope with the one affiliated by a company. Three small-to-medium-sized processing factories have been driven to discontinuation in the 1980's. In consequence, two processing factories, i.e. Fuji Broiler Co.,Ltd. and Asahi Broiler Co.,Ltd. survived, but their management did not get under way. Then they joined together in 1985 for the purpose of reconstruction to Fuji-Asahi Broiler Co.,Ltd. by aid of investment from the largest meat wholesaler in Gunma prefecture, Miyama Broiler Co.,Ltd. (see Figure 18). The new company affiliated the farms that had made contracts with the closed other factories. At the same time, it closed the factory of the former Asahi Broiler, because its facilities had decayed. Then it expand the factory of the former Fuji Broiler (to processability of ten thousand broilers per day), and it promoted rationalization. Thus, the oligopolistic order of the processing factory and the integration system were established, through which the regional integration of broiler production was achieved in the Fuji district.

Since the beginning of the 1980's, the small-sized diversified farming farms have been prominently driven to withdrawal from broiler raising under the influence of the financial difficulties of the processing factory. The number of the raisers has reduced to one-third of that in the height of prosperity, i.e. 27 households in Fujinomiya city (including 17 at Kitayama area)²⁹, 6 in Fuji city and 2 in Shibakawa town, in 1987. The broiler raising thus has become intensive mainly in Kitayama area. Further, the number of raising broilers was 560 thousand, only two-thirds of that at the peak. Through introduction of the windowless broiler house, the raising scale has been enlarged to 70 thousand of the shipment number per farm, being, however, less than 92 thousand of the whole country average. The same decaying tendency can be observed also in Shizuoka prefecture (Figure 22), especially in its eastern part of prefecture centered by Izu district. The production

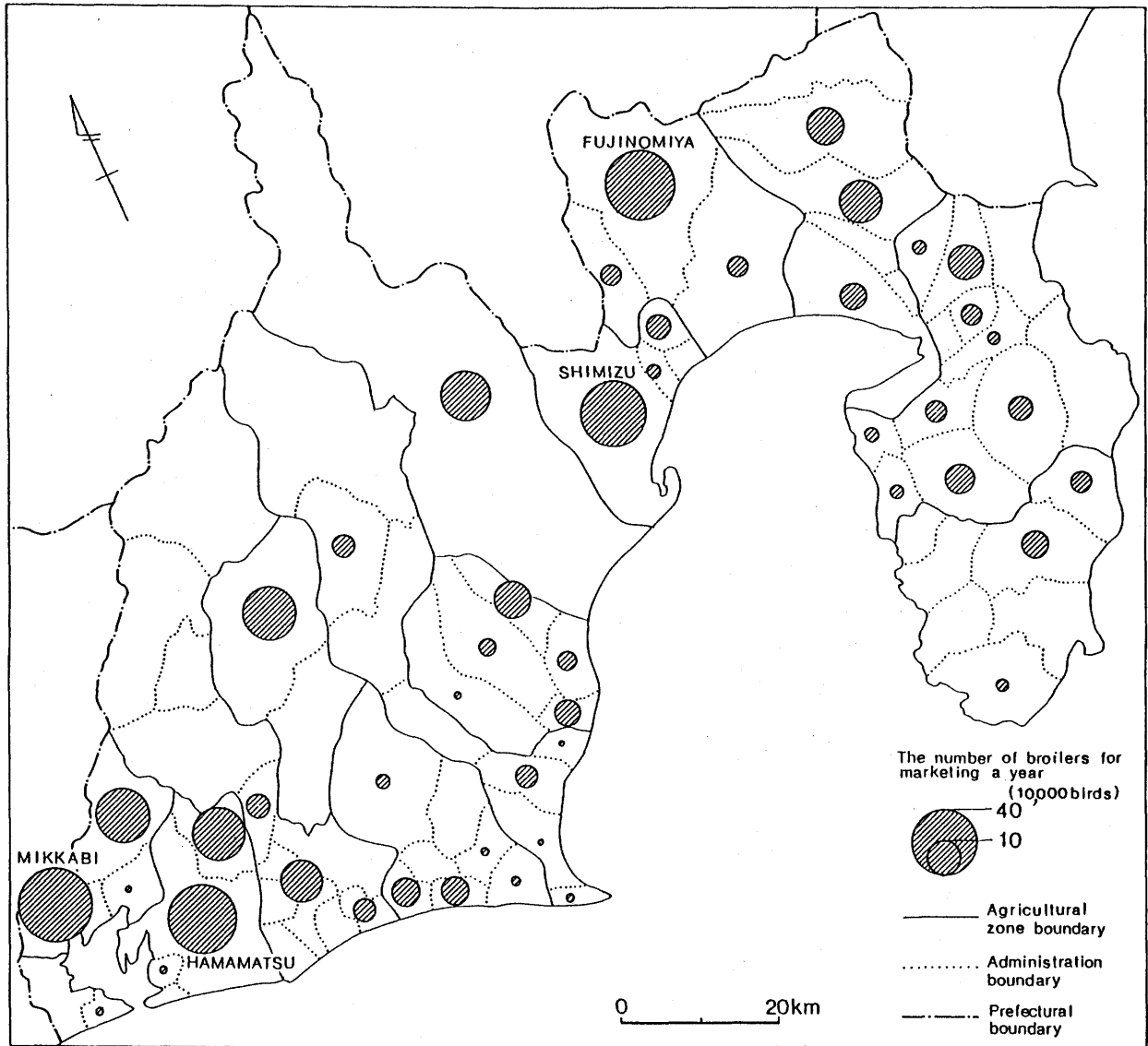


Fig. 22 Distribution of the number of broilers for marketing by cities, towns and villages, Shizuoka Prefecture, 1985

Data source: World's agriculture and forestry census

regions have been restricted to the three areas, i.e. west Totoumi, Seishin and Fujinomiya. This degeneration by scale down of the production area has been common to those existing in the metropolitan regions and their outskirts.

In 1985, Fuji district enhanced its gross broiler production ratio to 6.8 %, which was a little higher than those of the 1970's, through the regional reorganization of the broiler industry. However, it has not come to form a main production area. In addition, in Fujinomiya city the fresh milk production tripled, expanding its share to 25.8 %. That of broiler doubled with the share of 9.9 %, which approached 13.0 % of egg, but the swine production retreated largely to 7.9 % (Figure 23).

In the Fuji district holding the production region of a large scale livestock industry including cow and beef cattle, the small-to-medium-sized livestock production dealt swine and layer on the other hand. The farms that switched to broiler raising in majority came from layer raising, and none came from swine raising. The broiler raising thus was competitive with that of layer, but not with swine raising. Further, none turnovered to the broiler sector from non-agricultural sector. The broiler raising has not held advantage of the income over other crops, and, in consequence, it has not become a fundamental sector of this district.

2) The regional structure of the broiler industry

a. The regional structure of the integration system

Formation of the integration system in the Fuji district was first introduced by Fuji Broiler Co. in 1983, and it has been succeeded to the present company. The factors, which materialized the integration system might be the following ones. First, the processing factories were in financial difficulties owing to decrease of the broiler raisers. Secondly, the producers desired to reduce the production cost and to

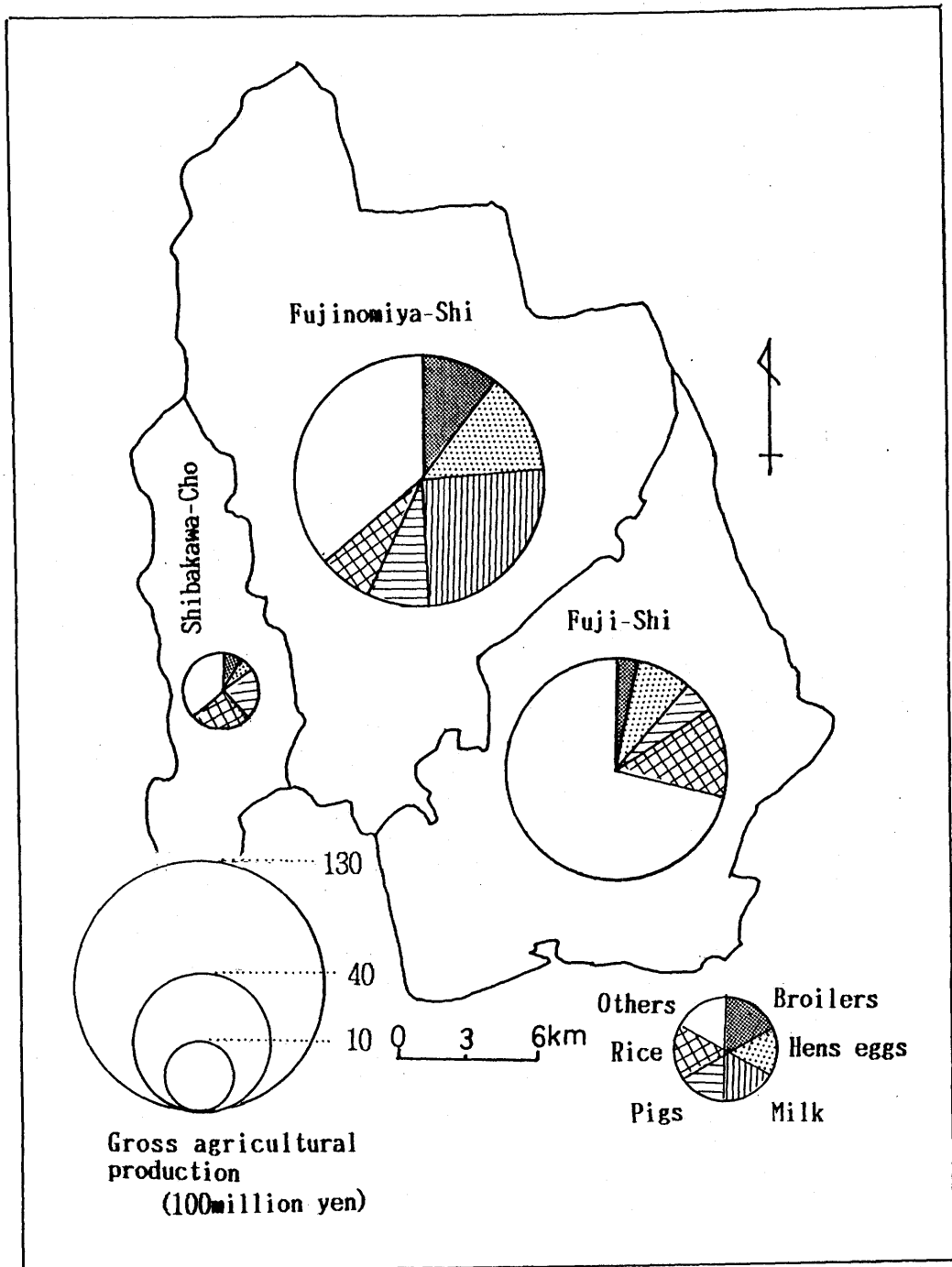


Fig. 23 Proportion of main agricultural sections in Fuji district, 1985
 Source: Statistics of net product of agriculture in Shizuoka Prefecture

maintain the long term and stabilized raising. They wanted accordingly to be affiliated by the special processing factory to obtain unified supply of the chicks and the feed. The processing factory, for these purposes, made the contracts with a local hatchery, Fuji farmland of Arbor Acres Japan Co., Ltd. which was affiliated firm by Mitsui & Co., and with Yokohama plant of Nippon Formula Feed Co., in the same affiliation on the transactions of the feed respectively (Table 13). Thus, the foundation of the integration system was established. The factory adopted the commission contract system.³⁰ By this system, the factory would offer to the farms the production materials such as the feed, the chicks and chemicals, would purchase the live birds, and would pay them the difference as the handling fee.

On the other hand, 12 raising farms in the Fuji district were not affiliated by Fuji-Asahi Broiler Co. conducted the production contracts with Sansei Broiler Co.³¹ at Nanbu town in Minami-koma gun of Yamanashi prefecture, Keizai-Ren Meat Center of Shizuoka Prefecture³² at Ogasa town in Ogasa gun or Corporative Association of Shizuoka Broiler Center³³ in Shizuoka city.

Next, the processing and the selling of broiler in the Fuji district will be surveyed.

Until the beginning of the 1970's, 70 to 80 % broiler was shipped in the form of carcass to the local cooperative stores and to the wholesalers in east prefecture. Afterwards, broiler were increased the volume of cut-up meat shipment, and expanded their market to supermarkets and convenience stores in Kei-Hin district. They were shipped about 70 % of the total production in the cut-up meat from in 1985.

Fuji-Asahi Broiler Co. has been conducting regional specialization since its affiliation, i.e. carcass treatment at Fujinomiya processing factory and cut-up meat at Okitsu factory in Shimizu city, because labor

Table 13 A broiler processing factory and its systematization in Fuji district, 1986

Name of broiler processing factory	1) Year of operation	Investors	Location	2) No. of processed broilers per year (10,000)	3) No. of affiliated farms, () no. of directly managing farms	Breeding type		The hatchery for buying most chicks, () Location	Main suppliers of formula feed	Main distributors of broilers
						Owed	Contract			
Fuji-Asahi Broiler Co.	1964	Miyama Broiler Co. Asahi Broiler Co. Fuji Broiler Co.	Fujinomiya-Shi Shimizu-Shi	3 6 0	4 2 (1)	6 %	9 4 %	Arbor Acres Japan Co. (Fujikawa-Cho)	Nippon Formula Feed MFG, Co. (Port of Yokohama)	Asahi Broiler Co.

Notes: 1) The beginning year of operation 2) No. of processed broilers per year 3) No. of affiliated farms, () no. of directly managing farms
4) The rate to total breeding birds

Source: The author's field survey

for the processing work can be secured in the vicinity of Shimizu city relatively easily. This company, originally a chicken store, has opened three direct stores and three restaurants in the city since the latter half of the 1970's, and has been aiming the multiple marketing exemplified by the various household dishes.

b. The regional distribution of the raising farm households

Fuji-Asahi Broiler Co., owing to its affiliation and withdrawal of the small-to medium-sized processing factories, has come to double the number of its affiliated raising farms. Its regional distribution is: 18 farms at Fujinomiya city (including 11 ones at Kitayama area), 4 ones in Fuji city and a direct farm managed by its member at Kitayama area. This member utilizes four broiler houses in which the farms have given up raising as well as his own broiler house, and ships 200 thousand broilers in a year.

Since the factory can secure only a little more than 50 % of its capacity in the Fuji district, it has to supplement the rest by securing 19 affiliated farms mainly at Higashi-Fuji (the east outside of Fuji district) and Izu districts and other prefectures. The broiler collection region of the factory thereby is obliged to be a wide and diffused one, being formed in 70 km range (Figure 24). This situation has originated from the following fact. Since there is no feed base from the east outside of the Fuji district in this prefecture, integrators have to depend on the one at Yokohama Port. Thus, the factory approached to join raisers in these areas whose region integration system had not been formed. In consequence, the factory has to set outside of the district the base of the chick raising and the shipment schedule, and has to supplement the vacant period with the production by the local farms. The factory has succeeded in stabilized operation of the processing in this way.

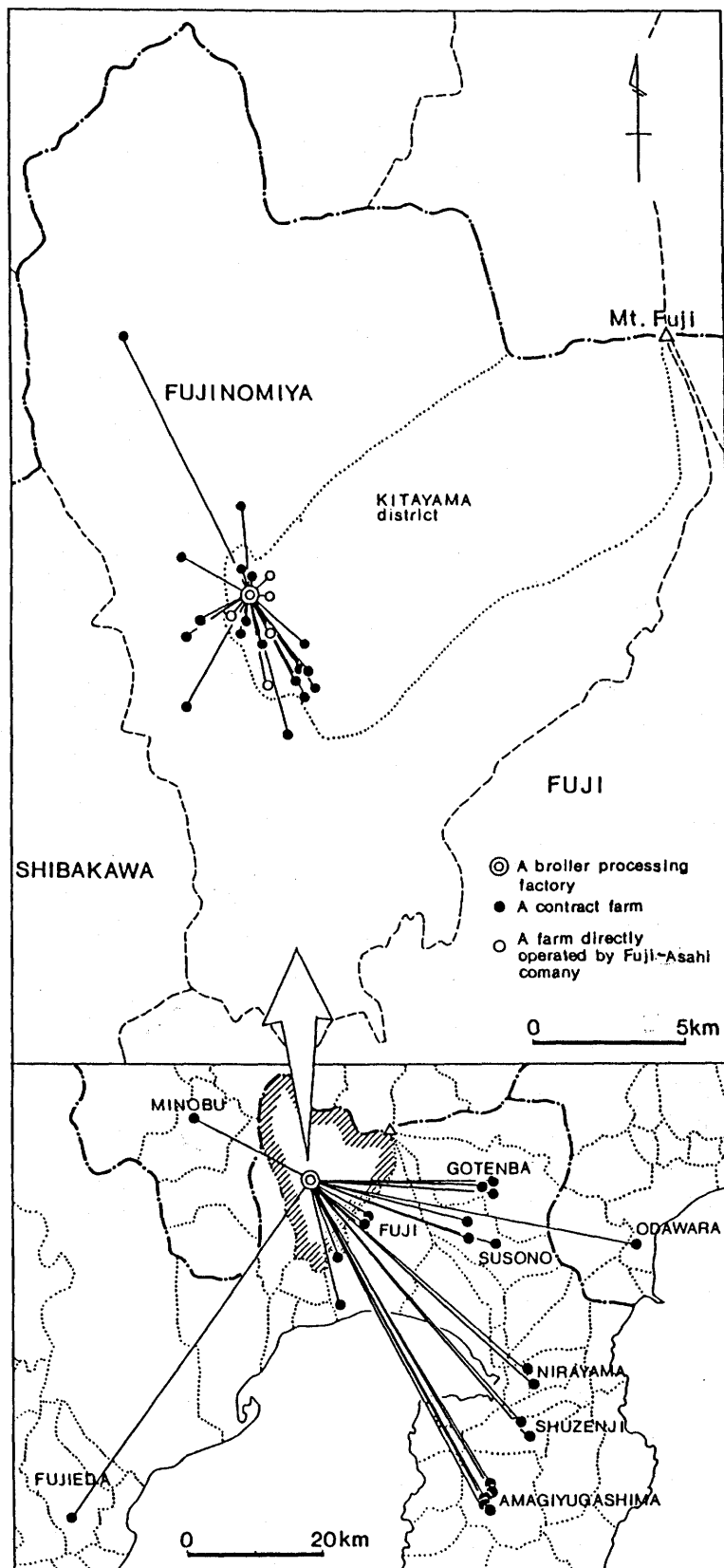


Fig. 24 Distribution of contract farms with Fuji-Asahi broiler processing company, 1986

Data source : The author's field survey

3) The regional character of the broiler industry at Kitayama area in Fujinomiya city

a. The position of the broiler industry in the agriculture

As for the agriculture in Kitayama area, the total number of the farms was 585 in 1985 (15 % of that in Fujinomiya city), which showed 35 % reduction from that in 1960. The number of the specializing farms has been largely reduced from 37 % to 10 %, and that of farms with side jobs has also fallen from 35 % to 19 %, which situation has spurred increase of the farms doing farming on the side (Table 14). Until the beginning of the 1960's, around 20 % of the farms had managed more than 1 ha land through cultivation of the devastated region, the wilderness and the forest, which had existed outside of the national forest at the mountain foot. When the 1970's started, however, Gakunan area was industrialized, and the bypass of the national road No.139 line was opened. Accompanying these changes, some farmlands were turned into housing lots, and farm roads were enlarged, thus accelerating destruction of the farmland. Moreover, the heads and the successors of farms with side jobs increased in number. Since the beginning of the 1980's, the householders have been working in the full-time service outside of agriculture, and thereby the agricultural management has been committed to their wives and seniors. Accordingly, transactions and lending of farmland have increased, and the number of the farms with less than 0.5 ha has increased up to the two-thirds of total farms in 1985. In addition, around 60 % of the householders of mainly other jobs farms work outside of agriculture, and only 10 % of the total householders are conducting the full-time farming.

The agricultural land use will be examined regionally (Figure 25). The variation of the altitude seems to determine the difference of the weather and the soil conditions, which might bring about the right crops for the right land so far. Namely, up to 350 meters altitude, the paddy

Table 14 Changes in farm structure at Kitayama district of Fujinomiya-Shi

Items	1960	1965	1970	1975	1980	1985	
Total farm households	896	817	743	662	647	585	
Full-time farm households ratio	37.1%	25.2	19.6	11.8	11.9	10.2	
Part-time farm households ratio	Mainly farming	34.6%	27.9	26.8	23.6	17.0	19.0
	Mainly other jobs	28.3%	46.9	53.6	64.6	71.1	70.8
The ratio of livestock farm households	100%	98.7	69.9	39.9	32.0	24.4	
The ratio of farm size by cultivated land							
Under 0.5ha.	38.4%	40.0	46.4	52.7	59.5	65.3	
0.5 ~1.0ha.	39.6%	39.8	36.1	33.6	28.4	25.7	
1.0 ~1.5ha.	19.2%	16.6	13.9	10.1	8.8	5.6	
Over 1.5ha.	2.8%	3.6	3.6	3.6	3.3	3.4	
Agricultural land (ha.)							
Paddy field	126	132	131	108	112	101	
Upland field	453	374	279	174	149	164	
Land under permanent crops	18	13	12	40	24	22	
Permanent meadows & pastures	1	8	28	44	40	36	

Sources: Agricultural census, Statistical of net product of agriculture in Fujinomiya-Shi

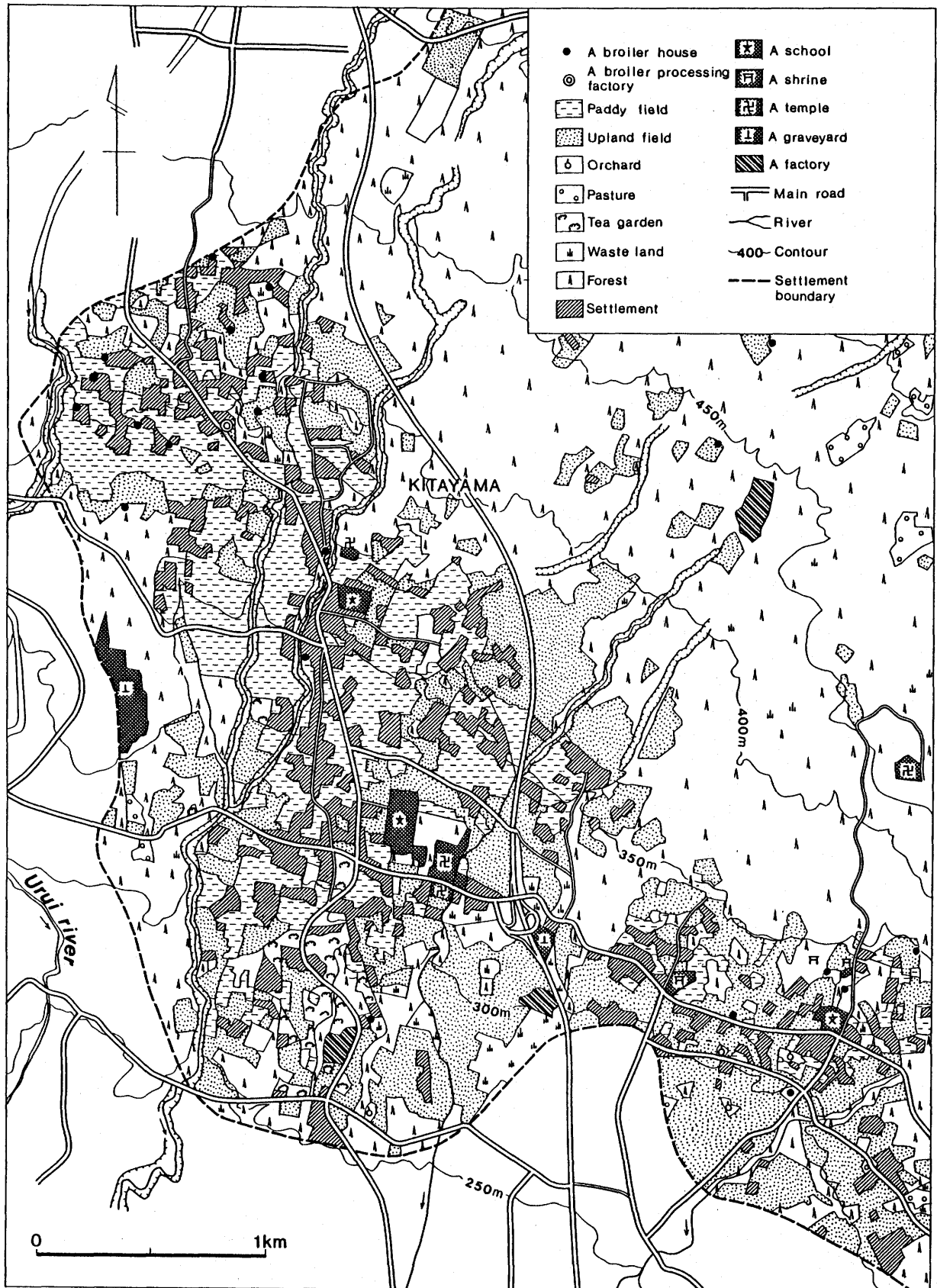


Fig. 25 Land use at Kitayama district of Fujinomiya Shi, 1987
 Data source : Topography of Fujinomiya Shi. The author's field survey

field is prominent in the basins of small rivers, and up to the vicinity of 500 meters, the upland field is dominant, and the orchard and the grass land are also observed. The national forest of Mt. Fuji occupies the land above 500 meters altitude. Further, the specialized farms doing rice growing concentrate at the west edge of this area, and the specialized farms conducting upland field farming are dispersed in the east. Many livestock raising farms are gathering in the south region. The density distribution of the hamlets is high along the national road running from south to north and its bypass road, and some are scattered as far as to the east foot of the mountain at about 400 meters altitude.

As for the agricultural management, the rice growing farms occupy 42 % of the total, the first rank in the agricultural products money amount, which surpasses largely the second 8 % of the vegetable farming households. Thus, this area can be specified as an agricultural region of the strong composite management which has the rice growing as its core combined with the livestock and the vegetable productions. However, 15 dairy farms in the livestock sector conduct the single management, and the successors in around their thirties bear responsibility in 8 farms particularly. This may be explained by the fact that each of them gains the most stabilized income of about 8 to 10 million yen per year, through raising 19 heads on average. The broiler raising farms doing the single management were 12 in number out of 14 total farms. This number follows that of the dairy farming, but the average income amounts to around 50 % of that of the dairy farms. Moreover, only 2 farms hold their successors doing management. The others are: the swine raising (21 farms out of the total 66 conduct the single management), the beef cattle raising farms (5 ones out of the total 38 do the single management) and the poultry raising farms (3 ones out of the total 10 do the single management). However, these farms keep just a small

raising number. They are thus conducting their managements composite with other crops, but their scales are gradually diminishing.

b. The location and the agricultural management of the farm households raising broilers

The 17 broiler raising farms in 1986 will be surveyed (Table 15). The ones raising more than 70 thousand broilers per year are conducting the single management (farm household from No.1 to 8), and the others raising less than those are performing the diversified management (farm household from No.9 to 17). All of the raising farms depend on the family labor. Besides, the larger scale raising farms tend to manage the smaller cultivated land, and, on the contrary, the farms holding large arable land tend to concentrate on the crop cultivation. Namely, there exists a correlation between the broiler raising number and wideness of the arable land, which fact may suggest their agricultural management being oriented to the market trend of the farming and livestock products. In addition, among 11 farms that had started raising till the 1960's, 8 farms expected strongly its high profitability and its future, but the late runner raisers were induced by processing factories. Moreover, 10 farms turned from the poultry raising. They started the broiler management earlier than those from other sectors, which fact may indicate that the broiler industry has been developed on the basis of the poultry raising management. In addition, there has been neither livestock housing prepared nor movement of the broiler house done in Kitayama area. Almost all of the broiler raising farms have practiced the improvement to the windowless house responding to the animal waste pollution and to the requirement of scale enlargement since the 1970's, but they have not achieved the largest scale management in view of the broiler industry of the whole country.

Since this area, adjoining to the industrialized district, has been relatively favored with employment opportunities, the agricultural

Table 15 Management of farm households raising broilers at Kitayama district of Fujinomiya-Shi, 1986

Farm number	No. of broilers raising per year (10,000)	Acreage of cultivated land (a.)		Forest land (a.)	The ratio of broiler income to total one (%)	Other sources of income	Family worker 1)	The beginning year of raising broilers	The changing year from open house to window less one	The greatest reason of beginning raising 2)	Works before raising broilers
		Paddy field	Upland field								
1	3	20	10	320	100		○○	1967	1977	A · B	Poultry, Rice, Sweet potatoes, Corn
2	2			200	100		○○	1972	1972	C	Poultry
3	2		2	40	100		○○	1959	1974	B	Poultry, Tobacco
4	1		40		100		○	1965	1977	B	Poultry
5	8		25		80	Vegetables	○○	1974	1985	B	An office man
6	8	15			100		○○	1963	1967	D	An office man
7	7		40		100		○	1965	1976	B	Poultry
8	7	40	20	40	90	Rice	○○	1967	1976	A	Poultry
9	5	55			5	An office man, Rice	○○	1973	1973	A	Rice
10	3		20	80	60	An office man	○	1970	1977	A	Poultry, Dairy cattle, Tobacco
11	3	10	40	20	50	An industrial worker	○○	1967	1973	A	Vegetables
12	2	80	60	50	30	An industrial worker, Rice	○	1967	1977	C	Poultry
13	2	15	4	5	30	Vegetables, An office man	○○	1967	1973	C	Rice, Vegetables
14	2	50			10	An office man	○	1979	1981	C	Rice
15	1	10	40	30	30	An office man, Vegetables	○	1965	1977	A	Poultry, Vegetables
16	0.7	100			10	Rice, Part-timer	○	1970	1975	C	Rice, Vegetables
17	0.6	20	80	250	20	Vegetables, Medical crops	○	1967	1973	C	Poultry, Rice, Vegetables

Notes: 1) H: Householder W: Wife of householder S: Successor W: Wife of successor

2) A: Profitability, B: Promising feasibility, C: Canvassed by the broiler processing factory, D: Animal fancier

Source: The author's field survey

successors have been hardly brought up. Moreover, owing to slow down of the broiler gains since the latter half of the 1970's, the raising farms have tended to give up raising and to conduct the diversified farming management depended on women. While two farms such as No.1 and 8 have the successors in their thirties doing management, but all of the other managers are in above fifties.

In view of the location and the management, the broiler raising farms may be classified into the following two types. The first type: the location is at a upland field farming zone. The farm is conducting the broiler raising in the specialized management. Farm from No.1 to 5 and 7 belong to this type.

The second type: the location is mainly at a paddy field farming zone. The farm is conducting the broiler management as a subsidiary occupation. Farm No.9, from 12 to 14 and 16 belong to this type.

As a example of the first type, the management of farm No.7 will be surveyed. The family consists of four members, i.e. the householder (53 years old), his wife (48 years old), the householder's mother (78 years old) and their eldest daughter (25 years old). The hoseholder only conducts the broiler management, and he and his wife do cultivation. The eldest daughter has a service at a company in Fuji city, and the householder's mother has retired. As they are dependent neither on the daughter's salary nor on the mother's national pension, they gain their income actually from the broiler raising and the irregular crop cultivation. The farm house exists at the mountain foot at the altitude of 280 meters in south Kitayama area, and is attached by 40 are upland field. Two broiler houses (9 thousand broilers in one house) and one shed stand at a corner of the farm, and they occupy 14 are in total. They cultivate corn and green soy beans on the land of 25 are at present, and sell a part of their products. However, the cultivation has not been performed constantly.

In addition, they had been farming sweet potato until 1961, and keeping poultry till 1965. At this time, as the demand for the broiler was anticipated, they accordingly utilized the cage type layer houses without any modification, and introduced 3,500 broilers. The broiler litter was, after the solar drying treatment between the broiler houses, restored to the farm, and a part of it was sold through Fujinomiya City Nokyo. In 1976, they changed the houses to a windowless one with a loan of about 6 million yen and about 4 million yen of his own fund. The transfer enabled them both to save labor and to meet the animal waste pollution. They increased the raising number, and became able to manage the broiler litter treatment once for all at the time of broiler shipment. Moreover, having been affiliated by Fuji Broiler Co. till 1985, they purchased the chicks from the processing factory and the feed from a local dealer respectively, and sold live birds to the factory at the current market price. Afterwards, owing to the introduction of the integration system by the processing factory, all the transactions have been performed between the factory and them, and thereby they have complied with the raising commission contract system.

As an example of the second type, the management of farm No.13 will be studied. This farm house is located at north-east part of Kitayama district, and stands at 410 meters altitude and in the boundary where the three areas, Kamiide, Shiraito and Ueno, meet together. The river Urui is running nearby. The family comprises four members, i.e. the householder (64 years old), his wife (62 years old), their eldest son (35 years old) and his wife (30 years old). The son and his wife have no child. The family belongs to the typical farm household with mainly other jobs. The householder and his wife engage in the broiler raising and farming works. The son and his wife are working at a plant and a store in Fujinomiya city respectively. They own the arable land of 19 are, are managing the paddy field of 15 are, and are cultivating the

farm of 4 are (corn, taro and a herb called Mishima-saiko). Besides, they possess a copse of 5 are.

Since this farm had been a small crop cultivating one until the introduction of broiler, the householder had been working temporarily in the road maintenance. In 1967, a local processing factory induced him to raise broiler. He responded to the advice to get a more stabilized income. He demolished the farmland of 6 are, and set up a cage type broiler house there. Then he introduced 3 thousand broilers, by which he came to supplement 20 % of the living income. In 1973, he altered the broiler house to a windowless one. Since that time, he has been raising 5 thousand broilers constantly. The broiler litter has been consumed for his own purposes. Besides, he had purchased the chicks and the feed from local dealers up to 1973, and he had offered live birds to a processing factory at Naibu town in Yamanashi prefecture according to the payment guarantee contract. Afterwards, coping with the jump of the chick and the feed prices, he changed the dealers. He has laid in the chicks from a hatchery at Izu-nagaoka town, and the feed from another local dealer. He was obliged to alter the broiler contract by request of the processing factory in 1982, owing to the sluggish broiler market price.

In addition, among the farms which do not belong to either of these two types, farm No.6 and 8 are located in the paddy field farming zone and conduct the specializing broiler management. Other No.10, 11, 15 and 17 farms exist in the upland field farming zone, and perform the broiler raising as a part of their diversified management.

4) The regional conditions for production area formation of the broiler industry

Through the blood relationship and the regional connection that have been firmly founded among the broiler raising farms in Kitayama area,

they have been conducting the information exchange and the mutual farming cooperation in their agricultural management. Accordingly, they have moved smoothly from the poultry to the broiler raising since the 1960's. Namely, the switchover has been made collectively. In consequence, although the stratum differentiation, i.e. the principal and the specializing, may be observed at present, the broiler raising has continued to be performed by majority of them, and few farms have discontinued raising. The small-sized raising farms, that possessed the poor self-funds, fell behind in switchover to the windowless house, and thereby had to fill the repayment to their loans by non-agricultural services. The farms that had not borrowed much money changed the broiler houses quickly to the windowless ones, and thereby they have been enjoying the raising scales.³⁴ Other local specificities are: (1) a strong correlation exists between the wideness of the arable land and the broiler raising, and (2) the broiler management has been performed in connection with land use.

Moreover, Broiler Producer Council of North Fuji District, which was organized for the purpose of arranging the small production groups in a wide range, has been indispensable to the maintenance of production through mutual contacts. However, since the integration system, that characterizes the broiler industry most, has not been formed until the latest, the regional development of the broiler industry has been restricted in the Fuji district. Further, in comparison with the dairy and the tea sectors that have been abundant in successors, the broiler sector has not been favored with a relative advantage of profitability. In addition, the farmers have been inclining to the employment opportunities in the secondary and the tertiary industries. From these reasons, the broiler management has been gradually committed to women and seniors. It may be concluded that the formation and the enlargement of the broiler industry have not come to maturity in this district.

- 1) Harima district in Hyogo prefecture, particularly Himeji city, and Yumesaki town, has been a poultry raising region for a long time. The district had occupied about 60 % (75 % in 1985) of the total raising number of the prefecture till the 1960's. On the other hand, Tajima district had occupied less than 10 %, and held a small number of farms conducting the principal and the specialized management. (From Annual Report of Agriculture, Forestry and Fishery in Hyogo prefecture.)
- 2) Usui and Yoshida (1965, p.70).
- 3) The whole year raising was practicable by a stove type heating, but raising was not conducted owing to its low profitability due to the high heating cost. (Interview at Tajima Broiler Agricultural Cooperative.)
- 4) Two employees became independent in 1961 to 1962. They got linked with Nippon Formula Feed MFG, Co., and Taiyo Shiryo Co., respectively, and became the wholesalers (see Figure 10). (Interview at San-in Nogei Co.,Ltd..)
- 5) Because the contract price in 1965 was 185 to 195 yen for 1 kg, which gave a high gross profit of about 50 yen per a broiler (1.5 kg), the broiler raising attracted more attention. (Note 2, pp.80 ~83.)
- 6) Corresponding to the hatchery in Table 10.
- 7) They set up two incinerators where the broiler and cattle litter were mixed, and they guided the raw sewage to a purification tank together with the cleaning drainage from each livestock house. (Interview at Clerk of Agricultural Administration in Hidaka town hall.)
- 8) Fukuchiyama farmland, Wadayama farmland and Moriyama farmland at Hidaka town took over a broiler raising farm, a swine raising farm and a breeding cook plant respectively, and each farm has been raising

- there under the salary contract system. (Interview at Tajima Broiler Co.)
- 9) The broiler production cost amounted to 31,889 yen per 100 live broilers in 1970, 57,636 yen in 1975 and 56,911 yen in 1985. (Interview at Livestock Section of Agriculture, Forestry and Fishery Department of Hyogo prefecture.)
- 10) Nagasaka (1988a, pp.245 ~246).
- 11) Nokyo affiliation established National Broiler Price Stabilization Fund System in 1970. The assessment of 6 yen per 1 kg was assigned to Zen-Noh, Keizai-Ren, Nokyo and the producer, and was used as a supplement in case of a sudden rise of the market price. Shosha affiliations, together with the processing factory and the producer, also contributed a fund of 5 yen per 1 kg. However, the live bird price being paid by the processing factory was not calculated through subtracting the freight from the carcass market price, but the actual purchasing price was estimated on the basis a certain income level of the farm. The purchase price was about 15 yen per 1 kg higher than that in the new production areas, thus forcing the factory to cover a deficit of about 50 to yen per 1 kg. (Interviews at Tajima Broiler Co. and Tajima Broiler Agricultural Cooperative.)
- 12) As the preventive measures to the chicken disease which prevailed in the Tajima district from 1978 to 1979, they intended to improve the raising management through the simultaneous chick raising and shipment of each housing. Further, they performed an energy saving step by heating the broiler house through use of the heat source in the broiler litter treating plant. In addition, Livestock Housing of Hirotsu Area in Yabu town was prepared in 1978 as a link in the chain of Secondary Agricultural Structure Improvement Project, and 7 broiler farms moved into it. Livestock Housing of Mitani Area in Yoka

town was also born as a link in the chain of Group Livestock Industrial Management Environment Arrangement Project, and two swine raising and two broiler raising farms moved into it. (Interview at Mikata Nokyo.)

- 13) For its personal possession, 54 million yen was imposed on a tenant. Thus, a household was obliged to ship 100 thousand broilers per year to fulfill the repayment. (Interview at Mikata Nokyo.)
- 14) When Tajima Broiler Co. was set up, the broiler raising farms affiliated by the company organized. An agricultural cooperative which has been a sole special one in the Tajima district and holds 17 % of the stocks of the company.
- 15) Processing of broilers was done during the daytime in general, but the products were the most fresh carcass, because the broiler was collected in the evening, processed at night, and delivered to Kei-Han-Shin markets in the morning. However, its production cost was higher than that of the ordinary carcass, and the demanded volume was restricted. (Interview at Osaka Suehiro Broiler Co..)
- 16) The regional environment disliked slaughtering living animals. The workers thus had little endurance at the operation, and the factory always suffered from a lack of man power. (Interview at Tajima Branch of Keizai-Ren of Hyogo prefecture.)
- 17) Eleven hatcheries existed in 1970. The small-sized ones which could not afford to improve the facilities were driven to discontinuation. Seven hatcheries remained in 1986.
- 18) Five plants at Kobe Port, one at Amagasaki Port and one at Sumoto Port have retired. Three plants of large scale feed firms were included among them.
- 19) Around 1,000 yen was alleviated from the freight of 3,500 yen per ton. (Interview at Tajima Broiler Co..)
- 20) Most of them were engaged in the secondary and the tertiary

- industries (including part-time jobs). The number of those who worked away home in winter season was large till the 1960's, but decrease to less than 10 in 1985. (Interview at Hidaka town hall.)
- 21) According to the agricultural division of Shizuoka prefecture by Kanto Agricultural Administration Bureau, Fujinomiya city, Fuji city and Shibakawa town are called Fuji district.
- 22) It was integrated to Fujinomiya city in 1958 together with other three villages, i.e. Ueno, Kamiide and Shiraito.
- 23) In 1968, the number of the raising farms was 60 in Fujinomiya city, 20 in Fuji city and 10 in Shibakawa town, and the shipment number reached 10 million level. (According to Statistics of livestock products in Shizuoka prefecture.)
- 24) Nine organization existed in total: one in both Fuji city and Shibakawa town and 7 in Fujinomiya city. Besides, the sibling relationship exists between the householders in Table 15, i.e. between 11 and 12, and between 16 and 17. Among the householders of 5, 10 and 15 the relationship of brother-in-law exists.
- 25) Feed supply to the Fuji district was 15 to 20 % from Shimizu Port, and the rest from a plant at Yokohama Port. (Interview at Fuji-Asahi Broiler Co..)
- 26) It started from a retail chicken store in 1960, and established processing factories in Shimizu city in 1967 and in Kitayama area of Fujinomiya city in 1975. It changed its name from that of individual management to Fuji Broiler Co. in 1968.
- 27) In the first half of the 1970's, 10 farms mainly holding householders in their less than fourties gave up raising in Fujinomiya district except Kitayama area. The grounds were: (1) failure in the broiler raising management by the cage type house, and (2) low selling price of the broiler. (Interview at farms in Kitayama area.)

- 28) It has not come to such an organization as special agricultural cooperative or to utilize cooperatively the raising facilities.
- 29) In the Kitayama district, one farm in 1977, and from 1983 to 1984 5 ones gave up raising. One of them turned to poultry raising, and other 5 farmlands were shifted to the owned farms of Fuji-Asahi Broiler Co.. The company member has been managing them. (Interview at Fuji-Asahi Broiler Co..)
- 30) The system that the processing factory payed 45 yen per 1 kg of live bird under the feed conversion ratio standard of less than 2.25.
- 31) This company was set up by the one who came from Asahi Broiler Co. in 1980. Owing to its financial difficulties, it was taken over by a meat wholesaler in Numazu city; Yonekyu Co.. (Interview at Sansei Broiler Co..)
- 32) The factory conducted also the carcass treatment as to the broiler from 1970, and suspended it in 1986. However, the factory has continued to process cattle and swine since the 1960's. (Interview at Keizai-Ren Meat Center of Shizuoka prefecture.)
- 33) It was established as a cooperative association organization by Shimizu Branch of Mitsui & Co., nine special agencies of Nippon Formula Feed in Shizuoka prefecture and Shizuoka Chick (hatchery). (Interview at Shizuoka Broiler Center Co..)
- 34) Interview at Fuji-Asahi Broiler Co..

PRODUCTION AREA FORMATION OF THE BROILER INDUSTRY IN REMOTE AREAS

1. Production area formation of the broiler industry in Miyazaki prefecture

In Miyazaki prefecture holding the inferior circumstances such as the typhoons and the volcanic ash soil, the agriculture had been dependent on crops, and conducted on a basis of the double-cropping including upland rice and sweet potato centering around the inland, and paddy rice and grain in the seaside. In consequence, the productivity had kept a low level in the whole country agriculture, and the prefecture had been called a district of the boundary agriculture. For the purpose of a new turn in its agriculture, the livestock industry and the house horticulture were introduced in the 1960's. The broiler raising formed a typical sector, and it spread over centering around Koyu district. It further diffused to Morokata district centering around Miyakonojo basin in the 1970's. In the latter half of the 1970's, the prefecture became one of the main production areas comparable to Kagoshima prefecture in the broiler industry of Japan. It has been holding the position up to now.

1) Development of the broiler industry

a. The stage of development of the production area

(until the beginning of the 1970's)

The chicken raising in Miyazaki prefecture started around 1930 as a supply to chicken cooking restaurants in Fukuoka city. The farms in Morokata district raised about 10 chickens per farm in their gardens. The buyer laid in the male chicks from Aichi prefecture, and sent the

chicken every day from Miyakonojo Station to Hakata Station by a goods wagon.

The broiler industry was started by Kobayashi Poultry Cooperative in Nishi-morokata district centering around Kobayashi city toward the end of the 1950's.¹ It was actually a subsidiary management (raising about 100 broilers per farm in the battery type broiler house). Each farm packed broiler after removal of internal organs in apple boxes, and shipped to north Kyushu district by night train. However, owing to deterioration of its freshness, shipment was impracticable from spring to summer. The cooperative set the refrigerator in the treatment process in 1961, thus making the whole year shipment possible. In consequence, the members increased to 70 farms, and the shipment scale reached 400 thousand broilers per year. The cooperative established Kobayashi Poultry Cooperative Ltd. (changed to Co.,Ltd. in 1975) in 1965, and set up a local processing factory in Kobayashi city. Then it was affiliated by Mitsui & Co. and came to deal the feed of Nippon Formula Feed MFG, Co.,Ltd.. Thus, a full-scale broiler production system was established.

As for other poultry raising sectors, Tomita Village (Shintomi town at present) Poultry Cooperative and Takanabe Town Poultry Cooperative joined together to organize Koyu Poultry Cooperative², which held most raising farms and the largest raising number in the layer sector of the prefecture, thus being the kernel of the poultry raising industry of Miyazaki prefecture. Koyu Poultry Cooperative set up a processing factory for treatment of the culled chicken in Shintomi town in 1958, and processed also the broiler from about 10 members of Kawaminami Chicken Meat Production Cooperative.

In 1959, Primary Disaster Prevention in Agricultural Management Project (~1964) was practiced as an Agricultural Fundamentals Plan in Miyazaki prefecture. The purpose of this policy existed in enhancing the

land productivity through: (1) avoiding typhoons by the early rice growing, (2) arrangement of the land foundation and the irrigating facilities for upland field, (3) introduction of the house horticulture by use of the warm winter climate, and further (4) the goods producing agriculture such as the livestock oriented ones by using the relatively wide forest and upland field.

At that time, the broiler industry was in its germinal stage as shown by the figure of 730 thousand, the number of the broilers raised in the whole prefecture, stood 29 th in the whole country, which figure corresponded to 8 broilers per farm. Although the raising was conducted in a small scale management, it was attracting attention as the most promising sector in the small-to-medium-sized livestock raising.

Secondary Disaster Prevention in Agricultural Management Project (~ 1970) was put into operation in 1965, thus accelerating the district's inclination to the house horticulture and the livestock production. From the latter half of the 1960's, the livestock oriented management was spurred in Morokata district. The farms, specializing in rice, wheat, sweet potato and sericulture etc. in the area at the mountain foot of Kirishima Volcano, began turning to the Japanese cattle raising and to the dairy farming at this time, and to the swine raising from the 1970's. On the other hand, the small scale diversified farms, that had been cultivating grain, sweet potato, rape and sericulture etc., were shifting to the broiler management from the latter half of the 1960's.

In 1966, three diligent farmers, Katahira, Oshikawa and Numata, became independent from Kawaminami Broiler Production Cooperative to conduct cooperating sale business of broiler. They founded Koyu Shokucho Co.,Ltd. (the organization was changed to a stock corporation in 1971), and set up a processing factory (a processing capacity of 60 thousand broilers per month) in Kawaminami town. Further, this company

absorbed the Cooperative to begin with, advised the farms of Koyu district to raise broiler, then affiliated about 20 raising farms, and started a contract production system by which every farm had an obligation of raising 3 thousand broilers on the average. The company started the transactions of the feed and the chick purchase through business tie-up from Kawada Feed Corporation (C.Itoh & Feed Co. today) in Fukuoka city and from Tomita Hatchery Ltd. at Takasaki town in Kitamorokata gun respectively. Moreover, it set up a direct hatchery in Kawaminami town, and equipped there 8 hatching machines for the incubation to give 160 thousand chicks in 1968. In the sale strategy, it succeeded the sales network of Koyu Poultry Cooperative, which had retreated from the meat chicken sector in 1965 and stucked to the layer one, established the route to the meat stores in the northern part of the prefecture. Thus, it has founded a foothold for development of the broiler industry in Miyazaki prefecture.

In the latter half of the 1960's, the authorities published a project. In the project, they positioned Kagoshima Port as a grain center of south Kyushu, would arrange the port environment, and would start its operation as a feed base from the 1970's.³ Accordingly, south Kyushu came to attract public attention as a target region for Shoshas and the feed firms to enter for the purpose of the livestock management such as the broiler and the swine.

In 1967, Minami Kyushu Food Products Co.,Ltd., a subsidiary company of Marubeni-Ida Co.,Ltd. (Marubeni Co. today), advanced into Miyazaki prefecture as a starting member of the big capitals. The company constructed its direct farmlands in 5 places at the plateau from Kawaminami town to Takanabe town next year. It formed a large farmland with a total accommodation of 230 thousand broilers. The composition was: 74 open type houses, 34 flat floor type windowless ones and 16 two stairs windowless ones. It constructed, at the same time, a large scale

processing factory with a treatment capacity of 200 thousand broilers per month at Tsuno town close to the direct farmland and along the National Highway (No.10). In 1969, it further finished, in Kijo town, a direct breeding cock plant (a capacity of 40 thousand cocks), which consisted of 18 houses in 6 farmlands, and a hatchery which comprized 6 houses in 2 farmlands. The feed was transported on the Nippo Trunk Line from the feed plant of Marubeni Co. in Fukuoka city. The company combined contract with 107 farms in the Koyu district to reinforce both the feed sale and the broiler production. The company mobilized the Marubeni affiliated firms, i.e. Nissan Marubeni Co. and Daiei Co., in their strategy of the broiler sale. The product of 1 kg packing was transported by the exclusive refrigerating car to the area west of Kanto, and sold the products to the wholesalers and chainstores there.

Following Mitsubishi Co. set up Nihon Broiler Corporation⁴ in Hyuga city in 1968. The company constructed its direct farmland with a constant capacity of 90 thousand broilers. The construction comprized 78 houses in total, of which 37 were the open type ones with a total capacity of 340 thousand broilers and the rest were the windowless ones. A processing factory with a treatment capacity of 400 thousand broilers was also built as its attachment. As for the feed purchase, its 80 % was transported by goods wagon from Moji plant of Nihon Nosan Kogyo K.K., a Mitsubishi affiliated firm, and the rest was offered from Hyuga City Nokyo⁵. As for the chick, its 75 % was laid in from the affiliated Nishi-Nihon Pilch Ltd. (established in Hyuga city in 1966)⁶, and the rest from non-affiliated Mori Hatchery Co.,Ltd. (in Kawaminami town) through the cooperative relationship. The company further made the commission contract with 6 members of Hyuga City Nokyo, and committed to them raising 150 thousand broilers per month.

In 1968, Comprehensive Facility Fund System by Agriculture, Forestry and Fishery Finance Corporation started. Its maximum financing (private;

24 million yen, corporation; 90 million yen) was higher than those of Agriculture Modernization Fund and Swine and Poultry Facility Fund before that time, and the lending terms (5 % of annual interest and repayment in 25 years) were alleviated. Thus, the farms in the crop cultivation sector became able to prepare the fund which might be necessary for their switchover to the broiler management. These financial conditions and invitation by the processing factories accelerated to increase the number of the raising farms mainly in Koyu and Morokata districts. In 1970, the number of the raising farms in Miyazaki prefecture reached 750, and the broiler shipment number of 12 million stood seventh in the whole country ranking (Figure 26).

The farm directing to the viable farming and specializing broiler management was financed with about 7 million yen on average. The household managed two open type houses with 20 thousand broilers by the labor of the householder and his wife, and entered the integration system. On the other hand, many farms had anxiety concerning a new livestock management and a large amount of loan. However, they either responded to the land take over by Shoshas for construction of their direct farmlands, or became wage workers such as the raising manager of a farmland and the operator in the processing factory being attracted by the cash income. Particularly, both the seaside belt of the Koyu district and Chausubara plateau zone between the sea and Osuzu mountain were developed after the war to the zones of the upland field farming such as sweet potato, upland rice and grain, but their land fertility was low. These areas were thronged by the small and self-supporting farms owing to the low productivity and the low profitability. They had no basic crop comparable to the rice in the paddy field belt. The fact, that the villages existed in the boundary district and thus were characterized by its low land price and the low wages, might be the most important factor that induced Shosha capitals and others to

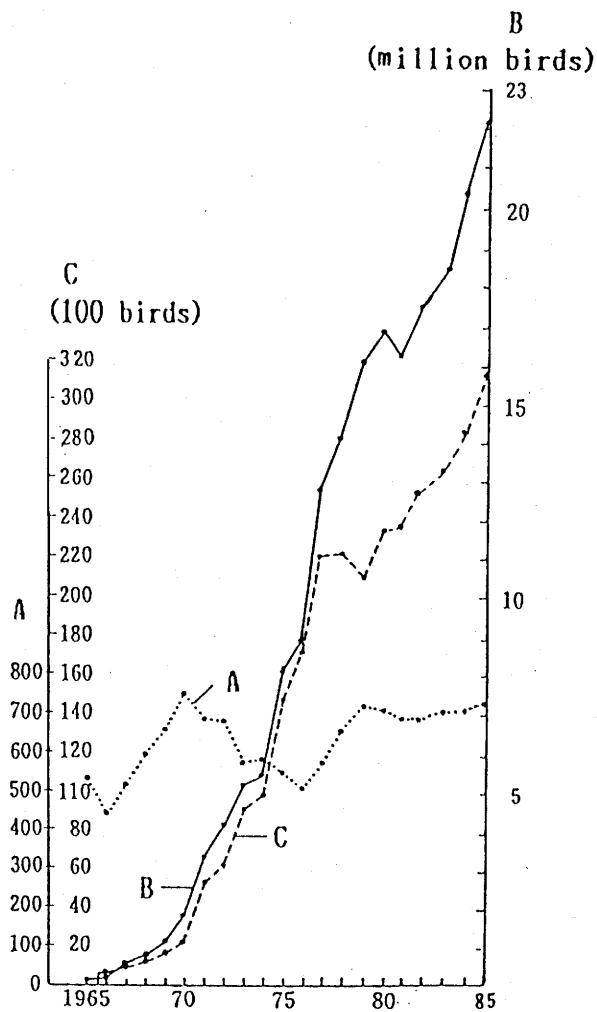


Fig. 26 Changes of broiler raising in Miyazaki Prefecture

Note: A) No. of farm households raising broilers

B) No. of broilers raising

C) No. of raising broilers per farm household

Source: Statistics of livestock products in Miyazaki Prefecture, 1986

advance into the small-to-medium-sized livestock industry such as the broiler and the swine one in this region.

In 1971, Miyazaki prefecture planned New Agriculture Promotion 10 years Project (~1980), in which it was stressed characterization of the food base in Japan. In the Project, it was offered a policy shift from the passive correspondence to the physical circumstances so far as manifested in Disaster Prevention in Agricultural Management practiced in two times to a more positive one which would make good use of the warm climate in winter, the uncultivated wilderness and the surplus labor force. According to the Project, modernization of the agriculture and the livestock production, therefore, should be promoted actually by the specialization to the livestock industry. The Project, to realize the goal, took up improvement of both the transport conditions and the agricultural management, which included upbringing of successors and the training courses of agricultural techniques (SAP Movement)⁷.

As for the transportation conditions, the pavement of the National Highway (No.10) had been finished until 1966, but the Nippo Trunk Line remained a single line. Thus, the transport time to the metropolitan regions had not been shortened, and the district had been still left as a desert island in the land. In 1967, Miyazaki Kumiai Feed Manufacturing Plant of Zen-Noh was constructed at Hyuga (Hosojima) Port as a sole feed base in Miyazaki prefecture.⁸ At this occasion, the plan on the marine transportation was raised. In March of 1971, Nihon Car Ferry Ltd. entered service to Kawasaki Port to begin with, to Higashi-Kobe Port in June, to Osaka-Minami Port next year and to Hiroshima Port in 1974.⁹ Every voyage was in both ways and once a day. In consequence, the transportation time to the large consumption areas such as Keihin and Kei-Han-Shin became shortened, and the cost reduction was achieved as well.¹⁰ Besides, the advancement in the refrigerating technology had made a mass transportation practicable. Based on these conditions, the

livestock industry including the broiler sector as its center developed remarkably in Miyazaki prefecture. The livestock sector (32.6 %) outran the rice one (27.2 %) and stood first in the gross agricultural production at the beginning of the 1970's.

As for the improvement of the agricultural management, it started in the following way. The members of Nokyo who wanted to use the National Loan Facilitation System strongly required Nokyo to enter the broiler industry. Then Keizai-Ren of Miyazaki prefecture decided its direct participation by using Hyuga Feed Plant of Zen-Noh. Corresponding to this movement, each Nokyo took the measures to bring up viable farming farms and for the purpose of raising successors to practice the technical guidance to young members. Nokyo asked the farmers for participation in raising broiler through these steps.

Keizai-Ren of Miyazaki prefecture set up a processing factory (a processing capacity of 750 thousand broilers per month) at the seaside in Takanabe town in 1972, its direct breeding cock plant¹ in Sadowara town and a hatchery (a producing capacity of 500 thousand chicks per month) next year. They affiliated about 50 farms in the Koyu district, and put the raising contract in operation. The processing factory thus coped with the proceeding factories under Shosha affiliations, and came to hold the largest scale in the prefecture. The integration system started as an unprecedent case in the whole country in the respect that its integrator belong to agricultural cooperatives.

In the upland field farming belt of the Koyu district, the farms specializing in the broiler increased, and the production competition among the processing factories was promoted. The district thus was establishing its position as a main production region. It may be understood from Figure 27 that production scale is large at the seaside from Hyuga city to Miyazaki city.

b. The stage of the main production area formation

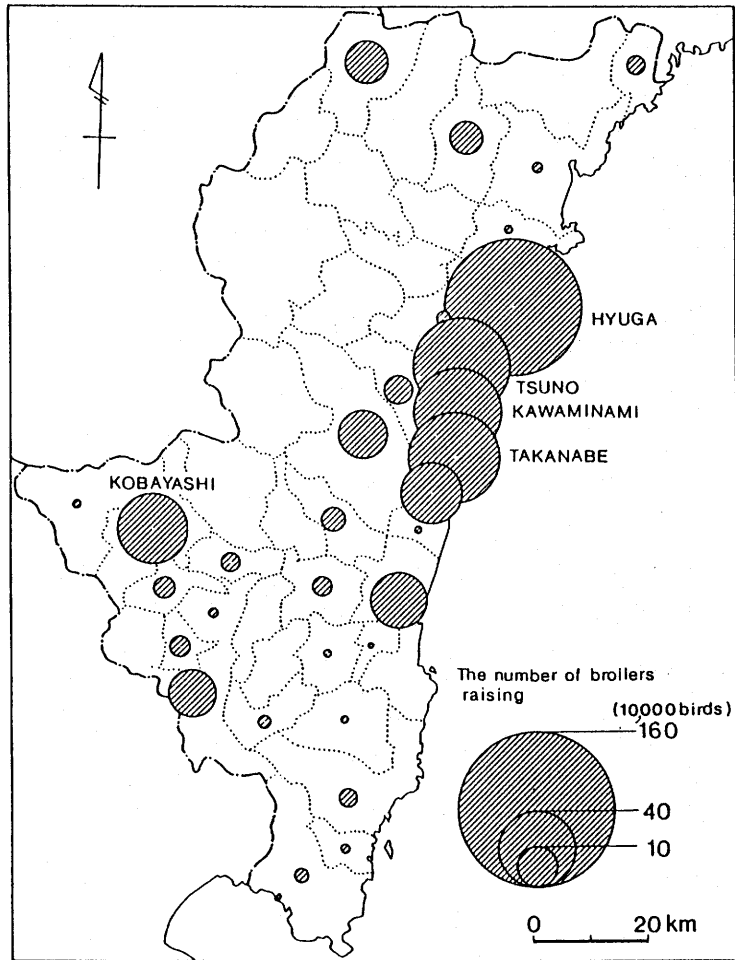


Fig. 27 Distribution of the number of raising broilers by cities, towns and villages, Miyazaki Prefecture, 1972

Data source: Statistics of livestock products in Miyazaki Prefecture

(after the first oil crisis)

Activity of the broiler processing factories in Miyazaki prefecture was not weakened by the influence of the first oil crisis. The integrators there succeeded in enlargement of selling volume both in the said district and in the large consumption areas through the competition in the Miyazaki prefecture among the enterprises. The factories accordingly reinforced their processing ability, and promoted to increase the number of the affiliated farms. In consequence, a big number of the large-scale raising farms were born in the Koyu district. The specialization degree in the management of the small-to-medium-sized livestock raisers such as the swine exceeded that of the truck farming. The farms tended to change the existing crop cultivation, which had been utilized for prevention of disasters in a part, to the agricultural and the livestock industries that depended largely on the facilities with high income. Accompanying this movement, the rapid modernization of the villages was progressing.

In Morokata district, on the other hand, a number of the production housings were constructed as the Secondary Agricultural Structure Improvement Project. Five members of Agricultural Association of Miyakonojo city led to construct a broiler production housing (15 broiler houses) in 1974 to begin with. From 1976 to 1977, 2 broiler production housing (5 farms in 15 houses and 6 farms in 18 houses) were built in Takasaki town, and 6 farms moved into 18 houses of a new production housing in Takajo town. Further, Keizai-Ren of Miyazaki prefecture, having accepted the request from the members of the local Nokyo, set up a broiler processing factory (a treatment capacity of 150 thousand broilers per month) in Miyakonojo city in 1974.¹² In addition, full operation of the feed base at Kagoshima Port gave momentum to the three local feed dealers to participate in production. Thus, the neighboring farms started the broiler production contracted with these

enterprises. The number of the farms specializing in the broiler increased in Miyakonojo city, Takasaki town and Takajo town. On the contrary, the farms that had conducted the broiler management subsidiarily in Kobayashi city, Takahara town, Nojiri town and Nichinan city tended to drop out, because they apprehended the influence from the jump of the facilities funds and the uncertainty to specialization. As a result, the raising number of Miyazaki prefecture showed the largest increase in contrast to the decreasing trend in the whole country. In 1974, this prefecture outran Hyogo prefecture, and stood second in the shipment number ranking of the whole country following Kagoshima prefecture.

Successive operations of the processing factories thus generated competition in the fields of production and distribution, and led the major factories to hold still larger scales.

Koyu Shokucho Co., for example, promoted enlargement projects ranging from production through shipment, and wonned a definite position as one of the leading local integrators in Japan. In the production, they (Koyu Shokucho Co.) affiliated a number of firms to secure the producers in south Miyazaki prefecture and Kagoshima prefecture. Namely, they affiliated Fujii Bussan Ltd., a feed dealer at Sueyoshi town in Kagoshima prefecture, in 1973, and let the firm set up a processing factory. In 1978, they affiliated Naka-Kyushu Shokucho Ltd. which had held 38 raising farms all over Kumamoto prefecture and had conducted the treatment processing. Further, in 1977 they moved the hatchery to Saito city, reinforced it to produce 1.5 million chicks per month, and set up a new hatchery (1.6 million chicks per month) in Kitago town in 1987. Since 1980 they have affiliated 4 food products companies in Miyazaki and Kagoshima prefectures to produce the processed foods. As for the feed transportation, they established a subsidiary company, Maruwa Unso Co.,Ltd. in Takanabe town in 1974, and set up a distribution center in

Miyakonojo city afterwards. Thus, they became independent of the wholesalers.

In the broiler sales, they came to cooperate with the major meat store of Miyazaki prefecture in 1975, and proceeded to let the affiliated processing factories sell broilers. In the Kanto market, their largest shipment destination of the cut-up meat, they affiliated an old meat wholesaler, Toriki Shoten Co. in Tokyo, and set it as the sale base. In order to advance into the Kei-Han-Shin market they took over Nissho Iwai Delica Corporation-affiliated Osaka Suehiro Broiler Co. which was in financial difficulties (see Figure 10). They practiced enlargement of the sale bases network in this way. In 1981, they advanced to the swine enterprise. They engaged the farms in the contract raising in the Koyu and Nichinan districts: 12 farms in the breeding sector, 10 ones in the fertilizing sector and 28 ones in the integrated sector. Besides, the swine has been committed to the slaughter house for treatment, and almost dressed carcass has been shipped to Tokyo by their own route.

Minami Kyushu Food Products Co. absorbed Kirishima Food Products Co., Ltd. at Kokubu city in Kagoshima prefecture in 1975, and opened a processing factory there. It converted about 70 raising farms to their direct farmlands, and intended to enlarge its production scale. Further, it advanced to the poultry raising through absorbing Hyuga Poultry Co. in Hyuga city in the same year, and raised 200 thousand layers at 42 houses in 5 farmlands in Kawaminami town.

The circumstances happened to change in these districts from 1976 to 1978. In other words, a chicken disease (the infectious laryngotracheitis) prevailed in this period owing to aggravation of the raising environment¹³ caused by overcrowding of the broiler raising. Centering around the Koyu district, the broiler industry suffered a serious loss, and particularly the small-scale raising farms dropped out,

thus reducing the number of the whole raising farms (see Figure 26). The fact that many farms expanded their broiler houses for scale enlargement at that time made the situation severer. As a matter of fact, they now could not be allowed to give up the management, because the financed loan¹⁴ of 17 million yen on average (for 3 houses with accommodations of 10 thousand broilers) had to be repayed. To cope with this situation, the producers practiced the epidemics prevention measures through the simultaneous chick raising, broiler shipment and the disinfection. Some hatcheries actually moved to the interior of the mountain foot for the purpose of raising the chick of high quality. Moreover, the broiler industry confronted another critical circumstances that the market conditions of the broiler stayed sluggish. The farms thus came to improve their managing technique and to inspire their motivation to raising more than before.

In the age of the 1980's, majority of the broiler raising farms shipped more than 100 thousand in a year in Miyazaki prefecture. The farm household, that conducted enterprising management of raising more than 300 thousand broilers mainly by the employed labor, appeared.

As for the regionality, the enterprises affiliated by Shosha have secured the farms in the districts which extends from Nishi-usuki gun (including towns of Togo, Kitaura and Kadokawa and surrounding the area concentrated with the existing broiler farmlands) to south Oita and west Kumamoto prefectures with convenient traffics. Keizai-Ren has secured the producers in the environs of Miyakonojo basin. Koyu district, however, has been saturated with the fixed raising farms. Extension of the broiler house and new participation thus have become difficult in view of both raising environment and the pollution problem (Figure 28).

As for the shipping destination of the broiler produced in Miyazaki prefecture (Table 16), the share has diminished in Kyushu district including Miyazaki prefecture where mainly the carcass has been shipped,

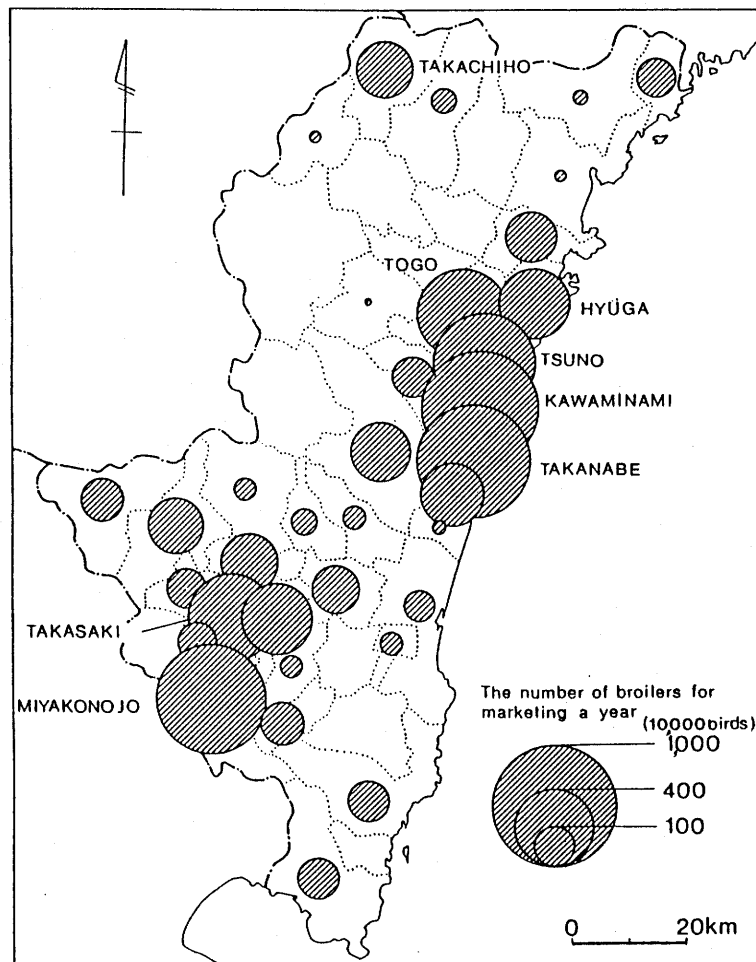


Fig. 28 Distribution of the number of broilers for marketing by cities, towns and villages, Miyazaki Prefecture, 1985

Data source: Agricultural census

Table 16 Proportional changes of rate of the marketing destination of the broiler in Miyazaki Prefecture

Destination (prefecture)	1970 ¹⁾	1973		1975		1980		1985	
	%	%	%	%	%	%	%	%	%
Tokyo	—	42.5(90.2)		46.8(78.5)		58.2(95.9)		37.1(97.4)	
Osaka	—	16.2(98.7)		10.0(99.2)		10.7(100)		13.1(94.5)	
Aichi	—	2.1(98.5)		2.1(99.4)		4.3(100)		10.5(100)	
Fukuoka	0.2	5.6(5.0)		6.2(19.4)		5.3(76.2)		6.1(66.4)	
Miyazaki	99.1	30.1(31.3)		23.4(35.0)		16.7(66.6)		11.6(61.7)	
Others	0.7	3.5(88.6)		11.5(55.8)		4.8(82.1)		21.6(92.0)	
Total	11,731 (1,000 birds)	34,282 t (66.4%) ²⁾		50,898 t (64.6%) ²⁾		97,488 t (89.9%) ²⁾		142,969 t (90.1%) ²⁾	

Notes: 1) The ratio of the number of live birds in 1970 and weight of birds in others

2) The ratio of carcass to all broiler meat for marketing

Source: Egg and broiler distribution statistics

and the share to the three big markets including Tokyo as the kernel has been increasing in the form of cut-up meat. The major processing factories affiliated by Shoshas, meeting the competition between the domestic and foreign production areas in the 1980's, have been promoting labor saving through mechanization of the boneless meat process and development of the highly value added products.¹⁵

Next, the trends in the gross agricultural production classified by the sector in Miyazaki prefecture will be surveyed. Since the first oil crisis, production of the main cereals increasing rice, wheats and potato kind etc. has dropped rapidly in inverse proportion to those of the facility utilizing sectors (such as broiler, swine and vegetable) which have shown a distinguished development. The broiler has kept the first ranking being followed by the swine, the rice, the beef cattle and egg in the order named since 1980, and this order of the highly ranked sectors has not changed.¹⁶ The districts in which the broiler sector occupied the largest ratio in the gross agricultural production in 1985 were: the two cities, i.e. Hyuga and Miyakonojo and 10 towns, i. e. Kawaminami, Tsuno, Takanabe, Togo, Takasaki, Takajo, Nojiri, Takaoka, Kadokawa and Takachiho. Particularly, Togo town, which started raising later in Miyazaki prefecture, occupied the highest ratio of 73 % in the whole country. Further, it stood tenth in the whole country ranking of the gross broiler production, thereby showing the high degree of specialization of this area in the broiler (see Table 7).

The broiler industry in Miyazaki prefecture, which has spread over the region from the plateau to the mountain foot (from Hyuga city to Takanabe town), thus has taken root. This region has become one of the main production areas. Morokata district, which exists in the mountainous area surrounding Miyakonojo basin, also is in the stage of forming a main production area. Today the region ranging from Kagoshima through Miyazaki prefecture has been suffering the animal waste

pollution that has come out to be a serious regional problem, which might have originated from the overcrowding of the small-to-medium-sized livestock farms raising broiler, swine and layer. In consequence, preparation of a new production housing is strictly restricted at present. Meanwhile, Shibushi feed base was lured and constructed (its construction started in January of 1986 and it entered full operation in 1988)¹⁷ with the purpose that it would supply inexpensive feed to south Kyushu district and thus would strengthen the foundation of the livestock management. However, it is being questioned in these circumstances whether the feed base can exhibit its full function.

2) The regional structure of the broiler industry

a. The regional structure of the integration system

As of 1987, 16 broiler processing factories are operating in Miyazaki prefecture. They are, if classified by the type of management, : 3 factories managed by Keizai-Ren of Miyazaki prefecture, 12 ones managed by companies and one managed privately, out of which 15 factories possess more than a million broilers per year occupying 99 % of the total processing number in the whole prefecture (Table 17).¹⁸ Many factories hold the large scale of the whole country level, and possess 200 employees on average. The number of the employees in the largest one amounts to 510. The factory of private management holds such a small number of operators as less than 50. The processing factories had been founded until the middle of the 1970's. However, some regional differences existed between the two districts. The factories located in the Koyu district were set up mainly in the 1960's, and most of them possessed large scales. On the other hand, those in the Morokata district were established in the 1970's, and their scale were small in general. The most factories have adopted the payment guarantee system, which fixes the transaction price of broiler through the year, between

TABLE 11 BROILER PROCESSING FACTORIES AND THEIR SYSTEMATIZATION IN MIYAZAKI PREFECTURE, 1961

Name of broiler processing factory	1) Year of beginning of operation	Investors	Location	2) No. of processed broilers per year (10,000)	3) No. of affiliated farms, () Except farms in Miyazaki prefecture	Breeding Type		The hatchery for buying most chicks () Location	Main suppliers of formula feed () Location	Main distributors of broilers
						Owned	Contract			
Kobayashi Poultry Co.	1965	Kobayashi Poultry Agri. Coop. Nippon Formula Feed MFG. Co.	Kobayashi-Shi	190	15		100%	Yamagata Hatchery Co. (Nojiri-Cho) Nagatomo Hatchery Ltd. (Hyuga-Shi)	Nippon Formula Feed MFG. Co. (Kagoshima)	Ichirei Co.
Koyu Shokuchu Co.	1966 1987	Local farmer's unions	Kawaminami-Cho Miyakonojo-Shi	2,600	119		100%	Direct management hatchery (Sai-to-Shi, Kitago-Cho) Tomita Hatchery Ltd. (Takasaki-Cho)	C. Itoh & Feed Co. (Kagoshima) Nichiwa Industry Co. (Kagoshima)	Toriki Shoten Co. Nissho Iwai Delica Co. Osaka Suehiro Broiler Co.
Fujii Bussan Co.	1975 1985	Local feed dealer Koyu Shokuchu Co.	Sueyoshi-Cho Takasaki-Cho	2,500	108 (33)		100%			
Miyazaki Broiler Co.	1967	Marubeni Chikusan Co. Koyu Shokuchu Co.	Takanabe-Cho	150	20		100%			
Minami Kyushu Food Products Co.	1967	Marubeni Co.	Tsuno-Cho	1,200	153 (51)		15% 85%	Direct management hatchery (Kijo-Cho)	Marubeni Shiryo Co. (Kagoshima)	Marubeni Chikusa Co. Itoh Ham Co.
Nihon Broiler Co.	1968	Mitsubishi Co. Nippon Ham Co. Nihon Nosan Kogyo K.K. Nishi Nihon Pilch Ltd.	Hyuga-Shi	1,200	37		56%	Nishi Nihon Pilch Ltd. (Hyuga-Shi) Hatchery managed by Miyazaki Pref. Agri. Coop. Asso. (Sadowara-Cho) Mori Hatchery Co. (Kawaminami-Cho)	Sanko Shiryo Co. (Kagoshima) Nihon Nosan Kogyo K.K. (Shibushi)	Nippon Ham Co.
Miyazaki Chubu Shokuchu Miyazaki Nambu Shokuchu Miyazaki Hokubu Shokuchu	1972 1974 1975	Miyazaki Prefectural Federation of Agri. Coop. Associations	Takanabe-Cho Miyakonojo-Shi Hyuga-Shi	750 950 300	39 88 45		100% 100% 100%		Miyazaki Kumiai Feed Co. (Hyuga) Minami Kyushu Kumiai Feed Co. (Kagoshima)	Zen-Noh & Toriichi Co. Direct sale
Miyakonojo Broiler Center Co.	1973	Fukuoka Broiler Co. (Chicken Meat wholesaler)	Miyakonojo-Shi	120	20		100%	Yamagata Hatchery Co. Matsuno Hatchery Co. (Mimata-Cho)	Sanko Shiryo Co.	Enatsu Shoji Co. Fukuoka Broiler Co.
Miyako Broiler Ltd.	1973	Local feed dealer	Shintomi-Cho	380	40		100%	Mori Hatchery Co.	Nihon Nosan Kogyo K.K.	Nippon Ham Co.
Ebino Broiler Ltd.	1976	Local feed dealer	Takahara-Cho	240	30		100%	Minami Kyushu Food Products Co.	Marubeni Shiryo Co.	Miyazaki Marubeni Shiryo Sale Co.
Ebisu Broiler Center Co.	1979	Ebisu Shoji Co. Nihon Nosan Kogyo K.K.	Nojiri-Cho	360	30		100%	Yamagata Hatchery Co.	Nihon Nosan Kogyo K.K.	Ebisu Shoji Co.

Notes: 1) The beginning year of operation 2) No. of processed broilers per year 3) No. of affiliated farms, () Except farms in Miyazaki prefecture

4) The rate to total breeding birds

Source: The author's field survey

the factory and the farm. Namely, they take measures to assure the farm a certain income by modifying the income in connection with the feed price in case of its jumping, and prevent the raiser's shift to other factory.

The integration system of this perfect integration, very seldom in the whole country, has been developed by Marubeni Co. and Mitsubishi Co. in connection with establishment of the two processing factories. The form of this integration system may have the most prominent characteristics in the following point. The integrator has carried out a large scale raising by means of the advanced facilities, and has completed the all managements from production through sales by its own group. However, it has been shifting to a compromised raising system by introducing the contract production with the farm in order to achieve reinforcement of the factory's ability, risk dispersion and stabilization of the gains.¹⁹

Keizai-Ren of Miyazaki prefecture also completes its whole business by its own group, but has some differences from the said Shosha affiliated integrator in the following respects. It possesses no direct hatchery and no direct farmland in the first place. Secondly, its participation in the broiler industry fell behind that by the Shosha affiliated processing factory, because its participation was brought about by the request of the Nokyo members.

Koyu Shokuchō Co., which originated from a local farm, has not possessed the capital relationship with Shoshas and feed firms. This local integrator has been developing through carrying out all the businesses by its own group except the feed, which a number of feed dealers have bid for.

As for other processing factories, two ones are managed by the wholesalers, and the remaining factories belong to the local feed special agencies.

Besides, both Keizai-Ren of Miyazaki prefecture and the major processing factories have been corresponding to the problems accompanied by the regional progress of the broiler industry. Since the latter half of the 1970's, they have introduced the simultaneous chick raising and broiler shipment in the same hamlet to prevent the chicken disease caused by the locally overcrowded location of the broiler houses. The broiler litter, which has become difficult to be consumed or sold by the raising farms in the Koyu and the Morokata districts, has been collected with some charge, processed in the exclusive broiler litter treatment plant, and sold as an organic fertilizer.

In Miyazaki prefecture no plant had existed until the construction of Zen-Noh Feed Plant in 1967. The processing factories except those affiliated by Keizai-Ren accordingly had to transport the feed in a long way from the feed bases at Moji Port and Fukuoka Port by either goods wagon or truck till about 1973. They switched to Kagoshima Port after its completion, thus reducing the transporting cost and reinforcing their competitive power in the market. As for the chick supply, the hatcheries have been founded in the vicinities of the locations of the processing factories: 6 hatcheries in the Koyu district and 5 ones in the Morokata district. Some large-scale processing factories own their direct hatcheries, or hold some connections with the large-scale hatcheries through capital investment and dispatch of the stuff. Other factories, on the other hand, have made the tie-ups only in the long-term transaction with the hatcheries.

Finally, the broiler sales in this region will be surveyed. Until the opening of the ferry service, the broiler shipment had been directed to all over Kyushu centering around Miyazaki prefecture in the form of carcass. Since the ferry entered service, the shipping destination has been shifting to Tokyo and Osaka markets by shipping, and thus the shipping volume of the cut-up meat has been increasing. Accordingly, the

ratio of the products shipped to the local regions has diminished. Some processing factories have been developing the processed goods from the cut-up meat, and directing the shipment towards the products of high price in the 1980's. The carcass shipment thereby has been reduced to an infinitesimal volume (see Table 16).

The processing factories in Miyazaki prefecture had been able to employ abundant women at low wages because of the limited employment opportunities there until the 1970's. However, owing to advance of the plants producing electronic parts and other high technological industries,²⁰ it has been hard to secure young women. In addition, the middle aged members in long time service have come to occupy a big ratio in the total workers, which situation has been lowering the production efficiency. Some processing factories have intended to introduce mechanization of the cutting-up process to meet the situation.

b. The regional distribution of the raising farm households

The broiler collection region, which may reflect the distribution of the broiler processing factories and the raising farms, will be studied in the case of the Koyu district where the raising farms exist in a high density (Figure 29).

Minami Kyushu Food Products Co. which holds the greatest numbers of both the contracted farms and the direct farmlands among the processing factories in Miyazaki prefecture, scatters 11 farmlands out of its 59 direct farmlands²¹ at 5 places in Koyu district. The numbers of its contracted farms in the following towns of the said prefecture are: 34 at Takachiho, 23 at Kitaura, 14 at Kawaminami, 13 at Tsuno, 11 at Togo, 3 at Shintomi and 2 at Takanabe. Further, the company has advanced to Oita prefecture, and hold there the farms : 19 at Ume town and 6 at Naoiri town , and to Kumamoto prefecture : 17 at Takamori town and 9 at Soyo town. The broiler collection region of this company extends in a

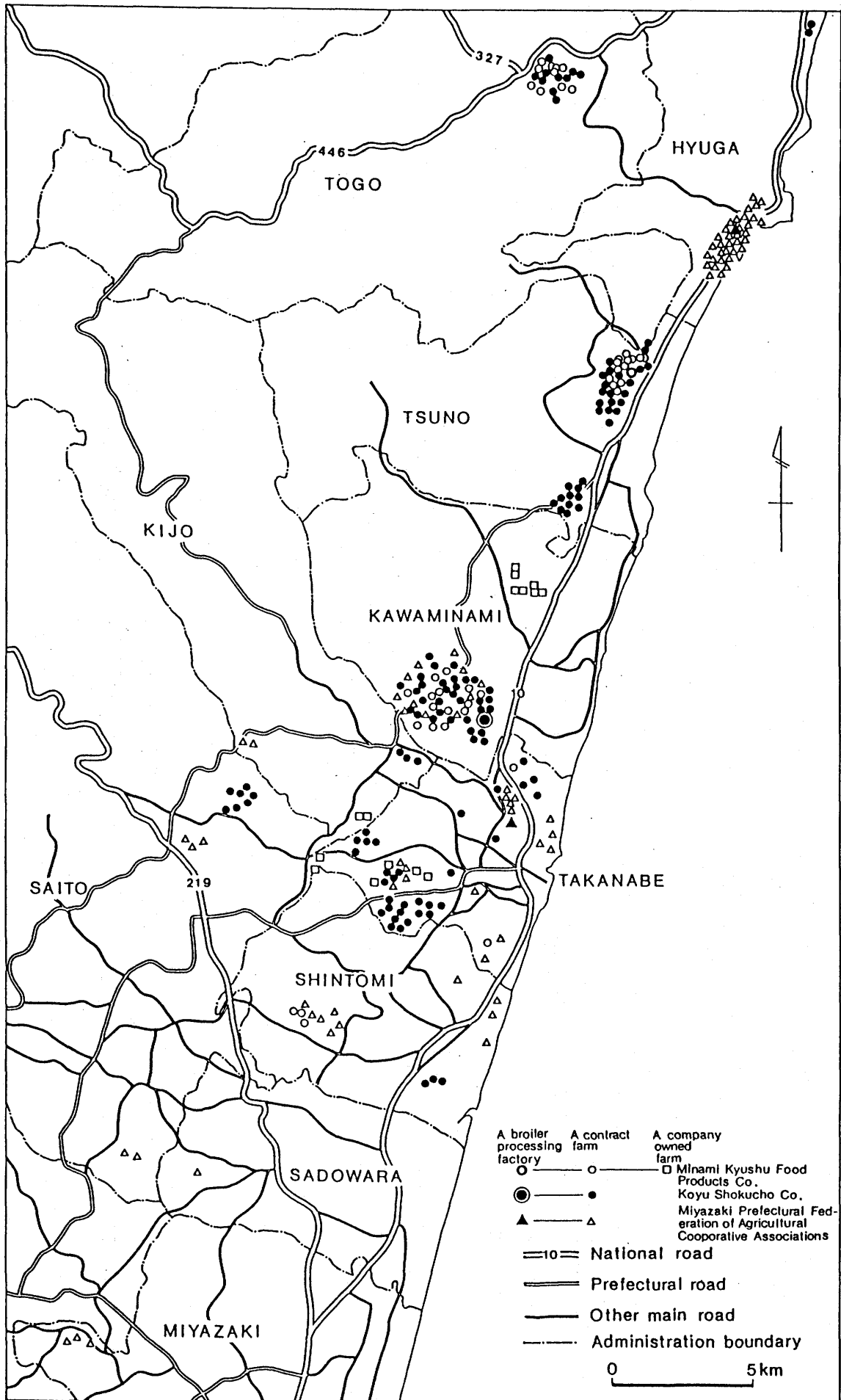


Fig. 29 Distribution of broiler processing factories, contract farms and direct management farms raising broilers in Koyu district of Miyazaki Prefecture, 1987

Data source: The author's field survey

range of about 80 km accordingly.

Koyu Shokuchō Co., which follows the above company in the contraction number, holds 32 at each town of Kawaminami, Tsuno and Takanabe, 10 at Togo town, 7 at Saito city, 3 at Kijo town, 3 at Shintomi town and 2 at Hyuga city. The company has gathered all the contracted farms in the Koyu district, and thereby has formed the broiler collection region within 30 km.

Keizai-Ren of Miyazaki prefecture endows its three processing factories with the regional allotments.²² Hyuga factory in the north district has affiliated the farms : 33 at Hyuga city, 11 at Kawaminami town and 1 at Nobeoka city. Takanabe factory in the middle district has affiliated the farms of 39 members : 16 at Takanabe town, 10 at Shintomi town, 8 at Saito city, 3 at Sadowara town and 2 at Kijo town in the Koyu district. It holds a broiler collection region of about 25 km.

Besides, Nihon Brioler Co., which has been managing mainly its direct farmlands, holds not many contracted farms, which are : 19 at Togo town adjacent to the company, 8 at Tsuno town, 7 at Hyuga city and 3 at Kaokawa town. It forms the narrowest broiler collection region of about 20 km.

The following three characteristics may be observed in the situation described above about the relationship between the broiler processing factory and its affiliated raising farms. In the first place, there exists a general trend. Namely, the number of the raising farms in the vicinity of the processing factory is found to be large, and it diminishes with separation from the factory. Secondarily, the raising farms at the north of Kawaminami town in the Koyu district have been directed to the broiler management by the following circumstances. The regional connection and the blood relationship have been predominant on one side, and the competition among the broiler, the agricultural and the livestock industries has determined the other side. The local

concentration of the raising farms on the special hamlets accordingly has been brought about, and the connection with the special processing factories has tended to be strong. Thirdly, the processing factories extended their broiler collection regions in accompaniment with enlargement of their production scale. Avoiding the overcrowded neighboring regions in the Koyu district, they advanced to the surrounding districts (the west part of the prefecture and the adjoining prefecture) that possessed convenient traffics, and they found the villages where they could secure a definite number of farms.

In the next section, Takanabe town, which is located in the center of the Koyu district, will be cited for the study on the regional character in the broiler industry. In this town the broiler industry started earliest in the Koyu district. In addition, competition among the processing factories affiliated by Shoshas and Nokyos in securing the raising farms accelerated diffusion of the broiler raising over the said city. Thus, its ratio of the raising farms has stood first in the district. It may be concluded that Takanabe town has been the most typical objective region for the broiler industry.

3) The regional character of the broiler industry in Takanabe town

a. The position of the broiler industry in the agriculture

The zone, that comprises the north and the west parts of Takanabe town, was authorized as the postwar group-settlement area (233 households settled in from 1948 to 1952), and the number of the farms amounted to 1,994 in 1955. However, owing to the inconvenient traffic and the unfavorable land conditions, the farms that did not possess enough knowledge and experience on the agricultural management, and farmers that did not possess their own funds continued to give up farming and to change their occupations. The number of the farms was reduced to half in 1985 (Table 18). On the other hand, the land bases

Table 18 Changes in farm structure at Takanabe-Cho of Koyu district

Items	1960	1965	1970	1975	1980	1985	
Total farm households	1,987	1,699	1,493	1,291	1,149	1,070	
Full-time farm households ratio	49.5%	31.8	32.3	35.4	36.3	35.9	
Part-time farm households ratio	Mainly farmig	23.2%	34.7	34.6	23.2	15.0	22.0
	Mainly other jobs	27.3%	33.5	33.1	41.4	48.7	42.1
The ratio of livestock farm households	100%	100	82.8	53.1	44.5	36.1	
The ratio of farm size by cultivated land							
Under 0.5ha.	34.9%	31.9	32.5	36.4	36.7	36.4	
0.5 ~ 1.0ha.	23.4%	20.9	17.9	19.5	18.5	18.7	
1.0 ~ 1.5ha.	20.5%	19.6	17.3	15.4	13.2	13.0	
Over 1.5ha.	21.1%	27.6	32.4	28.7	31.6	31.9	
Agricultural land (ha)							
Paddy field	723	682	680	587	576	557	
Upland field	1,089	1,023	816	693	668	710	
Land under permanent crops	31	51	109	131	108	90	
Permanent meadows & pastures	141	36	40	38	18	0	
The best 5 sectors in gross agricultural production	R (35.9) Po(32.0)	R (32.6) Po(27.2)	Br(21.6) R (20.7)	Br(40.2) Pi(12.7)	Br(42.3) E (11.8)	Br(37.6) R (29.6)	
():The rate in total gross agricultural production(%)	L (12.9) I (9.7) V (6.6)	V (9.4) I (8.4) B (6.6)	E (11.9) Pi(6.3) B (5.8)	E (12.0) R (8.2) B (6.5)	Pi(10.3) B (6.4) R (6.2)	E (13.8) Pi(10.4) S (6.1)	

R:Rice Po:Potatoes I:Industrial crops B:Beef cattle V:Vegetables S:Sweet potatoes

L:Livestock products Pi:Pigs Br:Broilers E:Hens eggs

Sources: Agricultural census, Statistics of net product of agriculture in Miyazaki Prefecture

have been arranged through Land Improvement Project since the 1960's, and rationalization and modernization of the agricultural management have been promoted in this district. Accordingly, the ratio of the specialized farms that have stuck to agriculture has been increasing. However, the small-scale farms with acreage of less than 1 ha occupied more than 50 %, which fact shows the underdevelopment of arable land. In addition, the upland field cropping farm has been predominant. Thus, many farms have found their ways out in the vegetable cultivation and the livestock raising.

The number of farms conducting the single management reached a peak in 1970, and has kept diminishing afterwards. The number of rice growing farms is particularly large i.e. 147 (34.8 % of the total households). They cultivate other household's paddy fields, which belong to the aged farms or to the farms holding no successor, in order to supplement the decrease of planting acreage due to the acreage reduction policy. They hold a relatively large management scale accordingly. Following the rice sector, the number of the farms conducting the single management in cultivation such as potato and sweet potato amounts to 63, being followed by those of the poultry raising (31 broiler households and 21 layer ones) and the house horticulture with 32 farms in 1985. In the gross agricultural production classified by the sector, the broiler one has been leading since the 1970's, but the ranking of other production ones has been fluctuating.

The state of agricultural land use will be surveyed in each area of Takanabe town (Figure 30). The paddy field has been distributed mainly in the environs of the town and at the lowlands in the valley of the river Omaru. While the wheat kinds had been planted as the main aftercrops until enforcement of the acreage reduction policy, the farms have been shifting to the vegetable in the secondary cropping since its enforcement. On the plateau of 50 to 150 meters altitude surrounding the

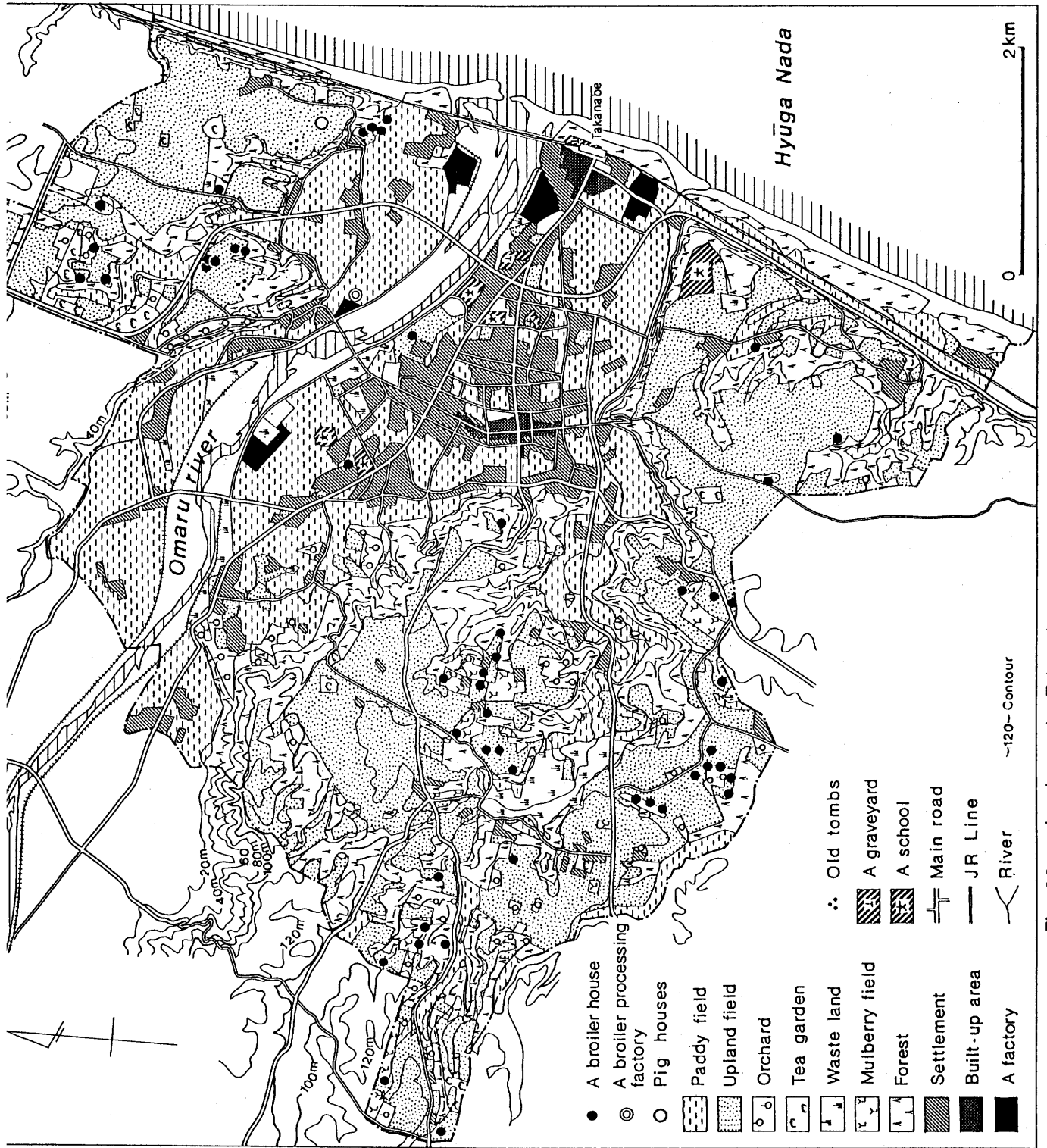


Fig. 30 Land use in Takanabe - Cho, 1981

Data source : The author's field survey

town area, which has been cultivated as the upland field, the potato kinds and outdoor vegetables have been planted mainly, In the vicinity of the seaside at the south area of the town, the house horticulture (tomato, cucumber and sweet pepper)²³ in plastic green houses has spread since the 1960's, from the latter half of which melon, cucumber and squash etc. have been introduced as the late raising vegetables.

As for the livestock production, the beef cattle raising farms, that occupy about 70 % of the total livestock raising farms, are widely distributed. Among them, the farms of the single management, the number of which is 37 (16.3 %), are distributed mainly in the upland field area of the south part. About 150 farms of the swine raising has been carried out by the self-supplying feeds such as sweet potato and leftovers till the 1960's. Afterwards as the measures to the maldor pollution and for the purpose of increasing the raising heads, Takanabe town prepared livestock housings in the seaside of the north area as a subsidiary project of the government in 1970, and let 9 farms move it. While the farms existing in the environs of the town have been gradually giving up the swine management, about 30 crop farming households in the west area have been carrying out swine raising through conducting the drainage treatment (21 farms doing the single management, and the single management ratio being 53.8 %).

The poultry raising had been conducted subsidiarily till the 1960's. It was enlarged to the level of 10 thousand layers since the 1970's, which was largely contributed by Koyu Poultry Cooperative that promoted the large-scale raising. In 1985, it was enlarged to the scale that the number of the specializing management raising 30 thousand layers came to occupy 36 %. The poultry raising farms are mainly distributed in the upland field areas and in the north and the south parts. The broiler raising was started by advance of processing factories in the latter half of the 1960's, and has been spread mainly in the upland field areas

of the north and the south parts. These areas are located in the small-to-medium-sized livestock production regions that are packed densely with the poultry and the swine raising farms.

b. The location and the agricultural management of the farm households raising broilers

The broiler raising in Takanahe town was introduced by the farms since 1967, earliest in the Koyu district, through inducement by Koyu Shokuchō Co. and Minami Kyushu Food Products Co. and with an expectation for its high profitability. The shipment number of broilers, having been only 200 thousand by 7 farms in 1970, increased to 2 million by 50 farms in 1972 owing to establishment of a processing factory (Miyazaki Chubu Shokuchō Co.) by Keizai-Ren of Miyazaki prefecture in this town. Afterwards, the competition among the processing factories in introduction of new farms into the broiler raising to enlarge their processing scales accelerated increasing of the number of the participators, which reached 65 farms and shipment of 6.2 million broilers in 1980. Out-break of the chicken disease since 1981 has brought about damages to the raisers, and particularly the small-scale raising farms have been driven to drop out. The number of the raisers thereby has tended to decrease. It was reduced to 55 with the shipment of 6.6 million broilers in 1987.

The broiler raising farms have been distributed in majority in the three upland field zones of the west parts and distributed the raising group on the plateau in the north of the river Omaru (see Figure 30). In view of the classification by the affiliation of the processing factory, Keizai-Ren (16 farms, raising 430 thousand broilers) has been governing mainly the north area, Koyu Shokuchō Co. (32 farms, raising 1.03 million broilers) has been focusing on the south-west area and Minami Kyushu Food Products Co. has distributed its direct farms at five places and 2 contracted farms (raising 200 broilers) in the town (see Figure 29).

The broiler raising farms, by sampling 19 farms, can be classified into the following two types in view of their locations and agricultural management (Table 19).

The raising farms of the first type are located at Mochida area in the north of the river Omaru. The broiler houses stand close together in the farms neighboring to a group of tumuluses, and the resident houses exist about 500 meters distant from the broiler ones. These farms possess the average (the broiler shipment number of 120 thousand) or less than the average raising scale. The farm numbers of this type are 10 in total : from No.5 to 8, from No.13 to 16, No.18 and No.19.

Through the Land Readjustment Project since the 1970's, the land of this area has been readjusted (exchanged, segmented or combined). In parallel with the readjustment, the farms got fascinated by the high profitability of the broiler production that the plural processing factories invited them to participate. A definite number of them, after mutual information exchange, came to enter this business from the management of upland rice and potato such as crop cultivation. At this time, however, a number of houses for swine and poultry raising had been set up already. For this reason and for preservation of the tumulus group, the construction site for the broiler house was specified together with the limitation of four houses per farm (a capacity of 34 thousand broilers constantly). In consequence, the standard farms have been the specializing ones that manage two broiler houses by one family member and cultivate rice, vegetable and potato kinds as well. Besides, every householder and his wife are in their fifties to sixties. The successors in their twenties have already participated in farming in the cases of No.6 and No.15. Except the households of No.16 and No.19 have given up farming entirely, the expected successors in their twenties are working as salesmen at the local processing factories, and will succeed their family jobs in the case that the householders

Table 19 Management of farm households raising broilers in Takanabe-Cho, 1987

Farm number	No. of broilers raising a year (10,000)	Acreage of cultivated land (a.)		Forest land (a.)	The ratio of broiler income to total one (%)	Other sources of income	Family worker		The beginning year of raising broilers	The greatest reason of raising (3)	Works before raising broilers
		Paddy field	Upland field ¹⁾				HWS	Hired worker			
1	24.0	30	125		100	Lawn grass	○	○	1970	A	Sweet potatoes
2	20.4	40	210			Potatoes, Sweet potatoes,	○○	○○	1977	A	Sericulture
3	18.0		40(80)			Japanese cedar	○○	○○	1971	A	Sericulture
4	18.0		120				○	○	1977	C	Sweet potatoes, Radish, Taro
5	13.4		(42)				○○	○○	1972	A·B	Japanese cattle, Fodder
6	13.4	55	120			Rice, Tea	○○	○○	1972	A·C	Rice, Tea
7	13.4	30	74			Vegetables	○○	○○	1974	B·C	Dairy cattle
8	12.0	20	(250)				○○	○○	1971	A·C	Rice, Sweet potatoes
9	12.0		140				○○	○○	1971	A·B	Sweet potatoes, Sericulture, Wheat crops, Rape
10	12.0		30				△	○	1970	A·C	Sweet potatoes, Work away from home
11	10.2		300			Pigs	○○	○○	1977	C	Oranges, Melon, Watermelon, Radish
12	10.2		180			An office man	○○	○○	1977	A	Sweet potatoes
13	9.2		(57)				○	○	1972	C	Sweet potatoes
14	9.2		15			An office man	○	○	1967	C	An office man
15	7.4	42	27			Rice, Potatoes, Squash	△	○○	1972	C	Sweet potatoes, Rice
16	6.8	120	30			Rice, Vegetables	○○	○○	1972	A	Rice, Sweet potatoes
17	6.8		(220)				○○	○○	1972	A	Oranges, Chestnut
18	6.4	80	60			Vegetables, Sweet potatoes	○	○	1972	A·B	Rice, Sweet potatoes
19	6.4	100	30			Rice, Potatoes	○	○	1972	A	Rice, Sweet potatoes

Notes: 1) (): Rending land 2) H: Householder W: Wife of householder S: Successor

3) A: Profitability B: Promising feasibility C: Canvassed by the broiler processing factory

Source: The author's field survey

discontinue their roles.

As an example of the first type the farm No.15 will be surveyed (Figure 31). This farm household consists of three members, i.e. the householder (59 years old), his wife (53 years old) and eldest son (27 years old). Before they started the broiler raising, the householder and his wife had gained their living from a paddy field of 50 are and a upland field of 80 are (60 are for sweet potato and 20 are for potato). When Keizai-Ren set up the processing factory, they were invited to participate in the broiler raising by the whole hamlet. Further, they were stimulated by the high profit that raising farms affiliated by other major factories were enjoying. Thus, they decided to enter the broiler raising together with 4 farms in the same hamlet. They moved their family land according to the land readjustment, and purchased a site for 2 broiler houses adjoining to their farmlands. They applied their own fund of 600 thousand yen, and were financed 7 million yen by National Loan Facilitation System (10 years repayment unredeemed for one year). The eldest son graduated from high school in 1981, and entered a company in Miyazaki city. The householder retired from the agricultural working owing to his chronic disease in 1984, and the eldest son succeeded to his occupation. At present, his wife and the eldest son are conducting the broiler raising and cultivation of the paddy field (42 are since the acreage reduction) and the upland field (27 are, the rest land is in fallow). The householder lends them a helping hand in the busiest seasons.

The broiler raising farms of the second type exist at the farming zone in the west parts, and the remaining 9 farms belong to this type. The broiler houses have been set up in the upland field adjacent to the resident ones. They have been trying to outgrow their dependence on the crops by means of the broiler raising. Accordingly, they raise more broilers than those of the first type, and thus higher ratio of them

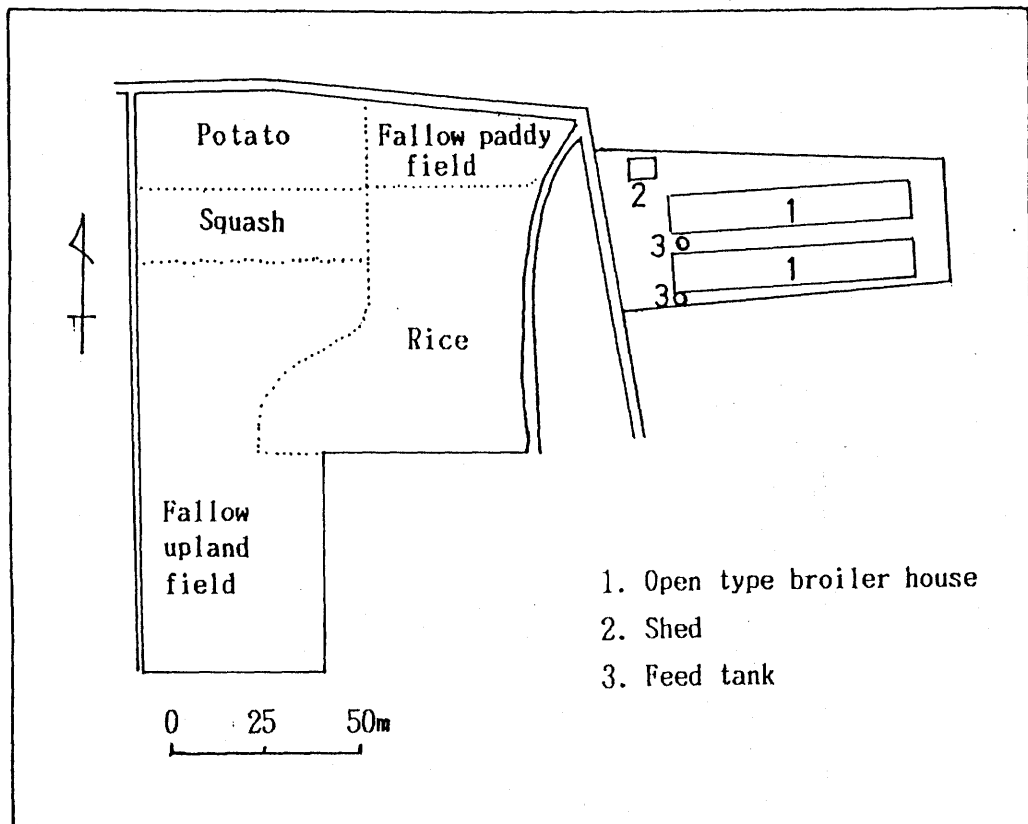


Fig. 31 Land use of a farm raising broilers, 1989

Source: The author's field survey

are specializing in the broiler production.

Until the 1960's and the start of the broiler raising in the west parts, they had been dependent on the double cropping in the combination of sweet potato and wheats, and some of them had carried out the diversified management by introducing tangerine, vegetable, Japanese cattle and sericulture to cover its low productivity. However, they had been unable to obtain a satisfactory result owing to the price fluctuations, the irregular weather and their insufficient agricultural technique, which situation drove the farms to gamble on the broiler raising that came diffused in the Koyu district since the 1970's. Majority of the raisers, in order to withdraw from the crop cultivation, have set up more than 4 broiler houses in their farms through utilization of National Loan Facilitation System. The successors have been offering the fundamental labor force since the latter half of the 1980's.

As an example of the second type the farm No.10 will be introduced. The household comprises 4 members, i.e. the householder (62 years old), eldest son (30 years old), his wife (26 years old) and granddaughter (2 years old). The householder was repatriated from the continent after the war, and entered the reclaimed land in this area in 1948. He was provided with a forest of 90 are, which he reclaimed afterwards and farmed sweet potato on. Although he got married with the deceased wife in 1957, he had to work, owing to their hardship, by the day at the local water-supply maintenance and away home in winter. In 1970, being stimulated by the profitability and invited by the leader No.9 of a neighboring reclaimed cooperative, he made up his mind to start the broiler raising earliest in the area. He applied 30 are of the farm to 4 broiler houses, and was financed 1.2 million yen as Agricultural Modernization Fund. When his son entered a company in Tokyo after graduating from university in 1982, he finished the repayment to

National Loan Facilitation System. However, his son disliked the life of wage worker, and returned home just after his marriage in 1985. Thus, he specializes in the broiler raising, which the householder helps subsidiarily.

The broiler raising farms in Takanahe town have been facing a following common problem. They have sons including the potential successors, few of whom, however, have succeeded in marriage. The shortening of the brides thus has been standing as the largest problem of the area.²⁴ Accordingly, the wives of the successors engage mainly in the housekeeping and the mothercraft, but seldom in the farming work.

Further, those who have the successors are confronted with other problems. They hold insufficient number of broilers being raised on one side, and they are relatively over-working on the other side. If one wants to set up a new broiler house or to expand the existing one, he has to manage various difficulties such as deterioration of the raising environment a loan of more than 10 million yen necessary for the facilities cost and acquisition of the document of consent by the local inhabitants. In consequence, they tend to lease the broiler houses that the farm (No.1) has abandoned and to purchase it in future.

4) The regional conditions for production area formation of the broiler industry

The following three terms may be pointed out as the primary factors and the regional conditions through which Miyazaki prefecture has become the main broiler production area.

(1) The agriculture of Miyazaki prefecture had been an extensive one which had depended on the main cereals including upland field rice, wheat kinds and potato kinds as the fundamental crops, and thus the prefecture had been called a boundary agricultural district until the

1960's. They intended to produce the agricultural merchandise to overcome the low productive level of this district. Actually, they have promoted switchover to the new sectors such as the small-to-medium-sized livestock industry including broiler and swine and the truck farming.

(2) Miyazaki prefecture, on the other hand, has been favored with a warm climate and a good environment for the broiler raising together with the inexpensive land and the surplus labor in the background. The conditions for development of the broiler industry have been arranged since the 1970's through construction of the feed base at Kagoshima Port, the change of the distributing form to the cut-up meat, establishment of the transportation system that utilizes the refrigerating car and opening of the ferry service to the metropolitan cities.

(3) The multiple enterprises, i.e. the Shoshas primarily, Keizai-Ren of Miyazaki prefecture, the firms of the local farmers and the feed special agencies etc., have participated in the broiler industry of the prefecture. They have performed competition centering around the large scale processing factories in securing their affiliated farms.

Moreover, they have promoted to enlarge the distribution volume through the cooperative and the affiliated relations with the wholesalers and the supermarkets that play roles of the sales bases in the metropolitan markets. On the other hand, the farms having depended on the loan by National Loan Facilitation System, have succeeded in acquiring the higher income than by the ordinary agriculture so far, and thus have tempted other farms to participate. In addition, they have joined in the SAP movement to begin with and the training course for the successor. They have intended to carry out the viable farming and specialized management through these steps. Finally, they have been supported by their strong motivation for rapid repayment of their loans.

2. Production area formation of the broiler industry in Iwate prefecture

In Iwate prefecture, raising of the large-sized livestock has been popular historically under its cold climate and through utilization of forests and wildernesses that spread centering around the mountainous Ou and Kitakami districts. On the other hand, raising farms of the small-to-medium-sized livestock such as swine and poultry had been diffused in the environs of the city such as Morioka, Hanamaki and Mizusawa. However, it had been carried out in a very small management scale until the 1960's, because its consumption had been limited owing to the low level of people's income and the relatively high prices of meat and egg.

A local special feed agency of a feed firm came to lead opening of the broiler industry at Ofunato city. It was spread to the south area of the prefecture in the latter half of the 1960's. Moreover, the production region was extended by the multiple enterprises of the north area in the first half of the 1970's. The broiler industry of this prefecture succeeded in the most prominent development in the whole country in the latter half of the 1970's by virtue of the integrators' activities and the strong motivation of the farms raising broilers. Today, Iwate prefecture has established one of the main broiler producing areas comparable to those of south Kyushu.

1) Development of the broiler industry

a. The stage of development of the broiler production area

(until the first half of the 1970's)

Amatake Feed Store (renamed to Amatake Broiler Co. in 1970) played a pioneering role in the broiler industry of Iwate prefecture. This firm had been dealing feed as a special agency of Nisshin Seifun Co. since

1952. In 1961, the head of the firm obtained information that a staff of Nisshin Co. got through inspection of the broiler industry in the U.S.A. . Amatake perceived a promising feasibility on the broiler industry, which strongly motivated him to advance into the broiler business. Next year, he immediately entered the broiler industry together with the feed selling business. He laid in the broiler chicks imported from U.S.A. in the number of 4,700 every month from Kanto district. He let 8 farms in the city offer the building sites for broiler houses, where he made an investment on the producing facilities. He offered feed and chicks to the farms, and made contract with them on the committed production which assigned the broiler raising management to the farms. A household raised a small number of 300 to 1,000 broilers at a time. However, Amatake searched after the wholesalers at the centers of distribution from the south to north district of the prefecture for its shipping destinations of live birds, and succeeded in marking the shipment contract with them. Thus, the firm founded the bases of the production and the sale system. Afterwards, owing to the gradually increasing consumption of broiler, it established a processing factory (a processing capacity of 2,300 broilers per month) in 1964 for the first time in the district. With this full-scale production system, the firm intended to enlarge the production scale through increasing the numbers of new participators and broilers being raised.

At that time, farms doing farming on the side occupied 79 % of the total farms in Ofunato city. The side jobs in fishery and the small-scale farming management on less than 1 ha carried out by women and seniors were observed prominently. In consequence, the farms held expectations for the broiler raising that required less restriction on land, fund and raising techniques in comparison with other livestock industries. The farms that participated in the broiler raising were distributed in the areas neighboring to the old Ofunato city. The

region was under influence of the ocean through the year, and the average temperature was 0°C in winter, owing to which circumstances the climate of this region was relatively warm in the Tohoku district. For this reason, they introduced the open type broiler house.²⁵ Amatake, further, practiced the guidance on the broiler raising technique to the participators exhaustively, and inspired them that enhancement of the raising efficiency would be directly connected to the high profitability. The firm practiced cash settlement, and adopted a commission system in order to make the broiler raising more attractive to the small-scale farms that possessed insufficient self-funds.

Koyama Rice Store (renamed to Koyama Broiler Co. in 1969) at Murone village in Higashi-iwai gun, having been stimulated by the activity of Amatake, entered the broiler industry in 1961. This firm made contract on the committed broiler raising with 40 farms in the same village and Fujisawa town adjacent to the western part of the village. These farms consisted of those that were farming mainly rice and tobacco and those that changed from other industries. The firm also started a trade of feed selling as a special feed agency of Taiyo Gyogyo Co., Ltd.. Then the firm set up a processing factory in 1966, thus participating actually in the broiler industry.

In 1969, Yokoya Bussan Ltd., that had been dealing liquor and the feed of Nichiro Gyogyo Co., Ltd. at Kawasaki village in Higashi-iwai gun, made the commission contract with 36 farms conducting tobacco farming, sericulture and cattle and horse raising in the same village and in the neighboring areas, i.e. Fujisawa town, Higashiyama town and Murone village. It further constructed a processing factory and its direct farms.²⁶

Toriichi Co. paid attention to development of the broiler industry in the south district of the prefecture, and advanced to Fujisawa town as a link of the production bases for Tokyo market in 1971. The company

set up a factory, and started the contracted production by 5 farms.

The primary factor that promoted development of the broiler industry in the south area of Iwate prefecture might exist in the fact that mainly the local feed dealers intended to gain an enterprising profit by the multiple management. In other words, except Toriichi, they were all special agencies of major feed firms, and these feed dealers were forming the local bases in the sales network of the feed bases at Ishinomaki Port and Shiogama Port. Although they were favored with access to the feed bases, they were confronted with a limit in enlargement of their marketing routes owing to the very small number of the small-to-medium-sized livestock raisers. As a result, the feed dealers intended to realize the synthetic advantage, which would reinforce the management base by the stabilized expansion of feed sale, in connection with their participation in the broiler production that was being expected as a new growth industry. Thus, their main subject existed in how they could fix and develop the broiler industry in the district abundant in the small-scale diversified farming farms. They had to adopt preferentially the contract system by the method of committed raising mentioned above accordingly.

Opening of the broiler industry in the north area was brought about by switchover of 2 farms, Dobashi and Jumonji, to the broiler management. They had been managing the poultry at Fukuoka town (Ninohe city from 1972) in Ninohe gun since the postwar. Dobashi Poultry, corresponding to the order by the American soldiers at Misawa base in Aomori prefecture and after a long deliberation on its future, shifted entirely to the broiler raising from 1963, and made the commission contract with 5 farms at Fukuoka town and Kunohe village at the same time. In 1970, when its production got well under way, the firm set up a processing factory, and changed the name to Dobashi Broiler Ltd..

Jumonji Poultry Ltd., which had been processing the culled chicken

from the poultry raising and shipping products to the local meat stores in the 1950's, anticipated the increase in the consuming volume of broiler, and thereby attempted shifting to the broiler raising in 1965. With favorable progress in the production, the company set up a processing factory in 1972, and made the commission contract with 3 farms in the same town for the purpose of raising the working ratio of the factory.

In addition, Abe Hanko Shoten Co.,Ltd., that had been managing wholesale of foods such as rice, cereals and feed in Fukuoka town since 1907 and searching after a new way out from the depressed trade in the cereals and the feed since the 1960's, decided to enter the broiler business by the following reasons. Primarily, the participation in the broiler industry by the local farms such as Dobashi and Jumonji stimulated the company in the situation described above. Secondly, the broiler industry seemed to have a promising future in response with the increasing demand for meat. Thirdly, the company had been familiar with the local farmers through dealing of rice, soybean and tobacco as the old wholesaler, and it held an established social confidence. The company constructed a processing factory in 1967, earliest in the north area, and started the contracted production by 59 farms centering around Fukuoka city and at Kunohe village.

Further, Tohoku Nosan Broiler Co.,Ltd., a subsidiary company of the feed capital (Nihon Nosan Kogyo K.K.), also joined through setting up a processing factory at Tamayama village in Iwate gun in 1970.

Mitsui & Co.,Ltd. affiliated Daiichi Broiler Co.,Ltd., held its head office in Hachinohe city, managed a special feed agency, and possessed its direct small-to-medium-sized livestock farms and its processing factory. This company opened a broiler processing factory and its direct farm in Aomori prefecture in 1965. It further advanced to Karumai town in Ninohe gun, made the contract with the farms, and set up a processing

factory in the same town in 1972.

The processing factories, that belong to Dobashi and Jumonji and existed in the north area, in particular, adopted the committed production system in order to open wide the door of the broiler raising to the farms. In addition, they persuaded the farms through training of the raising technique that they had obtained from experience of the poultry raising. Moreover, they introduced the open type broiler house to reduce the cost of facilities, and developed the efficient house comparable to the windowless one through improvement of its ventilation, use of the heat insulating material and equipment of a heat supply system for winter heating.

On the other hand, other factories all adopted the contracted production system. However, they took the measures to alleviate the burden of investment on the facilities that the contracted farms had to bear. Namely, they stood guarantee for application of National Loan Facilitation System (mainly applied Comprehensive Facility Fund by Agriculture, Forestry and Fishery Finance that started in 1968), or subrogated a part of interest. Further, they led the farms employ the windowless house for the purpose of : keeping the working ratio of the processing factory at a high level, enhancing the raising efficiency higher than that of the open type house of the same scale, maintenance of the stable shipment number and thereby stabilization of the raiser's income. They were promoting arrangement of the conditions necessary for the mass production and the mass sale in this way.

By virtue of these active competitions among the processing factories in securing the farms and in enlargement of the production scale, the raising number of the north area increased remarkably. In 1970, although the number of the raising farms in the north district was half of that in the south district, the shipment number of the former outran that of the latter (Figure 32).

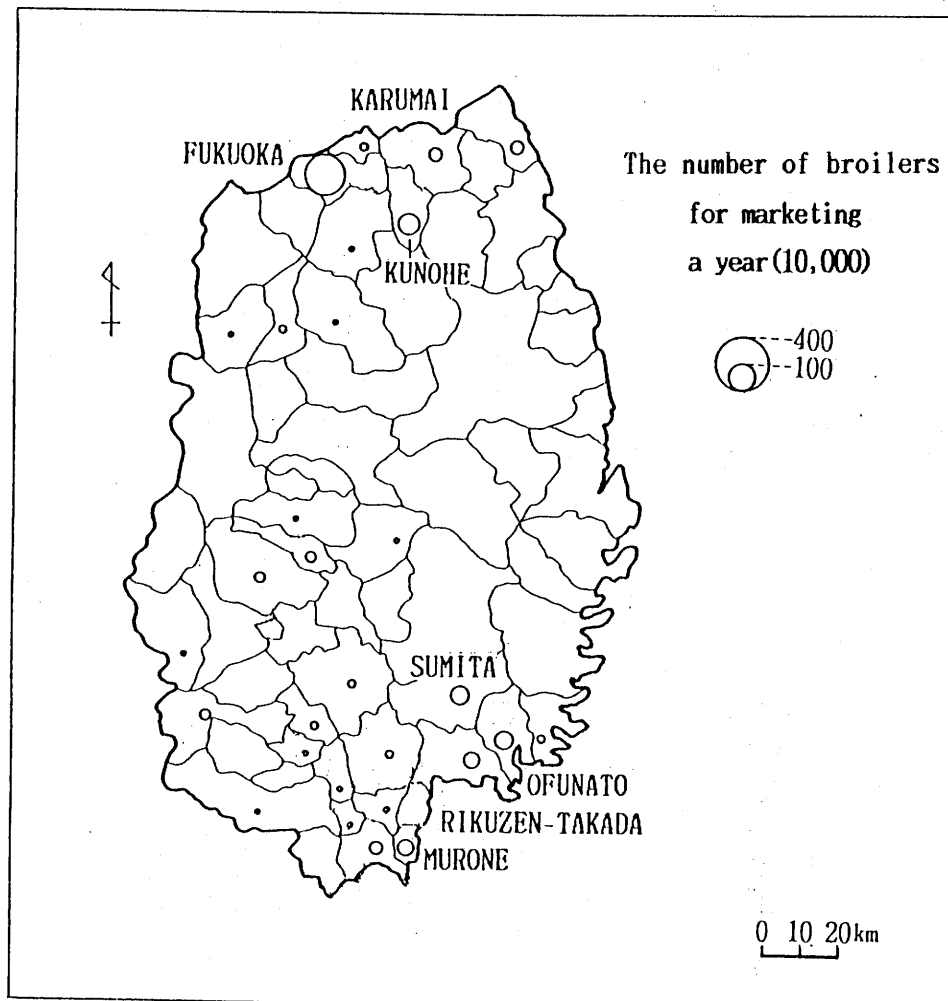


Fig. 32 Distribution of the number of broilers for marketing by cities, towns and villages, Iwate Prefecture, 1970
 Source: Statistics of livestock products in Iwate Prefecture

Fukuoka town, which held the largest number of broilers being raised, particularly made a record in the broiler shipment number per year, thus becoming the core region of the broiler industry in Iwate prefecture. On the other hand, the number of broiler raising farms in the south area came almost fixed in the first half of the 1970's, and increase of the shipment number became slower than in north area.

In the background of development of the broiler industry in the north area, there might exist, besides participation of integrators, the following three basic characteristics due to the regionality inherent in the village and its agriculture to direct the farms to the broiler raising. In the first place, the north area was occupied by forests, and the farms were growing barnyard millet, wheat and soybean by the harvest of three times in two years. The farm managing less than 1.5 ha numbered more than about 70 % in total, and the base of the agricultural management was generally fragile. Thus, they were obliged to carry out the upland field farming of self-supplying and low productivity. Secondly, movement of the multiple conversion in the regional agriculture was brought about for the measures since the 1960's. It included shifts of the upland field to the paddy one, to the livestock industry such as dairy farming and to the intensive cultivation that would produce merchandising crops. The broiler raising was included as well, and incorporated in its frame. Thirdly, phenomena of the giving up farming and the rural exodus became conspicuous in those farms that were conducting the small-scale diversified management with poor self-funds or dependent largely on the working away from home.

Next, movements of the livestock integrators belonging to Shoshas in Iwate prefecture from the latter half of the 1960's to the half of the 1970's will be surveyed. In this period, the supermarket and the chain stores came widely spread in the whole contry centering around the

metropolitan cities, and also the restaurant business began to diffuse.
27 Shosha paid their attention to these circumstances. They promoted organizing the networks that connected the supermarkets directly to the main production areas. They also promoted the integration system of an ownership type by introducing the system of the direct farm production that could reduce risks and give increased profits (Shindo,1978).

C,Itoh & Co.,Ltd., in 1970, set up its affiliated Fukuda Hatchery Co.,Ltd., Itoh Artificial Hatchery Co.,Ltd. and Iwate C.I.Farm Co.,Ltd.²⁸ as a direct farm of the poultry raising through cooperative investment with Hideo, Inc. at Kanegasaki town in Izawa gun. The east foot of Mt. Komagatake, to which Itoh advanced, had been partly occupied by Kanegasaki town and partly used as the common of the town people. It had been utilized as a grass collecting area until that time. By Reclaim Pilot of Government, the common would be started to convert the grass collection area to orchards and pastures in 1966. This was a preparing step in arrangement of agricultural management base for 657 existing local farms. Itoh had purchased about 200 ha in order to construct a fruit processing plant in its first planning. However, it was suddenly turned to construction of its direct farm for the poultry raising by the following reasons. Primarily, the poultry raising was declining in the environs of the metropolitan cities. Secondly, this area was favored with sufficient land, a good raising environment, and the condition that the excellent staffs for the raising management could be recruited. Thus, the area was concluded to be a promising supplying region of egg to the Tokyo metropolitan areas. The company, being also confident of the regional development of the broiler industry in Iwate prefecture, further established a broiler processing factory to manage treatment of the culled chicken from the poultry raising as well at Shiwa town in 1971. It was managed by Shosan Shokucho Co.,Ltd. (renamed to Showa Delica Corporation in 1984), which was founded jointly by the group of

Showa Industry Co.,Ltd., that was in charge of the food processing and the feed sectors of Itoh group, and farms in Shiwa town and Hanamaki city. Shosan also prepared its direct farms in parallel with the contracted production by these 6 farms, thus establishing a double management form.

As described above, the processing factories that belong to Shoshas got located over the three areas, the south, the central and the north, of Iwate prefecture in the first half of the 1970's. In this connection, development of the marketing route to meet the expanding production was promoted, and the integrators invited actively the farms to join in the broiler raising, in which the farms participated to secure stable cash incomes. Accordingly, in 1972, the number of broilers being raised per farm amounted to 7,800, which figure reached the highest level of 1.8 times the average of the whole country. The total broiler shipment number of Iwate prefecture also exceeded 10 million, and advanced to ninth in the whole country ranking, hence establishing the position of a new production area.

b. The stage of the main production area formation

(after the first oil crisis)

In the age of the 1970's, the farms in the north area of Iwate prefecture, having been suffering instability of the agricultural income due to the cold weather damages, further confronted enforcement of the acreage reduction according to the rice production adjustment policy and the decreased employment opportunities in such as working away from home in the Tokyo metropolitan area and finding jobs in the local region after the first oil crisis. These factors naturally threatened the living of the farm households. In this situation, the administrations of Iwate prefecture and of each city, town and village and agricultural cooperatives organized a nucleus of a project to strengthen the economical foundation of the district through promoting

the livestock industry. Livestock Housing Preparation Project²⁹ for beef cattle raising dairy farming, swine raising and broiler raising etc. was planned and practiced consequently. These cooperatives particularly, having fallen behind in the broiler industry in Iwate prefecture where it had been growing prominently, began to move actively responding to preparation of the livestock housing.

Sumita Town Nokyo in Kesen gun and Dendo Nokyo of Nishine town (joined with each Nokyo of Obuke and Terada, and renamed to Nishine Town Nokyo in 1982) in Iwate gun were typical examples that obtained good results. Both Nokyos aimed outgrowth of the farms that belonged to them from the small-scale diversified management. They started a movement to a new district where the stabilized agricultural income could be secured and the working outside of the district in winter would be eliminated, and placed the broiler raising at the center of their movement. These Nokyos confirmed that promotion of shift from the crop cultivating management and maintenance of the livestock production by the farms would be impractical without an integrated system through production, processing and marketing. In consequence, they intended to form relationships with a Shosha (in the former, Sumita town, case) and a chicken wholesaler in the distribution center (in the latter, Dendo, case) for the purpose of establishing the organization and its system that had been one of the weakest sectors of the both Nokyos.

In the first place, Sumita Town Nokyo will be surveyed in respects of the details on its participation in the broiler industry and of its cooperation with the Shosha. Five farms that had contracted with Amatake in Sumita town eliminated their contract because of their dissatisfaction at the substance and the conditions of the contract in 1969, and strongly requested the Nokyo to enter the broiler industry, request which triggered its participation. Next year, when Primary Sumita Town Agriculture Fundamental Plan was put into operation, the

mayor and the leader of the Nokyo members demonstrated their desire to participate in the broiler industry contrary to the standard line of the plan that focused on the beef cattle and the swine raising. Sumita Town Nokyo then asked Keizai-Ren of Iwate prefecture for help. As a result, they confirmed that Miyagi Broiler Co.,Ltd., a subsidiary company of Minori Feed Co.,Ltd. (a joint venture with Tohoku Kumiai Feed Co.,Ltd.) existing in Ishinomaki city, would receive the produced broilers and undertake the sales business. Thus, this company, Keizai-Ren of Iwate prefecture and Sumita Town Nokyo jointly established Sumita Broiler Corporation. In this connection, a contracted production system, by which the promoters or the five farms mentioned above would raise 25 thousand broilers per month, was adopted. It was also decided that Keizai-Ren of Iwate prefecture and Sumita Town Nokyo would take responsibility for the production. Further, Marubeni Co.,Ltd.³⁰ newly joined in order to reinforce their marketing organization, and to bear a part of business risk. In 1972, the processing factory was put into operation, which brought new participators, i.e. 5 farms from Sumita town and 7 ones from Rikuzen-takada city and Ofunato city, and the scale of the enterprise was enlarged accordingly.

After outbreak of the first oil crisis, the prices of feed and production materials jumped up. Marubeni, coping with this situation, required the raising farms to accept 10 % cut down in the production price assurance (a system of fixed price through the year) by the broiler benefit system. The raising farms took counteraction to this measure. They obtained from Keizai-Ren of the prefecture and Nokyo a definite promise on the remuneration security for their stable living and for continuation of the broiler production. It was mutually agreed that Keizai-Ren would bear the additional part of the guarantee. Thus, the farms held still more volition to production. In 1976, when management of the processing factory got going, a broiler housing (5

houses with a capacity of 130 thousand broilers) at Kami-arisu area in the north Sumita town was constructed, into which 5 new farms that had been cultivating rice and tobacco etc. Thus, the number of through the year broiler shipment controlled by Sumita Town Nokyo amounted to 2.5 million, and Sumita town became the largest production area in the south area of the prefecture.

On the other hand, Dendo Nokyo obtained a governmental aid as a link of Secondary Agricultural Structure Improvement Project in 1972, and prepared a broiler housing at Hirakasa area in Nishine town for the first time in Iwate prefecture. Next year, the tenants started raising, and it completed an exclusive broiler housing on the land of 10 ha, in the number of 30 houses and with a capacity of 330 broilers in 1975 (Figure 33), housing which was located on the slope north-east of Mt. Iwate at the south-west part of Nishine town. The surrounding area of about 500 ha had been the substitute for a maneuvering field of the Self-Defence Force after the war, and owned by Nishine town. Owing to its poor soil, however, it had been unemployed besides the pasture land. Since the 1960's, a counterplan council had been arranged for the purpose of growth of the viable farming farms and effectual use of the land in its connection. For the future farms, the council made the guidelines, which was classified into the three categories : paddy rice growing, dairy farming and broiler raising, and investigated measures to realize enhanced land productivity and profitability in each category. The conception of the planning that advocated advanced land use consisted of :(1) effective utilization of the by-product including restoration of the broiler litter to the pasture and of the compost from dairy to the paddy field and the vegetable field respectively, and (2) reduction of labor by mechanization of rice growing and application of the resultant surplus labor to operation in the processing factories.

In order to realize the concept of the planning, 15 farms, which

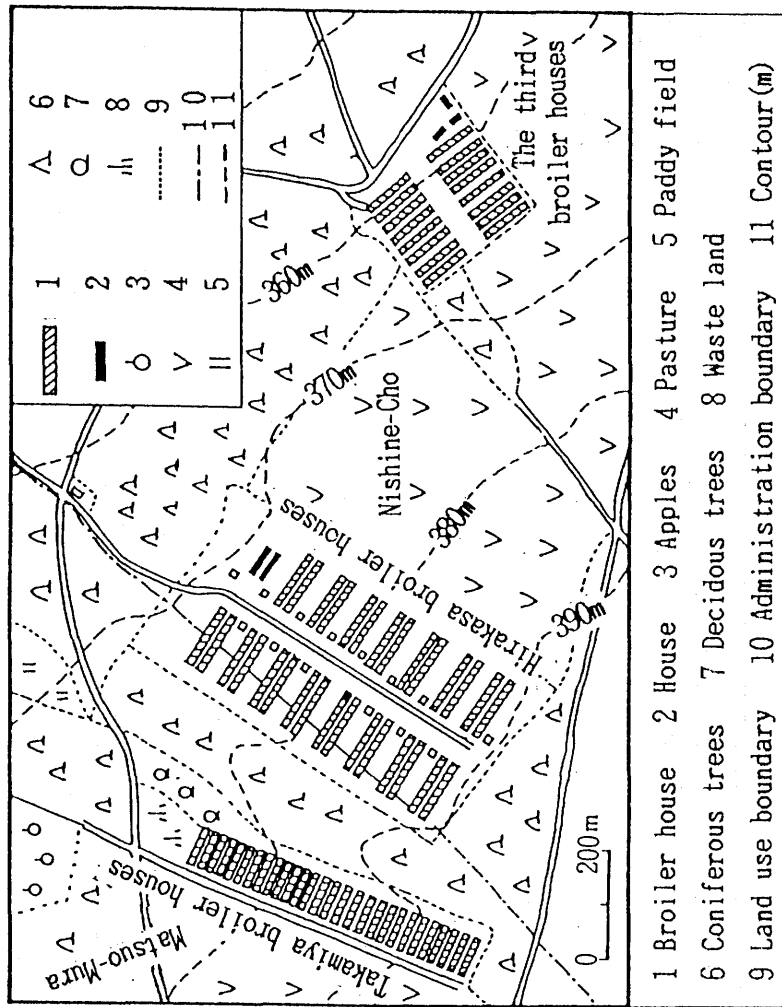


Fig. 33 Outline of broiler houses in the Dendo Agricultural Cooperative Association, 1983

Source: Topography of Nishine-Cho

included the medium-sized ones holding about 1.4 ha as the central members of Dendo area intended to carry out the diversified management that positioned the broiler raising at its foundation. They managed the housing according to the cooperated maintenance system, by which every day raisers took care of all houses in turn except the periods of chick arrival and broiler shipment. They received the management guidance from Keizai-Ren of the prefecture to supplement the experience shortage of the laymen group. Further, in order to overcome the unfavorable condition of lacking in a processing factory in the vicinity, they succeeded in luring Zen-Noh & Toriichi Co.³¹ which was attempting advance to the Tohoku district for roll back in the production and the marketing against the Shosha groups. The firm set up a factory at point-blank distance of 2 km eastern part of the housing in 1972. This gave an impetus to Zen-Noh, which established a plant of Iwate Kumiai Feed Co., Ltd. in Hanamaki city to reinforce the supplying system of livestock feed in Iwate prefecture in 1975.³²

When construction of Hirakasa housing was finished, adjacent to the west side of it Takamiya housing (5 ha, 28 broiler houses and accommodations of 170 thousand broilers) was also completed, housing which 7 farms of Nishine town entered. In 1981, as the final stage in the planning that aimed processing of 3 million broilers, construction of the third housing (3 ha, 16 houses and accommodations of 200 thousand broilers) was started at the east of Hirakasa housing. Eight households of Nishine town moved into this housing. Thus, full operation of the regional assembly of housings for broiler raising started consequently.

³³ The integrated system from production to distribution accordingly came to be formed in this area except breeding and hatching sectors. Development of the regional broiler industry that was led by Nokyos and particularly by Zen-Noh at their summit got under way.

Next, will be considered the movement of the broiler industry of

Iwate prefecture that responded to the extensive change in the broiler distribution form after the first oil crisis. From 1973, by virtue of wide diffusion of chilled and frozen broilers, the products of Iwate prefecture were shipped in the form of cut-up meat to the south Kanto centering around Tokyo and to the north Hokkaido for the first time (Table 20). As the refrigerating facilities came to be equipped in the wholesalers at the distribution center and in transporting cars, regional differentiation in the form of the products was brought about. Namely, the boneless meat and the leg meat were mainly processed in the remote production areas such as Iwate prefecture and south Kyushu, and the quite different product forms such as the carcass and the meat without internal organs were applied in the regions neighboring to the consuming areas. Owing to this situation, the broilers produced in Iwate prefecture confronted competition with the one in south Kyushu, the largest production area in the whole country.³⁴ The major processing factories such as Amatake and Daiichi Broiler, aiming to overcome the situation, began to develop new marketing routes, to diversify their markets and to enlarge them.³⁵ Actually, they exploited new routes in the underdeveloped markets such as the north Tohoku district and the small-to-medium cities in Hokkaido, promoted the self-supporting wholesale in the Tokyo metropolitan area, and took over the existing wholesalers in the distribution centers in order to establish their marketing positions.

In connection with subsidence of the advanced production area in the production and the distribution sectors, the major integrators in Iwate prefecture were promoting reduction of the production cost and the distribution one and elimination of the business risk by the following measures to develop the competition among the production areas favorably. Namely, they opened the breeding plant, the hatchery and their direct farms,³⁶ and intended to stabilize the cost price at a low

Table 20 Proportional changes of rate of the marketing destination of the broiler in Iwate Prefecture

Destination (prefecture)	1970 ¹⁾	1973		1975		1980		1985	
	%	%	%	%	%	%	%	%	%
Tokyo	—	55.5(62.2)		61.6(67.3)		44.0(73.7)		40.1(78.8)	
Aomori, Akita	6.9	19.7(54.7)		15.2(61.6)		23.2(87.1)		24.2(93.3)	
Miyagi	—	0.1(100)		1.1(34.5)		11.1(94.4)		10.1(99.2)	
Hokkaido	—	0.1(100)		1.1(34.5)		11.1(94.4)		10.1(99.2)	
Iwate	93.1	13.6(48.1)		10.6(19.4)		7.9(95.8)		8.3(92.5)	
Others	—	11.1(78.8)		11.5(67.8)		13.8(64.0)		17.3(79.0)	
Total	6,879 (1,000 birds)	28,472 t (60.7%) ²⁾		28,716 t (66.8%) ²⁾		60,292 t (79.5%) ²⁾		99,519 t (85.6%) ²⁾	

Notes: 1) The ratio of the number of live birds in 1970 and weight of birds in others

2) The ratio of carcass to all broiler meat for marketing

Source: Egg and broiler distribution statistics

level through bid contest among plural feed dealers. In addition, thanks to the regionally low raising density in Iwate prefecture, they had experienced neither outbreak of the chicken disease nor uprise of the pollution problem. Thus, the broiler industry was going satisfactorily in this prefecture.

In December of 1978, Tohoku Expressway opened down to Morioka. This shortened the transport time to the Tokyo metropolitan area, and enabled them to supply fresher broilers from Iwate prefecture than the ones from south Kyushu. Besides, the magnified refrigerating and chilling cars reduced the freight per unit broiler, thus enhancing the competitive power of the Iwate product in the market.³⁷ As a result, the number of broiler shipment of Iwate prefecture exceeded 35 million, and it outran that of Hyogo in 1978. Iwate prefecture thus became one of the main production areas following in the scale Kagoshima and Miyazaki prefectures. The broiler number increased prominently in the three prefectures afterwards, which trend resulted in a polarization phenomenon of the production areas into the north and the south.

Further, in 1980, Hachinohe Feed Base Construction Project, which had been authorized by Aomori prefecture as one of livestock promotion steps, was materialized. Further, next year, the authorities of Iwate prefecture publicated a political guideline for establishment of the food-base region of Japan according to the " Toward 21th century — the way Iwate agriculture must go ". Based on these backgrounds, the shift to the small-to-medium-sized livestock raising was promoted from the south area of Aomori prefecture to the north-east area of Iwate prefecture. The rapid progress of the broiler industry in the latter half of the 1970's lured the feed manufacturing plants to withdraw from the feed bases in the metropolitan cities and to move them (including newly setting up) to the new production areas. This movement let the local integrators to place their big hope on cutdown of the feed price,

because the construction of the feed base would reduce its freight to the districts centering around the north area of Iwate prefecture.³⁸ In consequence, from 1978 to 1982, Jumonji and Zen-Noh & Toriichi set up processing factories in the areas ranging from Kuji city to Kunohe gun that had not been favored with a special local industry and have suffered from depopulation. The integrators of Abe Hanko and Daiichi Broiler also set up processing factories at Sannohe gun in the south of Aomori prefecture in this period. At the same time, they promoted to turn the cultivating farms to raising broilers, and, in parallel with this, employed them as the operators of the processing factories.

As for Hachinohe feed base, Chubu Feed Co.,Ltd. started operation at the mouth of the river Mabechi in 1982, next year Nichiwa Industry Co., Ltd., Tohoku Feed Co.,Ltd. and C.Itoh & Feed Co.,Ltd. started operation, and Kita Tohoku Kumiai Feed Co.,Ltd. started operation in 1984. Thus, the feed production of 500 thousand tons by 5 plants started, and the feed of about 200 thousand tons came to be supplied to the north area of Iwate prefecture. The arrival composition of the formula feed in Iwate prefecture increased from Aomori prefecture, and weight of the supply from the Tokyo metropolitan area, which had been the major supplying territory, decreased largely below that in 1970.

Since increase of the raising farms and expansion of the raising scale had been promoted hand in hand in the north area in about 10 years after the first oil crisis, the broiler industry of Iwate prefecture came to outrun the two prefectures of south Kyushu in the number of the large-scale raising farms with more than 100 thousand broilers per farm and in the ratio of the broiler number, and stood highest in the level of the whole country (see Table 5 and 8). According to the transition of the broiler shipment number of Iwate prefecture (Figure 34), it numbered 10 million in 1972, kept rapid increase afterwards, and has exceeded 70 million in the period from

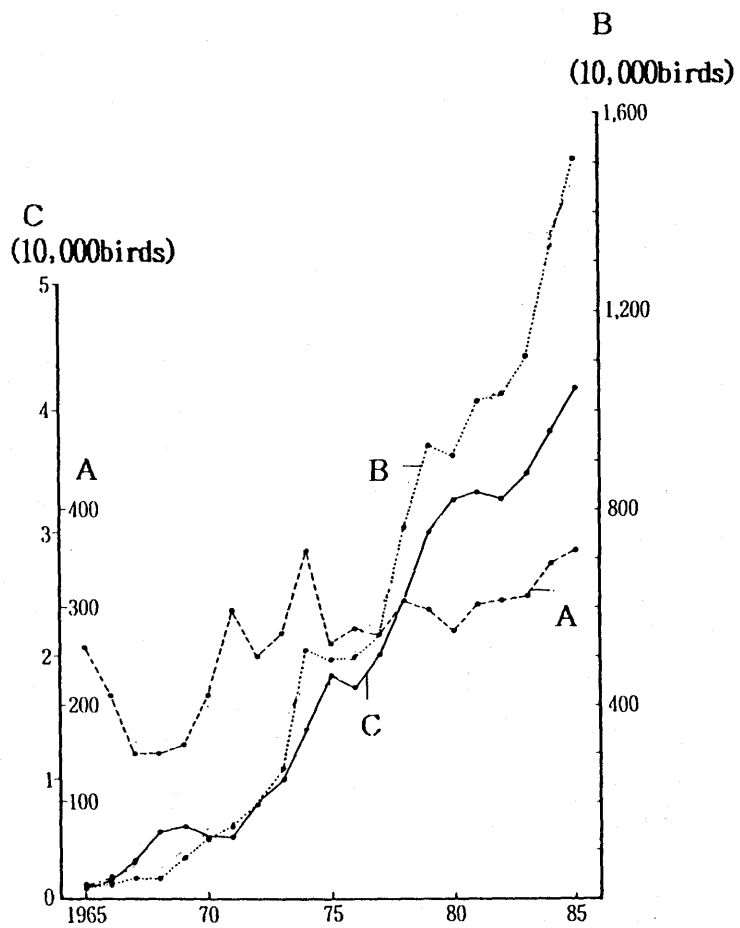


Fig. 34 Changes of broiler raising in Iwate Prefecture

Notes: A) No. of farm households raising broilers

B) No. of broilers raising

C) No. of raising broilers per farm household

Source: Census of livestock products

1985 up to the present. This growth pattern seems to follow after those of Kagoshima and Miyazaki prefectures around 5 to 6 years behind. The raising farm number, which has tended to decrease through the oil crisis in twice in the whole country, has been gradually increasing in Iwate prefecture together with expansion of the raising scale.

According to the regional variation in the number of broilers shipped in Iwate prefecture (Figure 32 and 35), regional features can be observed in the following areas. The number of the raising farms decreased largely in the area ranging from Hanamaki city to Ichinoseki city.³⁹ On the contrary, extension of the production area may be noteworthy in the area of north area ranging from Kuji city to Kunohe gun where the raising farms have increased in number in the 1980's. Particularly in the north area of the prefecture ; centering around Ninohe city as starting production area, and Kunohe village that has developed under influence of Ninohe city, the production area extend over wide range from the east, i.e. Kuji city, to the west, i.e. Nishine town and Matsuo village, and these areas have formed the accumulated production area. It can be clearly observed that the development in this region has been higher than that in the south area of the prefecture centering around Sumita town and Ofunato city.

2) The regional structure of the broiler industry

a. The regional structure of the integration system

In 1985, 16 broiler processing factories exist in Iwate prefecture, among which factories one is managed privately in a small production scale of 50 thousand broilers per year. Among other 15 processing factories (Table 21), 12 factories under Shosha affiliations occupy about 85 % of the total treatment within the prefecture, which fact indicates that they have been taking leadership in the broiler industry of Iwate prefecture.

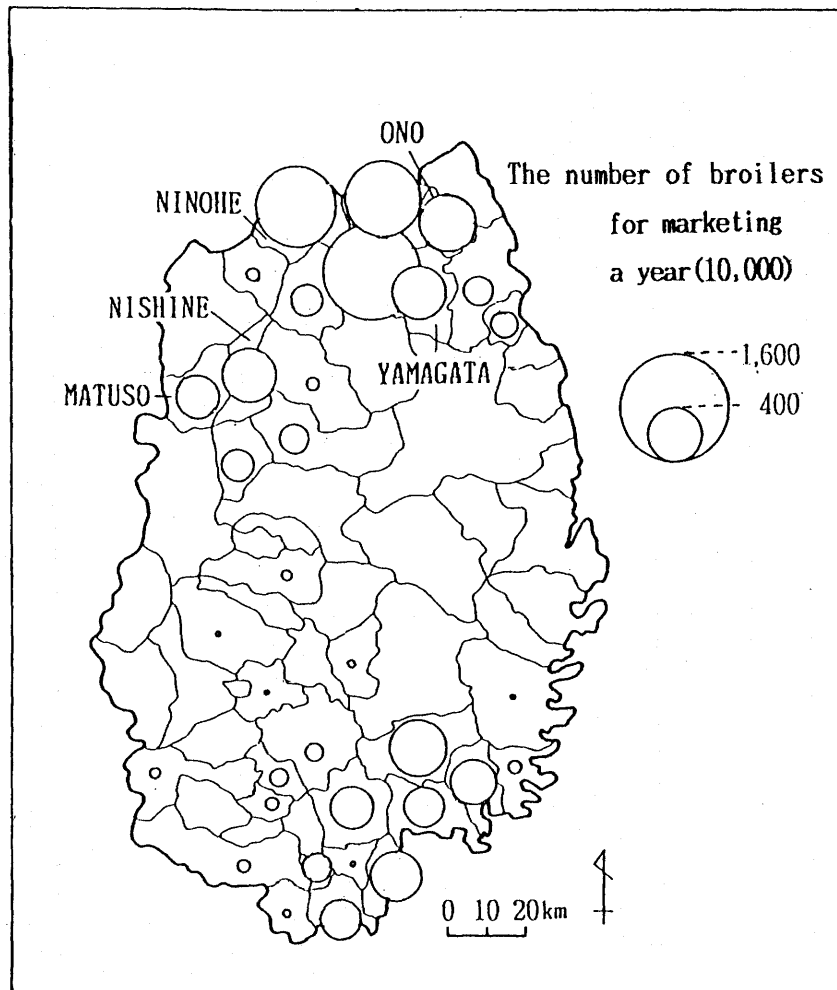


Fig. 35 Distribution of the number of broilers for marketing by cities, towns and villages, Iwate Prefecture, 1985
 Source: Statistics of livestock products in Iwate Prefecture

Table 21 Broiler processing factories and their systematization in Iwate prefecture, 1983

Name of broiler processing factory	1) Year	Investors	Location (10,000)	2) No. of broilers	3) No. of broilers	Breeding type 4)		The hatchery for buying most chicks, () Location	Main suppliers of formula feed	Main distributors of broilers
						Owned	Commission Contract			
Amatake Broiler Co.	1964	Local feed dealer, Nissin Seifun Co.	Ofunato-Shi	720	29	29	4 6 7 % % %	Direct management hatchery (Ofunato-Shi)	C. Itoh & Feed Co. Nihon Nosan Kogyo K.K.	Direct sale
Koyama Broiler Co.	1966	Local feed dealer, Taiyo Shiryo Co.	Murone-Mura	396	37	37	2 5 7 5 % % %	Takada Hatchery Co. (Ichinoseki-Shi)	Nisshin Feed Co. Taiyo Shiryo Co. Meiji Shiryo Co.	Direct sale Nihon Shokuchu Co.
Abe Hanko Ninohe Shoten Co.	1967 1974	Local rice & cereals dealer	Ninohe-Shi Kunohe-Mura	298 596	15 40	15 40	100% 100%	Matsumoto Keiten Co. (Kunohe-Mura) Hoko Chikusan Co. (Kitakami-Shi)	Nihon Nosan Kogyo K.K. Kyodo Shiryo Co. C. Itoh & Feed Co. Chubu Feed Co.	Nosan Foods Co. Suehiro Broiler Co. Toriichi, Nichirei Co.
Yokoya Bussan Ltd.	1969	Local wine & feed dealer, Nichiro Gyogyo Co.	Kawasaki-Mura	150	12	12	100%	Mori Hatchery Co. (Tamayama-Mura)	Kyodo Shiryo Co. Nichiro Gyogyo Co.	Direct sale Nichiro Gyogyo Co.
Tohoku Nosan Broiler Co.	1970	Nihon Nosan Kogyo k.k.	Tamayama-Mura	150	4	4	100%	Mori Hatchery Co.	Nihon Nosan Kogyo K.K.	Nosan Foods Co.
Dobashi Broiler Ltd. 5)	1970	Local poultry raising	Ninohe-Shi	660	22	22	100%	Kita Nihon Poultry Farm Co. (Karumai-Machi)	Nippon Formula Feed MF G. Co. Kyodo Shiryo Co.	Daiichi Broiler Co. Nihon Shokuchu Co.
Showa Delica Co.	1971	Showa Industrial Co. C. Itoh & Co. Shosan Shoji Co.	Shiwa-Cho	204	16	16	2 0 %	Hoko Chikusan Co. Fukushima Enya Co. (Shiwa-Cho)	Showa Industrial Co. C. Itoh & Feed Co.	C. Itoh & Prima Broiler Co.
Tohoku Chunky Co.	1971	Sumita-Cho Agri. Coop. Marubeni Chikusan Co.	Sumita-Cho	400	32	32	100%	Tohoku Chunky Co. (Kanan-Cho of Miyagi Pref.)	Zen-Noh	Chunky Foods Co.
Toriichi Co. Tohoku	1971	Toriichi Co. 6)	Fujisawa-Cho	267	5	5	100%	Ishii Hatchery Co. (Morioka-Shi)	Zen-Noh	Direct sale
Daiichi Broiler Co. Karumai	1972	Feed dealer of Hachinohe-Shi, Nippon Formula Feed MFG. Co.	Karumai-Cho	460	25	25	6 0 %	Kita Nihon Poultry Farm Co.	Nippon Formula Feed MF G. Co. Kyodo Shoryo Co.	Direct sale
Jumonji Poultry Ltd. Kuji Broiler Ltd. 7)	1972 1978	Local poultry raising Jumonji Poultry Ltd.	Ninohe-Shi Kuji-Shi	420 780	45	45	100%	Direct management Hatchery (Kunohe-Mura)	Zen-Noh Taiyo Shiryo Co. Nippon Formula Feed MFG. Co. Showa Industry Co.	Nichirei Co. Suehiro Broiler Co. Zen-Noh Shin-Toyo Broiler Co.
Zen-Noh & Toriichi Co. Kita	1972 1982	Zen-Noh & Toriichi Co.	Nishino-Cho Karumai-Cho	340 300	30 25	30 25	100% 100%	Ishi Hatchery Co.	Zen-Noh	Zen-Noh & Toriichi Co.

Notes: 1) The beginning year of operation 2) No. of processed broilers per year 3) No. of affiliated farms 4) The rate to total breeding birds

5) Affiliated by Daiichi Broiler Co. in 1982 6) Tied up with Zen-Noh & Toriichi Co. in 1983 7) Subsidiary of Jumonji Poultry Ltd.

Source: The author's field survey

The characteristics of the integration system roughly classified by the type of the group, i.e. Shosha system and Nokyo one, will be compared in the following sentences.

The processing factories under Shosha affiliations are classified into the ones affiliated by the Shoshas and the feed capitals : Amatake, Daiichi Broiler, Koyama and Yokoya, the ones independent of any special capitals : Abe Hanko and Jumonji, and the subsidiary companies of the Shosha and the feed capital : Tohoku Nosan, Showa Delica and Tohoku Chunky. The former two integrators among them, have functioned as the local integrators independent of the Shosha and feed capitals since the latter half of the 1970's. It may be noteworthy that they have formed an integration system of the self-completing type. The starting integrators, in particular, have tended to make contract with farms by the committed production system on one side, and have possessed, on the other side, their direct farms in which they have burdened the farms with a responsibility to production on some conditions to maintain efficiency of the chick raising and to stabilize shipment of live birds.

40

The processing factories under Nokyo system deal less broiler in the big distribution center than the affiliated ones by Shosha, and exert less influence on the wholesale market, owing to which situation they can not take leadership in pricing. With Zen-Noh at the summit, Keizai-Ren of Iwate prefecture and Nokyos (each Nokyo of Sumita town and Nishine town), coping with this situation, have been trying to reinforce their mutual relationship through which they are aiming to achieve unification by Zen-Noh and organization of the producing sectors. They have intended to organize the distribution sectors through their connection with the Shosha (Marubeni Co.) and the distributor (Zen-Noh & Toriichi Co.) on the other side. However they have been supplying the chicks from dealers, since the production in the direct farm has been

banned. Their marketing sector also has been largely dependent on the route to wholesalers by way of Zen-Noh & Toriichi. As a matter of fact, the integrated system from production to distribution has underdeveloped in the Nokyo group holding Zen-Noh at its summit. In consequence, the entire leadership has been taken by the Shosha and the distributor that have been in charge of the final step of the sales route. Moreover, Keizai-Ren of Iwate prefecture possesses no processing factory of its own, and is making the transaction contracts on the chicks and the feed purchase and broiler shipment with the farms through Nokyos, thus holding an incomplete integration system.

The Nokyos, which have been considering basically reinforcement of the agricultural management and stabilization of the living of the farm by guaranteeing a certain income, have recommended to the farm the windowless broiler house of relatively high cost. But productivity of the windowless house has been found to be not necessarily higher than that of the open type one that has been employed by the farm affiliated by the non-Nokyo enterprise. Their functional management and efficiency responding to the production and the distribution have stayed at an insufficient level, and their responsibility for the final risk burden has been indistinct.⁴¹

b. The regional distribution of the raising farm households

The processing factories are located collectively in the two main production areas in the north and the south-east areas of the prefecture. Their broiler collecting regions that have been formed by the factories, their direct farms and the raising farms can be converged within 30 km zone.

For example, Figure 36 shows distribution of the representative processing factories, i.e. Amatake, Tohoku Chunky, Abe Hanko and Jumonji of their direct farms and of the affiliated raising farms in the two main production areas. In the south-east area of the prefecture, the

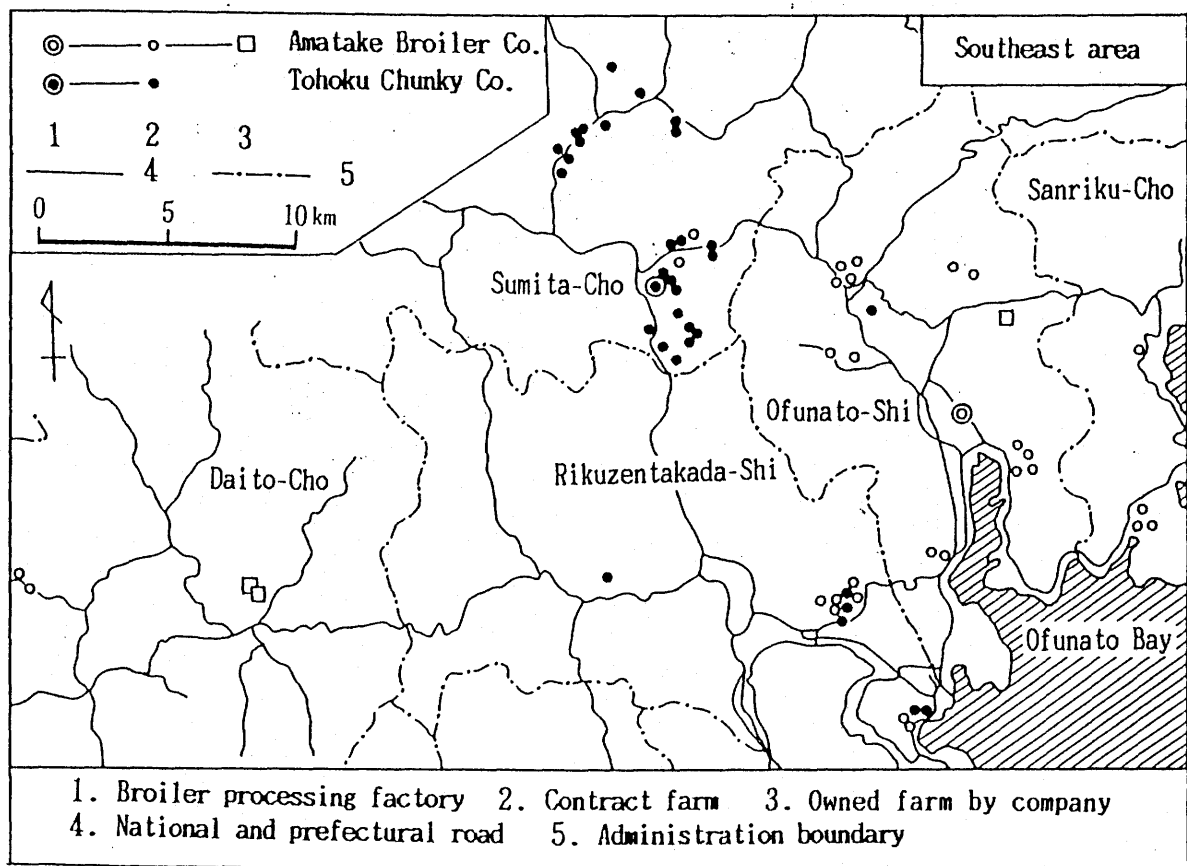
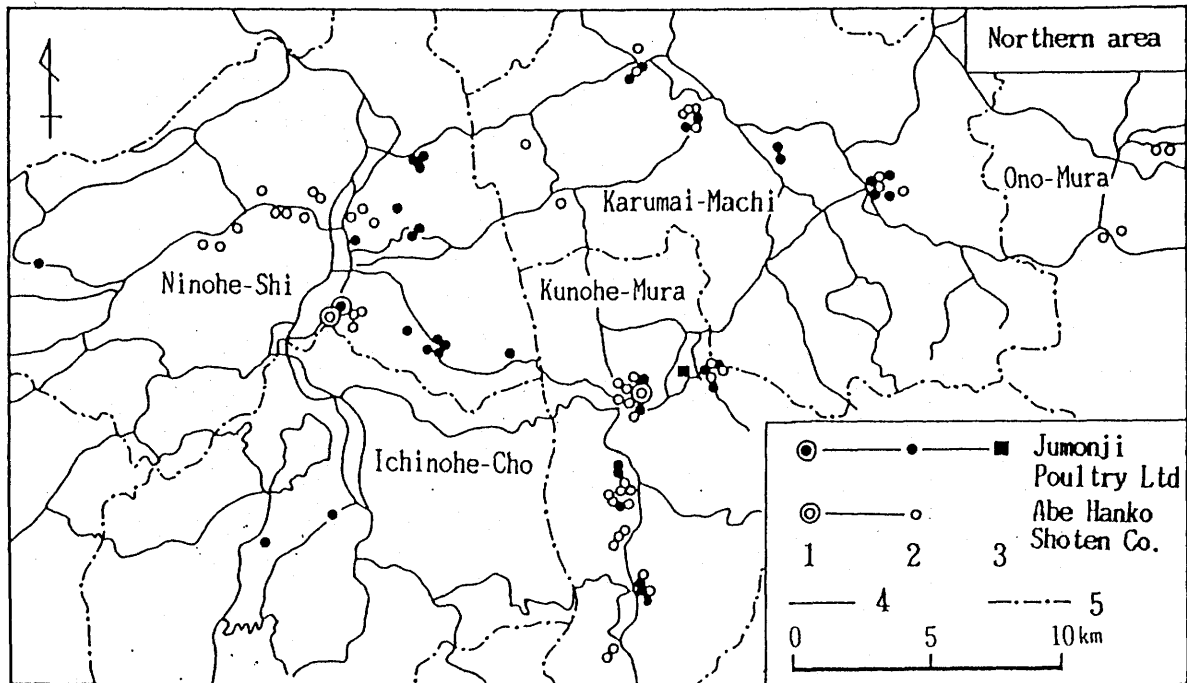


Fig. 36 Regional distribution of broiler processing factories and their contract farms and direct management farms raising broilers in the northern and southeast areas of Iwate Prefecture, 1983

Source: The author's field survey

processing factories and the raising farms are located relatively close to each other, and the raising farms form relatively intensive groups regionally. In the case of Amatake exceptionally, its two direct farms and its two raising farms are distributed in Daito town located to the west of the factory at a distance of 40 to 50 km, which situation has originated from their large raising scales and reflects their care to the chicken disease.

In the north area of the prefecture centering around Ninohe city, however, the processing factories have been set up neighboring to each other and at different times. The processing factories in Ninohe city, the earliest production area in the area, have secured a definite number of their affiliated farms in the specific villages at a short distance from the factories. However, intrusion and conflict among the late started integrators have been prevailing in Karumai town and Kunohe village, owing to situation the affiliated farms are scattered over relatively wide range. The newly participated farms, which have been brought up with increase of processing capacity, are distributed separately in the area surrounding the locations of the affiliated farms. It also can be observed that the newcomers hold a larger raising number per farm than those in the neighboring areas to compensate increase of the cost in transportation of the chicks, the feed and the live birds. It can be further observed that plural farms belong to the same integrator, if a unit hamlet is examined.

This phenomenon may be explained as follows. They have chosen their integrator through the human relationship including the regional connection and the blood relationship in the hamlet together with the integrator's inducement to the specific hamlet. However, when the farms make contract with the integrator, they tend to take up the conditions and the substance of the contract preferentially rather than the regional access to the processing factory. Thus, the integrator's desire

to gather the farms in a narrow broiler collection region or in a specified hamlet in view of profitability has not been fulfilled so far. In addition, alienation and revocation often take place on the occasion of the contract renewal. Further, it has been considered to be risky in view of the chicken disease that the raising farms would concentrate on a specific area. In consequence, the broiler industry may be liable to fluctuation of the regional connection in its nature. In Iwate prefecture, one of the newly-risen and growing production areas in the whole country, however, the scale of the broiler raising has been expanding until the present, and the long-term and fixed relationship has been maintained between the integrators and the raising farms in general owing to the background that the integrators have established the production planning and the sales system. It may be also pointed out that the integrators have been satisfying the basic condition which assures the farms of a certain remuneration for labor and of the stable living.

Accordingly, the existing 15 processing factories all possess such a large scale as processing more than a million broilers in a year respectively. Among them, big factories processing more than 3 million broilers number 10. The expansion of the processing factory has produced plentiful regular employees, which number 100 to 300, in each factory, thus creating an employment opportunity as a measure to the working away from home. It also has been offering the way of non-agricultural income to the small-scale diversified farms. Thus, the development of the processing factory is contributing appreciably to the economy of the area which is not favored with a good industrial base.

Next, the regional character of the broiler industry will be considered through the example of Ninohe city in which the broiler production area was formed earliest in the north area of Iwate prefecture, the plural broiler processing factories have been located

to lure many farms to join in raising and the kernel of the broiler industry of the area has been formed.

3) The regional character of the broiler industry in Ninohe city

a. The position of the broiler industry in the agriculture

Ninohe city locates at a mountainous area close to the extremity of the Main Island. Since the area has strict weather conditions and a precipitous topography, it has been suffering from cold weather damages. In addition, its land is sterile, underdeveloped and fractionated, thus being insufficiently utilized. As for its land use, development of the paddy field has been restricted owing to the physical condition, and the area has been preferentially occupied by the upland field, which are scattered on the hills and the terraces.

The total number of the farms in this city has been gradually decreasing from than 3 thousand in the 1960's, and the agricultural population has kept diminishing as well. The ratio of the population in the primary industry was reduced from 43 % in 1970 to the lowest one of 27 % in 1985. The city is form of a typical mountain village where its agriculture has been increasingly depending on women and seniors (Table 22). The number of other industries and their scales had been so limited that they had been dependent on cultivation of the main cereals until the end of the 1960's, and thus they had to attempt a project of the agricultural management improvement. From the 1970's, they searched after new crops of high profitability as the measures to the migrating occupation and to the crop switchover according to the acreage reduction, and introduced the vegetable farming for cold upland and the livestock production as the cores of the measures, and intended to improve the quality of the crops, i.e. leaf tobacco and hop (of which the city was recognized as an excellent production region), by the contracted farming. From the latter half of the 1970's, the farms conducting the

Table 22 Changes in farm structure in Ninohe-Shi

Items	1960 ¹⁾	1965 ¹⁾	1970 ¹⁾	1975	1980	1985	
Total farm households	3,178	3,131	2,960	2,770	2,603	2,490	
Full-time farm households ratio	31.0%	26.7	22.5	23.0	18.7	17.3	
Part-time farm households ratio	Mainly farming	42.2%	39.9	34.7	31.5	31.0	28.8
	Mainly other jobs	26.8%	33.4	42.8	45.5	50.3	53.9
The ratio of livestock farm households	100%	100	77.1	28.6	15.3	12.0	
The ratio of farm size by cultivated land							
Under 0.5ha.	21.8%	22.1	22.7	25.7	28.5	30.7	
0.5 ~ 1.0ha.	24.4%	24.5	27.3	29.4	29.5	28.8	
1.0 ~ 1.5ha.	22.0%	22.8	22.6	21.7	19.7	18.6	
Over 1.5ha.	31.8%	30.6	27.4	23.2	22.3	21.9	
Agricultural land (ha.)							
Paddy field	622	642	733	752	832	831	
Upland field	2,837	2,627	2,018	1,649	1,324	1,429	
Land under permanent crops	349	384	391	392	391	376	
Permanent meadows & pastures	491	385	169	126	115	90	
The best 5 sectors in gross agricultural production (): The rate in total gross agricultural production(%)	R (29.8)	R (26.6)	R (23.9)	Br(25.0)	Br(32.4)	Br(40.3)	
	W (26.9)	F (13.1)	Br(15.2)	T (16.6)	T (13.8)	T (11.3)	
	L (16.7)	V (8.1)	T (10.3)	R (14.5)	P (13.8)	R (9.5)	
	F (10.6)	Ce(8.0)	A (9.7)	P (9.3)	A (8.8)	B (7.4)	
	V (8.7)	P (7.2)	B (6.5)	A (8.4)	B (5.6)	P (7.0)	

R:Rice Ce:Cereals F:Fruits W:Wheat crops V:Vegetables T:Tobacco A:Apples L:Livestock
P:Pigs Br:Broiler B:Beef cattle

Notes: 1) Including former Fukuoka-Cho and Kindaichi-Mura

Source: Agricultural census, Statistics of net product of agriculture in Iwate Prefecture

single management in the industrial cropping came largest in number, and the broiler raising was incorporated into the diversified management. In 1985, the farms cultivating industrial crops, potato kinds, fruit and rice in the single management numbered more than 200 respectively, and their number amounted to 39 % of the total number of the farms. The livestock raising farms conducting the single management occupied 24 %, i.e. 73 households, and majority of them managed broiler raising, beef cattle raising and dairy farming.

From the standpoint of the gross agricultural production, however, the broiler sector has kept the first rank since the latter half of the 1970's, and the share of only this sector has been increasing in reverse proportion to reduction in the shares of other fundamental crops of the region. The broiler raising farms number 35 as of 1985, and their number had reduced from the peak number of 67 in 1974. But the broiler number per farm has increased from 55 thousand to 240 thousand. Thus, the scale of broiler raising of this city has become largest in the cities, towns and villages of Iwate prefecture. They have succeeded in switchover from the management composite with the crop cultivation to the one specializing in the broiler production.

b. The location and the agricultural management of the farm households raising broilers

The broiler raising farms in Ninohe city almost concentrate on the areas centering around the three villages (see Figure 36): 9 farms at Shimotomai area along the river Jumonji, a branch of the river Mabechi, 4 ones at Kindaichi area along the river Mabechi and 7 ones at Shitatori area along the river Shiratori. However, the specialized farming farms in the broiler raising are mingling with the diversified ones mainly other crops in the same hamlets. As for the broiler houses, majority of them are set up on the slopes of hills and at about 1 km distance from another one. The density of the raising farms stays at a

low level accordingly.

Three processing factories exist in Ninohe city. Their existence might open the door of the broiler raising to the farms that had been fumbling a new way out in the circumstances of their weak agricultural management base. As a matter of fact, majority of them participated in broiler raising from 1967 to 1972 in which period the factories started operation.

Table 23 indicates the examples of the specialized farms that have placed the broiler raising at the center of their agricultural sectors. The farm No.1 and No.2, which are in the commission contract with a processing factory, hold larger raising number than other raisers. They carry out the perfect enterprising management that depends partly on the employed labor, and make their livings by the broiler raising. Other farms specialize in the management of the broiler raising and also cultivate rice and vegetables, which they consume by themselves mainly and are partly supplied to the local area. However, owing to the large-scale management concentrated on the broiler raising, they have been retreating from cultivation, and thus they have fallowed about 50 to 70 % of the arable land in each farm.

Among the broiler raising farms that are not involved in the table 23, 13 farms conduct the diversified management that combines the broiler raising with other crops: 4 farms adopt the combination with rice, the combination with fruit and vegetable and with fruit only are adopted by 3 farms respectively, and the combination with rice and vegetable, with rice and leaf tobacco, and with rice and fruit are adopted by 1 household respectively. The farm of this type ships less than 100 thousand broilers per year in total, which figure comes to only about 40 % of that shipped by the specialized farms. Accordingly, the raising farms carry out all management by their family labor, owing to which situation their income stays at the level of 50 to 60 % of that

Table 23 Management of farm households raising broilers in Ninohe-Shi, 1983

Farm number	No. of broilers raising a year (10,000)	Acreage of cultivated land (a.)			Forest land (a.)	The ratio of broiler income to total one (%)	Other sources of income	Family worker ¹⁾		Hired worker	The beginning year of raising broilers	The greatest reason of beginning raising ²⁾	Works before raising broilers
		Paddy field	Upland field	Orchard				H	W				
1	92.7	13	29		180	100		○○○○	3	1967	A	Rice	
2	70	45	150		400	100		○○	2	1966	A·C	Rice, Vegetables	
3	30	30	40	140	100	80	Fruits	○○	1	1966	A·C	Apples	
4	22	7	20		140	99	Vegetables	○○		1961	A	Apples	
5	20	90	155		1400	80	Rice	○○		1967	C	Apples, Rice	
6	18.7	40	300		900	87	Wheat crops	○○○○⊙	4	1968	D	Wheat crops, Pulse, Carpenter	
7	17.6	40	80	12	1000	85	Vegetables	○○	2	1970	A·D	Dairy cattle, Tobacoo	
8	15	55	120		200	85	Vegetables	○○○△		1973	C	Dairy cattle	
9	13.6	66	34		180	90	Rice, Vegetables	○○		1973	A·D	Rice, Non-agriculture	
10	8	40	10		800	70	Non-agriculture	○○		1974	D	Rice	
11	10.8	30	150			60	Vegetables	○○		1973	C	Vegetables	
12	10.4	100	45			80	Rice	○○		1973	B·D	Rice	

Notes: 1) H: Householder W: Wife of householder S: Successor w: Wife of successor 0: Others

2) A: Profitability B: Never working away from home C: Canvassed by the broiler processing factory D: Promising feasibility

Source: The author's field survey

gained by the specialized ones. However, they utilize their arable land to a high degree, and hold a high ratio of crop selling.

The farms specializing in the broiler raising and the diversified ones mingle in the three villages which accommodate majority of the broiler raising farms. The broiler houses are located on the slopes of hills, and none of them can be observed on the flat land. Moreover, each broiler house stands more than 1 km distant from another one, and the raising density of the region has remained at a low level accordingly. The raising environment, has been kept in such a good condition that the broiler litter is being treated by the solar drying method for their own use, and the drying plant can be observed nowhere.

4) The regional conditions for production area formation of the broiler industry

In regard to the primary factor for the formation of the main production area in the broiler industry and the condition of its existence, the following four terms may be pointed out.

(1) Most farms had carried out the small-scale management with the operative arable land of less than 1 ha. They had not been favored with development of other agricultural and livestock sectors and of other industries owing to the inferior agricultural management base. They introduced finally the broiler raising because of its relative advantage of profitability, and promoted it as the fundamental sector of their agricultural management. Thus, the broiler raising has spread over and has taken root in particularly the north and the south-east districts of the prefecture.

(2) The raising farms have conquered the disadvantages for the broiler raising due to the cold climate through development of the appropriate facilities, which they have been improving to reduce the cost and to

raise the efficiency. They have been stirring up their motivation to establish the management of a commercializing agriculture that would eliminate the necessity for the migrating occupation. Further, they have been always intending to expand the raising scale, and a relatively large number of the farms have been favored with the successors to the broiler raising.

(3) The integrators have arranged the definite conditions (the committed raising system and the subrogation system for a part of interest of the loan etc.) in order to secure the broiler raising farms existing close to the factories. They have been trying to correspond to actualities of both the regional agricultural management and the economical conditions of the farms. Actually, they have adopted a flat fee a year system as a basis, through which they have assured the farm of a certain income to maintain the contract connection rigidly. In addition, they have employed a large number of middle-aged women as the operators in the processing factories to let the farms secure the way to obtain the stable cash-income.

(4) From the latter half of the 1970's, the broiler product came to be transported to the Tokyo metropolitan area by the expressway. This brought about not only cut down of the transport time but also change of the distributing system corresponding to the form of cut-up meat. These conditions and construction of Hachinohe Feed Base have prepared an advantageous background to the total system (from production through distribution) of the broiler industry in Iwate prefecture. The competitions among the local integrators and the Nokyo affiliated processing factories have taken place in these circumstances, competitions which have enabled this production region to cope with the advanced ones and those in south Kyushu successfully.

Notes

- 1) Besides, Mr. Takayuki Inoue in Miyazaki city started the broiler raising in 1959 (Marui Industry Co., Ltd. was founded next year). He laid in 5 to 6 thousand chicks twice a month from a hatchery in the city, and sold live birds to meat stores and hotels in the city. He raised 20 thousand broilers constantly from 1965, and set up a processing factory at the place, through which factory he shipped the product in the form of carcass (of which 70 % to Miyazaki city and 30 % to north Kyushu). After he opened a direct store in Miyazaki city in 1965, he sold all products at the store to the local area. In 1970, he had to give up both raising and processing owing to uprise of the pollution problem. (Zootechnical Society of Miyazaki prefecture, 1983)

- 2) When it was established, the numbers of its members and of its layers being raised amounted to 255 and 20 thousand respectively. It set up a direct hatchery at Shintomi town in 1959, absorbed Kawaminami Town Poultry Cooperative and constructed a chicken processing factory in 1962. It proceeded further to the broiler enterprise in the same year, but suspended it in 1965, following which it has been concentrating on the layer or on the activity as a special agricultural cooperative. It has been carrying out also a group poultry raising (in which the farms basically conduct the individual management) which is combined with utilization of the common facilities such as the chick raising farm and the broiler dropping drying plant. (Interview at Koyu Poultry Cooperative.)

- 3) Kagoshima Kumiai Feed Manufacturing Plant came first in 1967, Minami Kyushu Kumiai Feed Co., Ltd. was placed in 1971, and Nippon Formula Feed MFG, Co., Ltd. was set up in 1972. Kawada Feed Co. (C. Itoh & Feed Co. today), Marubeni Feed Co., Nichiwa Industrial Co., Nisshin Seifun Co.

and Zen-Raku-Ren were founded in 1973. Hikari Industry Co.,Ltd. and Keikyo Feed Co.,Ltd. were set up on commission of Nihon Nosan Kogyo K. K. and Kyodo Shiryo Co., in the same year, too.

- 4) Capital composition was :46 % by Mitsubishi Co., 44 % by Nippon Ham Co.,Ltd., 9 % by Nihon Nosan Kogyo K.K. and 1 % by Nishi Nihon Pilch Ltd.. (According to the company guidance of Nihon Broiler Co..)
- 5) When Nihon Broiler Co. advanced to Hyuga city, the company and the local Nokyo exchanged a memorandum which contained: commission of a part of the production to the farm households belonging to the Nokyo within its production planning, purchase of feed and other materials required for the committed enterprise from the Nokyo, and facilities for supply of technical information and for practice of training courses. (Interview at Hyuga City Nokyo.)
- 6) For the purpose of chick sale, a few Shoshas were lured, among which Mitsubishi Co. expressed its will. Mr.Nasu, the founder of Nishi Nihon Pilch Ltd., obtained the appropriate land through an intercession of the mayor of Hyuga city, thus succeeding in luring Nihon Broiler Co. (Interview at Nishi Nihon Pilch Ltd..)
- 7) Expresses the capital letters of "Study for Agricultural Prosperity" that defined the Measures Gist for Upbringing of Youth in Agriculture in 1962. According to the movement, the department of horticulture of Minami Kyushu University was founded at Takanabe town in 1967, and Miyazaki Prefectural Farmer's Academy (two-year system, a management department of 4 courses, i.e. the vegetable, the fruit, the dairy and the livestock for meat, and a guidance department of two courses, i.e. the agriculture and the livestock) was founded at the same town in 1972. (Edition by Takanabe Town History Editorial Committee.)
- 8) After the feed base at Kagoshima Port was put into operation, Zen-Noh and Keizai-Ren of Miyazaki prefecture, to prevent excessive competition, suggested to the authorities of Miyazaki prefecture that

construction of a new feed base would be unnecessary in the prefecture.
(Interview at Keizai-Ren of Miyazaki prefecture.)

9) Nihon Car Ferry Ltd. entered service in 1974. It connected Kagoshima Port to Osaka Port via Shibushi Port, thereby enhancing farmers' volition to the livestock production in the Osumi Peninsula.
(Interview at Nihon Car Ferry Ltd..)

10) The car ferry realized transportation to the Tokyo market in 25 hours and with the freight of 8 thousand yen per ton. Its service reduced the transport time and the freight from the former ones by: 10 hours and 4 thousand yen in the case of truck, 25 hours and 1 thousand yen in the case of goods wagon and 2 hours in the case of limited express container. This gave a big contribution to the extension of their marketing route. (Edition by Toshio Aono, 1975 and Society for the Research of the Agricultural Economics of Miyazaki, eds, 1979)

11) It closed the breeding cock farm because of financial difficulties of the breeding sector in 1977. The hatching egg came to be laid in from Mori Hatchery Co.,Ltd. at Kawaminami town. (Interview at Keizai-Ren of Miyazaki prefecture.)

12) It took over the processing factory of Hyuga Food Products Co.,Ltd. (opened at Hyuga city in 1975) in 1980.

13) According to findings of the inquiry to the broiler raising farms on the measures to the chicken disease practiced by Poultry Association of Miyazaki prefecture in 1979, the farms whose broiler houses existed at a distance within 300 meters from another one numbered 207, which occupied 73 % of the said farms. In the extent from 300 to 500 meters, the farm number amounted to 177 (62 %). The number of the farms that found another broiler house less than 500 meters distant from their own houses amounted to 295. This number was prominently bigger than 31 in the same case of the poultry raising farms that followed the

broiler ones in the total number. (Interview at Poultry Association of Miyazaki prefecture.)

- 14) The financing case-number and the monetary amount in application of Comprehensive Facilitation Fund in Miyazaki prefecture from 1968 to 1980 came to 995 farms and 6.5 billion yen respectively, the details of which were: 399 farms and 7.14 billion yen in the broiler sector, 159 farms and 2.9 billion yen in dairy farming sector, 147 farms and 2.57 billion yen in the swine sector, 89 farms and 0.98 billion yen in the fruit sector and 0.98 billion yen in the poultry sector. The same statistics, if classified by the type of affiliation, were: 192 farms and 3.75 billion yen in Keizai-Ren group, 106 farms and 1.2 billion yen in the group of Koyu Shokuchō, 37 farms and 0.62 billion yen in the group of Nihon Broiler and 35 farms and 0.49 billion yen in the group of Minami Kyushu Food Products Co.. (Interview at Miyazaki Office of Agriculture, Forestry and Fishery Finance Corporation.)
- 15) They set up to a cutting-up line the standard -150 operators for 10 thousand broilers in a day, but they cut down the number of operators to about 100 through processing boneless meat into nuggets and bulky slices and by introducing the machine with a facility of seasoning process. (Interviews at the three major processing factories in Koyu district.)
- 16) According to the gross agricultural production in 1985, the occupation ratios of the main sectors were: 18.9 % of broiler, 16.2 % of swine, 14.7 % of rice, 9.8 % of beef cattle, 4.5 % of egg and 4.4 % of sweet pepper etc. Besides, the whole livestock production occupied 54 %, the vegetable did 17 %, and the total of wheat kinds, potato kinds and cereals amounted to only 4 %.
- 17) Six companies, i.e. Kyushu Showa Industry Co.,Ltd.(a subsidiary of Showa Industry Co.,Ltd.), Nihon Nosan Kogyo K.K., Minami Nihon Kumiai Feed Co.,Ltd., Nan-Kyu Feed Co.,Ltd.(a subsidiary of C.Itoh & Co.,Ltd.

-), Shibushi Feed Co.,Ltd.(a joint venture of Mitsubishi Co.,Ltd. and its three related feed companies) and an American company, Cargill, Inc., held a production capacity of 54 thousand tons per month, which was a little less than that of 65 thousand tons by Kagoshima Feed Base. (Interview at Agricultural Administration and Fishery Department of Miyazaki prefecture.)
- 18) Fujii Bussan Ltd. has its locality in Kagoshima prefecture. It is, however, added in the table 17, because it has affiliated a number of raising farms in Miyazaki prefecture.
- 19) Management of farms in the direct farm system has been carried out through the salary contract system (A monthly salary of 200 thousand yen for raising 40 thousand broilers under the following conditions. The employee will receive, as a bonus, a third of the profit he has produced. In the case of inferior results, he will be discharged next year.). In this system, the employee tends to dislike the overtime working, to lack in delicate and motivated management and to move to another company that might offer to him a more favorable wage and conditions. It has been understood, in consequence, that the contracted production system can give a high broiler growing rate and good profits in general. (Interview at a Shosha-affiliated processing factory.)
- 20) The companies or their plants described below are in operation at the localities. Yoshikawa Semi Conductor Co.,Ltd. at Shintomi town, Miyazaki Oki Electric Co.,Ltd. at Kiyotaki town, M. Elec. Co.,Ltd. at Takaoka town and the plant of Kyushu Fujitsu Electric Co.,Ltd. at Kunitomi town. (Interview at Machinery and Information Industries Bureau in Ministry of International Trade and Industry.)
- 21) The company owns 26 direct farms at Miyakonojo city and 22 ones at Kokubu city in Kagoshima prefecture. The live birds raised in these farms are all shipped to Kokubu processing factory. (Interview at

- Minami Kyushu Food Products Co..)
- 22) Miyakonojo processing factory in the south district has affiliated the following number of farms, which form a broiler collection region of about 40 km: 20 houses at Takajo town, 13 ones at Takaoka town, 9 ones at Miyakonojo city, 8 at Takasaki town, 6 ones at Nichinan city, 5 ones each at Kushima city and Yamada town, 4 ones at Takahara town and 3 ones each at Yamanokuchi town and Mimata town. (Interview at Keizai-Ren of Miyazaki prefecture.)
 - 23) The area was specially designated by the government as the production region of tomato in 1966 and cucumber in 1970 respectively, following which Takanabe (Koyu at present) Nokyo established a cooperative shipping center in order to modernize both the production and the shipment system. (According to each yearly edition of "The vegetable in Miyazaki" by Agricultural Production Division in Agricultural Administration and Fishery Department of Miyazaki prefecture.)
 - 24) Among the farms in Table 19, 16 farms possess their expected successors, among whom only 4 ones have secured brides (from non-agricultural farms). Moreover, the farms in Takanabe town hesitate to marry their daughters to farmers in general. (Interviews at Koyu Nokyo and farms.)
 - 25) They promoted switchover to the windowless house in order to enhance the raising efficiency and increase the number of broilers being raised from 1966. (Interview at Amatake Broiler Co..)
 - 26) The firm disposed of this farm to the raiser 10 years after its opening, and abandoned both the direct system and the commission one entirely in 1978, adopting the contracted production system only.
 - 27) Nippon Kentucky Fried Chicken Co.,Ltd., a joint venture set up by the fifty-fifty investment of Mitsubishi Co. and Kentucky Fried Chicken Co.,Ltd. of the U.S.A., opened in Nagoya city in 1970,

- following which it has spread its chain restaurants over the whole country. (According to the company guidance of the said enterprise.)
- 28) The farm held the largest raising scale in the whole country: a site of 95 ha, 75 poultry houses for raising of chicks and layers and a constant raising capacity of 660 thousand poultries. As a collateral to the transfer of the land from reclaimed Nokyo in the area, the farm employed the members of the Nokyo as the staffs of the raising management at start of its operation. However, owing to slowdown of the egg consumption and deterioration of the raising management, it fell heavily in debt since the latter half of the 1970's. Accordingly, it has cut down the direct production sector, and has been shifting to the contract and the commission systems. (Interview at Iwate C.I.Farm Co.,Ltd.)
- 29) As a link in the chain of Agricultural Structure Improvement Project, the following cooperatives constructed the exclusive broiler housings: Hirakasa Broiler Producing Cooperative of Nishine town (from 1972 to 1979), Takamiya Broiler Producing Cooperative of Nishine town (from 1973 to 1975 and Komatsu Broiler Cooperative of Sumita town in 1976. Besides, as a link in the chain of Environment Arrangement Project, the following housings were constructed: Nishine Area Livestock Housing (from 1974 to 1980, for dairy, beef cattle, swine and broiler) by Iwate prefecture and Ninohe city as the project proprietors, and Ono Area Livestock Housing (from 1975 to 1976, for dairy, beef cattle, swine and poultry raising) by Ono village. In addition, Sumita Area Livestock Housing (from 1977 to 1978) was constructed by Sumita Town Nokyo as the proprietor of the project in Livestock Housing Upbringing Project that focused on the raising of broiler and swine. (Interview at Animal Industry Division in Agricultural Administration Department of Iwate prefecture.)
- 30) At that time, Marubeni Co., searched after a broiler production base

in the Tohoku district. It affiliated three companies, i.e. Sumita Broiler Co., Miyagi Hatchery Co. and Miyagi Broiler Co., and reorganized them into Tohoku Chunky Co..

31) The company was established in 1972 with the purpose of broiler marketing promotion through the fifty-fifty investment of wholesale sector under Zen-Noh system and Toriichi Co., a chicken meat firm. Besides, Toriichi was absorbed by the said company in 1983.

32) Until this time, no feed plant had existed in Iwate prefecture except for Snow Brand Nursery Co.,Ltd.(set up in 1970). Feed supply in the south area of the prefecture had been dependent on the feed plants mainly in Miyagi prefecture. (7 plants affiliated by Shosha at Ishinomaki Port and at Shiogama Port, and 2 ones affiliated by Shosha at Ishinomaki city at Furukawa city.)

The north area had depended on those in other prefectures centering around Hachinohe city. (one affiliated by Shosha and one affiliated by Zen-Noh.)

33) While the large-scale production system such as a regional system or a grouping one may have advantages in the production efficiency, the cooperative management and purchase of the chicks and the feed, it has not given always the expected profitability owing to the necessity of the special managing techniques to cope with the chicken disease. (Interview at Nishine Town Nokyo.)

34) The ratio of the Iwate prefectural products in the arrival of the cut-up meat at the Tokyo market in 1973 was 13 %, which came close to 19 % from Kagoshima prefecture and 18 % from Miyazaki prefecture. However, the said ratio in 1975 was 14 %, 33 %, and 22 % respectively, which statistics indicated offensive of the products from south Kyushu and, slowdown trend of the occupation ratio of the Iwate products.

35) Amatake established a traffic company as a subsidiary in 1975, and

opened a distribution center at Omiya city in 1983 as the base for the large-sized refrigerating cars for the purpose of developing sales route in the Tokyo metropolitan area. Besides, the company opened a supermarket in Ofunato city to reinforce its direct sales sector.

Daiichi Broiler, which have managed a meat processing industry as well as the feed trade, also owns a traffic sector, 15 sales offices and 5 restaurants mainly in the Tohoku district and Hokkaido.

Both companies are taking the way to the comprehensive food products enterprise through systematization of their organizations. (Interview at the both companies.)

36) Amatake set up a breeding and hatching farm in the suburbs of Ofunato city in 1970. In 1982, the company constructed three direct farms (raising 1.8 million broilers in a year) at Ofunato city and at Daito town respectively. Jumonji set up a breeding and hatching farm at Kunohevillage in 1976. Koyama set up its direct farm (raising a million broilers in a year) at Murone village in 1978. Daiichi Broiler owns 6 direct farms at Misawa city, at Shimoda town and at Hashikami town in Aomori prefecture, and at Karumai town and at Ono village in Iwate prefecture (raising 500 thousand broilers in a year). Besides, the company holds 75 % capital of Kita Nihon Poultry Farm Co.,Ltd., a breeding and hatching farm. Abe Hanko holds 50 % capital of Matsumoto Keien Co.,Ltd. (a hatchery).

37) After opening of the expressway, the transport time from the north district of Iwate prefecture to the Tokyo metropolitan area was shortened to about 8 hours, i.e. reduction of 4 hours from the former time, reduction which made supply the broiler of high freshness practicable. The size of the transporting car was enlarged from the 5 to 6 tons class to the 11 tons class, which brought about the freight of 11 to 12 yen per 1 kg of boneless meat (cf. from 20 to 25 yen for from south Kyushu to the Tokyo metropolitan area). (Interview at

Keizai-Ren of Iwate prefecture.)

38) A large-sized ship could not enter each port of Ishinomaki, Shiogama and old Hachinohe. Feed was thereby transhipped to small-sized ships of the 3 thousand tons class at the ports of Chiba, Kashima and Yokohama, otherwise it was transported by truck from the Keihin district. Accordingly, its cost freight in the north district of Iwate prefecture amounted to 7 to 8 yen per ton. However, since completion of the feed base at Hachinohe Port, the vessel of the from 50 to 60 thousand tons has been able to come alongside the pier of this port. In consequence, it is estimated that the feed price might be about 5 thousand yen per ton on the assumption that the charge for the grain terminal as well as the burden of repayment to the old feed plants might be incorporated into the price. (Interview at Japan Feed Industrial Association.)

39) They had been conducting the small-scale raising as a subsidiary management. However, owing to the dull tone of broiler market, they suffered from the consecutive deficits due to repayment of the fund for the facilities, and they were gradually driven to give up raising.

40) Jumonji has set up a standard: the growth ratio of 98 %, the average weight of 2.35 and the feed conversion ratio of 2.3. If the farms succeeds in the result higher than the standard, the farm will be given a bonus. In the reverse case, the company will impose a penalty on the farm to prevent dropping of its raising technique.

Daiichi Broiler employs the raising manager by the yearly contract that determines his salary 40 % by his result and the rest by the fixed amount. If he fails to raise a definite number of broilers, he will be discharged at the change of a fiscal year. (Interview at each processing factory.)

41) As for Zen-Noh & Toriichi Co., Kenhoku factory processes the carcass exclusively. The company ships the products in the form of carcass to

the Tokyo metropolitan area. A part of the carcass is being processed into the cut-up meat at Iwate factory, at Toriichi Factory and at Tohoku Chunky Co. on commission. Thus, the company holds a disadvantage of low efficiency in the processing. The raising farms affiliated by Tohoku Chunky Co. impose the loss from the difference of quotations on Keizai-Ren of Iwate prefecture that does not own its processing factory, if the sales price of live birds is lower than their production cost.

CHAPTER V

CONDITIONS OF PRODUCTION AREA FORMATION IN BROILER INDUSTRY OF JAPAN

1. The regional conditions for the production area formation in the broiler industry

In the four cases of the production areas, considerations on the following three subjects were given in Chapter III and IV: (1) the processes of the production area formation, (2) the regional structure in connection with (1) and (3) the regional character of the broiler industry in the core areas. As a result, the common conditions were found, but local conditions in the areas also were founded.

In this chapter, a comparative study of these production areas will be made to identify the regional characteristics inherent in the broiler industry. For this purpose, the study will be focused on the following three subjects: (1) function of the integrator that exerts the most influence on development and decay of the broiler industry, particularly the role of the processing factory, (2) location and management of the broiler raising farm and (3) regional structure of the integration system which affects the segments of this industry, i.e. production, treatment and processing, and distribution. Furthermore, with a procedure to model the regions according to their properties, the regional characteristics in the each model will be explained.

1) The function of the broiler integrator

At the beginning of the 1960's, 10 Shoshas' and one Shosha specializing in food products, Toshoku Ltd., intended to advance directly into the livestock industry to expand their profiting ranges

besides their own trades, import of feed and its domestic sale. They came to establish the control over this industrial sectors; production, processing and distribution, and succeeded in organization of the integration system appropriate for pursuing larger profits. As a measure of its aim, Shoshas owned the feed manufacturing plant as a subsidiary or as an affiliated company, through which it distributed agencies and special agencies to practice the feed sale. Then, these local feed dealers set up the processing factories, and the Shoshas by themselves proceeded into the remote areas to carry out the direct production. Moreover, they incorporated the receipt agents and the meat wholesalers into their groups to distribute the processed broiler to the distributing centers and the mass selling stores. They, further, led some of the affiliated distributors to set up the processing factories.

However, after the first oil crisis, the serious situations were generated, including the price hike of the imported feed and the problem of pollution caused by the livestock raising, thus deteriorating the marketing environment that surrounded the livestock industry. Consequently, the broiler raising farms were decreased remarkably in number, driving the feed dealers to curtail their trades and some Shoshas to withdraw from the livestock industry. Four Shoshas, Mitsui & Co.,Ltd., Mitsubishi Co., C.Itoh. & Co.,Ltd. and Marubeni Co.,Ltd. have succeeded in getting over the difficulties, and are exerting strong influence on the present broiler industry.

In contrast with these non-agricultural capitals, Nokyos, which fell behind in entering the broiler industry, have attempted to strengthen the organizational relationship with Keizai-Ren and Agricultural Cooperatives, with Zen-Noh as their summit. They, further, have attempted to form connections with Shoshas, the non-agricultural organizations, in the distribution field to cover their weakest, sales

department, resulting in the double-sales system. Besides, some farmers set up the processing factories by themselves, advanced into the wholesale businesses, and came to carry out the company managements.

The comparative study on how the processing factory functioned or played its role to fix the broiler industry in each of the four production areas revealed that the patterns of the production area formation could be classified into six types : (1) Shosha completing type- the integrating form in which the Shosha conducts by itself the direct management from production through marketing, (2) The local integrator completing type- the form in which the local integrator holds the control over all sectors except feed manufacturing, (3) The local wholesaler leading type- the form in which the local trader affiliated either by a Shosha or its incorporated company, such as receipt agent, feed dealer and meat wholesaler, fills the central role in integration, (4) Nokyo completing type- the integrating form in which the direct management is carried out jointly by Zen-Noh, Keizai-Ren and Agricultural Cooperative, (5) Nokyo leading type- the form in which Nokyo functions as the main integrator, partly depending on the enterprise incorporated by the company, and (6) Nokyo and Shosha cooperating type- the segmented form in which Nokyo takes charge of production and processing, with Shosha in charge of distribution.

The Tajima area may be characterized by (2) and (5) for the following reasons. The local feed dealer, affiliated by the Shosha, also conducted the wholesale trading to lead the broiler industry of this area. And competition between the said dealer and the late-started Nokyo brought this industry to fix in the Tajima area.

In the Fuji area, Nokyo and the feed dealers withdrew from the broiler business, and the receipt agent, incorporated by the capital of an urban merchant, and the retail store came to be united. As a result, a sole processing factory has remained in this area. Hence, this

factory represents the type (3).

Miyazaki prefecture may be characterized by the three types, (1), (2) and (4). It is because the formation of the production area was led by Shosha. It is also because the broiler industry took root in the district by virtue of competition among the Shosha, and the coexisting late-started Keizai-Ren and farmer capital.

In Iwate prefecture, the local integrators took leadership in the formation of the production area first, following which Zen-Noh and Nokyo joined. Thus, the manifold integration systems, e.g. a joint venture of a Nokyo-affiliated company and a Shosha-incorporated firm, have been developed in the course of the production area formation. Hence, Iwate prefecture can be prescribed by (2), (5) and (6).

Next, a survey will be given on the broiler collection region. In both Tajima and northern district of Iwate, the territories can be converged into the areas ranging from 30 to 40 km. On the contrary, the territories in both Koyu and Fuji districts are expanded to the ranges of 70 to 80 km, because a part of the affiliated farms are scattered over the outskirts outside the prefectures.

In Koyu area, having been overcrowded with the broiler raising farms, the processing factories of the integrators positively looked for new participants in the areas outside the prefecture to meet the increasing processing capacity. In the case of the Fuji area, the broiler raising farms had to be recruited from the remote areas, because the number of the raisers in this district was so limited. To conclude, in the first place, it is commonly observed that the affiliated farms concentrate in the vicinity of the processing factory. Secondly, the production area in the remote area possesses a higher raising density than the advanced production area. This may lead to a conclusion that the broadness of the broiler collection region does not necessarily hold the correlation with the degree of the production area development in the

broiler industry.

Finally, the contract system will be examined that has been applied between the processing factory and the raising farm household.

The contracted production system has been a mainstream in the broiler industry. Namely, the raising farm household offers the broiler house and the labor force, purchases the chick and the feed from the processing factory, and sells the live bird. The purchase price has been determined by one of the manifold transaction methods², including the flat fee a year system, the guaranteed payment system and the quotation method. Besides, two other production systems can be observed as shown below. In one case, i.e. the committed production system, the processing factory sets up the broiler house, with the farm household offering land and labor to receive the raising charge. The other case is the direct production system, in which the member of the farm household is employed under a salary system as a worker of the direct farm owned by the processing factory.

In the selected areas except Fuji, the processing factory adopted the flat fee a year system which particularly included a term of the guaranteed income, the most advantageous for the farm household in order to secure raisers. This system enhanced farm's motivation in the said area, thereby bringing about the formation of the production area.

In the case of the Tajima area, where the processing factories were concentrated on the specific area, severe competitions prevailed to obtain broiler raisers among the factories, thus producing the favorable condition in the contract. As for Iwate prefecture, the factories started with the committed production system, which made a number of the farms with poor self-funds practically decide to enter the broiler raising without depending on financing. On the contrary, convinced of its advantage over other agricultural sectors, the applicants for the

broiler raising in Miyazaki prefecture positively depended on big loans through use of National Loan Facilitation System for example. Accordingly, they intended to expand their raising scales for repayment of the loans as well as for upbringing of their successors. In the case of the Fuji area, the processing factory arranged the purchase price of the live bird in advance with the raiser, and paid the raising charge that was calculated by subtraction of the expenses on feed, chicken and chemicals etc. from the predetermined purchase price. Since this method was based on the market price of broiler, it was not always favorable to the producers. With no other processing factories located in the region, the factory could materialize the contract method favorable to itself.

To conclude, the processing factory may have attempted to incorporate the optimum condition for its profiting into the contract system in due consideration of : (1) the regional, agricultural circumstances, including the level of agricultural income, the productivity of land and labor and the farm's ability for a new investment, and (2) the competitive conditions of other processing factories.

The direct farms were opened in the four areas, farms which functioned to support the unstable processing volume due to fluctuation in the contract number. Actually, the integrators gradually have shifted towards securing the contracted raisers to meet the expanding, processing management after the direct farms in the remote areas opened. On the other hand, in the production area neighboring to the metropolitan region, they are utilizing the broiler houses belonging to the contracted farms that nevertheless have discontinued raising as their direct farms through purchasing.

2) The management and the location of the broiler raising farms

The comparative investigation on the broiler raising farms in the four areas has revealed the following five regional differences.

(1) Eager farmers promoted introducing the broiler raising into both Tajima and Koyu districts. In the former case, the opportunity of its introduction was brought forth by setting-up of the livestock association as well as advice of a local representative. In the case of northern district of Iwate prefecture, the poultry raisers were changing their trades and the local wholesalers were asking for promising industries in those days.

(2) In Fuji and Koyu areas, both the postwar reclaimed lands - land of volcanic ash (the former) and diluvial upland (the latter), the broiler raising was introduced to overcome the inferior land conditions. And in the Tajima area and the northern district of Iwate, it was adopted as a measure of the mountainous agriculture. While the broiler raising farms shifted from the poultry management in the Fuji area, a region of basically poultry raising, Tajima district could be termed a self-developed, raising region to which the broiler farming was an entirely new agriculture. Koyu and northern district of Iwate, newly-risen production areas, might be an introduction shifted region to which the broiler raising was diffused from the advanced production areas.

(3) In the districts except Tajima, the agricultural management has been dependent on the blood and regional relationship. Consequently, the raisers can be observed to be distributed in the specific villages. It can be also observed that they have participated in raising in a relatively same period. The raisers in the Fuji area, in particular, organized small groups, through which they cooperated in purchasing chicken and feed and in transaction of live bird according to the quotation method. Thus, contrary to other districts, the contract system did not come to fix in the Fuji area. Besides, the raising farms in

Tajima and Fuji areas experienced the livestock breeding in the past, reflecting the regional character oriented to the livestock industry. The custom to dislike cutting animals in the Tajima area might be an example of the regionally inherent characteristics.

(4) In the districts of Tajima, Koyu and northern district of Iwate, the regions dependent on the migrating occupations, the processing factories lured the farms to participate in the broiler raising with offering the conditions that would assure them of the income of a certain level through conducting the broiler management and of emergence from working outside the area in winter. Attracted by these managerial conditions, many farms joined in the broiler industry. In the Fuji area, on the other hand, with the manufacturing industries as well as the other livestock and tea farmings coexisting in the zone, the broiler raising was unable to form a favorable business, limiting the diffusion of the broiler raising farms over the district.

(5) In the early stage of the broiler industry, Tajima and Fuji districts, the advanced production areas applied the broiler houses generally of the two types, i.e. the battery and the cage feeding. However, these houses had to be transformed into the floor feeding windowless ones from about the 1970's as the measures to prevent emergence of the livestock pollution and to expand the raising scale. The situation forced a number of the farms to give up raising because of their insufficient self-funds for the new investment and anxiety to its future, reducing the number of the continuing raisers to a small level. In order two districts, the late-started regions, they, on the contrary, held high passion for the broiler raising from the beginning. Since they started with the floor feeding houses equipped with more substantial facilities than those in the advanced regions, they could manage broilers in a larger raising number per person.

Reflecting these historically distinctive circumstances, the

expectant successors in the advanced production areas have tended to discontinue farming, with many farm households carrying out either specializing or principal management with the labor supplied by the aged householders and their wives. On the other hand, with the successors or the expectants secured, the broiler raising farms in the newly-risen production area, in a large part, have been conducting specializing and enterprizing managements.

A comparative investigation on the application forms of the broiler houses will be shown next (Table 24). It is particularly noticed³ that the open type broiler houses are popular at Ninohe city, a cold country. The open type predominates at Takanabe town as well.⁴ But the windowless houses have almost completely spread over the advanced production areas. The windowless house, whose construction cost is generally higher than that of the open type one, is observed to be characterized by a distinct chick arrival per tsubo (=3.95 sq.yds.) because of its high raising efficiency and labor productivity. An exception to this rule is the open type house applied in Ninohe city that holds a larger chick arrival than the whole country average. This fact may suggest that the differences in the managerial conditions can bring more effect than those originated from the regional conditions on the productivity of broiler raising.

Furthermore, a survey will be given on the raising cycle (the time period from the chicken introduction and its raising through the live bird shipment plus a term for preparation to the next chicken arrival) expressed by days. Little deviations can be observed from the period of 80 days⁵ in these districts, but this seems to be a little longer than the whole country average. It may be because shipment of the large-sized broiler, about 2.3 kg in weight, has become usual to raise the processing efficiency, corresponding to the new consuming trend for cut-up meat. However, these production areas used to produce broiler in the

Table 24 Regional characteristics in the use of broiler houses, 1985

District	The number of raising broilers per 3.3m ²		Raising term (day)	The number of chick raising cycle per year	The average number of broilers raising per farm(1,000)
	Windowless type houses	Open type houses			
Hidaka-Cho	70 birds	—	81	4.5	24.0
Fujinomiya-Shi	64 birds	—	85	4.3	14.8
Ninohe-Shi	65 birds	46 birds	78	4.6	42.5
Takanabe-Cho	—	42 birds	83	4.4	30.8
The national average ¹⁾	42 birds		72	5.1	10.6

Note: 1) Data taken by Central Society of Zootechnical Science (1987),

Source: The author's field survey.

shorter period on average through shipping the broilers of manifold types from the small and the medium to the large.

Besides, to investigate the regional difference in the cycle from chicken arrival to broiler shipment between the advanced and the newly-risen production areas, Tajima district and Takanabe town are compared as the examples (Figure 37).

In the Tajima area, the three production housings, associated with Nokyos at Hidaka town and Takeno town, adopted the simultaneous system in both chicken introduction and broiler shipment at each housing. This form could not be observed in other districts. This led the farms to arrange the raising environments with the purposes to prevent emergence of the chicken disease primarily as well as to increase the producing efficiency. However, it also brought forth a problem that the broiler shipment tended to concentrate on the specific seasons. To solve the problem, a strategy is being applied at present to adjust fluctuation of the shipment in the district that other raising farms associated with Keizai-Ren of Hyogo prefecture are divided into several groups to compensate the resultants, vacant seasons of the three housings. Accordingly, practice of simultaneous system is confined to the three housings in this production area.

In Takanabe town, the broiler raising farms affiliated by the company have applied the simultaneous system in both chicken arrival and broiler shipment by each unit composed of 2 to 4 households in the same hamlet, succeeding in formation of the effective producing cycles. However, since application of the simultaneous system has caused the shipment volume to fluctuate widely, stabilization of the processing volume is being attempted through consideration of the shipment plannings in other cities, towns and villages.

Besides, the regional, simultaneous system has not been organized in Iwate prefecture, because the broiler raising density is relatively low

A regional program for raising and marketing broilers of farm households affiliated by agricultural cooperatives in the Tajima district, 1985

Month ()No. of farms	1 2 3 4 5 6 7 8 9 10 11 12										No. of raising broilers usually (10,000)							
	E	M	L	E	M	L	E	M	L	E		M	L	E	M	L		
Inokogaki broiler houses (4)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15	
Chimi broiler houses (3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	
Okutakeno broiler houses (7)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9	
Farm households raising (2)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	
" (2)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	
" (2)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	
" (3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	
" (3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	
No. of broilers for marketing (10,000)	6	3	4	4	4	9	15	10	7	4	4	0	9	15	4	7	4	15
	4	9	15	10	3	4	4	0	9	15	10	7	4	4	6	9	0	8

A regional program for raising and marketing broilers of farm households affiliated by a local integrator in Takanabe-Cho, 1987

Month ()No. of farms	1 2 3 4 5 6 7 8 9 10 11 12										No. of raising broilers usually (10,000)							
	E	M	L	E	M	L	E	M	L	E		M	L	E	M	L		
Farm households raising (3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10.2	
" (4)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.1	
" (4)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.9	
" (3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.4	
" (3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.8	
" (3)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.0	
" (2)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.9	
" (4)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.0	
No. of broilers for marketing (10,000)	8	6	4	10	8	6	4	10	8	6	4	10	8	6	4	10	8	6
	9	6	8	9	9	6	8	9	9	6	8	9	9	6	8	9	9	6

Fig. 37 Regional examples of in-out system in broiler raising in the case of both Tajima and Koyu districts
Notes: E—early ten days of a month M—the middle ten days L—the last ten days
Source: The author's field survey

in this production area. In the case of the Fuji area, with the raising farms concentrating on Kitayama district in Fujinomiya city, the regional, simultaneous system has been impracticable, since it would cause the working ratio of the processing factory to fluctuate.

3) The regional structure of the broiler integration system

As the requirement for the production area formation in the broiler industry of Japan, the following regional conditions have been generally proposed.

(1) The processing factory is located in the vicinity of a feed manufacturing plant. (2) The large hatchery and the large-scale raising farm households exist in the surrounding area. (3) The region is appropriate to secure the operators in the processing factory with low wages as well as to raise broiler at a low production cost. (4) And the region is favored with the good traffic conditions for mass transportation to large distribution centers.

Accordingly, in this section, the comparative examination of the conditions realized in the said production areas will be done.

In the first place, the regional correlation in the feed supply is examined (Table 25). Since these selected regions except the Tajima area had no substantial ports in their prefectures, the feed supplies were largely dependent on the feed bases in other prefectures. However, in Iwate prefecture, with a new feed base put into operation at Hachinohe New Port, the inexpensive feed has come to be supplied systematically, promoting development of the broiler industry, thus establishing the main production area in this area. The similar movement could be observed in Miyazaki prefecture, with the feed bases opened at Kagoshima Port and Shibushi Port (Figure 38).

Secondarily, the production areas are compared regarding the feed transporting distance (Table 26). In the northern district of Iwate, 100

Table 25 Changes in the distribution ratio of formula feed flowing into main production prefectures and of the ratio of respective feed supply

Hyogo Prefecture					Shizuoka Prefecture				
year	1970	1975	1980	1985	year	1970	1975	1980	1985
Flowed quantity (t)	639	590	643	708	Flowed quantity (t)	561	524	601	626
Total	100.0	100.0	100.0	100.0	Total	100.0	100.0	100.0	100.0
Desti- nation					Shizuoka	63.5	49.2	34.1	32.4
Hyogo	81.5	87.8	85.3	76.9	Aichi	18.8	35.5	56.3	57.0
Okayama	4.2	3.2	2.1	13.8	Kanagawa	13.9	13.5	7.8	5.0
Osaka	11.3	6.1	6.0	4.1	Chiba	1.8	0.8	0.9	4.7
Aichi	1.6	1.9	5.4	2.5	Others	2.0	1.0	0.9	0.9
Others	1.4	1.0	1.2	2.7	Supply rate (%)	77	61	49	35
Supply rate (%)	257	268	290	243	Iwate Prefecture				
Miyazaki Prefecture					year	1970	1975	1980	1985
Flowed quantity (t)	296	692	1103	1467	Flowed quantity (t)	215	355	652	982
Total	100.0	100.0	100.0	100.0	Total	100.0	100.0	100.0	100.0
Desti- nation					Iwate	5.6	22.6	26.3	17.4
Miyazaki	33.4	31.1	28.9	24.1	Miyagi	48.6	44.4	45.0	40.5
Kagoshima	1.5	45.9	54.9	64.4	Aomori	7.7	4.5	9.9	33.4
Fukuoka	49.5	16.9	10.8	8.3	Tokyo, Kana- gawa, Chiba	35.4	25.2	12.6	6.8
Others	15.6	6.1	5.4	3.2	Others	2.7	3.3	6.2	1.9
Supply rate (%)	33	30	28	21	Supply rate (%)	11	32	32	22

Note: Supply rate = Production ÷ Flowed quantity × 100
Source: Monthly report on formula feed

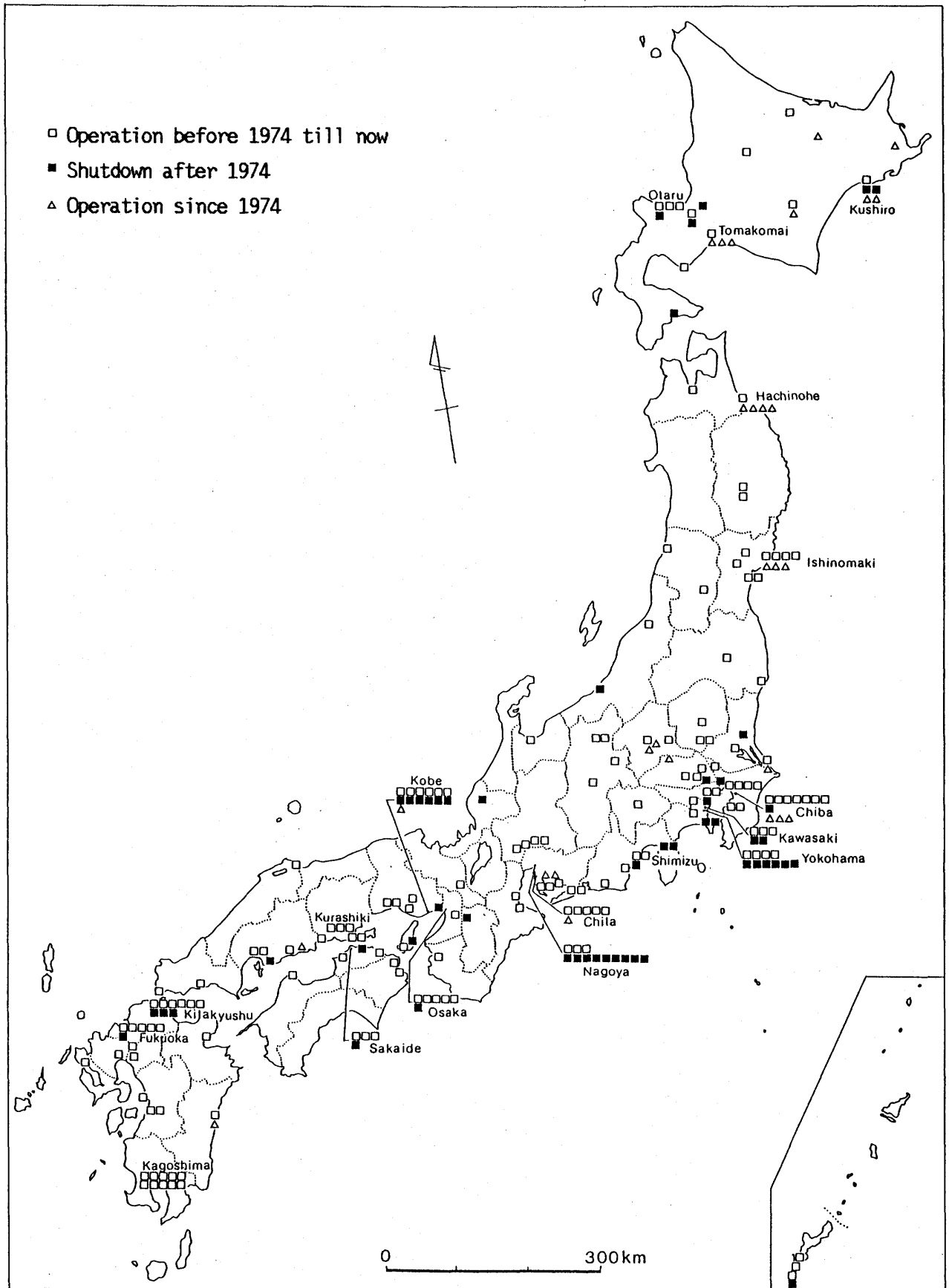


Fig.38 Locational changes of formula feed factory in Japan, 1985

Data source: Annual handbook of formula feed

Table 26 Regional comparison of expenses in broiler production and marketing, 1985

Region	Grower's price ¹⁾ (yen/kg)	Production costs ¹⁾ (yen/kg)	Feed cost ¹⁾ (yen/kg)	Chick cost ¹⁾ (yen/kg)	Traffic cost of formula feed (yen/kg)	Traffic cost of processed broilers (the greatest market & minimum hours) (yen/kg)
Tajima	265	255	184	38	2.5	13 (Osaka, 3h)
Fuji	258	258	174	37	3.33	10 (Tokyo, 2.5h)
Northern of Iwate	251	242	180	40	5.0	12 (Tokyo, 8h)
Koyu	239	233	163	39	5.0	22 (Tokyo, 25h)

Note: 1) price or cost per live bird of 1kg

Source: The author's field survey

to 120 km distant from both Ishinomaki Port and Shiogama Port, the feed transporting distance has been shortened to 40 km by way of Tohoku Express-way since opening of feed plants at Hachinohe New Port.

The Tajima area is located at a distance of 70 to 90 km from Kobe Port and Himeji Port. The Fuji area exists 120 km distant from Yokohama Port from which the feed is being supplied. But the actual transport time is less than 2 hours by way of highway. The nearly same transport time is available in the Tajima area.

On the other hands, two cases can be observed in the Koyu area. The farm households associated with Nokyo lay in the feed from Hyuga Port that exists about 30 km distant from the Koyu area. But many farms affiliated by Shoshas supply the feed from either Shibushi Port or Kagoshima Port that are separated 100 to 120 km from the district.

Usually the freight cost is determined by the transporting distance, the measure and the traffic volume. But the freight from Hachinohe New Port to the northern part of Iwate is exceptionally high. This is because the freight largely contains both the charge for the port use and a share of the repayment to the old plants. However, the present price is lowered by 3 yen per kg from the former one charged for transportation from the feed bases in Miyagi prefecture.

As for the chicken supply, one may not observe regional difference among the districts, because it is available in a circle with a radius of 30 km centering on the processing factory in every area.

Thirdly, the production cost in each area is examined. The production cost is lowest in the Koyu area, followed by that in northern district of Iwate. In the advanced production areas, on the contrary, the elevated labor expense as well as the high land price push the production cost to rise, which situation is directly reflected on the producer's price. The feed cost, which occupies the largest part in the production cost, is observed to be higher in the cold district,

reflecting the increased feed consumption by the chicken in the winter season. In addition, the extra cost including the electric expenses, has to be added to the production cost in the case of the warm district where operation of the ventilating fans in the broiler house is indispensable to prevent the underdeveloped broiler due to the high temperature and humidity in summer. The expenses for heating in winter also have to be added to the production cost in the cold production area.

The broiler marketing destinations of the four areas are surveyed. The Tajima area is located closest to the metropolitan market. But the unit freight is not lowest in these production areas owing to the regional character of Osaka market, which can be analyzed into : (1) primarily, the distributing organizations are so intricate here, (2) livelihood cooperative associations, public markets, wholesalers and retail stores- all these hold the stronger control over the distributing network than the mass selling stores do, and (3) the relationship among those concerned with transaction has been so deep historically as to form a closed society to newcomers. Consequently, the broiler price in this market is higher by 10 to 20 yen per kg than those in other districts.

On the contrary, the processing factories in both Fuji and Iwate areas have possessed the wholesale sectors by themselves, thereby succeeding in reduction of the unit freight. In the Fuji area, as a measure to the competition with the south Kyushu production areas in Tokyo market, they have shifted the shipment destinations of the products, largely in the form of cut-up meat to other markets in Kanto provinces. Iwate production area has been distributing its chain stores to establish trading relationship with the local markets. The Koyu area holds its markets in the three metropolitan regions. The traders of this district have organized the mass distribution system that connect with

the mass selling stores in these big markets, with their products successfully competing with those from Kagoshima production area.

Finally, the wage levels in the processing factories are compared among the districts.

The cutting-up operation has been depending on hands in every district, hands which have been given by mainly women employed by the part time system. The wage level is being determined in correspondence with other broiler sectors in the same district. However, it is raised at the area in a hard employment situation. The Tajima area, the region of relatively low income in Hyogo prefecture, is nevertheless awkwardly situated to collect hands particularly because of the regional nature to dislike cutting animals historically, thus paying relatively high by-the-hour wages. In the Fuji area, where the processing factory used to produce mainly carcass but seldom cut-up meat due to its labor consuming process, it has come to carry out the latter process as well to meet diffusion of this product form in markets. However, with Gakunan industrial area coexisting in the area, the factory is in a situation difficult to employ workers. Accordingly, the segmenting system has been applied : processing carcass at Fujinomiya city and cut-up meat continuously at Shimizu city.

On the other hand, the employment opportunities being scarce in both Iwate and Miyazaki prefectures except those in agriculture, the processing factories in these production areas have been functioning to offer the working places for the farm households to secure the way of cash income. Thus, they have been able to recruit stably the workers with relatively low wages.

For example, the wage per hour of a woman worker in 1968⁶ in each district : 90 yen in the Tajima area, 85 yen in the Fuji area, 65 yen in Iwate prefecture and 60 yen in Miyazaki prefecture. The figure was changed in 1985 to 480 yen, 475 yen, 440 yen and 415 yen, respectively.

In both years, the wage was lower in the remote areas. It may be understood that the ratio of the labor cost in the total production cost has been lower in the remote areas. It may also be understood that this low wage may have been supporting the remote production areas to run at the leading positions in the broiler producing race.

To summarize, the manifold segments in the broiler industry from production through distribution, their regionally connected forms and their spatial arrangement, are observed to be diversified further by the regional characteristics inherent to the production area.

The Tajima area has been favored with the firm, regional relationship together with the most intensive spatial arrangement of the producing elements. However, the custom of inhabitants to hate cutting-up operation, the historically closed transaction system in Kei-Han-Shin area and the unsatisfactory response to the change in the broiler consuming patterns - these factors may have produced a distinct situation of the broiler industry in this district so far.

In the Fuji area, where the producers originally attempted to found the regional connections in both production and distribution by themselves, the broiler industry has been destined to face a limit in the development of the production area under the circumstances that have emerged from the other agriculture and technological sectors coexisting in the district. Moreover, the spatial arrangement of the industrial segments indispensable to the development of the broiler industry has been formed excentrically, thus impeding a self-completing production area to be established in the Fuji area. In this insufficient environment, the farms have not come to raise broiler effectively, nor the processing factory has succeeded in an efficient management. Thus, the destination of broiler shipment has been confined to the local markets. However, most of the farms that have already participated in the broiler raising are, regardless of the lowering income, sticking to

this business by virtue of their strong regional connection and blood relationship, a reality that should be discriminated from the case of the Tajima area.

In the Koyu area, local farmers and Shoshas first promoted the broiler business, following which Nokyo joined in the broiler production as well, thus opening a new agricultural industry. Then, improvement of the agricultural management was stressed as well as upbringing of the successors, accelerating simultaneously the regional, agricultural shifting from the grain cultivation to the one applying facilities. This movement made a number of farmers so enthusiastic as to apply the big loans to the broiler raising. On the other side, the processing factories were getting strength the producing competitions in the area, as were the hatcheries. Consequently, with the ferry entering service, and with the new feed bases constructed, the Koyu area has come to establish a main production area in the broiler industry of Japan.

In the northern district of Iwate, the broiler industry was originally promoted in the same way as in the Koyu area. The farms made their ways to participate in the broiler raising with relatively small investment mainly through : modification of the open type broiler house that was diffused in the warm districts and selection of the committed raising system. A lot of non-agricultural workers, one may observe, have joined in the broiler industry either as raisers or as workers in processing factories to obtain the stable cash income, which fact represents the regional character well.

4) Regionality of the broiler industry

The finding about the regional characteristics in the four broiler production areas are compared in Table 27.

The production areas in the broiler industry can be roughly

Table 27 Regional comparison of characteristics in broiler industry

Items	Production areas	Tajima district	Fuji district	Koyu district	Northern district of Iwate Pref.
Motivation of raising broilers		Self-development	Based on poultry management	Introduced from outside	Same as Fuji and Koyu districts
Introducer of raising broilers		Eager farmer to raise	Regional production union	Eager farmers to raise	Farm households raising poultry, Production area wholesaler
Leading integrators		Local integrator Agricultural Coop.	Production area wholesaler	Business firm, Agricultural Coop. Local integrator	Local integrator, Agricultural Coop.
Sale type to market		Carcass, Cut-up meat	Cut-up meat, Carcass	Cut-up meat, Processed meat	
Broiler collection region		40 km	70 km	80 km	30 km
Contract system		Flat fee a year Commission(a part)	Commission	Flat fee a year	Flat fee a year Commission(a part)
Management of breeder		Full-time	Full-time and part-time	Full-time and enterprising	Enterprising and full-time
Type of broiler house		Floor feeding in windowless house	Floor feeding in windowless house	Floor feeding in open house	Floor feeding in windowless-house (some open houses)
Method of raising & marketing of chicks		All in & all out in big broiler houses		All in & all out in each breeder	
Existence of successor		Less (city-ward migration)	Less (giving up farming & stay at home)	Enough (someone works in broiler company)	Enough
Natural condition and dominant agricultural land use		Mountainous region (Paddy field)	Volcanic ash land (Upland field, Pasture)	Diluvial upland (Upland field)	Mountainous region (Upland field)

classified into the two types : the metropolitan type and the remote type.

Accordingly, Tajima and Fuji areas represent the former, and Koyu and the northern district of Iwate belong to the latter. The broiler industry of the metropolitan type has progressed through shipment of carcass to supply fresh broiler to neighboring markets. However, the management specializing in the broiler production is being conducted generally with the family labor chiefly contributed by the aged members, because most successors have given up agriculture. Further, owing to the problem of livestock pollution and from the standpoint of broiler raising environment, raisers had to reform the existing broiler houses into those of the windowless type at the middle of the 1970's. In those days, with the successors coming short, and with facility investment depressed, a number of raising farms demolished their broiler houses, returned to the crop cultivation, and shifted to non-agricultural occupations. This situation drove the integrators to curtail their managerial scales. They have been attempting continuation of the broiler business ever since. Actually, they are promoting rationalizations in the producing, processing and distributing sectors, aiming to form the production area that may not be directly competitive with those in the remote areas.

Concerning the production area of the remote type, multiple integrators advanced into the areas with fragile agricultural bases. They distributed the hatcheries and breeding farms that belong to their groups, affiliated farm households, and constructed their direct farms. With the transportation system innovated by diffusion of refrigerating facilities, and with the consuming trend shifting since the beginning of the 1970's, they came to organize the regional system that combined the production area directly with the mass selling stores in the big consuming areas to sell the cut-up meat in large volume. In addition,

the local government as well as Nokyo stressed promotion of the livestock industry, bringing the feed bases to be constructed in the surrounding regions, a condition that enlarged the territory to secure the raising farms. Since the remote area had not been blessed with the fundamental crops, the agricultural successors had been hardly brought up. However, by virtue of introducing the broiler raising, they came to hold anticipation for the stabilized management as well as the stable income. Some raising farm households, one may observe, have carried out the enterprising management that incorporates not merely the employees but also their successors.

There has been observed another characteristic about the function of the integrators in the newly-risen production areas. They have attempted to form effective organizations in the investment, the technology and the production. They have always considered the general economical and social movements, and, moreover, have taken after the features of the broiler industries in the advanced production areas nevertheless through optimalizing the conditions of the regional broiler industries according to the location and the agricultural management characteristic of the districts.

2. The general conditions for the production area formation in the broiler industry

In this section, based on the regional characteristics examined in Section 1, the general conditions in the broiler industry of Japan will be discussed. These conditions are the requirement that should be satisfied for both development of the broiler production area formation and continuation of the region.

The principal product form in distribution of broiler to the market had been the live bird up to the 1950's, following which the carcass became popular in the 1960's. With the broiler products seldom transported over a long distance,⁷ the production areas in the environs of the metropolitan regions stood at the superior positions thanks to their access to the consuming areas in those days. In addition, other small-to-medium livestock farmings tended to gather in the areas neighboring to the big cities as well, bringing the feed plants to concentrate on these areas naturally (see Figure 38).

Accordingly, the regional processing factories were set up in these areas, and the hatching plants and the raising farm households were also established in their vicinities. The following three conditions might influence the production area formation of this type.

(1) The region existed in the environs of the metropolitan region, i.e. the consuming area with a large demand, a condition required to the consumption oriented business.

(2) No fundamental crops had been farmed, or introduction of broiler raising seemed to have the highest advantage in securing relatively good income over other crop farmings.

(3) Plural processing factories competed with each other to secure the raising farm households, which situation promoted formation of the integration system centering on the processing factory.

However, emergence of the livestock pollution problem in the metropolitan regions, change in the pattern of land use with industrialization of the district, phenomena of giving up farming in the young generation, jumping of goods prices after the oil crisis and the dull tone of the broiler market due to overproduction - all these phenomena, brought by the shifting economical and social environments in the 1970's, acted against the broiler industry in the said region, thus depriving of its superiority over other production areas. On the other hand, with the ferry entering service to combine the remote area to the metropolitan regions, and with the highway network completed over the country, the broiler product in the form of cut-up meat, processed in the remote area, came to be supplied to the mass selling stores and the big demanders in the consuming areas. Shoshas and local feed dealers, accordingly, participated in the full-scale broiler business, and advanced into the areas favored with the relatively good traffic conditions in the remote areas through setting up the processing factories, the area where, with no fundamental crops having been farmed, sufficient labor could be secured with lower wages.

Meanwhile, in the metropolitan environs, they were attempting to hold back the shrinking broiler production through rationalizations of the producing management, including discontinuation and / or integration of the processing factories, with a limited number of farm households expanding their raising scales. However, as the sales shares of the broiler production in the metropolitan markets were lowering, the positions of these production areas in the big markets were forced to retrogress.

When the 1980's started, the price of the imported feed fell due to the rising yen, bringing forth drop of the price of broiler goods as well. Thus, it was requested to produce the broiler products with lower cost price. Moreover, with import of broiler from the foreign

production areas, e.g. Thailand and China, tending to increase, the Japanese broiler industry got into an age of the full-scale, international competition. This situation shocked the broiler industry in the advanced production areas particularly, causing the farm households to give up raising, thus driving the processing factories to go bankrupt or to incorporate each other in the wide range of the regions. To continue the broiler businesses in these production areas, the processing factories, with the small-to-medium processing scales, have been attempting to take the following measures to avoid the direct competition with both the domestic and foreign production areas : (1) shipping fresh and tasty broiler, though in the limited distribution, to the markets in the metropolitan regions, (2) planning to expand the local consumption by setting up the direct stores and restaurants, (3) developing the multiple, value-added good for the local markets and stabilized shipment of the various kinds of products in small quantities to the regional markets.

On the other hand, the stratum differentiation has been proceeding in the remote areas, bringing forth the farms that carry out the expanded management. These farmers and the processing factories have reinforced mutual dependence to pursue the scale-merit, forming groups in their production areas. Moreover, integrators have attempted to meet the demand for the product with high quality in parallel with scale enlargement.⁸ However, both the cost reduction and the further expansion of the vehicle size (15 to 20 tons) for long distance transportation have reached limits. On the contrary, the freights have appeared to rise inevitably. Consequently, the measures are being attempted in the transportation sector of the broiler industry. The measures are (1) effective utilization of the returning service as to the highway transportation and (2) arrangement of the trailer at every port to receive and to ship only the containers as to the ferry service.

Finally, concerning the broiler raising farms, the following general conditions were found through the comparative study on the their characteristics, including motivation to enter the broiler production and management forms in the regional agriculture.

(1) The raising farms, in a large part, have carried out the small-scale agricultural management with arable land less than 1 ha. Those with narrower farm land place, thereby, more emphasis on the management of the broiler raising. Further, since those located in the narrow places in mountains and on hills have not been favored with the land condition appropriate to rice growing, i.e. the fundamental crop cultivation, many farms have chosen the facility-applied livestock farming on which the land fertility may not exert influence. The broiler raising may have been selected among the livestock farmings mainly by the following reasons : (a) for modernization of their agriculture, (b) practicable with a relatively small facility investment and (c) possible with the relatively simple management and technology.

(2) The farm households that had been blessed with neither profitable crops nor promising industries noticed the broiler raising, because it seemed to have bright future as well as to assure them of the relatively high income.

At the conclusion of this section, a brief comment is given on the production area in Japanese broiler industry. While the production areas in the broiler industry of Japan are concentrated in the remote areas, the main ones are getting specified to a few districts. And integrators, separating from the agricultural land use, have attempted to construct the integration system or the regional organization to connect the production area directly with the market as well as to reduce the production cost. Accordingly, the broiler industry is susceptible to the non-agricultural or the economical factors, the variables that include the product price fluctuation mainly

attributable to that of the imported feed and the profit ratio in distribution sectors. Further, it tends to compress the production cost, thus favoring only the district in which the inexpensive land and labor are available.

In consequence, the spatial arrangement of the producing segments, one may observe, is most important in the broiler industry. At the main production areas in the remote area, the commercial livestock enterprises incorporated by the non-agricultural capitals took leadership in organization of the production area. They reinforced mutual relationship to strengthen their managements; arranging the producing groups in the vicinity of the feed base, locating the processing factories at the center of the production area, and concentrating the producing organizations at its surroundings to aspire both their specialization and scale enlargement.

Moreover, the agri-businesses affiliated by the huge capitals with full use of modern technology advanced into the broiler industry under the said circumstances, a move that promoted reformation in the characters of the farm households and the structure of the regional agriculture from outside of the district. However, the regionally inherent characteristics, such as the land condition, the specific agricultural operation and the farmer's temper or motivation, have been strongly reflected on the history of the main production area formation.

To summarize, it is clear that areas which have been least advanced so far may become the most advanced production areas, utilizing their regional characteristics in forming the agricultural production area.

Notes

- 1) Mitsui & Co.,Ltd., Mitsubishi Corporation, Sumitomo Corporation, Marubeni & Ida (Marubeni, at present) Co.,Ltd., C.Itoh & Co.,Ltd., Toyo Menka Kaisha,Ltd, Nichimen Jitsugyo (Nichimen, at present) Corporation, Nissho Iwai Corporation, Kanematsu-Gosho Ltd. and Ataka Industry Corporation (went bankrupt in 1977).
- 2) The broiler price is determined by subtracting the processing cost and the freight cost, about 15 yen in total, from the receipt price for carcass of 1 kg at the processing factory. In the case of the guaranteed payment system, the minimum transaction price is predetermined. When the quotation drops below this, the difference is supplemented from the benefit reverse fund. In the reverse case, 10 yen is subtracted from the predetermined price. This system is not profitable for the farms, unless the quotation soars. The flat fee a year one seems to be most stable. The quotation method holds an risky aspect because of instability of the broiler market.
- 3) In Iwate prefecture, all the farm households affiliated by Jumonji Poultry and Dobashi Broiler and a part of those incorporated to Abe Hanko Shoten are applying the open type broiler houses. In this broiler house, the heat supplying system is used in winter with the side windowes closed, thus lifting the broiler production cost per 1 kg by about 10 yen compared with that in the case of the windowless house. (Interview at some processing factories concerned.)
- 4) The windowless house can be found only in the direct farm owned by Shosha.
- 5) About 60 days up to shipment and subsequent about 20 days for preparation to the next chicken arrival, including removal of broiler litter and disinfection of the house.
- 6) The figure of 1968 was obtained at the oldest factory in each

district and that of 1985 was on the factory with the largest scale in the district, respectively.

7) Lacking the refrigerating facility to prevent deterioration of freshness during the long distance transportation, the remote area was not appropriate to the mass raising of broiler.

8) With the household consumption of broiler staying stagnant in contrast with the marked increase in the demand by companies, the major integrators in the remote areas have started raising the fowls of high quality, e.g. Nanbu fowl (Iwate prefecture), Hyuga fowl (Miyazaki prefecture) and Satsuma fowl (Kagoshima prefecture). They are propagating those products as the exclusive meat from special areas, a new strategy that may create a further expanded consumption of broiler.

CHAPTER VI

CONCLUSION

Broiler industry in Japan has progressed rapidly as a new specialized livestock sector since the 1960's.

The primary factor in the development of the Japanese broiler industry may be the establishment of the so-called integration system in which the broiler processing factory has played an important role. Actually, the processing factory has led the farm to modernize the raising facilities, developing a contracted farming that has made it possible to produce the broiler with a certain standard in large quantities. Further, it has succeeded in integration of the industrial segments of the broiler business, beginning with processing of broiler and its treatment and shipment of products to receipt agent or meat wholesaler through their mass distribution into markets in metropolitan regions. The integration system, thus, can be observed most distinctly in the broiler sector among the livestock industries.

Concerning this fundamental character of the broiler industry, there have been accumulated so far the research results on the structure of the production area and its formation processes from the standpoint of either agronomics or agricultural management. However, the positive geographical studies which pay attention to the regional structure of the integration system, intend to disclose the regional conditions and the local character which have exerted influence on formation of the production area have been scarcely carried out.

In this study, the regional conditions for the production area formation in the broiler industry have been elucidated through consideration of the formation processes. Besides, the general conditions in the production area formation have been found, and

correlated to the characteristics inherent to the areas.

The result of this study, will contribute a concrete analysis of the broiler industry to the existing and continuing research field concerning the livestock production area formation. Moreover, it may offer a significant measure to planning of agricultural policies as well as to systematic understanding of the production area formation in the livestock industry.

As the objective areas to be investigated in this study, four districts were selected according to the three criteria : (1) satisfying the prescription of the broiler production area, (2) holding a relatively even distribution of the producing elements and (3) representing a distinctive development stage and a different producing environment.

The Tajima area in Hyogo prefecture and the Fuji area in Shizuoka prefecture were chosen from the production areas existing in the environs of the metropolitan regions. In the former, one of the advanced production areas, the broiler industry, having been established first in western Japan, has been largest among the production areas neighboring to metropolitan regions. The latter is the largest one among those in the environs of the big cities of eastern Japan.

From the remote areas, two areas representing the main production areas in the broiler industry of Japan were selected, the Koyu area in Miyazaki prefecture and the northern district of Iwate prefecture (see Table 9). Actual investigations were made particularly regarding the location of the producing segments and the specificity of their management in the core areas in those areas, which were Hidaka town, Kitayama district in Fujinomiya city, Takanabe town and Ninohe city.

As a result, the general conditions were found as to the production area formation of the broiler industry in both the region neighboring to

the metropolitan region and the remote area.

Primarily, Shoshas and Nokyos participated in the broiler industry with setting up plural processing factories through which they developed competitions to secure the raising farm households. Consequently, with the production area expanding spatially, the raising farm households gradually enlarged their raising scales to carry out the principal and the specializing management.

Secondarily, the integrators advanced into the areas where, being located in the mountainous or on the hills, the many farm households were carrying out the small-scale agricultural management with the less than 1 ha land favored by the inferior land condition. These farms accordingly took in the facility applied livestock farming which by no means depends on the land fertility, expecting large incomes and the stable management.

Thirdly, in the areas favored with no other industries, the number of the farms that introduced broiler raising increased by the following reasons : (1) required to do relatively small investment, (2) manageable for an unexperienced farm household and (3) assured of relatively high income.

Fourthly, the factors affecting the development and the continuation of the broiler industries in the production areas of various types may be classified into the four patterns : (1) transition of the competitive environment, such as the urbanization and industrialization of the district, (2) traffic conditions, including advancement in the transporting measures, (3) economical movement, such as shift of the demand for products and of the distribution route, and (4) technological development, including improvement of the broiler house and its facility and system reformation in the chick arrival and the broiler shipment.

At the same time, the regionally inherent conditions were considered

to exert remarkable influence on the production area formation. These regional conditions include : (1) natural conditions, such as areal climate and land fertility, (2) managerial conditions of the farm household, such as area of arable land, content of crop cultivation, labor force and its financial state, (3) social conditions, such as local custom, temper of inhabitants and existence of leader.

In the first place, the natural conditions are briefly surveyed. Both Fuji and Koyu districts are the reclaimed areas, located on the land of volcanic ash and the diluvial upland respectively. Tajima and the northern district of Iwate exist both in the mountainous areas. With development of the paddy field restricted in those districts, the farms had to reform their agriculture concentrated on the crop cultivation. In order to escape from the migrating occupation, particularly in Tajima, Koyu and northern district of Iwate, as well as from the existing agriculture, the farms in those districts participated in the broiler raising that could be managed constantly through year and would assure them of a certain income in the system of the contracted raising with the processing factory. Convinced of the fact that the broiler raising could bring a higher income than the crop farming, a number of farms shifted to this business subsequently. In the Fuji area, on the other hand, with other manufacturing industries coming brisk in the same prefecture, and with dairy farming and tea culture coexisting in the area, the broiler production could not reach formation of an advantageous industrial sector, thus setting a limit to regional diffusion of the participant in the broiler raising.

Next, the social conditions are referred to.

In the said areas except the Tajima, the farms have entered broiler raising nearly in the same period through their proper blood and regional relationship. Thus the broiler houses can be observed in groups in the specific hamlets. In the Tajima and Koyu districts, local

farmers took leadership in setting up broiler processing factories, and also functioned as regional wholesalers. In the Fuji area, on the other hand, a producing cooperative association was organized by a small group of farms which became a nucleus to form the production area subsequently. The Koyu area, as a whole area, aimed shifting to the facility applied agriculture, such as the livestock industry and the truck farming, planning to bring up the agricultural successors as well as to master the technologies required for the purpose. In the northern district of Iwate, they promoted improvement of the agricultural management as a whole district to achieve its stability, developing the livestock oriented movement focused on the broiler raising.

These regional features became the important factors for the subsequent production area formation in the respective districts.

Next, for the purpose of this study to clarify the regional characteristics in the broiler industry, the second procedure, i.e. the comparative examination, was carried out on the integration system in each production area, particularly on function of the integrator, location and management of the raising farms and its regional structure.

Primarily, the analysis of the role played by the integrator is by all means required to consider the function of the integration system. The processing factory, having been functioning as the nucleus of the integration system in the broiler industry, may be prescribed as the substantial or the integrator. The processing factories can be classified into the following five according to the kind of the affiliating capital : (1) the one set up by Shosha, feed capital or their subsidiary, (2) the one by urban merchant, such as receipt agent and meat wholesaler, (3) the one set up by local merchant, such as feed dealer and cereal trader, (4) the one set up by Nokyo, such as Keizai-Ren and Agricultural Cooperative and (5) the one set up by raiser

himself. Further, the actual behaviors of the integrators can be classified into the five types : (1) Shosha completing type, (2) the local integrator completing type, (3) the local wholesaler leading type, (4) Nokyo completing type and (5) Nokyo leading type. In the Tajima area, the broiler industry has been developed by the integration systems of the types (2) and (5). In the Fuji area, that of the type (3) has dominated. Those of the types (1), (2) and (4) have played central roles in the production area formation in the Koyu area, as did those of the types (2) and (5) in the northern district of Iwate.

In the next step, the broiler collection region, i.e. the area in which the processing factory and its associated raising farm households are appropriately arranged, was investigated.

The broiler collection region in the northern district of Iwate is narrowest with a range of 30 km on average, followed by that of 40 km in the Tajima area, that of 70 km in the Fuji area and that of 80 km in the Koyu area in the increasing order. In both Iwate and Tajima districts, the producing segments can be observed to exist relatively concentrated. But in the Koyu area, with the processing capacity increasing, and with the raising farm households coming dense, they had to meet both emergence of the chicken disease and the problem of the broiler pollution. The processing factories looked for new participants in the outskirts of the area, thus expanding their broiler collection regions. In the Fuji area, with a limited number of the raising farm households existing from the beginning, the new raisers had to be recruited from its surroundings.

Consequently, it comes clear that the broiler collection region in the remote area has accumulated more producing elements than the one in the environs of the metropolitan region. It is also found that the enlargement of the territory can not always be correlated with the expansion of the production area.

In this connection, the system of the raising contract agreed between the processing factory and the farm in each area is examined below.

While the raising charge system is being adopted in the Fuji area, the flat fee a year system is general in other three areas that contains the income guarantee most advantageous to the raiser. Besides, in order to introduce the farms with poor self-funds into raising, the processing factories in the northern district of Iwate have applied the committed raising system as well, and have taken the measure to partly subrogate interest of their loans. Nokyo of the Tajima area has applied the commission contract system to its associated farms with an intention to move them into the production housings. Hence, it has to be remarked that some modifications have been added to the contract system according to the regional circumstances.

The regional difference can be also observed in the location and the management of the farm. In both Tajima and Fuji areas, in particular, many farmers shifted from other livestock farmings, such as the Japanese cattle and poultry, to broiler raising. In the Tajima area, the cutting-up process that required hands could not be promoted successfully owing to the areal custom to dislike cutting or treating animals. And in Tajima and Fuji areas, they started broiler raising with the battery type and the cage feeding houses. But they had to reform the broiler houses into the windowless ones to prevent emergence of the pollution as well as to expand the raising scale in the 1970's. This transformation required a large investment, thus bringing the increasing number of the farms to give up raising. At present, the raising is being continued by a small number of farms, with the aged householders and their wives conducting either specializing or principal management. As a matter of fact, most expectant successors have discontinued farming, and have left the district.

On the contrary, in both Koyu and Iwate districts, they started with the more efficient broiler houses, i.e. the open type and the windowless houses. Moreover, with their high motivation to the broiler raising, and with the successors or the expectants secured in many farm households, they are making their ways in the direction of the enterprising and specializing management.

Regarding the regional structure of the integration system in the broiler industry, the examination was carried out on the regional character in the assembly of the industrial constituents, including the distribution of the producing segments (feed plant, hatchery, processing factory and raising farm household), the producer's price and the distribution factors, i.e. the traffic conditions from the production area to the main markets and the transportation cost.

The results are described in the remaining part of this chapter. The Tajima area holds the most intimate, regional relationship and the most appropriate spatial arrangement of the producing segments. However, since it exists in a basin surrounded by mountainous, its climate is characterized by the high temperature and humidity in summer and the coldness in winter. Thus, the broiler production cost comes relatively high due to deterioration of feed and the increased expenses on light and heat. Further, the broiler distribution is restricted to transactions in the Kei-Han-Shin market. The broiler industry in this district has stucked to the wholesalers and the retail stores, but has held almost no connection with the mass selling stores. These big traders have been combined with the newly-risen production areas, a handicap imposed on this district in the business competition that has been developed strictly among the production areas.

In the Fuji area, small organizations formed by the producers imported feed and chicken individually from other area, and made transactions with different processing factories and distributors. Thus,

this production area had a scattered arrangement of the producing segments and the insufficient, regional relationship. With the efficiency of management staying at an extremely low level in both the raising and the processing sectors, the producers attempted to unify the organizations in 1974. However, the raiser did not come to contract with a single integrator. The broiler integration system in the Fuji area was established for the first time in the 1980's when the processing factories in the area were incorporated into one factory.

In the Koyu area, Shoshas began to launch from the second half of the 1960's, and , at the same time, the ferry entered service to combine Miyazaki prefecture with the metropolitan regions. These movements triggered development of the facility applied farmings. Particularly, the local processing factories, in multifarious forms, entered the broiler industry, with the breeding cook plants and the hatcheries arranged close to the factories. And the raising farm households came concentrated mainly along the seaside of the Koyu area. Although the farm households associated with Zen-Noh could lay in feed from the neighboring feed base at Hyuga Port, other raisers had to depend on the one at Kagoshima Port. However, the raising farm households had strong motivation to the broiler raising partly because of the repayment of their big loans. Besides, the integration system was firmly founded from production through distribution particularly in this production area. Thanks to this raising environment, they succeeded in prominent reduction of the production cost that could cover the long distance freights on the products sufficiently, thus completing the system to supply the most inexpensive broiler to the markets in the consuming areas. They have been sustaining the superiority of this production area ever since.

In the northern district of Iwate, the manifold processing factories with integrating function and their related hatcheries exist, with the

raising farm households distributed in the surroundings of the factories. Moreover, the transporting distance in feed supply became shorter after the feed base at Hachinohe Port completed than those from Ishinomaki Port and Shiogama Port in the early period. In addition, Tohoku Expressway facilitated the long distance transportation of the broiler products. These new situations accelerated the development of this production area, bringing about reduction of the broiler production cost to the level of that in the Koyu area. In particular, the broiler industry has been creating the working fields, such as the processing factory, to the middle and highly aged farmers in the district favored with scarce employment opportunities.

To summarize, the integration system of the production area in the environs of the metropolitan region has a weak regional structure, with the constituents of the broiler industry diffusely scattered over the region. In the remote area, on the other hand, its regional structure has been properly conformed. Accordingly, the industrial segments are arranged densely. And this arrangement space appears widening with the development of the production area.

The production areas in the broiler industry of Japan can be classified into the two patterns, i.e. the metropolitan type and the remote type. Since, in the production area of the metropolitan type, the agricultural successors tend to discontinue farming, the broiler raising, in many a case, is being maintained mainly by the family management depending on the seniors. Consequently, the scale of the production area is shrinking, with discontinuation and / or incorporation of the integrators proceeding. However, thanks to its access to the metropolitan market, it ships the carcass at higher ratio to supply fresh broiler. Further, the windowless houses have spread over in the region to prevent livestock pollution.

In the production area of the remote type, many successors are

participating in the broiler raising of large managerial scale. Some farms carry out the enterprising management. Further, with the multifarious integrators functioning in the region, the regional diffusion of the raising farms is proceeding. Cut-up meat processed in the region has supplied to the mass selling stores in the metropolitan regions. Besides, the processing factory is playing the role to open the way for gaining non-agricultural income by offering the employment field to the district.

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長坂 政信

日本のブロイラー産業は、1960年代から新しい専門化した畜産部門として急速に発展してきた。

日本のブロイラー産業発展の背景として、ブロイラー処理場が中核となって、農家に対して施設・設備の近代化・高度化を図らせて、一定規格のブロイラーを大量飼育させる契約農業を展開してきたこと、また、処理場がブロイラーを処理・加工して、関連の荷受・食肉加工会社を通して大都市市場へと大量出荷するという生産から流通に至る組織の統合化、いわゆるインテグレーションを構築してきたことが基本的要因となっている。しかも、農畜産業の中で、ブロイラー産業が最も工業的・加工業型部門となっており、インテグレーションが最も典型的にみられたのである。

こうしたブロイラー産業の基本的性格から、これまで農業経済学・農業経営学的観点から産地形成や産地の構造に関する地域研究の蓄積がなされてきたが、インテグレーションの地域構造に着目し、産地形成をもたらす地域的条件や地域的性格を解明しようとした地理学的な実証研究はほとんどなされてこなかった。

そこで本研究では、ブロイラー産業の産地形成過程を考察し、産地形成の地域的条件を解明した。併せて、ブロイラー産業の産地形成の一般的条件を明らかにすると共に、それに基づいてブロイラー産業が産地形成されてきた地域の特徴も明らかにした。

この目的を達成することにより、従来の諸研究で行われてきた産地形成について、ブロイラー産業についても具体的に明らかになるだけでなく、農畜産業の産地形成を体系的に捉えたり、農業政策を遂行させる上からも大きな意義があり、今後のブロイラー産業の産地化を検証する上でも、1つの指針を提示することができよう。

本研究の事例調査地域として、産地形成の発展段階と立地環境の異なる地域で、その分布の偏りがなく、産地の規定条件に適合した4地域を選定した。先進的産地である大都市圏周辺地域からは、西日本でブロイラー産業が最初に成立し、現

在も大都市圏周辺地域の中で最大の産地である兵庫県但馬地方と、東日本の大都市圏周辺地域で最大の産地である静岡県富土地方とを取り上げた。遠隔地域からは、日本のブロイラー産業の主産地を形成している宮崎県児湯地方と岩手県北地方を選定した（第9表参照）。また、上記の4地域のうち、ブロイラー産業の核心地域である日高町、富士宮市北山地区、高鍋町、二戸市において、具体的に農家の立地と経営の特質を考察し、地域の性格を解明した。

その結果、大都市圏周辺産地と遠隔産地とのブロイラー産業の産地形成において、次の一般的条件が存在することが明らかになった。

第1に、総合商社などの農外資本と系統農協がブロイラー産業に参入し、複数の処理場の立地によって契約飼育農家獲得競争を行った。この結果、飼育農家が空間的拡大を遂げつつ、次第に主業化・専門化するための規模拡大が図られてきたこと。

第2に、インテグレーターがブロイラー産業に進出した地域は、土地条件に恵まれない山間地や丘陵地で、1ha未満の零細経営農家が多く存在していた。このため、これらの農家では地味に左右されず、高収益と経営の安定が期待できる農業として、施設型畜産を取り入れることになったこと。

第3に、他産業に恵まれず、素人でも経営し易く、相対的に高所得が得られたことから、設備投資額が相対的に少なくて済み、ブロイラー経営を取り入れる農家が増大したこと。

第4に、産地・主産地の型は多様であるが、都市化・工業化などによる他産業との競合、輸送手段の発達と需要品の変動、流通経路の変化などの経済的・交通的条件や、鶏舎や付帯設備、入雛・出荷方法の改善などの技術的条件の変化によって産地の盛衰が生じ易いこと。

しかし、地域の気候・土壌などの自然条件、土地面積と栽培作物の内容・労働力・資本蓄積などの農家の経営条件、地域の慣習・住民の気質・リーダーの有無などの社会的条件といった地域固有の条件も強く反映されていることも検出された。

まず、自然条件についてみる。

富士・児湯地方は、開拓地で火山灰地や洪積台地の地域であり、但馬・岩手県北地方では、山間地にあって開田の制約があり、耕作を中心とした農業の改善が

必要であった。出稼ぎ地域であった但馬・児湯・岩手県北地方では、農業経営の改善のために、年間を通して経営が恒常的に可能で、しかも処理場との飼育契約条件で、一定所得が確保できる魅力からブロイラー飼育への参加をしている。

さらに、作物栽培よりも高収益が得られたことを知って、ブロイラー飼育に転換する農家もみられたのである。これに対して、富士地方では、工業地域を控えていたことや酪農・茶などとの経営の競合によって、ブロイラー飼育が有利な部門とはならず、参入農家の地域的拡大には限界があった。

次に、社会的条件についてみる。

但馬地方を除く地域では、飼養者は地縁・血縁関係の基盤があり、ほぼ同時期に飼養を開始している。その結果、特定集落に比較的まとまってみられた。また、但馬・児湯地方では、地元農民がリーダーとなってブロイラー処理場を設置して、産地問屋の役割を果たしたが、富士地方では小集団による生産組合の結成が、産地化する際の母体となった。児湯地方では、地域ぐるみで農業後継者の育成と農業技術の習得によって、畜産・施設園芸などの施設利用型農業を目指し、岩手県北地方では、安定した農業を推進するために地域ぐるみで営農の改善を図り、ブロイラーを中軸として畜産を指向したことがそれぞれ重要な要因となった。

次に、本研究の目的を達成させるために、第2の作業として、筆者はそれぞれの産地におけるインテグレーターの機能、ブロイラー飼養農家の立地と経営およびインテグレーションの地域構造をそれぞれ比較して、地域的特性を明らかにした。

まずインテグレーターの機能を考察するためには、インテグレーターの役割を分析することが不可欠である。ブロイラー産業におけるインテグレーションの中核として機能する処理場は、実質的な推進者（インテグレーター）である。処理場は次の5つの資本形態に大別できる。即ち、総合商社や飼料資本自身あるいはその子会社などが作るもの、荷受会社や食鳥問屋などの都市商人が作るもの、産地の飼料商・穀物商など地元商人が作るもの、経済連や単協などの農協が作るもの、飼養者自身が経営者となって作るものである。これらの経営体が産地でどのような役割を果たしたのかをみると、①総合商社完結型、②ローカル・インテグレーター完結型、③産地問屋主導型、④系統農協完結型、⑤系統農協主導型、の5つが認められた。そして、但馬地方では②と⑤、富士地方では③、児湯地方で

は①②④、岩手県北地方では②⑤がそれぞれ中核的な役割を果たしてきた。

次に、生産における機能地域としての集鳥圏（処理場とその傘下飼育農家との空間的配置）についてみた。

岩手県北地方が30km圏と最も狭く、但馬地方が40km圏、富土地方が70km圏、児湯地方が80km圏と拡大している。岩手県北・但馬地方は地域的にまとまっているのに対して、児湯地方では、処理場の処理能力の拡大とともにこの地方での飼育農家の集中が進み、鶏病の発生や公害問題などに対応して、新規の農家をこの地方の外延部に求めたために、地域的拡大が図られた。富土地方では、この地域での飼養農家が少ないために、外延部に求めざるを得なかったのである。

このことから、遠隔産地が大都市圏周辺産地よりも、集鳥圏内での生産の諸要素が集積しており、集鳥圏の拡大と産地の地域的拡大とは必ずしも直結していないことが明らかになった。

さらに、処理場とブロイラー飼養農家との飼育契約方式を比較した。

富土地方の処理場は飼育手数料方式を採用しているのに対して、他の3地域では生産者に最も有利な所得保証を盛り込んだ年間一定価格方式を採用している。なお、岩手県北地方では、自己資金に乏しい農家にブロイラー飼育を導入させる手段として、処理場は委託飼育方式を採用したり、借入金の一部利子負担をするなどの措置を採った。但馬地方の農協では、傘下農家を生産団地への移転を図り、委託契約を結んでおり、地域の農業事情によって差異があることが認められた。

飼養農家の立地と経営における地域差も認められた。

但馬・富土地方では、和牛・採卵鶏といった家畜飼育からブロイラーに転換した農家が多いことが特徴である。しかし、但馬地方では、動物の解体や処理を嫌う土地柄のため、手作業を必要とする解体処理が進まなかった。また、但馬・富土地方では、初期にはバタリー・ケージ式鶏舎による飼育であり、1970年代に、公害防止と規模拡大を兼ねてウインドレス鶏舎に転換を図った。このため、多くの資金が必要となり、飼育を断念する農家が増大し、現在では少数の飼養者に集約されている。しかも、後継予定者の離農・転出によって、高齢者の夫婦を中心とした専業・主業的経営農家が多い。

これに対して、児湯・岩手県北地方では、当初から先進的産地の鶏舎よりも効率の良い開放型・ウインドレス型鶏舎を導入し、しかも飼育意欲が高く、後継者

や後継予定者も存在する農家が多いために、企業的・專業的経営の傾向にある。

ブロイラー産業のインテグレーションの地域構造について、生産要素としての飼料工場・孵化場・処理場・飼育農家の分布と生産価格、流通要素としての主要販売市場への交通事情と輸送費の総体から地域的特性を考察した。

この結果、但馬地方が最も地域的結合が強く、しかも空間配置では好条件にあることが認められた。しかし、盆地性の山間地のため、夏季の高温多湿と冬季の寒冷における飼料効率の悪化や光熱費の負担増から生産費が相対的に高くついている。また、流通において、京阪神市場との取引に限定され、しかも問屋・小売店との固定的な関係が強く、新興産地と結合した量販店との関係が薄いことから産地間競争では不利となっている。

富土地方では、生産者による小集団組織がそれぞれ他地域から飼料・糞を調達したり、ブロイラーの処理・販売先も個別に取引していたため、空間配置が分散し、インテグレーションの地域的結合も不十分であった。また、生産者や処理場の経営効率が極めて悪かったので、生産者は1974年に組織の地域的一元化を図ったが、1つのインテグレーターとの飼育契約までに至らなかった。1980年代に初めて富土地方の処理場は1社に統合化され、ブロイラーインテグレーションが成立したのである。

児湯地方では、1960年代後半からの商社の進出を始め、1971年に大都市圏とを結ぶフェリーの就航によって、施設利用型農業が展開することになった。とくに、地元の多様な形態としての処理場がブロイラー産業に参入し、種鶏場や孵化場も近接地に配置され、飼養農家もこの地方の海岸部を中心に集中的に立地させた。全農系は近接地の日向港から飼料を調達できたが、その他は鹿児島港に依存せざるを得なかった。しかし、農家は多額な借入金の返済とブロイラー飼養への魅力により、生産意欲が高いこと、インテグレーターが生産から流通部門まで一貫して統合していることなどから、生産費の低減が図られ、製品輸送費を加えても最も安くブロイラーを消費地市場に供給する体制ができている。それ故、産地の優位性を保っているのである。

岩手県北地方では、多様なインテグレーターと関連の孵化場が存在し、処理場は周辺部に飼育農家を配置させている。飼料の調達は石巻・塩釜から依存していたのが、八戸の飼料基地の完成によって輸送距離が短縮されたこと、東北自動車

道を利用した製品輸送によって、この地方は急速に産地化したため、児湯地方と同程度の費用となっている。さらに、雇用機会の少ない地域のために、処理場の作業員として働く中高年者にとって安定した収入源となり、ブロイラー産業は地域の雇用創出をもたらした点で地域の発展に多大の貢献をしたといえる。

以上のことから、大都市圏周辺産地ではインテグレーションの地域構造が弱いことから、ブロイラー産業の構成要素の空間的配置は分散しているのに対して、遠隔産地ではインテグレーションの地域構造は強化されてきたので、構成要素の空間的配置は集中化され、産地の発展につれてさらに広域化していく傾向にあることが明らかになった。

日本におけるブロイラー産業の産地を地域類型すると、大都市圏周辺型と遠隔地型とに大別された。大都市圏周辺型産地では、後継者が離農し、高齢者を主体とした家族経営による少数のブロイラー専業農家により維持されているために、産地の規模は縮小され、インテグレーターの地域的統廃合が進行している。しかし、市場が近接地にあるために新鮮なブロイラーを供給できる地域的特性を生かし、屠体出荷の比重は遠隔産地と比べて高い割合を占めている。なお、公害対策からウインドレス鶏舎が普及している。

遠隔地型産地では、後継者が存在していることから、経営規模は大きく、企業的経営農家もみられる。また、多様なインテグレーターが存立していることから飼育農家の地域的拡大が進んでいる。しかし、消費市場が遠いために、大都市市場の量販店と直結して解体品を大量出荷する体制を図っている。また、処理場は地域に雇用の場を提供し、農外収入の道を開かせているという役割ももっている。