REPORT ON SURVEY

FOR

THE DAIRY DEVELOPMENT PROJECT

IN THE REPUBLIC OF KOREA

FEBRUARY 1970

OVERSEAS TECHNICAL COOPERATION AGNECY

GOVERNMENT OF JAPAN

Preface

The Government of Japan, in compliance with the request of the Government of the Republic of Korea, which is preparing to request financing from the International Bank for Reconstruction and Development (IBRD) for its Dairy Development Project entrusted to the Overseas Technical Cooperation Agency (OTCA) the execution of technical cooperation which consisted of a survey on the Dairy Development Project.

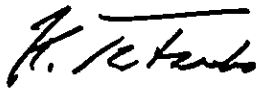
In view of the importance of the project in the development of the dairy industry in Korea, the OTCA upon consultation with the Ministry of Foreign Affairs and the Ministry of Agriculture and Forestry applied for cooperation to the Central Association of Livestock Industry (whose Board Chairman is Mr. Munenori Akagi, former Minister of Agriculture and Forestry) which has been providing consultation service to the livestock industry in Japan. The OTCA, after consulting with the Association, set up a survey committee to advise OTCA on the programming survey plans, the selection of the members of the survey team and the review of the survey results for the effective implementation of the survey.

A field survey in Korea was carried out by two survey teams, the First Phase Survey Team consisting of five members and the Second Phase Survey Team of thirteen members, both headed by Mr. Kikujiro Gejyo, Executive Director of the Milk Transport Facilities Lease Corporation, who had been recommended by the Survey Committee. The First Phase Survey Team was sent to Korea during a period from July 31 to August 1, 1969 and the Second Phase Survey Team from September 15 to October 30, 1969. During the field survey, the teams collected required data and reviewed from a technical, economic and financial point of view, details of the Dairy Development Project preliminarily prepared by the Government of the Republic of Korea.

We would be more than pleased if this report proved useful in contributing to the promotion of the livestock industry in Korea and at the same time contributed to the promotion of goodwill between our two countries as well as the cementing of technical and economic relations.

Finally, I would like to take this opportunity to express my sincere appreciation and gratitude to the officials of the Government of the Republic of Korea, the Agriculture and Fishery Development Corporation, the Korean Dairy Foods Processing Company and other government agencies concerned.

February, 1970



Keiichi Tatsuke
Director General
Overseas Technical Cooperation Agency

Letter of Transmittal

January 14, 1970

Mr. Keiichi Tatsuke
Director General
Overseas Technical Cooperation Agency

In extending technical cooperation for programming the Dairy Development Project in Korea at the request of the Government of the Republic of Korea, the Overseas Technical Cooperation Agency asked the cooperation of the Central Association of Livestock Industry which had been providing consultation services on livestock industry in Japan. The two organizations agreed to set up the Committee for Dairy Development Project Survey in Korea in an attempt to establish a new method for extending cooperation in the survey of development projects and the Committee members were selected as listed on the attachment.

The Committee, after making a careful study of the substance requested by the Government of Korea for technical cooperation, recommended Mr. Gejyo for the head of the survey team, Mr. Haga for deputy head and the members listed in the report for the members of survey team to be sent to Korea.

Thereafter, the Committee held meetings on various occasions to debate on programming and the methods to be employed for the execution of the survey and for reviewing the interim survey report. Besides, the Committee sponsored special meetings on the occasion of the repeated visits to Japan by Mr. D. Stroops, Director of Livestock Division, IBRD for exchange of views.

The Committee, upon careful studies of the report prepared by the Survey Team, concluded that the contents of the report is appropriate and justifiable. The report is herewith transmitted under joint signature of the undersigned.

On this occasion, we wish to express our sincere thanks to all who extended their generous support and cooperation both in Korea and Japan during the course of field survey and for the preparation of the report.

Tadao Makino
Chairman
Committee for Dairy Development
Project Survey in Korea

K. Gejyo

Kikujiro Gejyo
Head
Survey Team for Dairy Development
Project in Korea

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Members of the Committee
for Dairy Development Project Survey in Korea

Motonaga Ohto	(Executive Director, Overseas Technical Corporation Agency)
Kikujiro Gejyo	(Executive Director, Milk Transport Facilities Lease Corporation)
Masami Shimomura	(Director, Japan Milk Industry Technical Association)
Shigetaka Zushi	(Senior Technician, Central Association of Livestock Industry)
Hiroyuki Takeuchi	(Animal Breed Improvement Technician, Animal Breed Improvement Section, Livestock Bureau Ministry of Agriculture and Forestry)
Keishi Nakamura	(Secretary General, Japan Holstein Registration Association)
Kazuhiko Haga	(Agricultural Finance Consultant, Agriculture, Forestry and Fisheries Financial Corporation)
Motozo Hirose	(Chief, Investigation Section, Japan Holstein Registration Association)
Tadao Makino	(Executive Director, Central Association of Livestock Industry)
Motoyuki Matsuo	(Professor, Komazawa University)
Takashi Maruo	(Investigator, Livestock Bureau, Ministry of Agriculture and Forestry)
Yukichi Morita	(Chief, International Cooperation Section, International Department, Agricultural Economics Bureau, Ministry of Agriculture and Forestry)
Kiyoshi Yoshihara	(Senior Technician, Central Association of Livestock Industry)

Introduction

1. Background and Purpose of Survey

In June 1969, the Government of the Republic of Korea requested the Government of Japan for technical cooperation in prepairing the Dairy Development Project to be requested for financing from the International Bank for Reconstruction and Development (IBRD).

In compliance with the request, the Overseas Technical Cooperation Agency, acting on the Government of Japan, carried out the survey with the cooperation of the Committee for the Dairy Development Project Survey in Korea which was established as an organ to help promote effective implementation of the survey.

The First Phase (preliminary) Survey was conducted during the period from July 21 to August 1, 1969, and on the basis of the findings the Second Phase Survey (detailed) was made during the period from September 15 to November 1, 1969 and the results of both surveys are contained in this report.

The purpose or the nature of the survey was that Japan, whose basic condition of livestock industry is much similar to that of Korea, provides livestock industry technical staffs who would act as consultants for Korean counterpart by making effective use of their techniques and experience in preparing the Dairy Development Project which has a character of regional development project in progress in Korea for the purpose of obtaining loans from IBRD.

2. Organization of Survey Team

First Phase Survey Team

Head:	Kikujiro Gejyo	General	Exective Director, Milk Transport Facilities Lease Corporation
Advisor:	Motonaga Ohto	"	Executive Director, Overseas Technical Cooperation Agency
Member:	Kazuhiko Haga	Livestock Industrial Location	Agricultural Finance Consultant, Agriculture Forestry and Fisheries Financial Corporation
"	Shingo Sato	Livestock Industrial Management	Specialist, Central Association of Livestock Industry
"	Hiroko Onaga	Coordination	Planning Section, Development Research Division Overseas Technical Cooperation Agency

Second Phase Survey Team

Head:	Kikujiro Gejyo	General	Executive Director, Milk Transport Facilities Lease Corporation
Advisor:	Motonaga Ohto	"	Executive Director, Overseas Technical Cooperation Agency
"	Tadao Makino	"	Executive Director, Central Association of Livestock Industry
Member	Kazuhiko Haga	Livestock Industrial Location	Agricultural Finance Consultant, Agriculture, Forestry and Fisheries Financial Corporation
"	Shigetaka Zushi	Guidance system on Dairy cattle raising	Senior Technician, Central Association of Livestock Industry
"	Shoichi Miura	Livestock Management	Agriculture and Forestry Technical Official, Livestock Management Section, Livestock Bureau, Ministry of Agriculture and Forestry
"	Shingo Sato	"	Technician, Central Association of Livestock Industry
"	Kiyoshi Yoshihara	Forage crops	Senior Technician Central Association of Livestock Industry
"	Nobuyuki Hirota	Grassland	Agriculture and Forestry Technical Official, Forage Crops Section, Livestock Bureau, Ministry of Agriculture and Forestry
"	Shohei Miyatani	Agriculture & Forestry Finance and Economy	Deputy Director, Agriculture Dept. The Central Cooperative Bank for Agriculture and Forestry
"	Yoshichi Sugiura	Milk Industry	Director, Japan Milk Industry Technical Association

Member	Sada Koga	Market	Agriculture and Forestry Technical Official, Livestock Administration Section, Livestock Bureau, Ministry of Agriculture and Forestry
"	Kenji Iwaguchi	Coordination	Project Implementation Section, Development Survey Division, Overseas Technical Cooperation Agency

3. Itinerary of Survey Team

First Phase Survey

July 13 to July 18, 1969	Advisor Mr. Ohto accompanied Mr. D. Stoops (Chief, Livestock Division, IBRD) to Korea.
	Consultation with the Ministry of Agriculture and Forestry (MAF) and the Agriculture and Fishery Development Corporation (AFDC) on general matters.
July 21	Head and four other members left Tokyo and arrived at Seoul.
	Visited the Director of Livestock Bureau, MAF and consulted on the itinerary of Preliminary Survey.
	Inspected the Seoul Milk Cooperative Milk Plant.
July 22	Visited the President and officials of AFDC.
	Visited the Director of Economic Cooperation Department, Economic Planning Board (EPB).
	Briefed by AFDC staff on the Dairy Development Project.
July 23	Briefed by AFDC staff on the Dairy Development Project.
	Called on the National Agriculture Cooperative Federation, (NACF).
	Visited the Livestock Experiment Station of Rural Development Agency.
	Inspected Korean Dairy Foods Processing Company's Model Livestock Station (Korea -New Zealand Model Livestock Station).
July 24	Visited the Cheonweon-gun Government and was briefed on the status of livestock industry in Cheonweon-gun.
	Inspected Nanyong Milk Industry Company's Chonan Plant.

July 24	Visited the National Stock Breeding Station.
	Inspected Chonghan Livestock Cooperative Milk Collecting Station.
	Inspected Korea-Germany Model Livestock Station operated by NACF.
	Inspected dairy farmers.
July 25	Departed Chonan City and arrived at Kwangju City.
	Visited the Chollanam-do Provincial Government and was briefed on the status of livestock industry in the province.
	Inspected milk plant operated by Kwangju District Livestock Cooperative.
	Inspected dairy farmers.
July 26	Visited the Chollanam-do Office of Rural Development Agency.
	Inspected Provincial Joint Livestock Industry Area.
	Inspected three dairy farms.
July 27	Departed Kwangju and arrived in Pusan.
July 28	Visited the Kyongsangnam-do Provincial Government and was briefed on the status of livestock industry in the province.
	Inspected Pusan Milk Cooperative's Milk Plant and ranch.
	Arrived at Kyongju.
July 29	Briefed on livestock industry in Kyongsangpuk-do.
	Travelled from Kyongju to Taegu and then to Seoul.
July 30	Held a meeting with AFDC President and the President of Korean Dairy Foods Processing Company.
	Compilation and re-arrangement of collected data.
	Review of survey result jointly with Korean counterpart.
July 31	Exchanged views with Korean counterpart on the survey result at AFDC.
	Paid a call to the Japanese Embassy and MAF to report on the result of survey.
Aug. 1	Departed Seoul and arrived at Tokyo.

Second Phase Team

Sep. 15, 1969	Team head and five team members in charge of marketing and finance part (A group) departed Tokyo and arrived at Seoul.
	Paid a courtesy call to Japanese Embassy and Ministry of Agriculture and Forestry (MAF).
	Consulted with the Director of Livestock Bureau and his staff and AFDC staff on the itinerary of the survey.
Sep. 16	Paid a courtesy call to Ministry of Foreign Affairs, Economic Planning Board, Science and Technology Agency and AFDC.
Sep. 17	Inspected NACF and Seoul Milk Cooperative's Milk Plant.
Sep. 18	Held a consultation with Korean counterpart in charge of marketing and research work on the Dairy Development Project at AFDC.
	Visited the Kyonggido Provincial Government, Provincial Branch of NACF and Chonghan Livestock Cooperative.
Sep. 19	Inspected Onyang Livestock Cooperative's slaughter house, Nanyang Gun (county) Milk Industry's plant and Agricultural Cooperative in Onyang. Inspected privately owned ranches and Livestock Market.
Sep. 20	Paid a call to Pyongtek-gun Agricultural Cooperative, Korea-Germany Model Livestock Stations and Korea-New Zealand Model Livestock Station. Inspected Onyang Livestock Cooperative and its milk plant.
	Arrived at Seoul.
Sep. 21	Made a survey on the retail condition of market milk and milk products in Seoul City.
Sep. 22	Departed Seoul City and arrived at Kwangjo City.
	Visited the Chollanamdo Provincial Government and was briefed on livestock industry in the province.
	Held a meeting at the office of Rural Development with dairy farmers and officials of various agencies concerned with livestock industry.
Sep. 23	Visited the Kwangjo Livestock Cooperative.
	Inspected milk plant and feed manufacturing plant operated by the cooperative.

Sep. 23	Inspected the dairy farm of provincial joint livestock area.
	Visited the Kwangsam-gun Government and Gun Agricultural Cooperative.
	Inspected Seiho Industry Company's dressed carcass wholesale market.
Sep. 24	Collected data on marketing and finance at MAF and NACF.
	Inspected Honam Food Company in Kwangju City and milk plant operated by dairy farmers.
	Five team members departed Tokyo and arrived at Seoul City (B group, in charge of production part).
Sep. 25	Held a joint meeting attended by A and B groups. Compiled and re-arranged collected data.
	On-the-spot survey on sales of market milk and milk products.
	Held a joint meeting with Korean counterpart.
Sep. 26	Held a joint meeting with Korean counterpart.
Sep. 27	Team head and two members of B group returned to Japan.
Sep. 28	Compilation and re-arrangement of collected data. B group made preparations for field survey.
Sep. 29	Visited the National Animal Health Experiment Station, Kyonggido Provincial Government and Seoul Agricultural College.
	Visited the National Livestock Experiment Station, National Botanical Environment Research Institute and the Rural Development Agency.
	Made an on-the-spot survey on the sales of market milk and milk products. (A group).
Sep. 30	Visited the Chungchongnam-do Provincial Government.
	Visited the Daedeog-gun Rural Extension Service Station Provincial Stock Breeding Station and the Cheonweon-gun Government.
	Inspected privately-owned ranches.
	One member of A group returned to Japan.
	Visited the Cheonweon Livestock Cooperative's Chonghan Artificial Insemination Station and National Stock Breeding Station.

Oct. 2	Inspected a private dairy farm.
	Inspected Korea-Germany Model Livestock Station and Korea-New Zealand Model Livestock Station.
	Paid a call to Anseong-gun Government,
Oct. 3	Compilation and re-arrangement of collected data.
Oct. 4	Inspected the NACF Artificial Insemination Station, NACF Suesamnung Model Livestock Station, Korean Livestock Breed Improvement Association, Agriculture Engineering & Utilization Research Institute and Agricultural Management Research Institute.
Oct. 5	Compilation and re-arrangement of collected data.
Oct. 6	Visited the Chollanam-do Office of Rural Development Agency and exchanged views with officials and representatives of dairy farmers.
Oct. 7	Inspected six dairy farms and Provincial Joint Livestock area.
Oct. 8	Visited the Chollanam-do Provincial Government, Mt. Muto ranch and the Kensei model district.
	Team head and two members of A group arrived at Seoul.
Oct. 9	Held an intra-team meeting. Compilation and re-arrangement of collected data.
Oct. 10	"
Oct. 11	Held a coordination meeting for finalizing the results of survey.
Oct. 12	"
	Advisor Mr. Ohto arrived at Seoul.
Oct. 13	Held a coordination meeting for finalizing the results of survey.
Oct. 14	Held a joint meeting to review the interim survey report (draft) with Korean counterpart.
Oct. 15	"
Oct. 16	"
Oct. 17	Reviewed and summarized major items for interim survey report (draft).
Oct. 18	Reviewed interim survey report (draft) with Korean counterpart.

Oct. 18	Paid a courtesy call to Japanese Embassy, MAF and AFDC.
	Members of A and B groups returned to Japan.
Oct. 19	Compilation and re-arrangement of collected data.
Oct. 20	Collected data at AFDC. Inspected AFDC invested company. Two members of A group returned to Japan.
Oct. 26	Team head Mr. Gejyo and Advisor Mr. Makino accompanied Mr. Stoops of IBRD and Mr. J. Clerk of FAO to Korea.
	Visited the agencies concerned and reviewed party's schedule.
Oct. 27	Held a joint meeting participated by members of IBRD, FAO, Korean government agencies and survey team.
Oct. 28	Visited the Director of Economic Cooperation Department, EPB.
Oct. 29	Visited the AFDC President with IBRD and FAO staff. Held a meeting also participated by responsible directors and high ranking officials.
Oct. 30	Made a make-up survey at AFDC.
	Observed National Korean Cattle Show.
Oct. 31	Made a make-up survey at Livestock Bureau, MAF. Held a consultation on preparation of survey report and the Dairy Development Project.
	Inspected Taehan Food Company's Suwon Milk Processing Plant.
Nov. 1	Held a make-up coordination meeting with officials of AFDC.
	Departed Seoul and arrived at Tokyo.

CHAPTER I TRENDS OF AGRICULTURE AND LIVESTOCK INDUSTRY

CHAPTER I TRENDS OF AGRICULTURE AND LIVESTOCK INDUSTRY

1 Trends of Agriculture

1-1 Economic Growth and Status of Agriculture

1-1-1 Course of Korean Economy

The preface of the First 5-Year Economic Development Project (1962-1966) states in part, "The ultimate objective of Korean economy is the industrialization of the nation through modernization of industries", and it also says that the First 5-Year Project is "The preparatory stage of such development", directly describing the basic course of Korea which advocates to become an industrialized nation.

During the project period, the average annual growth rate of Gross National Project was estimated at 7.1% with the objective of eliminating all the social and economic vicious cycles of the past and improving the basis required for the attainment of self-supporting economy. Against this estimate, actual growth rate during the same period was as high as 8.5%. Though it may be difficult, as a matter of fact, to expect a complete statistical data in Korea where the people had just experienced the war and ensuing political turmoil, such achievement as revealed, in substance, may be recognized as the direct result of the effort of the Korean people in their first step in building a modernized nation.

1-1-2 Roles of Agriculture

During this period, the position of the primary industry declined gradually. Against the estimated decline in the range of 36.3% to 34.0% in the composition ratio of industrial structure, actual result was such a sharp decline in the range of 33.4% to 31.7%. In this respect alone, it may be said that the objective was well achieved with the result which surpassed the projected figure. In other words, it was an indication that the secondary and tartiary industries had made a great progress. On the other hand, however, it must not be overlooked that the agricultural production in general had also made a steady growth attaining an average annual growth rate of 6.3%, thus surpassing the projected growth rate of 5.6% and played an important role in supporting the economy growth, even though the production rate in some agricultural sectors had been influenced by harvest in each year.

In 1967 the Second 5-Year Project was put into effect. Unfortunately, however, the damage from a drought which hit the granary areas in Kyongsang namdo and Cholla namdo was such a hard blow to the project that the overall economic growth was only 8.4% against the projected 10.5% despite the marginal decline of 6% in the growth rate of the primary industry compared to 1966 and an appreciable growth rate of 22% in the secondary industry. Also in the following 1968, the country suffered from a lean crop in succession and the importance of stabilized supply of food had come to be felt more keenly.

There is no doubt that the relative importance of agriculture in the overall economy has been on decline. The ratio of agricultural population to the total population, for example, decreased from 58.3% in 1960 to 54.5% in 1967. Yet, the agricultural population accounted for more than half of the total population and their share in the economic growth during the period of the First 5-Year Project is said to have been 26.5% on average. Thus, agriculture still holds a dominant position in Korea and its role in the national economy is regarded as important as ever. (See Appendix (1))

1-2 Food Supply and Demand, and Agricultural Production

1-2-1 Changes in the Food Demand Pattern

As a result of remarkable high economic growth since 1960, the income level of the people has also risen and demands for food have also grown accordingly.

Table 1 Private Expeciture on Consumption and Food Expenses

Unit : Billion Won

	Description \ Year	1960	1961		1962		1963		1964		1965		1966		1967	
		Amount	Amount	Comp Rate	Amount	Comp Rate	Amount	Comp Rate	Amount	Comp Rate	Amount	Comp Rate	Amount	Comp Rate	Amount	Comp Rate
Current Price	Private Expenditure on consumption (a)	207.26	245.44	18.4	293.79	15.6	399.55	36.0	585.96	46.7	669.08	14.2	805.90	17.0	983.42	22.5
	Food (b)	106.77	132.90	24.5	150.71	13.4	222.57	47.7	355.04	59.5	370.97	4.5	419.22	13.0	486.93	16.2
	(b)/(a) %	51.5	54.0		51.3		55.7		60.6		55.4		52.0		49.5	
Constant Market Price	Private Expenditure on consumption (a)	523.30	528.38	1.0	568.96	7.7	587.74	3.3	620.44	5.6	669.08	7.8	716.99	7.2	780.01	8.8
	Food (b)	300.01	306.70	2.2	317.31	3.5	314.66	△0.8	350.83	11.5	370.97	5.7	389.45	5.0	402.93	3.5
	(b)/(a) %	57.4	58.0		55.8		53.5		56.5		55.4		54.3		51.7	

Source : Bank of Korea.
Note : Constant market price is the modified real price base on the level in 1965.

According to Table 1, the food expense on the constant market price base increased from 300.01 billion won in 1960 to 402.93 billion won in 1967. However, its share in the total private expenditure on consumption rose from 51.5% in 1960 to 52% in 1966 on the current price base but dropped to 49.5% in 1967 partly due to lean crops of that year. In respect to the rate of increase, food expense; increased by 25.5% against the average annual increase of 24.3% for the total expenditure on consumption. The rate of rise in the prices of staple food during this period was 18.9%, far exceeding the 13.5% for commodity prices other than food. This was attributed to the restrictions imposed on the quantity of food consumption. Accordingly, the rate of rise in food expense was 4.4% against 5.9% for the total expenditure on consumption, on the basis of constant market price. (See Appendix (2)).

Thus, the unbalanced food demand and supply, coupled with changes in the food demand pattern, brought about a sharp price rise for certain items, which in turn has brought changes to the relative profitability of cropping items. (See Appendix (3)). That is, as generally seen following

the improvement in the standard of living, the dietary pattern of the people has gradually shifted from starch to protein food, fruit and high class vegetables. In the case of beef, particularly, because of extreme shortages in supply against increasing demands, it was necessary for the government to take some restrictive measures to prevent incontrolled price rise and further shortage of supply.

Meanwhile, demands for processed food and crops for industrial use have also increased. In view of increasing demands for expanded export market and also as in indication of new direction of the agriculture in Korea, "The Agriculture and Fishery Development Corporation (A.F.D.C.)" has been established as an operating body of these national projects.

1-2-2 Production of Food Crops

Under these circumstances, agricultural production in general has shown a remarkable increase, even though there have been some fluctuations in some year due to unfavourable weather conditions. The total agricultural production in the period from 1961 to 1967 increased by 54.2%, of which food crops accounted for 56.4%. (See Appendix (4)).

The total production of food crops, consisting of rice, barley and wheat, miscellaneous cereals, pulses and potatoes, reached 5.93 million tons in 1961 and further rose to 7.57 million tons 1966. The rate of self-sufficiency in food supply in that rice year reached 94% but the total agricultural production dropped to 6.8 million tons in the following 1967-1968 rice year due to the drought which hit the country.

Table 2 Status of Slef-Sufficiency in Food Supply

(Unit : 1,000 ton)

Description / Rice Year	Domestic production (A)	Imports (B)	Exports (C)	Domestic supply (D) (A)+(B)−(C)	Rate of self-sufficiency (A)/(D) x x 100 (%)
1960	5,388	468	30	5,826	92
1963	4,916	1,225	7	6,134	80
1966	7,244	525	67	7,702	94

Source : Annual Report on Agriculture 1967, Ministry of Agriculture and Forestry.

Main factor that contributed to the increase in the production of food crops was the progressive agricultural policies such as the encouragement for increase in cultivated land and improvement of cultivation techniques. By type of crops, the production index of farm products in 1966 as compared with that in 1960 was 129 for rice, 147 for barley and wheat, 132 for miscellaneous cereals, 130 for pulses and 299 for potatoes, showing a remarkable increase in the production of potatoes and barley and wheat.

Table 3 Food Crop Production Index (Index of 100 for 1960)

Type / Year	Total	Rice	Barley and Wheat	Misc Cereals	Pulses	Potatoes
1960	100	100	100	100	100	100
1961	114	115	108	119	126	115
1962	105	99	103	123	121	126
1963	109	124	32	134	121	142
1964	146	130	112	156	127	252
1965	145	115	133	149	135	279
1966	152	129	147	132	130	299
1967	120	118	135	142	156	187

Source: Agricultural Statistics Annual Report 1968, MAF.

Rice production accounted for more than half of the total production of food crops and the yield per 10 a increased by 18% to 316 kg on the average during the period from 1960 to 1966.

Table 4 Trends of Rice Production

	1960	1961	1962	1963	1964	1965	1966	1967
Cropping Area (100 ha)	11,305	11,375	11,485	11,650	12,052	12,384	12,416	12,456
Yield per 10 a (kg)	269	304	263	323	328	283	316	289
Total Production	3,047	3,463	3,015	3,758	3,954	3,501	3,919	3,603

Source: Agricultural Statistics Annual Report 1968, MAF

As discussed above, while the land productivity in Korea has increased remarkably, the yeild of rice per 10 a is still at the level considerably lower than that in Japan. On this point, the Government is putting out an all-out effort to reach the goal of per 10 a production of 400 kg or more in the next few years.

1-2-3 Production of Fruits, Vegetables, Industrial Crops and Livestock Products

The area used as orchard is 45,000 ha, accounting for about 1.3% of the total cultivated area and the area sued for such purpose in 1967 was an increase of twofold and the fruit production increased by about 2.3 times, respectively, compared with 1960. Of the total fruits production, apples and peaches accounted for about 72%, which in terms of manetary value represent about 61.5% of the total fruits production. Except citrus fruits, the majority of fruits grown are consumed within the country and only a portion of fresh apples is exported to Southeast Asian countries in a small quantity.

Many of the fruits raised in Korea are from inmature orchard and such cases are seen in apples which account for about 30% and citrus fruits accounting for about 70% of the total production. Such being the case, further increase in the production is expected for the future.

The area used for the cultivation of vegetables accounts for about 4.4% of the total cultivated area and it increased by about 30% to 160,000 ha and the production also increased by about 40% during the period from 1962 to 1967. Of the total production of vegetables, raddish and Chinese cabbage accounted for about 65% and their share in the total production in manetary value was 35%. Both red pepper and garlic are indispensable for ingredients of Korean cooking and their prices also rise sharply in the pickling season of the fall.

Though special attention is being paid to the supply and demand situation of vegetables during the winter season, production of other vegetables is within the confines of domestic consumption with the exception of garlic which is exported in small quantity.

For industrial crops, their production in general is somewhat at a standstill being influenced by the recent trend toward a gradual decline in cotton raising following recent trade liberalization movement and the area used for these crops accounts for 2% or 70,000 ha. Main items falling under this category are cotton, rapeseed, and sesame, accounting for about 77% of the total production of industrial crops in terms of quantity and 57% in terms of manetary value. Of industrial crops, hemp products, sponge gourd, and rush goods are exported and are contributing to the maintenance of balance of payments, while the rest are consumed within the country. For livestock products, there is a firm demand for meat and its production increased by 180% to 163,000 tons in 1968 from the 91,000 tons in 1960. By breakdown, however, more increase is seen in the consumption of pork and poultry meat than beef. Per capita annual consumption of meat was 3.7 kg in 1960 and around 4 kg in the following year but jumped to 5.3 kg in 1968.

Production of eggs also showed a sharp increase, jumping from 830 million eggs in 1960 to 1,700 million eggs in 1968, an increase of 202% and the per capita annual consumption also increased from 34 eggs to 52 eggs.

Production of milk will be the question to be answered mostly in the future. Domestic consumption of milk in 1968 including milk products imported as aid amounted to 93,000 tons in raw milk, an increase of twofold compared to that in 1963. Of this total consumption, domestic milk production accounted for only about 26%. Despite this fact, however, it will be difficult at present to make an accurate prediction on the future development on the basis of these figures.

1-3 Structure of Agricultural Production

1-3-1 Composition of Farm Household by Class

Agriculture in Korea in general is still in the confines of "The Management for Existance" and can hardly be said to have reached the stage of commercial production. However, there is an indication in recent years that people's attention has been gradually shifting to the selective expansion centering on the cultivation of hopeful items.

According to the data on farm household classified by operating size, the number of farm households increased slightly from 2.35 million in 1960 to 2.587 million in 1967, but its breakdown shows a decrease in the number of farmers possessing the cultivation area of less than 0.5 ha and an increase in the number of farmers in the class with the cultivation area exceeding the foregoing standard. A rapid increase in the number of farmers in the 1.0-2.0 ha class is particularly noticeable. In the composition ratio of farming class the ratio of those farmers having cultivation land less than 0.5 ha decreased from 42.9% to 35.6%, that of those in the 0.5-1.0 ha class increased from 30.1% to 33.3%, that of those in the 1.0-2.0 ha class increased from 20.7% to 25.7% and that in the 3.0 ha class and the above increase from 0.3% to 1.2%. These changes in the composition ratio indicate the progress of expansion of farming size in the form of decrease in the number of farmers on marginal operating size and the increase in the number of farmers on medium operating size. Rapid increase in the number of farmers above the 3.0 ha level in particular was a result of intensified land reclamation projects following the First 5-Year Project and it is also an indication that agriculture is becoming more commercialized. In any case, the recent tendency toward the expansion in operating size, when considered in connection with the recent increase in the number of farm household, should be appraised highly as a favorable indication. Average cultivation area per farm household in Korea increased from 0.87 ha to 0.92 ha in 1967.

1-3-2 Farm Household Population

Agricultural population increased from 14.56 million in 1960 to 16.08 million in 1967. However, the rate of increase is lower than that of the total population in the same period and moreover, the difference has further widened in recent years. This is an indication that the shifting of population from rural area to urban area is now in progress. The number of people shifting is said to be some 100,000 to 200,000 annually and it is also said that the number increased twofold at the time of bad crops. The ratio of agricultural population to the total population decreased from 58.3% in 1960 to 54.5% in 1967. Yet it is an undeniable fact that the agricultural population still dominates the majority of the total population.

Table 5 Number of Farm Household by Operating Size

Unit : 1,000

Description / Year	Total		Less than 0.3ha		0.3~0.5ha		0.5~1.0ha		1.0~2.0ha		2.0~3.0ha		More than 3.0ha	
	No. of household	%	No. of household	%	No. of household	%	No. of household	%	No. of household	%	No. of household	%	No. of household	%
1960	2,350	100	463	19.7	545	23.2	707	30.1	486	20.1	141	6.0	7	0.3
1961	2,327	100	440	18.9	506	21.8	741	31.8	491	21.1	143	6.1	6	0.3
1962	2,470	100	490	19.9	523	21.2	803	32.5	505	20.5	141	5.7	7	0.3
1963	2,416	100	490	20.3	520	21.5	761	31.5	497	20.6	139	5.8	9	0.4
1964	2,450	100	466	19.0	513	20.9	782	31.9	526	21.5	148	6.0	16	0.7
1965	2,507	100	431	17.2	470	18.7	794	31.7	643	25.7	140	5.6	29	1.1
1966	2,540	100	430	16.9	464	18.3	818	33.4	657	25.9	137	5.4	35	1.1
1967	2,587	100	458	17.8	460	17.8	829	33.3	665	25.7	135	5.2	39	1.2

Source : Report on the Survey of Farm Household Economy, MAF.

Table 6 Status of Agricultural Population

(Unit : 1,000)

Description / Year	Total population A	Agricultural population B	B/A X 100 (%)
1955	21,526	13,300	61,8
1960	24,989	14,559	58,3
1966	29,208	15,781	54,0
1967	29,471	16,078	54,5

Source: Korea Statistics Annual Report, Economic Planning Board, Agriculture Census Report, MAF

Relative productivity of agriculture may be influenced by the change in the number of employed labor but the number of farm workers in 1960 was 6.8 million, accounting for 72.3% of the total working force of the country. Since then the number showed a gradual decrease but remained on the 5 million level during the period from 1963 to 1966, still accounting for more than 60% of the total working force of the country. However, the number decreased to 4.1 million in 1968 showing an astonishing rate of decrease in the last few years, which may be interpreted as the beginning of unexpectedly early change in the employment structure. If that is the case, how it will affect the growth of agricultural production or whether agriculture in Korea will shift its course at an unexpectedly early stage and transformed into modernized structure is still undetermined. This movement, however, should be regarded as being directed toward that goal at least in its basic course.

Table 7 Status of Agricultural Employment

(Unit : 1,000)

Description / Year	Total Employment A	Agricultural Employment B	B/A X 100 (%)
1960	9,350	6,775	72.3
1963	7,947	5,129	64.5
1964	8,210	5,255	64.0
1965	8,522	5,260	61.7
1966	8,659	5,259	60.7
1967	8,294	4,461	53.8
1968	8,408	4,053	48.2

Source: Economic Activities Census, Economic Planning Board: Data published by Statistics Bureau, Economic Planning Board.

1-3-3 Agricultural Income

Agricultural income per farm household increased 2.9 fold to 116,359 won in 1967 from the 39,891 won in 1960. Breakdown of this increase by operating size shows that the households of large operating size have a higher rate of increase in their income as a matter of course. However, the strata which is able to cover its own household expenses with agricultural income alone is limited to those having the cultivation area exceeding 1.5 ha and they account for only 15% of the total independent farmers. Then, are the farmers below the 1.5 ha level supplementing their income by side-work income? Under such circumstances as the rate of agricultural income to non-

agricultural income is 78 to 22 on average and the ratio further decreases to 60 to 40 in the case of petty farmers below the 0.5 ha, it is natural for them to seek employment as hired laborer in their own rural area. Now, the rate of utilization of hired laborer is surprisingly high accounting for 10% in the class below the 0.5 ha level and 12% in the class of the 0.5 - 1.0 ha level, it may be said that such high dependency on hired laborer is obviously abnormal for the farmaers whose operating size is so small that can be adequately managed by his own family laborer. This fact shows the low employment rat e of labor and low labor productivity. Though the prices of agricultural products have generally developed in favor of the farmer in the last several years, there have been noticeable price fluctuations depending on the type of products, which coupled with the lack of flexibility in distributi on structure, sometimes caused price rise as high as 40% during the period between the shipping season and non-shipping season. Difference in the labor income between agricultural workers and those of other industries is not the problem peculiar to Korea. However, even though the ratio of agriculture to non-agriculture in the production of added value per laborer increased from 37.4% in 1963 to 44.3% in 1966, the rate is still held at a low level far below the half of the level of average workers. Against the per capita annual income of 37,000 won for the average workers in 1967, per capita income for farmers was 22,000 won, showing a wide difference between them. (See Appendix (5)).

Table 8 Trends of Agricultural Income Per Household (Current Price)

(Unit : won)

	Gross Agricultural Income	Agricultural Expense	Agricultural Profit	Index
1960	51,433	12,241	39,891	100.0
1962	73,416	19,390	54,026	135.4
1963	100,925	24,383	76,542	191.9
1964	128,072	24,327	103,745	260.0
1965	115,991	27,179	88,812	222.6
1966	131,407	29,977	101,430	254.2
1967	150,995	34,636	116,359	291.7

Source: Agricultural Annual Report, MAF

1-3-4 Increase of Food Production and Change in Agricultural Structure

Agriculture in Korea has experienced a technical innovation in the past one decade. Major changes brought by this innovation are the use of fertilizer, lime, agricultural chemicals and improved seeds and the improvement in water utilization.

Originally being laden with ill-luck such as unfavorable soil conditions and adverse weather conditions, the country at intervals suffered from such disasters as the great drought which hit the southern region in the 1967-1968 period. These experiences taught the people of Korea that the preparedness of the country against adverse weather condition in the past had been almost nil or not adequate, if there had been any. Also on water utilization, about 40% of the total paddy field are classified as that of poor water utilization. Overall progress of the water utilization project is said to have been 93% during the First 5-Year Project period but the progress of reservoir construction lagged considerably. Land re-adjustment project can hardly be said to be in smooth

progress. Utilization of farm machinery is not favorably progressing, either. It should be noted, however, that even under these unfavorable conditions, a fairly high increase in agricultural production has been achieved. Yet the need for increased food production was most urgent in order to meet ever increasing population. Under the Second 5-Year Economic Development Project which began in 1967, increase of food production was advocated as the prime objective. The nucleus of measures required for increased food production is, first of all, the expansion of water facilities to insure adequate supply of water at an appropriate time for rice cultivation, as well as the increased and improved cultivated land and also the increase in the unit production. To be emphasized together with the increased food production should be the cultivation of profitable crops, promotion of livestock industry and rural processing industry using the foregoing raw materials and the increase of exports. For fruit production among the profitable crops, increase in the production of citrus fruits and grapes and the stability of market price are recommended. For vegetables, in addition to increased supply during the summer season, promotion of horticulture and increased production of vegetable for canned food for export purpose (mushroom, asparagus) are recommended. Also recommended for industrial crops are the encouragement of contract cultivation aimed at stabilizing the price of such raw materials as ramie, creation of major production area of rush, full utilization of paddy field and coordinated import of rape with the consideration given to the trends of domestic price of rapeseed oil so as to maintain stabilized price of domestic oil and fat. For livestock industry, emphasis is being placed on the creation of major production area to promote the rationalization of management and to help promote the industrialization of dairy farming, beef production, pig raising and poultry farming. In this way, Korea is taking the course toward a new agricultural structure in its attempt to increase the income for rural area or individual farmers. It is needless to say the so-called "Special Project for Increased Income for Farmers and Fishermen" is based on the concept of "Harmonized progress of Agriculture and Industry" which is aimed at balancing the national income by realizing a high growth of industrial production.

1-3-5 Establishment of "Agriculture and Fishery Development Corporation"

The Agriculture and Fishery Development Corporation was established in December 1967 as a special corporation with a capital of 5 billion won which was wholly invested by the Central Government in compliance with "The Agriculture and Fishery Development Corporation Law".

Required operating funds are expected to be financed by the procurement of foreign investment, loans from the Treasury Account, government subsidy and the issue of bonds in addition to its own capital and some of the projected works have already been carried out. Major projects now in operation are the consolidated food processing plant for processing of various vegetables and fruits, cold storage facilities which are aimed to establishing a national cold chain network, lobster breeding and processing facility, hog raising and meat rpocessing complex, silk manufacturing complex, citrus fruit farms, rush raising farms, laver quality improvement project, fruit processing plant and clam processing industry. Agriculture in Korea involves many problems covering various aspects and as a result, agricultural policies are also diversified. However, it is inevitable that the development of agricultural products processing industry on the premise of increasing farmer's income combines with the "Major Production Area Promotion Project". By

implementing intensive development of major production area for the production of the right crop in the right place and establishing agricultural processing plant at the same time, it will be possible to secure economically justifiable plant size and structures necessary to gain appropriate profit which can be returned to the hand of farmers.

This is one of the reasons that the Agriculture and Fishery Development Corporation is contemplating the development of livestock industry.

2 Trends of Livestock Industry

2-1 Characteristic of Livestock Industry

2-1-1 Trend of Enterprise Livestock Industry

Because of the status of agriculture in Korea which is supported mainly by farmers of small operating size, who are more inclined toward the production of staple food, it is inevitable that the livestock industry which is regarded only as a subordinate and supplemental function holds a very low position from both managemental and technical points of view. Particularly, when the mechanization of agriculture is not fully realized and the level of livestock products consumption is still low, the only reason the stock raising can find its place in farm work would be that it can provide draft cattle and manure. So far, there have not been any adequate measures taken for the livestock improvement and even the National Fair of Korean Cattle held this year was first in its kind. Moreover, there has not been any attempt made for fattening not only of cattle but also of pigs.

In recent years, however, there have been some movements at last toward enterprise livestock farming. This tendency is particularly noticeable in dairy farming and poultry farming, but this movement has not spread widely among the farmers at large. However, the most of the farmers are engaged in stockkeeping and poultry farming in some form or other and they account for about 80% of the total farm household population. But the number of farmers raising stock has been on a decrease every year with the progress of farm mechanization or increased number of farmers leaving the farm work. In particular, the number of Korean cattle has decreased by almost 10% in the last five years.

Livestock industry in Korea, while satisfying ever increasing demands for livestock products on one hand, is being promoted with the expectation that it will play an important role as the basis for increased income for farmers. It seems difficult, however, to expect stabilized stockkeeping from the farmers whose operating size is so small and feeble. It may be inevitable, therefore, that the movement toward the enterprise livestock farming is seen only in the non-farmer sector or in the highest farming class under the present agricultural structure. Distribution system of livestock and livestock products is also left in the state of old days. Livestock market is serving only as the place of reciprocal dealing or the place of gathering for cattle dealers. Also on the dealing of meat, dressed carcass wholesale markets have just been opened in Seoul and Pusan Cities. Although there are still many problems to be solved, the livestock industry in Korea is gradually transforming its shape and is progressing steadily.

2-1-2 Position of Livestock Industry in Agricultural

The share of livestock farming in the total agricultural production increased from 5.4% in 1961 to 13.9% in 1967 and the share of food crops, meanwhile, dropped from 84% to 56.4% during the same period (See Appendix (6)).

Table 9 Status of Agricultural Production

		1961	1962	1963	1964	1965	1966	1967
Total agricultural production		100	100	100	100	100	100	100
Farm production	Total	94.4	93.1	92.3	90.7	87.9	88.6	85.3
	Food crops	84.4	78.2	74.0	70.8	64.4	59.8	56.4
	Monopolized crops	1.6	2.1	1.7	2.8	4.3	4.8	4.1
	Fruit	0.9	1.4	1.2	1.9	2.4	2.4	2.6
	Begetables	3.5	4.8	7.4	7.3	9.5	12.0	11.0
	Industrial crops	0.7	0.9	0.6	0.8	1.0	1.3	1.3
	By-production	3.7	5.7	7.4	7.1	6.3	8.3	8.9
Livestock industry	Total	5.4	6.6	7.4	8.9	11.4	10.6	13.9
	Livestock	4.3	5.2	5.6	6.9	7.6	7.8	10.3
	Livestock products	1.1	1.4	1.8	2.0	2.8	2.8	3.6
Sericulture		0.2	0.3	0.3	0.4	0.7	0.8	0.9

Source : Agricultural Statistics Annual Report 1968, MAF.

On the share of each item in the total livestock production, eggs rose from 19.5% to 24.5% and milk jumped from 0.4% to 1.2%. It is particularly noticeable that the combination of eggs and milk rose from 20.4% to 26.6% but relative importance of meat has not changed greatly. It is noteworthy that the share of Korean cattle decreased from 79.6% to 73.4%. Such tendency is closely related with the rate of rise in agricultural products prices and in this case it may have been prompted by the fact that the price index of livestock products has risen to the record high of 278.7% against 268% for producer's price in all agricultural products with 1960 as the basis. In general the rate of rise in consumer's price seems to be less than that in the producer's price. This is probably because the price stabilization measures taken by the government for consumers price of cereals and the Livestock Products Price Stabilization Fund are playing effective roles in the stabilization of prices.

Table 10 Comparison of Consumer's Price and Producer's Price of Agricultural Products (1960 - Index of 100)

1966	Total Agricultural Products	Cereals	Vegetables	Fruit	Livestock Products
Consumer's Price	251.0	246.1	155.7	248.7	256.6
Producer's Price	268.0	259.1	265.9	202.4	278.7

2-2 Current Status of Stockkeeping

2-2-1 Korean Cattle

One of the typical domestic animals of Korea is Korean cattle. It was recognized in Japan that the Korean cattle had contributed to the improvement of Japanese cattle to some extent before the war.

As is widely known, the Korean cattle is utilized mainly as draft cattle and is regarded as the most important source of meat supply. This animal is indispensable to the agriculture in Korea where mechanization has not yet been fully materialized. The Korean cattle received a deadly blow from the Korean Conflict. The number of cattle totaling as many as 900,000 before World War II decreased drastically to less that 400,000 at the end of the conflict. Despite this fact, however, the number jumped to the one million level in 1960, showing noteworthy rehabilitation and growth rate. Since then, the number continued an upward trend until 1963, and in recent years the number has been gradually decreasing. To cope with this situation, the government provided a measure prohibiting the slaughter of cow under the age of 6 and oxen under the age of 2. This measure was further expanded to prohibit the slaughter of cows of any age during the period from September 16, 1968 to September 30, 1969. Even with these measures, however, it still seems difficult to find the way to increase the number of declining Korean cattle. For beef cattle, such as Brahman, Hereford, Shorthorn and Aberdeen-Angus are being imported. These breeds are also used for crossbreeding with the Korean cattle and crossbred of these breeds now totals more than 2,000. Size of cattle raising is small throughout the country and the number of Korean cattle raised by per farm household is only one in most cases. Also with the foreign beef breed, the number has been on gradual decrease except the imported time and the number raised by per farm household at present still remains at around 1.6.

Table 11 Number of Korean Cattle and Beef Cattle Unit : 1,000 head

Description \ Year		1960	1961	1962	1963	1964	1965	1966	1967
Korea cattle	No. of cattle (Growth rate)	1,009 (100)	1,095 (109)	1,254 (124)	1,363 (135)	1,351 (134)	1,313 (130)	1,290 (128)	1,243 (123)
	No. of household (cattle/household)	893 (1.1)	968 (1.1)	1,093 (1.1)	1,178 (1.2)	1,187 (1.2)	1,156 (1.2)	1,132 (1.1)	1,097 (1.1)
Beef cattle	No. of cattle (Growth rate)	0.656 (100)	0234 (36)	0.861 (131)	0962 (147)	0.854 (130)	0805 (123)	1,139 (174)	2,132 (325)
	No. of household (cattle/household)	0.076 (8.2)	0131 (1.8)	0.155 (5.6)	0.183 (52)	0.259 (33)	0.185 (4.3)	0414 (2.7)	1,307 (1.6)

Source : Livestock Statistics, MAF.

So far, the Korean cattle has been raised mainly for draft use. In the country like Korea where land space is limited and the average per household acreage is less than one ha, stockkeeping of one or two heads of animal has been more than enough and demands for beef have also been adequately met with the utilization of retired draft cattle.

Such being the case, no attempt has ever been made to raise beef cattle for the sole purpose of beef production. In recent years, however, consumption of beef has been gradually increasing with the growing income of the people and as a result, price of beef is rising annually and large scale Korean cattle raising farms are seen at times. However, the feeding method used is a short term fattening extending about 100 days for the oxen 2 to 3 years old in most cases.

These Korean cattle fattening farms concentrate in and around the major cities such as Seoul, Pusan and Taegu.

Large scale cattle raising for breeding purpose is seen sporadically only in Cheju do and other areas.

Table 12 and 13 show the profitability of Korean cattle raising for fattening and breeding purposes. These tables show that in the case of fattening of Korean cattle the increase in the size of stockkeeping results in a decrease of per head profit and even with three turn-overs per year by means of a short term fattening, the per head profit is still lower than that of dairy farming. In the case of Korean cattle raising for breeding purpose, the table shows a high income rate for the farmer raising only one head. However, the assessed income from the cattle being raised, assessment of manure and income from the service of draft cattle are all disguised income with the exception of the proceeds from the sale of calves. Thus, the increase in the size of stockkeeping results in a decrease of income from the service of draft cattle and an increase of wage from hired labor, thus causing gradual decrease of per head income. It indicates that the profitability of breeding is lower than that of fattening, hinting that multiplication is more difficult in this case.

Table 12 Profitability Analysis of Korean Cattle Fattening

Operating type	No. of cattle raised	Gross Income	Operating Expense	Profit	Per head profit
Side-line stockkeeping	2	141,600	62,040	78,660	13,110
Specialized stockkeeping	50	3,540,000	2,287,000	1,253,000	8,353
Enterprise stockkeeping	100	7,080,000	4,690,840	2,389,160	7,964

Source: Report on the Study of Livestock Industry Promotion 1968, Korea Livestock Management Institute

Table 13. Profitability Analysis of Korean Cattle Raising For Breeding Purpose By Operating Size

(Unit: won)

		Side-line (Raw feed)	Side-line (Cooked feed)	Farming & Stock Keeping	Specialized	Enterprise
No. of cattle raised		1	1	5	30	100
Income	Proceeds from sales of calves	24,000	24,000	-	630,000	2,100,000
	Assessed profit from cattle being raised	18,250	18,250	130,000	411,625	1,350,000
	Assessment of manure	10,500	10,500	22,000	180,000	600,000
	Income from service of draft cattle	40,000	40,000	96,000	400,000	400,000
	Total	93,250	93,250	248,000	1,621,625	4,450,000
Expenditure	Labor expense	-	-	10,000	288,000	330,000
	Feed expense	14,900	30,500	88,000	480,600	2,222,000
	Depreciation	660	940	4,150	46,100	94,150
	Others	1,900	1,900	11,600	40,000	16,000
	Total	17,460	33,340	113,750	854,700	2,662,150
Net profit		75,890	59,910	134,250	766,925	1,787,850
Profit per head		75,890	59,910	26,850	25,564	17,879

Source: Same as for Table 12.

2-2-2 Pig

Pig raising has seen no remarkable fluctuation while repeatedly expericencing some changes affected by the so-called "Pig Cycle", with the number decreased slightly from 1.4 million in 1960 to 1.3 million in 1967. In recent years there is an indication of increased number of enterprise-type pig raising and vigorous structural change is about to take place. However, the number of pigs raised by per farm household is only 1.3 on the average, which indicates that pig raising in this country is still in the confines of self consumption or side line job for petty farmers. The number of farm households raising 50 heads or more now reaches 50 with a total of 14,000 heads. This is a sharp increase compared with the size of the past. By breed, the Yorkshire made a drastic decrease and the crossbred of the Berkshire with the Hampshire or the Landrace has been increasing gradually. There is also an indication of movement toward the promotion of pig fattening project which has not been seen in the past.

Table 14. Status of pig raising

(Unit 1,000 head)

Description \ Year		1960	1961	1962	1963	1964	1965	1966	1967
Transition of No. of head	No. of pigs (head)	1,402	1,262	1,690	1,510	1,256	1,382	1,457	1,296
	Growth rate %	100	90	121	108	90	99	104	93
Transition of No. of household	No. of household unit	1,097	1,005	1,245	1,285	1,006	1,083	1,149	1,041
	No. of pig per household	1.3	1.3	1.4	1.2	1.3	1.3	1.3	1.3

Source: Livestock Statistics, MAF.

Table 15 Number of Household Raising Pigs by Operating Size

Unit : 1,000 heads)

	1 Head		2–5 Heads		6–10 Heads		11–50 Heads		51–100 Heads		Over 100 Heads	
	No. of House-hold	Head	No. of House-hold	Head	No. of House-hold	Head	No. of House-hold	Head	No. of House-hold	Head	No. of House-hold	Head
1965	956.7 (89.2%)	956.7 (69.2%)	115.2 (10.6%)	301.4 (22.0%)	8.6 (0.8%)	64.7 (4.7%)	2.3 (0.3%)	59.1 (4.3%)				
1966	1,018.9 (88.9%)	1,018.9 (70.0%)	119.5 (10.4%)	318.0 (21.6%)	8.9 (0.8%)	65.7 (4.4%)	1.9 (0.2%)	54.6 (3.7%)				
1967	934.0 (89.5%)	934.0 (72.1%)	96.6 (9.3%)	256.1 (19.5%)	8.4 (0.8%)	64.3 (5.0%)	1.6 (0.2%)	27.8 (2.4%)	0.03 (0.003%)	2.2 (0.017%)	0.02 (0.002%)	11.7 (0.9%)

Source : Livestock statistics, MAF.

Note : Figures in parenthesis show the ratio to the total number of household and number of pigs.

Table 16 Per Head Profitability Analysis of Fattened Pig by Operating Size

Unit : Won Unit : Won

Description \ Operating Size	1–3 heads		4–7 heads		More than 8 heads		Enterprise		Average	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Cost of commercial feed	3,027	25.9	2,930	26.6	4,075	31.9	4,040	34.4	3,517	31.3
Cost of self-supplied feed	2,333	20.0	2,233	20.3	1,060	11.0	1,500	12.7	1,781	15.9
Direct material cost	666	5.7	467	4.2	582	6.0	266	2.2	495	4.5
Cost of feeder pig	4,500	38.6	4,500	40.8	4,250	44.2	3,750	31.8	4,250	37.7
Building	350	3.0	310	2.8	275	2.9	385	5.8	330	3.0
Farm machinery	193	1.7	170	1.5	125	1.3	505	4.3	248	2.3
Rent and charge	600	5.1	417	3.8	760	2.7	700	5.9	496	4.4
Labor expense							348	2.9	87	0.9
Total	11,669	100.0	11,027	100.0	10,627	100.0	11,494	100.0	11,204	100.0
Sale of products	15,200		14,400		13,200		14,000		14,200	
Income	3,531		3,373		2,573		2,506		2,996	
Profit rate		30.2		30.5		24.2		21.8		26.8

Source : Same as for Table 12.

Table 17 Per Head Profitability Analysis of Breeding Pig by Operating Size

Description \ Operating Size	1–3 heads		4–7 heads		More than 8 heads		Enterprise		Average	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Cost of commercial feed	5,566	25.0	5,400	23.1	7,200	29.0	15,919	43.7	8,521	30.7
Cost of self-supplied feed	2,766	12.4	3,110	13.3	1,966	8.0	265	0.7	2,027	7.3
Depreciation of sow	5,500	24.7	5,500	23.5	5,500	22.2	5,500	15.1	5,500	21.3
Direct material cost	766	3.4	681	2.9	516	2.1	1,964	5.4	982	3.5
Building	590	2.7	566	2.4	550	2.2	367	1.0	518	1.8
Farm machinery	373	1.7	333	1.4	300	1.2	300	0.8	327	1.1
Rent	116	5.0	1,026	4.3	982	4.0	1,570	4.3	1,173	4.2
Nursing expense	5,600	25.1	6,720	29.1	6,020	24.3	8,400	23.1	6,685	23.1
Labor expense					1,789	7.0	2,135	5.9	1,962	7.0
Total	22,277	100.0	23,336	100.0	24,823	100.0	36,420	100.0	27,695	100.0
Sale of products	29,300		33,330		30,000		42,000		33,650	
Income	7,023		9,994		5,177		5,580		5,955	
Profit rate		31.4		42.8		20.9		15.4		21.5

Source : Same as for Table 12.

Like Korean cattle fattening, enterprise pig raising is only seen in and around the major cities such as Seoul, Pusan and Taegu. When the feed supply has to depend only on the concentrates, the economy of pig raising becomes extremely low and therefore the feed source is mainly garbage.

The reason that specialized pig raisers could not keep their business is that the price of pig is relatively low compared with that of concentrates.

In the present stage when there is no bright prospect for export of

pork, relatively stabilized pig raising could be hoped only on the conditions that over half of the required feed supply depend on garbage or low price feed is readily available or self-supply of feed is guaranteed.

For this reason, it may be said that pig raising on garbage feed is promising for urban area and that the right direction for rural area would be to encourage pig raising on self-sufficing feed.

The center of side-line pig raising is West Kyongsang do, entire area of Cholla namdo and rice growing area in Chugchong namdo and Cholla pukdo.

Comparative profitability of pig fattening and breeding is shown in Tables 16 and 17. These tables show that in the case of fattening the increase in the operating size results in a decrease in per head profit. Reasons given are that in proportion to the increase in the number of heads, the ratio of self-sufficing feed decreases and dependency on commercial feed increases on the contrary and that enterprise pig raising must also bear labor expense.

In the case of breeding, multiplication of pig raising results in a decrease in per head profit from the same reason as for fattening. Thus, both fattening and breeding lack basic requirement for existance as enterprise pig raising.

As evident from the income rate in the table, profit from fattening stands higher than that from breeding at present. This is probably a universal phenomenon seen when pork demands are on a increase.

2-2-3 Poultry

Poultry farming is one of the fields which made a remarkable growth in recent years and the number of poultry increased by 144% from 11.9 million to 17.1 million during the period from 1960 to 1967. The number of enterprise poultry farmers has also increased during this period and the farmers raising more than 500 chickens now totals 1.813 with a total of 1.8 million chickens, accounting for 15% of the total poultry raised in the country. This rapid increase is particularly noteworthy compared with 1965, when the number was 620,000 representing 5% of the total poultry in the country. However, the size of chicken raising is still small with the average number per farm household being 13 but when compared with the average of 9 in 1965, it is evident that the size of chicken raising is being expanded at a fast pace.

Of the poultry farming, the recent growth of broiler is specially noteworthy.. The number of broilers hatched increased by about 4 times to 1,947,000 in 1967 from 493,000 in 1965. Judging from the recent tendency toward industrialization and the increase in the number of broilers, poultry industry will see a revolutional progress in not-so-distant future. The main breed are the White Leghorn and its crossbred followed by the New Hampshire and Plymouthrock. Recent sharp increase in the import of chickens is specially noteworthy.

Table 18 Status of Poultry Farming

(Unit: 1,000)

Description	Year	1960	1961	1962	1963	1964	1965	1966	1967
Change in the No. of chickens	No. of chickens	11,885	11,030	13,216	11,907	10,282	11,893	14,007	17,079
	Growth rate %	100	92.8	111.2	100.2	86.5	100.1	117.9	143.7
Change in the No of household	No. of household						1,320	1,297	1,293
	No. of chickens per household						9	11	13

Source : Livestock Statistics, MAF.

Table 19 Number of Chidkens and Household Raising Chickens

Unit : 1,000

Description / Year	Less than 10 heads		11–15 heads		51–100 heads		101–500 heads		501–1,000 heads		Over 1,000 heads	
	household	head	household	head	household	head	household	head	household	head	household	head
1965	1,161.3	590.	141.2	2,578 6	9.8	727.2	7.3	1,524.9	0.7	432.9	0.2	5889
	% (88.1)	(505)	(10 6)	(21.8)	(0.73)	(6.1)	(0.4)	(12.9)	(004)	(38)	(0.02)	(4.9)
1966	1,102.4	5808.	1668	3,134.3	155	1,107.6	11.9	2,467.2	09	607.9	03	882.5
	% (840)	(41.6)	(12.8)	(22.2)	(1.2)	(7.9)	(0.8)	(17.7)	(007)	(4.3)	(0.02)	(63)
1967	1,053.3	5,786.9	1943	3,819.3	22.1	1,628 8	165	3,530.6	1.3	893.9	06	1,3196
	% (81.5)	(338)	(129)	(22.2)	(1.9)	(95)	(1.3)	(20.8)	(01)	(5.2)	(005)	(7.7)

Source : Livestock statistics, MAF

Note : Figure in parenthesis show the ratio th the total household and total number of chicken

In the management of poultry farming the cost of feed accounts for about 80% of the total operating cost and therefore, the farmers are particularly sensitive about the fluctuation of egg and feed price. Following the decline in egg price in recent years, poultry farmers of large operating size are capable to maintain their business only because of high productivity of their business but side-line poultry farmers are in the state of constant unrest.

Table 20 shows the profitability of poultry farming for eggs. From the table it is evident that the increase in the operating size;will result in higher profitability. This is due to the fact that in proportion to the expansion of operating size, the egg laying rate also increases and income from eggs increases at a rate higher than that of the increase of operating cost. Thus, any increase in the rate of egg laying plays a dominant role in the increase of income for poultry farmers. Other advantages with increased operating size would be the savings in labor cost, depreciation allowance and the cost of farm machinery and increased feed efficiency and rise in egg price.

Table 20 Profitability Analysis of Poultry Farming by Operating Size

Operating type		Side-line	Farming & Poultry farming	Specialized	Average
Average No. of chicken raised		74 head	460	1,525	686
Per head	Feed required for raising	13.0kg	12.0	11.5	12.2
	Feed required for egg laying chicken	49.7	44.7	40.4	45.0
	Total	62.7	56.7	51.9	57.2
Invested capital per 100 heads		won 101,581	115,762	116,580	111,307
Manhour required per 100 heads		h 11,351	601	324	759
Cost of feed per 100 heads		won 111,859	118,040	120,922	116,940
Average annual rate of egg laying		41.1%	48.5	58.0	49.2
Sales price of per egg		won 8.95	9.10	9.58	9.21
Per household	Gross income	148,234	1,029,777	4,000,648	1,726,219
	Operating cost	150,781	1,009,061	3,548,812	1,569,551
	Net profit	− 2,547	20,716	451,836	156,668
Profit rate		_%	2.1	12.7	9.1

Source: Same as for Table 12

2-2-4 Other Domestic Animals

Of other domestic animals, dairy cattle raising is making a rapid progress, though the size of stockkeeping is not too great, backed by a strong support of the Government, as discussed in detail at a later stage. Particularly, in view of national development and also from the standpoint of promoting enterprise, further progress of this industry is much expected.

The horse still plays an important role in plowing and transportation in agriculture. The number of horses increased by 123% to 25,000 in 1967 from 20,000 in 1960, but in the last 3 years there has been an indication of gradual decrease in their number, showing a trend similar to that of Korean cattle. The number of horses kept by per farm household except in Cheju Island now stands at 1.1. In the case of Cheju Island which is known for a long time as a producing center of unique horses called "pony", 58,000 households, accounting for 44% of the total horse raising household of 134,000 in the country, are now raising 17,000 heads accounting for 68% of all horses in the country totaling 25,000 heads. The average number raised by per household is 3.

Under strong encouragement of the government Angora rabbit raising is growing rapidly and the number of rabbits jumped from 5,000 heads in 1965 to 200,000 heads in 1967, an increase of fourfold in a couple of years. Main raising areas are seekn in Kyonggido, Kangwondo, Cholla namdo and Kyongsang pukdo.

Table 21 Number of Dairy Cattle, Horse, Goat, Sheep and Rabbit Raised

Unit : 1,000 heads

Description \ Year	1960	1961	1962	1963	1964	1965	1966	1967
Daity cattle	0.9	1.1	2.4	3.5	5.2	6.6	85	104
	(100%)	(130.4)	(277.2)	(407.6)	(5990)	(761.8)	(9759)	(11935)
Horse	202	21.7	25.3	26.7	26.9	27.7	27.7	25.0
	(100%)	(107.2)	(125.1)	(131.9)	(133.1)	(136.8)	(136.7)	(123.3)
Goat	155.5	231.6	313.4	286.4	224.9	1975	161.3	133.4
	(100%)	(149.0)	(201.6)	(184.2)	(144.6)	(114.1)	(1038)	(858)
Sheep	1.0	1.4	1.5	1.2	1.0	1.0	1.6	1.6
	(100%)	(147.4)	(152.6)	(122.8)	(108.6)	(107.2)	(170.5)	(167.1)
Rabbit	0.8	0 8	1.3	1.1	0.8	0.8	0 9	0.8
	(100%)	(95.4)	(168.2)	(143.7)	(100.9)	(96.9)	(1154)	(1058)

Source : Livestock Statistics, MAF.

Note : Figures in parenthesis show the rate of increase and decrease with 1969 being the index of 100.

2-3 Demand and Supply of Livestock Products

2-3-1 Meat

Recent changes in the food demand pattern in Korea may be interpreted as an indication of increased consumption of livestock products.

Starting with the meat, its consumption has been growing steadily and the growth rate of recent years is particularly noteworthy, even though there have been some changes depending on the year and the figure shown may not necessarily represent an accurate picture because of incomplete statistical data. Per capita annual consumption was 3.7 kg in 1960 and 4.2 kg in 1967, and an unofficial announcement puts the consumption in 1968 at 5.3 kg Forecast puts the future consumption in 1971 at 6.9 kg.

Breakdown of meat consumption shows that the dependency on beef is decreasing gradually and the share of broiler is increasing steadily. It is expected that the beef will be substituted by pork and chicken gradually.

Production of beef depends primarily on Korean cattle and as long as the purpose of Korean cattle raising is limited to the utilization as a draft cattle, the number of Korean cattle will continue to decline and the number of slaughtered cattle will further increase. For this reason, the government enacted a law in 1965 providing restriction on the slaughter of cattle. This law prohibits the slaughter of male Korean cattle under the age of 2 and female cattle under the age of 6. This measure was further expanded to prohibit the slaughter of all female cattle regardless of ages during a period from October 1968 to September 1969. On the other hand, introduction of foreign beef breeds and crossbreeding of these breeds with Korean cattle are seen recently after much controversy. Apart from the propriety of such measure, this decision can be recognized as having prompted positive consideration to review and improve the way in which Korean cattle has been treated in the past. Bull calf of Holstein breed also seem to create a new movement. Dairy beef production, though its merit in terms of meat resources may not be too great at present, is expected to play an important role in the future in respect to both livestock management and beef resource following the development of dairy farming. A study on the pattern of meat consumption in both urban area and rural area shows that per capita meat consumption in the urban area in 1967 was 2.037g for beef and 1.274g for pork, representing two times in the consumption of beef and one half in the consumption of pork as compared with the average per capita consumption in the whole country. This indicates a high rate of beef consumption in urban area and more consumption of pork in rural area.

Meat products are being exported to the United States, Japan and Hong Kong. Exports in 1967 amounted to 47,417 kg in quantity and $ 55,743 in monetary value. Main export item is canned beef. (See Appendix (7)).

Table 22 Trends of Meat Consumption

(Unit : M/T)

		Beef	Pork	Goat & Sheep	Rabbit	Chicken	Duck	Total	Per capita Consumption
Achieved	1960	12,590 (13.6)	58,025 (64.0)	60 (0.1)	1,039 (1.4)	18,068 (19.9)	1,129 (1.2)	90,916 (100)	3.7 kg
	1962	16,847 (23.3)	38,019 (52.6)	210 (0.3)	1,086 (1.5)	15,730 (21.8)	569 (0.2)	72,461 (100)	2.8
	1964	31,923 (27.1)	62,511 (53.1)	1,072 (0.9)	2,474 (2.1)	18,836 (16.0)	949 (0.8)	117,764 (100)	4.3
	1965	27,261 (27.3)	55,881 (55.9)	813 (0.8)	1,358 (1.3)	14,458 (14.5)	193 (0.2)	114,280 (100)	4.0
	1966	29,152 (26.1)	95,800 (54.0)	626 (0.5)	957 (0.7)	18,700 (18.5)	253 (0.2)	127,559 (100)	4.4
	1967	30,173 (23.2)	72,154 (55.4)	823 (0.6)	1,965 (1.5)	23,960 (18.4)	1,184 (0.9)	125,173 (100)	4.2
	1968	35,870 (22.4)	82,014 (51.1)			42,557 (26.5)		160,441 (100)	5.3
Forecast	1969	39,784 (21.8)	90,595 (49.9)			51,727 (28.4)		182,106 (100)	5.8
	1970	43,632 (21.3)	99,170 (48.4)			61,268 (29.0)		204,070 (100)	6.4
	1971	47,444 (21.0)	107,741 (48.0)			71,484 (31.0)		226,669 (100)	6.9

Source : Livestock Statistics, MAF, for the 1960 – 1967 period.
Data provided by MAF for the 1968 – 1971 period.

Table 23. Per capita meat consumption in urabn area

(unit : g)

Year / Description	1965	1966	1967	Country-wide per capita consumption (1967)
Beef	1,595	1,794	2,037	1,072
Pork	815	1,064	1,274	2,423

Source: Agricultural Yearbook, NACF and Livestock Statistics, MAF

2-3-2 Eggs

Eggs produced are mainly chicken egg and the recent growth in production is remarkable together with a sharp rise in consumption. Per capita annual consumption increased from34 eggs in 1960 to 53.5 eggs in 1967. Prospects for the future also indicate a sharp increase in production by the advancement of enterprise poultry farming with the anticipated increase in consumption. Production achieved in 1967 was 1,672.9 million and the consumption in the same year was 1,605.9 million, showing a firm basis for self-supporting.

Production of milk in 1967 was only. 19,188 M/T against doemstic consumption of 125,205 M/T, which indicates apparent lack of self-supporting power. (Details will be discussed at a later stage).

Other products include hides, fur and pig hair for exports and eggs which are supplied to UN Forces.

Table 24 Trend of Egg Consumption

(Unit : million eggs)

Year / Description	1960	1962	1964	1965	1966	1967	1968	1969	1971
Chicken egg	818.8	838.1	9430	855.8	1,298.1	1,590.7	1,584.0	1,757.4	2,095.7
Duck egg	11.4	7.7	94	8.1	13.5	15.2			
Total	830.2	846.8	952.5	863.9	1,311.6	1,605.9	1,584.0	1,757.4	2,095.7
Per capita consumption	34	32	34.3	31.3	44.5	53.5	52	56	64

Source : Livestock Statistics, MAF for the 1960 – 1967 period and data provided by MAF for the 1968 – 1971 period.

Table 25 Trends of Egg Production

Unit : Million eggs

	Chicken egg	Duck egg	Total	Eggs supplied to UN forces
1964	943.0	9.4	952.5	33.5
1965	855.8	8.1	863.9	25.0
1966	1,298.1	13.5	1,311.6	29.0
1967	1,657.0	15.9	1,672.9	35.0

2-4 Distribution and price of Livestock and Livestock Products

2-4-1 Livestock Market

Distribution system of livestock and livestock products is still bound by the practices of olden times. and facilities are very unsatisfactory. Despite the recent government measures aimed at the improvement of facilities and operation of livestock market and slaughter house, it may be said that the progress is still in the trial stage as a whole.

Registered livestock markets are seen in three different types, namely small local market, medium local market and large city market. They number 661 and are under the control of livestock cooperatives or agricultural cooperatives in their respective areas. Transaction at the livestock market is limited almost to the dealing of Korean cattle. Small local markets are located in Yu (town) or Men (village) and are utilized mainly for the transaction between farmers. Medium local markets are located in each Gun (county) and are utilized by farmers and cattle dealers and transaction here is by negotiation. Meanwhile, most of the large city markets are located along with slaughter houses and are utilized main by meat dealers for transaction of Korean cattle which were purchased from local markets. Almost no participation by farmers is seen in the dealing at these markets.

Dealing at the market is not by auction and the livestock market is serving as a place of mediation for brokers. Identification of sex and quality or measurement of animal is not being practiced. Do (provinces) having many livestock markets are Kyongsang pukdo with a total of 144, Kyongsang Namdo with 133, Kyonggido with 77, Cholla namdo with 76 and Kangwondo with 63. Market commission is generally set at 2% of the total amount of each dealing.

In relation to the recent restriction imposed on the slaughter of Korean cows, 90% of the total cattle dealt in the market in urban area accounted for by oxen.

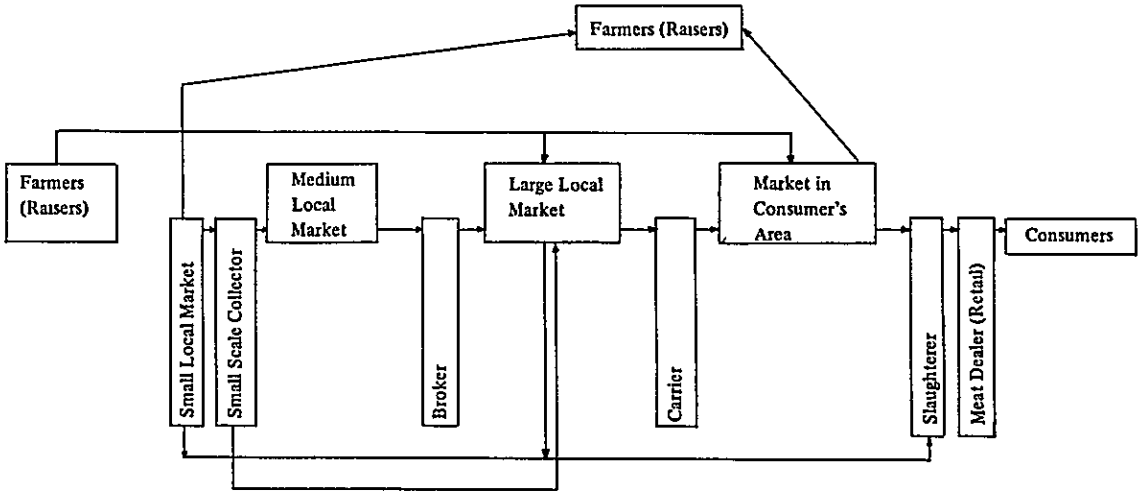
Table 26 Typical Examples of Livestock Market Transaction in Urban Areas (1967)

Market \ Description		Total Transaction	No.of oxen Transacted	Ratio of oxen to total transaction
		head	head	%
Kyonggido	Suwan	15,656	13,285	84.9
	Pochon	6,080	5,355	88.1
	Kwangju	5,184	5,184	100.0
	Yangpyong	4,392	3,664	83.4
	Yongin	2,304	1,863	81.0
	Anyang	1,604	1,538	95.8
	Total	35,220	30,889	87.7
Kyongsang Pukudo	Taegu	11,067	9,879	89.3
	Yeongyang	4,913	4,690	95.5
	Uljin	3,678	3,309	90.0
	Yeongcheon	3,014	2,536	84.1
	Kyongsan	2,713	2,484	91.6
	Total	25,385	22,898	90.0

Source : Data provided by MAF.

Following chart illustrates a distribution channel of Korean cattle but the actual condition seems to be more complicated.

Distribution channel of live cattle and beef



Distribution channel of pig is much simpler than that of Korean cattle. In most cases, the pig is sold from the slaughter house to retail store by the hand of collectors or middlemen (sometimes called bicycle dealers because the pig purchased is transported by bicycle) through meat dealers or from the slaughter house directly to retail stores or sometimes resold to other farmers by middlemen. Pig is seldom dealt at the livestock market.

2-4-2 Slaughter house and meat processing plant

A total of 785 slaughter houses of various sizes are now in operation in Korea (as of 1969). In general most of them are of the size of a hut which may be found in the front garden of the farm house and their conditions are very unsatisfactory from standpoints of hygiene and efficiency. However, facilities in Seoul Special City and Pusan City, which are said to have been buit with the support and guidance of the United States, had very modern equipment and layout. In March of 1969 meat wholesale markets were opened in these cities. Work is also in progress at the slaughter houses in Taejon City and Osam City to establish wholesale markets.

Although ordinary slaughter houses are not equipped with refrigerators retail butcher shops are obliged to be equipped with refrigerators by the Food Sanitation Law.

Most of meat processing plants are of extremely small operating size. Of the total of 55 plants in the country, four major companies, namely the Seoul Million Co., Kyoggi Orion Co., Inchon Crown Co. and Pusan Chinju Co. produce 90% of the total production of meat products of the nation (See Appendix (8)).

Table 27 Number of Slaughter Houses and Meat Processing Plants

Description \ Area	Seoul	Pusan	Kyonggi do	Kangwon do	Chung Chong pukdo	Chung Chong namdo	Chol la pukdo	Chol la namdo	Kyong sang pukdo	Kyong sang namdo	Cheju do	Total
Slaughter house	6	3	109	52	90	103	62	87	147	110	16	785
Meat processing plant	1	11	5	3	—	3	2	4	9	1	9	55

Source : Livestock Statistics, Livestock Bureau, MAF.

2-4-3 Prices of Livestock and Livestock Products

Prices of livestock and dairy products have been continuously rising annually with the increase in the demand for these items. Particularly, the soaring price of meat has come to lead the rise of other commodity prices. Under this situation, the gogernment ordered the Fresh Meat Dealers Association to adopt designated price system as one of its price policies and in 1968 the government enforced the beef grade system in major cities in an attempt to improve market system and promote Korean cattle raising, thus relieving the market from the bound of designated price system. Yet the market is not completely free the designated price system. Taking beef for example, its price index rose to 310 in 1967 with the index of 100 in 1960 and the price still continue to rise even now.

Net profit of farmer from a live Korean cattle weighing 350 kg. was 80, 881 won for both male and female cattle, more than double of the price in 1965.

There is almost no difference in the price of beef for tenderness flavor, and marbling and the transaction is made simply on the basis of volume following the customary Korean dietary pattern preferring red meat. There is no practice of castration of male cattle. These are the main obstacles to the promotion of fattening in the past. It will be necessary, therefore, to take this point into account in future planning of dairy beef production and in providing required technologies.

Most appropriate way to obtain relatively accurate sales price of beef would be from the result of the dressed carcass wholesale market which was opened just recently. The price fluctuation was 459-479 won per kg during a period from March to September 1969.

Against this, the retail price of fresh beef which stood at the 300 won/kg level in 1967 jumped to the 500 won/kg level in 1968 and further rose to the 600 won level in 1969.

Table 28 Trends of Cattle Price (Average price in the country)

Description \ Year	1960	1961	1962	1963	1964	1965	1966	1967	1968
Live cattle, 7 years old or more, for slaughter (ox)	won 17,267 (100)	18,702 (108.3)	20,122 (116.5)	21,772 (126.1)	25,322 (146.6)	40,699 (235.7)	48,094 (278.5)	61,553 (356.5)	80,881 (468.0)
Beef, fresh meat 600 g	69 (100)	81 (117.4)	87 (126.1)	92 (133.3)	107 (155.1)	141 (204.3)	160 (231.9)	203 (310.4)	
Consumer price index (Food)	(100)	(109)	(118)	(156.5)	(213.4)	(231.4)	(248.3)	(269.4)	

Note: (1) Selling price surveyed by NACF for the 1960-1969 period.
(2) Farmers' net profit surveyed by Livestock Bureau, MAF for 1968.
(3) Average weight of a live cattle is 350 kg.
(4) Fresh meat price represents retail price.

Table 29 Sales Price at Dressed Carcass Market

(Unit: won)

Price \ Month	1969 Apr.	May	Jun	Jul	Aug	Sep
Dressed Carcass per kg	459	462	479	470	471	471

Notes: (1) Based on the survey made by Livestock Administration Section, Livestock Bureau, MAF.

(2) Shown in table are the average price at dressed carcass markets in Seoul and Pusan Cities.

(3) Both markets opened in April 1969.

(4) The weight of a live cattle is about 350 kg, which the government is aiming at increasing to 450 kg.

Table 30 Trends of Beef Prices

Price \ Year	1965	1966	1967	1968
Fresh meat won/per kg	240	270	357	563
Index	100	112.5	149.6	234.6

Price \ Month	1969 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Fresh meat won/per kg	569	575	585	586	590	596	596	596	601

Note: Based on the survey made by Livestock Administration Section, Livestock Bureau, MAF.

2-5 Government Policies on Livestock Industry

The Government of the Republic of Korea, after completing it First 5-Year Economic Development Project, is now pushing it Second 5-Year Economic Development Project which came into effect in 1967. According to the revised forecast on economic growth made by the Economic Planning Board, the annual growth rate of agriculture, forestry and fishery is held at the originally projected rate of 5% against the growth rate of 10.2% for GNP (originally 7.0%) and 19.0% for mining and manufacturing industries (originally 10.7%). If this unbalanced economic growth is to continue, difference of income between agriculture and manufacturing will be further widened in the course of industrialization of the nation and there is a grave concern expressed over the anticipated growing shortage in the domestic supply against ever increasing demand for food.

In January 1967 the Agriculture Basic Law was promulgated, which advocated fostering of independent farmers supported by family hand who will be able to realize income equivalent to that of workers in other industries. The Independent Stabilized Farm Household Development Project commenced in 1965 was suspended in 1967 for absorption by the Main Production Area Development Project which was put into effect in 1966 on the principle of the right crops in the right place.

It was pointed out as a problematical point with the past agriculture that because of the emphasis placed on the production of single crop item, there was no guarantee for the operation of process-related industries, thus causing instability of marketing and price of products. As a measure to cope with this situation, the new concept of the Main Comprehensive Production Area with the aim of establishing an integrated system from production through handling and processing to sales came in the limelight. In other words, it is the implementation of the Special Project for Increase of Income for Farmers and Fishermen. For this reason, it is greatly hoped that livestock industry will play an important role as the mainstay of this concept.

For the four-year period from 1968 to 1971 under the Special Project for Increase of Income for Farmers and Fishermen, the estimated total project cost amounts to 47.4 billion won, of which 18.7 billion won or 39.7% is expected to be spent for livestock industry. It is needless to say that this special project will become the mainstay of the Livestock Industry Development Four Year Project which was worked out a year after the inauguration of the Second 5-year Project.

Of the 7,763 million won budget for livestock industry in 1969, 4,763 million won was earmarked for special project to be used mainly for the establishment of Main Production Area of Korean cattle and other livestock products.

Table 31 Project Fund of Special Project for Increase of Income for Farmers and Fishermen

(Unit. Amount in 1,000 won)

Description \ Year	1968~71	1968	1969	1970	1971
Total fund required	47,426,509[5]	6,212,118[5]	16,176,101	12,787,881	12,250,409
Project cost	46,984,509[5]	6,212,118[5]	15,705,101	—	—
No of project	90 Places	40	87	74	64
No of participating farmers	449,570	125,704	345,726	396,930	449,570
Livestock portion	18,700,481	1,887,624	6,615,720	5,464,199	4,732,939
Ratio of livestock industry	39.43%	30.38	4089	42 72	3863
Korean cattle raising (25)	126,878 head	12,188	38,025	39,015	37,650
Korean cattle fattening (10)	52,778 head	2,398	17,630	17,650	15,100
Dairy farming (11)	4,871 head	1,191	1,400	1,395	885

Note : Surveyed by MAF in 1969
(See Appendix (9) and (10))

CHAPTER II CURRENT STATUS AND FUTURE ROLE OF DAIRYING

CHAPTER II CURRENT STATUS AND FUTURE ROLE OF DAIRYING

1. Trends of Dairy Production

1-1 Basic Course of Dairy Development

1-1-1 Need of Dairy Development

On July 23, 1953 the so-called Korean Conflict finally came to an end. In the country where all land had been turned into a devastated field it was quite natural that the total number of dairy cattle in 1954 was a mere 289, a record low in the history of the country as far as the statistical data could prove.

Since then the situation was gradually improved and in 1961, the year in which the First 5-Year Project started, there were more than 1,000 heads of dairy cattle raised in and around major cities like Seoul. However, it was sometime later that the full scale measures were taken up for development of dairy farming.

Since the introduction of 1,182 heads of dairy cattle from the United States and New Zealand in 1962, import of foreign dairy cattle from the United States, Canada and Japan followed in succession and the total import amounted to about 8,000 heads. Funds for the import of dairy cattle were provided mostly by loans or foreign aid funds and the counterpart fund raised in the country also comes to a tremendous amount. It is considered that this tendency will continue to be seen in the future. What could be the reason for such vigorous efforts for the development of dairying in Korea where national economy cannot necessarily be said to be as favorable as other nations. One of the reasons and the prime reason is the need for developing devastated forest areas. Of the total forest area of 7 million ha in the country, approximately 500,000 ha is said to be the area suited for grassland. It is natural that the utilization of these forest areas for raising cattle came into the mind of people. Surveys of available grassland in a Korea are complete and cover even small districts and the division of area for utilization as dairy farming area has been well planned. The reason for taking up dairy farming which ensures higher land utilization in parallel to the planning of beef cattle raising is that the government is attempting to upgrade the value production by effective utilization of unexploited resources. Secondly, it is an attempt to connect produced value with agriculture which is being pressed for change and farmer's income. Despite the growing number of farmers leaving farm work, the farming district is still bound by the fate of buffer zone to absorb unemployed population. In respect to clutivation structure, omnipresent farming method centering on the production of rice and barley is practiced and the productivity of land is extremely low. It is a matter of urgency which has a direct bearing on the basic proposition of the Korean economy that the size of agriculture is expanded and intensive employment of excessive idling manpower is planned to secure reasonable income level for farmers.

For the fulfillment of these requirement, there must be a growing demand for milk. Therefore, such background as a sharp increase in the consumption of market milk and milk products must be given as the third reason. Although it may be extremely difficult to make an accurate forecast on the present and future demand from the estimate based on the past records in view of the recent growth of economy and improvement of dietary pattern and the level of consumption is still extremely low, consumption of these items increased by fourfold in the last four years. The desire for securing self-sufficiency of market milk at least, if not the self-supporting of both market milk and milk products, may be considered most justifiable. The fourth reason is that there is a favorable condition of overcrowding volunteer for dairy farming. This fact may be the result of the government attempt to promote its policies but it is an indication that the profitability of dairy farming surpasses that of other crop items. The fact that the city capital is flowing into agricultural area by the medium of dairy farming must also be properly appraised.

1-1-2 Course to be taken in Developing Dairying

Then what is the basic course to be taken in developing dairying in Korea?

The target of dairy cattle multiplication program officially announced under the Four Year Livestock Industry Development Project covering a period from 1968 to 1972 calls for the increase of dairy cattle to 21,010, milk production to 41,970 M/T and the number of dairy cattle per household to 6.6 in 1972. However, because of changes in social and economic conditions since then and from the need for revising political measures to accommodate these changes, a new project is being worked out by the government by taking into account the actual achievements in the 1968-1969 period.

In compliance with the provision of the Dairy Industry Development Law which was promulgated in 1966, four intensive dairy industry areas have been designated. They are the Central District (centering around Taejon City and extends to Seoul City), Homan District (centering around Kwangju City), Yungdong District (with Taegy City as the center) and Yungnam District (centering on Pusan City). Each of these districts is composed of main production areas formed in the district.

The basic plan of dairying development was, as a matter of course, centered on the development and utilization of grass resource. With the prime objective of promoting enterprise-type dairy farming "The Grassland Law" was promulgated on January 17, 1969. This law provides a severe restriction including compulsory expropriation of privately owned land.

Proper distribution of raw milk collecting points, milk plant and milk processing facilities are also important factors of dairy. However, under the present state, there is a mixture of very simple facilities with fairly modern facilities and there is no harmony between milk production and processing facilities and between each facility or lack of necessary facilities is seen at times.

It is also considered very urgent at present to establish a complete distribution system rather than putting efforts on the consumption of milk. It is not uncommon under the present organization that consumers are unable to find the means to obtain desired items even though there is a strong potential demand.

1-1-3 Dairying and Increase of Farmer's Income

An utmost consideration is being given to the process between the production point and consumers through distribution channel, particularly to managemental and technical guidance and assistance for the producers. As a result of continuous efforts to organize systematic setup mainly in administrative aspect, the work is gradually bearing fruit. However, the work cannot be said to have reached a satisfactory stage in substance. This will be the problem left to the future for solution. The very fact that the number of volunteers for dairy farming surpasses the number which the public finance can handle is an indication that the profitability of dairy farming is relatively high, which is due to the price of raw milk favorably set for producers. Procedence of speculative motives on the promise of high milk price may possibly endanger the structure of agriculture in Korea. Furthermore, if the management of enterprise dairying is to consist mainly of absentee landowners who regard the diary farming only as the objective of speculation, it will be extremely difficult to expect firm settlement of diary farming in Korea. Such speculative movement may be necessary at first to play the role of a forerunner but the main constituent must be farmers to the end. Only this way, dairy farming will be linked to the increase in farmer's income and establishment of stabilized dairy farming will be realized.

With the above objective firmly established, the Republic of Korea, while orientating its course toward the fulfillment of the objective, is now making a vigorous effort for the development of dairy farming.

1-2 Current Status of Dairy Cattle Raising

1-2-1 Number of Dairy Cattle

After experiencing a record low number of 289 in 1954 in the wake of Korean conflict, the number of dairy cattle showed a rapid increase after 1961 with the progress of the First 5-Year Economic Development Project. The number of dairy cattle totaling only 1,149 in 1960 increased to 10,360 in 1967 and further rose to 12,760 in 1968. This sudden increase was due to imports of cattle and the total import during the period after 1962 amounted to 8,169 (1962-Oct. 1969). With the start of this large scale import project, such work as cattle purchasing, sea transportation, quarantine service, handling of accidents and various works ranging from making necessary arrangement for participating farmers to the training of farmers on the management of stockkeeping were sufficient enough to keep the parties concerned busy all over the country. In the country like Korea where there was no other means available but to depend on the import of foreign cattle for establishing the basis for dairy farming, this government policy was probably unavoidable.

Such rapid increase in the total number of dairy cattle was reflected on the number of cattle by per household which increased from 4.4 in 1961 to 5.7 in 1967, a very high rate compared with the average rate of 4.0 in Japan for the same year.

Table 32 - Number of Dairy Cattle and Household Raising Dairy Cattle

Year / Description	1961	1962	1963	1964	1965	1966	1967
No. of house-holds	254	676	813	1,087	1,210	1,478	1,478
Total number of dairy cattle	1,132	2,406	3,538	5,199	6,612	8,471	10,360
Heads per household	4.4	3.5	4.3	4.7	5.4	5.7	5.7

Source: Livestock Statistics, MAF

1-2-2 Size of Dairy Cattle Raising

A study on the number of household raising dairy cattle by operating size shows that the house holds with only one dairy cattle account for 26.9%, those with 2-5 heads, 44.8%, those with 6-10 heads, 15.6% and those with more than 11 heads, 12.8%, of the total cattle raising households, respectively. The share of dairy cattle raised by farmers who keep more than 11 heads is such a high rate of 40% of the total number of dairy cattle in the country. The pace of expansion in the operating size was so fast that the number of households raising more than 51 heads reached 9 in 1967. Though there still are a large number of household raising only one head, it is probably due to farmers intention rather than the result of administrative measures.

Table 33 - Trends of Dairy Cattle by Operating Size

Size / Year	1 head		2 – 5 heads		6–10 heads		11–50 heads		Over 51 heads	
	No. of House	head	No. of House	head	No. of House	head	No. of House	head	No. of House	head
1961	75 (29.5)	75	127 (50.0)		25 (9.9)		27 (10.6)			
1962	224 (33.0)	224	335 (52.5)		57 (8.4)		40 (5.9)			
1963	203 (25.0)	203	439 (54.0)		116 (14.3)		55 (6.7)			
1964	289 (26.6)	289	536 (49.3)		159 (14.6)		103 (9.5)			
1965	270 (22.3)	270 (4.0)	587 (48.5)	1,925 (29.1)	204 (16.9)	1,588 (24.0)	149 (12.3)	2,829 (42.7)		
1966	376 (25.4)	376 (4.4)	668 (45.2)	2,227 (26.3)	250 (16.9)	1,914 (22.6)	184 (12.4)	3,954 (46.7)		
1967	489 (26.9)	489 (4.7)	814 (44.8)	2,593 (25.0)	283 (15.5)	2,204 (21.2)	223 (12.3)	4,379 (42.2)	9 (0.5)	695 (6.9)

Source: Livestock Statistics, MAF

Note: Figures in parenthesis show the rate to the total households and heads.

This rapid expansion in the average operating size is probably a direct result of the government policies on livestock industry which is still in its incipient stage. This government attitude is exemplified in the loan granted by the Canadian Government and the promulgation of the Pasture Land Law in 1969 under the dairy cattle introduction project in 1968 and 1969.

In implementing the import of dairy cattle with the Canadian loan the Government established a criteria for the selection of participating farmers, providing "one dairy cattle for every 2 ha of available grassland." However, from a political consideration to promote stockkeeping of high productivity, allocation of 3 heads for every 4 ha of grassland was granted only for the first year of the project. The selective criteria itself seems to be very severe. It was probably aimed at checking the possible dependency on commercial feed. It was probable that the wide difference in the price of milk set at 50 won/kg and that of the formula feed set at 22 won/kg had contributed to neglecting the necessity of self-sufficing feed on the part of farmers.

Meanwhile, one of the reasons that the farmers were satisfied with this criteria was probably the favorable conditions for the introduction of dairy cattle providing loan accounting for 70% of the amount required to purchase dairy cattle and such a low interest rate as 9% for the 70% of 100,000 won, loaned for facility investment against the general interest rate of 24%. This was more evident in the development of grassland which required the farmers to burden only 10,000 won for every ha of land they form.

The "Enterprise Stock Raiser" registration system and favorable treatment guaranteed by the Grassland Law, which are in line with the government policy calling for the flow of city capital into agricultural district, are also helping accelerated establishment of fairly a large number of stock farms of large operating scale in and around Seoul City.

The foregoing high level in operating size per household is the results of accumulation of various factors as mentioned above, which is creating a new class of farmer enterprisers who may not be classified as the so-called farmer in true sense.

1-2-3 Locality of Dairy Cattle Raising

Geographical distribution of dairy cattle in 1968 shows the concentration of cattle raising in specific areas such as Seoul City and surrounding Kyonggido and Chungchongnamdo accounting for 69% of the total dairy cattle in the country, followed by Pusan City and adjacent Kyongsang pukdo and Kyongsang namdo accounting for 18.5%. The number of dairy cattle in these areas alone accounts for 87.5% of the total dairy cattle in the country.

The number of cattle per household in these areas is also very large with Kyonggido being 12.9%, Pusan City 8.9 and Seoul City 8.7. Though such distribution of dairy cattle may be considered natural because of such background as large consuming cities like Seoul and Pusan, this fact indicates that these area possess favourable conditions for the investment of city capital from a standpoint of operating size and the number of cattle raised.

Table 34 - Geographical Distribution of Dairy Cattle (1968)

City and province	No. of households	No. of cattle	Head per household
Seoul	193	1,670	8.7
Pusan	95	854	8.9
Kyonggido	900	6,472	12.9
Kangwondo	80	320	4.0
Chungchong pukdo	190	506	2.7
Chungchong namdo	199	1,368	6.9
Cholla pukdo	79	242	3.1
Cholla namdo	104	586	5.6
Kyongsang pukdo	184	803	4.9
Kyongsang namdo	111	783	7.6
Chejudo	10	49	4.9
Total	2,145	13,760	6.4

Source: Based on the survey made by Livestock Bureau, MAF (Unannounced)

As to the breeds of dairy cattle, the Holstein accounts for 95.7% of the total dairy cattle in 1967 followed by the Jersey numbering 266 in Pusan City and Kyonggido and the Guernsey tatling 107 in Kyonggido. In any event it is obvious that the breed will be unified to the Holstein alone in the future.

The fact that there are many dairy cattle of the age ranging from 2 to 6 is due to a large number of import of primiparous cattle. Such a high milking cow rate as 80.7% in 1965, 78.9% in 1966 and 84.1% in 1967 is also attributed to the above fact.

1-3 Introduction and Improvement of Dairy Cattle

1-3-1 Introduction of Dairy Cattle

Imports of foreign dairy cattle began in 1962. The number of cattle imported reached 3,487 by 1966 under the First 5-Year Project and 1,342 by 1968 under the Second 5-Year Project.
Imports of 3,340 heads are now under way for 1969, completion of which will increase the total number of imported dairy cattle to as many as 8,169.

Table 35 - Imports of Dairy Cattle by Year

First 5-Year Economic Development Project ----------Results----------					Second 5-Year Economic Development Project --Results--|In Progress--|Planned				
Year	1962	1963	1964	1965	1966	1967	1968	1969	1970
No. of cattle imported	head 1,085	271	905	600	626	306	1,036	3,340	3,500
Import sources	USA New Zea-land	USA	USA	USA	Canada	Canada Japan	Canada	Canada	

Source: Based on the survey made by Livestock Bureau, MAF.

The result and the project for this year show that the introduction of dairy cattle is most active in Kyonggido, Chungchong pukdo and namdo, followed by Kyongsang pukdo and namdo, indicating a widening difference in the existing geographical distribution of dairy cattle. Import of dairy cattle under the project is the sole responsibility of the government and more than 95% of the total import are financed by the dollar currency of the Treasury Fund (delegated to NACF) or the Canadian loan and the import by private trading channel and missionary organizations in 1969 amounted to only 115 heads.

Table 36 - Distribution Plan of Imported Dairy Cattle for 1969.

Area / Description	Seoul	Pusan	Kyong gido	Chung Chong pukdo	Chung Chong namdo	Cholla pukdo	Cholla namdo	Kyong sang pukdo	Kyong sang namdo	Cheju do	Total
Canada Loan	45		359	9	232		5		50		700
KFX NACF	20	80	586	200	470	40	83	426	521	5	2,426
Aid from West Germany			99								99
Missionary or private channel			97						13		115
Tatoal	65	80	1,141	209	702	40	88	426	584	5	3,340

Source: Livestock Bureau, MAF

Dairy cattle to be imported must be all primiparous cattle in principle and the past record shows the most pregnant cattle were 18 to 27 months old with the rare case in which the cow 13 months old was found. However, in view of increasing difficulty in selecting primiparous heifers and frequent accident occurring during the transportation, there is a pressing need for the reexamination of the criteria for the import of dairy cattle.

The price of dairy cattle varies with the quality but the following standard is generally accepted:

a. Import price US$ 700-800 (C.I.F.)

b. Selling price 160,000-276,000 Won

30% burdened by farmers

70% financed by the government loan (handled by agricultural cooperatives)

Because of difficulties in compering the performance of milk production in each area, no systematic follow-up survey has been conducted to date. However, the result of the advanced registration performance test conducted by the Livestock Improvement Association at the request of the government shows an average of 4,842 kg., a relatively high rate for the performance of the first and second generation.

1-3-2 Distribution of Bulls

The numbef of bulls totaling 129 seems to be extremely large compared to the number of dairy cattle totaling 10,000 or so. However, the distribution of ownership shows that only 14 heads are owned by the public organizations for artificial insemination service and the remaining 115 heads are owned by individuals.

Table 37 - Number of Bulls by Ownership

Description	Provincial Livestock Breeding Farm	NACF Artificial Insemination Station	National Livestock Bfeeding Station	Livestock Experiment Station	Total	Individual stock farm	Grand Total
No. of bulls	heads 7	4	1	2	14	115	129

SOURCE: Based on the survey by Livestock Bureau, NAF (as of end of September 1969)

Geographical distribution of bulls is generally in proporation to the number of dairy cattle but is unbalanced in respect to the effective utilization of the bull.

Table 38 . Geographical Distribution of Bulls

City & Province	Seoul	Pusan	Kyong gido	Kang wando	Chung Chong pukdo	Chung Chong namdo	Cholla pukdo	Cholla namdo	Kyong sang pukdo	Kyong sang namdo	Cheju do	Total
No. of bulls	32	0	35	1	2	9	1	7	10	27	5	129

SOURCE: Based on the survey by Livestock Bureau, NAF

Of the 115 heads of bull owned by individuals, only 40 heads carry pedigree certificates. Most of the remaining bulls are of less value and are generally utilized in the remote areas where artificial insemination service is not readily available or for mating with Korean cattle while being used by farmers as a draft cattle. Table 40 shows the relationship between the breeder and the owner of the 71 registered bulls. The table shows that except the imported bulls and those raised by private sector, the majority of bulls were originated in the National Livestock Breeding Station. At present no sales of bulls is made to the Provincial Livestock Breeding Stations but the role is being played by the National Livestock Experiment Station. The National Livestock Breeding Station is now expanding its facility area to 480 ha from the present 60 ha and is planning the import of bulls from Canada in the near future.

Table 39 - Number of Bulls by Breeder and Ownership

Breeder		Owner	
Description	Head	Description	Head
Foreign bulls	16	NACF	4
		Provincial Livestock Breeding Station	9
		National Livestock Experiment Station	3
Bulls raised by National Livestock Breeding Farm	9	National Livestock Breeding Station	9
Bulls raised by National Livestock Experiment Station	3	NACF	1
		Private Sector	2
Provincial Livestock Breeding Station	4	Provincial Livestock Breeding Station	3
		Private Sector	1
Bulls raised by private	39	Private Sector	39
Total	71	Total	71

SOURCE: Based on the survey by Livestock Bureau, MAF

As to the quality of bulls, regular or periodical breeding inspections are being carried out in compliance with the provision of the Livestock Industry Law and measures are being taken to implement castration for the bulls failing to qualify the required standards. It is generally recognized that there is a need for further effort to upgrade the quality and for effective utilization of bulls.

The target of dairy cattle improvement plan set on September 20, 1968 is shown in Table 40.

Table 40 Target of Dairy Cattle Improvement Plan

Description	Performance	Fat percentage	Calving interval	Remarks
Present	3,800 kg	3.4 %	16 months	1967 year
Target	4,000	3.5	14	1971

SOURCE: Livestock Industry Development Project, MAF

1-3-3 Organization of Artificial Insemination Service

Artificial insemination service is being carried out by the group of administrative roganization consisting of the National Livestock Experiment Station, National Livestock Breeding Station and Provincial Livestock Breeding Stations and by the group under the jurisdiction of the Artificial Insemination Center, National Agricultural Cooperative Federation.

Work project provided under the Livestock Industry Law is shown in Table 41 which shows the achievement of the National Agricultural Cooperative Federation accounting for more than 50% of the total artificial insemination services.

Table 41 Result and Future Plan of Artificial Insemination Service

(Unit: head)

	Korean cattle	Dairy cattle	Swine	Total	Remarks
1966	8,937	3,194	63,497	75,628	Result
1967	9,839	4,129	64,052	78,020	"
1968	13,400	4,400	91,700	109,500	"
1969	26,300	5,500	110,000	141,500	Planned
1970	32,000	6,600	121,000	159,600	"
1971	40,000	7,900	135,000	182,900	"

SOURCE: Based on the survey made by Livestock Bureau, MAF

(a) National Livestock Breeding Station

Of the 480 ha owned by the farm, 50 ha of glassland located close to private dwellings have been leased to the farmers in the neighboring area free of charge with the aim of establishing a collective livestock industrial area having a close relation with the activities of the National Livestock Breeding Station.

One of the activities being carried out is the breeding of candidate bull. This is implamented by distributing bull calves originated the in the farm to the farmers and then selecting and redistributing the candiate bulls to the Provincial Livestock Breeding Stations in an attempt to establish a systematic structure including the progeny test of the bull.

Sales of semen for artificial insemination service amounts to approximately 100 units per year at present and they are distributed mainly to the part of Chungchong pukdo and Namdo. The Artificial Insemination Department has been newly established in preparation for setting up a production structure of frozen semen.

(b) Artificial Insemination Service Center, National Agricultural Cooperative Federation.

This organization consists of a center, seven branches, 10 subcenters and 164 stations and is responsible for the distribution of semen throughout the country. Its achievement for this year during the period up to August 31st is show in Table 42. Its facilities are almost satisfactory and effectively utilized.

Table 42 Status of Artificial Insemination Service By NACF's Artificial Insemination Center

	Livestock				Province							
		Korean Cattle	Beef Cattle	Dairy Cattle	Kyong gido	Kang wondo	Chung Chong pukdo	Chung Chong namdo	Cholla pukdo	Cholla namdo	Kyong sang pukdo	Kyong sang namdo
Project.	91,009	21,098	9,200	4,407	2,321	150	194	587	81	230	300	541
Achieved	47,178	12,222	4,203	2,596	1,413	89	106	377	45	140	129	297
Ratio	% 49	58	45	62	53	59	55	64	56	60	48	55

Source: : Based on the Survey made by Artificial Insemination Center

Note : Figures shown represent achievement during the Jan - Aug. period under 1969 project.

The current plan calls for the annual production of 80,000 units of semen on the basis of 6,000 heads of dairy cattle per bull by assigning 10 dairy bulls, 10 Angus bulls and 20 Korean Cattle bulls to the center, 40 Korean cattle bulls and 5 Angus bulls to Taegu city and 40 Korean Cattle bulls and 5 Angus bulls to Kwangju.

On the other hand, studies on the use of frozen semen are being progressed. Because of difficulty in securing liquid netrogen and also from economical reasons, immediate use of liquid nitrogen is not considered practical. As a result, preperations are being made to employ the oxygen method developed by the center for the time being.

The National Livestock Breeding Station and the Artificial Insemnation Center of the National Agricultural Cooperative Federation will be the two main channels of artificial insemination service in the future.

Of course there will be and must be a difference in their respective role. Main function of the Livestock Breeding Station should be the production of breeding stock which will the mainstay of the improvement of breeding stock. For this reason, commercialization of artificial insemination service should be materialized in close cooperation with the Livestock Breeding Station. Though the present set up of artificial insemimation service may differer in their character as being the government base and private base, there is no difference in their origin in that both started from the same point, the utilization of imported bulls. The Government is providing a subsidy equivalent to 1/4 of the total expense required by the Artificial Insemination Center. The subsidy of the Government amounted to 8.6 million won in 1969. In that respect the operation of the Center may be said to be on the Government base. The future proposition would be to improve facilitied and coordinate the relationship between the two organizations so that each of them will maintain its own specific functions to avoid unnecessary competition.

Besides the Center, Production and distribution of semen are carried out by the Livestock Experiment Station and the Provincial Livestock Breeding Stations. Semen is distributed by the Livestock Experiment Station to the farmers in the neighboring area upon request in addition to its own research work. On the other hand, the Provincial Livestock Breeding Stations are not adequately equipped with necessary facilities and left in the state unable to implement its function satisfactorily. Firm establishment of livestock improvement organization combining the National Livestock Breeding Station with the Provincial Livestock Breeding Stations is considered most important.

The unit artificial insemination stations at the end of the line are established either by the agricultural cooperative or the livestock farming cooperative in each country. The inseminators whose license is issued by the provincial governors, must receive training for more than a month either at the Livestock Breeding Station or the Artificial Insemination Center to quality the assignment. The Government earmarked 55.5 million won in its 1969 budget as a subsidy for the unit Livestock Artificial Insemination Station. / This includes a subsidy equivalent to 1/2 of the total salary and travel expense for the inseminators assigned to these stations.

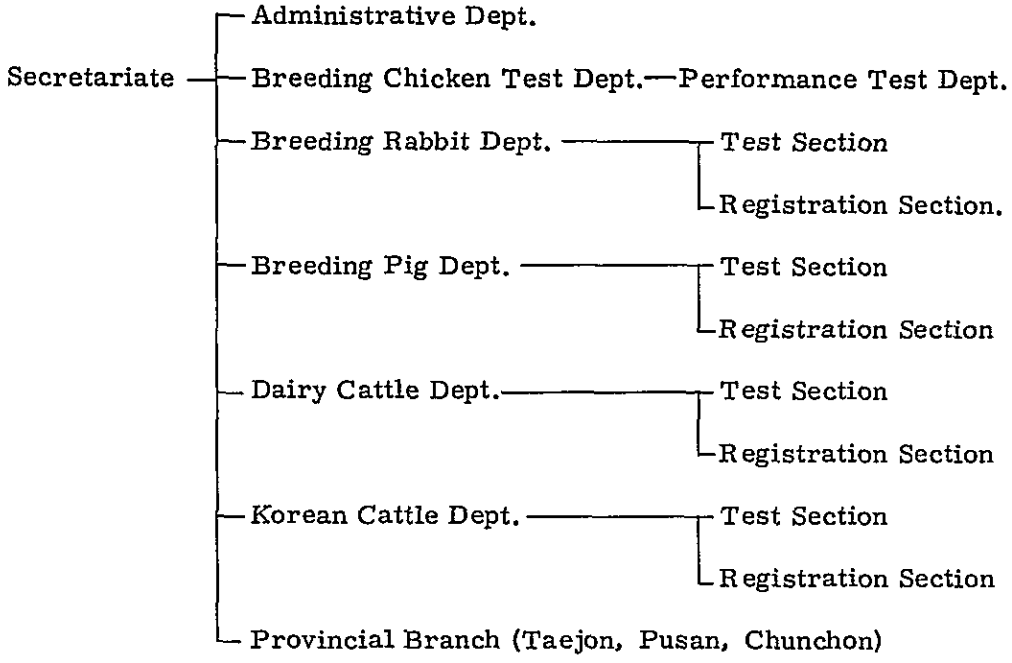
1-3-4 Registration and Performance Testing of Dairy Cattle

The Korean Holstein Registration Association established in February 1966 was reorganized to the Korean Livestock Improvement Association in April 1969 by bringing all domestic animals with the exception of swine under its control. Table 43 shows its administrative organization.

Dairy cattle registration service is divided largely into two categories, namely the Stud cattle registration and the grade cattle registration (Stud cattle registry - Pedigree registry - Advanced registry) (Grade cattle registry - Primany registry - Preliminary registry - Fundamental registry). Besides, as part of dairy cattle performance test, milk production test is conducted for a period of 305 days starting 6 days after calving.

Dairy farming in Korea is still in its incipient stage and the history of the Registration Association is more brief and short.

Table 43 Organization of the Korean Livestock Improvement Association



The association itself is not yet in the state of complete readiness but more evident is the lack of interest in this association on the part of the raisers. At least the registration of imported cattle is obligated by law but the registration of calves is not included in this scope. Moreover, under the present condition where there is almost no transaction except bull calves, farmers can not even appreciate the profit from the difference in price because of registration. As a matter of fact, there seems to be no difference in the sales price between the registered and non-registered cattle.

The composition of the Association member is also stationary. The membership fee is 1,000 won per annum and the total number of regular members is said to be 312. There are no full time judges assigned to the Association. Judges panel consists of five celebrities such as professors at the Seoul Agricultural College and directors of Agricultural Cooperatives. The positions of all 22 local judges are also filled by temporary members mainly the university professors.

In any event, there is no room for effective utilization of the registration system at present when the import of foreign cattle is at its peak. However, the foothold for the improvement of dairy cattle would be lost unless the registration is conducted.

The performance test service also does not seem to be in the state of full-fledged activity. Only activities were the tests conducted on 23 heads last year and 200 heads this year, on the cattle selected from farmers in and around Seoul City, as a part the government assistance project. However, the present cattle import project is to be terminated in 1973 and thereafter the required number will be filled by the improvement of domestic cattle.

It is the desire of all parties concerned, therefore, that the performance test will be made into an effective means of management guidance and that the improvement of testing system will be developed to a well organized breeding system.

Active dairy cattle transaction is also expected in the foreseeable future and there will be a need for opening livestock markets. In that event, judgement of the quality of dairy cattle will have to be based on the registered performance record. From this consideration the government subsidy for the registration related work was increased to 15.5 million won in 1969.

1-4 Production and Utilization of Feed

1-4-1 Weather Conditions and Kinds of Grass

The climograph shown in Appendix (12) shows the weather conditions which are the basic requirement for the cultivation of forage crops. As the graph shows the climate of Korea is characterized by a large fluctuation of the temperature and concentrated rainfall in summer, a typical monsoon type climate of the East Asia.

Under these weather conditions, the native grasses are mostly rough and strong, the so-called summer type grass which grow in summer in high temperature and humidity and ceases growing in the winter when the temperature is low and the air is dry.

Therefore, in the future improvement of grassland there will be a need for the introduction of perenniel grass of high quality. Following are the matters to be taken into consideration in the selection and utilization of grass species, which are summarized on the basis of the result of experience in the warm south western part of Japan, whose weather conditions are similar to those of Korea.

Most of the grass and legume originated in the European countries show the so-called "Summer Withering" phenomenon. Particularly, the Timothy and the Perennial rye grass, which are very susceptible to the heat, are very short lived. Even with the Orchard which has a relatively high resitivity against the heat, its life span is about 3 years.

Introduction of the Bermuda grass and Bahia grass which are successfully grown in the warm district of Japan will not be practical because of low temperatures in Korea.

As the autumn seeding annual forage crop, soiling rye will be the type generally acceptable.

In Kwangju soiling oats will be suitable. Cultivation of the Italian rye grass will be possible in the area south of Seoul.

1-4-2 Utilization of Cultivated Land

Table 44 shows the distribution of average sized cultivated land in Yu, Men. According to the table, the stratum having more than 1 ha of cultivated land is found more in the area north of Seoul with Kwangwon do accounting for 30.3% and Kyonggido, 67.6% respectively, but the size of cultivated land is far smaller in the Southern area. However, this relative disadvantage as a result of small operating size is being compensated by an effective utilization of the land for double cropping. (See Table 45).

Table 44 Distribution of Yu, Men by Acreage

(Number of Yu, Men)

Description	Less than 50 a	50–75 a	75–100 a	100–125 a	Over 125 a	Total
Kang wondo	1 (0.9)	12 (11.0)	63 (55.0)	29 (26.6)	4 (3.7)	109 (7.3) (100.0)
Kyong gido	1 (05)	7 (3.5)	57 (284)	112 (55.7)	24 (11.9)	201 (136) (100.0)
Chung Chong pukdo	0	11 (10.5)	75 (71.4)	19 (18.1)	0	105 (7.1) (1000)
Chung Chong namdo	0	36 (198)	117 (643)	28 (15.4)	1 (0.5)	182 (123) (100.0)
Cholla pukdo	0	66 (40.7)	84 (51.9)	12 (7.4)	0	162 (11.0) (1000)
Cholla pukdo	8 (3.4)	102 (43.4)	116 (49.4)	9 (38)	0	235 (15.9) (100.0)
Kyong sang pukdo	2 (08)	110 (44.5)	117 (47.4)	18 (7.3)	0	247 (16.8) (1000)
Kyong sang namdo	25 (10.7)	137 (588)	70 (300)	1 (05)	0	233 (158) (100.0)
Total	37 (25)	481 (37.6)	699 (47.4)	228 (15.5)	29 (2.0)	1,474 (1000) (100.0)

Table 45 Ratio and Distribution of Rice Double Cropping Area

Description	Less than 25%	25–50%	50–75%	More than 75%	Total
Kang wondo	109	0	0	0	109
Kyong gido	201	0	0	0	201
Chung Chong pukdo	85	15	5	0	105
Chung Chong namdo	166	15	1	0	182
Cholla pukdo	111	45	6	0	162
Cholla namdo	96	88	45	6	235
Kyong sang pukdo	50	59	80	58	247
Kyong sang namdo	13	55	130	35	233
Total	831	277	267	99	1,474

In the past the Korean cattle raising, which is the main strength of livestock industry in Korea, has been operated on a very small scale depending on rice straw or native grass and without requiring the production of forage crops. In the course of introduction of dairy cattle which is now in progress, cultivation of forage crops (at the cultivated land) will be accelerated as a matter of course in view of the position of dairy farming which is definitely more advantageous than other crops but the extremely small size of cultivated land may become the factor for putting a limit on the size of forage crop cultivation for dairy farming. Meanwhile a report on the fact-finding survey conducted by the Korean Livestock Management Research Institute shows in the following table the size of cultivated land of the farmers who are engaged in both dairy farming and cultivation. From the table it is known that the farmers introducing dairy cattle have advantages over others in respect of feed production, capital accumulation and the size of cultivated land.

Cultivated Area Owned by Farmers Engaged in Stock Raising and Farming

(per household)

Description	No. of Farms	Paddy field	Upland field	Orchard	Total
Less than 6 heads	3	1.1 ha	1.1	-	2.2
7 - 16 heads	3	1.4	0.2	-	1.6
More than 17 heads	3	3.0	-	3.7	6.7
Total or average	9	1.8	0.4	1.2	3.2

Though the report did not give a detailed account of forage crop raised at cultivated land, the recent survey shows some dairy farmers with advanced techniques have established almost complete setup for small cultivated area by growing summer Dent corn in the northern region and the summer Dent corn and winter Italian rye grass in the Southern region. The Government, meanwhile, is making intensive studies on these species and is now in the process of preparing cultivation standards for forage crops. (See Appendix (13)).

1-4-3 Utilization of Native Grassland

Utilization of range in Korea prior to the recent introduction of dairy farming was represented chiefly by the preparation of nativegrass hay for Korean cattle. Such practice is evident from the fact that even today when the dairy farming is making a progress there are still many farmers who heavily depend on the market nativegrass hay for their dairy cattle. In the Kwangju district where the dairy farming is still its incipient stage, nativegrass hay of good quality is freely available at a price of 6 won per kg. Some dairy farmers are even against the idea of early grassland development. A fairly large quantity of nativegrass are in circulation even in the central district. Main species of nativegrass found are as follows:

Grasses: Miscanthus sinensis; Arundinella hirta; Cymbopogen Goeringii; Themeda triandra; Spodiopogon Sibiricus; Calamagrostis arundinacea; and others.

Legumes: Lespedeza cyrtobotrya; Pueraria hirsuta; and others.

Other species: Aster scaber; Artemisia japonica; and others.

All of these species are rough and strong perennial plants growing to the height of 1 to 2 meters in the summer season when the temperature and humidity are high and completely stop growing in the winter season when the temperature is low and air is dry. Cutting is made by hand once a year or every two years in the fall when the growing period ends and are dried in the air.

In the past when the surplus labor was abundant in the rural area and when the low wage was prevalent, utilization of nativegrass hay may have been justified. However, if a rapid progress of dairy farming is to be planned in the future, utilization of nativegrass will become increasingly difficult from the following reasons, even though the importance of nativegrass will remain the same as a substitute of grass and legume in the slack summer season.

(a) Decrease in cutting and preparation of hay as a result of a decrease in available manpower and the rise in the price of nativegrass hay as a result of wage hike.

(b) Shortage of nativegrass hay and rise in its price as a result of growing demand following the increase in the number of dairy farmers..

(c) Difficulties in securing free cutting as a result of competing stock raising by large scale dairy farmers and Korean cattle raisers.

1-4-4 Grassland Development

It may be said that the grassland development in Korea in substance made its start with the inauguration of the First 4-Year Livestock Development Project in 1968.

Even prior to that year grassland development was carried out as a part of government measures but due to lack of understanding on the part of farmers or ineffective management, the improved grassland turned to a waste land. The acreage of grassland now on record are that of those improved after 1967. Of the total land area of 9487, 748 ha of Korea, woodland are 6, 667, 570 ha accounting for 68% of the total land. Of the total woodland area, the land available for development in the from other than woodland totals 1, 234, 000 ha, of which 10% or 123, 400 ha is being planned for use in grassland development under the Livestock Industry Development Project.

Result and Future Plan of Grassland Development

Unit : ha

Description	1967	1968	1969	1970	1971	計 (1968~1971)
Intensive Pasture	2,840	5,000	5,000	5,000	5,000	20,000
Autumn sowing grassland	—	—	10,000	10,000	10,000	30,000
Improvement of Native grassland	—	—	20,000	20,000	30,000	70,000
Conversion of sand erosion area into pasture	—	—	1,000	1,000	1,000	3,000
Total	2,840	5,000	36,000	36,000	46,000	123,000

Four Year Livestock Development Project

Methods to be employed for each category of grassland development shown in the above table and the criteria of grass production are as follows:

Description	Method of grassland development	Criteria of grass production
Intensive grassland	Improvement of intensive pasture by means of tillage	25 T/ha
Autumn sowing grassland	Gradual improvement of pasture by autumn sowing of Legume seed	15 T/ha
Improvement of native grassland	Removal of obstructions and improvement of grassland by fertilizing	7 T/ha

Of the above, improvement of nativegrassland, autumn sowing of grassland and improvement of existing grassland are mostly aimed for Korean cattle and the grassland for dairy farming comprises mainly the intensive grassland.

The system of grassland development was given a firm position by the enactment of "Grassland Law" in 1969. Special features of this law are the provisions providing measures for the procurement of land including expropriation of land as; a means of grassland development and measures for establish large scale enterprise livestock industry. This law encourage the investment of city capital in the development of grassland, as already seen in the increasing number of large scale ranches in the suberbs of Seoul City, and at the same time provedes means to use or lease the grassland and aims at promoting projects for the increase of farmer and fishermen's income, thus paving the way for introduction of dairy farming. On the other hand, however, the question of systematic financing for the introduction of fairy farming and expansion of its operating size will be left to the future for solution.

As to the financial aid to the grassland development standard cost for per ha of intensive grassland is 63,000 won, 1/2 of which is subsidied by the National Treasury and the remaining 1/2 is financed by loans. These loans are available on the condition of equal redemption of principal and interest on three year installment, 2 years deferment and with an annual interest rate of 9%.

The method now employed for the development of grassland is the utilization of abundant manpower and careful preparation by hand. However, in view of recent tendency toward a decrease in the number of farm laborers, it will be necessary to simplify and speed up the work to allow seeding at the right time and to employ such construction method as to allow the use of machinery. For this purpose, adoption of mechanical construction method and hoof cultivation method will be considered.

Soils in the projected area are highly acidified due to heavy rainfall in the summer season and lime will be indispensable to the development of grassland. Use of phosphoric acid, particularly the boron for alfalfa will also be necessary.

Species of grass found in the intensive grassland are mostly

perennial Mixture Sowing pasturage. They consist of mainly Orchard grass and Tall fescue of grass family and Ladino Clover of the Legumes. However, in view of the fact that the Ladino clover is overpowering the grass family and shortening the life of grassland, it will be necessary to replace the Ladino clover with the common type (New Zealand white, for example) or the white clover of the Wild type. The Orchard grass has a high yield rate and palatability but its life is rather short ranging from 3 to 4 years, probably due to withering in the summer season.

The Tall fescue is a perennial grass and ensures a high production rate even in the (land used for 5 to 6 years. However, the palatability lowers unless utilized while it is young and short in the height. Other types being used are the perenniel rye grass and Kentucky blue grass but they present problems in respect of perenniality because of their susceptibility to withering in the summer season of high temperature and humidity.

Approximately one half of the total demands for seeds to be used for grassland development depend on import. It will also become necessary to establish a quality inspection system to check on the percentage of germination, germination rate and the purity of imported seeds. On self-supporting seeds, it is important to take immediate measures to secure required quality and breed standards as well as the improvement of seeding techniques and establishment of systematic sowing bed and seeding bed.

As for the measures against summer withering because of the fact that the excessive growth of the first crop in spring is rather prompting summer withering it will be necessary to provide proper guidance to the farmers on the positive utilization of grass such as the preparation of grass silage by cutting at an appropriate time. For selection of the grass species having a highest resistibitity against the withering in the summer season, the most practical way would be to collect all available grass and legume and pick up the most appropriate type from these species.

Meanwhile, studies have also been made on the selection from nature grass as a part of measures against summer withering it is now considered difficult to expect effective results from the growing of native grass in a short period of time. It will be necessary to strengthen the organization of research staff and establish a system which will enable continuous research work over the period of 10 to 20 years.

1-4-5 Utilization of Improved Grassland

Improved grassland are being utilized mainly for supply soilage feed cut by hand with the use of hand sickles.

This form of pasture utilization is followed by both the farmers possessing a grassland at a rate of 2 ha for every head of dairy cattle and large scale enterprise ranch owners.

And this fact may be said to be the main factor contributing to such vicious cycle as delayed reaping of the first crops, summer withering and accelerated devastation of grassland. This fact is the basis of the assertion that the introduction of machinery is a pressing need from a technical

point of view besides such background as the flow of manpower out of the rural area and constant wage hike.

Meanwhile, utilization of abundant improved grassland for grazing is not being practiced in most cases. Only on very rare occasion, the ranch with a herd of cattle driven by a farmer is to be seen. Even the operators of large scale ranches which have been operated on abundant manpower of low wage in the past will be pressed to mechanize the work due to increasing difficulty in securing seasonal labor. As a result, the time will also come when it becomes extremely difficult to secure annual contract labor whose wage standard is relatively lower than that of temporary labor because of stabilitity of their employment.

And on the other hand, there will be an increasing need for intensive utilization of land following multiplication of dairy farming as a natural response from the management.

Also in the past, because of the failure of farm machinery manufacturer to make auxiliary farm machinery and the government policies restricting the import of such machinery, the majority of dairy farmers could use their domestically manufactured tiller only for transportation purpose. Recently, however, manufacturing of auxiliary farming machinery has begun by a joint venture participated by local manufacturers and these in Japan and U.K. with a support of the government. Since the mechanization of dairy farming, particularly in the utilization and management of grassland is expected to make a rapid progress under these favorable conditions, it will be necessary to establish systematic means for utilization of machinery in advance. Utilization of improved grassland for grazing will become a pressing need for not only large scale dairy farms but also for mixed dairy farm management because of conflicting demand for labor for cultivation and securing reserved feed for the summer season.

On this point it will also be necessary for the government to take appropriate measures to provide fences and water supply facilities for grassland in parallel with necessary technical preparations.

1-4-6 Demand and Supply of Feed

Concentrates in Koreas consists of rice bran accounting for 68%, cereals, 18% and others, 14%. Their utilization in the past has been only in the form of single feed. From this pattern in the utilization of concentrates it can easily be imagined that the livestock industry in Korea has been a complete side-line business depending on the utilization of by-products of agriculture.

In recent years, however, consumption of feed has increased rapidly and the growth in the consumption of concentrates is particularly noteworth following the industrialization of poultry farming, emergence of broilder industry and progress of dairy farming.

Full scale production of formula feed was commenced in 1967 and the number of formula feed manufacturing plants registered with the government as of October 1968 totaled 60 with an annual production capacity of 700,000 M/T.

Under the livestock multiplication project, a feed demand and supply plan has also been worked out as shown in Appendix 14, to correspond individual stock multiplication plan by type. According to this plan, the amount of feed to be imported in 1971 as a result of shortages in concentrates is expected to be 279,000 M/T, about ten times the amount imported in 1967. Though the present prices of main feed are relatively low compared with the milk price as shown below, they are expected to rise in the future as a result of anticipated shortage of concentrates as described previously.

Against this forecast, the Government set aside Feed Regulating Fund in an attempt to stablize feed price. Also, as a means to cope with feed price fluctuation, the Government decided in 1969 to import 270,000 M/T of corns every year for a period of three years starting in 1969 under PL 480-1 and the import of 90,000 M/T, allocation to 1969, has already been executed. Responsibility of management over the imported corn has been delegated to AFDC. Prices of purchased feed per kg are as follows.

Corn	30.00 won	Wheat bran	12.70 won
Barley	29.00	Barley bran	12.17
Defatted rice bran	11.23	Salt	6.25
Soybean meal	40.63	Powdered Shell	3.25
Rapeseed cake	20.50		

Note: Since the ingredient of formula feed varies depending on the request of purchaser, standard price of formula feed is not available. Price being paid by farmers for formula feed for dairy cattle ranges from 18 to 22 won.

Imports of appropriate amount of feed may be necessary as a means to stabilize feed price, but from a long-range viewpoint, it will be absolutely necessary for Korea, where there is no prospect for the export of livestock products, to gradually decrease the import of feed by positively utilizing available resources of self sufficing feed.

1-5 Dairy Farm Management and Extension Service

1-5-1 Special Features of Dairy Farm Management

Cattle raising and geographical distribution of dairy farms by operating size have already been discussed in II-1-2-1 through II-1-2-3.

The report on the survey conducted by the Korean Livestock Management Research Institute in 1968 gives the following outline on the actual state of dairy farm management.

This survey was conducted on a total of 22 ranches 14 in Yangju-gun, Kyonggi-do in the vicinity of Seoul city and 8 in Pyongtaek and Chonwon area by interviewing the operators of ranches.

However, the production of formula feed in 1968 was only 200,000 M/T with 30% workability of pland facilities. Geographical distribution of formula feed manufacturing plants by province is shown in the following Table 46.

Table 46 Geographical Distribution of Formula Feed Manufacturing Plants

	No. of registered feed plants by ownership				Status of registration by year						
	Feed Association	Stock Farm	Private	Total †	1963	64	65	66	67	68	Total
Seoul	20	1	2	23	2	8	1	3	7	2	23
Pusan	2	2	1	5	2	1		1	1		5
Kyonggido	5	5	2	15	5			2	2	3	12
Kangwondo	1			1	1						1
Chungchong pukdo	1		1	2	1				1		2
Chungchong namdo	3	2		5	1	1			1	2	5
Cholla pukdo	2	1		3	2					1	3
Cholla namdo	1	1	3	5		3				2	5
Kyongsang pukdo		2		2			1		1		2
Kyongsang namdo	1			1					1		1
Chejudo			1	1		1					1
Total	36	14	10	60	14	14	2	6	14	10	60

Source : Study on Livestock Development by Korea Livestock Management Research Institute.

From the trends of prices of feed and livestock products as shown in Table 47, it is evident that the prices of both items have been on constant fluctuation and that the every change in the price had given a hard blow not only to the livestock producers but also to the feed producer.

Table 47 Trends of Feed and Livestock products price

(1962 = 100)

		1960	1961	1962	1963	1964	1965	1966	1967
Feed	Corn	63	92	100	142	260	189	227	244
	Wheat bran	77	78	100	102	119	134	269	167
Livestock Products	Chicken eggs	79	86	100	119	170	135	238	246
	Live pig	62	71	100	95	133	207	185	279

Source: Study on Livestock Development by Korea Livestock Management Research Institute.

Table 48 shows the number of dairy farms by size, type of management, educational background of proprietors.

Table 48 Proprietors and type of management

Description	Status of proprietor			Educational Background				Age of proprietor and experience		Management System		
	Full-time	Absentee operator	Total	Primary school	Junior high school	Senior high school	College	Age	Experience	Specialized dairy farming	Dairy and crop farming	Dairy and other livestock raising
Less than 6 heads	7	–	7	2	2	–	2	46.9	4.2	2	3	2
7 – 16 heads	5	4	9	–	1	5	3	47.7	5.4	5	3	1
More than 17 heads	4	2	6	–	1	–	5	49.8	6.0	2	3	1
Total or Average	16	6	22	2	4	5	10	47.5	5.2	9	9	4

Table 49 Analysis of Dairy Farm Management

Size of stock keeping	1–6 heads	7–16 heads	More than 17 heads	Average	Remarks
Average Number of cattle raised (Milking cow)	2.9 Head (2.1)	10.9 Head (9 0)	30.7 Head (22.8)	1 3 8 Head (1 0 6)	
Forage cropping area	0 5 hr.	4.8	7.9	4.3	
Pasture area	0.5	1.9	2.0	1.5	
Manhour required per head (Family labor included)	1,3 5 0 hr. (9 2 5)	1,1 0 8 (1 4 1)	7 2 5 (4 9)	8 9 1 (1 3 9)	
Per head	won				
Purchased feed	7 2,9 7 5	5 3,8 5 6	6 6,4 1 8	6 2,6 9 7	
self-sufficing feed	1 7,6 7 7	9,1 3 3	7,5 4 4	8,7 2 3	
Total	9 0,6 5 2	6 2,9 8 9	7 3,9 6 2	7 1,4 2 0	
Rate of feed self-sufficiency	1 9.5 %	1 4.5	1 0.2	1 2.2	
Per head capital investment	6 2 7,8 0 0 won	6 5 6,4 6 1	5 6 4,9 9 8	5 9 5,3 1 4	
Per head milk production	4,8 0 5 kg	4,0 4 7	4,3 8 0	4,3 3 2	
Production cost per kg of milk	4 6.0 5 won	3 2.7 3	3 2.4 1	4 4.3 5	
Milk price per kg.	4 9~5 0 won	4 9~5 0	4 9~5 0	4 9~5 0	
Per head					
Gross income	1 8 8,3 1 9 won	1 5 7,3 1 3	1 8 3,4 0 6	1 6 6,8 8 7	
Operating cost	1 2 7,2 6 0 won	1 1 7,6 1 8	1 3 0,2 1 3	1 2 5,7 4 8	
Net profit	6 1,0 5 9 won	3 9,6 9 5	5 3,1 9 3	4 1,1 3 9	
Profit rate	3 2.4 %	3 3.7	2 9.0	2 4.7	

Table 49 shows profitability analysis of these dairy farms by operating size.

As shown in the table, the farmers in the class of 6 heads or less are realizing the highest income of 61,059 won per head of cattle, followed by those in the class of 17 heads or more earning 53,193 won and those in the 7-16 heads class whose income is 39,695 won, the lowest level.

One of the common factors of relatively low income for farmers with more than 7 heads of cattle may be the decline of income from the operation of ranches which has to depend on contract labor. The share of the contract labor in the total working hour in the farm is 87% for the class of 7-16 heads of cattle and as high as 93.2% for those with more than 17 heads of cattle. The main reason for the lowest income for the 7-16 head class is such a low milk production rate as 4,047 kg. This low income according to the report, was brought about not by the quantity of feed or manpower requirement but by the difference in technical level or extent of rationalization of management. To justify this conclusion, the report gives analysis of milk production as shown in Table 50, by classifying milk production according to the technical standard on the basis of backgrounds of operators such as education, type of management (full-time or absentee-operator) and experience in livestock keeping.

Table 50 Milk production classified by technical standard

Description	Unit	Technical Level I	II	III	Average
Milk Production	kg	3,735	4,280	4,984	4,332
Ratio of milking cow	%	82.8	70.0	79.4	76.9
Feed Cost	won	74,029	58,587	84,736	71,240
Working hour	hour	957	756	997	891
Operating income	won	21,444	44,663	55,110	41,139

1-5-2 Production and supply of Feed

Following Table 51 shows the production and supply of feed.

Table 51 Production of Self-sufficing Feed

Description	Forage Production Acreage			Breakdown of self-sufficing feed				Forage crop production (per 10 a)
	Forage cropping	Grassland	Total	Cropped forage	Nativegrass	Farming By-products	Total	
Less than 6 heads	16.9[a]	16.4[a]	33.3[a]	5,518[kg]	5,094[kg]	1,484[kg]	12,096[kg]	1,600[kg]
7 – 16 heads	44.3	17.3	61.6	9,816	8,344	367	18,160	1,500
More than 17 heads	25.6	0.65	32.1	4,360	2,100	282	6,742	1,300
Average	30.7	10.6	41.3	6,196	4,320	391	10,907	1,500

As shown in the above table, the area used for feed production is 41.3 a on the average for all operating sizes and the acreage increases in proportion to the increase in the operating size. However, the rate of forage crop production against this acreage is such an extremely low figure as 1,500 kg on the average for all operating sizes and instead native grass is being consumed in large quantity. This fact is considered to be one of the main reasons for the increase in the overall workload at these farm.

Table 52 shows the feeding rate of concentrates and roughage.

Classification	Quantity of annual feeding (per head)		Quantity of daily feeding (per head)	
	Concentrates	Roughage	Concentrates	Roughage
Less than 6 heads	4,433 kg	15,435 kg	12 kg	42 kg
7 - 16 heads	3,947	14,775	11	40
More than 17 heads	6,235	11,137	17	30
Average	5,362	12,589	15	34

From the table it is evident that feeding of concentrates is in excess of required nutrient.

So far, discussions have been made mainly on the matters contained in the report which may present problems in the future. It was noticed on many occasions during the recent survey that the vast grassland was seldom utilized for grazing but used mainly for hand cutting of grass and that much labor was being consumed in milking and transportation of milk. Moreover, many of the dairy farms were being operated by absentee proprietor who heavily depend on contract labor for the majority of required work. Also on milk production, despite the low milk production rate mainly due to lengthy calving interval, there seem to be an excess feeding of concentrates. This fact shows that the management and techniques are lagging behind the fast realization of multiplication in an unexpectedly short period of time and that each element of the management is not functioning properly.

The outstanding features of dairy farming in Korea are the high milk price and low feed price. Under these conditions, dairy farming for a sole purpose of milk production without utilizing grass land in and around city area can assure reasonable profit and on the other hand, even the operator of ranches possessing sizable forage crop land and grass land would avoid the production and utilization of self-sufficing feed requiring time and labor and incline toward easy management heavily dependent on purchased feed for dairy farming with a large number of cattle. This tendency is spurred by low wage and the availability of low priced nativegrass hay.

The criteria previously established by the government for the allocation of funds for the purchase of imported cattle and improvement of facilities requiring the farmers to possess grass land at a rate of 2 ha per head of cattle is considered to have stemmed from the government intention

to improve this situation and raise sound dairy farming based on the utilization of grassland.

To attain this objective, it is hoped that the establishment of dairy farming of optimum operating size and main production area based on the effective utilization of land and family labor be realized.

1-5-3 Organization of Dairy Farming Extension Service

Research and extension service organizations of agriculture are systematically arranged as shown in Table 53. Among these organizations, those having experiment and research functions for dairy farming are the Botanical Environment Research Institute, Livestock Experiment Station, Livestock Hygien Research Institute, Agriculture Utilization Research Institute and Agricultural Management Research Institute under the administrative control of the Research Bureau of the Agriculture Development Agency, a branch agency of the Agriculture and Forestry Ministry. With the exception of the Botanical Environment Research Institute and the Livestock Hygien Research Institute, both of which have tradition and accumulated experience, all of these organizations are still in the incipient stage as far as the dairy farming is concerned. However, the future role of these organizations staffed by young and spirited researchers is highly expected. For this reason, it will be of particular importance to have highly effective and flexible structure of research function to deal with the dairy farming having many problems because of its nature of round about production.

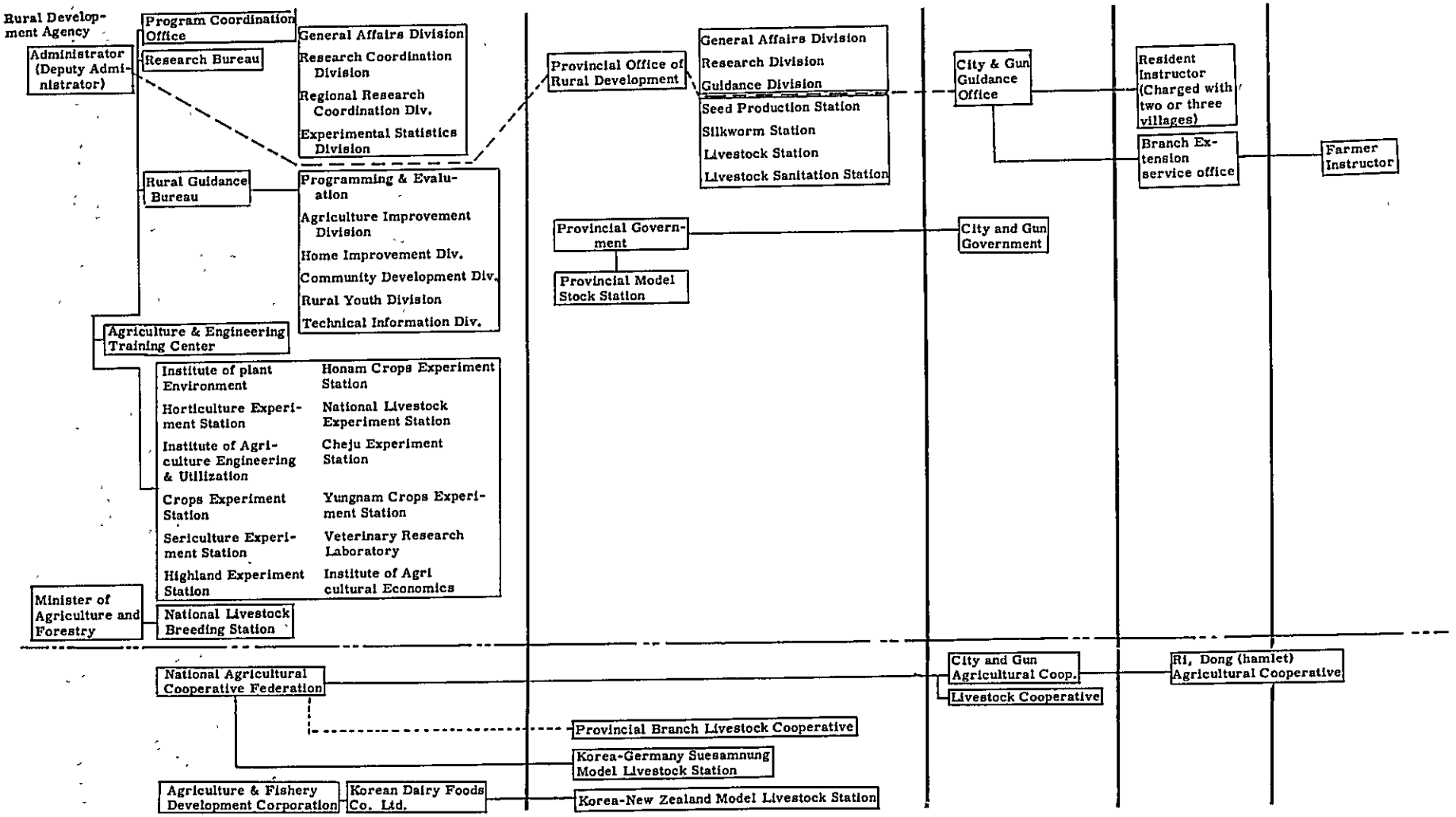
On the extension service, meanwhile, an organization has been set up to link the Agriculture Development Agency, the top function of the organization, with the provincial agriculture development agencies down to the city and county extension service centers.

The city and county extension service centers and sub-centers totaling 800 have a staff of 6, 700 who are responsible for extension work. This number includes the resident instructors (of the total of 640, those responsible for livestock farming number 146) who have been selected among the extension service and provide instructions to the farmers in their respective area while engaging in their own work. Besides, efficient and leader-type farmers have been selected and appointed as the farmer-instructor who become a core of group activities.

Common features in the early stage of the development of dairy farming would be the important role and influence of guidance on the promotion of project provided by the central, provincial and city or county governments. This type of administrative guidance is particularly conspicuous in the case of Korea.

Organizations providing guidance are the city and county agricultural cooperatives and Ri, Dong (hamlet) Agricultural cooperatives, which are under the jurisdiction of National Agriculture Cooperative Federation and are responsible mainly for providing loans. Extension service workers (instructors) assigned to these organizations are responsible mainly for confirmation of dairy cattle introduced under the loan and providing instructions on general matters of dairy farm management. Besides, instructions are also provided by the technical staff of the provincial livestock

Table 53 Agriculture Extension Service Organization



cooperatives which are under the administrative control of NACF but do not have functions of providing loans and inseminators of artificial insemination service facilities (NACF, Livestock cooperatives).

From the past discussion, it may be said that the orginizational structure of experiment and research work conducted by the government agencies, extension service through the central, provincial and county governments and guidance provided by administrative organs is satisfactory and their activities in providing guidance are positively carried out.

However, to attain the objective of sound growth of dairy farming corresponding with the rapidly increasing number of dairy cattle and the emergence of new multiplication dairy farming, there must be well planned measures in the future in respect of both quality and quantity and it is strongly hoped that a stepped up guidance be provided by organizations concerned.

In view of the future need for intensified guidance following the anticipated rapid growth of dairy farming, it will be of particular importance that appropriate measures are taken to avoid confusion among farmers and duplication of instructions in providing diversified guidance.

1-6 Hygiene of Dairy Cattle and Insurance System.

1-6-1 Prevention of Animal Diseases and Hygiene of Dairy Cattle.

For the prevention of animal epidemics, a national epidemic prevention structure has been set up linking the Hygiene Section, Livestock Bureau of the Central Government as the top organization down through the Provincial governments and the provincial animal health centers. So far, the cases of animal epidemics have been kept to a minimum as shown in Table 54, which is an indication of vigorous efforts of the parties concerned (See Appendix 15).

Among these organizations, the time-honored and long experienced Animal Health Research Institute is under the administrative control of the Agriculture Development Agency and is responsible mainly for the experiment and research work on animal diseases and also engaged in the production of vaccine. In recent years, it has expanded its functions to the treatment of reproductive disturbance case or general diseases and further to the research work on artificial insemination in response to the imports of a large number of dairy cattle and a rapid increase in the number of domestic cattle. (See Appendix (16)).

The animal health center is located in each city and province as a subordinate organization of the Provincial Office of Agricultural Development and is responsible for the prevention of epidemics, maintenance of animal health, inspection of livestock products, treatment of diseases and inspection of specimen to be tested (See Appendix (17), (18), (19)). Geographical distribution of veterinarians is shown in Table 55. Figures shown in the table include public veterinarians whose assignment to the non-veterinarian areas, mountain villages and islands is financed by subsidy of the government.

As for the quarantine activities to cope with a rapid increase in the number of dairy cattle, a plan is being worked for the establishment of

additional facilities and expansion of the existing facilities for 1970 as in the case of the previous year. It may be said that the setup of epidemic prevention and animal hygiene is well organized. (See Appendix (20)).

However, in view of the recent stepped up import of dairy cattles amounting to 3,000 heads per year, a rapid increase in the number of multiplication dairy farming and inevitable utilization of pasture land for grazing as a result of the progressing grassland improvement, the following propositions require immediate attention of the government.

(a) Quarantine activities and review of the method for the purchase of imported heifer.

(b) Expanded measures against the case of reproduction disturbance and mastitis.

(c) Studies and guidance on animal hygiene for pasturing.

(d) Improvement and effective use of techniques of veterinarians.

Table 54 Cases of Animal Diseases

	Black-leg	Anthrax	Rabies	Hog Cholera	New-castle Disease	Fowl Pox	Infect-ious Coryza	Swine Erysi-pelas	Cattle Influ-enza	Swine Influ-enza	Pasrure-llosis	Black head	Pullo-rum	Tubere-ullosis	Bruce-llosis
1965	54	28	47	1,817	14,179	–	–	133	–	–	–	–	17,720	33	–
1966	27	5	10	687	6,499	200	480	73	3,788	28	7	300	6,411	44	3
1967	18	1	8	46	5,194	100	1,849	22	1	–	72	11	13,627	46	10
Seoul	–	–	–	–	–	–	–	–	–	–	–	–	137	3	–
Pusan	–	–	–	–	–	100	3	–	–	–	72	11	173	2	–
Kyonggdo	–	–	2	–	–	–	–	–	–	–	–	–	1,083	32	–
Kangwondo	–	–	2	–	1,411	–	–	–	–	–	–	–	426	–	–
Chungchong pukdo	4	–	–	–	463	–	–	–	–	–	–	–	759	–	2
Chungchong namdo	–	–	–	7	1,325	–	1,589	3	1	–	–	–	2,875	1	–
Cholla pukdo	–	–	2	19	1,380	–	260	19	–	–	–	–	619	–	–
Cholla namdo	–	–	–	–	549	–	–	–	–	–	–	–	1,025	–	1
Kyongsang pukdo	12	–	2	1	3	–	–	–	–	–	–	–	2,569	7	–
Kyongsang namdo	–	–	–	17	63	–	–	–	–	–	–	–	1,194	1	–
Chejudo	2	1	–	2	–	–	–	–	–	–	–	–	–	–	7

Source : Livestock Statistics 1967, Livestock Bureau, MAF.

Table 55 Geographical Distribution of Veterinarians

Description		Total	Professional classification						
			Admin.	Research	Gov. Employee	Private practi-tioner	School	Assoc..	Others
1965		2,054	438	116	421	421	185	157	316
1966		2,073	433	119	364	509	183	178	287
1967		2,122	466	141	349	549	216	169	256
Seoul		190	25	6	—	109	15	12	23
Pusan		72	14	13	—	23	4	4	14
Kyonggido		285	56	59	46	58	17	32	17
Kangwondo		117	33	6	36	16	7	2	17
Chungchong pukdo		88	25	5	22	17	8	4	7
Chungchong namdo		163	28	11	39	43	8	17	17
Cholla pukdo		325	74	5	36	51	40	33	86
Cholla namdo		250	67	10	49	47	36	18	23
Kyongsang pukdo		276	52	9	61	102	24	17	11
Kyongsang namdo		236	47	7	52	59	39	16	16
Chejudo		120	25	10	8	20	18	14	25
Kyonggido	Ansong	11	3	—	2	2	1	2	1
	Pyongtek	15	2	—	3	7	—	3	—
Cholla namdo	Cheongwon	9	—	4	2	1	—	—	2
	Chonan	11	3	—	—	3	—	2	3
	Goesan	11	5	—	3	3	—	—	—
Chungchong namdo	Kwangju	40	10	3	—	5	16	2	4
	Changsong	7	1	2	3	—	—	—	1
	Tamyang	8	2	—	2	1	1	2	—
	Whasun	9	5	—	3	1	—	—	—
	Naju	12	1	—	3	5	—	—	3
	Changsong	7	2	—	3	1	—	1	—
	Hampyeong	7	2	—	2	1	2	—	—
	Total	90	23	5	16	14	19	5	8

Source : Livestock Statistics 1967 and data provided by Healthe Section, Livestock Bureau, MAF.

1-6-2 Insurance System for Dairy Cattle

Livestock insurance system is divided into the general insurance system and special insurance system and dairy cattle is covered by the special insurance system.

Operating agencies of the system are the National Agricultural Copperative Federation and city and county agricultural cooperatives. Dairy cattles to be covered by the system are those 6 months old or over and the coverage of those falling under the following categories is compulsory.

(a) Dairy cows and bulls having been given pedigree registration.

(b) Cattles owned by the central government or local government.

(c) Cows imported under the government project.

(d) Cows imported with funds under the right of claim against Japan

Objects of the insurance are death, emergency slaughter and slaughter under the provisions of law or regulations. Maximum amount to be covered by the insurance is set at 80% of the value of the stock assessed at time of executing the insurance contract. For the dairy cattle purchased with agricultural loan, the amount payable by the insurance is set higher than the amount of the loan and lower than the purchase price of the cattle. The premium rate is set at 2.5% of the value of dairy cattle and the term to be covered is one year.

As discussed above, the insurance system is available only for the coverage of death of livestock at present but it is considered certain that studies will also be made in the future on the advisability of including the case of diseases in this system.

It is also advisable that the Korean Dairy Foods Co. establishes a mutual aid system with the participation of farmers and rancher as a means of self-protection.

1-7 Agricultural Finance and Loan for Dairying (See Annex No. 1)

2 Trends of milk and milk products

2-1 Demand, supply and consumption of milk and milk products

2-1-1 Demand and supply Situation - Outline

Raw milk production is Korea in 1968 was 24,400 M/T, an increase of more than three times from the 7,100 M/T in 1964.

A study on the trends of demand and supply of milk and milk products for the past five years shows that domestic production has never been able to satisfy demands. However, the breakdown of demand and supply shown in Appendix (36) compiled on the data such as the Agricultural Yearbook of Korea shows that the figure representing the demand includes the demand for

dried skimmilk for school lunch under foreign aid program, which is considered to account for nearly all the portions of imported milk products. Handling of this type of demand and other general demand on equal base is very questionable.

In any event, demand for milk and milk products in Korea has grown remarkably in the past several years and further growth is expected in the future with the increase of national product and improvement of the dietary pattern of the people. Following discussion will be centered on demand and supply situation of market milk and milk products.

2-1-2 Market Milk

Production of market milk in Korea was 11,255 M/T. A study on the trends for the last 8 years (See Appendix (21)) shows that the production has been growing every year at a rate of 11.1% to 14.9% over the previous year but at the same time the share of milk processed for market milk, which was overwhelmingly high 4 or 5 years ago is now coming close to that of milk processed into milk products. This change was due to the domestic production of milk powder which began in 1965 in line with the government policy which gave priority to the production of milk powder for infant and the increase in the production of milk powder corresponding to the increase in the production of raw milk. In the summer of 1968 a shortage of modified powdered milk for infant was seen at times. Because of this situation, coupled with an increase in the seasonal demand and rise of the price at the market, emergency measures such as the conversion of part of raw milk for market milk to the production of powdered milk had to be taken as seen in the case of the Seoul Milk Cooperative.

Thus; the demand for market milk in Korea is influenced by political considerations and differs from that of other countries where priority is given to the market milk. Therefore, it must be noted; that in Korea there is a considerable demand for market milk in addition to that shown in the table. A study on the supply and demand situation of market milk by area shows that on the assumption that the production shown in the Appendix (25) equals the consumption of market milk, two major cities, Seoul and Pusan, have an overwhelmingly large share (73% in 1967 and 69% in 1968) in the total consumption.

Per capita annual consumption of market milk in 1967 in the whole country was only 292 g as shown in Appendix (29) which is equivalent to a daily consumption of less than 1 g. Against the per capita daily consumption of 4.3 g for Seoul City and 1.8 g for Pusan City, which are well over the average national consumption level, the per capita daily consumption in Cholla namdo and Chejudo is around 0.1 g, which may be the lowest level in the world.

2-1-3 Milk Products

Like the consumption of market milk which is extremely low, the consumption of milk products in Korea at present is also very low mainly due to the supply situation.

Production of milk products in Korea began with the start of

condensed milk production by the Seoul Milk Cooperative in 1963. Two years later in 1965, production of powdered milk was commenced by the same cooperative. Therefore, it may be said that the domestic supply of milk products is still in its incipient stage.

Production of milk products in Korea in 1968 was:

Milk Powder 1,311 M/T (mainly modified milk powder for infant)

Condensed Milk 930 M/T

Others 5.5 M/T

The total sale of milk products by the major enterprises during the same year almost correspond to the above figure. Assuming that this figure represents the consumption of domestically produced milk products in the same year, it is equivalent of 11,583 M/T in raw milk, which is almost equal to the consumption of market milk for the same year.

Trends of consumption of these domestic milk products in the past shown in Appendix (21) indicate that the consumption made a sharp growth after 1963 when the production of condensed milk began in the country for the first time and that the consumption estimated in raw milk in 1968 grew by 13 to 14 times over 1963.

On the consumption pattern of these milk products, nearly all the milk powder, a leading item of the whole milk products, is canned (450 g) modified powdered milk (whole milk powder) for infant and is marketed by agents (or special agents) to retail stores (including chain stores or department stores) as shown in the attached sales channel chart. These sales channels are concentrated in such large cities as Seoul and Pusan.

Besides the above milk powder, sweetened condensed milk and evaporated milk (production is small) are marketed in small cans (397 g in weight for sweetened condensed milk and 411 g for evaporated milk) but they are consumed mainly by general household and coffee shops as a luxury food of the urban area. Sales channel of these products is similar to that of the powdered milk.

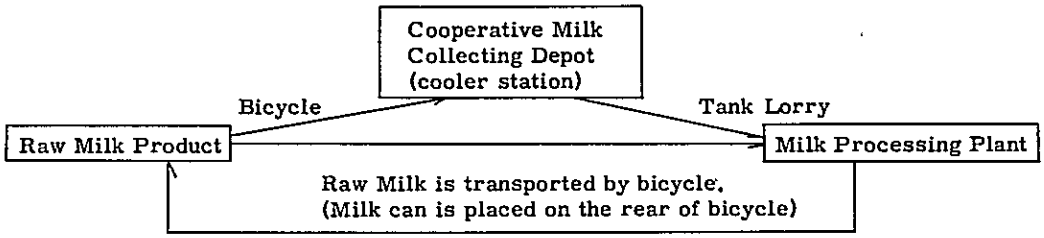
Recent sales prices of milk products are shown in Appendix (31).

In addition to the above domestic milk products, aid milk products are also available for school lunch.

All the demands for school lunch are filled by dried skimmilk imported under the foreign aid program and the quantity imported and supplied to schools amounted to 12,000 M/T in 1968 as shown in Appendix (34). Import and distribution of dried skimmilk for school lunch are the responsibility of the Education Ministry and the quantity of products imported and supplied to schools to feed two million school children amounted to 61,600 M/T, comprising 48,000 M/T of flour, 12,000 M/T of dried skimmilk and 1,600 M/T of edible oil.

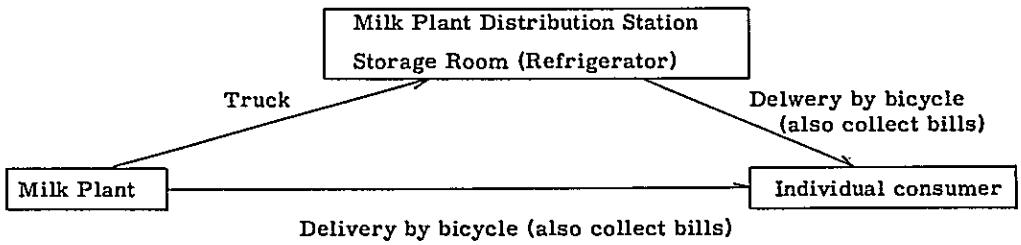
Sales Channel of Raw Milk, Market Milk and Milk Products

(1) Sales Channel of Raw Milk



Payment of raw milk price (Verbal agreement: Generally paid every 15 days. Price of milk is 50 won per kg.)

(2) Sales Channel of Market Milk

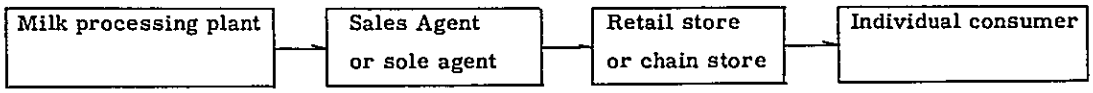


Delivery by bicycle (also collect bills)

Typical example of sales price

Description	Milk plant sales price	consumer purchase price
In 180^{cc} bottle	13 won	16 won
In 360^{cc} bottle	26	32

(3) Sales Channel of Milk Products



Typical example of sales price

Description	Milk processing plant sales price	Consumer purchase price
Sweetened condensed milk 397 gr. can	105 won	130 won
Evaporated milk 411 gr. can	130	150
Modified milk powder 450 gr. can	250	300
Whole milk powder	120	140

Operating standard for school lunch calls for a total of 154 g for bread comprising 120 g of flour, 30 g of dried skimmilk and 4 g of edible oil. For recombined milk, the total requirement is 180 cc of milk made by dissolving 36 g of dried skimmilk. School lunch in the form of recombined milk is served to the children accounting for less than 1 % of the total school children fed by school and the majority of school lunch is served in the form of bread.

As to the operation of school lunch program, the board of education in-each district consign the material to the bakers to be baked in the case of bread and the cost of 1.22 won per piece, is borne by the government. In the case of recombined milk, a milk processing equipment is provided in each school.

All school lunch materials are provided free of charge under foreign aid program. In handling this matter in the future it is desirable that appropriate measures are taken by authorities including the Ministry of Agriculture and Forestry to improve the existing system.

It is advisable that in view of the nature of the special milk products such as these for school lunch as mentioned above, supply and demand for these products be handled separately and not to be mixed with the general supply and demand.

2-1-4 Demand Forecast for Milk and Milk Products

As discussed above, general consumption of market milk and milk products in Korea at present is extremely low with the per capita daily consumption of market milk and milk products being 2 g in terms of raw milk. Reasons for consumption level are:

(a) Because of the past dietary pattern centering around rice and barley, begetables and sea food, milk and milk products have been regarded as luxury foods or special nourishsing foods.

(b) In relation to the above practice, general public are not too familiar with milk and milk products with the resultant lack of knowledge and interest in these products.

(c) In spite of the recent growth in consumption, people's interest in these relatively expensive milk and milk products generally low mainly due to low income level.

(d) Market milk is not readily available even in large cities like Seoul.

(e) Because of frequent incidents in which these items were handled in an unsanitary manner in the processing facilities or in the course of distribution, the people do not fully trust domestic milk and milk products.

A typical example of people's distrust in domestic products is seen in the leading hotels in large cities where they serve only imported evaporated milk along their coffee. A 450 g can of powered milk for infant, some are sold at market through special route, is sold for such a high price as 900 won.

It is extremely difficult to make an accurate prediction on the future trend of consumption of milk and milk products mainly due to a short history of consumption of these items in Korea, spanningless than a decade. However, in view of the fact that the main obstacles to the growth of demand for milk and milk products in the past have been gradually eliminated by a rapid growth of Korean economy, concentration of population in urban area and changes in the dietary pattern of the people, particularly the recent rapid growth in the consumption of animal protein composed of mainly meat and eggs, demands for milk and milk products in Korea are expected to make a rapid growth in the future with major cities such as Seoul and its satellite cities and Pusan as a nucleus of consumption area following the course similar to that seen in Japan.

As a reference, trends of consumption of milk and milk products in Japan are given below:

Per capita consumption of market milk in 1960 was 56 bottles, such each containing 180 cc of milk (equivalent to 10,360 g, which is equal to a daily consumption of 28.4 g = 0.153 bottle). Breakdown of this consumption by area show that the Kanto Area had a highest figure with an average of 71 bottles (equivalent to 13,135 g, which is equal to a daily consumption of 36.0 g = 0.195 bottle) and that the Kyushu Area had the lowest level with 37 bottles (equivalent to 16,845 g, equal to a daily consumption of 18.8 g = 0.101 bottles). However, five years later in 1965, the average per capita consumption in the Kanto Area increased to 120 bottles and the lowest Kyushu Area attained the level which was held by the Kanto Area five years before.

Three years later in 1968, the nation-wide average reached 131 bottles with the highest Kanto Area jumping to 156 bottles (equivalent to 28,860g which is equal to a daily consumption of 79.1 g = 0.427 bottle) and the lowest Kyushu Area showing a remarkable growth of 104 bottles (equivalent to 19,240 g, which is equal to a daily consumption of 52.7 g = 0.285 bottle) and surpassing the level held by the Kanto Area 5 years before by 20%.

Trends of market milk production (consumption) after 1950 is shown in Table 56.

Table 56 Trends of Market Milk Production

Year	Market Milk Production (1,000 M/T)	Index
1950	138	100
1960	938	679
1965	1726	1257
1968	2404	1742

Source : Annual Census Statistics, Statistics Research Dept., MAF, Japan

The ratio of raw milk processed to market milk to the total raw milk processed increased gradually during this period as shown in Table 57.

Table 57 Ratio of Raw Milk Processed to Market Milk

Year	Comparison of raw milk processed		Other consumption
	For Market Milk	For Milk Products	
1950	37.3 %	54.2 %	8.5
1960	52.3	39.3	8.4
1965	55.0	39.1	5.9
1968	57.8	37.5	4.7

Source : Annual Census Statistics, Statistics Research Dept. MAF, Japan
Note : Milk products were under the government control in 1950.

Trends of milk consumption including milk products consumption in Japan are shown in Table 58.

Table 58 Trends of Milk and Milk Products consumption and supply in Japan

Year	Per capita annual consumption (Quantity in raw milk)			Milk and milk products supplied (Quantity in raw milk)		No. of Dairy cattle by year (as of Feb. 1)
	Market milk	Milk products	Total	Total supply	Imports	
	kg	kg	kg	M/T	M/T	(1,000 heads)
1951	...	...	58	529	59	256
1955	6.2	4.9	13.1	1,159	130	421
1960	11.8	9.6	21.4	2,539	606	824
1965	19.9	16.4	363	3,901	580	1,289
1967	21.3	22.0	43.3	4,491	964	1,376
1968	23.0	21.8	44.8	4,706	630	1,489

Source: Food Supply and Demand Table, Ministry of Agriculture and Forestry, Japan

Note :
1. Years shown are the fiscal year which start April 1st and ends March 31st. Consequently, there may be differences in figures between this table and other tables which are based on calendar year.
2. Of the total milk products consumption, powdered milk for infant has the largest share and accounted for more than 50% in the past few years, followed by butter and condensed milk. The share of cheese has been increasing annually in recent years.

From the above table it is known that the consumption of milk and milk products in Japan has grown remarkably in the last couple decades. Such growth is also reflected by the rate of change in the food consumption shown in Table 59. However, the present consumption level of milk and milk products in Japan, which was the result of rapid growth as described above, is still far below the international level. Consumption of market milk, for example, is in

Table 59 Changes in Per Capita Food Consumption In Japan (1960=100)

Description \ Year	1912	1926	1935	1955	1960	1965
Direct consumption						
Rice	114.7	135.5	123.9	103.2	1000	97.2
Barley & wheat	154.7	119.7	83.4	184.8	100.0	12.4
Misc. cereals	494.1	279.8	149.6	1306	100.0	386
Pulse	181.1	152.7	127.5	120.0	1000	984
Potato	168.7	109.4	108.6	144.5	100.0	69.6
Vegetable	77.3	71.1	78.0	91.3	100.0	117.0
Fruit	58.1	75.7	78.0	62.2	1000	1503
Meat	37.6	63.9	700	76.6	100.0	226.7
Milk	94	155	22.9	51.4	1000	169.5
Chicken eggs	17.2	32.4	51.3	747	1000	193.5
Total	1003	109.0	1022	101.3	1000	1155
Processed food						
Grain powder and dextrin (Wheat flour)	44.6 (27.2)	58.7 (450)	559 (40.0)	90.0 (90.6)	100.0 100.0	1081 (1133)
Meat products	83	6.4	8.8	42.0	1000	170.3
Milk products	7.6	19.6	20.6	58.3	100.0	200.1
Liquors	12.7	1344	964	583	100.0	193.1
Condiments	83.8	104.9	1004	98.7	100.0	926
Vegetable oil	25.3	326	61.6	47.8	1000	129.8
Sugar	389	92.8	97.2	79.9	100.0	131.9
Drinks	25.7	40.0	47.5	69.9	100.0	157.6
Tobacco	31.1	42.8	49.7	84.0	1000	137.0
Total	56.8	76.0	700	73.6	1000	144.3
Ground Total	81.4	94.7	880	89.3	100.0	127.9

Source : Excerption from "Food Industry White Paper" by National Food Life Improvement Association.

the range from 1/7 to 1/8 or 1/10 of that in Western countries and it is no exaggeration that the consumption of butter and cheese, in particular, is so low that there is no comparison.

This may be interpreted as on indication of the possibility or the basis for great potentialities of growing demand for milk and milk products with the growth of people's income in the countries of high economic growth where the life of the people is gradually westernized.

In the case of Japan, however, when the demand could not be met by domestic production, measures were always taken to import milk products to balance supply and demand and stabilize prices. Judging from the past experience it may be said that the increase in domestic production of milk and milk products following the growth of dairy farming had also accelerated the imort of milk products. Here a simple calculation was made in an attempt to estimate the consumption of market milk in Seoul City in 1975 on the following assumption:

	Present (1967)	1975	Remarks
Population of Seoul City	(1,000 person) 3,969	(1,000 person) 4,600	Annual growth of 2% was estimate.
Daily consumption of market milk per 10,000 population	(*1) 43 kg	(*2) 188 kg	

NOTES: (*1) indicates the result in Seoul City in 1967

(*2) indicates average consumption in the Kyushu Area of Japan in 1960. (Lowest consumption area in Japan is the same year with annual per capita income of ¥90,000).

The result of calculation shows a daily consumption of 86 M/T and an annual consumption of 31,390 M/T. Assuming that the share of milk consumption in Seoul City in 1975 is still around 1/2 of the total consumption in the country, the level held in 1967 and 1968, the consumption of market milk in Korea in 1975 is expected to grow to about 63,000 M/T. Consumption in other key cities beside Seoul and Pusan is also expected to make a rapid growth depending on the supply situation of market milk. It was witnessed in the summer of 1969 at the capital city of a Do (province) convered by the recent survey that the supply of market milk could not satisfy the sharp increase of demand which was particularly keen depending on the season. It is considered, therefore, that the total consumption of market milk in the country may exceed the above estimate under certain circumstances.

Calculations were also made on modified powdered milk for infant as a typical example of milk products. Taking Japan, for example, the average annual consumption (level) of milk powder by a artificially-fed-infant is: 450 g x 9 can x 12 month = 48.6 kg (equivalent to 420 kg of raw milk) and that by a mixed-fed-infant is said to be 25.4 kg (equivalent to 220 kg of raw milk). Assuming that the total production of milk products in Korea, 11,583 M/T in raw milk, is to be converted to milk powder, it will be only sufficient to feed 27,600 artificially-fed-infant and will be only enough to feed 52,600 mixed-fed-infant. Still more, because of the present classification which includes sweetened condensed milk and ice-cream in the category of milk products and in view of anticipated growth in demand for milk products for use in confectionery, which was relatively a small quantity in the past, demands for milk products as a whole is expected to grow considerable as the result of diversification of new drink milk product and increase demand for them.

2-1-5 Imports of Milk Products and Customs Duties

As described previously, only milk products now on the import list is the aid milk products (dried skimmilk) which is being imported under a foreign aid program. However, the government in an attempt to improve its balance of payments situation and promote domestic dairy farming, is now placing a ban on the import of condensed milk and is taking restrictive measures against the import of other milk products.

Customs duties imposed on imported milk products range from 80% to 150% as shown in Appendix (33).

Republic of Korea became a member nation of GATT in 1967 and it is needless to say, therefore, that the Korean dairy farming and milk industry are expected to become internationally competitive in the future.

Comparison of domestic prices of main milk products in Japan and Korea as shown in the following Table 60 indicates that the price in Korea is approximately 20% higher than that in Japan. In the future, however, the price in Korea is expected to come down with the increase of the production of milk and the improvement of facilities.

Table 60. Comparison of Milk Products Prices in Korea and Japan.

Description	Korea (A)	Japan (B)	A/B
Fullfat sweetened condensed milk 397 g can	105 won	88 won	119%
Modified milk powder for infant 450 g can	250	215	117

Note: Korea: Sales price by the Seoul Milk Cooperative

Japan: Producers' sales price, average price in 1968

Fullfat weetened condensed milk ¥110

Modified milk powder for infant ¥270

2-2 Raw Milk Transaction

2-2-1 Raw Milk Collection and Shipment System

Each time the cow is milked the farmer puts the raw milk in milk cans, each having a capacity of 20 kg or 30 to 40 kg in weight, without cooling and delivers them to nearly milk plant by bicycle, bicycle-down cart or tiller. In some districts, use of containers similar to closed plastic gasoline containers was also witnessed. In the village of Chonghan located between Pyogtek and Chonan, there is a milk cooling station for collected milk operated by the Cheongweon Provincial Dairy Farm cooperative (membership of 64 with 660 - 670 heads of dairy cattle) and equipped with a 1 T/h brine plate type cooling unit and a milk storage tank having a capacity of 5,400, where the raw milk collected from the farmers in the neighboring area is once cooled and then shipped to its Chonan plant by tank lorries of the Namyang Milk company.

Quality inspection of raw milk at the above milk collecting stations and general milk plants (except small plants) includes flavor test, alcohol test (68%), acidity test, specific gravity test and fat test (not conducted at milk collecting stations). Resazurin test is also conducted on rare occasions. Quality of milk at time of the survey in mid September was satisfactory in general with the exception of a very few cases. However, in view of the fact that analytical tests made on condensed milk and powdered milk revealed a considerably large quantity of yeast mixed in these products, it

was felt that more attention should be paid to the improvement of quality of these products.

Incidentally, the ratio of milk condemned by the above inspection conducted at time of the survey in early autumn was in the range from 1 to 2 % but this rate seems to increase to 5% in the busiest season such as the farming season and midsummer.

Fat content is in the neighborhood of 3.5% but at present the raw milk is sold simply on weight basis and no additional price is paid for high fat content but the raw milk with fat content less than 30% is being handled as condensed milk.

2-2-2 Raw Milk Sales Price

Standard sales price of raw milk is set at 50 won per kg on delivery to the plant but when the collection of milk by the plant is made to individual household, collection charge of about 2 won per kg is deducted from the price of milk. However, some milk plants are paying about 53 won for one kg of milk as a net-profit of farmer and some enterprises are even providing loans on the condition that farmers deliver milk in the quantity exceeding a certain level in their attempt to secure stabilized milk supply.

In any event, an overwhelming majority of milk sales is by direct dealing between dairy farmers and the milk plant and the payment of milk price is not made through agricultural cooperative in most cases. With the increase in the number of dairy farming households and the growth in the sale of milk in the future, it will be necessary for producers to make further efforts for the improvement of milk collection and shipping system and related facilities.

The most serious problem which may have a great effect on the sale of raw milk and consequently the cost of dairy products in Korea is the fact that the raw milk sales is based on the single price system irrespective of the type of usage and that the price level is extraordinary high compared with international standards.

Table 61 Comparison of Raw Milk Producers Price by Country.

(Yen/kg)

Country	For Market Milk	For Milk Products	Remarks
U.S.A	(1) ¥50.24 – ¥51.43	(2) ¥ 32.42	(1) Standard price at market milk wholesale market. 3.5% fat. (Jan. – May 1968) (2) Buttermilk. Producers receipt ex factory. average 3.69% fat. (Average price in 1967)
EEC		37.08	Common indicator price ex factory. 3.7% fat. (July 1966)
Australia	(1) 27.32	(2) 16.84	(1) Producers' receipt. Plant tank lorries are used for collection. 3.5% fat. (1967) (2) Producers' receipt on butter fat transaction, price in term of 1 kg of raw milk. (1967)
Japan	(1) 52–53	(2) 37.03 (3) 43.03 (4) 46.60	(1) Estimated contract price set by producers association. 3.2% that (Oct. 1969) (2) Standard proce set by the Livestock products price stabilization law. (3) Government-guaranteed investock product price. 3.2% fat (19690) (4) Average price by the survey of prices and wages in agricultural community. (1968)
Korea	₹ 65.00		Producers' price ex factory = 50 w/kg x 1.3 9(in yen)

Source : Summarization of data for each country.

As shown in Table 61, while the price of raw milk intended for market milk in the United States and Japan is in the neighborhood of 51 yen/kg which is still considered rather high (although the conditions such as the quality standards and milk delivery points differ in each country), the price in Korea is equivalent to about 65 yen/kg, about 30% higher than that in the United States and Japan. Moreover, in Korea this price is directly applied to the raw milk intended for milk products and as a result, against the price of raw milk intended for milk products which is about 65% and 83% of the price of raw milk intended for market milk in the United States and Japan, respectively, the price in Korea is held at an extremely high level.

In view of the serious effect of the single price system of faw milk and the high price level on the cost of milk products, it will be necessary to make a thorough study on this matter in every respect from the standpoint of milk producers, process industry and consumers and also from the standpoint of national economy in the course of future development of dairying in Korea so that it will be brought in the right direction.

2-3 Milk Industry

Demand and supply of raw milk and milk products in Korea have already been discussed in the previous section. Production of milk products, particularly the condensed milk, production of which began in 1963 and the powdered milk which began its first domestic production in 1965, has a very short history and the production level is extremely low compared with that in other countries of advanced dairying.

A study on the present state of milk industry which is responsible for the production of market milk and milk products in the country shows that the market milk plants are located in all the major cities of the country including Seoul City (See Appendix 28) with a total number of 25, of which 18 are in operation and 7 are not in operation as of September 1969.

Milk products processing plants now in operation are the Seoul Milk Cooperative Plant, Namyang Milk Industry Co., Ltd. in Chonan City and three others, of which one plant is a tentative establishment only to process a small amount of left-over market milk during the winter season. In addition to the above plants, those authorized for establishment under the provisions of the Livestock Products Processing Law but are not in existance or operation are the Pusan Milk Cooperative Plant and the Korean Milk Industry Corporation Plant in and around Pusan City and four others in Kyong Sang Namdo and Kyong Sang Pukdo.

Recent survey made by the mission shows that an overwhelming majority of milk plant facilities in Korea are extremely small in size with the exception of a few cases. In the case of market milk plant, for example, while being equipped with a small HTST pasteurizer, the bottle washer provided is an inefficient hand washing type or there is no refrigerator provided. These plants not only present sanitary problems but seem to require many extra hands (2 or 3 workers for processing 180 liter of raw milk) partly due to unbalanced equipment distribution.

Most of these market milk plants are located in the urban area.

Because of limited plant space or unfavorable traffic condition around the plant area, receipt of raw milk and shipment of products are not smoothly carried out, resulting in an inefficient plant operation. Expansion of facilities at the present location is not conceivable for the most of these plants.

One of the problems in processing market milk is the handling of milk bottles. In Korea bottles are manufactured by the month-blow method which sometimes cause irregularity in the bottle shape. Particularly, because of frequent occurrence of bottles (presently, the majority are 180 cc bottles and the rest are 360 cc) having a slightly distorted neck getting mixed with other bottles, thus resulting in the breakage of bottles during filling operation or in some extreme cases fragments of broken bottles getting into the milk. This is not only a health hazard but is unfavorable from a economical point of view. For this reason, it is important to plan for the production of standard bottles.

Major milk processing plants are the Seoul Milk Cooperative plant, Namyang Milk Industry Co., Chonan plant and Korean Food Co., Suwon plant, all of which are listed in Table 62 as the project area plant and there are not any other significant plants in operation except the above three.

Even with the above three plants, only the Namyang plant is equipped with a continuous system such as the powdered milk continuous manufacturing facility largely due to a small supply of raw milk at the initial stage of operation and because the fact that facilities had to be expanded gradually according to the increase of raw milk supply and the growth of demand for special milk products. Therefore, in the event of a sharp growth in the supply of raw milk in the future, there will be a need for improvement or replacement of existing facilities.

A study on the production capacity and operating conditions of dairy plants in the whole country shows that the present facility has an over-capacity for the present supply of raw milk amounting only to about 22,000 M/T (in 1968). In the case of milk processing plants in particular, all of the major plants seem to have a considerably large surplus-capacity mainly due to the recent addition or expansion of facilities.

However, the above stated over-capacity is not the result of stagnant demands but is largely due to unsufficient supply of raw milk. It is expected, therefore, that this situation will be gradually improved with the increase in the supply of raw milk unless there is a rush of planless addition of new facilities.

A study on the state of processing facilities by area as shown in Table 62, "Status of Milk Plant in Project Area" shows that the market milk processing facilities operated by the Seoul Milk Cooperative are in full operation in the summer season when there is a growing demand for market milk and that in the Kwangju area there is no available facility for processing the left-over of the market milk in the winter season when the demand for market milk drop. For the latter in particular, economic transportation of excess milk to the Namyang plant or other plants on permanent base would be difficult in view of the present road conditions and the distance to be covered. Besides, the Pusan Milk Cooperative Plant, the leading market milk processing facility in Pusan City, is now in full operation and the present facility is not considered adequate to meet the growing supply of raw milk in the future.

At present, construction of a milk plant in Korea requires permission of Minister of the Ministry of Agriculture and Forestry under the provisions of the Livestock Products Processing Law. Standards for the processing facilities and the manufacture of milk or milk products containers are also governed by the provisions of the Livestock Processing Regulation under the same law. It is also provided by the said regulation that the commission for milk processing is not to exceed 50% of the cost of raw milk.

Table 62 Current Status of Milk Processing Plants in the Project Area

Location	Plant	Type of Management	Products	Inauguration	Milk collecting area	No. of milking cows affected	Daily collection of raw milk	Production capacity and workability (in raw milk)			
								Capacity (annual)	Achievement in 1968	Workability	Remarks
Seoul city	Seoul Milk Cooperative Plant	Specialized Agr. Coop.	1) Market milk 2) Condensed milk 3) Milk powder ice-cream	May'63 Mar'63 May'65	Seoul city and surrounding area including Yangzu and Siheung. Collecting time is 2 to 4 hours. Milk is brought from Pusan in winter.	Member of Co-operative numbers 800. Milking cows numbers 8,000.	50~80 M/T	Market milk - 7,665 (calculated in milk powder) 15,768 ice-cream 400 q/1 tin	5,948 M/T 12,444	78% 79	Market milk processing facility 6,000 bottle/hx1. 360 cc bottle, 3,000-4,000 bottle/hx1 in full operation in summer. Powder milk facility - 3,600 kg/h. Dryer was completed in Sep. '69 and therefore is of 100% workability. Evaporator is of Batch type.
Suwon city	Korean Food Co. Plant	Private enterprise	Powder milk	Jul'69	In and around Suwon city and Pyongtek area.		2~5	2,920 (in milk powder)	5 T/day (Oct. 1969)	63	Capacity of dryer - 1 T/h. Evaporator is of the Batch type. Market milk proc. facility is under plan.
Cheonan City	Namyang Milk Industry Co. Ltd. Cheonan Milk Plant	Private Enterprise	Milk powder Condensed milk	Dec. '65 Dec. '68	Cheongweon gun Goesan gun and around Cheonan city In winter milk is also brought in from Pusan area.	Three co-operative in Cheongweon and Goesan Share 80% of the total quantity. Remaining 20% is shared by individual farmers.	6~10	6,716	1,685 (Jul'68 Jun '69) 2,600	25 39	Main facilities are of Northern Europe's continuous system. Capacity of evaporator is 2,300 kg/h.
Kwangju City	Livestock Co-operative's Milk plant	Specialized cooperative	Market milk	Sep. '54	Kwangju City and 6 guns in the neighboring area	About 600 heads of dairy cattle	½ 1	2 T/day	1 T/day	50	720 batch pas. x 1. Manual bottle cleaners Food processing such as fruit canning is the main function. One extremely small domestically manufactured single effect evaporator is in use. Plant operates only when there is left-over of market milk. The facility was not in operation at time of survey.
"	Honam General Food Industry Co's Plant	Private Enterprise	Condensed milk	1969	"		0.5~1 only fall to spring	0 5 T/day	0.5~1.0 T/day	100~200 when in operation	

(Notes) 1. Source: Current status of Dairying by Livestock Bureau, MAF, data on operation company and field survey.

2. Production Capacity. Standard capacity was determined on 8 hour operation of main facilities on the basis of facilities at time of field survey conducted in September through October 1969. In the case of the plants manufacturing both condensed milk and milk powder, same evaporator is used for both products. Capacity shown is based on the production of milk powder.

3. Production results: For the plants which had no production achievement in 1968 or those for which production result was not available, production was estimated based on the conditions at time of field survey.

4. Deletion of extremely small plant. Extremely small plants having a capacity less than 2 T/B of raw milk are not indicated in the above table except special cases.

CHAPTER III S U M M A R Y
(COMMENTS AND RECOMMENDATIONS)

CHAPTER III SUMMARY (COMMENTS AND RECOMMENDATIONS)

1 Comments of Project Planning

1-1 Organization of Project Operation

1-1-1 Selection of Project Area

Under the present social and economic conditions inevitably requiring a structural change of agriculture, the efforts of the Republic of Korea Government and other parties concerned for the development of agriculture in Korea as seen in the establishment of classified agricultural area on the principle of the right crops in the right place and such administrative measures as the implementation of "Special Project for the Increase of Income For Farmers and Fisherman" based on the concept of the main comprehensive production area are expected to bear fruit gradually. On dairy farming, the following four priority areas have already been designated and efforts are being executed for the development of dairy farming centering on these project areas. Further, the current project plan calling for systematic selection of the Central and Honam districts for project area is considered most appropriate also from the following reasons.

Production center for raw milk for market milk	Central district (Ansong, Pyongtek, Chonan, Choongweon, Goesan)
	Yungnam district (Pusan, Dongnae Ulsan, Yangsan, Milyang, Kimhae)
Production center of raw milk for milk products	Honam district (Kwangju, Changsong, Tamyang, Changsong, Hampyeong, Naju, Whasun)
	Yungdong district (Kyongju, Weolseong, Yongchon, Kyongsan, Taegu)

Under the circumstances where the consumer's market in Korea, while possessing a strong potential demand for milk and milk products, is in the stage of transition to combine such potentialities with effective demand, there should be careful attentions paid to this point. In this context, the above four areas may be divided into the following two groups.

Central district and Honam district
Yungnam district and Yungdong district

In making a forecast on the future demand for market milk it will be most appropriate to take up the Central and Honam line which is backed by Seoul City and includes the city of Taejon and Kwangju. Development of Chollanamdo which is behind in every respect but is under favorable condition as a dairy farming area is considered most urgent.

On guidance for individual farmers for which the administrative guidance alone was not sufficient in the past, it is hoped that the Korean Dairy

Foods Company, the project operator, will be provided an integrated guidance system ranging from the production, processing to the marketing and establish a complete business structure for the development of the area as a model dairy farming area.

1-1-2 Project operator

Since 1962 the government has been making a vigorous effort for the development of dairy industry under the Dairy Industry Development Project centering around the import of foreign dairy cattle. However, actual execution of the project has been the function of the National Agriculture Cooperative Federation with a strong support of the government.

On the other hand, it seems that the priority was mostly given to the increase in the number of dairy cattle. This process was unavoidable in the early stage of development of dairy industry, particularly, when the political, economic and social conditions were pressing for immediate results. Accordingly, there are quite a few problems involved which must be given due consideration. Today, with high economic growth based on the principle of industrialization, social structure is undergoing a rapid change. For this reason, it may be said that both agriculture and dairy farming, one of the basic element of agriculture, have come to a turning point for further development under a carefully planned project based on the long range viewpoint. It is considered desirable, therefore, that AFDC delegates the implementation of the project to the Korean Dairy Foods Company, its wholly owned subsidiary. In implementing the project, special attention should be given to the following points.

(a) The government is to provide adequate guidance and support to insure smooth operation of the work implemented by AFDC.

(b) AFDC is to fully support the Korean Dairy Foods Company and participate in substance in the execution of the project work as its own undertaking.

(c) AFDC and the company are to make efforts to maintain close relations with the National Agricultural Cooperative Federation and its subordinate organizations and plan for positive utilization of promotive power of these organizations.

1-2 Dairy production

1-2-1 Increase of Dairy Cattle

Dairy cattle multiplication plan is estimated on the nation-wide level and no detailed plan by regional classification such as do (province), gun (county) and Yu (town) and Men (village) has been established. The estimate which seems to be somewhat overevaluated in some points compared with the past achievement, should also be reexamined.

1-2-2 Introduction of Dairy Cattle

In consideration of the existing conditions and the preparedness of the proposed area, it is desirable that the number of dairy cattle to be brought in should be 1,000 for Kyonggido, 1,500 for Chungchong-namdo and 2,500 for Chollanamdo.

In establishing standards for the introduction of dairy cattle, the following points must be taken into consideration.

(a) Introduction of pregnant dairy heifers has so far been a success in respect of both management and the increase of the number of cattle.

(b) Keen desire of the farmer for realizing profit as early as possible.

From the above reasons, the plan calls for the introduction of pregnant diary heifers only but it involves the following problems.

(1) Extreme difficulty in procuring a large number of pregnant dairy heifers.

(2) High risk of abortion or still-birth during transportation.

(3) Difficulties in providing necessary measures against the possibility of infertility or low milking ability after the cattle is imported.

(4) Apprehensions over the technical standard and other aspects in bringing in a large number of pregnant dairy heifers to inexperienced farmers at one time.

(5) Lack of adequate measures for nursing and raising calves born to the introduced cattle in respect of techniques and raising system.

In establishing standards for the introduction of dairy cattle, therefore, it is desirable that the present plan be reexamined to include the introduction of adequate number of heifers not in-calf in combination with the pregnant cattle not only for the savings of foreign currency but also for eliminating the abovementioned obstacles.

However, in view of the problem involved in determining reaction at time of guarantine of such heifers imported from the countries where Brucellosis vaccination is being administered, there will be a need for making prearrangement in close coordination with the countries from which cattle is being purchased on the purchase and inspection method to insure smooth implementation of the import.

1-2-3 Dairy Calf Raising System

It is desirable that an improved system for dairy cattle raising be established as early as possible from the following reasons.

(a) The type of dairy farming which is not benefited by the basis of forage production may include the mixing farming and large scale ranches operating in the suberbs of city area. With this type of dairy farming, separation of calf raising portion from its function in an anticipation of increased efficiency of the management may be conceivable.

(b) Also with other types of dairy farming, farmers are liable to sell heifers as a source of cash income except the cattle raised as a replacement or as a portion to meet the requirements under the multiplication

project.

(c) Though it is desirable to reexamine the present plan so that the heifer may be included in the cattle import project, it is also conceivable that the imported young heifers are raised by mass raising method and made into pregnancy before delivery to individual farmers depending on their preparedness for receiving the cattle.

(d) To secure dairy cattle resources within the country, it is essential that a system be established to insure favorable growth of cattle and that smooth circulation of heifers is to be maintained.

For the establishment of improved system for calf raising, it is desirable that a careful attention be paid to the following points.

(1) Even though the immediate implementation of mass raising at the national or provincial model farms may be difficult, a effort should be made as soon as possible to make necessary arrangement for such event.

(2) To take necessary measures to encourage farmers benefited by the basis of forage crops and the group of such farmers to form a calf raising center.

(3) To establish systematic means for financing calf raising.

(4) To plan for an effective utilization of the company's model farm as the place of calf raising for farmers.

(5) To plan for early realization of purchasing method based on proper assessment of heifers and to encourage market transaction.

(6) To take necessary measures to relax present restrictive provisions for obtaining loans for the introduction of heifers.

1-2-4 Introduction of Bulls

Under the proposed plan, the company is to raise breeding bulls and distribute semen. However, it will be extremely difficult for the company to fulfill this work both from technical and economical points of view. Selection and distribution of bulls should not be evaluated by the production of semen alone but also by the result of cattle improvement brought by the use of semen. Particularly, in view of the impending general use of frozen semen, establishment of proved sire system will become a prerequisite to the implementation of this project. For this reason, the company should rather direct its efforts to the fulfillment of guidance by sharing the responsibility of testing and registration with artificial insemination service as its main function. If and when the introduction of bulls is required for the Honam district, it is conceivable that the company purchase these bulls and consign them to the provincial livestock breeding farms.

1-2-5 Artifical Insemination Service for Dairy Cattle

Distribution of semen for artificial insemination service is now made through two different channels state or provincial facilities and the facilities of the NACF's Artificial Insemination Center. In all cases, however,

actual insemination service is being carried out by the artificial insemination service facilities of local agricultural cooperatives or livestock cooperatives.

It is desirable that the company establishes unit artificial insemination stations and assign to these stations dairy instructor-technicians who are responsible not only for artificial insemination service but are familiar with breeding technique and the management of stock raising.

1-2-6 Selection of Participating Farmers

It is desirable that the following criteria be given a full consideration in selecting participating farmers.

(a) Selection should be made with the aim of helping establish independent management which will be supported mainly by family labor. Consequently, the minimum requirement is that the participating farmers will be able to secure income level compatible with that of urban workers in about five years.

(b) To classify the type of farming management and establish standard target on the size of dairy cattle raising for each classification. This target must be established by taking into consideration the available means for the attainment of the target on the basis of the existing conditions.

The following requirements established by AFDC as a minimum requirement for the selection of participating farmers are considered appropriate.

(a) Thefarmer must possess 1.5ha or more cultivated land and must be able to utilize 0.8 ha or more of the foregoing acreage for the cultivation of forage crops.

(b) The farmer must have access to 2.0 ha or more grassland and must have abilities to manage and utilize such grassland.

(c) The farmer must be a graduate of highschool or above, or must have a successor who is also a graduate of highschool or above.

(d) The farmer must be able to play the leading role in his respective area.

(e) The farmer must be able to provide mortgage for dairy cattle introduction loan and equipment loan.

(f) The farmer must have finished required technical training at institutions such as the company's model livestock farm.

In the past most of dairy farming were the object of investment by city capital under unavoidable circumstances but the above criteria was the minimum requirement for the improvement of basic policy required to combine dairy farming with the income of rural area and individual farmers.

1-2-7 Establishment of classification of Dairy Farm Management and Business Design

In order to realize stabilized and efficient dairy farming as early

as possible for the benefit of newcomers and existing dairy farmers, it will be important to give priority to the implementation of promotive measures by establishing classification of dairy farming by taking into consideration the locality and production requirements.

Also in view of the need for making estimated on the total investment for production facilities under this project and evaluating overall economic effectiveness, it is desirable that a business analysis be made for each classification and operating year to justify the profitability of the business and the prospects for the repayment of loans. In this connection, the following points should be given special attention.

(a) In classifying dairy farming, essential elements should be selected from various factor of production and management of dairy farming and other sectors as the index of classification and at the same time the number of participating farmers should be fixed.

(b) For each classification, target operating size, production structure and promotive measures should be established in that order by taking into account the production requirements and the prospects for the improvement of techniques under each classification.

(c) In making a business analysis for each classification of dairy farming:

(1) Analysis should be made on various factors of production and management for each operating year with the consideration given to the present state and the prospects for the future improvement of techniques.

(2) Analysis should be made on the result of each profitability study by means described in the project planning to review the feasibility of the project, particularly to evaluate the repayment plan and net income so that the feasibility of the project may be justified.

1-2-8 Utilization of Machinery for Dairy Farming

So far, agriculture in Korea with its overpopulation had to be satisfied with the position of buffer zone for the unemployed for the nation. Meanwhile, farm work itself had to face a long standstill as seen in unavoidable seasonal idling of farm labor. However, the recent change in the economic condition is so rapdi that there is a strong indication that the outflow and the decreasing trend of agricultural population will be further intensified at an unexpectedly high pace.

So far, in the management of dairy farming, particularly that of the enterprise dairy farming, most of the work including development and utilization of grassland had to depend on hand labor and the management was supported mainly labor of low wage and overwork by contract. This practice, however, is now showing its limitation from a technical standpoint as well as wage increase.

Meanwhile, tiller has come to be in wide use at a rapid pace but the machine is not necessarily be in effective use because in most cases it is used for transportation purpose. This may be partly due to lack of smooth

supply of attachment; but mostly due to lack of willingness for promoting rationalization of business structure on the past of producers. The Government is now working out a draft plan of the Agriculture Mechanization Promotion Law under which the government is contemplating to set aside 2 billion won as fund for the introduction of farm machinery, which will be loaned to farmers on condition that it will be repaid in 5 years with an annual interest rate of less than 5%.

The government is also planning to establish the Agriculture Development Corporation in an attempt to accelerate project work by providing large trucks in the development and, improvement of grassland, farm land and drainage.

In the fiscal budget for 1970, the government estimates the number of tillers already in use at 9,000 and demands on outlay for financing loans to cover 16,000 units in 1970. Thus the use of small farm machinery is expected to make a rapid progress in the future.

Judging from the above mentioned trends it may be said that the mechanization of agriculture in Korea has already begun and its diffusion to the entire country will probably be realized much earlier than expected. Dairy farming is one of the fields which must be mechanized at the earliest opportunity and at least there should be a study and preparation for the time when the need arises. Under present circumstances where the problems of capital investment for the manufacture of farm machinery still exist and the rural area is suffering from overpopulation, the government should take a positive measure to lead the mechanization program in the right direction. This measure should include the following:

(a) Establishment of systematic structure for the utilization of machinery by taking into account the comparative economic advantage of mechanization over the labor cost and anticipated improvement of techniques in production and utilization of forage crops and to incorporate this setup into the project.

(b) Under the current rural area electrification plan of the government calling for an annual progress of 15%, priority should be given to the area under this project as much as possible.

(c) In view of anticipated need for milker among the machinery for the operation and management of dairy farm, purchase of this machine should be incorporated in the project by comparing the price of machine with labor cost.

1-2-9 Operation Company's Extension Service Plan

According to the project plan, the operation company is to operate the Korea - New Zealand Model Farm to demonstrate management and to provide training for farmers and technicians and further plans to assign instructors in the farm area at a rate of one instructor for every 200 heads of cattle brought in or one instructor for every forty units of farm household. The intention of the operation company to establish an integrated business structure from production to sales may be called as a very positive and appropriate approach. However, in providing guidance on the essential items, the operation company should pay attention to the following points.

(a) In addition to the administrative guidance, the guidance provided by the operation company should be in the form of supplementing the former and should give priority to feeding, breeding and prevention of disease in individual farm management. It is preferable that veterinarians are assigned as instructors.

(b) Operation of model dairy farm should be planned not only for milk production but for the management including the purchase and raising of calves.

(c) Efforts should be made to obtain government subsidy for training project.

(d) Special efforts should be made to upgrade technical level of technicians and measures should be taken to provide means of transportation such as motorcycle for individual guidance.

1-2-10 Guidance on the Production of Dairy Beef

Production of dairy beef in the form of raising and fattening bull calf is playing an important role in providing beef resources and in the management of dairy farming. It is desirable therefore, that a particular attention be paid to the guidance on the dairy beef production in the future (See Annex No. 2).

1-2-11 Development and Utilization of Grassland

(a) Grassland development and improvement plan should be worked out for each Do (province), Yu and Men.

(b) The plan should also include grassland maintenance and utilization.

(c) On introduction of tractors, the type and the number of tractor should be specified for each district. Since a rapid increase in the number of tiller is expected in the future, consideration should be given to ~~domestic~~ production and utilization of attachments and at the same time, the need for larger machinery, if any, should be clearly indicated.

1-2-12 Production and Utilization of Forage Crops

Under the current project, management of dairy farming with 5 heads of cattle is based on the utilization of 1 ha of intensive grassland for grazing and soiling, 1 ha of grassland of mixture sowing of legume and grasses for the purpose of hay making and 1 ha of cultivated land for corn as silage material and for mixture sowing of rye and vetch for soiling. However, with the expansion of operating size and the improvement of management, a standard for the production and utilization of forage crops should be established and a crop cultivation plan should also be established for available cultivated land within the area.

1-3 Demand, Supply and Consumption of Milk and Milk Products

1-3-1 Dairy plant project

It is advisable that the size and design of dairy plants to be

constructed in the project area and milk processing plan be based on the separate plan prepared for No. 1 and No. 2 plant but the following points should be given careful attention in working out such a plan.

(a) It is an indispensable requirement that the required quantity of raw milk, the basis for determining the size of each of the above plants, is to be secured.

(b) The size of the plant was determined as the first step on the ground of present status of production and supply of raw milk, and demand forecasts for market milk and milk products in the project area. On this basis, the capacity of plant No. 1 was set at 12,000 bottles/hour (180 cc in contents) of market milk with one line system and that of plant No. 2 at 6,000 bottles/hour of market milk with one line system and a set of milk powder processing equipment of 2,100 kg (in raw milk per hour). However, from the standpoint of more economical plant operation, it is desirable that the attention be paid to the centralization of raw milk collection and the expansion of plant facilities in pesponse to the increase in raw milk supply and the growth in the demand for market milk and milk products in the future. With the milk products plant in particular, it is desirable that the daily milk processing capacity be increased to such a large quantities as 50 to 60 M/T. In working out the current plant project the vision as mentioned above should be given due consideration.

(c) The site to be selected as plant location should meet the general conditions called for by the criteria for the location of dairy plant. For No. 1 plant (Specialized in market milk production) which depends on the supply of raw milk from the Central District, an appropriate site must be selected by taking into account its relationship with certain plants in the project area which will be sharing the production of milk products on the supply of surplus milk by this plant, and various factors concerning market milk sales area.

(d) The plant should be able to maintain standard operating hour. three years after its inauguration.

(e) Operation and management of each plant as well as manpower requirement should be rationalized as much as possible and effort should also be made to cut down production cost such as milk handling and processing costs by planning centralization of raw milk supply.

(f) For the Korean Dairy Foods Co., Ltd. which is responsible for the operation of these dairy plants, it will be necessary to establish an organization for the supervision of the plants and particularly the product sales network including transportation of products.

1-3-2. Demand and Supply plan for Market Milk and Milk Products

In working out a demand and supply plan for market milk and milk products centering around the project area, consideration must be given to the maintenance of equilibrium with the national project of the government by making a careful study and fully understanding the position of the project area in the overall supply and demand plan for the entire nation.

2 Matters to be given special attention in promoting dairying

2-1 Dairy production

2-1-1 Improvement and multiplication of dairy cattle

(a) Efforts should be made for proper allocation of outstanding bulls, as well as for the selective culling of privately-owned bulls.

(b) Improvement and expansion of facilities of the provincial Livestock Breeding Stations should be accelerated and effort should be made for systematic implementation of progeny test through the state and do (province).

(c) Promotion of mass breeding areas should be planned through the establishment of dairy cattle improvement bases.

(d) Efforts should be made to up grade the technical standard of dairy cattle artificial inseminators and measures should be taken to provide means of transportation such as motorcycle for their activities.

(e) Plans should be worked out for establishment of a system for the use of frozen semen.

(f) Efforts should be made to promote the understanding of the farmers on the importance and necessity of dairy cattle registration and at the same time, plans should be worked out to strengthen the registration organizations.

(g) Establishment of systematic dairy cattle breeding organization should be planned along with the guidance on management by implementing performance test for dairy cattle.

2-1-2 Production and utilization of self-sufficing feed

(a) A complete and thorough guidance should be provided on the seed production of forage crops and grass and an organization should be established for testing of both domestic seed and imported seed.

(b) Technical standards for the production of forage crops and grass and legumes should be established and efforts should be made to improve such standards.

(c) Efforts should be made to improve the method used in the development and improvement of grassland and attempt should be made to obtain expanded support of the government.

(d) The government should provide fund for the procurement of grassland.

(e) Utilization of machinery should be encouraged by public entities for the development and improvement of grassland.

(f) Promotive measures for the construction of posture road and required auxiliary facilities for the utilization of grassland should be

provided or expanded.

(g) Establishment of distribution system of roughage should be planned.

(h) Measures should be taken to release grassland owned by public organizations so that they may be utilized by public.

(i) Efforts should be made to establish a breeding system of grass and legume and forage crops and constant efforts should be made over a long period of time for the study and research work on summer withering and utilization of native grasses.

2-1-3 Diary cattle raising and dairy farm management

(a) Utilization of milk replacer should be encouraged in calf raising.

(b) Efforts should be made to establish a system for raising calves and heifers, particularly the mass raising method.

(c) Utilization of machinery for dairy farming should be promoted and encouraged.

(d) Current Beef price restraint measures should be reexamined to encourage beef production and efforts should be made to establish fattening techniques for dairy bull calf as a means of promoting dairy beef production.

2-1-4 Organization of dairy farming extension service

(a) A particular attention should be directed to the upgrading of technical standard of dairy farm technicians.

(b) Attention should also be given to the upgrading of technical standard of farmers.

(c) A study should be made on the feasibility of establishing the Dairy Farming Instruction Center (tentative designation) in major dairy farming areas.

(d) Expansion of animal health center and strengthening of its functions should be planned.

2-1-5 Animal Health

(a) Attention should be paid to the hygien of dairy cattle, particularly to pasturing hygien, reproductive disturbance and brucellosis.

(b) Efforts should be made to improve the present structure for the treatment of general animal diseases and studies should be made on the advisability of establishing independent organization responsible for the livestock insurance system and combining the medical system with the foregoing organization.

(c) On the dairy cattle insurance system, efforts should be made for the improvement of the present system so that the system may be applied to condemned animals and allow group application.

2-1-6 Finance for dairy farming

(a) In assuming the responsibility of the sponsorship for financing dairy farming, it will be necessary for the Korean Dairy Foods Co., Ltd. to pay attention to the following points:

(1) In selecting participating farmers full consultations should be made with agricultural cooperatives to avoid duplication of the introduction of cattle and loans already made through the agricultural cooperatives. Collection of raw milk and redemption fund should be unified by the company.

(2) Cooperation with agricultural cooperatives of all levels should be established in the following manner.

(i) Price of milk paid to farmers by the company should be transferred to the farmers saving account at agricultural cooperatives.

A certain amount should be deducted from the price of milk and transferred to the account of the company at agricultural cooperative as redemption fund.

(ii) All dairy cattle brought in should be covered by the special livestock insurance system sponsored by agricultural cooperative.

(iii) Post finance service such as the guidance on the management and staff assignment system provided by the agricultural cooperative should be fully utilized by the company.

(iv) Artificial insemination service facilities of agricultural cooperative should be utilized to the full extent.

(b) In providing loans to farmers the company should pay attention to the following points.

(1) A thorough study should be made on the status of management and debts of the farmer concerned.

(2) Loans should be made only on the condition that the farmer is able to provide a security and gives farm land or other real estate as a security and applies for livestock insurance system for dairy cattle introduced.

(3) Conditions for loans should be such that the redemption fund be established by deducting a certain amount from the proceeds of milk sale every month from the beginning of grace period.

(4) Though there is a need for considering the risk in converting redemption fund collected from farmers to the US dollar, measures should be taken so that the risk may be borne by the government in view of the nature of such risk.

(5) Provisions should be made so that the loan provided for the procurement of feed, which is financed by the loans from treasury fund, be handled as normal loan made on the basis of money lending agreement between the company and individual farmers.

2-2 Market milk and milk products

2-2-1 Milk industry

(a) To operate a milk plant economically and realize reduction of the production cost, it will be necessary for the plant to have an operating capacity above a certain level (this requirement differs depending the type of products or the type of milk processing equipment but a daily capacity of 30 M/T in raw milk is considered as a minimum requirement and the plant producing mainly milk powder in particular tend to become larger and more centralized in its operating size). In planning the construction of a dairy plant, there should be a well arranged location plan on the basis of the dairy farming development project of the state and planless establishment of small inefficient plants should be avoided.

(b) Increase in the supply of raw milk in the future will require highly capable and efficient dairy plant equipments and it will be necessary to plan for the training of operators for these equipments and upgrading technical standard of these operators.

(c) With the increase in the number of dairy plants and the introduction of highly efficient equipment, it will be necessary to plan for fostering enterprises which will be responsible for the maintenance and repair of such equipment.

(d) It will be most urgent that efforts should be made for the improvement of sanitary condition for milk throughout its distribution channel from the shipment of raw milk to the processing and sales in order to secure consumers' trust in market milk and milk products.

(e) For containers of market milk, it will be necessary to secure production of standardized bottles of high quality as the first step.

2-2-2 Demand, supply and consumption of milk and milk products

(a) It is recommended that steps be taken to grasp actual conditions and trends of the market in the area accurately and promptly and that positive and flexible measures be taken for the production and sales of milk and milk products corresponding to the development of dairy farming in the country.

(b) In relation to the above statement, it is recommended that the production of milk and milk products in more familiarized form (such as ice-cream, milk coffee or sour milk beverages etc.) be also commenced as a means to stimulate real demand among the general public in the future and that the sales system which will enable these products including market milk and general milk products readily available to the public be adopted.

APPENDIX

Appendix (1) Share of Agriculture, Forestry and Fishery Products in Gross Domestic Products

Unit : Billon won

Description		1960		1961		1962		1963		1964		1965		1966		1967	
		Value added	Comp. rate(%)	Value added	Comp. rate(%)	Value added	Comp. rate(%)	Value added	Comp. rate(%)	Value added	Comp. rate(%)	Value added	Comp. rate(%)	Value added	Comp. rate(%)	Value added	Comp. rate(%)
Ordinary factors by expense	G.N.P. (A)	22641	11.8	27618	22.0	31898	15.5	45455	42.5	65868	44.9	75114	14.0	94637	26.0	113458	17.7
	Agriculture, forestry & fishery(B)	9054	19.0	11839	30.8	12664	7.0	20459	61.6	31201	55.9	31026	△0.7	37060	19.4	38653	4.3
	B/A×100	40.0		42.9		39.7		45.0		48.5		41.3		39.2		34.1	
Constant factors by expense	G.N.P.(a)	54864	2.2	57486	4.8	59114	2.8	64540	9.2	70202	8.8	75114	14.0	84645	12.7	90484	6.9
	Agriculture, forestry & fishery (b)	24290	0.1	26735	10.1	25125	△6.0	26937	7.2	31293	16.2	31026	△0.9	34439	11.0	32845	△6.1
	(b)/(a) ×100	44.3		46.5		42.5		41.7		44.6		41.3		40.7		35.8	

Sources : The Bank of Korea.

Appendix (2) Wholesale Price Index

(1965=100.0)

Description / Year	Total Index	Foodstuffs	Grain	Commodities other than grain	Commodities other than foodstuffs	Production goods				Consumption goods		
						Average	Raw material	Construction materials	Others	Average	Nondurable goods	Durable goods
1960	45.2	40.5	40.6	46.1	48.1	45.9	42.8	50.9	50.8	44.7	-	-
61	51.2	47.7	50.3	51.4	53.5	52.5	47.4	54.4	64.8	50.4	-	-
62	56.0	51.6	53.3	56.5	57.3	57.6	52.8	59.3	69.4	54.9	-	-
63	67.5	73.4	84.5	64.2	63.3	63.9	60.9	63.2	72.3	70.0	-	-
64	90.9	101.7	106.7	87.8	84.2	85.0	84.2	84.5	87.3	95.1	-	-
65	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
66	108.8	107.3	105.0	109.4	109.4	108.0	106.4	112.8	108.0	109.4	109.3	112.9
67	115.8	116.8	117.0	115.7	115.5	110.9	106.3	114.9	118.0	119.1	119.0	124.0

Sources : NACF

Appendix (3) Profitability Comparison of Farm Products per 10a

Description	Yield per 10a	Gross income(a)	production expense (b)	Net Profit (a) – (b)	Remarks
Rice	813 kg	18472	3689	14783	Average harvest
Barley	185	6847	2443	4557	1967
Rye	207	6561	2776	3867	1967
Wheat	264	6474	2499	4138	1967
Corn	267	6806	2677	4129	1967
Soybean	106	5676	1428	4248	1967
Red bean	102	6466	1066	5400	1967
Sweet Potato	1668	11093	2609	8484	Average harvest
Potato	965	13664	3923	9741	1967
Apple	1934	84661	32500	52161	Average harvest
Raddish	1710	14723	3454	11269	1967
Cabbage	2230	27362	6261	21101	1967

Sources : Data provided by AFDC.

Appendix (4) Trends of Agricultural Production by Year

Unit : 1,000 Won

		1961	1962	1963	1964	1965	1966	1967
Total Agricultural production		247816 (1000)	288985 (1000)	286849 (1000)	353408 (1000)	379785 (1000)	444448 (1000)	478276 (1000)
Crop Farming	Total	233871 (944)	222847 (981)	264367 (923)	326079 (907)	333830 (879)	393876 (886)	407852 (853)
	Food crop	208091 (840)	186919 (782)	211978 (740)	254360 (708)	244561 (644)	265888 (598)	274617 (564)
	Mono-polized crop	3885 (16)	4978 (21)	4963 (17)	10236 (28)	16512 (43)	21502 (48)	20018 (41)
	Fruit	2163 (09)	3394 (14)	3337 (12)	6700 (19)	9135 (24)	10619 (24)	12552 (26)
	Vegetable	8707 (35)	11545 (48)	21131 (74)	26148 (73)	36201 (95)	53485 (120)	52714 (110)
	Industrial crops	1711 (07)	1952 (09)	1995 (06)	3007 (08)	3680 (10)	5599 (13)	6281 (13)
	By-products	9315 (37)	13560 (57)	21168 (74)	25634 (71)	23741 (63)	36728 (83)	41671 (89)
Livestock farming	Total	13382 (54)	15829 (66)	21064 (74)	31920 (89)	43372 (114)	47728 (106)	66160 (139)
	Livestock	10655 (43)	12887 (52)	15959 (56)	24881 (69)	32818 (76)	34817 (78)	48568 (102)
	Livestock Products	2728 (11)	3442 (14)	5105 (18)	7039 (20)	10555 (28)	12411 (28)	17592 ((36)
Sericulture		561 (02)	759 (03)	918 (03)	1409 (04)	2582 (07)	3699 (08)	4264 (09)

Sources : Agricultural statistics year book 1968, Ministry of Agriculture and Forestry.

Appendix (5) Treands of per Farm Household Income and Agricultural Income

Unit : won

		Income			Expenditure			Farmers Income	Agricultural Income
		Total (a)	Agricultural income (b)	Non-agricultural income	Total (c)	Agricultural expenditure (d)	Non-agricultural expenditure	(a) - (c)	(b) - (d)
Year	1962	89442	73416	16026	21557	13390	2167	67885	54026
	1963	122057	100925	21132	28878	24383	4495	93179	76542
	1964	158007	128072	29935	32315	24327	7988	125692	103745
	1965	146823	115991	30832	34122	27179	6943	112201	88812
	1966	166987	131407	35580	36811	29977	6834	130176	101430
	1967	190150	150995	39155	40680	34636	6044	149470	116359
Classification by acreage	Less than 0.5 ha	120907	66493	54414	24027	14569	9458	96880	51924
	0.5 ~ 1.0	158223	119885	38338	32208	24553	7650	126020	95332
	1.0 ~ 1.5	211023	181722	29301	44481	41512	2919	166592	140210
	1.5 ~ 2.0	277098	246144	30954	58609	57589	1020	218489	188555
	More than 2.0 ha	377947	340355	37592	95285	91868	3417	282662	248487

Sources Agricultural Statistics Yearbook 1968, Ministry of Agriculture and Forestry

Note : Tax and duties and interest paid are not included in the above expenditure. Classification by acreage is for 1967.

Appendix (6) Production of Livestock and Livestock Products by Year

Unit : won

Year	Grand Total	Livestock									
		Total	Korean cattle	Dairy cattle	Pig	Goat	Sheep	Rabbit	Chicken	Duck	Horse
1961	18888278	10654887	2920084	23490	8757591	51080	845	135148	869,168	60841	12695
	(1000)	(786)	(218)	(02)	(281)	(04)	(0)	(10)	(275)	(05)	(01)
1962	15828867	12886622	4114925	74881	4249509	101427	895	194229	3570659	40816	40481
	(1000)	(788)	(260)	(05)	(268)	(06)	(0)	(12)	(226)	(03)	(03)
1963	21064105	15959115	5049187	48328	4748334	408990	2165	359278	5282318	81582	27928
	(1000)	(758)	(240)	(02)	(226)	(19)	(0)	(17)	(249)	(04)	(01)
1964	31913909	24681220	3917180	128227	7198910	224265	1784	423976	6859410	123679	3789
	(1000)	(779)	(310)	(04)	(226)	(07)	(0)	(13)	(214)	(04)	(01)
1965	43372208	32817517	10450157	53680	13066906	170100	1408	275874	8631398	182406	36088
	(1000)	(757)	(241)	(01)	(301)	(04)	(0)	(06)	(200)	(03)	(01)
1966	47227900	34816625	11766308	61982	12395428	210952	948	537568	9286407	52464	4628
	(1000)	(737)	(249)	(01)	(278)	(04)	(0)	(11)	(197)	(01)	(01)
1967	66160417	48568197	14106156	92305	18790596	178988	1961	348872	14958244	96180	-
	(1000)	(734)	(214)	(01)	(284)	(03)	(0)	(05)	(227)	(01)	

Year	Total	Livestock Products				
		Chicken egg	Duck egg	Cow Milk	Honey	Goat Milk
1961	2728386	2576921	32994	20599	80220	17652
	(204)	(192)	(03)	(02)	(06)	(01)
1962	3442245	3242912	27381	32406	102440	37156
	(217)	(205)	(02)	(02)	(06)	(02)
1963	5104990	4753286	51726	92849	144356	63323
	(242)	(226)	(02)	(04)	(07)	(03)
1964	7038689	6584192	59730	147748	177845	69174
	(221)	(206)	(02)	(05)	(06)	(02)
1965	10554691	9853246	75559	314226	193881	117779
	(243)	(227)	(02)	(07)	(04)	(03)
1966	12411275	11428065	101560	431871	238772	216006
	(263)	(242)	(02)	(09)	(05)	(05)
1967	17592220	16072861	131605	825084	376061	187609
	(266)	(243)	((02)	(12)	(06)	(03)

Source : Agricultural Statistics Yearbook 1968, Ministry of Agriculture and Forestry.

Appendix (7) Exports of Meat and Meat Products

	Korean cattle		Pig		Meat products	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
	head	$	head	$	kg	$
1965	5	950	100	3300	180598	154289
1966						83160
1967			780	33485	47817	55748
U.S.A					6128	19749
Japan					8040	3600
Hongkong			780	33485	1000	750
Other areas					32649	31644

Source : Livestock statistics 1967, Livestock Bureau, Ministry of Agriculture and Forestry.

Appendix (8) Production of Meat Products

Unit : Kg

Description	1966	1967
Ham	147335	169209
Sausage	852642	741246
Bacon	4110	5488
Wiener Sausage	-	125
C-Ration	-	20400
Meat Powder	800	749
Dry Meat	8268	8318
Dried slices of Beef	1741	524
Pork Can	18906	48078
Beef Can	157938	476932
Freezing Beef	-	6000
Other	7749	590
Total		1,477654

Source : Livestock Statistics 1967. Livestock Bureau, Ministry of Agriculture and Forestry.

Appendix (9) Laws and Regulations Concerning Livestock Industry

Livestock Industry Law

Enforcement Ordinance of Livestock Industry Law

Enforcement Regulation of Livestock Industry Law

Feed Control Law

Enforcement Ordinance of Feed Control Law

Enforcement Regulation of Feed Control Law

Livestock Products Processing Law

Enforcement Regulation of Livestock Products Processing Law

Dairy Industry Development Law

Enforcement Regulation of Dairy Industry Development Law

Grassland Law

Agriculture Basic Law

Agriculture and Fishery Development Corporation Law

Enforcement Ordinance of Agriculture and Fishery Development Corporation Law

Appendix (10) Government Budget for Livestock Industry,1969

Unit : 1,000 Won

Item	Details	Investment (subsidy)	Loans	Remarks
(1) Livestock improvement	1. Artificial insemination	66,221.8		
	(1) Central station	8,606.5		
	(2) City and county	57,615.3		
	2. Livestock Show	6,750.0		
	(1) Central Show	0		
	(2) Local Show	6,750.0		
	3. Livestock Breeding Registration	12,393.0		
	4. Replacement of Korean bulls	45,000.0		
	5. Protection of Rare Animals and Bird	8,000.0		
	6. Provincial Livestock Breeding farm project	29,703.6		
	7. Livestock mutual aid system	15,638.2		
	(1) General mutual aid	5,638.2		
	(2) Special mutual aid	10,000.0		
	8. Promotion of Outstanding bull raising	24,000.0		
	9. Training of baby chick sexer	2,000.0		
	10. Livestock industry promotion facilities	20,000.0		
	11. Cooperative Livestock Farming Area		450,000.0	Special Project
	12. Korean cattle raising		1,785,875.0	〃
	13. Dairy farming		461,038.0	〃
	(1) Introduction of dairy cattle		9,000.0	
	(2) Barn and auxiliary facilities		3,000.0	
	(3) Land procurement		341,038.0	
	14. Angora		117,400.0	Special Project

Item	Details	Investment (subsidy)	Loans	Remarks
(2) Feed Supply	1. Grassland Improvement	29,940,00	15,024,70	97,867.0 is aside from loan for special project
	(1) Intensive grassland improvement	15,500,00		
	(2) Native grassland improvement	11,200,00		
	(3) Tractor	1,320,00	2,200,00	
	(4) Survey of land suitable for grassland	1,920,00		
	(5) Special project (grassland improvement)		12,824,70	
	2. IDA Feed operating fund	3,360,00		
	3. Feed Regulating fund		5,500,000	
(3) Livestock products distribution	1. Cattle weight scale	2,293,50		
	2. Egg storage facilities	3,800		
	3. Egg grader, candler and washer	700,00		
(4) Inspection and quarantine	Construction of animal quarantine station	89,441.4		
Sub total		63,588,30	30,239,650	
(5) Administrative expense		2,148,32		
Total		65,736,62	30,239,650	

Source : Data furnished by Ministry of Agriculture and Forestry.

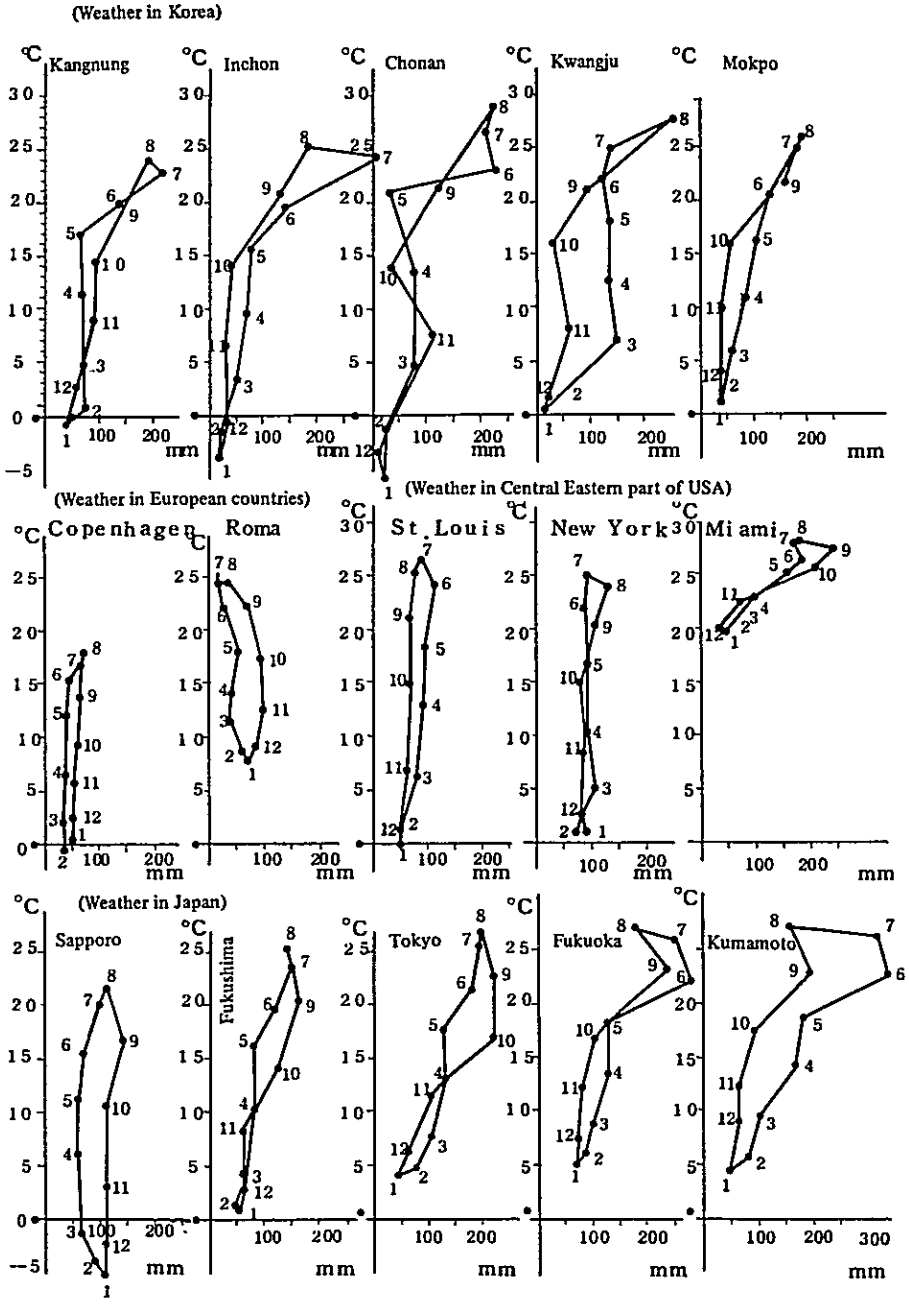
Appendix (11) Government Budget for Artificial Insemination Service

Unit : 1,000 Won

Description	Budget requested for 1970			Budget for 1969		
	Item	Breakdown	Budget	Item	Breakdown	Budget
Total Amount		Subsidy	104,645.1		Subsidy	66,221.8
Agricultural cooporative		Central	10,663.5		Central	8,606.5
	facility expense	2,442 subsidy 0.5	1,221.0	management expense	8,765.4 subsidy 0.5	4,382.7
	management expense	16,578.8 subsidy 0.5	8,289.4	Equipment & Facility expense	4,613.6 subsidy 0.5	2,306.8
	Training expense	2,306.1 subsidy 0.5	1,153.1	Bull purchasing expense	425 x 5head	1,060.0
				Training	1,714. subsidy 0.5	
City and country		171 place	92,613.6		171 place	56,459.7
	Salary	171 x 2 x 12 (22,300w) subsidy 0.5	45,759.6	Salary	171 x 40.4 subsidy 0.5	35,089.2
	Travel expense	171 x 2 x 12 (200w) subsidy 0.5	4,104.0	Travel expense	2,000 x 342 x 12 x 0.6	4,924.8
	management expense	171 place (500,000 W) subsidy 0.5	42,750.0	Breeding stock expen expense	Beef cattle 70,998 x 37 x 0.6	1,576.2
					Pig 120,450 x 169 x 0.6	12,213.6
				Breeding stock purchasing expense	52 places (3,500w) x 6 head x 0.6	655.2
				Repair of equipment	171 places (19,500) x 0.6	2,000.7
City and province personnel salary		20 x 12 (11,400w) x 0.5	1,368.0		20 (9,630 w) x 12 x 0.5	1,155.6

Source : Data furnished by Ministry of Agriculture and Forestry.

Appendix (12) Weather condition of Korea and Other countries



Appendix (13) Criteria for Forage Crop Cultivation

Type of crop	Main object	Seeding Time	Seeding rate (kg/ha)	Planting Distance (cm)	Seeding method	Annual fertilization rate (kg/ha)					Harvesting season	Yield (kg/ha)	
						Manure	Nitrogen	Phosphate	Potash	Lime			
Mixed pasture plant	-	Mid-March to early April Mid-August to Mid-September	20-30		Scattering	12000	90-160	70-140	90-180	4500	Spring, early summer and autumn. Cutting is made 3 or 4 times a year	25000 - 60000	Fertilization rate at time of improvement
Legume	Soiling, grazing, hay	〃	〃		〃	〃	10- 30	140-270	120-180	〃		25000 - 50000	
Grass	〃	〃	〃		〃	〃	140-160	140-180	120-180	〃		30000 - 50000	
Corn	Seed	Late April to early May	40-60	ridge 75-90 stup 30-45	Dot Seeding	10000-12000	100-120	100-120	100-120	1000-1500	after germination 130-140 days	2100 - 3500	
	Ensilage	〃 Late April	70-80	ridge 60-75 stup 20-30	Dot Seeding	〃	100-120	80-100	100-120	1000-1500	after germination 110-120	35000 - 50000	
	Soiling	Late April to Mid-June	80-100	ridge 45-60 stup 10-20	Drill Seeding	〃	90-100	50- 70	50- 60	1000-1500	after germination 60-80	30000 - 40000	
Oat	Seed	Mid-March to early April Mid-March to Mid-April	50-60	ridge 70-80	Drill Seeding	〃	40- 60	50- 60	50- 60	〃	Lipen	1500 - 2500	
	Soiling	Mid-August to late-August	60-100	〃 60-75	〃	〃	70- 80	〃	〃	〃	heading 30% stage	20000 - 30000	
Wheat	Seed	Late-Sept. to Mid-Oct.	50-60	ridge 70-80	Drill Seeding	〃	40- 60	〃	30- 50	〃	Period of heading stage	2000 - 3000	
	Soiling	Mid-August to Late-Oct.	80-100	〃 50-75	〃	〃	70- 80	〃	〃	〃		20000 - 35000	
Soybean	Seed Ensilage	Late-April to Mid-May	70-80	ridge 60-70 stup 10-20		〃	〃	40- 60	〃	〃	Blooming stage	20000 - 25000	
Turnip	Soiling Storage	Mid-April Early-August to Mid-August	3- 7	ridge 60-70 stup 20-30	Dot Seeding	〃	40- 60	50- 60	70- 90	〃	Before the first frost	50000 - 70000	
Sweet Potato	Ensilage	Early-May to Mid-June	36000 40000	ridge 60-75 stup 30	Transplantation	10000-15000	20- 40	50- 80	60- 90	〃	Before the first frost Late-September to early-October	Sweet Potato 15000-25000 Leaves 15000-25000	

Source : Guide to Ranch Management published by Ministry of Agriculture and Forestry.

Appendix (14) Livestock Multiplication Plan and Feed Demand and Supply Plan

Description		1967		1971	
Livestock	Korean cattle	1,242,648 head	100 %	1,540,000 head	124 %
	Dairy Cow	10,360	100	21,010	203
	Pig	1,296,109	100	1,804,300	139
	Chicken	17,097,169	100	22,044,000	129
Feed	Roughage	1,207,600 M/T	100	3,007,200 M/T	256
	Concentrate feed	1,051,300	100	2,176,490	207
Breakdown of feed	Commercial feed	523,860	100	1,338,950	255
	Modified feed			370,000	
	Reserve feed			57,000	
	Substitute feed			378,670	
	Procurement of shorted feed	26,800	100	279,000	1,041
	Formula feed	106,978	100	567,000	530

Source : Data furnished by Ministry of Agriculture and Forestry

Appendix (15) Number of Livestock Vaccinated Against Infectious Diseases

	1965	1966	1967	Seoul	Pusan	Kyonggido	Kang Won Do	Dhung Chong Puk Do	Chung ChongNam Do	Cholla Puk Do	Cholla Nam Do	Kyong Sang Puk Do	Kyong Sang Nam Do	Che Ju Do
Rinder Pest Vaccine	22599	19052	19818	-	-	8707	11111	-	-	-	-	-	-	-
Black Leg Vaccine	646942	971348	681056	2011	924	78625	72227	69680	72822	9410	8764	57079	107088	55426
Anthrax Vaccine	348113	485763	486769	-	1544	5029	-	-	-	-	-	280083	189271	60842
Rabus Vaccine	378727	458725	289337	8895	-	57717	81392	13287	15896	30450	51652	70810	8887	8922
Hog Cholera Vaccine	1746268	1865767	2129908	83737	53602	247057	97304	128842	281145	383706	352626	199536	376140	75213
Swine Erysipelas bacterin	-	74705	30821	1802	969	1993	1970	2882	9031	6178	2050	1970	1981	-
Newcastle Vaccine	11810802	11256175	11324577	6833555	-	1818552	5955238	728283	775949	797985	709201	1685618	1367002	18249
Fowl-Pox Vaccine	420032	470270	516448	239650	47934	66361	15000	60277	99081	-	-	52855	35284	-
Distemper Vaccine	-	750	1000	-	-	-	-	-	-	-	1000	-	-	-
Encephalitis Vaccine	-	30348	35652	8907	978	4714	1949	2866	3064	7307	5176	2898	2800	-

Source : Data Furnished by Livestock Bureau, Ministry of Agriculture and Forestry.

Appendix (16) Production of Veterinary Medicine

(1) Production of Vaccine

	Rinderptse Lapinized	Rinderpest Dried L-A Vaccine	Blackleg Vaccine Avirulent	Anthrax Vaccine (Spored)	Rabis Vaccine	Hog Cholera Lapinized Vaccine	Swine Erysipelas Bacterin	New castle Formolized Vaccine	New castle B1Live Dried Vaccine	Newcastle B1live Vaccine Dried
1957	-	15000	320000	3680	51900	411000	-	8415000	-	-
1958	-	20000	500000	-	1000000	160000	-	6180800	-	1500000
1959	-	20000	450000	20000	1200000	200000	-	3100000	30950000	328700
1960	-	20000	400600	20000	133640	827000	-	2720000	16033000	319400
1961	12000	-	546600	20000	244030	487100	-	5495000	5200000	-
1962	34000	-	849200	20000	424980	1863970	-	10802000	12008000	-
1963	21000	-	731800	140000	397180	1543000	60000	1013000	15045000	-
1964	23740	-	777500	206000	362740	1804800	140040	-	13179000	-
1965	22360	-	798600	292452	368840	1658200	60500	-	7150000	-
1966	21760	-	610000	518500	300400	1585700	78480	-	2002500	-
1967	24020	-	514000	302600	165720	2173360	27180	-	-	-

Source : Livestock Statistics 1967, Livestock Bureau, Ministry of Agriculture and Forestry.

(2) Production of Sera and Diagnostics

	Pullorum antigen	Mallein	Tuberculin	Contagious Pleuro Pneumonia Antigen	Brucellosis Antigen	Rinder Pest Serum
1957	10000	-	480	-	-	100000
1958	10000	-	210	-	-	-
1959	21900	-	270	-	2000	50000
1960	20000	-	550	-	2000	-
1961	15000	-	4300	-	15777	50000
1962	1551900	-	7600	500	16600	-
1963	1000020	-	3000	3000	20000	-
1964	1010000	-	21000	7000	20000	-
1965	1213200	-	10000	4100	28700	-
1966	1204340	-	18400	6000	15900	-
1967	1201200	-	9600	9600	8400	600

Source : Livestock Statistics 1967, Livestock Bureau, Ministry of Agriculture and Forestry.

Appendix (17) Diagnosis and Treatment of Aniamal Diseases

		1965	1966	1967	Seoul	Pusan	Kyong gido	Kang wondo	Chung Chong pukdo	Chung Chong namdo	Cholla pukdo	Cholla namdo	Kyong sang pukdo	Kyong sang namdo	Cheju do
Total No. of cases		100496	136928	86527	3504	325	3522	7105	466	3690	6544	5270	24062	16610	3000
Results	-	92900	135665	86039	3504	325	3462	7105	466	3690	6544	5270	24062	16610	3000
	Death	3634	3731	2744	69	17	866	583	21	330	215	192	426	298	232
	Recovery	96266	131934	83295	3435	308	2097	6522	445	3360	6329	5078	23636	16317	2768
	Digestive system	54247	65826	47646	1859	140	5499	3795	240	5562	3709	2864	18128	8841	1582
	Respiratory system	15082	38190	14921	811	63	1592	965	107	1549	1067	987	4958	2963	364
	Circulatory system	3556	2952	2399	126	15	284	319	20	192	74	116	400	714	139
	Reproductive system	3675	3744	2830	569	—	411	288	12	862	222	192	180	550	99
	Nervous system	4927	4695	4049	120	5	459	301	20	436	444	220	1117	649	278
	Urinary system	1670	2623	1423	219	15	78	118	4	120	77	88	501	156	44
	Traumatic system	5186	5617	5754	420	26	829	597	28	766	572	194	1528	718	81
	Others	8817	14018	6967	880	61	811	728	35	662	879	664	2260	1024	468
	Total	92900	135665	86039	3504	325	3462	7105	466	3690	6544	5270	24062	16610	3000

Source . Data provided by Livestock Bureau, Ministry of Agriculture and Forestry

Appendix (18) Status of Inspection in Slaughtered Animal by Year (cattle)

Description / Year and Province	No. of Animals Inspection	No. of slaughtered animals							No. of condemned Animal			
		Slaughter in Routine			Slaughter in Emergency			Total	Pregnancy	Immaturity	Others	Total
		Female	Male	Total	Female	Male	Total					
1965	292712	121255	156981	278236	1501	565	2066	280252	1150	1294	16	2460
1966	252032	113031	138072	251104	1978	1203	3178	254282	591	1105	54	1750
1967	255562	108955	140575	250532	2023	1004	3027	253560	1182	749	71	2002
Seoul	112958	45610	66461	112071	113	28	141	112212	506	266	4	776
Pusan	23898	22773	1518	23311	78	29	107	23418	391	82	2	475
Kyonggido	24671	3984	20293	24277	134	138	272	24549	2	11	9	22
Kangwondo	11284	5868	5407	11795	158	86	244	11039	98	118	84	245
Chung chong pukdo	4978	2883	2410	4793	109	59	168	4961	10	7	-	17
Chung chong namdo	15438	5967	9161	15128	216	80	296	15424	5	8	1	14
Cholla pukdo	6820	3408	3238	6646	84	45	129	6775	13	25	7	45
Cholla namdo	3953	4651	4942	9593	266	82	348	9941	6	6	-	12
Kyong sang pukdo	26015	4748	20497	25240	268	308	576	25816	29	169	1	199
Kyong sang namdo	10945	6583	3690	10243	433	134	567	10810	76	61	1	138
Cheju do	2674	1478	958	2436	164	15	179	2615	46	1	12	59

Description / Year and Province	Disease excluding parastic disease						Parasitic Disease				
	Digestive system	Respiratory system	Circulatory system	Reproduction system	Others system	Total	Cysticercous	Echinococcus	Liverfluke	Others	Total
1965	6248	5480	1838	328	2820	17154	1032	558	15428	11697	28715
1966	2562	4163	1185	822	1755	10007	241	181	11122	13819	24363
1967	2501	3618	1037	298	1468	8722	152	10598	975	11764	23789
Seoul	118	2545	588	8	224	3478	12	341	4570	5260	10183
Pusan	107	185	73	47	810	722	—	—	721	694	1515
Kyonggido	144	98	41	110	74	462	21	4	182	33	241
Kangwondo	350	256	131	29	111	877	2	750	1418	870	1940
Chung chong Pukdo	138	43	5	8	87	226	3	16	154	124	297
Chung chong Namdo	278	102	8	4	44	436	7	61	79	82	229
Cholla pukdo	28	30	12	9	76	155	12	1	38	9	60
Cholla namdo	195	113	85	31	127	551	18	79	428	328	853
Kyong sang pukdo	250	114	38	16	283	651	85	262	2572	2844	5713
Kyong sang namdo	194	69	31	22	129	445	9	32	118	37	191
Chejudo	504	68	25	19	102	719	33	33	422	1988	2467

Source Livestock Statistics 1967, Livestock bureau, Ministry of Agriculture and Forestry.

Appendix (19) Milk Inspection

Unit . M/T

Description / Year & city and province	Inspected	Passed	Total	Fat	Specific gravity	Precipitant	Acidification	Others
1965	8351	8208	144	32	8	2	98	5
1966	12681	12363	299	52	36	8	189	8
1967	14971	14604	367	92	48	2	218	18
Seoul	13312	12949	264	66	33	-	150	15
Pusan	1141	1090	51	24	5	-	23	-
Kyonggido	242	233	8	-	1	-	7	-
Kangwondo	244	242	2	-	-	-	1	1
Chung chong pukdo	282	280	3	-	-	-	2	-
Chung chong namdo	1498	1480	19	-	1	-	18	-
Cholla pukdo	83	81	2	-	-	-	1	-
Cholla namdo	249	245	4	-	-	-	3	-
Kyong sang pukdo	687	682	5	-	-	-	3	-
Kyong sang namdo	217	208	9	1	2	1	5	1
Cheju do	14	14	-	-	-	-	-	-

Source : Livestock Statistics 1967, Livestock Bureau, Ministry of Agriculture and Forestry.

Appendix (20) Quarantine Inspections

Export & Import	Type	1963		1964		1965		1966		1967	
		Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount
Export	Cattle Bone	kg 2218651	$ 124216	kg 8494	$ 187748	kg 4851	$ 258464	kg 8916	$ 268447	kg 2925	$ 196465
	Animal Hair	247498	1695401	275508	1048367	2007741	10174480	2138188	11408852	2611651	14244411
	Hides & Skins	108909	129829	199815	189770	109251	168498	187949	182847	85562	72681
	Fresh Meat	396001	292503	77485	55821	180598	154289	88988	83160	47817	55743
	Swine	114543	8815361	37900	1194904	100	3330	-	-	820	33485
	Feed	-	-	-	-	-	-	201450	32246	-	-
	Others including hand carried goods	35883	32670	48807	57905	88289	83009	52318	55650	203	4526
	Poultry eggs	2261720	59157	598000	20015	50	-	800	-	9	-
	Total	-	6148642	-	3547845	-	11702022	-	1758837	-	5987313
Import	Livestock Animals	587	136582	1034	289029	2010	355094	1867	459837	703	185990
	Poultry and eggs	kg 5100500	8556	1	-	16607800	26560	2925219	58548	136892	98069
	Others including hand carried goods	302	8774	-	-	2647	126133	5511	40501	337	20056
	Game birds	8	10	3266	4185	1483	2724	40	-	508	5856
	Hides	kg 485926	141217	1029217	190593	125163	35858	1704682	738864	4244	1362596
	Total		290141		2428968		554870		1085618		14617211

Source : Livestock Statistics 1967, Livestock Bureau, Ministry of Agriculture and Forestry

Appendix (21) Quantity of Raw Milk Processed by Product Type and Year

Unit : M/T

		1961	1962	1963	1964	1965	1966	1967	1968
Farm Household	Total raw milk production	1168	2647	4512	7130	10685	14600	18188	24360
	Breakdown of consumption: Home consumption	...	1127	1822	1816	1834	1939	1750	2212
	Breakdown of consumption: Others	...	29	61	114	143	298	453	-
	Raw milk collected	..	1491	3129	5200	8708	12368	16985	22148
Milk processing plant	Breakdown of processing: Market milk	...	1491	2295	4436	6618	8381	10136	11255
	Breakdown of processing: Condensed milk	-	-	834	763	1351	1462	2082	2425
	Breakdown of processing: Powdered milk	-	-	-	-	739	2520	4650	8455
	Breakdown of processing: Others	-	-	-	-	-	-	117	13

Source . Current Status of Dairy Farming 1969, Livestock Bureau, Ministry of Agriculture and Forestry

Appendix (22) Status of Raw Milk Processing by Month (1968)

Unit : M/T

Month	Quantity of raw milk collected	Quantity of Raw Milk Processed			
		Market milk	Condensed milk	Powdered milk	Others
1	1716	840	326	550	-
2	1714	771	317	623	3
3	1864	894	419	551	-
4	1792	942	258	592	-
5	1821	1025	76	720	-
6	1726	1048	52	626	-
7	1612	958	59	600	-
8	1765	918	130	717	-
9	1847	965	94	788	-
10	1891	839	207	845	-
11	2009	923	219	862	5
12	2391	1137	268	981	5
Total	22148	11255	2425	8455	13

Source : Outlook of Dairy Farming 1969, Livestock Bureau, Ministry of Agriculture and Forestry.

Appendix (23) Status of Raw Milk Production and Processing by Area (1968)

Unit : M/T

Area	Description	Quantity
Seoul	Production of raw milk within district	7,024
	Raw milk processed within district	15,731
Pusan	Production of raw milk within district	1,808
	Raw milk processed within district	1,680
Kyonggido	Production of raw milk within district	9,594
	Raw milk processed within district	541
Kangwondo	Production of raw milk within district	322
	Raw milk processed within district	302
Chungchong pukdo	Production of raw milk within district	670
	Raw milk processed within district	445
Chungchong namdo	Production of raw milk within district	2,408
	Raw milk processed within district	2,131
Cholla pukdo	Production of raw milk within district	181
	Raw milk processed within district	148
Cholla namdo	Production of raw milk within district	504
	Raw milk processed within district	309
Kyongsang pukdo	Production of raw milk within district	1,041
	Raw milk processed within district	647
Kyongsang namdo	Production of raw milk within district	761
	Raw milk processed within district	207
Chejudo	Productio of raw milk within district	47
	Raw milk processed within district	7

Source : Outlook of Dairy Farming 1969, Livestock Bureau, MAF.

Appendix (24) Trends of Market Milk Production

Unit : M/T

Year	1962	1963	1964	1965	1966	1967	1968
Market milk production	1,448	2,228	4,307	6,425	8,169	9,899	11,068

Source : Outlook of Dairy Farming 1969, Livestock Bureau, MAF.

Appendix (25) Status of Market Milk Production by Area (1967, 1968)

Unit : M/T

Area	1967	1968
Seoul	6,206	6,228
Pusan	981	1,371
Kyonggido	234	686
Kangwondo	240	256
Chung chong pukdo	277	439
Chung chong namdo	560	503
Cholla pukdo	81	132
Cholla namdo	236	309
Kyong sang pukdo	765	649
Kyong sang namdo	305	488
Cheju do	14	7
Total	9,899	11,068

Source : Outlook of Dairy Farming 1969, Livestock Bureau, MAF.

Appendix (26) Production of Milk Products by Type and Year

Unit : M/T

	1963	1964	1965	1966	1967	1968
Condensed milk	309	283	511	544	802	930
Powdered milk	-	-	110	346	701	1,311

Source : Outlook of Dairy Farming 1969, Livestock Bureau, MAF.

Appendix (27) Production of Milk Products by Area (1967, 1968)

Unit : M/T

Area	1967		1968	
	Condensed milk	Powdered milk	Condensed milk	Powdered milk
Seoul	676	607	723	1,080
Pusan	37	-	144	-
Kyonggido	-	-	-	-
Kangwondo	-	-	-	-
Chung chong pukdo	-	-	-	-
Chung chong namdo	89	94	63	231
Cholla pukdo	-	-	-	-
Cholla namdo	-	-	-	-
Kyong sang pukdo	-	-	-	-
Kyong sang namdo	-	-	-	-
Cheju do	-	-	-	-
Total	802	701	930	1,311

Source : Outlook of Dairy Farming 1969, Livestock Bureau, MAF.

Appendix (28) Current Status of Milk Plant and Milk Processing Plant by Area
Sheet 1

Area	Name of Plant	Location	Operation Inaugurated	Month Year	Capacity	M/T	Type of Products
Seoul	Seoul Milk Cooperative	Tong Dae Moon ku	Market Milk	May '63		7,665	Market milk , chocolate milk
			Condensed Milk	May '63	}	15,768	Small can of swt. condensed milk
			Powdered Milk	May '63			Modified powder milk for infant
	Kun Kuk Milk Plant	Sung Ton ku	Market Milk	Jan. '65		256	Market milk
	Sam Yuk Shin Hak "	Sung Puk ku	"	Dec. '65		183	"
	Pyong Hwa Non Chuk "	Chung No ku	"	Dec. '65		37	"
Milk plant 4					Market milk	8,141	
Milk proc. plant 1					Milk products	15,768	
Pusan	Pusan Milk Cooperative	Tong ku	Market Milk	Jan. '69		2,160	Market Milk
	Korea Milac Co.	Pusan City	Condensed Milk	Feb '65		1,314	Small can of swt. condensed milk
Milk plant 1					Market milk	3,474	
Milk proc. plant 1							
Kyonggido	Inchon Milk Plant	Sung In Dong	Market Milk	Jul. '63		648	Market Milk
	Suwon Milk Plant	Suwon City	"	Jul. '64		226	"
	Daikan Food Corporation	"	Condensed & powder milk	Jul.' 69		2,920	Condensed & powder milk
Milk plant 2					Market milk	874	
Milk proc. plant 1					Milk products	2,920	
Kangwondo	Chunchon Milk Plant	Chunchon City	Market Milk	Apr. '64		432	Market Milk
	Wonju Milk Plant	Wonju City	(Not in operation)			432	"
Milk plant 2					Market milk	864	
Chungchong pukdo	Chongju Milk Plant	Chongju City	Market Milk	Dec. '68		432	Market Milk
	Chungju Milk Plant	Chungju City	(Not in operation)			432	"
Milk plant 2					Market milk	864	
Chungchong namdo	Jaejon Milk Plant	Jaejon City	Market Milk	Apr. '63		1,080	Market Milk
	Chonan "	Chonan City	"	Sept. '66		226	"
	Onyang "	Onyang City	(Not in operation)			432	
	Nonsan "	Nonsan City	(Not in operation)			432	
	Nanyo "	Chonan City	Condensed Milk	Dec. '66	}	6,716	Small can of sweetened and evaporated milk.
			Powdered Milk	Dec. '65			
Milk plant 4					Market milk	2,170	Small can of whole milk powder and
Milk proc. plant 1					Milk products	6,716	modified evaporated milk
Cholla pukdo	Chonju Milk Plant	Chonju City	Market Milk	Apr. '64		432	Market Milk
	Iri Milk Plant	Iri City	"	Jan. '65		226	"
Milk plant 2					Market Milk	658	
Cholla namdo	Kwangju Livestock Coop.	Kwangju City	Market Milk	Nov. '64		648	Market Milk
	Sung Lin Milk Plant	"	"	May '67		210	"
	Honam Foods Company	"	Condensed Milk	'69		183	Condensed Milk
Milk plant 2					Market milk	858	
Milk proc. plant 1					Milk products	183	
Kyongsang pukdo	Taegu Milk Plant	Taegu City	Market Milk	Jul. '63		648	Market Milk
	Pek Sul Milk Plant	"	"	"		292	"
	Kyongju "	Kyongju City	(Not in operation)			432	"
Milk plant 3					Market milk	1,372	
Kyongsang namdo	Masan Milk Plant	Masan City	Market Milk	Sept. '64		432	Market Milk
	Chinju "	Chinju City	(Not in operation)			432	"
	Ulsan "	Ulsan City	(Not in operation)			432	"
Milk plant 3					Market milk	1,296	
Total milk plant 25 (7 non-operated plant included)						19,257	
Total Milk Processing plant 5						26,901	

Source . AFDC data and from the result of survey made by the team .

Sheet 2

Area	Milk plant		Milk processing plant	
	No. of plants	Raw milk processing capacity	No. of plants	Raw milk processing capacity
		M/T		M/T
Seoul	4	8,141	1	15,768
Pusan	1	2,160	1	1,314
Kyonggido	2	874	1	2,920
Kangwondo	2	864	-	-
Chung chong pukdo	2	864	-	-
Chung chong namdo	4	2,170	1	6,716
Cholla pukdo	2	658	-	-
Cholla namdo	2	858	1	183
Kyong sang pukdo	3	1,372	-	-
Kyong sang namdo	3	1,296	-	-
Total	25	19,257	5	26,901

(7 non-operating plant included)

Appendix (29) Annual per Capita Consumption of Market Milk and Milk Products

Unit : Gr. in raw milk

	1961	1962	1963	1964	1965	1966	1967	1968
Market milk	...	-	-	161	228	287	292	369
Milk products	-	...	...	27	74	132	291	369
Total	-	101	168	188	302	419	583	738

Sources:
1. Production result of Livestock Products MAF, for 1962 & 1963
2. 1967 edition of Livestock Statistics for 1964 - 1967, MAF.
3. Estimation for 1968

Appendix (30) Market Milk Production and Consumping Population by Area (1967)

	A Market milk production(M/T)	B Population (1,000)	A/B (gr)
Seoul	6,206	3,969	1,564
Pusan	981	1,463	671
Kyonggido	234	3,071	76
Kangwondo	240	1,825	132
Chung chong pukdo	277	1,547	179
Chung chong namdo	560	2,907	193
Cholla pukdo	81	2,504	32
Cholla namdo	236	4,127	57
Kyong sang pukdo	765	4,519	169
Kyongssang namdo	305	3,195	95
Cheju do	14	347	40

Source : Outlook of Dairy Farming 1969, Livestock Bureau, MAF.

Appendix (31) Prices of Market Milk and Milk Products

Year & month	Raw milk (per kg)	Market milk(180cc)		Sweetened condensed milk 397 g can		Modified powdered milk 450 g can	
		Wholesale	Retail	Wholesale	Retail	Wholesale	Retail
1967	48	10 71	18 51	125	150	252	264
1968	50	12 29	15 19	129	139	280	299
1969 1	50	13	17	139	149	301	319
2	50	13	17	138	148	302	319
3	50	13	16	137	146	303	310
4	50	14	18	137	147	305	324
5	50	13	17	137	147	305	324
6	50	13	17	138	148	305	321
7	50	13	17	137	146	301	319
8	50	13	17	137	147	301	319

Sources: 1. Survey by Livestock Bureau, MAF.
2. Seoul Milk Cooperative for Sweetened Condensed Milk and Modified Powdered Milk.

Appendix (32) Imports of Milk Products by Year

Unit : M/T

Classification	1962	1963	1964	1965	1966	1967	1968
Trade	846	830	85	221	-	-	-
Aid	4,004	9,645	6,367	17,384	4,635	15,477	10,055
Total	4,850	10,475	6,452	17,605	4,635	15,477	10,055

Sources : 1. Research Dept. The Bank of Korea, for 1962 – 1966.
2. Livestock Bureau, MAF for 1967 – 1968.

Appendix (33) Milk Products Import System and Import Duties

Item	Import system	Import duties
Raw milk	Import restricted	60 %
Condensed milk	Import prohibited	80
Powdered milk	Import restricted	80 - 150
Butter	"	100
Cheese	"	100

Source : Livestock Bureau, MAF.

Appendix (34) Milk Products for School Lunch

Unit : M/T

Year	No. of applicable school children	Composition of school feeding				
		Wheat flour	Powdered corn	Powdered skimmilk	Food oil	Total
1966年	2,000 (1,000)	11,043	11,608	8,139	331	31,121
1967	2800	17026	40,314	15,330	760	73,430
1968	2,000	48,000	-	12,000	1,600	61,600

Source . Ministry of Education

Appendix (35) Milk Products and Demand Supply by Type and Year

Unit : M/T

Description		1864	1965	1966	1967	1968
Condensed milk	Production	283	511	544	802	930
	Imports	...	...	-	-	-
	Domestic Consumptio	283	511	541	802	930
Whole Powdered Milk (Modified Powder Milk for Infant)	Production	-	110	346	701	1,311
	Imports	...	...	-	-	-
	Domestic Consumption	-	110	346	701	1,311
Powdered skimmilk	Production	-	-	-	-	-
	Imports	6367	13,783	4,635	15,477	10,055
	Domestic Consumption	6,367	13,783	4,635	15,477	10,055

Source : Livestock Bureau, MAF.

Appendix (36) Demand and Supply of Milk and Milk Products

Unit . M/T in raw milk

Description	1964	1965	1966	1967	1968
Domestic production	7130	10,685	14,600	19,188	24,360
Imports	51,475	57,287	32,198	106,017	68,876
Domestic consumption	58,605	67,972	46,798	125,205	93,236

Note · (1) Raw Milk Production

(2) Agricultural Yearbook 1968, Research Dept. National Agricultural Cooperative Federation.

ANNEX

ANNEX NO. 1

Current Status of Agricultural Credit

1 System of agricultural credit

Agricultural cooperations play a vital role in agricultural credit service in Korea.

As shown in the attached Table 1, more than 94% of the total agricultural loans made by the financial institutes are being handled by agricultural cooperatives.

Agricultural cooperatives in Korea are organized on three levels; with the unit cooperatives located in Ri, Dong, city or provincial cooperatives in each city or province and the National Agricultural Cooperative Federation as the top organization. Beside this conventional agrecultural cooperative system, two special cooperatives, namely livestock cooperative and horticultural cooperative constitute, the membership of the National Agricultural Cooperative Federation.

Business offices of agricultural cooperatives throughout the nation number 607 (Remittance handled by 275, National Treasury Revenue Agent by 166, National Treasury Agent by 12).

Today's agricultural cooperative, originating in the financial cooperative which was inaugurated in 1907, is the second organization established in August 1961 by the amalgamation with the agricultural bank.

The function of agricultural cooperative includes such projects as guidance and education, purchasing, sales, utilization and processing in addition to credit service under the provision of the law, but its main function may be said to be financing in view of its origin.

Moreover, because of its historical backgrounds in which the financial cooperative was originally established in the city and Gun as a unit and developed to the present state, the city and Gun agricultural cooperatives are playing a leading role among all the cooperatives.

Ri, Dong agricultural cooperatives are of small units, having less than 160 members. Among the Ri, dong cooperatives, 400 units or 2.8% of the total are authorized to handle the sales of fertilizer and agricultural loan service, being transferred such functions from the city and Gun agricultural cooperative. These cooperatives are called "Independent Cooperatives".

On the contrary the National Agricultural Cooperative Federation has city and county agricultural cooperatives and special agricultural cooperatives in its membership and a branch in each Dong. It provides nation-wide mutual coordination as the central organization and owns various facilities such as the agricultural products sales market, compound fertilizer manufacturing plant, dairy farms, livestock artificial insemination stations and Agricultural Cooperative College. As shown in the attached Table 2, it is a powerful central organization undertaking various projects with a total operating fund of 150

billion won, of which 70 billion won being its own funds and 80 billion won, the government investment.

A study on the organizational structure of agricultural cooperative in Korea shows that the upper organizations have more stable business foundation than lower organizations; the Ri, Dong agricultural cooperatives which are directly connected to individual members are weak in both their organization and managerial ability.

Agricultural loan in Korea is made centering around the agricultural cooperatives but the operating sponsors of the loan for the member farmers are the city and Gun (county) agricultural cooperatives. Financial route from the city and Gun agricultural cooperative through the Ri, Dong agricultural cooperative is utilized only by a limited number of "independent" Ri, Dong members and the majority of loans are made directly from the city and Gun cooperatives to individual members.

Special agricultural cooperatives are not allowed to handle financial activities.

2 Description of Agricultural Loan

The current status of agricultural loan could be summarized as follows.

(a) Financial guide policies of the National Agricultural Cooperative Federation

The National Agricultural Cooperative Federation operates on the own funds consisting of surplus absorbed from the city and Gun agricultural cooperatives and the government investment. Seasonal shortage of fund is financed by the loan from the Bank of Korea and the loan to individual farmers is made through the city and Gun cooperatives. Financial guide policies worked out by the National Agricultural Cooperative Federation are as follows.

(1) Increase of own funds of the agricultural cooperatives

70 billion won, the goal of agricultural cooperative deposit balance as of the end of 1969 (end of December) is to be attained.

Note: Target of the increase in deposit in fiscal 1969 was 24.2 billion won.

(2) Measures for Ri, Dong cooperatives

Merger of the cooperatives on a unit of Men (village) is to be accelerated for handling agricultural fund (Short-term Agricultural Loan). Target of merger plan is set at 10,000 cooperatives by the end of 1969 from the present 14,000 cooperatives.

(3) Upper limit of loans for individual member

Loans to be made should not exceed 80% of the assessed value of mortgage in principle and the maximum allowable limit of ordinary short-term loan is to be 200 thousand won.

(4) Rate of money lending

Money lending is to be held within 70% (within 50% for operating fund) in principle. Confirmation on procurement of its own fund is to be made on the result of deposit and the payment of money is to be made at the rate of money lending according to the achievement.

(5) Mortgage

To be given on the first priority base in principle.

For farm household, farm land is to be mortgaged. (Farmland Mortgage Law).

(6) Surety

One joint surety is required when mortgage is given and 2 joint surety are required when no mortgage is given in principle.

(7) Redemption rate of Loan

At least 70% of a Short-term Agricultural Operating Loan is to be redeemed by the end of December of the year and the whole loan is to be redeemed by the end of March of the following year.

(8) Guidance (Extension service) for members of cooperative

Management guidance is to be provided on the improvement of agricultural management, rationalization of management, and business bookkeeping.

Because of insufficient number of staff assigned to the city and Gun agricultural cooperatives against the number of farm households within the area, Ri, Dong agricultural cooperatives are to be expanded to a unit of Men and strengthen guidance (extension service) structure.

Note: Technical instructions are provided by the state or provincial technical extension service organizations and are not provided by agricultural cooperatives.

Following the policies of the National Agricultural Cooperative Federation, the city and Gun agricultural cooperatives adopt strict policies on the selection of farmers to be loaned, conditions for making loan and the ex post fact management.

Screening of the object of loan, for example, is insured by assessment of point system based on credit research (both personal and material factors). The ex post fact control is carried out by full-time staff member assigned to villages.

(b) Interest rate

Interest rate on agricultural loan in Korea is shown in the following table.

(Deposits)

Description	Interest Rate	Remarks
Savings deposit	1.8% per annum	
Deposit at notice	5.0% "	Grace period of more than 30 days
People's savings Association deposit	22.8% "	
Deferred savings	Same as for time deposit	
Time deposit More than 3 months	12.0% "	
Time deposit More than 6 months	16.8% "	
Time deposit From 1 to 2 years	22.8% "	
Living deposit	9.6% "	Deferment for more than one month. Upper limit set at 5 million won.
Farmers deposit	12% "	Transferred from the sales of agricultural products

(Loans)

Description	Interest Rate	Remarks
General loan	24.0% per annum	
General agricultural loan	15.0% "	Agricultural production fund (Agricultural operating fund)
Agriculture & Forestry loan	24.0% "	Fund for production & shipment for agricultural processing industry & Forest Cooperative
General agricultural loan	15.0% "	Agricultural production fund (Agricultural operating fund)
Agriculture & Forestry loan	24.0% "	Fund for production & shipment for agricultural processing Industry & Forest Cooperative
Reserved fund loan	24.0% "	Lending is limited to within the agreed amount of reserve fund.
Loan against savings fund	18.8% "	Lending is limited to within the paid-up of reserve fund.
Overdrafts	26.0% "	

Description	Interest Rate	Remarks
Short-term Agricultural loan against counter-part funds	10.0% per annum	Counterpart of aid, agr. op. fund, Ridog Coop. Treasury Inv. & Loan, Sp. Coop. Proj. Fund
Medium-term Agr. Loan against counterpart funds	9.0% "	Counterpart of aid, Treasury Inv. & Loan, Equip. Fund. Agr. mod. Fund, warehouse fund
Treasury Inv. & Loan Agricultural Loan	9.0% "	Loan from treasury, Feed reg. Livestock products (Gen. account civ. ser. Price Stab. Fund, pension Fund)
Advance Loan Living Expense	11.6% "	Hedge Loan until the receipt of rice price

(Note) Overdue interest 36.5% per annum

In Korea a uniform interest rate is adopted for all financial institutions and interest on deposits are not taxable.

The considerably high interest rate in Korea is the result of the so-called "Counter-Margin Policy" (Absorption of idling fund by high interest rate) enforced by the new administration. The annual interest rate of general loan handled by the agricultural cooperative was set at 26% until 1968 was lowered to 24% from June 1969.

It is the policy of the National Agricultural Cooperative Federation to make every effort to bring down interest rate gradually following the increase of the deposited amount of the agricultural cooperative in the future.

(c) Scope of Fund procurement by Agricultural Cooperatives

As shown in the attached Table 3, the total fund procurement at the end of 1967 was 73.7 billion won, comprising 27.8 billion won (37.7%) of deposits, 19.2 billion won (26.1%) of government loan and 24.2 billion won (32.8%) of the Bank of Korea loan. Due to lack of its own fund, the agricultural cooperative depends heavily on loans from the government and the Bank of Korea.

Particularly, loan from the Bank of Korea for the Agricultural Cooperative Credit Service Fund is gradually increasing and the share of the Bank of Korea loan in the total financial credit of the agricultural cooperative increased to 22.5% at the end of 1967 (See attached Calculation Sheet (2)).

(d) Savings Deposit of Agricultural Cooperative

Savings deposit of the agricultural cooperative reached 46.8 billion won (Annual increase of 19 billion won with a rate of increase being 68.3%) at the end of 1968 and is growing rapidly every year.

Against the total deposit of 196.3 billion won of the general financial institutes, deposit of the agricultural cooperative amounts to 27.8

billion won or 14.2%. While the savings-type deposit accounts for 73% of the total deposit with general financial institutes, that with the agricultural co-operative accounts for 54.4% and this rate is showing a downward trend. (See attached calculation sheet (3)).

Breakdown of depositors at the agricultural cooperative shows that the deposit by non-farmers accounted for as high as 87.5% of the total deposit at the end of 1967. This characteristic fact indicates that the stratum of depositors and that of borrowers have separated each other completely and that the member farmers lack required fund and constitute the majority of the group demanding for fund.

(e) Loan by Agricultural Cooperative

Loans made by the agricultural cooperative amounted to 47.1 billion won (An annual increase of 12.7 billion won with a rate of increase being 36.9%) at the end of 1968, of which 38.9 billion won were loaned for agricultural fund, 20.2 billion won for financial portion and 18.7 billion won for treasury portion.

As shown in attached Table 4, loans provided by the agricultural cooperative amounted to 62.6 billion won in 1967. Breakdown shows that the financial credit centering around General Fund, Agriculture and Forestry Fund and The Member Economic Project Fund amounts to 55.2 billion won (88.2%) and the Agricultural Loan has a high share in the total Treasury credit amounting to 7.4 billion won.

Of the total Agricultural Loan, Medium and Long-Term Loan is 13.1 billion won (44.9%) and this rate is increasing (See attached calculation sheet (4)).

Conditions of Short, Medium and Long Term Credit of Agricultural Cooperative are shown in the attached Table 5.

3 Dairy Farming Loan

It was in 1968 that the financial measures were instituted and credit service was inaugurated for this field. In that sense, this is the newest field of credit service.

"Agriculture and Fishery Income Promotion Special Project" was instituted in 1968, under which financing of the Dairy Cattle Inducement Fund and Milk Processing Facilities Fund from the government loan started through the channel of agricultural cooperative.

(a) Dairy Cattle Inducement Fund (Loan to farmers

Planned Maximum amount:	FY 1968	400 million won
	FY 1969	400 million won
Condition of Loan:	Maximum of credit; 70% of required fund	
	Repayment:	3 year installment after 2 year grace period

Cont'd

	Interest	9% per annum
	(Of the total interest rate of 15%, the difference between the above rate and the rate on agricultural cooperative credit, 4% is covered by the government subsidy and the remaining 11% by the local government (Gun) subsidy)	

(b) Milk Processing Facilities Fund (Loan to Agricultural Cooperative)

Condition of Loan:	Repayment:	3 year installment after 2 year grace period
	Interest rate:	9% per annum
	(Since the government subsidy for payment interest covers 5% of the above 9%, actual burden is 4%).	

Moreover, lending of Dairy Cattle Indusement Fund by foreign credit began in 1968 as a part of "Agriculture and Forestry Income Promotion Special Project."

This loan is provided by the Canadian Government for the purchase of dairy cattle (1,500 head in total) amounting to 199 million won in 1968 and 150 million won in 1969.

Condition of Borrowing	Dairy cattle is loaned (sub-loaned by adding expense)	
	Redemption:	23 years installment after 7 years grace period
	Interest rate:	3% per annum
Condition of Loan	Upper limit of loan:	70% of required fund.
	Redemption:	4 years installment after 3 years grace period
	Interest rate:	9% per annum

As a measure against emergency of dairy cattle, special livestock mutual aid system is provided by agricultural cooperative and 1% of the price of dairy cattle is invested as a fund which is pooled to be used to compensate 80% of the current price of cattle when it fails. Coverage by this mutual aid system is one of the conditions for granting Dairy Cattle Inducement Fund.

Milk produced by cattle brought in under the loan is sold to dairy plants directly or through milk collecting depots of dairy farmers co-operatives. In Korea price of milk is paid directly to the shipper in cash in every 10 or 15 days and the producer repays his loan to the lender on the day designated for payment. Check-off saving system in preparation for the payment of loan such as holding or handling of milk price by financial institute is not practiced. This presents a problem on the management of loan.

4 Liabilities of Farmers

Liabilities of farmers by source as reported by a farm household economy survey conducted in 1965 is shown in the Table below.

The majority of the loan listed under public body and bank are the borrowing from agricultural cooperative but the share of agricultural cooperative loan in the total liabilities of farmers is only 22% and the borrowing from individuals accounts for 71.4%.

Because of insufficient own funds of the agricultural cooperative, money lending by individuals constitute main part of financing in rural area.

Classification		Amount	Ratio
Total Liabilities		(in million) 25.621	100.0%
Breakdown	Public body, bank, (Agricultural Coop)	5,655	22.1
	Individuals	18,309	71.4
	Others	1,656	6.5

Borrowings from individuals range from 10,000 won to 20,000 won per household in many cases but repayment of such debt seems difficult judging from annual agricultural income of 116,000 won.

Therefore, breakdown of borrowings by purpose shows that expenditure on consumption centering around living expense accounts for 57.6% and the borrowing for expense on agricultural management accounts for 23.7%, a relatively small share and the share of borrowings for capital expenditure (livestock, farm machinery and facilities) is only 18.7%.

It is generally believed that the borrowings from individuals bear a high interest rate more than 5 times that on the loan provided by agricultural cooperative. (See attached calculation sheet (5)).

From the above observation, the current status of agricultural financing in Korea may be summarized as follows.

(a) Due to low profitability of agricultural production in Korea, there is a shortage of required fund. The ordinary cycle of agricultural credit, i.e., the profit from agriculture, deposit of the profit, loan from the deposit and redemption thereof with interest, is not yet established in Korea.

Under the present circumstances, therefore, agricultural financing is implemented mainly by procuring necessary fund from the source other than agriculture.

(b) Because of insufficient own funds of agricultural cooperative which is responsible for agricultural financing, the main junction of agricultural cooperative at present is to handle government fund and the loan from the Bank of Korea.

(c) Ri, Dong agricultural cooperative which maintain the closest contact with individual farmers are very weak in their organizations and management and can hardly be responsible as a financial institute and meanwhile the special agricultural cooperative which provide specific guidance to farmers are not allowed to handle financial business.

(d) The city and Gun agricultural cooperative, because of their backgrounds, have a complete structure as a financial institute. However, because of insufficient number of staff assigned compared with the number of farm household, it is difficult to expect complete ex post management and ex post guidance in the field of financing.

(Note) Against 10,000 to 20,000 farm household, current strength of staff is 40 to 50.

(e) Guidance (Extension Service) provided by the agricultural cooperative to the farm household is limited to the guidance on management and technical guidance is the function of the State and do Technical Extension organizations. As a result, complete integrated guidance ex post financing can not be expected.

(f) Full-fledged handling of dairy farming loan began in 1968 and therefore it is the newest field of financing handled by agricultural cooperative.

At present, holding or handling by the agricultural cooperative of the proceeds from the sale of milk or check-off system for repayment fund is not adopted and ex post management is not adequate.

Annex Table 1 Trends of Agricultural Fund by Financial Institute

(in million won)

Classification	End of 1961		End of 1966		End of 1967	
	Amount	%	Amount	%	Amount	%
Agricultural Cooperative	16,410	99.5	23,550	95.2	27,837	94.4
Industrial Bank	-	-	412	1.7	429	1.5
People's Bank	-	-	101	0.4	349	1.2
Commercial Bank	78	0.5	686	2.7	873	2.9
Total	16.488	100.0	24.749	100.0	29.488	100.0

(Surveyed by NACF)

Annex Table 2 NACF General Fund Supply and Demand Plan

(in 100 million won)

Classification			1969 Project		
			Outstanding End of 1968	Outstanding End of 1969	Net increase
Procurement	Self-procurement	Deposit	468	700	232
		Investment, surplus	21	23	2
		Sub total	489	723	234
	Support by government fund	Treasury	226	269	43
		Rediscount	24	10	△ 14
		Loan	-	186	186
		Stabilizing Fund	10	51	41
		Fertilizer	279	320	41
		Sub total	539	836	297
		Total	1,028	1,559	531
Operation	Cash, reserve deposit requirement		107	133	26
	Lending	Agricultural loan: Financial	202	366	164
		Agricultural loan: Treasury	187	230	43
		Agricultural loan: Loan	-	129	129
		Agricultural loan: Sub total	389	725	336
		Stabilization Fund	1	10	9
		General Fund	81	148	67
		Lending total	471	883	412
	High interest bond adjustment		15	14	△ 1
	Economic Project		80	142	62
	Fertilizer		279	320	41
	Others		76	67	△ 9
	Total		1,028	1,559	531

(NACF Data)

Annex Table 3 Agricultural Cooperative Fund Procurement Plan

(in million won)

Classification	End of 1966	End of 1967	Variance
Borrowing from Gov. fund (A) Borrowing from Gov. Fund (A)	17,557	19,228	1,671
Borrowing from the Bank of Korea (B)	20,626	24,202	3,576
(Credit portion) (C)	(2,126)	(4,102)	(1,976)
(Fertilizer portion) (D)	(18,500)	(20,100)	(1,600)
Issuance of Agri. Financing Bond (E)	465	223	△ 242
Deposit (F)	20,948	27,774	6,826
Paid investment & surplus (G)	2,119	2,282	163
Total (H)	61,715	73,709	11,994
Exemption of borrowing for fertilizer (H-D=I)	43,215	53,609	10,394
Conversion to economic project (J)	4,507	5,689	1,182
Fixed investment (K)	2,367	2,707	340
Source of credit (I-J-K=L)	36,341	45,213	3,372

(Surveyed by NACF)

Annex Table 4 Trends of Agricultural Cooperative Loan by Type

(in million won)

Description		1961		1966		1967	
		Annual loan	Year end balance	Annual loan	Year end balance	Annual loan	Year end balance
Credit portion	Agriculture fund	320	1,817	2,598	1,642	3,018	1,805
	Agr. & Forestry Fund	351	957	6,449	3,682	11,489	4,061
	Rice	2,257	1,998	1,965	1,492	1,589	1,045
	High interest Bond. Adj.	2,488	2,715	-	1,916	-	1,786
	Fishery fund	21	128	1,421	662	2,136	1,264
	General fund	240	519	11,254	1,701	22,931	3,781
	Fishery Spe. fund	-	-	7	113	5	83
	Member economic project	35	-	10,767	2,541	12,193	2,910
	Agriculture enterprise fund	-	-	622	446	1,828	1,530
	Sub total	5,712	8,134	35,083	14,195	55,189	18,265
Treasury portion	Agriculture fund	512	2,376	4,018	6,062	5,433	8,036
	Water util. fund	161	6,106	1,248	6,713	1,917	7,947
	Warehouse fund	226	72	-	138	12	129
	Sub total	899	8,554	5,266	12,913	7,362	16,112
	Total	6,611	16,688	40,349	27,108	62,551	34,377
Agriculture and Forestry Fund		6,350	16,041	27,668	24,631	37,479	29,249

(Surveyed by NACF)

(Other reference calculation sheet)

(1) NACF Agriculture and Fishery Financial Support Plan (1969)

(in 100 million won)

Description		Annual Plan				Achievement as of Aug. 30
		Treasury	Credit	Food & cereals	Total	
Medium term Agriculture	Improvement of land foundation	21	-	36	57	46
	Increase of income	47	32	-	79	44
	Increase of Agr. prod.	48	3	-	51	4
	Livestock industry	6	15	-	21	8
	Profitable crops	6	-	-	6	3
	Fishery	-	8	-	8	4
	Forestry	-	-	-	1	1
	Sericulture	-	27	-	27	-
	Total	129	85	36	250	110
Short term Agriculture	Agriculture & Fishery	-	44	3	47	47
	Summer crop harvesting & purchasing	-	-	57	57	5
	Reserve	-	-	5	5	-
	Total	-	44	65	109	52
Grand Total		129	129	101	359	162

(NACF data)

(2) Trends of Depending of Agricultural Cooperative on Government Fund and the Bank of Korea Loan

(in million won)

Description		End of 1961	End of 1966	End of 1967
Government Loan	Water utilization fund	6,198	6,803	7,906
	Agricultural fund	3,235	9,156	9,733
	Warehouse fund	228	220	211
	High interest bond Adj. fund	-	1,378	1,378
	Total	9,661	17,557	19,228
Borrowing from the Bank of Korea	Credit service loan	2,854	2,126	4,102
	Economic project loan	200	18,500	20,100
	Total	3,054	20,626	24,202
Dependency on borrowing from the Bank of Korea	Credit portion lending (A)	8,134	14,195	18,265
	Borrowing from the Bank of Korea (Credit portion) (B)	2,854	2,126	4,102
	Dependency on borrowing from the Bank of Korea (B)/(A)	35.1%	15.0%	22.5%

(Survey by NACF)

(3) Trends of Agricultural Cooperative Deposit by Type and Depositor

(in million won)

Description		End of 1961		End of 1966		End of 1967	
		Amount	%	Amount	%	Amount	%
Type of Deposit	Deposit payable at request	1,831	52.7	7,586	36.2	12,673	45.6
	Savings deposit	1,638	47.2	13,362	63.8	15,100	54.4
	National Bond deposit	2	0.1	1	-	1	-
	Total	3,471	100.0	20,948	100.0	27,774	100.0
Depositor	Farmers deposit	985	28.4	1,895	9.0	3,461	12.5
	Non-farmers deposit	2,486	71.6	19,053	91.0	24,313	87.5
	Total	3,471	100.0	20,948	100.0	27,774	100.0

(Surveyed by NACF)

(4) Trends of Agricultural Cooperative Medium-Term Agricultural Fund

Description	End of 1961	1962	1953	1964	1965	1966	1967
Total Agricultural Fund (A)	16,410	17,125	18,285	21,287	21,717	24,631	29,249
(Medium & Long-Term) Agr. Fund (B)	(6,525)	(7,582)	(8,058)	(9,114)	(9,723)	(10,386)	(13,130)
Water Utilization Fund (C)	6,106	6,603	7,040	7,558	6,276	6,713	7,947
Agr. Fund (Water Util. Fund excluded) (D)	10,304	10,522	11,245	13,729	15,441	17,918	21,302
Medium & Long-Term Agr. Fund (Water Util. Fund excluded) (E)	419	979	1,018	1,556	3,447	3,673	5,183
B/A (%)	39.8	44.3	44.1	42.8	44.8	42.2	44.9
E/D (%)	4.1	9.3	9.1	11.3	22.3	20.5	24.3

(Surveyed by NACF)

(5) Distribution of monthly interest rate on Farmers Debt owed to Individuals

Interest rate (%)	Ratio (%)
0	5.4
Less than 1.7	0.7
1.7 - 3.0	3.3
3.0 - 5.0	43.8
5.0 - 10.0	45.7
more than 10.0	1.1
Total	100.0

(Surveyed by NACF in 1965)

ANNEX NO. 2

Status of Dairy Beef Production and Problematical Points

1. Current Status of Beef Production in Korea

As shown in Table 1, the share of beef production in the total meat production in Korea up to 1967 ranked second, next to pork production but dropped to a third place in 1968 being forced down by broiler production which made a rapid growth since 1967.

A sutdy on the backgrounds of this decrease in the production shows that the reserve of Korean cattle had been eaten up with a steady growth of demands for beef since 1964 with a resultant decrease in the number of Korean cattle and the government had to take measures to prevent further decrease by restricting the slaughter of female Korean cattle under 8 years old.

The government measure prohibits the slaughter of all female Korean cattle for a period of one year from October 1968 to September 1969.

The Korean cattle has been the main portion of the major beef resources in the Korea so far but the production requirement was fulfilled by slaughtering cattle which had been used as a draft cattle and retired because of age and there has been no practice of cattle raising aimed for meat production. Therefore, the decrease in the number of Korean cattle had a direct effect on beef production.

Table 1 Trends of Meat Production

(in M/T)

	Beef	Pork	Meat of goat & sheep	Meat of rabbit	Chicken	Meat of Duck	Total
1964	31,923 (27.1)	62,511 (53.1)	1,072 (0.9)	2,474 (2.1)	18,836 (16.0)	949 (0.8)	117,764 (100.0)
1965	27,261 (27.3)	55,881 (55.9)	813 (0.8)	1,358 (1.3)	14,458 (14.5)	193 (0.2)	99.964 (100.0)
1966	29,152 (26.1)	60,383 (54.0)	626 (0.5)	757 (0.7)	20,712 (18.5)	253 (0.2)	111.883 (100.0)
1967	30,173 (23.2)	72,154 (55.4)	823 (0.6)	1,965 (1.5)	23,960 (18.4)	1,184 (0.9)	130,259 (100.0)
1968	35,870 (22.4)	82,014 (51.1)	---	---	42,557 (26.5)	---	160,441 (100.0)

Note: Livestock Statistics, Livestock Bureau, MAF for the 1964 - 1967 period. MAF data for 1968.

Table 2 Trends of Retail prices of Beef and Pork

(per kg)

Year	Beef		Pork	
	Price	Index	Price	Index
1965	240 won	100.0%	183 won	100.0%
1966	270	112.5	193	105.5
1967	357	149.6	230	125.5
1968	563	234.6	332	181.4
Jan. 1969	569	237.1		
Feb.	575	239.6		
Mar.	585	243.8		
Apr.	586	244.2		
May	590	245.8		
June	596	248.3		
July	596	248.3		
Aug.	596	248.3		
Sep.	601	250.4		

Note: Price of beef is based on the data provided by Livestock Administration Section, Livestock Bureau, MAF and the Price of pork is based on the data of the survey of wholesale prices by the Bank of Korea.

2 Necessity of Dairy Beef Production

Against the total number of 1,242,648 for Korean cattle in 1967, the number of dairy cattle in the same year was 10,360 and the share of dairy beef in the total beef production in the country was negligible.

Although the government is planning the multiplication raising of Korean cattle by providing such measures as restricting the slaughter of female Korean cattle and establishing production centers in order to cope growing demand for beef, the progress of mechanization of agriculture in the future will greatly affect the need of Korean cattle which has so far been raised mainly for use as a draft cattle. Therefore, unless a definite prospects for meat production for Korean cattle is shown, it will entail a considerable difficulty in preventing the decrease in the number of Korean cattle, much less the increase.

Moreover the profitability of Korean cattle fattening is not necessarily high at present as pointed out in I-2-2-1. For this reason, it will not be advisable to expect much from Korean cattle but if the number of dairy cattle increase in the future the time will come when dairy beef production can not be ignored any longer to make up shortages of beef supply.

3 Current Status of Dairy Beef Production and Problematical Points

A study on the current status of dairy beef production in Korea shows that the number of dairy cattle raised is still small compared with feed production capacity for the majority of dairy farmers. Consequently, there are still many farmers who do not sell but keep male dairy calves even after weaning. Because of lack of established raising and fattening method for male dairy calves in Korea, intensive fattening with concentrates is not being practiced but the calves are fed mainly with grass and sold for beef when they become 18 months old and reach about 350 kg in weight.

Because of relatively high price of dairy beef compared with that of pork and chicken and from the fact that it is being so far almost the same price as the meat of Korean cattle, it seems to have a full potentiality for further development in the future.

Under the present circumstances, however, the following may be pointed out as problematical point.

(1) Problems deriving from mixed raising of milking cows and male dairy calves

Because of fewer number of dairy cattle raised by the farmers, male dairy calves are being raised along with milking cows at present. In the future, however, when the dairy farming gets on the right track and the multiplication of stock keeping is realized there will be a shortage of roughage resources and the present dairy beef production system which is now mainly depending on the grass will have to compete with milk production in respect of the supply of roughage.

At present, however, while the milk production is supported by high milk price, the price of beef, though rising annually, is controled from a political reason. For this reason, it will be difficult for the dairy beef production to become an integral part of dairy farming in view of its profitability. However, since there is no available data to fully justify comparative profitability of the two, there will be a need for a careful study in the future to justify their respective economic advantages.

(2) Technical problems on Fattening of Male Dairy Calves

These are the problems also applicable to the whole beef production industry in Korea. Because of lack of established fattening techniques, raising and fattening of male dairy calves practiced is still in its quite first step. It will be necessary therefore, to establish fattening techniques as early as possible to realize dairy beef production of higher productivity. For the time being, the following may be pointed out as technical measures to be taken.

1) Realization of early weaning

At present, the majority of dairy farmers are raising calves (both male and female) with whole milk, resulting in high production cost. It will be necessary, therefore, to realize early weaning by developing substitution milk and synthetic milk.

2) Establishment of fattening method

In the country like Korea where land space is limited, just the same in Japan, intensive beef production seems more practical than extensive fattening method which is heavily dependent on grazing. However, intensive fattening method with high concentrates may result in high production cost and may present a problem in relation to the price of beef. It is necessary, therefore, to make an immediate study on the advisability of such intensive fattening method.

3) Rationalization of Beef Sales Channel

Under the present system, the transaction of beef in Korea is being carried out without giving any serious consideration to the quality of meat such as the breed, age, sex or the degree of fattening but with only a rough classification of three ranks, special, high and ordinary according to the physical portion of the carcass. This fact is greatly hampering the willingness of the raiser for the production of beef of high quality and may obstruct a smooth supply of beef to cope with the growth of demand in the future. It is hoped, therefore, that measures be taken for rationalization of sales methods so that the quality of meat may be reflected on the price of beef in the future. Also in view of the fact that the price stabilization measures taken by the government are one of the factors for making the standardized transaction difficult, it will be necessary to reexamine the price policy of the government.

In the past the sales channel of beef had a very complicated, costly and old-fashioned system as shown in Chart 1, but in April 1969 dressed carcass wholesale markets were established in Seoul City and Pusan City as shown in Chart 2 and they are now playing an important role in the modernization of meat transaction system. It is strongly recommended that the dressed carcass wholesale market also established in other local cities.

Chart 1 Beef Sales Channel

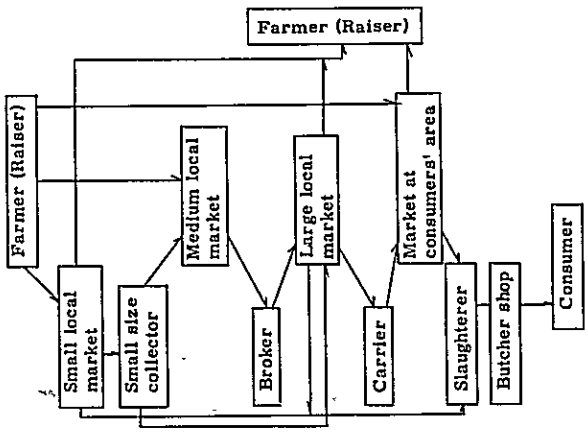


Chart 2 Dressed Carcass Wholesale Channel