THE MARKET MILK INDUSTRY IN NEW ZEALAND

by

R.C. SYKES

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University of New Zealand.
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CHAPTER 1

INTRODUCTION.

Milk is the most important of all foods for the human race. Throughout the ages it has been the sole food of the very young and has been part of the diet of adolescents and adults of the white races. It has been especially important to the growing and those of inferior health. Milk is a "protective" food rich in easily digestible proteins of high biological value and, in addition, contains valuable mineral and vitamin fractions essential to good nutrition. The importance of milk in the diet has been more particularly recognized in the last thirty years and special emphasis given to it by the League of Nations in an endeavour to improve the diets of the peoples of the world. New Zealand, along with other countries, has become more conscious than formerly of the value of milk during these last thirty years.

Because milk can be so important in the diet of the people of all ages it should be available at all times for consumption in adequate amounts by all sections of the population, and this is the requirement of the Market Milk Industry in New Zealand. In addition, since the food value of milk is dependent upon its composition and at the same time milk, as a highly perishable commodity, may be a carrier of pathogenic bacteria it is imperative to national well-being that the milk supply be of good composition, high bacteriological quality and free from pathogenic organisms. In association with the above, price is a most important consideration; it should be high enough to permit efficient production, collection, treatment and distribution, at all periods, of adequate quantities of safe milk of good quality and at the same time low enough to enable all sections of the community to purchase milk in adequate amounts. The services given in production, collection, treatment and distribution should ensure efficiency and economy in the practices pursued and the safety of milk to the health of consumers at all stages. At the same time, however, the services given should only be those necessary for the delivery of a safe milk of good quality to consumers such that the liquid milk industry as a whole is efficient relative to the functions required of it, and outlined above.

As a relatively young country, New Zealand has made a name for itself over the past fifty years through rapid increases in the export of dairy products to overseas markets, more especially the United Kingdom. Since World War 1 New Zealand, for its size and population, has come to be recognised as an important present and potential source of dairy products. Since the beginning of World War 11 it has been the largest exporter of dairy products in the world.

New Zealand is a country ideally suited to dairying. Although it has a relatively small human population its dairy cow population is comparatively large and it has, as above mentioned, a larger exportable surplus than any other country.

Hamilton (1944) has shown that the estimated total production of butterfat in the Dominion increased by 925 per cent between 1901-1902 and 1940-1941. He points out that there was a 97 per cent increase in the butterfat consumed within the Dominion in liquid milk and cream during the same period. This consumption of liquid milk and cream accounted for a utilisation of 16.4 per cent and 3.5 per cent of total butterfat production in these respective years.

In New Zealand the liquid milk market is only of minor economic importance to the dairy industry. Adequate liquid milk consumption, however, is socially imperative to the country and of national importance to public health. New Zealand is conscious of this, as shown by estimates of the New Zealand Dairy Board. Using a revised basis of derivation of data this Board (N.Z. Dairy Board,1948,1951) has estimated an increase in annual milk consumption, as liquid milk and cream, from 63.8 million gallons in the period 1934-1938 to 94.3 million gallons in 1950. These estimates show an annual utilisation as liquid milk and cream of 6.8 per cent and 8.8 per cent of total milk production in the respective periods.

From 1900 until the present time the population of New Zealand has more than doubled (N.Z. Official Year-book,1950). Associated with the overall increase there has been a "drift"of population from rural to urban areas (Calvert,1946). This has

brought a pronounced increase in the proportion of "urban" population and the encroaching of built-up areas into areas formerly devoted to milk production. These movements have combined to aggravate the milk supply problems arising from natural increase in population. As a consequence of this there have frequently been shortages of milk for liquid consumption in many areas, particularly in the larger centres of population at certain periods of the year. This has occurred despite the presence of areas suitable for milk production situated within reasonable distance of all centres of population in New Zealand. These areas possess a potential to supply several to many times the quantity of liquid milk demanded by the population. Only today, as a result of Government action through legislation, is the position being approached where there is available an adequate supply of milk of good quality to meet the demands of the population at all times of the year.

Since the turn of the century, great technological and practical advances have been made in the production, collection, treatment and distribution of milk for liquid consumption. Organisation, both voluntary and compulsory, has been introduced into the liquid milk industry and extended. Legislation has been introduced to effect control. With the passing of the Milk Act, 1944, developments have been most rapid since the end of World War 11.

In the course of this dissertation an endeavour will be made to point out the developments that have taken place in the Market Milk Industry in New Zealand. The past and present organisation and control of the Industry together with the circumstances affecting production, collection, treatment and distribution will be reviewed and suggestions for changes in the organisation and practices put forward which, if applied, may more nearly achieve the ideal of the availability, at all times, of an adequate supply of safe milk of good quality, at reasonable price, to all sections of the community.

CHAPTER 11

THE DEVELOPMENT OF THE NEW ZEALAND DAIRY INDUSTRY AND THE STATE OF THE TRADE IN MARKET MILK PRIOR TO 1900.

The Dairy Industry of New Zealand dates from 1814. In that year the Rev. Samuel Marsden, a Missionary, arrived at Russell, bringing with him a small number of dairy cattle from Australia to provide milk for the Missionaries and settlers and their families (Philpott, 1937). The food value of milk and milk products was recognised by Marsden and these cattle thus laid the foundation of the Market Milk Industry in New Zealand. From this very small beginning the development of the dairy industry is associated with Dominion growth and development.

The non-Maori population of New Zealand had grown to 26,707 by December, 1851. Thereafter changes in population, till 1896, can be observed from data recorded at the intervals shown in Table 1.

TABLE 1: Non-Maori population of New Zealand 1851-1896.

Year of Census	Non-Maori population	Year of Census	Non-Maori population
1851	26,707	1874	297,654
1858	59,413	1878	412,465
1861	97,904	1881	487,889
1864	171,009	1886	576,524
1867	217,436	1891	624,455
1871	254,928	1896	701,094

- N.Z. Official Year-Book (1947-49)

The non-Maori population had increased to 770,304 by the 1901 census.

The number of cattle used for dairying in New Zealand was not specifically enumerated until 1895. However, the total number of cattle in New Zealand was recorded from 1858. The increase in their numbers prior to 1900 is shown in Table 11. By 1900 the number of dairy cows had increased to 355,256 (N.Z. Official Year-Book, 1901).

TABLE 11: Cattle numbers in New Zealand 1858-1900

Year	Number of cattle	Year	Number of cattle
1858	137,204	1878	578,430
1861	193,285	1881	698,637
1864	249,760	1886	853,358
1867	312,835	1891	831,831
1871	436,592	1896	1,047,901
1874	494,917	1900	1,222,139

N.Z. Official Year-Book (1919)

The primary purpose of dairy cattle in New Zealand during the period 1814-1880 was to supply the needs of the people with milk, butter and cheese. There was no intention of establishing a large export trade. Milk was then, as now, a most important commodity in the diet of the people. Cows were milked throughout the year to provide adequate fresh milk for human needs. Butter was made in the spring and summer months and surpluses to fulfill local requirements salted down for the following winter. Some endeavour was made to develop an export trade and partial success was achieved with small shipments of butter and cheese to Australia during the Victorian gold rush of the late 1880's. However, there was no refrigerated or suitable transport available to enable any surplus dairy products to be delivered through the tropics, in good condition, to the large and growing markets in the Northern Hemisphere.

The land initially utilised for agriculture was that most easily settled; principally that free of bush and well drained. This land, for the most part situated in the South Island, was more suitable for sheep raising and grain production and these pursuits were widely followed. Development was hampered in the North Island by the Maori Wars. In the years prior to 1870 dairy production accounted for only a small proportion of the revenue of the colony but was, nevertheless, important because, as described above, it supplied the local needs for dairy products and indicated that New Zealand was suited to dairy production.

During the 1870's there was a pronounced increase

in the amount of land settlement in New Zealand. With the establishment of peaceful relations with the Maoris the land was opened up by roading systems and subdivided for closer settlement. The population of the Dominion increased rapidly in this period (see Table 1).

It appears that dairy production also increased substantially in the 1870's and by 1880 dairy production in the Dominion exceeded local requirements. An outlet for surpluses on an external market was therefore sought.

It was fortunate for the New Zealand Dairy Industry that technical advances overseas developed refrigeration for commercial use and subsequently applied it to sea transport to provide refrigerated facilities for meat and dairy products. In this way the dairy products surpluses could be delivered to an external market without deterioration in quality and could command remunerative prices.

The first refrigerated cargo from New Zealand was one of meat from Port Chalmers in 1882. The inclusion in the shipment of a small parcel of butter and its sale in the United Kingdom at a remunerative price demonstrated the possibilities of an export trade in New Zealand dairy products. Markets were made available in the Northern Hemisphere, the United Kingdom market being particularly important. The availability of a remunerative outlet for increasing quantities of butter and cheese placed emphasis on the export trade and exports of these products increased during the 1880's. By 1900 an export trade had been firmly established.

Whereas dairying had been undertaken until 1882 almost entirely to meet the needs of the resident population the introduction of an export trade placed emphasis on seasonal dairying, to provide butter and cheese as a surplus for export. The change to seasonal production which followed was to cause concern in later years by bringing about shortages of milk for liquid consumption in the periods of low production.

Available information indicates that the national

dairy herd in these early days consisted predominantly of the dual-purpose Shorthorn breed which was used for both milk and beef production and sometimes also for draught purposes. Though Ayrshires were introduced to New Zealand in 1848, Jerseys in 1862 and Friesians in 1884 (Philpott,1937), their numbers did not increase very substantially for some time because the relative merits of the various breeds under New Zealand conditions had not been appreciated.

Prior to 1900 the Market Milk Industry in New Zealand showed no development towards any overall organisation or intensive local organisation. The industry was composed entirely of producer-distributors or independent producers and distributors until 1884. In this year it appears that the first attempt at organised distribution of milk to a city population in New Zealand was successfully made by the Taieri and Peninsula Milk Supply Company of Dunedin. This business, as a farmers' co-operative organisation, was established to supply milk and cream to the people of Dunedin and its suburbs.

In 1893 the firm of Ambury, English and Company was formed in Auckland, and, amongst other pursuits, engaged in the retail distribution of substantial quantities of milk in that city. Surplus milk was utilised for butter manufacture in their butter factory at Mangere. This firm later established a large milk treating station in Auckland.

It appears that these were the only attempts to distribute milk in large quantities prior to the turn of the century. It is to be noted, however, that in the 1890's, due to the increase in urban populations and the associated extension of the "milk shed" to increased distances from the city and town boundaries, there were numbers of distributors dispensing milk from two or more producers. A number of distributors built up large businesses.

In these early times cows were milked by hand in sheds of rather primitive construction and layout compared with the shed standards of modern times. Milk was not

normally cooled following milking or stored under good conditions to preserve keeping quality and purity.

Producers were paid for milk on a gallonage basis estimated by volume. Fixed quantities of milk were sold at prices agreed upon between the producer and the purchaser. Agreements were verbal only and there is no record of provision being made in advance to ensure an adequate supply to meet demand. Producers aimed to maintain an even supply of milk all the year round, the experience of one year serving as a basis for calculating their supply in the following year. In a limited trade there was an intimate seller-buyer relationship and the understanding between parties promoted the production of milk of good quality. The competition to supply liquid milk encouraged farmers to consider the keeping quality of milk prior to its delivery to consumers.

Prior to 1900 milk was transported in cans on horse-drawn vehicles and distributed in the same way. Alternatively man-powered "dandies" were used in a more localised distribution. The dandy consisted of a large container mounted between two wheels. This meant that the area of supply was limited by the distances which could be travelled in reasonable time without mechanical aid. This was no great inconvenience, however, since there was sufficient dairy production in close proximity to the towns to provide milk to meet the demands for liquid consumption at most periods. More distant areas supplied the more concentrated, less bulky and less perishable manufactured dairy products.

There was virtually no treatment of milk, as we understand it today, undertaken prior to 1900. To maintain the keeping quality of milk until the next delivery "scalding" was practised in households and may have been practised by some distributors in the last few years of the 1890's. Towards the end of the nineteenth century pasteurisation was applied to milk and cream in Denmark and equipment became available to the dairy industry in New Zealand. In 1896, pasteurising equipment was introduced into a dairy factory at Waverley for

treating milk (Philpott,1937) and in the following year similar equipment for the pasteurisation of cream for butter-making was investigated in the same factory with a view to improving the quality of the resultant butter. About 1900 wholesale distributors in New Zealand began to practise the pasteurisation of milk for liquid consumption to improve its keeping quality, and so reduce losses due to poor keeping quality, but the techniques used were unsatisfactory. The temperatures employed were generally very high and frequently imparted a burnt flavour to treated milk. It was some years before pasteurisation was applied extensively to milk for liquid consumption after improved and controlled methods became available.

Milk was delivered to households in the "loose" state and therefore was subject to similar risks of bacterial contamination during handling and delivery as during milking. Milk was delivered twice a day, in most instances immediately after milking, in order to deliver milk to consumers in as fresh a condition as possible. Prior to the twentieth century, warm milk at the time of delivery was popularly considered to be proof of its freshness. Payment for milk was on a cash and credit system.

There was a lack of legislation prior to 1900 to ensure rigid control of the quality of milk in the liquid milk industry. Though inspection of farm dairies commenced in 1896 (N.Z.Dept.of Agric.,1896) it was not until after 1900 that inspection of farm dairies producing milk for liquid consumption became the general practice. Control was undertaken by the Department of Agriculture and by local authorities but administration was generally lax. Much freedom was allowed within the industry and competition afforded some substitute for the control of quality.

CHAPTER 111

THE GROWTH OF THE NEW ZEALAND DAIRY INDUSTRY SINCE 1900 AND THE MAGNITUDE OF THE MARKET MILK TRADE.

At the present time New Zealand is comprised of an area of some 66 million acres of which about 43 million acres are occupied (N.Z. Official Year-Book,1947-49). A large proportion of this occupied area is devoted to grasslands - sown and native grasslands together total 31 million acres or 72 per cent of the occupied area. Of the area devoted to grasslands 17 million acres are sown with improved English grasses.

The livestock industries of New Zealand are thus largely dependent on pasture production and the types of farming practised are intimately related to the type and productivity of the pasture sward which can be economically maintained on any given class of country. With a good and dependable rainfall, milder climate and accessible soils the North Island has been developed more intensively for dairying than has the South Island and at the present time about 90 per cent of dairy production in the Dominion is produced in the North Island (N.Z. Dairy Board,1951).

Hamilton (1944) has estimated that in the period 1937-1943 3.8 million acres were used for dairying in New Zealand, 3.5 million in the North Island and .3 million in the South Island.

Statistics published (N.Z. Dairy Board,1951) for the period 1st July, 1949 - 30th June, 1950 show an estimated gross production in New Zealand of 471 million pounds of butterfat in 1,011 million gallons of whole milk "at the pail" from 1,846,000 cows. The percentage utilisation of the gross butterfat production was 67.2 as butter and separation losses, 19.9 as cheese, 8.6 as milk and cream consumption, 2.7 as wastage and milk fed to calves and 1.6 to preserved milk products. An estimated consumption of 92 million gallons of whole milk as liquid milk and cream and whole milk used in ice-cream represented 9.1 per cent of the estimated total whole milk

production "at the pail".

The percentage of total production utilised for manufacturing purposes in the above period was the highest of any dairying country in the world and the percentage utilised as liquid milk and cream the lowest.

There has been an enormous expansion in dairy cow numbers and in dairy production in New Zealand since 1900, especially during the period 1918-1935. In 1935 the number of cows in milk reached a maximum prior to 1951 when the highest numbers for any year were recorded. The 1935 numbers were a result of the economic depression which New Zealand experienced between 1929 and 1935 and which caused dairy farmers to increase the size of their herds to maintain incomes when butterfat values reached low levels. There was a subsequent slight decline in numbers but with favourable prices and a constant overseas demand for dairy products since World War 11 there has been a continuous upward trend. The numerical increase in cow numbers in New Zealand is shown in Table 111.

TABLE 111: Dairy cow numbers in New Zealand 1900-1951, thousands.

Season	Cows in milk and dry	Cows in milk
1900-1	372*	
1905-6	518	
1910-11	634	
1914-15	725	
1918-19	826	
1920-21	1005	890*
1929-30	1440	1389
1935-36	1952	1828
1939-40	1850	1740
1945-46		1682**
1950-51		1866

* Hamilton (1944)
** N.Z. Dairy Board (1951)

Dairy production expressed as butterfat production "at the pail" and production utilised for the manufacture of dairy products and consumption as liquid milk and cream together with the percentage of total production utilised for consumption as liquid milk and cream may be observed in Table 1V. This

TABLE 1V: Utilisation of estimated butterfat production in New Zealand 1901-1950.
(Production "at the pail" in millions of pounds).

Season	Butterfat manufactured	Consumed as milk and cream	Total production	Percentage milk and cream to total
*1901-2	39.6	7.97	48.5	16.4
1902-3	43.7	8.16	52.9	15.4
1903-4	51.4	8.40	61.0	13.8
1904-5	53.8	8.64	63.7	13.6
1905-6	54.5	8.89	64.6	13.8
1906-7	57.3	9.18	67.9	13.5
1907-8	58.4	9.38	69.1	13.6
1908-9	63.5	9.69	74.8	13.0
1909-10	75.0	9.89	86.6	11.4
1910-11	76.5	10.08	88.4	11.4
1911-12	79.6	10.31	91.8	11.2
1912-13	89.6	10.58	102.2	10.4
1913-14	96.7	10.89	109.8	9.9
1914-15	98.5	10.99	111.8	9.8
1915-16	107.0	11.07	120.4	9.2
1916-17	113.9	11.04	127.5	8.7
1917-18	107.3	11.01	120.8	9.1
1918-19	108.2	11.11	124.5	8.9
1919-20	121.3	11.78	135.8	8.7
1920-21	139.8	12.07	155.0	7.8
1921-22	182.6	12.42	199.0	6.2
1922-23	208.4	12.66	225.5	5.6
1923-24	211.1	12.90	228.5	5.6
1924-25	223.0	13.16	241.0	5.5
1925-26	215.8	13.45	233.9	5.8
1926-27	239.8	13.72	258.7	5.3
1927-28	245.0	13.93	264.2	5.3
1928-29	269.2	14.08	289.1	4.8
1929-30	293.5	14.27	314.1	4.5
1930-31	301.1	14.46	322.0	4.5
1931-32	319.4	14.60	339.8	4.3
1932-33	374.4	14.72	397.1	3.7
1933-34	403.3	14.82	426.7	3.5
1934-35	386.8	14.95	409.9	3.6
1935-36	401.7	15.05	425.3	3.5
1936-37	418.4	15.21	442.4	3.4
1937-38	396.1	15.37	419.9	3.7
1938-39	353.6	15.76	376.7	4.2
**1933-34/ 1937-38	387.4	27.3	437.9	6.2
1938-39	345.7	33.0	400.3	8.2
1939-40	374.8	33.6	430.6	7.8
1940-41	409.4	33.7	466.3	7.2
1941-42	382.1	34.0	437.3	7.8
1942-43	351.8	34.7	406.8	8.5
1943-44	332.2	33.5	387.3	8.6
1944-45	375.5	32.7	431.7	7.6
1945-46	317.0	33.7	372.4	9.0
1946-47	350.1	34.7	408.1	8.5
1947-48	358.9	35.6	417.8	8.5
1948-49	396.0	37.1	457.3	8.1
1949-50	406.9	41.3	471.6	8.8

* Hamilton (1944): Adapted from data supplied by the Investigational and Statistical Section, N.Z. Dept. of Agric.
** N.Z. Dairy Board (1951).

table shows rapid increases in total butterfat production from 48.5 million pounds in the 1901-1902 season to 426.7 million pounds in the 1933-1934 season. The production for the 1949-1950 season was 471.6 million pounds but no marked increases in total butterfat production from the level of the mid 1930's are observed that cannot be partially accounted for by climatic variations within seasons.

Table 1V also shows that the amount of butterfat utilised in milk and cream for direct consumption has increased annually from 7.97 million pounds in the 1901-1902 season to 41.3 million pounds in the 1949-1950 season. As a percentage of total production this has accounted for a utilisation of 16.4 per cent and 8.8 per cent in the respective seasons. Lower percentages of utilisation are shown by Hamilton than by the New Zealand Dairy Board, the latter having used a revised basis of calculation.

Statistics of the New Zealand Dairy Board showing the increase in estimated consumption of liquid milk and cream, and the percentage utilisation of total production in this form, are given in Table V. Total whole milk production "at the pail" and the quantities of milk utilised for creamery buttermaking and cheesemaking are also given. This table shows an increase in the consumption of whole milk as liquid milk, cream and ice cream from an average of 64.6 million gallons in the five seasons 1933-1934 to 1937-1938 to 92 million gallons in the 1949-1950 season. The above account for 6.5 per cent and 9.1 per cent of total whole milk production "at the pail" in the respective periods.

With the increase in butterfat production in New Zealand there was a marked decline in the proportion of production utilised for consumption as liquid milk and cream over the period 1900-1937. The volume of production has not markedly increased since 1933, but liquid milk and cream consumption, as shown by Table V, has increased as a proportion of total production since the mid 1930's.

TABLE V: Estimated whole milk production and utilisation in New Zealand (million gallons).

Season (30th June)	Total whole milk production "at the pail"	Creamery butter-making	Cheese-making	Milk & cream consumed & ice cream	% utilised as milk & cream or milk for ice cream	% utilised for manufacture
1933-34/ 1937-38	988.0	691.9	191.2	64.6	6.5	91.2
1938-39	891.9	604.3	171.6	77.0	8.6	88.8
1939-40	951.2	638.2	195.1	77.7	8.2	89.4
1940-41	1018.9	657.2	242.4	77.0	7.6	89.9
1941-42	954.5	524.5	308.8	77.3	8.1	89.3
1942-43	893.4	567.1	203.8	79.6	8.9	88.6
1943-44	859.8	550.7	184.0	77.8	9.0	88.3
1944-45	940.7	613.1	202.9	74.5	7.7	89.3
1945-46	817.1	503.4	186.1	77.2	9.4	87.5
1946-47	885.6	575.9	179.3	78.7	8.9	88.3
1947-48	908.2	602.7	171.7	80.9	8.9	88.3
1948-49	983.4	649.0	194.6	83.4	8.7	88.7
1949-50	1011.3	658.3	205.5	92.0	9.1	88.3

N.Z. Dairy Board (1951).

Hamilton (1944) has shown that between 1919 and 1940 most dairy farmers increased the output of their holdings by more intensive production rather than by extending the area farmed, as indicated by the data below. Prior to this period increases in dairy production had resulted principally from an extension of the area used for dairying.

	1919-20	1929-30	1939-40
Cows/1000 acres sown grass in many dairying areas.	105	173	239
Average butterfat production/ cow in milk.	172.5	221.6	235.3
Butterfat produced/1000 acres sown grass.	18,112	38,337	56,237

The increase in butter and cheese exports from the Dominion in this period compared with other periods is shown by statistics compiled from customs returns by the New Zealand Dairy Board and given in Table Vl. Whereas it shows treble the butter exports and double the cheese exports from New Zealand in the period 1921-1930 compared with the period 1911-1920 and a further doubling of the butter exports in the period 1931-1940

compared with the exports in the previous decade there is no substantial increase shown for the period 1941-1950 compared with the period 1931-1940.

TABLE V1: Volume of butter and cheese exports from New Zealand (1,000 tons).

Period	Butter	Cheese	Period	Butter	Cheese
1867-1870	.3	.3	1911-1920	184.3	414.0
1871-1880	1.0	.8	1921-1930	616.5	733.9
1881-1890	10.3	8.9	1931-1940	1250.8	872.5
1891-1900	39.2	31.7	1941-1950	1203.8	961.0
1901-1910	140.1	86.1			

- N.Z. Dairy Board (1951)

Hamilton (1944) has broadly grouped the avenues for future expansion of dairy production as:

"(1) By more intensive farming of areas at present used for dairying.
(2) By diversion of land at present used for fat lamb raising or fattening of beef cattle to dairying.
(3) By development of land at present lying idle but capable of being utilised for dairying."

There is no doubt, however, that in the past an increase in the demand for milk has been met by an increase in the extent of the milk-sheds in addition to higher production within the milk-sheds. Perhaps in the future, increases will be met from grassland and herd improvement with associated advances in grassland and herd management.

It has already been pointed out that in 1900 there was no constructive overall organisation in the Market Milk Industry in New Zealand. The problems of the industry at that time were those associated with supplying good quality milk to meet the demands of a growing urban population. The increase in urban population and the corresponding increase in the daily demand for liquid milk and cream was taking place at the same time as dairy production in New Zealand was rapidly expanding to meet the export demands. Urban areas spread and encroached upon the rural areas surrounding them. Liquid milk producing areas became "built-up" areas and their use as dairying areas to supply the liquid milk demand was lost.

Producer-distributors or liquid milk producers within these areas were compelled for economic reasons to move further from the consuming areas to produce milk or transfer to alternative occupations, either specialising as milk producers or distributors or breaking their associations with the liquid milk industry.

In endeavouring to meet the demand for liquid milk economic incentive had always to be given to ensure supplies were forthcoming. For many milk producers the price incentive and security of demand from the liquid milk industry was insufficient to induce them to change from seasonal production for manufacture to all-the-year-round production for town supply. As a result there were shortages of milk in many areas throughout New Zealand in the years prior to 1944. Since that year the stability of demand given to producers under the National Milk Scheme has brought progressive decreases in seasonal shortages of liquid milk. At the present time all areas in New Zealand are assured of adequate supplies of liquid milk under normal conditions of production.

CHAPTER 1V

THE INFLUENCE OF INCREASES IN TOTAL POPULATION, AND ITS DISTRIBUTION BETWEEN RURAL AND URBAN AREAS, UPON THE MARKET MILK INDUSTRY.

During the early years of colonisation in New Zealand internal communications were poor. Towns were first established in the vicinity of natural harbours and inland settlement subsequently developed from these ports. Because of its favourable topography and open nature the South Island was initially settled most rapidly but with the advent of dairying and sheepraising and the subsidence of the Maori Wars the North Island was opened up rapidly. With the completion of the railway communication between Auckland and Wellington a series of inland towns were established and more recently towns have developed on the pattern of the main highways and motor transport routes as the centres of surrounding primary production areas.

The increase in the total population of the Dominion and the change in distribution of population between cities and boroughs, the urban areas, and the remaining rural areas has been of great importance in its effects on the demand for liquid milk and the difficulties associated with meeting this demand.

In Table V11 urban population refers to that in cities and boroughs while rural population covers counties, all town districts and the extra county islands.

TABLE V11: The non-Maori population of New Zealand 1881-1945, rural, urban and total.

Census Year	Population 1000's			Per Cent	
	Rural	Urban	Total	Rural	Urban
1881	292	195	487	59.61	39.8
1886	328	246	574	56.72	42.46
1891	353	270	623	56.33	43.14
1896	393	307	700	55.83	43.69
1901	419	350	769	54.19	45.32
1906	459	425	884	51.71	47.79
1911	498	506	1004	49.37	50.13
1916	502	585	1087	46.02	53.66
1921	532	682	1214	43.62	55.95
1926	552	785	1337	41.08	58.39
1936	603	884	1487	40.40	59.29
1945	592	1009	1601	36.91	62.89

N.Z. Official Year-Book (1947-1949)

Table Vll indicates that urban population as a percentage of the total population of New Zealand increased from 39.18 per cent in 1881 to 62.89 per cent in 1945. In the same period the total population increased from 487,000 to 1,601,000. At the end of 1950 the population of New Zealand, including Maoris, was 1,920,946 (N.Z. Abs.of Stats., 1951).

Another way of showing the change that has taken place in the distribution of population between town and country areas may be observed in Table Vlll. The "Centres" are boroughs, town districts or larger congregations of population. The figures given exclude Maoris because of incomplete records. The great bulk of Maoris inhabit rural communities and their numbers have increased from about 50,000 in 1906 to about 100,000 in 1945 (N.Z. Official Year-Book, 1947-49).

TABLE Vlll: Number and percentage of population resident in urban areas of defined size, 1901-1945.

Centres of	1901	1911	1916	1921	1926	1936	1945
			Population - thousands				
1000-2499	42	55	66	80	85	83	75
2500-4999	33	37	46	56	50	52	71
5000-9999	37	51	45	23	32	48	60
10000-24999	11	63	83	129	155	173	168
25000 & over	214	303	349	402	473	532	636
Totals:							
Urban	337	509	589	691	794	887	1010
Rural	432	494	499	523	543	600	590
Grand Total: (Excluding migratory)	769	1003	1087	1214	1337	1487	1600
			Percentage of population				
1000-2499	5.44	5.47	6.04	6.60	6.34	5.55	4.67
2500-4999	4.35	3.71	4.25	4.65	3.71	3.48	4.44
5000-9999	4.79	5.11	4.13	1.92	2.40	3.25	3.72
10000-24999	1.38	6.25	7.61	10.63	11.60	11.63	10.53
25000 & over	27.85	30.19	32.12	33.10	35.33	35.95	39.76
Totals:							
Urban	43.81	50.73	54.15	56.90	59.38	59.66	63.12
Rural	56.19	49.27	45.85	43.10	40.62	40.34	36.88
Grand Total: (Excluding migratory)	100.0	100.0	100.0	100.0	100.0	100.0	100.0

N.Z. Official Year-Book (1947-49)

Table Vlll shows that the percentage of non-Maori population resident in urban centres containing more than ten thousand people increased from 29.23 per cent in 1901 to 50.29 per cent in 1945.

The population increases within defined urban areas of provincial towns of New Zealand are shown in Table lX. This table indicates that the population resident within the defined urban area of Hutt Valley has almost trebled between 1926 and 1951. In relative terms it indicates that the populations of Hamilton and Nelson have doubled in the same period whilst those of Auckland, Christchurch, Palmerston North, Invercargill, New Plymouth and Hastings have increased by one-half.

TABLE lX: Population increases within defined urban areas of provincial towns of New Zealand 1911-1951 - in thousands.

Urban area	Excluding Maoris				Including Maoris			
	1911	1916	1921	1926	1926	1936	1945	1951*
Auckland	121.3	139.3	165.2	203.2	204.5	226.4	286.8	329.0
Wellington	72.4	84.2	92.7	103.3	103.7	122.1	132.3	133.4
Christchurch	87.6	93.5	106.1	118.6	118.7	133.5	151.1	174.1
Dunedin	70.2	72.1	75.8	88.8	88.9	85.6	87.6	95.3
Hutt	13.4	17.0	20.6	25.1	25.3	37.3	55.8	74.9
Hamilton	5.9	8.6	14.3	17.2	17.3	20.1	28.0	33.1
Palmerston N.	12.1	14.2	17.2	20.3	20.1	24.4	27.8	32.8
Invercargill	16.3	17.9	19.3	22.0	22.1	25.9	27.8	31.6
Wanganui	16.1	19.2	23.2	26.3	26.5	25.8	26.3	29.7
New Plymouth	8.7	9.9	12.8	16.2	16.3	18.6	21.1	24.9
Napier	13.9	15.6	17.5	18.3	18.6	19.2	20.7	24.5
Hastings	8.9	11.4	13.2	14.5	14.6	17.9	20.3	23.8
Timaru	12.7	13.5	15.6	17.0	17.0	18.8	19.7	22.8
Nelson	8.9	9.9	10.6	11.7	11.7	13.5	16.5	20.5
Gisborne	10.7	12.7	14.5	14.7	15.1	15.9	17.0	19.8

* Provisional N.Z.Abs.of Stats.(1951)

A number of factors have operated to bring about permanent changes in the pattern of population dispersion in New Zealand. Most important of all factors has been the recent growth of the manufacturing industries, as distinct from the direct processing of meat and dairy products prior to shipment overseas. Early industry was essentially local according to the demand but later industry has been of the

centralised type in which large works supply a Dominion-wide demand. Local industries to supplement these major industries have been a natural consequence. Once this concentration of population movement begins there are many forces which may work to give it momentum. In the opinion of Calvert (1946)

> "The relative growth of commerce, education, hospitals, entertainments, professional services and other tertiary industries and employments, which thrive on and add to the mere agglomeration of population, will in any case strongly reinforce the trend toward continued urbanisation and centralisation, regardless of other factors."

The increases in urban population, as shown, brought about an increased demand for liquid milk which, in turn, called for an extension of the areas devoted to liquid milk production. This extension was accentuated by the loss of dairy lands to "built-up"areas. The distances between areas of production and centres of consumption increased the difficulties associated with the provision of a good quality milk supply to consumers because of the time lag and distances involved. At the same time there was a reduction of the numbers of producer-distributors in the town-milk trade. It became necessary to organise the supply of milk to meet the demand with a product of good quality. Advances in the production, transportation, treatment, storage and distribution of milk were necessary to offset these unfavourable conditions. The changes brought a specialisation into the Market Milk Industry and a need for strict control within the industry to ensure the supply of a good quality, safe milk to all consumers.

CHAPTER V

THE EFFECT OF TWENTIETH CENTURY ADVANCES IN THE STATE OF KNOWLEDGE UPON THE MARKET MILK INDUSTRY IN NEW ZEALAND AND UPON THE LEVEL OF MILK CONSUMPTION.

There have been enormous advances made during the twentieth century in the scientific knowledge relating to milk and its products and in the practices employed in the Market Milk Industry in New Zealand. It has been a period of general scientific advancement and there has been a growing public appreciation of the part that science can play in helping to solve the problems of the liquid milk industry.

At the same time considerable advances have been made in the study of preventive medicine. As a result of higher educational standards and scientific, technological, nutritional and medical advances there is today a much improved knowledge of the nutritive value of milk, the role of milk in the diet of humans and its potential as a means of spreading disease. This latter consideration has emphasised the need for care in milk production and the precautions necessary in all subsequent handling operations.

Because of New Zealand's relatively small population and consequent small liquid milk consumption there was no active research undertaken on a large scale in the Dominion. Large overseas countries conducted research with vigour and their advances were made available to New Zealand. These were applied by progressive trade interests for economic gain and by education authorities for the national well-being.

At the turn of the century information was elementary in the light of present-day knowledge and indeed, many fields of specialised study were then unknown or uninvestigated.

In the field of milk production technological advances have been responsible for the more economic production of milk of better composition and higher bacteriological quality. Studies of the physiology of milk secretion have brought an understanding of the factors influencing the composition of

milk and enabled more efficient milking to be practised. Further, the effect of feeding and other factors upon the composition of milk have been studied.

The breeding of cows with increased production potential and the feeding of these cows on scientific principles have been responsible for an increased per cow production with greater economy of production (N.Z. Dairy Board,1943).

Dairy bacteriologists have studied the organisms responsible for the deterioration of milk quality and have shown the importance of producing milk of low bacterial count. The sources of bacterial contamination have been investigated and practical methods of elimination evolved, methods which may be adopted within normal cost-of-production budgets. Consequently milking machines have been introduced and used on an extensive scale and milking sheds constructed on approved principles. Adequate supplies of hot and cold water have been made available in these sheds and all milk cooled immediately after milking. These developments have resulted in milk of improved keeping quality for liquid consumption. Milking machines also enabled the milking of larger herds and the more economic production of milk.

Allied with advances in animal breeding and the physiology of milk secretion, there have been improvements in farm management practices and in the productivity of the strains of grasses and clovers sown for pasture production. Thereby, feeding materials have been made available as and when required to a greater extent than hitherto and greater dependance can now be placed upon pasture fed in situ for the feeding of stock. In association with the other principles adopted the decreased use of fodder crops has resulted in many areas in more economic milk production.

The perfection of the internal combustion engine in this century meant much to the Market Milk Industry. In addition to being used on the farms to promote more economic milk production it has speeded up milk collection and milk distribution and enabled the carrying of greater quantities of

milk over increased distances. This has been particularly important in milk collection where the milk-sheds have extended from consuming areas as the result of population increases, increases in the extent of urbanisation and an increased "per capita" consumption of milk.

At the beginning of this century the treatment of milk for liquid consumption in New Zealand was almost non-existant. Raw milk was delivered loose to consumers. The effect of treatment on milk was not fully understood. In England, America and Europe there was a rapid expansion in dairy research from shortly after 1900. Research workers were endeavouring to promote economy in the liquid milk trade and provide a safe milk of good keeping quality to consumers. By 1910 this research was being pursued on an extensive scale.

Pasteurisation was first accepted as a means of preserving the keeping quality of milk. When milk was proved to be a dangerous means of spreading disease it was shown that this could be completely checked by correct pasteurisation of the raw milk and the prevention of subsequent recontamination. Whereas milk was first "pasteurised" by heating to preserve keeping quality and then flash pasteurised for the same reason, scientific investigations established the time-temperature relationships required to completely destroy pathogenic bacteria. "Holder" pasteurisation was then introduced but was time consuming and permitted of only comparitively small throughputs. To correct these defects the modern high-temperature short-time pasteurisers were introduced to do the same work in shorter time and facilitate the treatment of larger volumes of milk. At the same time as these developments have taken place legislation has been introduced to provide that only milk that is efficiently heat-treated to ensure its safety to public health may be sold as pasteurised milk.

In association with the extended use of pasteurisation, milk has been cooled by mechanical refrigeration and held at low temperatures to minimise bacterial growth prior to distribution to consumers. Mechanical advances in refrigerat-

ion have enabled numbers of small cooling units to be used so that milk can be cooled at every stage between production and consumption.

Glass bottles have been used in milk distribution to minimise post-pasteurisation contamination. They have been widely used in New Zealand but the more recently developed single-service cardboard carton has not, as yet, come into use. These developments have provided a service and a safe milk to consumers but are added costs which must be met by consumers.

Associated with the above advances has been a continual improvement in the metals used in milk treatment equipment and the utensils necessary for the handling of milk. Tinned-steel, copper, aluminium and other less used materials have, in the last twenty years, been replaced by stainless steels. Science has produced these steels to possess durability and to be insoluble in milk so that tainting or quality deterioration of milk does not result from their use.

With advances in the field of milk treatment laboratory control has been used to an ever increasing extent. With a fuller organisation and the channeling of greater quantities of milk through milk treatment stations in New Zealand, particularly since 1937, there has been an increase in laboratory control of milk treatment processes and the quality of milk. This has been especially marked since World War 11.

In 1900 the practice of determining the butterfat content of milk had not long been introduced into New Zealand and was not adopted as a practice in the liquid milk trade. There was no regular examination of milk supplies for compositional and bacteriological quality as practised today. Milk grading relied upon the senses test and efficiency varied with the personal ability of the grader, never attaining any reliable high standard or consistency because it lacked laboratory confirmation.

Today laboratories work in close association with milk treatment houses to ensure the supply of milk of good composit-

ional and bacteriological quality. Supervision of the subsequent treatment of this supply provides to consumers a safe milk and one that will remain wholesome and sweet at least until the next delivery is made a day later.

Transport advances following upon the perfection of the internal combustion engine, the pasteurisation and bottling of milk and the general improvement in the keeping quality of milk have been responsible for major changes in the practices of milk distribution. Milk is now distributed to consumers once a day whereas it was formerly common practice to distribute milk at least twice daily. This rationalisation of distribution together with the carrying of bigger payloads and speedier delivery has promoted economy in distribution and with other advances already enumerated a milk of better bacteriological quality has been delivered to consumers.

The supply of milk of good quality has given consumers confidence in the quality of the commodity supplied. At the same time economies in production and handling have enabled them to include increased amounts of milk in their diets.

It is only in the last forty years that the importance of milk in the diet has been properly understood. Vitamins have been discovered and their importance in nutrition studied. The place of minerals in metabolism has been fully investigated and the biological value of the proteins in milk appreciated. Detailed studies have been made of the composition of milk and the factors affecting variation in the quantity of individual constituents present in milk. The contributions of milk to the requirements of an adequate diet have been more fully understood and following this the public have been taught to appreciate the value of adequate milk consumption. Milk is now being consciously consumed as a food which makes a valuable contribution to the diet, whereas formerly it was consumed because of habit and custom. It is also appreciated as a cheaper food than the equivalent substitutes.

Greater appreciation of nutritional problems by the population of New Zealand has been noticeable since 1936. In

this year the League of Nations published reports of nutritional surveys in many countries and made dietry recommendations. These reports laid before the public the results of nutritional surveys and experiments in the milk feeding of humans and stressed the importance of milk consumption in the diets of people of all ages, especially those of children, expectant and nursing mothers and the aged.

The increasing awareness of the importance of milk and the rise in the living standards of the people of New Zealand resulted in the "per capita" consumption of liquid milk and cream, expressed as milk, expanding from .52 pints per head per day in 1901 (N.Z. Dept. of Agric.,1952) to more than 1 pint per head per day in 1951 (N.Z. Dairy Board,1952). This increase has been facilitated by improvements in dairy technology, as already outlined.

The introduction of the Milk-in-Schools Scheme in 1937 whereby cooled, bottled, pasteurised milk was provided free to school children was a recognition by the State of the importance of milk in the diet of growing children. It was hoped to promote a milk drinking habit among children which would be continued by the future adult population.

More recent and continued subsidisation of all milk purchased by consumers has given them additional consciousness of the importance attached by the Government to adequate milk consumption and has further stimulated the increase in milk consumption.

In New Zealand milk has become appreciated as a protective food which prevents "deficiency" diseases and it is now consumed in adequate amounts by large numbers of consumers.

CHAPTER V1

THE DEVELOPMENT OF THE MARKET MILK INDUSTRY IN NEW ZEALAND 1900-1918.

Prior to World War 1 producer-distributors dominated the liquid milk industry in most areas in New Zealand. A high proportion of the milk supply to most centres of population was produced within the town or city boundaries or in close proximity to them.

Producer-distributors endeavoured to sell all the milk produced on their own farms at full liquid milk rates. They frequently supplemented their output in periods of low production by purchasing sufficient milk from other producers to satisfy the liquid milk demands of their customers. There was for the most part a happy producer-consumer relationahip and few milk shortages occurred.

In the years immediately prior to and during World War 1 increases in urban populations, as already indicated, brought an expansion in the demand for liquid milk and necessitated an extension of the milk-sheds of some centres. Wholesale distributors then became more frequent in the liquid milk trade. They entered into verbal agreements with producers for regular supplies of milk and arranged for additional supplies from alternative sources not normally supplying whole milk for liquid consumption during periods of low production. Some distributors made no forward contracts for milk but obtained their supplies from any available source on a day to day basis.

As a consequence of these distributor policies conditions were frequently unsatisfactory for the independent producers of liquid milk. Many producers were not assured of a market in advance but were compelled to accept the ruling day to day price. In periods favourable for milk production their returns were very low, often at butterfat rates for manufacture, but during periods unfavourable for milk production they received a high price for their supply, as a result

of the increased demand.

There were no fixed prices for milk for liquid consumption either to producers or consumers. Under laissez-faire conditions price was the result of the balance of supply and demand. There was no organisation of the persons engaged in the liquid milk trade and prices were fixed as a result of competition between distributors for the milk available for liquid consumption within any area. Consequently prices varied from one area to another and quite frequently within one area there were pronounced variations between adjacent localities.

Throughout this period the dual-purpose Shorthorn breed of cattle predominated in the dairy herds of the Dominion (Hamilton,1944) and in the absence of any records it may be assumed that the same predominance existed in the town-milk herd.

In 1900 the conditions under which milk was produced left much to be desired. Though milking machines had been invented and were introduced into a small number of milking sheds, hand milking was the general practice in farm dairies. The dairies themselves were predominantly constructed of wood with iron roofs (N.Z. Dept. of Agric.,1900). Concrete and brick surfaces for use in dairies and yards were being introduced but many holding yards and dairy floors were constructed of earth. This frequently resulted in farm dairies becoming unsanitary, especially during the winter period. Hand-milking pails presented conditions of easy access of visible dirt, dung etc. into the milk. Many dairies had previously been built for other uses and had been unsatisfactorily converted for milking purposes. Others erected for temporary use had remained to be used as permanent structures. Most dairies had low roofs and were poorly lighted. Walls were dirty and rarely whitewashed. Little provision was made for milk storage and milk cooling was practised only in about half the dairies (ibid). Water supplies were drawn from surface springs and running streams such that they were often

very unsatisfactory during the summer period. Drainage was often poor or non-existent. Manure heaps and piggeries were frequently situated in close proximity to milking sheds and milk storage.

A Department of Agriculture report for 1900 gave the following summing up of production conditions:-

> "Filthy and unsanitary conditions existed in many dairies; cows were poorly fed, especially during the winter period, and no adequate care was taken with produced milk."

In 1900 the Department of Agriculture assumed responsibility for the inspection and registration of farm dairies used for the production of milk for liquid consumption. By 1903 all milk for sale for liquid consumption came from dairies that were registered and regularly inspected. General insanitation was an initial common defect but owners of dairies were generally willing to comply with the regulations and rapid improvement to comply for registration took place. A time margin was allowed for dairies to be improved to comply for permanent registration. Dairies not up to standard were closed (N.Z. Dept. of Agric.,1901). Cooling had been generally inadequate but was expanded such that with improved production conditions once-daily delivery of milk of better keeping quality was possible in some areas. However, once-daily delivery did not become widely practised under the existing customs and distributor competition.

Milk samples were taken and tested by the Department of Agriculture and prosecutions made for non-compliance with regulations. Adulteration was the basis of many prosecutions. This had an educating effect on producers and the quality of milk improved though it was still poor bacteriologically compared with later standards.

It is more than interesting to note that in the early years of this century the tuberculin test for tuberculosis was being widely applied by the Livestock Division of Department of Agriculture and reacting animals destroyed. The tuberculin test was undertaken at the request of producers.

Regular inspection and registration brought gradual improvements in shed construction, sanitation, water supplies and milk storage conditions. At the same time the use of milking machines increased from about 1905 when improvements in design became effective (Hamilton,1944). In the years prior to 1914 and during the wartime period that followed there was fairly rapid acceptance of milking machines due to the difficulties in obtaining satisfactory hand milkers and the high wages asked during periods of labour shortage. Hot water available for cleaning purposes, however, was in poor and unsatisfactory supply.

From 1909 the Department of Agriculture had given instruction in the handling of milk for factory supply with the aim of obtaining the production of milk under sanitary conditions prior to correct cooling and storage. This had a general educative effect in the dairy industry and brought some improvement in the quality of milk which hitherto had been very unsatisfactory.

With large numbers of producer-distributors in the liquid milk trade in 1900 the collection and distribution of milk was undertaken as one operation, the milk being conveyed directly from farms to consumers. Milk was supplied to consumers in the raw state, delivered loose by can and dipper methods to receiving vessels of many types left out for the purpose by the housewives.

The entry of wholesale distributors into the liquid milk trade by the end of World War 1 led to the collection of milk by people other than producers from the farms of one or more producers. This had the effect of reducing the number of persons engaged in milk collection to some extent although large numbers were still engaged in this service.

The only recorded organised collection of milk in large quantities prior to 1905 was by the Taieri and Peninsula Milk Supply Co., for supply to the City of Dunedin. From this date, however, some organised collection of treating house supplies was undertaken in other areas as treating

houses became established.

The milk containers employed during transport in the period under review were very similar to the tinned-steel cans with close fitting lids used at the present time. There have been some structural improvements in the containers used in more recent years, as indicated in Chapter V.

In the period 1900-1914 horse transport was the best and most popular mode of transport. In addition, the "dandy", a large container between two wheels, and man-drawn, was popular for distribution and was frequently used for collection from farms in close proximity to consuming centres.

Transport was slow, however, and the area of supply was limited by the practical effective range of the transport used in collection. But, with milk production for liquid consumption usually undertaken within or in close proximity to the city areas, the distances involved were not excessive.

With the development of rail transport railways were used, where feasible, thus enabling milk to be utilised from greater distances than was previously practicable. This mode of transport found only limited application.

Developments in the efficiency and reliability of the internal combustion engine from 1910 onwards brought the introduction of motor transport during World War 1. This enabled milk to be brought to the population centres more quickly and from a greater distance than previously. However, motor transport was not widely used for the transport of milk until some years later.

It has already been noted that a high percentage of milk for liquid consumption in 1900 was supplied through producer-distributors. At this time Dunedin was the only centre with liquid milk supplies passing through an organised milk treatment station. Treatment consisted of receiving and bulking milk prior to it being cooled and placing it in cool storage to await distribution. Milk surplus to liquid requirements was separated for cream for liquid consumption

or manufacture into butter.

In the case of producer-distributors who supplied and distributed a high percentage of milk for liquid consumption in Dunedin and other areas the treatment applied to milk was negligible. The same may be said of milk distributed by wholesalers. The general bacteriological and hygienic quality of milk supplies was poor. This was indicated by the general poor keeping quality of milk at that time, according to statements of men then associated with the industry (Stonex,1951).

Prior to the establishment of a treating house in Auckland and the introduction of pasteurisation to a portion of the milk supply to that city about 1905 some milk was being crudely pasteurised in New Zealand by producer-distributors and private distributors. Milk was heated to varying temperatures, usually 160°F. or higher, for varying lengths of time. This promoted a cooked flavour in much of the milk so treated. However, the amounts treated by these interests was small and only sufficient for private distribution requirements (N.Z. Farmer,1900).

Treating-house pasteurisation was commenced in Dunedin in 1910 and with Auckland was the only area in which this was practised prior to the end of World War 1.

Though bottles had been used for the distribution of milk overseas since the 1880's this practice did not come into extensive use in New Zealand for many years. It appears that bottling was first applied on an appreciable scale in New Zealand to some raw milk supplied in Auckland about 1905. Raw milk was bottled by a large producer-distributor in Christchurch from 1916. During the period under review it appears that other progressive distributors were bottling milk but they were comparatively few in number.

In the period 1900-1918 the average amount of milk distributed by persons engaged in distribution was not large by present-day standards. There was keen competition

between distributors. This necessitated the travelling of long distances under laissez-faire conditions for the distribution of milk to consumers. It was normal for two or more deliveries a day to be made, usually following milking. Thereby milk was delivered to consumers in as fresh a condition as possible. Regular personal contact was maintained between distributors and consumers. Milk was paid for by cash or credit was allowed for weekly or other convenient periods.

Though the supply situation was satisfactory for most population centres in New Zealand in this period, difficulty was experienced in Wellington from the first decade of the present century in maintaining a satisfactory supply of milk to that city. The factors responsible for this and the organisation which developed to restore and maintain stability in the liquid milk trade in this city will be discussed in the next Chapter.

CHAPTER V11

MUNICIPAL CONTROL OF THE MILK SUPPLY TO WELLINGTON.

Wellington is almost entirely surrounded by high hills, and the surrounding land for many miles is not generally suitable for dairying. In the first decade of the present century less than one-half of the milk supplies to Wellington were obtained from within the city area or within a two-mile radius of the city boundary, chiefly from producer-distributors (Rawlinson,1951). The remaining supply was obtained from areas beyond the hills surrounding the city, in many cases up to 50 miles distant. Large quantities of milk were railed by producers to the city railway station where private distributors purchased their requirements at the ruling price. The mechanism by which this milk was sold is not clear but it appears that some producers consigned milk to specific distributors while others consigned to agents who sold on their behalf at the best price obtainable. After storing milk in generally uncooled and unhygienic conditions the distributors competed for custom in the city (Wellington City Council,1924).

There was wide-spread dissatisfaction among consumers and representations were made to the City Corporation in an endeavour to achieve an improvement in both the quality and quantity of the milk supply. Distributors who did not produce their own milk blamed producers for the poor quality of the milk supply and while this may have been the cause of some of the trouble it was really the distributors who were responsible for the greater part (ibid).

In an endeavour to strengthen their position in the market and gain some stability and uniformity in the prices received for milk for liquid consumption, the producers formed the Wellington Dairy Farmers' Co-operative Association, Ltd., in 1912 to bargain collectively with distributors. Membership was on a voluntary basis but the producers' organisation quickly achieved a strong voice in the control of the liquid

milk supply to Wellington. The organisation expressed its dissatisfaction with the activities and conduct of the distributors to whom it was selling milk and as a result of the combined representations of the producers and consumers the City Corporation decided to take action to improve the unsatisfactory position obtaining (ibid).

The milk supply position had been aggravated by the high prices available for manufactured dairy products during the wartime period when supplies were cut off to the United Kingdom's market from countries which normally forwarded substantial quantities of butter and cheese.

In 1917 the City Corporation entered upon a comprehensive scheme to supply milk to Wellington City and the suburbs. Before reports on an extensive supply and delivery scheme could be obtained the Dairy Farmers' Co-operative Association, Ltd., urged the city authorities to establish immediately a clearing house for the following reasons (ibid):

1. Producers were experiencing difficulties with the transit of milk from country railway stations. They were suffering financial loss and milk quality was deteriorating due to lengthy transit periods and subjection to unfavourable conditions.
2. The loss of cans which necessitated expensive replacements.
3. Producers were receiving the blame for the poor quality and faulty condition of milk distributed in Wellington whereas it was considered the reason was the lack of suitable transport facilities and the storage and distribution conditions existing in the City.

The producers demanded that the city authorities take over control or the milk supply would be cut off.

Enquiries by the Council revealed that private enterprise had failed to give an adequate, clean and cheap

supply of milk to Wellington City. There was insufficient supply in the winter months and contamination of supplies frequently occurred. Milk was often diluted with water, despite the frequent prosecutions (Rawlinson,1951). There was uneconomic distribution due to the complete absence of zoning in any form and the quality of milk supplied varied considerably.

From 1917 the City Corporation, in association with the Department of Health, appointed an official inspector for the inspection of milk storage, treatment and distribution conditions and the sampling, for official testing, of milk sold to consumers. This appointment has been continued.

The first municipal intervention and attempt at constructive organisation came in 1918 when a clearing house was brought into operation. It was unable to carry out the functions required of it and was closed after one day's operations. In the opinion of the City Corporation the failure of the venture would have resulted from the general conduct of the distributors who offered the least assistance possible to its success, even if all other conditions had been satisfactory. The latter was not the case, however, since the floor space and plant provided was inadequate to handle the volume of milk, there was insufficient prearranged planning in respect of handling and the labour engaged was only about half the true requirements (Wellington City Council,1924).

As a result of this reverse the City Corporation decided on municipalisation of the milk supply to the City. Later in the same year (1918) premises were purchased for the reception, pasteurisation and cooling of milk in the City and a country dairy factory leased at Otaki to overcome the difficulty of the fluctuating supply and demand and provide a suitable supply of cream to the City. The Rahui factory at Otaki and an additional factory at Te Horo were later purchased for the manufacture throughout the

year of milk surplus to liquid requirements, though there was frequently little or no surplus during the winter period. The factory first purchased was later used as a permanent country receiving depot. During 1918 negotiations were opened up by the City Council with producers and distributors in an endeavour to rationalise the supply and distribution of milk to the people of Wellington.

Necessary legislation for municipal control of the liquid milk supply to Wellington was passed in 1919 and the City Corporation commenced operating a treating house to handle milk on a large scale early in the same year. Milk was purchased from producers and after reception, pasteurisation and cooling was resold to distributors for distribution at a fixed margin. The margin included compensation to distributors for loss of business at the end of a two year period when the Corporation planned to enter the field of distribution. This period was later extended for a further year and in 1922 the City Corporation took over the distribution of all milk passing through the treating house except small amounts sold to nearby producers for distribution when their own production was deficient to their requirements.

With the assumption of control of distribution bottling was commenced. Agencies were established for the sale of tokens to consumers for the purchase of milk in retail quantities from Corporation roundsmen. Roundsmen were not permitted to accept cash payments for milk. Eventually only bottled milk was distributed in retail quantities by the City Milk Department. Private distributors continued to sell loose milk.

Producer-distributors resident within two miles of the City boundary were allowed to retain their businesses. These conditions have continued, conditional upon the maintenance of the quality of milk supplied by producer-distributors to the satisfaction of the Department of Health.

With the handling of milk established on a large scale a laboratory was set up in 1922 for the testing of incoming raw milk supplies and their scientific grading together with the control of treatment processes and the quality of the outgoing milk.

Initially milk was purchased from producers on a gallonage basis providing it conformed to the minimum standard of 3.25 per cent butterfat content, but from 1922 the Corporation purchased milk supplies on the basis of the value of the butterfat content at ruling butter manufacture rates with an added payment on a gallonage basis to compensate the producers for costs of transport, loss of by-products and interest and depreciation on the capital value of improvements required to comply for farm dairy registration. The butterfat payment was doubled during the four winter months to compensate for the costs of hand feeding, lower production and the arduous conditions of winter milking. Winter production was thereby stimulated (ibid).

This basis of payment applied only to milk classed first grade which required milk not to reduce methylene-blue under standard conditions in less than 250 minutes and show less than .18 per cent of acidity at the time of receipt. Milk not up to this standard was paid for at butterfat rates and separated for cream if a methylene-blue reduction time of more than 50 minutes or an acidity between .18 per cent and .22 per cent was obtained (ibid). Milk below second grade standard was returned to producers.

In an endeavour to ensure adequate supplies at all times of the year contracts were made with producers by the Wellington Dairy Farmers' Co-operative Association, Ltd., which collectively contracted with the City Corporation. Similar circumstances applied for the other producer associations formed in association with the country factories. The Wellington Dairy Farmers' Co-operative Association, Ltd.,

owned and operated a small cheese factory for the manufacture of milk surplus to liquid requirements produced by its members. Manufacture became uneconomic due to the small amounts of milk handled and the factory was eventually disposed of in 1942, all milk then passing to the Corporation's treating house under agreement and the supply surplus to contract paid for at butterfat rates. As a condition of the contracts with the Corporation substantial penalties were provided for any deficiencies between the actual supply and the contracted supply. The penalties were doubled for the winter period.

Though the basis of fixing the price for milk was later adjusted to include the price of butterfat for cheese manufacture and to increase the butterfat payment in the winter period by 85 per cent the above basis of price derivation was, in principle, continued throughout. The basing of payment on the butterfat content of milk supplied served to raise the compositional quality of milk available to the citizens of Wellington through municipal enterprise to a high standard. By laboratory control and inspection of distribution, allied with pasteurisation, the bacteriological quality was similarly raised.

The Corporation employed an inspector to visit producers' farms, especially those experiencing difficulty in producing milk of high quality as indicated by the treating house laboratory tests. The help and advice given aided the maintenance of a raw milk supply of high quality, reduced the incidence of second grade milk and promoted co-operation between producers and the Corporation.

Milk supplied to the Corporation has been obtained predominantly from the Wellington Dairy Farmers' Co-operative Association, Ltd., and producer supply groups associated with the country receiving depot and factory. The Corporation throughout has provided cans for milk supplied directly to the city treating house by producers and has charged hireage for these on the basis of milk gallonage

supplied. In this manner the cost has been equitably shared between the Corporation and milk producers.

Wellington occupied a unique position in being the first city in the British Commonwealth with municipal control of the milk supply to its citizens (Wellington City Council, 1939). The City Corporation very soon reached a position where it could assure to its citizens an adequate, pure and reasonably cheap supply of milk of uniform quality. Pasteurisation was increasingly practised until eventually all the milk handled by the Corporation was pasteurised by efficient methods, and bottling was extended to include the whole of the retail sales. Inspections and testing showed that the milk supply under municipal control was more satisfactory in every way than a supply left in the hands of large numbers of competing private distributors.

From the time retail distribution was taken over in 1922 there were economies in distribution due to the greater ease with which zoning could be introduced and the distribution of bottled milk only.

Though the Corporation handled up to 80 per cent of the milk supplies for Wellington its bargaining power did not assume a monopolistic position because the advantage was neutralised by the presence of the equally powerful Wellington Dairy Farmers' Co-operative Association, Ltd.. At the same time it had to offer a sufficiently high price to ensure the availability of adequate supplies of milk for liquid consumption when a manufacturing market was readily available at all times and permitted less arduous seasonal production compared with the more arduous and more costly all-the-year-round production required for liquid consumption. In practice, however, the price to producers was equal to or better than the prices paid in other areas for milk that did not attain an equally high compositional and bacteriological quality. The price of milk to consumers was maintained at the lowest possible level and always compared favourably with consumer prices in other areas. At the same time the

consumers were assured of a regular supply of milk of high quality. Organisation of the liquid milk supply to Wellington by the City Corporation has been a great success.

CHAPTER V111

THE DEVELOPMENT OF THE MARKET MILK INDUSTRY IN NEW ZEALAND 1918 - 1930.

In Chapter 1V mention was made of the increases in the population domiciled in "urban" areas during the period 1918-1930. The resulting increased demand for milk and the use of land formerly employed for dairy production for "urban" expansion caused an extension of the milk-sheds in the environment of the larger centres of population. This brought larger numbers of wholesale distributors into the town-milk trade and reduced the extent of producer-consumer contact. There was some decrease in the numbers of producer-distributors but their function continued to be important in these centres. In the smaller centres the dominant position of the producer-distributors remained unchallenged.

The extension of milk-sheds increased the distances between producing and consuming areas and involved longer times for milk transport. This necessitated the production of milk of better keeping quality than formerly. The keeping quality of the milk supply was not good, however, and to prevent the souring of milk there was a consequent expansion of milk treatment by progressive local interests in Auckland, Christchurch and Dunedin, where the longest collection distances prevailed. The milk treatment stations endeavoured to extend their milk sales through the delivery of milk of improved keeping quality to consumers.

In the years following World War 1 there were developments in all fields of the Market Milk Industry; production, collection, treatment and distribution.

Though difficulties were experienced in providing cheap and reliable sources of power and cheap and good quality rubberware, about one-half of the cows in the Dominion were milked by machines by the end of World War 1, in order to effect economies in labour. This proportion increased during the 1920's (Hamilton,1944).

Though milking machines facilitated the production of clean milk of good bacteriological quality they also introduced more problems into milk production because of the new sources of bacterial contamination which they provided. With an understanding of these problems, a fuller appreciation of milk hygiene, and an increased use of concrete in farm dairies there were improvements in the quality of the milk supply during the period 1918-1930.

The internal combustion engine, as a source of power, was associated with the increase in the number of milking machines. Engines increased in number quite rapidly until 1925 as their dependability and efficiency increased. Further increases were offset by the spread and increased use of electricity as a source of power. Electricity was first introduced in the South Island in 1915 and it was generally accepted by 1925. Thereafter the use of electric motors for motive power increased rapidly. Electricity also provided heating for hot water so that more efficient cleaning routines resulted.

From 1925 onwards special attention, through inspections, was given to the cleanliness of premises and the methods of handling and cooling milk. Sediment testers were introduced and used from the following year with good educational effects on producers (N.Z. Dept. of Agric.,1926, 1928).

Over the period 1927-1930 improvements were made in the type of milking shed being erected (N.Z. Dept. of Agric., 1931). The best principles of sanitation were being incorporated. The erection of new buildings declined, however, with the onset of the economic depression which brought lowered returns to producers.

As technical advances were made and became available so they were applied to the production of milk for liquid consumption. But milk producers were for the most part unorganised to bargain for the prices they received for milk and their returns were frequently poor. This provided

little money for improvements and retarded development in the greater use of improved machinery and methods.

Throughout the period there were improvements in farming practices and a general increase in the efficiency of dairy production. With payment to factory suppliers made on the basis of the quantity of butterfat supplied, emphasis was placed on butterfat production. Consequently the Jersey breed, as the most efficient producer of butterfat, became increasingly predominant in the Dominion. At the same time the average milk production per cow for the national herd increased. In the town-milk trade payment was made on the basis of volume. The Friesian, Ayrshire and Shorthorn breeds were thought to be more efficient producers of milk per acre and continued to predominate in the herds milked to supply liquid milk for human consumption. Butterfat was considered in the payment for milk supplied to Wellington but elsewhere milk quantity only was considered, provided that minimum legal standards of composition were fulfilled.

Outside the Wellington and Auckland areas there was no appreciable testing of milk quality by purchasers, and milk was accepted for consequent liquid consumption on its passing a low standard of senses grading. Producers were not penalised for the supply of milk of poor quality and had no incentive to improve the quality of milk to comply with enforced high grading standards. Allied with this was the lack of price differential to compensate for the production of milk of good quality. Milk was accepted from producers because it was milk and could be resold to consumers, not as a safe, good quality product of high nutritive value, but because it would remain sweet until delivery and provide economic gain to the distributors.

The use of phosphatic fertilisers and lime was increased during the 1920's. The resulting increase in pasture production encouraged the conservation of surplus spring and summer pasture growth as hay and sileage and these

practices were extended. In addition rotational grazing was introduced. The advances in the knowledge of feeding and farm management practices brought fuller utilisation of the increased natural pasture production and evened out the consumption of foodstuffs throughout the year by the town-milk herd. Pasture production gained favour in preference to fodder cropping and this practice found use chiefly in the renewal of run-out and low producing pastures.

During the period practices employed by producers in obtaining replacement stock varied widely. With a semi-seasonal type of production pursued by many producers the rearing of replacements was widely practised. In other instances replacements were purchased at public auctions, despite the undesirability of this practice. The rapid development of the Group Herd Test movement from the 1922-1923 season facilitated the selection of the progeny of the highest producing animals for replacement purposes, and permitted more accurate culling of low producers. Per cow cow production was undoubtedly raised as a result of these practices (N.Z. Dairy Board,1943).

Milk was purchased from producers on the basis of verbal or written contracts. These may or may not have been entered into sufficiently in advance to provide for adequate supplies of milk for liquid consumption during the winter period. Frequently treating house proprietors and private distributors endeavoured to obtain supplementary supplies only when supplies from regular sources declined in periods of low production.

Contracts and agreements provided for stipulated amounts of milk to be supplied at liquid milk rates or the whole supply to be forwarded and fixed amounts paid for at liquid rates. The balance of the supply would then be paid for on the basis of its butterfat content. By 1930 it was common practice for treating houses to collect the whole of producers' supplies and pay for quota amounts at liquid rates. The supply surplus to quotas realised

butterfat values only. Quotas were based on the supply in the three or four months of lowest production in the previous year or series of years.

All the prices of milk were farm gate prices and collection was the responsibility of purchasers, whether treating houses or private distributors. Milk surplus to liquid milk and liquid cream requirements was always sold to manufacturing dairies for conversion into dairy products.

The development and use of motor transport from the 1920's onwards increased the speed of collection and the distances from which liquid milk could be supplied to meet the increasing demands of the growing "urban" populations.

As the motor vehicle increased in popularity as a means of transport, roads were developed and improved. However, motor transport did not find great favour for use in milk collection while the milk supply areas remained within reasonably short distances of the centres of consumption and producer-distributors and wholesale distributors prevailed in the distribution of milk direct from the farm to the consumer.

With treating houses established in Auckland, Wellington and Dunedin for the treatment of large volumes of milk before 1920, and the establishment of treating houses in other areas in subsequent years, there was a growth of organised milk collection and a progressive increase in the use of motor transport for the carriage of milk. Speed was required to collect greater loads of milk from increasing distances from the treating houses, and from about 1925 onwards motor transport came into wider use for milk collection.

With scientific and bacteriological study advances during the 1920's the importance of keeping milk cool to preserve its keeping quality was realised. The use of covers over milk containers whilst in transit, to protect them from the heat of the sun, dust, etc., was recommended by the Department of Agriculture but did not become general practice.

The frequency and time of milk collection aimed to maintain milk quality for economic reasons and to meet the

consumer demand for milk quality under the existing competition between distributors for trade. Twice-daily distribution of milk was common practice.

There was, however, a gradual improvement in milk quality under the supervision of the Department of Agriculture. This seems to have been most marked from 1925 onwards (Stonex,1951). Quality improvement was allied with an extension of milk treatment. These factors combined to stimulate once-daily collection but because of the competition between distributors and the need to maintain milk quality twice-daily collection and distribution was maintained.

The increased numbers of wholesale distributors, the increased difficulties associated with maintaining the supply of greater quantities of milk of good quality for liquid consumption, and the availability of technological advances in the field of milk treatment brought about an extension of milk treatment in Auckland, Christchurch and Dunedin in the period under review. The treatment of the milk supply to Wellington has already been discussed (Chapter Vll). In areas other than Wellington milk treatment was extended for financial reasons rather than to improve the quality of milk delivered to consumers.

As milk treatment houses developed, individual distributors treated milk in greater quantities. Outside the four main centres, however, the milk supply to consumers continued to consist predominantly of raw milk, delivered loose.

Pasteurisation in the period under review was accomplished by "batch" and continuous pasteurisers employing the low-temperature long-time treatment of milk. The processes were manually controlled.

Developments in the field of milk distribution were the result of changes already discussed. Producer-distributors continued to distribute unbottled raw milk. Wholesalers pursued the same practices but their activities reduced the extent of producer-consumer contact. Where

treating houses were established, principally in the four main metropolitan areas, pasteurised and bottled milk was available for distribution to consumers.

The development of motor transport resulted in the application of this mechanical advancement to milk distribution. It permitted the speedier transport of milk for delivery over longer distances when compared with horse and float transport. At the same time larger payloads could be carried.

There was freedom for any person to enter the field of milk distribution, providing a license to do so was obtained from the local authority for the area. This was normally a City or Borough Council.

Distribution conditions were regulated by the Department of Health, which appointed inspectors to inspect distribution conditions from the time milk ceased to be the property of producers and to obtain samples of milk intended for liquid consumption. These samples were tested to ensure that only milk conforming to fixed minimum standards of composition and quality was delivered to consumers. Defaulting persons were prosecuted.

Because of the freedom of entry to the distribution business it was characterised by the duplication of delivery routes to capture maximum trade for individuals. This resulted in many rounds being excessively long.

Even at this early stage of development there was a tendency for milk distributors, in association with trade interests, to encourage the consumption of either raw or pasteurised milk, according to their individual interests.

The practice of "scalding" milk after delivery, to prolong its keeping quality, indicated the low hygienic and bacteriological standards of milk supplied to consumers prior to 1930. There is good reason to believe that the same practice was pursued on a larger scale by distributors for the same reason.

Except under municipal control in Wellington, distributors generally continued to dominate the liquid milk trade during this period. They were in contact with consumers and arranged the supplies of milk to meet the demands of consumers. Except in Wellington they bargained with unorganised producers in respect of the prices they would pay for milk, always endeavouring to obtain supplies at the lowest price and subsequently to maximise their distribution margin. The resulting instability promoted shortages of milk in the periods of lowest production and milk of poor quality was frequently used in an endeavour to maintain the necessary supply.

By 1930, however, the prices received for manufactured dairy products on the world's markets showed a decline from the price levels of previous years. Dairy farmers endeavoured to increase their production to maintain their gross incomes. Some milk producers entered the liquid milk trade to enjoy the advantages of the premium liquid milk prices. There was an oversupply of the liquid milk demand in many areas and intense distributor competition resulted. The instability was greatest in the Auckland area and gave rise to an organisation which is discussed in the following Chapter.

CHAPTER IX

THE AUCKLAND METROPOLITAN MILK COUNCIL AND ITS REGULATION OF THE MILK SUPPLY TO AUCKLAND CITY.

Auckland has the largest population of any city in New Zealand. It is favourably situated geographically in the centre of a large district well suited for dairy production.

Prior to 1929 there had been a loose voluntary organisation of farmers who produced liquid milk for consumption in Auckland (Stonex,1951). They bargained with representatives of the treating houses serving the city to reach general but unbinding agreements for the prices that they would receive from the milk-treating companies. These had established large distribution businesses in association with their treatment operations. There was still a high proportion of producer-distributors and wholesale distributors, however, and strong competition existed in the field of milk distribution. There had been no organisation in which either producers or distributors came together to their mutual advantage and for the benefit of consumers.

With the decline in prices received for exported dairy products from 1930 there was a tendency for dairy factory suppliers in the vicinity of Auckland to enter the liquid milk business in which more remunerative prices were then available. They did this in an endeavour to increase their gross returns and competed with producers and distributors already established in the liquid milk industry. A continued fall in the value of manufactured dairy products resulted in price-cutting among producers and distributors. It had become extremely bitter by 1932 when prices to producers were very low and retail prices through undercutting were similarly depressed (Rodwell,1947).

Late in 1932, in an attempt to stabilise the industry,

distributors formed themselves into the Auckland Retail Milk Vendors' Association. This Association endeavoured to stabilise retail milk prices at a level similar to prices in other areas and effected temporary stability in the liquid milk market. Early in 1933, however, there was another period of price-cutting consequent upon the formation of another distributors' organisation, the Farmers' and Vendors' Association. This Association consisted of persons who had broken away from the original Association; it openly advertised milk for retail sale at a very low rate, relying on voluntary zoning to keep distribution costs down. This breakaway group was supported by a powerful dairy manufacturing organisation, the New Zealand Co-operative Dairy Company, Ltd., which sought to enter the town milk business. The Auckland Retail Milk Vendors' Association retaliated by lowering their retail milk prices, even though the retail price level was below that which would cover costs (ibid). Retail prices in some areas declined to a level lower than that obtainable from the sale of milk for manufacture into dairy products, despite their substantial decline in prices. Prices were so low that under a continuation of these conditions the milk supply to Auckland City would have been insufficient to meet the demand (ibid).

The Auckland Retail Milk Vendors' Association accordingly supported a proposal from the Auckland City Council for the formation of a board of control with legislative authority and late in 1933 Government intervention and negotiations brought about the passing of the Auckland Metropolitan Milk Act, 1933, and the setting up of an Auckland Metropolitan Milk Council. There was strong opposition to such a move by sections of the producers and distributors who favoured the establishment of a co-operative organisation of producers and a vendors' association to consolidate distribution rounds. However, there was a strong case for public control on account of the condition of

the local milk trade and the Act was passed by Parliament. In the following year, at the instigation of a section of those in the milk trade, repealing legislation was introduced to Parliament but it subsequently lapsed (ibid).

The Act provided for the Council to consist of nine members, three representing the Auckland City Council, two representing local authorities within the Milk District, two representing retail milk distributors, and two representing dairymen producing for town supply (Auckland Metropolitan Milk Board,1951). From the time of its inception the Council generally carried out the duties imposed upon it, and enforced the powers vested in it by the Act. The administrative expenses entailed were redeemed by a levy on each gallon of milk sold in the Milk District.

The chief powers given the Council in 1933 were (Hazard,1937):-

"1. To license vendors and dairymen.

2. To carry on research and investigation relating to milk and its treatment.

3. To put into effect, as soon as practicable, an economic system of consolidation or zoning of rounds.

4. To establish "zones" of supply from which to draw the necessary city supplies.

5. To fix hours of delivery to roundsmen.

6. To fix milk prices, and to apportion such prices between producer, collector, treatment and distribution; also to fix wholesale and retail supply prices of milk and cream.

7. To prescribe rules for the collection, treatment and distribution of milk.

8. To make a levy upon all milk sold in the district, such levy not to exceed one farthing per gallon."

In accordance with its powers the Council licensed all producers, distributors, milk-shops and milk-bars in order to control the quality of milk and to regulate the milk supplies. At the same time it fixed milk prices. This was an important advance in the reorganisation of the City's milk supply following the price-cutting which had

threatened to cut off the City's supplies of milk. The problem was to fix a price low enough to promote consumer demand and sufficiently high to ensure adequate supplies. Allowances also had to be made to cover costs of collection, treatment and distribution. Fixed margins were allowed in respect of all services rendered.

Despite the sounder basis of the liquid milk trade seasonal shortages still occurred under Council control. Pools or groups of suppliers were established in association with each of the five treating houses and licenses were issued to producers only for supply to a stipulated pool. Pools were not required to purchase milk from specific producers. This caused diversion of available milk supplies to butter and cheese factories and necessitated the issuing of temporary licenses to ensure supplies in periods of lowered milk production. The pool regulations aimed to secure for producers an equitable share in the proceeds of liquid milk sales.

In addition to licensing milk distributors the Council fixed the hours of retail delivery in order to eliminate uneconomic distribution arising from two or more deliveries per day, as previously practised. At the same time it prescribed regulations for the handling and distribution of milk and appointed inspectors to enforce compliance with the Council's regulations. The licenses of unsuitable distributors were suspended and the number of licenses controlled to ensure, as far as practicable, economy of distribution. The Council also controlled the issue of licenses to milk-shops in order to eliminate the duplication of selling agencies.

Some voluntary consolidation of distribution rounds by exchange of customers was effected, but lack of legislative power prevented compulsory consolidation until an amending Act in 1935 provided the Council with this power. Systematic consolidation was proceeded with by purchasing the goodwill of some distributors and redistributing their supplies among

others who then became the only distributors licensed to deliver in defined areas (Rodwell,1947).

From 1938 the policy of distribution consolidation was changed and part of the Auckland Milk District was divided into blocks in which not more than three distributors were licensed to operate. This scheme was successful in the limited area to which it was applied, but its extension was anticipated in 1940 by complete compulsory zoning resulting from Government direction to conserve wartime petrol supplies (ibid).

The Council instituted inspections and the sampling of milk for testing, supplementary to those taken by the Department of Health. Initially these samples were submitted to the Department of Health for analysis but from late in 1935 the Council arranged for a practising analyst to undertake the tests on its behalf, this resulting in an increase in the number of samples tested. Routine testing of milk samples was then allied with inspections of treating houses, milk stores, shops, vehicles and utensils used in connection with the treatment, storage, distribution or sale of milk. A milk specialist was appointed and made available to assist those engaged in the milk trade to improve their methods and to confer with producers, treating-house operators and distributors where the results of tests were below the Council's standards. It is important to note that in Auckland minimum butterfat standards for milk and cream were raised from 3.25 per cent and 35 per cent to 3.5 per cent and 40 per cent respectively (Chapman,1951).

The Auckland Metropolitan Milk Act, 1933, gave a right of appeal to persons aggrieved by any decision of the Auckland Metropolitan Milk Council. The right of appeal covered decisions relating to alteration of the Electors' Roll, the granting, refusing, revoking, varying or suspending of a license, the attaching of any condition thereto, or the fixing or varying of any price; such appeal to be made to the

Magistrates' Court at Auckland. Appeals were heard against the Council with regard to prices fixed but none were successful.

The Council reorganised the liquid milk industry in the Auckland Milk District to promote stability for the benefit of producers, distributors and consumers. In practice the Council's function was to assist all sections of the trade and this it did by licensing and inspections and the application of bacteriological and hygienic standards (Neil, 1951). Under Milk Council control the milk supply to consumers was safeguarded for quality. Allied with this times of delivery to consumers and services given by distributors were regulated.

The Council created order out of chaos in the milk trade in Auckland and made the majority of consumers in this "urban" area satisfied with their milk supply.

CHAPTER X

THE DEVELOPMENT OF THE MARKET MILK INDUSTRY IN NEW ZEALAND 1930 - 1939.

There were no marked changes in the methods employed in the production, collection, treatment and distribution of milk in the Market Milk Industry in New Zealand during the period 1930-1935 because of the economic depression then being experienced in the Dominion.

During this five-year period there was a decline in liquid milk prices and producers endeavoured to increase their production to maintain gross incomes at the highest level possible. For the same reason milk producers formerly supplying milk or cream for manufacture into dairy products endeavoured to enter the premium liquid milk market. There was an adequate supply of milk available for liquid consumption and keen competition between distributors tended to cause further reduction in milk prices. All incomes were lowered and capital expenditure by private interests was at a minimum.

As trade conditions improved more money became available to the liquid milk trade. As a result, many changes took place in the Market Milk Industry between 1935 and the onset of war in 1939. Development then took the form of improvements in the general practices employed in the industry, the wider application of the best principles proved in the 1920's and particularly an extension of milk treatment.

An increased demand for liquid milk, as indicated in Chapter 111, led to a further extension of the milk-sheds and in the years following 1935 brought increased numbers of wholesale distributors into the industry. Outside the four main metropolitan areas, however, there were still large numbers of producer-distributors in the liquid milk trade.

In the period 1930-1939 the Jersey breed of cattle continued to increase in popularity in the national dairy herd. Evidence available from persons associated with the milk trade at this time, however, indicates that the higher milk-yielding non-Jersey breeds continued to be more popular

for the production of milk for liquid consumption. An exception to this breed popularity was in the area supplying milk to Wellington City. Here the Jersey breed was extensively used, since milk was partly paid for on the basis of its butterfat content.

There were also developments in the animal husbandry and plant husbandry practices. Pastures were resown with higher producing strains of grasses and clovers. Improved farm management practices were adopted. Less cropping was undertaken and more hay and sileage was conserved for feeding in periods of lowered pasture production, especially during dry summers and the autumn and winter months.

The use of milking machines continued to increase and with a better understanding of the principles of clean milk production there was a gradual improvement in the keeping quality of the milk supplies forwarded for liquid consumption. In and after 1935 many farm dairies were rebuilt and premises of better layout and construction erected. Following upon recommendations of the Dairy Industry Commission of 1934, finance, at a low rate of interest, was made available by the Government to farmers, to enable farm equipment and appliances to be modernised and rendered efficient for the production of dairy produce of the highest quality (Dairy Industry Commission, 1934).

By 1939 the water supplies available to farm dairies were generally good. Cool bore water, in adequate amounts, was being widely used. Coupled with this, electricity had spread to almost all areas in which milk was produced for liquid consumption, and electric water heaters were widely used in milking sheds. The cooling of milk was universally practised under Department of Agriculture regulations though it was not always highly efficient. The use of mechanical refrigeration was also practised for cooling in a small number of dairies. With increasing realisation of the perishable nature of milk, there was also an improvement in the

conditions of milk storage on farms.

Although production conditions and practices had improved under the inspection and registration of farm dairies by the Department of Agriculture, the cleanliness and bacteriological quality of the milk produced depended largely upon the milk producers themselves.

By 1939 milk for liquid consumption in New Zealand was being produced on more specialised farms than in earlier years. These were situated at greater distances from the consuming centres. Milk, mainly in ten and twelve gallon cans, was being collected almost universally by motor transport. Where delivered to treating houses it was collected from organised collection routes by heavy motor transport. Producer-distributors and wholesale distributors, however, continued to transport their individual requirements of milk from the areas of production to the centres of consumption. Duplication of collection routes frequently occurred and resulted in excesses of mileage being covered in the collection of milk.

The extent of milk treatment increased gradually, but in 1937 the introduction of the Milk-in-Schools Scheme gave this aspect great impetus. This scheme, sponsored by the Government under the direction of the Department of Health, aimed to supply to every child attending school in New Zealand half a pint of cooled, bottled, pasteurised milk on each day schools were in session. Where treating houses were already established it enabled them to enter into contracts with the Department of Health to supply pasteurised bottled milk to the schools in their locality. In other centres it provided a guaranteed market for pasteurised and bottled milk and gave incentive to the establishment of treating houses with these facilities. Treatment operations could then be extended to milk supplied to the remaining consumers.

As a result of the Milk-in-Schools Scheme treating houses were established in a number of population centres and

treatment operations commenced. Treating houses also provided cooling and cool storage facilities for all milk handled. Indirectly, too, the Scheme had an educational effect upon the population, which was reflected in a steadily increasing demand for treated milk.

The suspended weigh-vat with a dial scale had been developed to a working efficiency by 1905 and by 1939 its use was almost universal for milk reception at treating houses. Previously milk was frequently weighed in cans on platform scales, the weight of cans being subtracted from gross weights to give the weight of milk supplied. By 1939 can washers were also in general use in treating houses. Where correctly operated they provided clean sterile cans for return to producers. In some cases hand washing continued to be practised. Rotary-type can washers had become available during the 1920's and were the type commonly installed by the liquid milk industry. The modern type of "straight through" washer, perfected from the middle of the 1930's, was not installed to any appreciable extent in treating houses prior to World War 11.

Prior to 1939 pasteurisation was mainly carried out by the low-temperature long-time method. "Flash" pasteurisers, using high temperatures with no definite holding time, were still being used.

The low-temperature pasteurising machines employed were of the "batch" type which had a characteristically small throughput and the continuous type which enabled a somewhat larger throughput. Thermographs were introduced during the 1930's but pasteurisation continued to be manually controlled. Though regeneration, for heat conservation, was often allied with pasteurisation, cooling of milk was undertaken independently of the pasteurising process.

The bottling process did not change very markedly throughout, the developments being in improved design and efficiency and increased throughput capacity.

Laboratory control of the bacteriological quality and composition of milk and of treatment operations was not extensive prior to 1939. The senses grading of incoming raw milk supplies was practised in all areas but the grading standards were not high. Providing milk could be maintained in a sweet condition until delivered to consumers there were instances where it was very often accepted for treatment, irrespective of its condition (Ford,1951). The public were accustomed to accepting milk of poor quality and did not demand improvements because of their ignorance of what the quality of milk should have been. Laboratories had been established in large treating houses in Auckland and Wellington from the early 1920's but elsewhere little or no provision was made for any comprehensive laboratory control within treating houses in the period under review.

The testing of milk for butterfat content was common throughout the period in most areas, since milk supplied surplus to liquid requirements was paid for on a butterfat basis. Some methylene-blue testing for keeping quality and sediment-testing for cleanliness from visible dirt was also carried out. However, such testing was for the most part spasmodic and outside the Auckland and Wellington areas was not undertaken as a regular routine.

In the field of distribution there was an increased use of motor transport from 1935. This permitted the speedier coverage of greater distances, and, with an extension of milk treatment, distributors offered a wider choice of milk to consumers. Where available raw and pasteurised, bottled and loose milks were distributed according to the wishes of consumers.

With the larger numbers of full-time distributors and increasing facilities for milk treatment there was a gradual improvement in the keeping quality of milk delivered to consumers. Improved storage facilities were also introduced. These changes were especially noticeable in many areas from about 1935 onwards. The result was that milk was distributed

less frequently than previously and once-daily distribution became widely practised. For this undertaking the early morning and forenoon period was used as far as practicable.

As a result of social and economic changes within the Dominion, restaurants and milk-shops increased in popularity throughout the period 1930-1939. From the first introduction of milk-bars in 1937 there was a rapid increase in their numbers. All these agencies were supplied with milk in wholesale quantities and, by 1939, had assumed an important place in the distribution of milk.

During the 1930's distributors of milk continued to dominate the Market Milk Industry in New Zealand, except in the Wellington and Auckland areas. Except in these two areas they bargained with producers or treating houses in respect of the price they would pay for milk and endeavoured to obtain supplies at the lowest possible price. These supplies they sold at the maximum prices obtainable or alternatively at lower rates in an endeavour to increase their overall profit margins or net returns by increased turnover. As indicated, this condition was overcome in Wellington by the existance of a powerful producers' organisation and the local body control and operation of the treatment and distribution of a major portion of the milk supplies to that city. In Auckland, the Metropolitan Milk Council was given power to fix producer and consumer prices and margins for services rendered, and thus assumed control formerly held by distributors. In other areas, however, the distributor domination was evident until 1939. The supply situation in these areas will now be discussed.

CHAPTER XI

THE ORGANISATION OF THE MILK SUPPLY TO AREAS OTHER THAN WELLINGTON AND AUCKLAND PRIOR TO WORLD WAR 11.

No planned organisation existed in the milk trade and no co-ordinated endeavours were made to produce, treat or distribute milk in New Zealand, excluding the Wellington and Auckland areas, prior to 1939. Private enterprise only was engaged in the trade. The demand for milk was generally met but shortages frequently occurred in periods of low production, particularly in the Christchurch and Dunedin areas because of their larger populations and the lack of organisation in their liquid milk trades. In addition, milk in these centres was frequently of poor bacteriological quality.

Only producer-distributors and wholesale distributors were engaged in the milk trade in the Christchurch area prior to 1934. One large producer-distributor had supplied bottled milk from 1916 and pasteurised milk from 1924, but the remaining supplies were distributed in the raw state. A large treating and distributing company was established in 1934 and after commencing pasteurisation in 1937 this company endeavoured to extend the sale of pasteurised milk (Wright,1951). In 1937 a second treating house with substantial throughput, and concentrating on the sale of raw milk, was established.

Milk distributors had no central organisation but arranged themselves into two highly competitive groups according to the class of milk they sold, pasteurised milk on the one hand and raw milk on the other. Producers were similarly unorganised and in an attempt at organisation broke into two groups which became associated with the competing distributing interests (ibid).

Those responsible for the sale of milk completely dominated the liquid milk industry in Christchurch and prices received by producers were usually low. All treating and distributing interests that purchased milk from producers had one aim, namely, to obtain milk at the lowest price possible

to ensure that their own supplies would be adequate to meet their demands.

Except for wet and cold periods in the late autumn and winter the area surrounding Christchurch has been suited to dairy production. Had the surrounding area been less suitable severe milk shortages would undoubtedly have occurred due to lack of organisation in the liquid milk trade. In addition, the quality of milk supplies available to consumers would have reached a very low standard, because of the low returns received by producers.

Notwithstanding the general availability of supplies, conditions in the milk industry were not good and the Christchurch City Council became so concerned that in 1937 it promoted an investigation into the overall position of the milk market in that city. Mr. R.E. Herron, the late General-Manager of the Wellington City Corporation Milk Department, was appointed to investigate the circumstances of the milk trade with a view to rationalisation of the industry under local body control. He subsequently submitted a report in which he stated (Herron,1937):-

> "The industry is in a most chaotic condition, and the parties thereto have not, for lack of the necessary co-operation and cohesion, been able to carry out any scheme of organisation and control that would ensure to the Producers and Vendors a reasonable return for their labours, or ensure a milk supply of the necessary quality and hygiene."

The Christchurch City Council took no action on receipt of the above report. However, it continued to license distributors and dairies within the city and the conditions described by Herron continued unchanged until the outbreak of war in 1939.

Although co-ordinated organisation was lacking in the liquid milk trade in Dunedin there were not so many individual units in operation as in Christchurch. The pioneer Taieri and Peninsula Milk Supply Co. was engaged in the distribution of milk throughout the period under review and pasteurisation from 1910 onwards. A second treating and distributing organisation was established in 1918, a third in 1925 and a

fourth in 1933, but the treating house established in 1925 went out of business in 1935. Thus there were three companies engaged in milk treatment and distributing pasteurised milk from 1925 onwards and for a short period four companies. By 1935 about one-half of the total milk supply was pasteurised. The companies were in competition with producer-distributors and wholesale distributors who sold milk only in the raw state.

No good dairying area is situated in close proximity to Dunedin. The winter is more severe than in areas further north and supplementary feeding of dairy stock for a longer period is necessary. Prior to 1935 the greater part of the milk supplies were obtained from the hilly country surrounding or in close proximity to the city. This is an area of low fertility and not suitable for dairying. It was subdivided into small holdings and the individual herds were small. Farmers in these areas had no scope to increase production. Supplementary feeding had to be practised for the greater part of the year and wet grains from local breweries were extensively used for this purpose.

From 1935 there was a decrease in the total production of milk obtained from the hills surrounding the city and the Otago Peninsula, and in consequence supplies were obtained from the Taieri Plain, thirty miles to the south of the city. It was from the nearby areas, unsuited to the production of liquid milk, that producer-distributors and wholesale distributors obtained their milk supplies while the companies received the greater part of their supplies from the Taieri Plain.

As in Christchurch selling organisations held effective control in the liquid milk industry in Dunedin, The producers supplying milk for liquid consumption were not organised and competed to supply the liquid milk market. All buyers of milk endeavoured to purchase milk at prices that would promote maximum profit to themselves. Though contracts were held with both permanent and temporary suppliers by the

treating and distributing companies they attempted every possible economic gain. As an indication of this, milk was purchased throughout on the basis of a gallon of 10.5 pounds.

The low prices paid to producers, distributor domination in the industry and the competition between distributors brought about a need for comprehensive organisation and co-ordination in the liquid milk industry in Dunedin, prior to 1939. In an endeavour to protect their interests, private distributors and wholesale distributors formed the Dunedin Milk Vendors' Association, Incorporated, in 1937. In this organisation these sections of the trade found common interest in the distribution of raw milk in competition with the pasteurising companies, as distributors of pasteurised milk. Otherwise, however, no further organisation eventuated in the period under review.

In areas other than those already considered the liquid milk trade was very similar to the circumstances described for Christchurch and Dunedin. The industry was conducted by producers, distributors and producer-distributors with general distributor domination, though not always to the same extent as in the main metropolitan areas. Smaller supplies of milk were required to meet the demand and in many areas were more easily obtained, since most towns are favourably situated close to areas suitable for milk production. Nevertheless, shortages of milk for liquid consumption frequently occurred in the winter period, even after all available supplies had been obtained for the liquid milk trade. Generally milk was delivered raw but after the introduction of the Milk-in-Schools Scheme in 1937 substantial quantities were pasteurised.

The most common cause of shortages of milk was the inadequate price offered to producers to encourage the production of milk in periods when production was difficult and costly. This was allied with the failure on the part of distributors

to ensure, by forward contract, that adequate supplies would be available. Adverse seasonal conditions, by accentuating these defects of the trade, were the cause of additional deficiencies in supply.

The lack of adequate organisation resulted in periodic shortages of milk supplied to consumers in all areas, and the prevalence of high prices in periods of undersupply. General distributor domination and unrestricted competition between distributors led to a lowering of the prices received by producers, uneconomic services to consumers and malpractices in respect of milk.

CHAPTER X11

THE MARKET MILK INDUSTRY IN NEW ZEALAND UNDER WARTIME CONDITIONS 1939-1944.

During World War 11 the prewar tendencies in the liquid milk trade continued so far as the availability of manpower, building materials and metals permitted. The difficulties associated with obtaining adequate supplies of milk of good quality were increased by shortages of the factors mentioned above and the low prices offered to producers.

Producers outside the organisations already enumerated for Wellington and Auckland (see Chapters V11 and 1X) remained unorganised, except in Dunedin. In that area the producers supplying the treating houses formed themselves into the Dairy Farmers' Co-operative Milk Supply Company Ltd., in 1942. However, membership was voluntary and very few of the producers supplying raw milk directly to wholesale distributors had joined this organisation by 1944.

The volume of milk treated, as a result of the introduction of the Milk-in-Schools Scheme in 1937 (see p. 58), continued to increase under wartime conditions. A limit to this expansion was imposed by the facilities available in treating houses when the war commenced. There was one exception in Auckland, however, where what appears to have been the first modern high-temperature short-time pasteurising machine to be used in New Zealand was installed by Ambury's Ltd., in 1942.

Throughout the period under review all centres of population in New Zealand in excess of 6000 persons were served by established treating houses. In general, consumers in these areas were offered a choice between pasteurised and raw milk. By 1944 it would appear that approximately 40 per cent of the total milk supplied to "urban" areas was pasteurised and 30 per cent was bottled .

For the four main metropolitan areas the extent of milk treatment in 1942-1943 is shown in Table X.

Only in the Wellington and Auckland areas, as already indicated, was there any evidence of the consolidation of distribution routes prior to 1939. During the wartime period, however, petrol rationing was introduced and local authorities then effected some voluntary consolidation in most areas to effect savings in petrol consumption in milk distribution. This consolidation was not absolute.

TABLE X: Extent of milk treatment in Auckland, Wellington, Christchurch and Dunedin for the year 1942-1943.

	Percentage of all milk pasteurised	Percentage of retail milk pasteurised	Percentage of retail milk bottled
Auckland	84	70	46
Wellington	86	77	77
Christchurch	37	15	21
Dunedin	50	31	22

- Milk Commission (1944).

Mention has already been made of the lack of a nation-wide organisation in the Market Milk Industry in New Zealand prior to 1944 (see Chapter XI). Under laissez-faire conditions in which private enterprise was responsible for the ownership of a large number of the individual units, and for performing a majority of the services, every area in the liquid milk industry developed some kind of organisation. But in each area organisation had developed independently and as a result no uniformity was shown between areas. In each area the production, collection, treatment and distribution of milk for liquid consumption proceeded with some degree of regularity and co-ordination in its main functions and methods, but practices differed widely (ibid).

The only control common to all areas was that exercised by the Departments of Agriculture and Health. The Department of Agriculture enforced certain regulations and by inspection and registration of farm dairies endeavoured to secure the most sanitary conditions of production. By the inspection of treating houses and milk-shops and the analysis of milk obtained from distributors, the Department of Health

endeavoured to enforce the provisions of the Food and Drugs Act and so ensure that milk of reasonable quality and purity was delivered to consumers.

Except in Wellington and Auckland milk policies were primarily dictated by distributors. They determined the prices to be paid to producers and arranged the supply of milk to meet the demand. Individually they obtained sufficient supplies to meet their specific demands.

At the same time the Government endeavoured to control monetary inflation and in common with other commodities, as part of a general price stabilisation policy, fixed maximum prices at which milk could be sold to consumers. Prices were fixed in 1940 at the levels prevailing at the outbreak of the war. This determined the maximum price at which distributors were permitted to sell milk, but there was no guarantee of the price producers would receive. This was in contrast to guaranteed prices being offered for butterfat supplied for manufacture into dairy products.

In the wartime period the demand for liquid milk in New Zealand increased at an appreciable rate, particularly in the four main metropolitan areas, Auckland, Wellington, Christchurch and Dunedin. The increase in demand resulted from the natural increase in "urban" population but more particularly from an increased appreciation of the value of milk in the diet as a result of the introduction of the Milk-in-Schools Scheme, a rise in the standard of living, and the availability of milk as an unrationed commodity at fixed maximum prices at the same time as meat, butter and sugar were rationed. The wartime conditions further increased the demand in the four main metropolitan areas by the presence of large numbers of the Armed Services, including overseas troops, in these areas. They obtained supplies of milk from the same areas of supply as the civilian population.

Medical and nutrition experts had emphasised for a quarter of a century that milk was the most valuable of all

foods yet at the same time potentially the most dangerous means for the spread of disease. Prior to 1944 attention had been directed to ensuring that all milk for liquid consumption was safe and of good quality and that adequate supplies were available to meet the increasing demands of a growing population (ibid). But, under laissez-faire conditions, with supply and demand laws working together, this ideal had never been satisfactorily reached and there were pronounced deficiencies in the quantity and quality of the supply of milk during the period under review.

Milk producers on farms that could conveniently supply milk for liquid consumption frequently found it more profitable to supply a dairy factory at manufacturing rates on a butterfat basis, knowing that they could pursue more economic seasonal dairying, have less management and labour problems and be assured of a market and a guaranteed price for all their production, irrespective of variations in daily production. In addition, milk by-products were available for the rearing of replacement stock and for pig-feeding. In areas where the choice could be made between dairy factory and town-milk supply, as was the case in most areas, perfect competition existed. The extra reward from premium liquid milk sales may not have repaid the extra cost and effort required to produce a level supply of milk all the year round. In many instances the reward available did not compensate producers for pursuing town-milk production in localities conveniently situated to centres of consumption. As a result there was discontent among producers and an undersupply of the demand for liquid milk.

The prices being paid to regular producers were substantially below the price-level necessary to ensure adequate supplies of milk of good quality throughout the year. The position was aggravated by competition between unorganised producers. This resulted in unstable and often unsuitable supplies, with a tendency to further price

depression (Davenport,1949). In addition, producers were not only dissatisfied with the prices they themselves were receiving but also with the proportion of the consumer price that they received. Distributors were receiving a handsome reward for services performed, and the capital necessary for their businesses was only a small proportion of that necessary for milk production. The risks of distribution were negligible compared with the risks of production.

Further discontent resulted from the methods of treatment and distribution pursued. The quality of milk delivered to consumers in many areas was not good. Consumer interest was thereby aroused and producers tended to receive the discredit for the poor quality of the milk supply. Though this may have been partially justifiable much of the blame for neglect could be attributed to treatment and distribution practices.

In the period under review there were shortages of supply to each of the four main metropolitan areas in almost every year (Milk Commission,1944), and to many other areas in periods unfavourable for the production of milk. With the shortages, the supplies to schools were cut off for long periods. The priority supply available to private consumers necessitated voluntary rationing. It is important to realise that these shortages occurred notwithstanding the use of normally unsatisfactory milk from all available factory suppliers.

Shortages in the supplies of liquid milk in the wartime period resulted from abnormal conditions. The demand for milk had increased at the same time as the productive capacity of dairy farms had been adversely affected by the labour shortage resulting from the conscription of men into the Armed Services, and a reduction in the quantity of fertiliser available for topdressing. However, even if the milk supply had not been reduced as a result of wartime conditions, the liquid milk industry was not then organised to provide

adequate supplies of milk of good quality to meet the normal demand at all times of the year.

CHAPTER XIII

REGULATIVE CONTROL OF THE MARKET MILK INDUSTRY IN NEW ZEALAND 1900-1944.

In previous Chapters some mention has been made of Government and local body measures intended to regulate the conditions under which milk for liquid consumption was produced and distributed in the period 1900-1944. The discussion on them was by no means full and to clarify these measures they are here elaborated and summarised.

Under the powers conferred by the Dairy Industry Act, 1898, the inspection and registration of all farm dairies supplying milk for local consumption became the responsibility of the Department of Agriculture. This Act empowered the Department of Agriculture to assume responsibility for the control of milk supplies previously administered by local authorities who had appointed inspectors for the work. In 1900 the Department of Agriculture commenced inspecting and registering dairies used for the production of milk for liquid consumption. From the outset special inspectors were appointed in the four main centres of population, Auckland, Wellington, Christchurch and Dunedin, while in other areas inspections were carried out by Stock Inspectors (N.Z. Dept. of Agric.,1901).

The Department of Agriculture found many farm dairies were in an unsanitary condition but the owners were generally willing to co-operate with suggestions for improvements. Initially, however, the legislation and regulations governing the registration of dairies producing milk for liquid consumption were not strictly enforced. Time was allowed for necessary improvements to be effected for dairies to qualify for registration. Rapid improvements in the condition of farm dairies supplying milk for liquid consumption took place and by 1903 all farm dairies producing milk for liquid consumption were registered and being regularly inspected once a month. Dairies not up to standard were closed (N.Z. Dept.

of Agric.,1903). The Department of Agriculture continued to be the registering authority for farm dairies supplying milk for liquid consumption in 1944.

The Dairy Inspection Act, 1900, also removed the responsibility for town dairies from local authorities who had previously appointed inspectors for their inspection (N.Z. Dept. of Health,1901). Local authorities, however, retained the power to prescribe and control the conditions under which the sale of milk could be conducted. The Department of Agriculture required all dairies or places where milk was stored or exposed for sale to be registered and, in association with this Department, the Department of Health undertook the inspection of town dairy, milk storage and distribution conditions.

Control of the quality of milk delivered to consumers was undertaken jointly by the Departments of Agriculture and Health until 1909. In this year laboratories were established by the Department of Health and used for the analysis of milk samples (N.Z. Dept. of Health,1909). The Department of Agriculture then accepted the responsibility for controlling the quality of milk up to the point where milk left producers' farms, and from this point the quality of milk and treatment, storage and distribution conditions were inspected and controlled by the Department of Health.

The Sale of Food and Drugs Act, 1908, a consolidation of previous legislation, prescribed minimum compositional standards required of milk sold or intended for sale for liquid consumption. This Act prescribed minimum legal standards of composition for milk of 8.5 parts per centum of milk-solids other than milk-fat and 3.25 parts per centum of milk-fat. No added water was permissable in milk. These standards remained unchanged throughout the period 1908-1944.

In 1918 a three-hour standard reductase test for keeping quality of milk was introduced as a minimum requirement for milk intended for liquid consumption. This standard was

raised to four hours in 1925.

By 1920 local bodies in each of the four main metropolitan areas had appointed special inspectors under the provisions of the Sale of Food and Drugs Act, 1908, for the purpose of regular milk sampling and inspection work. This work was done in collaboration with the Medical Officers of Health in the respective areas.

In the course of routine inspection work it was not uncommon for Stock Inspectors of the Department of Agriculture to condemn on sight cows showing signs of visible disease. Condemned animals were compulsorily removed from the milking herds. Tuberculin testing was at all times undertaken by the Department of Agriculture at the request of producers. It was compulsory for reactors to be slaughtered. Though there was never compulsion for the application of the tuberculin test to cows in town-supply herds prior to 1944 there was a wide application of the test in many areas, particularly by producers whose milk was sold raw in competition with pasteurised milk. The tuberculin testing appears to have been used as a selling point in favour of raw milk.

Local authorities at all times licensed town dairies, milk-shops, milk-bars and milk distributors. By this means control over the persons and agencies associated with the distribution of milk to consumers was effected. The fee was small, however, and the right of entry into the milk distribution business was to all intents unrestricted, except in the Wellington and Auckland areas from 1922 and 1933 respectively. There was some restriction in other areas as a result of petrol rationing during the wartime period.

Though the measures of control outlined above were enforced where possible there was frequently a shortage of inspectors in both the Department of Agriculture and the Department of Health. The necessary regular and adequate inspections required for effective control could not, therefore, always be undertaken. At the same time fewer official

samples of milk supplies were analysed than was desirable.

There were many persons engaged in the production, treatment and distribution of milk for liquid consumption and with the low proportion of milk being pasteurised and bottled, conditions were unsatisfactory in many areas. However, it appears that there was a steady but slow improvement throughout. This became more pronounced between 1935 and 1938, as indicated by the decline in the number of prosecutions, but the latter increased substantially in the wartime period (N.Z. Dept. of Health, 1910-1941).

There was always an economic tension in one or more sections of the liquid milk industry because of the intense competition that widely existed under distributor domination of the industry. Producer prices were as low as could be reached to ensure near adequate supplies of milk to meet the demand called forth by distributors. The margins claimed by distributors were always intended to give them maximum economic gain, except under local organisation in the Wellington and Auckland areas. The resulting instability in the industry, and the seasonal shortages of milk supplies for liquid consumption which occurred, were conducive to malpractices and the depression of the hygienic quality of the milk supplied to consumers. Insufficient control inspections permitted these conditions to continue to the detriment of the quality of milk distributed for liquid consumption.

CHAPTER XlV

THE MILK COMMISSION, 1943, AND ITS RECOMMENDATIONS.

Early in 1943 the dissatisfaction of producers of liquid milk, from reasons already discussed in Chapter Xll, and the Government's fear of shortages in the supply of milk, as a result of depressed prices to producers, had reached a climax. It was evident that many producers, particularly in the South Island, were not prepared to continue producing under the existing circumstances, and the curtailment of all milk supplies to certain areas was, at one period, a strong possibility (Davenport,1949).

Consequently a Royal Commission, comprising three persons, was appointed on 12th March, 1943, under the provisions of the Commission of Inquiry Act, 1908, and the Commission of Inquiry Regulations, 1941, to enquire into and report upon the following matters (Milk Commission, 1944):-

"(a) The present circumstances of the supply of milk to the four metropolitan areas of Auckland, Wellington, Christchurch and Dunedin and to such other areas as may from time to time be directed by the Minister of Agriculture."

(b) The alteration and reorganisation in methods of supply, collection, treatment and distribution that may be necessary to such areas to ensure at reasonable prices, adequate supplies of milk of high standard.

(c) The supply of milk for the Armed Forces, including Allied Forces in such areas."

It is significant that the emphasis was laid on the supply of milk since it was adverse conditions of supply causing dissatisfaction among producers that initiated the setting up of the Commission.

The Milk Commission, after hearing evidence from all interested parties engaged in the liquid milk trade and seeking evidence from recognised experts within New Zealand, presented a report on 16th August, 1943 which, by direction, contained

"recommendations to the Government in regard to the future organisation of the town milk industry so as to ensure that at all times an adequate quantity of high-quality

milk was available to the consuming public at a reasonable price" (Central Milk Council,1947).

The recommendations of the Commission were very full and basically far-sighted in view of the disorganisation then prevailing in the liquid milk industry. It found that shortage or fear of shortage of milk of high quality prior to 1943 was the result of the low prices being paid to producers and the general lack of organisation, co-ordination and planning in the liquid milk industry.

The Commission stated that the first essential in reorganisation to attain the three-fold objective of adequate supply, high quality and reasonable price, would involve the following three major developments (Milk Commission,1944):-

"(1) The creation of a central authority to guide and control the development of the industry.

(2) The appointment of Metropolitan Milk Councils for the Christchurch and Dunedin areas and the Hutt Valley and bays sub-area with functions and powers similar to those of the existing Auckland Metropolitan Milk Council.

(3) The establishment in the Metropolitan Areas of Auckland and Christchurch of a Dairy Farmers' Co-operative Milk Supply Association similar to the Associations at present operating in Wellington and Dunedin and the provision of statutory functions and extended powers for all such associations."

As a second essential to the achievement of the three-fold objective it considered that prices and margins should be fairly and reasonably determined and be sufficient to attract the requisite supplies of milk to meet the demand.

The Commission considered that the fulfilment of the above recommendations would secure an adequate supply of milk of good quality at all periods of the year. It went further in its recommendations and put forward considerations for changes in the prices and service margins and for the organisation of the supply, collection, treatment and distribution of milk to supplement the major recommendations.

CHAPTER XV

THE MILK ACT, 1944, AND THE BASIS OF THE ORGANISATION OF THE MARKET MILK INDUSTRY IN NEW ZEALAND SINCE 1944.

Soon after the outbreak of war in 1939 an Economic Stabilisation Commission was established in New Zealand in an attempt to stabilise the prices of basic commodities, one of which was milk. Upon receipt of the recommendations of the Milk Commission in August, 1943, the Government consulted the Economic Stabilisation Commission for recommendations. It recommended to the Government that immediate increases in prices be allowed to producers in certain areas and that a temporary Central Milk Authority, in the form of a Town Milk Office of the Department of Agriculture, be established (Central Milk Council,1947).

As a result of these recommendations the Town Milk Office was established to act as the interim Central Authority and to develop, in consultation with the Economic Stabilisation Commission, a national milk scheme to be introduced as a long-term policy. It also had to prepare the necessary legislation, for submission to Parliament, to create a permanent Central Authority and to provide for the establishment of local authorities and the formation of co-operative town milk producer supply associations (ibid).

The Milk Act, 1944.

On 15th December, 1944, following the deliberations of the Town Milk Office, legislation in the form of the Milk Act, 1944, was passed by Parliament. As stated in the title of the Act, it was:-

> "An Act to provide for the regulation and control of the supply and distribution of milk in metropolitan and other areas with a view to the provision at a reasonable price of an adequate supply of milk of the best quality having regard to the health of the inhabitants of the areas; and for that purpose to set up a Central Milk Council and define its functions and powers, to authorise the setting up of Metropolitan Milk Boards, and to define their powers and the powers of certain Local Authorities in relation to the supply and distribution of milk."

The Central Milk Council.

In accordance with the provisions of the Milk Act, 1944, the members of the initial Central Milk Council were named in the Government gazette of January, 1945, and the first meeting held in February of the same year. It was established to act as the organising and co-ordinating body for the Market Milk Industry in New Zealand and to promote the organisation of production, collection, treatment and distribution, on an economic basis, of adequate supplies of milk of good quality for liquid consumption by the population of New Zealand.

Constitution of the Central Milk Council.

The Council, with the Minister of Health as Chairman, consisted of seven members:

(a) The Minister of Health.

(b) The Director of Milk Marketing.

(c) One representative of the Municipal Association of New Zealand, Incorporated, selected from a panel of not less than three persons nominated by the Association and appointed on the recommendation of the Minister of Health.

(d) Two producer representatives, one from the North Island, and one from the South Island, nominated by the producers through their central organisation and appointed on the recommendation of the Minister of Agriculture.

(e) Two other persons, one of whom to be a woman deemed to be representative of the interests of women and children, appointed on the recommendation of the Minister of Health.

Functions of the Central Milk Council.

The specific functions of the Council, as defined by the Act, have been (Clause 101):-

"(a) To carry on research and investigation relating to milk and milk products (including chemical, physical, bacteriological and economic research).

(b) To devise and promote as far as may be practicable improved methods of producing, collecting, treating, carrying, delivering and distributing milk (including the distribution of milk in sealed containers):

(c) To devise and promote as far as may be practicable means to prevent or eliminate wasteful, unnecessary or unhygienic agencies, methods, practices, costs, or charges in connection with the production, collection, treatment, carriage, distribution or sale of milk:

(d) To publish reports, information, and advice concerning the production, collection, treatment, carriage, delivery, keeping, storage, preservation, and use of milk, and by these and other means to encourage the consumption of milk:

(e) To encourage and assist any experimental, educational or research work which in the opinion of the Council is in the interests of consumers, producers or vendors of milk:

(f) To co-ordinate, having regard to the objects for which the Council is established, the activities of Government Departments, local authorities, and other public bodies in relation to any of the foregoing matters:

(g) To report to the Government from time to time upon matters affecting the objects for which the Council is established:

(h) To make recommendations to the Government as to the constitution, union, alteration, or abolition of milk districts and Milk Authorities:

(i) To guide and supervise the activities of Milk Authorities:

(j) To make recommendations to the Government as to standards for milk which in the opinion of the Council should be adopted for the purposes of the Sale of Food and Drugs Act, 1908, or the Marketing Act, 1936, or for any other purpose whatsoever:

(k) To make inquiries and recommendations on any matters referred to it by the Government."

The Council has been empowered to carry out its functions either independently or in conjunction with any Government Departments, Local Authorities, or other public bodies or persons, as it has thought fit.

Administrative powers of the Central Milk Council.

Briefly, the Council was established to act as the "brains trust" of the Market Milk Industry in New Zealand in the planning and co-ordination of the scheme of reorganisation as basically recommended by the Milk Commission in 1943 and drafted by the Town Milk Office of the Department of Agricult-

ure. It has been the arbitrating body in many differences and disputes between different sections of the trade and in this capacity its decision has been legally final and binding.

In conducting an inquiry any committee appointed by the Council, has, under the provisions of the Milk Act, been given all the powers of a Commission under the Commission of Inquiry Act, 1908. It has been possible for either party in a dispute or difference to refer their difference to the Central Milk Council for settlement. The Council has had authority to conduct inquiries into any of the following (Clause 103):-

"(1) The adequacy and effectiveness of the steps taken by any Milk Authority in carrying out its functions under the Milk Act:

(2) Any dispute or difference between producers, vendors and Milk Authorities referred to it:

(3) The maximum amount that may be paid for the goodwill of the businesses of milk vendors:

(4) The approval or revocation of approval of any Supply Association or association of producers:

(5) Any other matter whatsoever within the functions of the Council."

The Council could require Milk Authorities to operate pasteurisation plants. Further, it could conduct local inquiries into any matter concerning the liquid milk trade by appointing one or more of its members to investigate the specific problems and report back to the central organisation. In addition, the Council has had authority to appoint technical committees to investigate and report to the Council on any matter relating to the objects for which the Council was established.

The Milk Marketing Division.

A Milk Marketing Division of the Marketing Department was established under the provisions of the Milk Act, 1944, to function in association with the Central Milk Council. This Department was set up to carry out the functions of the Marketing Department so far as they applied to milk, and to administer the provisions of the Milk Act, 1944. The same

legislation also established an account in the Reserve Bank of New Zealand, known as the Milk Marketing Account, to enable the Milk Marketing Division to finance the National Milk Scheme.

The Milk Marketing Division was duly established within the Marketing Department and administered the provisions of the Milk Act, 1944, from the first day of September, 1945, the beginning of the 1945-1946 "milk" year. In the administration of the Act this Division became the administrative unit for the Central Milk Council. The secretary of the Milk Marketing Division was appointed ex-officio secretary of the Central Milk Council, in order to co-ordinate the activities of the Council and the Department.

Definition of Milk Districts and formation of Milk Authorities.

The Act provided for the definition and declaration of appropriate milk districts to cover the major areas of milk consumption throughout New Zealand. It also provided for every milk district to have a Milk Authority which could be either a Borough Council or a Metropolitan Milk Board. Provision was also made in the Act for any two milk districts to be united if considered necessary in the opinion of the Central Milk Council, the Milk Authority of the united districts to accept all the commitments of the previous separate Authorities of the two districts. Similarly, provision was made for the abolition, alteration or re-defining of milk districts with agreed financial and other arrangements between the Milk Authorities and the public bodies concerned. Provision was further made for a Milk Authority to be changed if deemed necessary, in which case the new Authority was required to accept all the commitments of the previous Authority.

Borough Councils as Milk Authorities.

Where a Borough Council has been constituted as the Milk Authority a special Milk Committee has been established to which has been delegated the powers and duties conferred or imposed on the Borough Council under the Act, except those

involving borrowing money, making by-laws relating to the milk trade, entering contracts or instituting legal actions (Clause 9). Provision was made for the appointment to these local Milk Committees of representatives of local authorities of any areas within the milk district but situated outside the Borough.

Operations which have been undertaken by a Borough Council, as a Milk Authority, have been deemed trading undertakings within the meaning of the Municipal Corporations Act, 1933 (Clause 10), and it has been necessary for a report of the Profit and Loss Account for each undertaking to be submitted to the Director of Milk Marketing within two months of the end of each financial year. This has been accompanied by a report of the Milk Authority's assets and liabilities at the end of the year and of its operations under the Act during the year.

Metropolitan Milk Boards as Milk Authorities.

When a Metropolitan Milk Board has been the Milk Authority the Board has been a body corporate, with perpetual succession and subject to all the powers and commitments of a body corporate. Each Board has been a Local Authority for the purposes of, and within the meaning of, the several Local Bodies Acts.

Each Metropolitan Milk Board has consisted of a maximum of seven members who have been representatives of the authorities of local areas within the milk district. Representatives have been members of the local bodies of the constituent districts but provision was made for the appointment of co-opted members if so desired by the Board. Persons having a special pecuniary interest in the production, treatment, distribution or sale of milk for human consumption within the district of the Board have not been qualified for election as members of the Board. A member has ceased to qualify for membership of a Board as soon as he has relinquished membership of the requisite local body or has acquired a special

pecuniary interest, as above, or voted on any issue in which he has had a pecuniary interest.

All meetings of Milk Boards, unless for special reason, have been open to the public. The Act required that minutes be taken and recorded in the normal manner. Milk Boards have been required to keep books of account and these, in addition to the minutes of meetings, have been open for inspection by qualified representatives of local authorities at all reasonable business hours at the Board's public offices.

Any money which has been paid to an appointed representative of a Board and, in total, has exceeded five pounds was required by the Act to be paid into a bank within seven days of receipt, and for this purpose an Imprest Account was necessary. Within two months of the end of each financial year each Metropolitan Milk Board, in common with Borough Councils where they have been the Milk Authorities, has been required to submit to the Director of Marketing a copy of the Profit and Loss Account related to its operations for the previous financial year, together with a statement of its Assets and Liabilities at the end of the year and a statement of its operations under the Act during the year.

The Milk Amendment Act, 1947.

A Milk Amendment Act, to be read as part of the Milk Act, 1944, was passed in November, 1947. In terms of this, District Milk Boards could be established and Milk Authorities could acquire and hold shares in any company formed for the treatment of milk.

The amendment to permit the establishment of District Milk Boards has applied in respect of any milk district in which the Council of any Borough which has been situated wholly or partly within the district had declined to be the Milk Authority for the district, or where there has been no Borough situated wholly or partly within the district, and it has been impracticable to establish a Metropolitan Milk Board for the district. In these circumstances it has been possible

for a District Milk Board to be constituted at the request of the Minister of Health and on the recommendation of the Central Milk Council. A District Milk Board has had similar constitution to a Metropolitan Milk Board and has possessed all the powers, functions and duties of a Metropolitan Milk Board.

Representatives of the Departments of Agriculture and Health on Milk Authorities.

The Ministers of Agriculture and Health have appointed representatives who have been entitled to attend every meeting of any Milk Authority. These representatives have had to be notified to the Milk Authority and thereafter have received notice of all meetings. They have been permitted to take part in discussions but have not been entitled to vote. In normal practice the Medical Officer of Health and the appropriate district instructor of the Dairy Division of the Department of Agriculture have been the appointed representatives.

Powers and Functions of Milk Authorities.

The primary object and principal function of each Milk Authority has been to ensure to the inhabitants of its milk district an adequate supply of milk for liquid consumption which has complied with the quality standard requirements of the Sale of Food and Drugs Act, 1908.

To give effect to the above each Milk Authority was given the following general powers under the provisions of the Milk Act, 1944 (Clause 57):-

"(a) To buy and sell milk, to treat milk and to provide for the cool storage of milk and cream:

(b) To devise and promote, if practicable, improved methods of producing, collecting, treating, carrying, delivering or distributing milk:

(c) To regulate and control exclusively, subject to provisions relating to recognised organisations of milk producers, the supply and distribution of milk within the district:

(d) To devise and promote means of prevention or elimination of wasteful, uneconomic or unhygienic methods associated with milk in the district, including methods of payment for milk which prevent the contraction of bad debts:

(e) To consolidate or zone milk rounds to promote economy of distribution:

(f) To investigate the adequacy of the supply of milk of good quality by examination of contracts between milk producers or their associations and milk vendors or vendor associations.

(g) To take land, buildings, or plant and maintain and operate such assets for the supply, transport, treatment, cool storage or distribution of milk and cream."

and, by the Milk Amendment Act, 1947,

"(h) To acquire and hold shares in any company formed for the treatment of milk."

To finance any of these undertakings a Milk Authority has been permitted to borrow money by way of special loan, by special order under the Local Board's Loan's Act, 1926.

A Milk Authority, as a general power already noted, has had the power to regulate and control exclusively the supply and distribution of milk within its milk district, subject to restrictive provisions relating to recognised organisations of milk producers, as will be indicated later. More specifically, each Milk Authority has, by a licensing system, had control of all milk sales within its district. Similarly, a license has been required from the Milk Authority for the treatment or storage of milk intended for human consumption in the district of the Authority.

It has not been lawful under the provisions of the Milk Act (Clause 61) for any person or group of persons, except at the direction of the Milk Authority, or by license, to:-

(1) Sell milk in the milk district.

(2) Deliver milk under contract in the district.

(3) Bring milk purchased outside the district into the district for use, consumption or sale.

(4) Be in possession of milk for sale in the district.

(5) Use as a milk store any premises within or outside the district if the stored milk is intended for supply or forwarding to the district.

(6) Sell outside the district any milk intended to come into

the district.

(7) Install or operate plant within the district for the treatment of milk or to subject milk to any treatment if the milk is intended for forwarding into the district.

The provision of milk, or a mixture containing milk, for ice cream manufacture has been considered in the same category as milk for liquid consumption. Milk for manufacture into other dairy products has not come within the jurisdiction of the Milk Act, 1944, or within the National Milk Scheme.

Under the provisions of the Milk Act, each Milk Authority has controlled by licenses the sources of production and the avenues of treatment, storage and sale of all milk for liquid consumption within its milk district. With the prior written consent of the Central Milk Council a Milk Authority has been permitted, by special order, to revoke or refuse to grant or renew licenses of any class.

It has been possible for any Milk Authority, having control of licenses relating to milk within its district, to buy and sell licenses and to grant or refuse to grant licenses as it has thought fit. It has been compulsory for compensation to be paid for the revocation or restriction of licenses where, in pursuance of its powers under the Milk Act, a Milk Authority has (Clause 66):-

"(a) By special order determined that all licenses of any class or classes shall be deemed to be revoked; or

(b) Revoked or suspended a license otherwise than for breach of the conditions thereof; or

(c) Refused to renew a license otherwise than for breach of the conditions thereof."

Under the provisions of the Milk Act (Clause 68) the owner of the goodwill of a milk round has not been permitted to sell this without first offering it to the Milk Authority for the district at the proposed purchase price. A Milk Authority has not been required (Milk Amendment Act, 1947, Clause 8) to grant a license to any person who has purchased or has agreed to purchase the goodwill of a milk round which

had not first been offered to the Milk Authority on terms as favourable as those on which the purchaser has purchased or agreed to purchase it.

Any goodwill and chattels which have been purchased by Milk Authorities have been retained, disposed of or leased, according to the decisions of the Authorities.

Milk Authorities have been permitted to arrange inspections as necessary to ensure that dairy premises, milk stores, vehicles and all scales, measures, appliances, apparatus and utensils used in the production, collection, treatment, storage, distribution or sale of milk have been in a satisfactory condition to aid the fulfilment of the objects and functions of each Milk Authority. These Authorities have also been permitted to carry out such tests and take such other steps as have been necessary to ensure that the milk sold in the district has complied with the requirements of the Sale of Food and Drugs Act, 1908, or of the Milk Authority. These inspections have been undertaken by Inspectors or Officers of Local Bodies, by Government Departments at the request of the Milk Authority, or by the Authority's own Inspectors. The latter have been appointed by a Milk Authority with the written approval of the Central Milk Council and have had the power to enter and inspect, at all reasonable times, any premises which have been associated with the production, treatment or storage of milk or any appliance therein or otherwise associated with the sale of milk for liquid consumption, whether within a treating house, dairy or milk store or not. However, Milk Authority Inspectors have required the written consent of a Producer Association before they have entered the dairy premises of a member of such an organisation.

It has been the duty of each Milk Authority to prepare an annual estimate of proposed expenditure and anticipated income early in each financial year. The Milk Act provided for the difference between anticipated income

and expenditure, a deficit, to be raised by a levy imposed in respect of all milk sold within the district for liquid consumption, one part of cream to be computed as ten parts of milk. In compliance with the provisions of the Act, the rate of the levy or any change in the rate was required to be publicly notified. The maximum levy imposeable was one-eighth of a penny per gallon but with the written consent of the Central Milk Council it could be in excess of this, up to a maximum of one-quarter of a penny per gallon.

Under provisions of the Milk Act, 1944, a Milk Authority has been permitted to enter into any contract for any of the purposes of the Act. Such contracts could be made in association with other Milk Authorities, or with private persons.

By-laws of Milk Authorities.

The Milk Act, 1944, has empowered Milk Authorities to make by-laws for many purposes but has provided for the disallowance by the Central Milk Council, either in whole or in part, of any by-law which it has considered unreasonable or undesirable, or which has provided conditions for licenses which had been disallowed by the Central Milk Council or any appointed committee thereof.

A Milk Authority has had power to make by-laws for the following purposes (Clause 83):-

"(a) To provide for different kinds of licenses with any general or special applicable conditions and to restrict the area of operation of licenses, whether by a system of blocking or zoning or otherwise:

(b) To fix the hours and places for the delivery of milk by roundsmen or the times and places of delivery of milk by producers or milk vendors, subject to existing awards or industrial agreements:

(c) To prohibit, either generally or for special classes of transactions, the sale or purchase of milk except for coupons or tokens issued by the Milk Authority:

(d) To prescribe the methods to be followed and the manner in which milk is to be treated, carried, deposited, stored, distributed or sold and the temperatures at which milk intended for sale is to be kept:

(e) To prescribe the manner in which the levy on milk and cream sales to cover the administrative costs of the Milk Authority is to be collected, by whom it is payable, dates for payment and penalties for late payment:

(f) To fix standards for the quality of milk that may be sold, different standards according to the treatment to which it is to be subjected or the purpose for which it is to be used:

(g) To prescribe the standards of quality to which milk must conform or the tests which it must pass before it may be pasteurised and forbidding the pasteurisation of milk which does not conform to standards or pass the tests:

(h) To prescribe for the keeping of books and records by licensees with prescribed particulars shown therein and for returns to be made and information supplied by licensees as required by the Milk Authority:

(i) To prescribe matters for which fees are payable and the amount of the fees."

It has been an offence for any person to resist, obstruct or deceive any person exercising or attempting to exercise any power or function under the Milk Act, 1944, to contravene or fail to comply with the provisions of the Act or regulations made under the Act, or to commit a breach of the conditions of a license. Persons who have committed such offences have been liable to a penalty. In any legal action certified records of a Milk Authority have been taken as correct until the contrary has been proved.

Provision has existed for legal proceedings to be taken against a Milk Authority. These could be served by deposit at the public office of the Authority or by personal delivery to the Chairman or Secretary of the Authority.

Producer Associations.

To endeavour to promote fulfilment of the first essentials in the reorganisation recommended by the Milk Commission and in an endeavour to ensure adequate supplies of milk for liquid consumption at all periods of the year, the Milk Act, 1944, has provided legislation for the approval of associations of milk producers and the promotion of security of demand for milk from all producer members of approved Associations. The Act has provided that the Central

Milk Council could approve, in respect of any milk district, an association of milk producers which has conformed with the requirements and regulations of the Act as a Producers' Association entitled to supply milk for consumption or use within the district (Clause 92). At the same time the position of producer-distributors has been protected.

Provisions for producer-distributors.

Any milk producer who has had a license from a Milk Authority authorising him to sell milk within a milk district has been permitted to bring into and sell in his district all milk which has been produced on his own dairy premises, provided that part or all of the premises were situated within three miles of the boundary of the milk district at the time of its constitution. These producer-distributors have been bound to submit such particulars as required by the Milk Authority relating to the quantities of milk which have been required for sale in addition to milk produced on their own premises.

Effect of approval of Producer Associations.

Where one Producer Association has been approved for any district and the Central Milk Council has been satisfied, after consultation with the Milk Authority for the district, that the one Association has been capable of supplying, at all times of the year, all the milk required to meet the demand for liquid consumption, over and above that supplied by producer-distributors, then the Central Milk Council has been authorised to approve of this Association as the Supply Association for the district.

Where more than one Producer Association has been approved for any milk district and the Central Milk Council has been satisfied, after consultation with the Milk Authority for the district, that the Associations together could supply, at all times of the year, all the milk required to meet the demand not supplied by producer-distributors, then the Central Milk Council has been authorised to direct the approved

Associations to form a Committee of Supply. This Committee, duly formed in accordance with directions of the Council, has been legally approved as the Supply Association for the district.

There has been only one Supply Association for any milk district and while there has been a Supply Association for a district it has not been possible for any additional Producer Association to be approved for the district. With just cause the Central Milk Council, after consultation with the local Milk Authority, or at its request, has been empowered to deregister any Producer or Supply Association.

The assurance of adequate supplies of milk to meet the demands of each area at all times of the year was stressed by the Milk Commission in its report. To avoid the recurrence of seasonal shortages of milk for liquid consumption, as occurred in several major areas of New Zealand prior to 1944, provision was made in the Act for gazetting regulations in respect of the following (Clause 92):-

"(a) The conditions to be fulfilled before any association of milk producers or Supply Association may be approved, including conditions of membership, the rules or regulations and the management and control of the association:

(b) The conditions relating to the formation of committees of supply for approval as Supply Associations including conditions of membership, the rules or regulations and the management and control of same:

(c) The provision of notices to be published or given concerning any request for approval or revocation of any approval and for the making of objections to the granting or revocation of any approval:

(d) The functions of Supply Associations and conditions to be observed by associations of milk producers and Supply Associations:

(e) The conditions of contracts to be entered into with and by associations of milk producers for the supply of milk to or by the associations."

The Milk Authority of any district has not been permitted to bring milk into the district or issue any license authorising milk to be brought into the district for use, consumption or sale, unless it has been supplied by or through an approved association of milk producers. However,

when an approved Supply Association has been unable to supply sufficient milk to meet the requirements of the district, over and above that supplied by producer-distributors, to the satisfaction of the Milk Authority, then the Authority has been permitted, with the consent of the Central Milk Council or the Director of Milk Marketing, to bring milk or authorise milk to be brought into the district, from approved sources of supply, to meet the deficiency.

Application of the Milk Act, 1944.

The Milk Act, 1944, has applied to all areas in New Zealand except Wellington, where the Wellington City Council has, under the provisions of the Act, been deemed the Milk Authority for the City of Wellington. Producer-distributors who were entitled to bring milk into this City under previous local legislation have been permitted to continue in the trade. In areas outside Wellington it has been compulsory for producers to belong to an approved organisation.

The administration of the Central Milk Council and the Marketing Department has applied to all areas in New Zealand.

Although amending legislation was passed in November, 1951, and the Central Milk Council reconstituted in March, 1952, there has, until the present time (May, 1952), been no marked change in the basis of the organisation outlined above. The Milk Amendment Act, 1951, is discussed in Chapter XVlll.

CHAPTER XVl

THE ORGANISATION OF THE MARKET MILK INDUSTRY IN NEW ZEALAND, AND ITS ACTIVITIES, SINCE 1944.

The Milk Act, 1944, the provisions of which were described in the last Chapter, has formed the basis of the organisation of the Market Milk Industry in New Zealand since 1944. It has promoted order and stability in a vital industry in which, as emphasized by the Milk Commission of 1943, no comprehensive organisation previously existed. The Act has also assured producers of milk for liquid consumption of a reliable market and has safeguarded the interests of those undertaking other services concerned with the supply of milk to consumers.

The Act established the Central Milk Council, as a representative body, to guide and to control the development of the liquid milk industry with the object of providing, at all times, an adequate supply of milk of good quality, at a reasonable price, to people in all areas in New Zealand. It is important to determine in retrospect, therefore, how far this has been achieved.

The Central Milk Council, when established, was intended to become the dominating and guiding body of the industry and, as far as practicable, within technical and financial limits, to promote the acceptance of its decisions by Milk Authorities, local bodies or the many branches of the industry. However, the inability of the Central Milk Council to enforce its decisions has recently been the cause of amending legislation (see Chapter XVlll).

Associated with the directive organisation of the Central Milk Council have been local Milk Authorities. The Marketing Department has been allied to both these through its administration of the Milk Act on behalf of the Central Milk Council.

The Marketing Department has a financial section through which it has administered the National Milk Scheme.

It has negotiated with producers concerning the guaranteed price for milk at the farm gate, and organised payment, and ensured that each branch of the industry has received the agreed margin for services rendered. This Department has also been made responsible by the Government for assuming ownership, and management on behalf of the Crown, of a number of milk treatment stations throughout the Dominion.

Provision has been made for the co-ordination, on a national basis, of all concerned with the supply, collection, treatment and distribution of milk. Provision has also been made for co-ordinating the activities of the Departments of Agriculture and Health, which have been responsible for enforcing the provisions of Regulations and Acts of Parliament which have applied to the production, collection, treatment and distribution of milk for liquid consumption. These organisations have also provided, where required, necessary advisory services.

In the following subsections a description is given of the means by which the interests of the various organisations concerned with the Market Milk Industry in New Zealand since 1944 have been co-ordinated.

1. THE DIRECTIVE AND ADMINISTRATIVE ORGANISATION OF THE MARKET MILK INDUSTRY IN NEW ZEALAND SINCE 1944.

A. CENTRAL MILK COUNCIL.

The members of the Central Milk Council were named in the Government gazette of January, 1945, and the first meeting of the Council was held in February of the same year.

In pursuing the fulfilment of the objects for which it was established one of the first tasks of the Council was to secure the definition of appropriate milk districts covering the major areas of liquid milk consumption in New Zealand and to promote, as far as possible, the effective establishment of a Milk Authority for each milk district.

Milk Districts having been declared, the first local Authorities were constituted or held their first elections in

July, 1945. Included amongst these were the Metropolitan Milk Districts of Auckland, Christchurch, Dunedin and Palmerston North, for each of which a Metropolitan Milk Board was constituted. Borough or City Councils have been appointed as the Milk Authorities in other areas.

In December, 1945, a Metropolitan Milk Board was constituted for the Hutt Valley and Bays Metropolitan Milk District as the consequence of a public inquiry conducted by the Central Milk Council into the organisation of milk supplies in that area.

Though the above are the only constituted Metropolitan Milk Boards in New Zealand at the present time the constitution of Borough or City Councils as Milk Authorities has continued from the time the first Authority was constituted. In addition, District Milk Boards have been constituted for New Plymouth, South Taranaki and Buller, following upon the passing of the Milk Amendment Act, 1947.

As far as has been possible within its powers, the Central Milk Council has met the provision of the Milk Act, 1944, which provides for every milk district to have a Milk Authority.

It is to be noted that by the Milk Act, 1944, the Wellington City Council was deemed the Milk Authority for the City of Wellington and the Auckland Metropolitan Milk Council the Milk Authority for the Auckland Metropolitan Milk District. The Wellington City Council has maintained this function but the Auckland Metropolitan Milk Council, as noted, was replaced by the Auckland Metropolitan Milk Board in 1945.

The primary function of the Central Milk Council has been to guide and supervise the activities of local Milk Authorities in an endeavour to promote uniformity and stability in the organisation and practices of the Market Milk Industry in all areas. It has endeavoured to obtain, at reasonable price, adequate supplies of milk of good quality to meet the consumer demand at all times. The Council has

had and exercised power over Milk Authorities in respect of (Central Milk Council, 1947-1951):-

(a) The approval, after consultation with Milk Authorities, of associations of milk producers and of Supply Associations for milk districts, subject to the existence of satisfactory circumstances and conditions.

(b) The direction of local Milk Authorities to maintain and operate milk treatment stations, where circumstances warrant this in the view of the Central Milk Council, after conducting local inquiries.

(c) The settling of disputes referred to it, as outlined under considerations of the Milk Act, 1944 (see p. 82).

(d) The fixation, after consultation with Milk Authorities, of the maximum amount that may be paid for the goodwill of the business of milk vendors.

The approval by the Central Milk Council of associations of milk producers and Supply Associations in respect of milk districts has meant the fulfilment, so far as has been practicable, of the recommendations of the Milk Commission for the re-organisation of the New Zealand Market Milk Industry. The recognition of Producer Associations and Supply Associations has signified that the Central Milk Council was satisfied that such Associations had the capacity to maintain a supply of milk of good quality from registered dairies in adequate quantities to meet the requirements of the specific districts at all times of the year. Milk shortages, such as frequently occurred in periods of low production prior to 1944, were thereby averted or minimised. The approval of Associations, as above, gave security of demand to milk producing members of the Associations through their contracts to supply nominated quantities of milk daily throughout the year at prices guaranteed for supply at the farm gate and known in advance. In addition, producers were assured of the liquid milk price on a percentage of milk produced as a surplus to their contracted nominated quantity. At the same

time no milk could be supplied for liquid consumption in addition to that supplied through Producer Associations, provided that Supply Associations were capable of supplying the demands of a milk district not supplied by producer-distributors.

From the time of its inception the Central Milk Council has endeavoured to obtain effective systems of milk treatment to promote high standards of quality for milk supplied to consumers. Its activity has been directed towards the improvement of milk treatment facilities and the treatment operations undertaken.

Where circumstances and conditions demanded a change of ownership of milk treatment stations in the view of the Council, the initial policy was to promote one of two alternatives in the ownership, control and operation of such treating houses. First alternative was for the local bodies of the milk districts in which they were situated to become the owners and operators of the treating houses. In the event of the local Milk Authority refusing to accept the request of the Central Milk Council the Crown was to provide the required finance for purchase, renovations etc, and to set up a local board of management or public utility corporation, comprising representatives of local and Government interests. Government policy approved in principle the policy of the Central Milk Council outlined above, on the conditional understanding that voluntary agreements could be negotiated between the owners of treating houses and the Crown (Central Milk Council,1947).

Present Government policy has stifled the above policy of the Central Milk Council. It appears that ownership and operation of treating houses is firstly offered jointly to the Milk Authority, Producer Associations and milk distributors in a milk district. Agreement not being reached on the above basis the ownership and operation of treating houses is then offered to the remainder of these parties

wishing to enter the milk treatment business.

Through the offices of the Marketing Department, twenty-two treating houses were purchased by the Crown. Six of these were subsequently closed. The Central Milk Council endeavoured to have the remainder brought up to a satisfactory standard before they were made available to local interests for continued operation.

Inquiries have been conducted by the Central Milk Council into numerous disputes and problems in the liquid milk industry. The inquiries have resulted from the presentation of disputes, as provided by the Milk Act, or have been undertaken by the Council in pursuance of its objects and functions.

The Council has arbitrated in the settling of many disputes between local Milk Authorities and distributive interests. In these disputes the decision of the Central Milk Council has invariably been in favour of a system of zoning for distribution which gives to one vendor the right to sell milk in his area to the exclusion of other distributors.

The Central Milk Council has conducted inquiries into the organisation of milk supplies, the circumstances of milk treatment and the most economic means of securing adequate treatment of milk in milk districts, when such inquiries have been necessary in the opinion of the Council.

The establishment of technical committees has been promoted by the Central Milk Council to investigate and report back to the Council on matters which have been referred to them. These committees have investigated the following (Central Milk Council, 1947-1951):-

(1) The quality standards for liquid milk.

(2) The compulsory testing of herds supplying milk for liquid consumption.

(3) The incidence of tuberculosis organisms in milk.

(4) Laboratory facilities available for the determination

of the quality of milk and the control of milk treatment operations.

(5) The best utilisation of dairy equipment available within the Dominion, and equipment imports.

(6) The quality of milk bottles.

(7) The utilisation of skim milk available from milk treatment stations.

(8) Publicity for increasing the consumption of liquid milk.

In addition, other matters of minor importance, but beneficial to the welfare of the Market Milk Industry, have been investigated.

The payment for milk on the basis of its compositional and bacteriological quality has been supported by the Central Milk Council. In this connection investigations of the problem of the low solids-not-fat content of milk in certain areas at particular periods of the year have been promoted.

To assist milk producers with the problems associated with the production of liquid milk, the Central Milk Council has sought the co-operation of the Department of Agriculture in respect of publicity through the Journal of Agriculture and instruction by Departmental officers. To encourage producers to cool milk on their farms the Central Milk Council has had recommendations accepted whereby a special allowance, payable to all producers chilling milk by mechanical refrigeration, has been incorporated in the National Milk Scheme.

Consideration has been given by the Central Milk Council, in association with the Standards Institute, to the definition of adequate standards of quality for milk bottles and milk bottle "caps".

The Central Milk Council, within its powers under the Milk Act, 1944, has approved the appointment of inspectors by Milk Authorities, where such appointments have been considered reasonable.

The qualifications of the personnel engaged in the liquid milk industry in New Zealand have given concern to the Central Milk Council. The Council has had consultations with the Director of the Dairy Research Institute (N.Z.) on plans to provide for the maintenance and extension of training schemes to supply fully qualified personnel for the key positions in milk treatment stations, more especially those associated with the quality testing of milk. Representations from the Central Milk Council to the Government have resulted in the provision of bursaries for degree, diploma and milk technicians' courses at the Massey Agricultural College, University of New Zealand.

B. THE MARKETING DEPARTMENT.

(a) National Milk Scheme Administration.

The Milk Act, 1944, provided for the establishment of a Milk Marketing Division of the Marketing Department. This Division became the administrative Department for the Central Milk Council. During the 1947-1948 "milk" year the Marketing Department was reorganised and the three separate Divisions, Internal Marketing, External Marketing and Milk Marketing, each of which had their own statutory powers and dealt directly with the Minister of Marketing, were brought under unified management and their functions transferred to a single Marketing Department (Marketing Dept., 1949). There has been no change in Marketing Department organisation since this unification.

At the time the Milk Marketing Division of the Marketing Department was established there was also established a Milk Marketing Account in the Reserve Bank of New Zealand, for the purposes of the Division. This account has been operated for the administration of the National Milk Scheme.

The amalgamation of the three Divisions of the Marketing Department enabled the administration of the National Milk Scheme to be decentralised. Benefit resulted because branches of the Marketing Department, already estab-

lished throughout New Zealand, were enabled to maintain closer contact with local interests. At the time of the initial decentralisation in 1947-1948 the intention of the Marketing Department was to have the National Milk Scheme largely managed by Milk Authorities but, until now, this has not eventuated. The amalgamation of the previously separate Divisions of the Marketing Department made it possible to transfer part of the responsibility of the National Milk Scheme from the Head Office of the Marketing Department in Wellington to branches that were already established at Auckland, Hastings, Gisborne, Nelson, Christchurch and Dunedin. A branch of the Marketing Department has since been established at Hamilton.

Since the initiation of the National Milk Scheme the primary activities of the Marketing Department, in respect of milk, have been associated with the fixation and payment of the guaranteed farm-gate price to producers for the supply of nominated quantities of milk and the associated surplus, ensuring that all sections of the Market Milk Industry have received the appropriate margins, fixed from time to time, for services rendered in respect of milk and ensuring that the margins have only been paid once.

The levies to Milk Authorities have been agreed upon and paid by the Marketing Department from the Milk Marketing Account. Administrative levies to Producer Associations, the cost of surplus milk schemes, hardship allowances for winter feeding and added costs of transport and handling incurred in obtaining emergency milk supplies have also been paid out of this Account.

The difference between the guaranteed price to producers plus the costs of surplus supplies of milk and margins for services, and the selling prices to the public, has been met by way of subsidy payable from the Milk Marketing Account, under the administration of the Marketing Department.

During 1951 the administration of the Milk-in-Schools Scheme was taken over completely by the Marketing Department from the Department of Health. The costs of this scheme are now met from the Milk Marketing Account to which a special Budget grant is made for the purpose.

One of the first activities of the Marketing Department was that of fixing the guaranteed farm-gate price to producers for milk purchased for liquid consumption. This was done after consultation with the Town Milk Producers' Federation of New Zealand, Incorporated, the organisation established to represent the interests of all producers of liquid milk under the National Milk Scheme. The original basis for arriving at an adequate price to producers of liquid milk in order to ensure an adequate supply, as far as possible, throughout the year had been put forward in the report of the Milk Commission of 1943.

The fixation of the guaranteed farm-gate price for milk has been considered in association with the aims and objects of the National Milk Scheme. The full liquid milk price has been paid to Producer Associations for nominated quantities as contracted with the Marketing Department. These contracts have been renewed annually.

Producers who endeavoured to supply level quantities of milk throughout the year have also been paid the guaranteed farm-gate price on fixed percentages of milk supplied surplus to nominated quantities, as a compensation for their services to the National Milk Scheme. This payment has applied to collective contracts as well as to individual contracts. Penalties have been imposed on Producer Associations where supplies have fallen short of contracted quantities. However, penalties have not been universally imposed on individual producers by their Associations.

Milk supplied at town milk prices and not required for utilisation for liquid consumption has been disposed of for manufacturing purposes in the best market. This has been

done by producers or Producer Associations at the direction of the Marketing Department. The Department has then been credited in respect of such sales at fixed rates, the rates differing according to the means of utilisation. The prices for milk manufactured have been fixed on a gallonage basis by the Marketing Department, after consultation with the Town Milk Producers' Federation.

Under powers conferred by the Marketing Amendment Act, 1937, the Minister of Marketing has fixed the prices and general conditions relating to the sale of milk, and the margins allowed for services rendered in the production, collection, treatment and distribution of milk, since the inception of the National Milk Scheme in 1945. All service margins and conditions of sale have been established through the Marketing Department, as the administrating authority for the National Milk Scheme.

Since 1945 the price of milk has been uniform throughout New Zealand, except in specific areas where increased margins have been allowed because of the nature of local conditions. In some areas the extra margins have been passed to consumers for payment through increased milk prices while in other areas special allowances have been met from the Milk Marketing Account.

Initially there was no margin that could be earned by producers for special services rendered in respect of milk produced by them. However, since the 1947-1948 "milk" year a margin has been allowed, through the Marketing Department, to producers cooling milk on their farms by mechanical refrigeration. Margins are also available for the holding of milk on the farm in rooms cooled by mechanical refrigeration and for both chilling and holding milk on the farm by mechanical refrigeration. The margins payable are in addition to the guaranteed farm-gate price for milk.

It has been the responsibility of the Marketing Department, in the administration of the National Milk Scheme,

to ensure that the correct margins have been received for all services rendered to milk from the time it has been removed from the farm gate of producers until it has been delivered to consumers. Consequently, the Marketing Department has provided margins for the following services in respect of milk:-

(a) Collection of milk from the farm gate.

(b) The pasteurisation of milk by treating houses, to include receiving, weighing, testing, cleansing, heating, chilling and holding by mechanical refrigeration.

(c) Chilling of milk by treating houses, including all those services included under the pasteurisation margin, excepting heating.

(d) Chilling and holding milk by mechanical refrigeration on the farm or either service individually.

(e) Chilling and/or holding milk by mechanical refrigeration.

(f) Bottling.

(g) Delivery to milk-shops.

(h) Bulk retail delivery, according to quantities delivered.

(i) Collection for delivery.

(j) Retail delivery.

Since September, 1950, the retail delivery and collection margins have been consolidated into one margin. The margin for chilling is distinct from chilling on the farm but this margin may only be claimed once.

The Marketing Department has standardised the accounting systems used in the payment of milk prices and service margins. It has distributed, to all branches of the industry, forms on which returns have been made to the Department. The checking of these returns and the distribution of the subsidy to meet any deficit has been undertaken under the supervision, directly or indirectly, of the Department.

The Milk Act, 1944, empowered Milk Authorities to pass by-laws to fix the levies to be paid to them for

administrative expenses in respect of all milk and cream sales within their respective milk districts, and to prescribe the manner in which levies were to be collected. To simplify accounting the Marketing Department has made mass payments to Milk Authorities to cover approved administrative expenses and has not collected levies from all sellers of milk to consumers in milk districts, since the levies would in any case be paid from the Milk Marketing Account as a subsidy.

Allied with this policy of payment of levies to Milk Authorities, the Marketing Department, on behalf of the Central Milk Council, has endeavoured to have the expenses incurred by Milk Authorities considered as expenses incurred for community welfare. In instances where local body officers have undertaken duties in respect of milk at the request of the Milk Authority for the area, and more especially where City or Borough Councils are the Milk Authorities, the Marketing Department has endeavoured to have local authorities pay substantial amounts of the costs involved, as if part of normal municipal undertakings.

The Marketing Department has been active in the promotion, where possible, of emergency supplies of liquid milk to areas in which shortages have occurred. There are few areas in New Zealand which at the present time are outside the National Milk Scheme. The growth of Producer Associations has been rapid since the inception of the Scheme and organisation has now advanced to the position where an adequate supply of milk to meet the demand for liquid milk is assured in most areas at all times. Marketing Department organisation now enables surplus supplies of milk from one district to be transferred to districts where the forthcoming local supply is temporarily inadequate to meet the local consumer demand.

Marketing Department policy, supported by the Central Milk Council, has encouraged the treatment of milk and the arrangement of milk supplies so that consumers have

had a choice of raw or pasteurised milk. More recently, however, the Marketing Department has discouraged the consumption of raw milk in areas where a high percentage of the supply was already pasteurised. Wherever possible the Marketing Department has endeavoured to secure the delivery of milk in sealed containers.

(b) The Ownership and Management of Treating Houses.

The Marketing Department, following upon recommendations of the Central Milk Council which were accepted by the Government, negotiated for the purchase of treating houses from 1945 onwards. In all, twenty-two treating houses were purchased on behalf of the Crown. Treating houses purchased were those in unsatisfactory condition in the opinion of the directive and administrative organisation.

In accordance with the policy of the Central Milk Council the Marketing Department brought purchased treating houses up to satisfactory standards in respect of buildings and equipment and then made them available to local interests. In some instances treating houses were closed and in others completely new treating houses were built, or temporary improvements effected until such time as new treating houses are erected.

At the end of 1951 the disposal of the twenty-two purchased treating houses was as follows (Marketing Dept., 1952):-

Sold to municipalities, public utility corporations, and semi-public bodies	5
Leased to public utility corporations	2
Managed for the Crown by municipalities and public utility corporations	4
Managed by Marketing Department	5
Closed	6
Total	22

The Marketing Department has been responsible for the management of purchased treating houses from the time of

their purchase on behalf of the Crown until the time of their sale or transfer to new ownership and management. As indicated above, a number of treating houses are still managed by the Marketing Department, on behalf of the Government, as business undertakings.

C. LOCAL MILK AUTHORITIES.

Whilst the Central Milk Council has been the overall directive authority of the Market Milk Industry, and, with the Marketing Department, has endeavoured to co-ordinate the organisation and activities of the industry as a whole, local Milk Authorities have functioned principally to ensure, at all times, adequate supplies of milk of good quality for the consumers in their respective milk districts and to control the sources and conditions of supply of this milk.

By a system of licensing, Milk Authorities have controlled the sources of production of milk supplied for liquid consumption, the avenues through which this milk has passed for treatment, where treatment has been undertaken, and finally, the conditions under which milk has been distributed to consumers, and the persons distributing it, within their respective milk districts. Before licenses have been issued by Milk Authorities, farm dairies and milk treatment premises must have been registered by the Department of Agriculture as conforming to satisfactory standards.

Though each Milk Authority has had power under the Milk Act, 1944, to buy and sell milk, to treat milk and generally provide for the cool storage of milk, only two Authorities, the Wellington City Council and the Whangarei Borough Council, have exercised these powers. At the present time, however, there are seven public utility corporations which undertake the above functions, and these have representatives of the appropriate Milk Authorities on their directorates.

As a result of wartime endeavours to conserve petrol, by 1944 a system of milk zoning, partially compulsory and

partially voluntary, was practised in many milk districts. Since then, however, zoning has been extended and placed on a compulsory footing by Milk Authorities in all milk districts.

The conditions under which licenses have been issued to milk distributors have ensured the observance of milk distribution conditions formulated by Milk Authorities. The hours during which milk has to be delivered and the services to be given to consumers have been fixed. Milk Authorities have revoked the licenses of persons defaulting in the pursuance of these conditions. The general policy of Milk Authorities in the licensing of distributors has been to give to distributors the sole right of distributing milk in defined areas.

Milk Authorities in some of the milk districts containing large numbers of consumers have arranged for inspections of conditions existing and practices pursued in their respective areas. These inspections have extended in some areas over all sections of the liquid milk industry and in other areas only to sections of the industry. Normally, inspectors have been engaged in the administration of the by-laws of Milk Authorities.

Under the authority of the Central Milk Council, which has approved of maximum values allowed in milk districts, local Milk Authorities have controlled the maximum goodwill value of the businesses of milk distributors. Prior to any change of ownership of these businesses each has first been offered to the Milk Authority at the proposed transfer price. In the event of refusal by the Milk Authority, provided the transfer price was considered reasonable, transfer to other persons has been approved. Some Authorities have purchased the goodwills of milk distributing businesses and either resold or leased them on the basis of gallonage of milk distributed, preferably to ex-servicemen. In other instances Milk Authorities have purchased distributing businesses

to enable more consolidated zoning to be practised within their districts.

The Milk Authorities in the four large metropolitan areas have undertaken quality testing of milk sold, or intended for sale, for liquid consumption within their milk districts. Milk Authority inspectors have taken milk samples from persons engaged in all branches of the liquid milk industry in these areas. Laboratory examination of these samples has effected improvement in the quality of milk available to consumers in these areas, and maintained milk quality at higher levels. The supply of milk of inferior quality has resulted in the cancellation of both producers' and distributors' licenses held from the Milk Authorities. Outside the four main Metropolitan Milk Districts the regulative control of the quality of milk supplied to consumers has been the responsibility of the Departments of Agriculture and Health. These Departments have appointed inspectors to work in collaboration with local Milk Authorities.

II. THE CO-ORDINATION OF THE SUPPLY, COLLECTION, TREATMENT, AND DISTRIBUTION OF MILK FOR LIQUID CONSUMPTION IN NEW ZEALAND SINCE 1944.

The Central Milk Council, Milk Authorities and the Marketing Department have all played some part in the co-ordination of the supply, collection, treatment and distribution of milk for liquid consumption in New Zealand since 1944. The quality of the milk supply and the practices employed in the various branches of the liquid milk industry have been regulated by the Departments of Agriculture and Health.

Under the National Milk Scheme, producers of milk intended for liquid consumption have, in most areas, become members of Producer Associations which have formed Producers' Co-operative Milk Supply Companies for the supply of milk to

treating houses or distributors. Members of Producer Associations have guaranteed to supply to their Associations level quantities of milk daily throughout the year. The Associations have then contracted with the Marketing Department to supply milk on a collective-contract basis daily throughout the year. Before contracts have been accepted by the Marketing Department the Producer Associations have had to satisfy local milk Authorities and the Marketing Department that they were capable of maintaining their collective guarantee from the supply of members at all periods of the year. Where more than one Producer Association has been formed for any milk district a Committee of Supply, comprising representatives of the Associations, has been formed and contracted with the Marketing Department. Contracts for supply have then been allotted to the individual Associations.

Contracts have provided for town-milk prices to be paid on all milk supplied up to 17 per cent above the nominated quantities in the five summer months and up to 10 per cent above the nominated quantities during the remainder of the year (Marketing Department,1949). Milk supplied in excess of the above amounts has received manufacturing prices, which have varied according to the utilisation to which the milk has been channelled. The town-milk price has been related to the guaranteed price for butter and cheese and is discussed in the next Chapter. The incomes of Producer Associations have been distributed on a co-operative basis.

In some areas Producer Associations have not been formed. Producers in these areas have contracted directly with the Marketing Department to supply milk under similar conditions to that supplied by Producer Associations.

In 1945 Producer Associations formed a Town Milk Producers' Federation of New Zealand, Incorporated, as a central organisation representative of producers of liquid milk throughout New Zealand, to safeguard their interests generally and to negotiate with the Marketing Department for

the fixation of milk prices, nominated quantities and surplus allowances. This Federation has been accepted as representing producers in all negotiations with the Marketing Department.

The collection of milk for liquid consumption has been undertaken by a number of different parties or persons, under the approval of the Marketing Department. In some areas the duty has been accepted by Producer Co-operative Milk Supply Companies and in other areas it has been undertaken by milk treatment authorities, contractors or by individual producers.

Most of the milk for consumption in the larger centres of population has passed through milk treatment stations. In all 38 milk treatment stations are functioning at the present time. The ownership and responsibility for these stations has varied with locality and with conditions obtaining prior to the Milk Act, 1944. The several organisations responsible for these milk treatment stations have included:-

(a) Public utility corporations.

(b) The Government, through the Marketing Department.

(c) Limited Companies with public capital.

(d) Private persons.

(e) Producer Co-operative Companies.

(f) Municipal Authorities.

In the greater number of cases milk received by the treating houses has been pasteurised and bottled prior to distribution to the public. Provision has also been made for the distribution of pasteurised milk in bulk to large-scale consumers and for raw milk which has passed through the stations to be bottled or distributed in bulk.

The Marketing Department has, as will be described in more detail, guaranteed to the owners of treating stations certain returns, called margins, for the services provided.

In those areas where treating houses have not been established the Marketing Department has made arrangements for producer-distributors and distributors to deliver raw

milk to consumers. Special margins have frequently been allowed for distribution in these less densely populated areas.

The distribution of milk to consumers has been organised in different ways in the several milk districts. In most areas milk has been distributed to consumers by independent distributors, licensed by the local Milk Authorities, and each one has operated in defined areas. There have been some exceptions to this rule. In other areas milk has been distributed to consumers by treating houses or by producer-distributors. In all districts provision has also been made for the distribution of milk through milk-shops licensed by Milk Authorities. The Marketing Department has guaranteed a certain return, at specific rates, to distributors for services given in distribution.

In some districts distributors have formed Distributor Associations and all distributors have been represented in negotiations with the Marketing Department by the Dominion Federation of Milk Vendors, Incorporated, a similar body to the corresponding producers' organisation.

The co-ordination of the activities of the several persons and organisations described in this section has aimed to ensure an adequate supply of milk of good quality at all times to all consumers in the Dominion. The smooth running of the National Milk Scheme has been effected by the clearly defined division of duties of the several administrative and executive organisations, and by the provision of facilities for considering all interests by the Central Milk Council and the several local Milk Authorities. An endeavour has been made to compensate all for the services provided by paying for these services on a scale commensurate with the value of the service given.

III. REGULATIVE CONTROL OF THE MARKET MILK INDUSTRY IN NEW ZEALAND SINCE 1944.

The Government Departments of Agriculture and Health

have been responsible for enforcing the Acts and Regulations relating to the Market Milk Industry in New Zealand since 1944.

The Livestock Division of the Department of Agriculture was, by the inspection and registration of farm dairies, responsible for promoting the production and supply of milk of good quality for subsequent liquid consumption from 1944 until January 21st., 1952. This Division has supervised the health of dairy cattle in registered dairies and has inspected dairy premises, machinery and utensils used in the production of milk for liquid consumption and the general conditions and practices associated with the production of this milk until it has been collected from the farm gate of producers. Unsatisfactory conditions of production have resulted in the cancellation of registrations and the cutting-off of supplies produced under unsatisfactory circumstances until necessary improvements have been effected.

The Livestock Division undertook the testing of dairy cattle for tuberculosis at the request of producers from 1944 until May, 1951. Since that date this Department has undertaken the compulsory testing of cattle milked for supplying town milk. It has ensured that all animals reacting to the tuberculin test have been slaughtered.

On January 21st, 1952 there was a change effected in the internal organisation of the Department of Agriculture in respect of its regulative control of the Market Milk Industry. The Livestock Division became responsible only for the health of stock and the activities of the Dairy Division of this Department were extended to include all activities relinquished by the Livestock Division.

Since 1944 the Dairy Division of the Department of Agriculture has been responsible for the maintenance of the quality of milk from the point at which it has ceased to be the property of producers until it has become the property of distributors. A specially created section of the Dairy

Division has inspected the conditions of milk collection, registered treating houses and inspected and instructed in the field of milk treatment.

Since the inception of the National Milk Scheme it has been necessary for the Minister of Agriculture to approve the plans for the alteration of existing treating houses or the erection of new treating houses. These approvals have been undertaken through the Dairy Division of the Department of Agriculture. This Division has also given valuable aid and advice to those concerned with milk treatment.

Where producer-distributors have been engaged in distribution or where distributors have collected their supplies of milk from producers the Dairy Division had no function to perform prior to January 21st, 1952.

The Department of Health in New Zealand has been responsible for the compliance of all food producers, processors and handlers with the regulations of the Food and Drugs Act, 1908. In respect of milk the Department of Health, through appointed inspectors, has endeavoured to ensure that all milk delivered for human consumption has complied with standards of quality defined by legislation and that the conditions and practices associated with the distribution of milk to consumers have not been liable to render milk harmful to public health. The activities of the Department of Health have extended to the farm gate for milk which has not passed through treating houses. Where milk has passed through treating houses the loading-out platform has been considered the boundary of its activities.

In some cases Milk Authorities have appointed inspectors and instructors to enforce the application of by-laws introduced by these Authorities that are independent of the national regulations. Care has been taken to ensure that these inspectors and instructors appointed by Milk Authorities have not interfered with the normal activities of the Departments of Agriculture and Health.

CHAPTER XVII

THE PRACTICES PURSUED IN THE MARKET MILK INDUSTRY IN NEW ZEALAND, AND THE REGULATIVE CONTROL THEREOF, SINCE 1944.

The implementation of the Milk Act, 1944 brought to fruition, on a national scale, developments respecting the organisation of the liquid milk industry which was begun by the Wellington City Council in 1919 and continued by the Auckland Metropolitan Milk Council in 1933.

Since 1944 the ideal of adequate supplies of milk of good quality to meet the demands of consumers at all times has been pursued with marked success. The organisation of the industry has ensured the absence of acute milk shortages and at the same time the practices in the industry have resulted in improvements in the quality of milk delivered to consumers. But the difficulties associated with meeting the daily demand for such a highly perishable commodity as milk have not been overcome without considerable pains being taken in ensuring satisfactory conditions of production, collection, treatment and distribution.

Steps taken to ensure satisfactory milk supplies have included adequate rewards for all services, control of prices and subsidies since the inception of the National Milk Scheme. The developments that have taken place in the Market Milk Industry and the practices pursued therein, together with the regulative control of the industry, since 1944, are described below.

1. PRODUCTION AND SUPPLY.

Though "urbanisation" has proceeded in New Zealand at a rapid rate since the mid 1930's, all centres of population have areas suitable for dairy production at a level which has always surpassed their yearly demands for liquid milk situated in close proximity. Though shortages of milk have occurred during some winter periods since 1944 the position has now been reached where adequate supplies of milk have

become available within reasonable distances of all centres of population at all times of the year. Since 1944 there have been numerous instances of a marked encroachment of liquid milk supply areas into areas supplying milk or cream for manufacturing purposes.

Though Jersey and Jersey-crossbred cattle have become increasingly predominant in the breed composition of the national dairy herd since World War 11 (N.Z. Abs. of Stats., 1951) this change in breed composition has not been simulated in the small percentage of dairy herds regularly milked for town supply. The increased popularity of Jerseys and Jersey-crosses has been the result of continued payment for milk and cream for manufacturing purposes on the basis of its butterfat content. With the exception of the Wellington and Hutt Valley areas payment for milk supplied for liquid consumption has been on a gallonage basis, provided that legal minimum standards of composition have been observed. Even in these areas increasing value has been attached to the quantity of supply rather than the quality since 1945. Elsewhere, the payment for milk for liquid consumption on a gallonage basis has encouraged the keeping of cows which have produced milk of lower compositional quality than has been produced for sale for manufacturing purposes.

The net effect of the higher proportion of dairy cattle other than Jerseys in the section of the national dairy herd milked to supply milk for liquid consumption has given liquid milk an average butterfat test which has been accepted as being one-tenth per cent below milk supplied for manufacture into cheese and one-quarter per cent below milk utilised for manufacture into butter (N.Z. Dairy Board, 1951).

The organisation of the Market Milk Industry since 1944 has required the production of milk on a level-supply basis each day of the year and has necessitated the calving of cows throughout the year to meet this demand. The period of lowest production varies between districts but provided

that adequate supplies have been available from individual herds to enable the supply of nominated quantities in the autumn and winter periods when pasture growth has been at a minimum, and supplementary feeding frequently pursued, it would appear that no difficulty has been experienced in maintaining adequate supplies to meet commitments during the remainder of the year. Consequently many producers of milk for liquid consumption have calved the larger proportion of their herds in the late summer and autumn periods and the remainder in the late winter, early spring periods.

The autumn calving policies pursued have made the rearing of replacement stock difficult and expensive, difficult because of the climatic conditions prevailing at the time of rearing and expensive because highly priced whole milk, otherwise sold for liquid consumption, or milk substitutes, have been fed to the calves. Because of this it has not been general practice for replacement stock to be reared on town-milk-supply farms but rather for replacements to be purchased as young stock or calving down cows from the herds producing milk for manufacturing purposes.

Evidence submitted to the Milk Commission in 1943 indicated that the annual replacement rate in herds then producing milk for liquid consumption was approximately twenty-five per cent and in some instances even higher. There is no evidence to indicate a reduction in this replacement rate since that time. Undoubtedly this high replacement rate, when compared with the seventeen per cent annual replacement (N.Z. Dairy Board,1945) estimated for other herds, has been the result of the practice of buying in replacements which have frequently been culled from other herds.

The most notable advance in the circumstances of production of milk for liquid consumption since 1944 has been the rebuilding of farm dairies, and the installation of new milking machines and equipment. During World War II there was no material available to provide for more than the

necessary maintenance and improvements to maintain satisfactory conditions of production. With materials and money available to producers since the wartime period, rebuilding and re-equipping have proceeded at a rapid rate.

The more general use of good equipment and improved conditions of production have facilitated the supply of milk of good bacteriological quality. This has been especially evident in the Auckland Metropolitan Milk Supply area.

At the present time milk for liquid consumption is produced in farm dairies of a general good standard of construction in which concrete yards and pathways are prominent. The dairies are generally clean and well lighted and have adequate supplies of hot and cold water available for cleaning purposes. Milking machines are used almost universally for the production of milk, and following upon milking, milk is cooled by means of water, with or without the additional use of mechanical refrigeration. Mechanical refrigeration is not extensively applied to the cooling of milk on farms but, under stimulus of premiums for milk refrigerated with approval of the Marketing Department, its use is expanding in northern areas of the Dominion.

Following production milk is filled into cans to await collection. The cans are either owned by producers or hired from Producer Associations or treatment stations. Between the times of production and collection milk is not generally held in a cool-room especially built for the purpose but delivered to the point from which it is collected for subsequent handling. A small proportion of farms do hold milk in special cool-rooms until collection. Where milk is collected from farm dairies mechanical refrigeration is frequently employed.

Although producers are permitted to supply milk for liquid consumption only from registered dairy premises under license, there are additional incentives to the maintenance of production conditions and practices and the supply of milk

of good quality. Inspectors of the Livestock Division of the Department of Agriculture may visit farm dairies without notice at all reasonable times and this serves to promote the maintenance of satisfactory conditions and practices of production. An incentive to the production of milk of good quality is the consciousness of producers to the fact that their milk supplies are regularly tested for quality and that non-compliance with standards may result in monetary loss. Eventually, however, much of the responsibility rests with the producer and milk quality varies with the care and ability of the producer.

Though it is easier to make a clean milk safe than it is to make a dirty milk clean, the introduction of the scheme for the compulsory testing for tuberculosis of all cows milked to provide milk for liquid consumption was a notable advance in the practices of milk production. The scheme was formulated and enforcing legislation passed in 1945 but set aside pending agreement on the prices paid in compensation for the slaughtering of reactors to the tuberculin test. Agreement was reached during 1951, however, and an active testing campaign commenced by the Livestock Division of the Department of Agriculture. Regular compulsory testing for tuberculosis has thereby been commenced to pursue a safer milk production campaign and by 1954 it is anticipated that the entire town-milk herd will have been tested.

The producer of town milk has enjoyed the same price guarantees for his efforts as has the producer of milk for supply to dairy factories for the manufacture of butter or cheese. Since 1936 the prices for butter and cheese have been guaranteed under a Government scheme aimed to guarantee a cost-of-production return to average efficient producers supplying average efficient factories.

The supply of milk for liquid consumption is comparable with the supply of milk for cheese manufacture in that whole milk is forwarded off the farm. The guaranteed price

for butterfat for manufacture has been based on the production of 12,000 pounds of butterfat from 48 cows producing 250 pounds of butterfat per cow and employing two labour units. On the basis of factory supply the allowance to producers of liquid milk on a butterfat basis has been the weighted average payout for the year to cheese suppliers in the five main cheese-producing districts in New Zealand. These districts are Auckland, New Plymouth, Wanganui-Patea, Wellington and Southland. To this figure has been added the difference between the basic figure for the previous year and the actual weighted average payout in the same year in the cheese districts enumerated, together with a compensation of .75 pence per pound of butterfat for loss of whey. The basic butterfat payment for the year has thereby been derived and known in advance to producers.

The basic butterfat figure has been multiplied by 12,000 to give a return to producers of liquid milk comparable with the return receivable assuming the alternative supply for cheese manufacture. Allowances have then been added to compensate for the differences between factory supply and liquid milk supply conditions.

Allowances have been paid to compensate for the hardships of winter milking and the necessity, under the present organisation, to pursue a minimum level of milk production every day of the year. At the same time the employment of labour on town-milk-supply farms has been more costly than on factory-supply farms because of the competition with the industrial employment in nearby towns and cities, the hardships of working under town-milk-supply conditions and the better quality of labour desirable for the production of milk for liquid consumption. An allowance has therefore been added for extra labour costs.

Extra interest on capital invested on town-milk farms has been allowed to compensate for capitalisation on land and the capital invested in farm equipment, buildings, milking

sheds and coolers etc. not considered essential on farms supplying milk for manufacturing purposes. Situated in close proximity to population centres the land value of farms producing milk for liquid consumption has had a higher locality value than have farms producing milk for manufacturing purposes.

Finally, allowance has been made for extra working and maintenance expenses on the added capital investments. This allowance has been derived on the basis of the gallonage of milk produced.

Because the conservation of substantial quantities of pasture production has been required in the spring and summer periods of the year to provide supplementary feed in the autumn and winter periods, a reduction in the carrying capacity of town-milk-supply farms compared with other dairy farms has been accepted. The recommendation of the Milk Commission that the carrying capacity of 48 cows for factory supply be reduced to 40 cows under town-milk-supply conditions has been accepted and used as a basis of comparison in the derivation of the guaranteed price for liquid milk. An average per cow production of 500 gallons of milk per year under town-milk-supply conditions has been accepted by producers and the administration and used in price derivation. On the basis of carrying capacity and per cow production, as indicated above, a production of 20,000 gallons of milk per year has been agreed upon as the yearly production on the standard town-milk farm.

To maintain comparisons with the guaranteed butterfat price standard of a production of 250 pounds of butterfat per cow per year, a production loss of 10 per cent from out-of-season production was considered reasonable and has been used in the derivation of the town-milk price. The production of 225 pounds of butterfat in milk of 4.3 per cent butterfat content requires the production of 523 gallons of milk. The production for liquid consumption of milk of 4.3 per cent butterfat content has consequently been accepted in

association with the guaranteed farm-gate price for milk for liquid consumption.

The price payable for milk for liquid consumption has been obtained by dividing by 20,000 the total return necessary to a producer of liquid milk who supplies under factory-supply conditions of level supply a milk of 4.3 per cent butterfat content. The price has been intended, through its basis of derivation, to compensate producers of liquid milk for the production of milk of good bacteriological quality and 4.3 per cent butterfat content and in minimum quantities daily throughout the year.

The derived price has been agreed upon by the Town Milk Producers' Federation and the Marketing Department. It has been a guaranteed price per gallon of milk delivered at the farm gate of producers.

By providing a guaranteed farm-gate price for milk for liquid consumption an endeavour has been made to make the returns from the production of liquid milk sufficiently attractive to promote adequate supplies of milk for liquid consumption to meet the consumer demand at all times. Allied with this has been a policy, agreed to by the producers' representatives and the administration, of the payment of differential prices for milk supplied under contract at different periods of the year. The policy has been designed to pay a price for the different periods in proportion to the costs associated with producing milk in the specific periods and overall to give a return of the national town-milk price for supply on a yearly basis.

Milk supplied to Wellington City and the Hutt Valley has been paid for on a different basis to that applying to all other areas in New Zealand. At the time the National Milk Scheme was introduced in New Zealand the milk supply to these areas (see Chapter Vll) was paid for on the basis of its butterfat content and volume. This basis was revised in 1945 to give a return judged equal to that in other areas where

payment was based only on the volume of supply. The principle of payment partly on a butterfat basis was retained. Since 1945 the costs of milk production have risen and the prices paid for milk for liquid consumption have risen proportionately. All price increases allowed in respect of supply to Wellington City and the Hutt Valley have been added to the payment on a volume basis (Marketing Dept., 1951). The present price therefore does not give incentive for the supply of milk of high butterfat content as it did in earlier years. As a result of this there appears to have been a slight transfer from the milking of Jersey and Jersey-cross cattle to the higher milk-yielding breeds other than Jersey in the areas supplying milk for liquid consumption in Wellington and the Hutt Valley.

II. MILK COLLECTION.

The most notable development since 1944 in the field of milk collection has been the increase in the organised collection of milk with the associated economy of collection. This development has resulted from the organisation of milk producers, the reduction in the number of producer-distributors in the liquid milk industry and the increase in the quantity of milk passing through treating houses since the inception of the National Milk Scheme.

Throughout the period motor transport has been used almost without exception for the collection of milk supplied for liquid consumption. Most widely used containers for the carriage of milk have been tinned-steel cans of ten or twelve gallons capacity. However, in some instances cans of irregular size and shape have been used. These have varied in capacity from four to twenty-five gallons. In some areas cans have been collectively owned by treating houses or Producer Associations and in these instances there has been uniformity in the size of cans used in milk collection.

Where milk has not passed through treating houses collection has either been undertaken by individuals who have

delivered raw milk to consumers, by Producer Co-operative Milk Supply Companies or by contractors.

However, the greater portion of milk supplied to the Market Milk Industry in New Zealand since 1944 has been channelled through treating houses. The collection of this greater bulk has been more economic than the collection of milk which has not passed through these channels. Where practicable maximum payloads have been collected from organised collection routes by heavy motor transport. Where producers' farms have been inconveniently situated to normal collection routes there have been individual producers who have delivered their own milk to treating houses.

The general practice in the field of milk collection at the present time is for heavy motor transport to collect the milk supply of a number of producers whose farms are situated along organised collection routes. Organisation of collection has been such that maximum loads have been provided, wherever possible, at the completion of the route. At the same time an endeavour has been made to have the transport used for the collection of milk on its journey to the treating house at the time the last pick-up has been made. The quantities of milk required to meet the daily demand of consumers has been delivered to treating houses and milk supplied as a surplus to these requirements has been delivered to manufacturing dairies.

Milk for liquid consumption has most frequently been collected from roadside stands adjacent to the farms of the producers. In a minority of instances collection has been made from the farm dairies where mechanical refrigeration may or may not have been employed to hold milk at a low temperature prior to collection. Milk has been collected from platforms of convenient height to permit loading without undue delay. Roadside stands have, for the most part, not been covered in any way to protect milk from the effects of the sun and the weather. In warm and sunny weather it has

therefore been imperative to the maintenance of the keeping quality of the milk to have the shortest possible delay between the time milk has been left at the collection point and the time of collection.

Milk has been collected both once and twice a day and in most areas the milk of at least a section of the producers has been collected once daily during some period of the year. Where the bacteriological quality of milk has permitted once-daily collection, and treating house organisation has enabled this to be pursued, then it has been practised. Throughout New Zealand once-daily collection has been commonly practised though in some areas the policy of collecting twice each day has been adopted in the summer months and once-daily collection has been practised in the winter months. Where possible milk has been collected as soon after production as practicable; to maintain its keeping quality.

Generally milk has not been covered during transit from farms to treating houses. However, Milk Authorities in some areas have enforced by-laws which have required milk to be covered during collection. Where milk has been transported long distances during the heat of the day it has generally been covered from the sun's rays and the weather but this practice has not been common where milk has been collected in close proximity to consuming areas. The latter condition has applied in almost all areas outside the four main metropolitan areas.

Throughout New Zealand there has normally been no substantial time lag between the time of milk collection from farms and the time of delivery to treating houses. This has been the result of supply areas being situated near to centres of consumption so that haulage over long distances has been unnecessary.

A notable exception to the general practices of milk collection has been provided by the practices employed in the collection of milk for the city of Wellington. Milk has been

supplied to this city directly from farms, through two country receiving and balancing stations to which supplies have been delivered from farms for bulking and chilling, and through dairy factories. Milk delivered directly to the treating house has been collected by motor transport. Milk tankers have been used to convey milk from the country receiving stations to Wellington and where milk has been supplied by dairy factories it has been railed to Wellington in cans.

III. MILK TREATMENT.

The aim of all milk treatment should be one of ensuring that the bacteriological quality of the raw milk supply is maintained at the highest level practicable. Treatment should also promote the absence from milk of disease producing organisms harmful to the health of consumers.

It cannot be claimed that the practices associated with milk treatment in New Zealand today are universally adequate to satisfy the above conditions. Though facilities for treating milk are satisfactory in some areas, in others they do not reach the desired standard. At the present time, however, it would appear that organisations within the industry, public authorities and consumers view the general conditions with mild satisfaction.

There have been substantial developments in the practices and circumstances of milk treatment in New Zealand since 1944. Most notable of these have been improvements in the structure, layout and equipment of treating houses, increased use of laboratory control of milk treatment processes and extended application of pasteurisation and bottling to milk. Post-war prosperity and the National Milk Scheme have been largely instrumental in bringing about these developments.

The increase in the extent to which milk passing through the National Milk Scheme has been treated during the period 1945-1950 is shown in Table XI.

TABLE Xl: Sales and Treatment of milk passing through the National Milk Scheme from 1st September, 1945 to 31st August, 1950; sales in thousands of gallons.

Milk Year	Town Sales	Raw Town Sales	Pasteurised Town Sales	Loose Town Sales	Bottled Town Sales
1/9/45-31/8/46	29,873	9,207	20,667	15,693	14,181
1/9/46-31/8/47	33,345	11,531	21,814	15,633	17,711
1/9/47-31/8/48	42,378	15,723	26,654	21,461	20,917
1/9/48-31/8/49	45,019	17,372	27,646	21,689	23,330
1/9/49-31/8/50	46,449	15,979	30,371	19,973	26,476

- Marketing Dept. (1951)

Since 1945 nearly all milk that has been treated has been supplied through the National Milk Scheme. The Marketing Department has encouraged the milk supply to be so arranged that consumers in at least the major centres of consumption have had a choice of raw or pasteurised milk and that, wherever practicable, milk has been delivered in sealed containers. The data cited in Table Xl shows clearly that this policy has resulted, between 1945 and 1950, in an increase of 47 per cent in the sales of pasteurised milk through the National Milk Scheme and a corresponding increase of 87 per cent in the sales of bottled milk.

All pasteurised milk sold has passed through recognised treating houses. About one-third of the raw milk sales are treated at the present time. However, there are still small quantities of raw milk bottled by individuals, mainly producer-distributors.

The most important features of milk treatment include milk reception, milk grading, laboratory control, pasteurisation, bottling and milk storage prior to distribution.

The general practice in milk reception has been to grade milk by the senses tests of sight and smell before tipping it into a weigh-vat. Whereas grading should have been undertaken by qualified and competent milk graders many unqualified and inexperienced men have been regularly employed for this work since 1944. The weighing machines used have been those with suspended weigh-vats and clock-dials.

Weigh-vats of one thousand pounds capacity have been most frequently used.

In many treating houses, particularly those with larger throughputs, daily samples of each supplier's milk have been taken from the weigh-vat to permit laboratory testing for composition and for bacteriological quality. The size of samples has either been proportional to the quantity of milk required for the specific tests undertaken, or alternatively, a half-pint or similar sized sample has been taken and forwarded to the laboratory, irrespective of the actual amount required for the tests.

Periodic sediment tests have been carried out on the receiving stages of many treating houses to determine the physical cleanliness of incoming milk. The use of sediment testers has increased rapidly under the guidance of officers of the Dairy Division of the Department of Agriculture.

In isolated instances short-time dye-reduction tests have been applied to the milk of producers who have forwarded milk of inferior bacteriological quality on previous days and in which defects escape detection by the senses. These dye-reduction tests have not been widely practised. The acidity test has not as yet been applied on any receiving stage as a routine grading test.

As part of milk reception milk cans have been washed by treating houses. Can-washing machines, predominantly of the rotary type, have been used for the purpose. In some of the treating houses with small throughputs cans have been washed by hand.

Excepting the grading system employed by the Wellington City Council Milk Department (see p. 38) it has been universal practice to recognise only two grades of milk delivered to treating houses. Milk has been classed as fit or unfit for human consumption at the discretion of the managers of treating houses. Milk rejected by treating houses has either been returned to producers or diverted to manufacturing

dairies where lower standards have obtained.

Department of Health standards have required milk to contain a minimum of 3.25 per cent of butterfat, 8.5 per cent of milk solids other than butterfat and no added water. Milk has also had to comply with a keeping quality standard of a 4 hour methylene-blue reductase test. Milk treatment authorities have had the right to reject supplies of milk not complying with the above Department of Health standards. However, where milk has been accepted for utilisation for liquid consumption and has later been found not to comply with these standards full liquid milk prices have been paid for such supplies. The supplies of defaulting producers have, in many instances, been rejected on subsequent days until all defects have been corrected.

Whereas there were comparatively few laboratories established in milk treatment houses prior to 1944 there has been a rapid increase in their number since that date. Most treating houses now practise the laboratory testing of incoming supplies of raw milk to some extent. The most widely applied test has been the methylene-blue dye-reduction test to determine the keeping quality of milk supplies and this test has frequently been applied daily to all incoming milk. The resazurin test has not been widely used.

The methylene-blue test has generally been applied as soon as convenient after milk has been delivered to the treating houses. However, following upon recommendations from the Dairy Division of the Department of Agriculture, in several treating houses samples are aged at atmospheric shade temperature until 5 p.m. on the day of delivery, then held in cool storage until the test is applied at 9 a.m. the following morning.

There are wide variations in the extent of laboratory control practised in treating houses in New Zealand at the present time. The most complete control is obtained at those

treating houses with well-equipped laboratories in which skilled and qualified staff are employed. However, the employment of qualified laboratory technicians is not widely practised, except in the larger treating houses. Again, it is common practice for laboratories to function only on five days of each week and for normal weekday control to be lacking at weekends.

In addition to the tests to determine the bacteriological quality of milk, laboratories have undertaken some or all of the following tests on incoming raw milk, outgoing milk or as control tests in the treatment processes - sediment, butterfat, solids-not-fat, acidity, lactometer, added water, direct microscopic examinations, bacterial counts, coliform, phosphatase, checking detergent strengths, checking temperatures employed and the accuracy of thermometers and the bacteriology and character of water supplies.

Following upon reception, grading and sampling, milk accepted by treating houses for liquid consumption has been bulked prior to its treatment. In isolated instances the milk of selected producers, because of its consistent good quality, may have been bulked separately for subsequent sale as raw milk.

Bulked raw milk has been treated according to the facilities available within treating houses and the requirements of consumers. General policy has been to meet the demands of consumers if practicable and in most areas consumers have been given a choice between raw and pasteurised milk. The choice between bottled and non-bottled milk has not been so widely offered to retail purchasers.

Since 1950 several treating houses have supplied only pasteurised milk to distributors. It appears that there has been a gradual extension of this policy throughout the Dominion. It is worthy of note that in one treating house pasteurising facilities are not yet available. Bottling facilities are available in all treating houses.

Since 1944 pasteurisation has been carried out by both low-temperature long-time and high-temperature short-time pasteurisers. The temperatures and times employed have been 145°F. for 30 minutes and 162-162.5°F. for 15 seconds. "Batch" pasteurisers are now employed for all low-temperature long-time ("Holder") pasteurisation except in one treating house in which a continuous low-temperature pasteuriser is being used until new premises are erected.

Most of the larger treating houses have used plate type "continuous" pasteurisers for high-temperature short-time ("H.T.S.T.") pasteurisation in the post World War 11 period. The rapid introduction of "H.T.S.T." pasteurisers has been a feature of developments in milk treatment since 1944. These machines have replaced "Holder" pasteurisers and provided pasteurising facilities in treating houses not previously heat-treating milk.

Following upon pasteurisation all milk has been cooled to a low temperature. Ideally the temperature should be lowered to 40°F. or below and this has been the general practice. With "H.T.S.T." pasteurisation, pasteurising and cooling have been accomplished as one operation in the pasteuriser. Where the "Holder" method has been employed independent coolers have been used. Raw milk has been cooled by passing it through "H.T.S.T." pasteurisers or by independent coolers.

Milk has been heated for pasteurisation either by live steam or by circulating hot water. Cooling has been accomplished by the use of regeneration, by water at atmospheric temperatures, by chilled brine or sweet water or by the direct application of liquid refrigerant.

All pasteurising machines, when correctly used, have been devised to ensure the efficient pasteurisation of milk. Manual control has been relied upon when "Holder" machines have been employed but with "H.T.S.T." pasteurisers control has been automatic, but subject to manual adjustment. For all pasteurisers temperature recorders have made permanent records

of the pasteurising temperatures that have been employed. Laboratory control of pasteurisation, where possible, has been carried out by phosphatase tests.

Milk cooled to low temperatures has been filled into clean bottles or cans as soon as practicable after cooling. The containers have then been transferred to cool-rooms and held at low temperatures to await delivery to distributors.

Bottles used for the distribution of milk in New Zealand have all been of the round type. They have been sealed with preformed cardboard discs or by aluminium foil discs which have been cut at the time of bottling. Cardboard disc sealing provides a cavity above the disc for the collection of water, dust, etc., but the aluminium foil sealing covers the top of the bottle completely. Aluminium foil has been used for bottle caps only since the introduction of the National Milk Scheme but its use is extending rapidly.

Milk treatment has been undertaken in all treating houses during normal business hours. Where facilities for milk treatment have been inadequate to permit the completion of all treatment in one daylight "shift" or where milk has been collected twice daily to preserve its keeping quality a "night shift" has been employed. However, most milk treatment has been undertaken between seven o'clock in the morning and five o'clock in the afternoon. Milk has then been held until distribution early the following morning. Consequently milk passing through treating houses has usually been 24 to 36 hours old when delivered to consumers.

IV. DISTRIBUTION.

Under the National Milk Scheme by far the highest single charge between producer and consumer has been the cost of delivering milk in retail quantities. In fact, the margin allowed for distribution has, at all times, exceeded the total of all other service margins which could be claimed. Constant endeavours have been made by the Central Milk Council and Milk Authorities to effect economies in the field of milk distribution.

Milk Authorities have consolidated distribution areas by licensing distributors to permit them to deliver milk in restricted areas and have frequently granted them an absolute monopoly for these areas. Christchurch and Invercargill have been the only large urban areas in which all consumers have had a choice of distributors. The choice has been limited, however, and has been intended as a choice of service, not of milk.

Milk Authorities, by licenses, have also controlled the periods during which milk could be distributed, the place of delivery and the distribution practices which could be employed. These have endeavoured to promote regularity of service and consumer satisfaction with the milk supply.

The most important agency through which milk has been distributed to consumers has been the milk roundsman or distributor who has delivered milk in retail quantities to the households of consumers. In the more highly "urbanised" areas, however, an appreciable proportion of the milk supply has been sold through milk-shops and milk-bars. Milk has also reached consumers through hotels, restaurants, hospitals and other institutions.

In areas in which treating houses are operating the average gallonage of milk distributed per roundsman is between 90 and 100 gallons per day. The average for the Dominion is reduced by conditions and practices in the smaller urban areas, the national figure being about 80 gallons per roundsman per day. These figures are averages from which there are wide variations for individual distributors. In Wellington municipal roundsmen deliver an average of 138 gallons per eight hour day; in some other centres, however, roundsmen deliver as little as 10-20 gallons per day but in these instances milk is distributed as a part-time occupation.

Motor transport has been widely used for the delivery of milk since 1944. In some areas it has been the only transport used. Elsewhere, however, horse and float trans-

port, electric vehicles and bicycles have been employed. The most popular motor transport has been the light truck but heavy trucks and converted cars have also been used.

The by-laws of several Milk Authorities have required milk to be covered by a canopy whilst on the distribution round. In other districts, however, covers have not been used and milk has been unprotected from the weather. It has consequently been exposed to sunlight and warm temperatures and, under unfavourable conditions, has been open to contamination by dust and rainwater.

Distributors have collected milk, for delivery to consumers, from the cool stores of treating houses, from pick-up stands to which it has been delivered by treating houses, from Producer Associations and from the farms of producers. In some areas milk has been collected from decentralised cool stores operated by treating house authorities. It has been considered that distributors should remove their own milk from treating houses but as a service to the distributors, to guard against dishonesty and to receive empty bottles returned to treating houses employees of the treating houses have normally delivered milk to the edges of the loading-out stages for collection by distributors.

Milk has been distributed in most areas in the early morning and forenoon period of the day. Each Milk Authority has had the power to make by-laws to fix the hours during which milk could be delivered, subject to existing awards and industrial agreements. The place to which milk could be delivered has also been fixed by Milk Authorities. To promote economy milk has usually been delivered to the front gates of the residences of consumers. In all areas only one retail delivery of milk has been made daily since 1944.

As far as practicable milk distributors have supplied the requirements of consumers for raw or pasteurised, bottled or loose milk. With no price differential for different types of milk, bottled milk has been sought where

treated milk has been available. Only loose raw milk has been available in areas not serviced by treating houses. There has been a retail sale of both bottled and loose milk in some areas but this practice has not been common.

Payment for milk has been made by tokens or coupons to the value of purchases, by cash and by credit. Credit has been allowed by some distributors to the convenience of consumers but in most areas tokens, coupons or cash have been required or no milk has been delivered. It has been general policy for consumers to pay for all bottle losses within their households.

Many of the personnel engaged in milk distribution have had no real appreciation of the perishable nature of the commodity they have distributed. Notwithstanding Milk Authority licensing and Department of Health regulatory control of distribution, there have been many distributors who have had little regard for the obligation they have owed to producers and treating houses to maintain the quality of milk at the highest practicable level or to consumers to deliver an article of the best quality. Many persons have been engaged in milk distribution only for the financial return they have received for their services. Since the introduction of zoning and the elimination of competition for business the monopolistic position of distributors has too often been misused. The worst offenders have come to the notice of Milk Authorities through complaints from consumers and their licenses have been cancelled or not renewed. Inspections have had similar results.

Overall, however, the nature of the personnel engaged in milk distribution has left much to be desired since 1944. Though malpractices as such have not been frequent a poor service has been given to many consumers and the reintroduction of restricted competition in the field of milk distribution would gain support in many areas. Alternatively, greater satisfaction would result from more complete control

of the practices of distributors through the stricter application of license conditions.

V. REGULATIVE CONTROL.

As explained in Chapter XVl and earlier subsections in this Chapter the regulative control of the Market Milk Industry in New Zealand since 1944 has been undertaken by the Department of Agriculture, the Department of Health and Milk Authorities.

The Department of Agriculture has examined the cows producing milk for liquid consumption, inspected and registered the farm dairies from which milk could be supplied for liquid consumption, inspected in the field of milk collection and inspected, registered and instructed in the field of milk treatment.

The Livestock Division of this Department has throughout examined the cows producing milk for liquid consumption and, until 21st January, 1952, inspected and registered farm dairies from which town milk could be supplied. Since this date these latter duties have been carried out by the Dairy Division of this Department, as a result of a change in the internal organisation of the Department of Agriculture (see p. 115). By regular biannual inspections of farm dairies an endeavour has been made to provide a supply of milk of good quality to treating houses and distributors. Additional inspections have been made in instances where adverse reports of the quality of the milk supplies have been received from treating houses, from officers of the Dairy Division who have inspected in treating houses or from the Department of Health. In the worst cases, or as a result of adverse reports from regular inspections, registrations have been cancelled. Cancellation of registrations has been revoked when satisfactory conditions have been restored.

The Dairy Division of the Department of Agriculture has, by checking the practices of milk collection and by inspection, registration and instruction in treating houses, endeavoured to regulate the quality of milk from the time it

has left farms until its receipt of distributors.

Additional control of the quality of milk forwarded for liquid consumption by producers has been effected by treating house authorities. They have rejected unsatisfactory supplies and the sale of these supplies in alternative markets at less than the normal liquid milk rates, or their return to producers, has resulted in monetary loss to producers.

The Department of Health has endeavoured to control the quality of milk delivered to consumers by inspection of the practices pursued in the distribution of milk and by obtaining samples, for official testing, of milk intended for delivery for subsequent liquid consumption. These samples have been forwarded to the Dominion Laboratories for analysis for composition in respect of fat and solids-not-fat content and freedom from added water. Non-compliance with fixed minimum standards has resulted in prosecutions.

Milk Authorities in all areas have, by licenses, controlled the actual sources of milk supplied for liquid consumption, the persons engaged in milk collection, the premises in which milk has been treated and the persons engaged in the distribution of milk. In the larger centres of population Milk Authorities have appointed inspectors to ensure the compliance with their by-laws of persons engaged in the liquid milk trade. These inspectors have, in several areas, undertaken inspections and obtained samples of milk for analysis and testing, supplementary to those carried out by the Departments of Agriculture and Health.

All regulative control has endeavoured, as far as practicable, to promote the regular delivery of milk of good quality to consumers in all areas at all periods of the year. In addition, it has endeavoured to provide this milk from healthy cows milked in dairies of satisfactory construction and in which practices conducive to the production of milk of good quality have been pursued.

CHAPTER XVIII

THE MILK AMENDMENT ACT, 1951.

Under the provisions of the Milk Act, 1944, the Central Milk Council was not given power to ensure an enforcement of its decisions relating to the organisation and practices of the Market Milk Industry in New Zealand. Decisions of the Central Milk Council required the co-operation of persons or organisations associated with the liquid milk industry for their application in practice, and this co-operation was frequently not forthcoming. Thereby, many of the decisions of the Council were made ineffective and the Council was severely handicapped in carrying out its objects and functions enumerated in the provisions of the Milk Act, 1944. Similarly, the Marketing Department and Milk Authorities, administering the National Milk Scheme under the provisions of the Milk Act, were confronted with contingencies not provided for in the provisions of the original Act.

The inability of the Central Milk Council to function with authority, shortcomings of the provisions of the Milk Act, 1944, and the change from a Labour to a National Government with a consequent change in Government policy in respect of subsidies payable on milk, promoted the passing of legislation in the form of the Milk Amendment Act, 1951, in November of that year. It was an Act to be read together with and deemed part of the Milk Act, 1944.

The Milk Amendment Act, 1951, consists of two parts. One part provides principally for the reconstitution of the Central Milk Council, formulates its objects, functions and powers, provides for its financing when and if subsidies on milk are removed and for the Governor-General to make regulations, in accordance with recommendations of the Central Milk Council, for organisation of the Market Milk Industry. The other part provides for amendments to the Milk Act, 1944, to clarify provisions of that Act, to supplement the legislation relating to the powers of the Central Milk Council and to

provide for changes in the policies of the various organisations of the industry.

Under the provisions of the Milk Amendment Act, 1951, the Central Milk Council now comprises seven members. These include one member who is appointed as Chairman, one member nominated by the Municipal Association of New Zealand who is a member of a Milk Board or of a Milk Committee of a Borough Council which is a Milk Authority, three members nominated by the Town Milk Producers' Federation of New Zealand, Incorporated, and representative of milk producers in the Auckland Province, the remainder of the North Island and the South Island respectively, one member nominated by the Dominion Federation of Milk Vendors, Incorporated, and one member who shall be deemed to represent the interests of women and children. All members are appointed by the Governor-General on the recommendation of the Minister of Marketing, excepting the last named member who is appointed on the recommendation of the Minister for the Welfare of Women and Children. The present Council consists of the same number of members as the initial Council but no specific provision is made for the Minister of Health or the Director of Milk Marketing to be members. Legislation now includes one more representative of milk producers and specifically includes a representative of distributive interests as a member of the Central Milk Council.

Present legislation also provides for the Director of Marketing, the Director-General of Health and the Director-General of Agriculture, or their appointed representatives, to attend any meeting of the Central Milk Council and to speak at the meeting, but not to take any other part in the proceedings.

The general objects of the reconstituted Central Milk Council are unchanged. The new Council is to discharge the same general functions as the initial Council, and, in addition, is charged to promote efficiency in all branches of

the liquid milk industry, to investigate the activities and efficiency of the organisation and practices of the industry and recommend to the Government the prices and the margins within which milk may be bought or sold and the margins that may be earned for all services rendered in respect of milk.

The Milk Amendment Act, 1951, appoints the Marketing Department as the agent for the Central Milk Council, and for this purpose it may exercise and perform any of the powers and functions of the Council on its behalf. The Council may, by resolution, delegate any of its powers and functions under the Milk Act, 1944, or the Milk Amendment Act, 1951, to the Director of Marketing, or with the written consent of the Director, to any other person or persons.

As soon as subsidies cease to be paid to the town milk industry from the Consolidated Fund it is provided that the Governor-General, by Order in Council, may on the recommendations of the Central Milk Council to the Minister of Marketing (Clause 18):-

"(a) Fix the prices at which milk produced or sold for human consumption may be bought or sold:

(b) Fix margins, whether as maximum prices or minimum prices, or by reference to the amounts or percentages by which selling prices may exceed buying prices, within which such milk as aforesaid may be bought or sold:

(c) Fix rates of allowances to be made in respect of the collection, treatment, storage, distribution and sale of such milk as aforesaid:

(d) Prescribe conditions subject to which sales of such milk as aforesaid may be made."

Provision is made also for special allowances, where considered necessary to the satisfaction of the Council, to be made in respect of the collection, treatment, storage, distribution or sale of milk and for the passing on of milk allowances to consumers through milk prices, which may be set accordingly. Special prices or margins may be fixed in respect of specified areas or all of New Zealand or to specified persons in particular areas. The charging or agreeing to charge or pay other than the specified prices in

respect of milk is a punishable offence.

The Central Milk Council is given power to act over Milk Authorities where they are not functioning to the satisfaction of the Council. The Council may also act as the Milk Authority in milk districts or areas where no Milk Authority is constituted and functioning.

To enable the Central Milk Council to exercise its functions when subsidies cease to be paid out of the Consolidated Fund in respect of the town milk industry, the Council is given power to impose a levy on milk and cream sold for direct consumption in New Zealand. The levy is not to exceed one-half pence per gallon of milk or five pence per gallon of cream.

Until such time as the above levies are imposed and collected the Council's expenses are to be met from moneys appropriated for the purpose by Parliament. On the cessation of payment of subsidies in respect of the town milk industry all monies received by the Council are to be paid into an account at a bank approved by the Minister of Marketing. This account is to be called the Central Milk Council Account.

The major reform resulting from the Milk Amendment Act, 1951, is that of giving the Central Milk Council the power to obtain an enforcement of its recommendations. The Governor-General is empowered to make regulations, in accordance with the recommendations of the Central Milk Council to the Minister of Marketing, for organisation of the town milk industry in respect of all or any of the following purposes (Clause 31):-

"(a) Ensuring the efficient and economic conduct of the town milk industry in relation to the production, quality, testing, supply, collection, treatment, storage, carriage, distribution, delivery and sale of milk:

(b) Preventing or eliminating wasteful or unnecessary expenditure in the conduct of any such activities as aforesaid:

(c) Providing for the licensing of milk producers, milk vendors, and persons engaged in the treatment of milk, and prescribing the grounds on which and the

conditions subject to which licenses may be granted, refused, renewed, suspended or cancelled:

(d) Conferring on the Central Milk Council such powers as may ~~be~~ reasonably be necessary to enable it to exercise any of its functions under the principal Act or the Milk Amendment Act, 1951:

(e) Enabling the fulfilment of the powers given the Central Milk Council in respect of milk districts or areas outside milk districts:

(f) Prescribing principles and rules to be observed and complied with by Milk Authorities in carrying out their duties in respect of the zoning of milk rounds:

(g) Prohibiting or restricting the granting to milk producers by Milk Authorities of licenses to sell milk, except with the prior written consent of the Central Milk Council, and prescribing conditions subject to which milk producers may sell milk under such licenses:

(h) Prescribing conditions to be observed by associations of milk producers that are not approved as such by the Central Milk Council:

(i) Regulating or restricting the leasing, bailment, or other disposition of milk rounds:

(j) Prescribing the books, records, and accounts to be kept by persons or associations engaged in the production, supply, collection, treatment, storage, distribution, delivery or sale of milk, and prescribing the particulars to be shown therein:

(k) Prescribing standards of quality of milk that may be sold, and prescribing different standards according to the treatment to which the milk is to be subjected and according to the purpose for which it is to be used or according to any other circumstances:

(l) Prescribing standards of quality to which milk must conform or the tests it must pass before it may be pasteurised, and prohibiting the pasteurisation of milk that does not conform to the standards or pass the tests so prescribed:

(m) Prescribing the manner in which milk is to be treated, carried, deposited, stored, distributed, or sold:

(n) Prescribing processes or methods to be followed in the treatment, carriage, deposit, storage, distribution or sale of milk:

(o) Prohibiting the delivery of milk except in sealed bottles or in sealed containers of a kind approved in accordance with the regulations:

(p) Prescribing conditions subject to which written or advertising matter may be placed on milk-containers:

(q) Prescribing matters in respect of which fees shall be payable, and the amounts of such fees."

The Central Milk Council has had its powers further increased by being empowered to have its members or appointed representatives take or purchase samples of milk, in addition

to undertaking inspections. It is also made lawful for the Central Milk Council to arrange with any Government Department, Milk Authority or local authority for inspectors or officers of these bodies to exercise, with authority and on behalf of the Council, any of the inspectorial and sampling powers of the Council.

The Milk Amendment Act, 1951, enables the local authorities of constituent districts to contribute or advance moneys to Milk Authorities. Local authorities of any constituent district of a milk district are given power, with the prior written consent of the Central Milk Council, acting on the recommendation of the Milk Authority of the milk district, to enter the liquid milk trade in the fields of milk treatment and milk dealing.

Milk Authorities may not impose levies on milk sold within their milk districts while moneys are payable by way of subsidy out of the Consolidated Fund in respect of the town milk industry, except with the prior consent, in writing, of the Central Milk Council.

Special provisions are set out in the Milk Amendment Act, 1951, relating to the zoning of milk rounds by Milk Authorities and the sale of milk rounds by individuals. It provides for licenses to be issued to roundsmen in respect of specified gallonages of milk, the gallonage to be endorsed on the license. Permanent variations in gallonages are to paid for by roundsmen in the case of increases or compensation paid in the case of decreases. Under this Act it is the duty of any person disposing of a milk round to disclose particulars of special allowances associated with the round.

The Milk Amendment Act, 1951, provided for Part I of the Act (see p. 140) to come into force at a date appointed by the Governor-General by Proclamation. The Central Milk Council was reconstituted in March, 1952, and until May, 1952, has held two meetings. However, sufficient time has not elapsed for the effects of this most recent legislation on the Market Milk Industry in New Zealand to be observed.

CHAPTER XlX

SUMMARY OF PROGRESS ACHIEVED IN THE MARKET MILK INDUSTRY IN NEW ZEALAND IN THE TWENTIETH CENTURY AND SUGGESTIONS FOR FURTHER IMPROVEMENTS.

Developments in the Market Milk Industry in New Zealand since 1900 have been revolutionary in their effects upon the liquid milk trade. Despite advances in the state of knowledge respecting milk, private enterprise in all centres and local bodies in Wellington and Auckland effected slow progress until the late 1930's, when, as a result of the Milk-in-Schools Scheme, a new outlook became apparent in the Market Milk Industry and more rapid development took place. This development was hindered during World War II. However, the problems of supply during the war resulted in the passing of legislation in 1944 to provide for future organisation on a national scale. Since that time rapid progress has been made but there still remains scope for further improvements before complete satisfaction from a national viewpoint is likely to be achieved.

Though endeavours were made through enactments in the various Health and Dairy Industry Acts up to 1908 to regulate the quality of milk supplied to consumers for liquid consumption, and the conditions under which it was produced and distributed, there was no national organisation prior to 1944 to co-ordinate the interests of all concerned with the liquid milk trade so as to ensure an adequate supply of reasonably priced milk of good quality to meet the demands of consumers.

During this century the proportion of total milk production in New Zealand utilised for liquid consumption has always been relatively small. The expanding outlet for dairy products in overseas markets, particularly the United Kingdom, were so attractive that interest in the dairy industry was focussed on the manufacture of dairy products for export and the liquid milk industry largely overlooked. No provis-

ion was made by the dairy industry to supply the demands of the population for liquid milk and shortages of liquid milk occurred, as described in earlier Chapters. The problem was not neglected in all centres, however, and an endeavour was made to overcome it during the 1920's and 1930's in Wellington and Auckland with success as described in Chapters Vll and lX. The highly unstable supply situations and unfair trade practices previously prevalent were thus overcome in these centres of expanding population.

The efforts to stabilise the milk trade in Wellington and Auckland aroused national and in fact world-wide interest but no further action was taken in New Zealand, despite advances in the state of knowledge described in Chapter V, until the Government introduced the Milk-in-Schools Scheme in 1937 (see p.58). The supply of free milk to school children focussed attention on the food value of milk for the young and the Health Department's insistance on pasteurisation and bottling emphasised in the minds of the people that milk was a means by which bacterial diseases could be spread. This realisation created a demand for milk treatment facilities throughout the Dominion.

Under wartime conditions the supply of milk was reduced because of labour difficulties, shortage of fertilisers and particularly the insufficient prices paid to producers. At the same time there was an increased rate of aggregation of population to "urban" areas and the presence of troops in large numbers in the vicinity of some centres of population resulted in shortages of supplies of milk to these centres in the autumn and winter periods. The somewhat chaotic conditions described in Chapter Xll gave rise to the appointment of a Milk Commission in 1943 which made comprehensive recommendations for the co-ordination of all interests in the liquid milk trade and the introduction of organisation on a national basis (see ChapterXlV).

As a result of the report of the Milk Commission,

legislation in the form of the Milk Act, 1944, was enacted and, as described in Chapter XV, laid the foundation of a national milk marketing scheme. By legislation the functions of the newly created sections were defined, and provision made for co-ordination of all interests by a Central Milk Council. Considerable progress has been made in the Market Milk Industry in New Zealand in the period 1944-1952 and under the National Milk Scheme the liquid milk industry has come to occupy a most important position in the social and economic structures of the Dominion. Liquid milk has been considered a social necessity and endeavours have been directed to ensuring an adequate supply of milk of good quality, at reasonable price, to meet the demand at all periods of the year. The importance attached by the Government to adequate "per capita" consumption of milk is indicated by its subsidisation of the liquid milk trade since 1944.

Since 1944 the National Milk Scheme has given security of demand to all producers of milk for liquid consumption and stability to the position of those rendering services in respect of this milk until its delivery to consumers. The supply of milk has been co-ordinated to ensure as far as practicable the absence of shortages. Milk Authorities have controlled the sources of milk supplied for liquid consumption, the persons engaged in its treatment and distribution to consumers and the practices associated with these functions. The Departments of Agriculture and Health, supplemented by Milk Authorities in several areas, have regulated the conditions under which milk has been produced, collected, treated and distributed and ensured that milk of good quality has been supplied to consumers. The Central Milk Council has endeavoured to co-ordinate all sections of the industry and the Marketing Department has administered the Milk Act on its behalf, ensured that all sections of the industry have received the correct and just financial returns for services undertaken and distributed the subsidy on liquid milk.

Weaknesses in the Milk Act, 1944, revealed in the period 1944-1951 and change in Government policy with respect to milk following upon a change in the party in power resulted in the passing of a Milk Amendment Act, 1951, described in Chapter XVIII. The Central Milk Council was reconstituted in March, 1952, and at the present time is just beginning to operate. However, the policy it intends to pursue has not yet been defined and it is too early to judge what effects it will have on the Market Milk Industry in New Zealand. Although considerable progress was made during the seven-year term of the original Central Milk Council, further improvements could be effected by the present Council, with its extended powers, to provide a more satisfactory Market Milk Industry in New Zealand from a national viewpoint.

The requirements of the Market Milk Industry in New Zealand were defined in Chapter 1. Milk is at the same time a social necessity because of its food value and potential contribution to the physical and mental well-being of all consumers and is therefore of interest to all sections of the community, irrespective of their level of income. It has therefore been necessary to enforce legislation which protects the food value of milk by imposing minimum standards of composition and bacteriological quality and ensures the maintenance, at a satisfactory standard, of the conditions under which milk is produced, collected, treated and distributed. Most recent legislation restricts the supply of milk for liquid consumption to that obtained from cows free from tuberculosis. There are additional features in all phases of the industry which can not be controlled by legislation and a mechanism is necessary to co-ordinate the activities of the several sections and many individuals of the liquid milk trade to endeavour to bring co-operation between all parties in matters which do not lend themselves to legislative control. Because of these shortcomings a planned organisation on a national scale and democratically operated on a decentralised

basis to suit the individual needs of specific areas is necessary to ensure the fulfilment of the requirements of the Market Milk Industry in New Zealand. An organisation has been in existence since the Milk Act, 1944, became effective and its efficiency further increased by the Milk Amendment Acts of 1947 and 1951, particularly the latter.

The success of an organised Market Milk Industry could be assured under the present legislation but it is suggested that more active progress would be likely to result from the deletion of one producer's representative from the present membership of the Central Milk Council and the appointment of a representative of milk treatment interests and a technical specialist on the recommendation of the Minister of Agriculture, this specialist to be a full member of the Council. This amendment to the constitution of the Council would reduce the possibility of producer domination of the policies of the Council, give representation to milk treatment interests which is not specifically provided for at present and provide for the inclusion of a technical specialist as a full member whereas it is not specifically provided that such a person be a member of the Council under the present legislation.

In addition to functions already outlined for the Central Milk Council (see p. 80 and p. 141) the following should be included:-

(1) To improve, as far as practicable, the composition, bacteriological quality and safety of the milk supplied to consumers for liquid consumption.

(2) To license premises in which the treatment of milk is undertaken and formulate the conditions under which such licenses may be held.

(3) To co-ordinate the present market milk industry with the dairy industry as a whole.

National satisfaction with the Market Milk Industry will depend on the successful decentralisation of the author-

ity and functions of the Central Milk Council and the co-ordination of the interests of the industry by the Council. Adequate authority and functions are bestowed upon the present Council but there are functions which have, as yet, not been fulfilled and which could bring about further progress in the liquid milk industry. These include the fixation of milk prices and margins for services at levels which promote maximum economy, the incorporation of differential payment for milk supplied for liquid consumption, payment for quality as well as quantity, the promotion of education for increased milk consumption and the co-ordination of the market milk industry with the major dairy industry. In regard to the latter, provision should be made for close liaison between the Central Milk Council and the New Zealand Dairy Board with regard to national policy. The two industries would be brought closer together by payment for liquid milk on a similar basis to milk supplied for manufacture into dairy products and the arrangement of milk supplies, where practicable, through established Co-operative Dairy Companies. Further, contributions should be made to the New Zealand Dairy Board on all liquid milk produced, the assessment being made in a manner similar to that in the manufacturing section of the dairy industry. The contributions should compensate fairly for services given by this Board to producers of liquid milk, in common with producers supplying dairy factories.

Since milk is a social necessity, the milk business must not return to laissez-faire trade practices and the industry must be subject to regulations, with provision for some degree of competition. For national satisfaction the organisation must be independent of political considerations and the policies of the party in power.

No change is necessary in the constitution, functions and powers of the present Milk Boards and Milk Authorities. The provision in the Milk Amendment Act, 1951, for local bodies to contribute money towards the expenses of Milk Author-

ities is a desirable change and should be pursued as a general policy by the Central Milk Council to effect economy in the liquid milk trade. It is suggested that Milk Authorities should give further consideration to the rationalisation of distribution and encourage distribution as a full-time occupation by all engaged in this business.

Producer Associations established since the inception of the National Milk Scheme have enabled the demand for liquid milk to be met at all periods, but not of necessity in the most economic way from a national viewpoint. Milk producers have been sectionalised and treated differentially. The liquid milk market should be available to all producers willing to comply with the conditions of production required by this market and to pursue the production of milk for liquid consumption in return for a just reward. It is suggested that the national policy in regard to the supply of milk for liquid consumption be changed and that where possible the supply be arranged through established Co-operative Dairy Companies or producer supply groups, with some degree of competition. Thereby the liquid milk market with its premium returns will be available to all producers and milk production will be undertaken in the areas and by the methods conducive to greater economy than under the present organisation of the industry. With several times the quantity of liquid milk demanded available within reasonable distance of all centres of population during eight months in any year it should not be necessary to have to allow full liquid milk prices on percentages of milk produced surplus to nominated quantities in these months. It is suggested that the surplus allowance be discontinued except in the four months of lowest production when full liquid milk prices be allowed on production up to 15 per cent in excess of nominated quantities.

The regulative control of the Market Milk Industry by the Departments of Agriculture and Health at the present time is capable of ensuring national satisfaction with the

hygienic quality of milk supplied to consumers. It is to be hoped that the policy of having all milk for liquid consumption obtained from cows free of tuberculosis be fulfilled at the earliest practicable date.

The desirability of a safe milk supply of good composition and bacteriological quality has already been mentioned in this Chapter. An improvement in the quality of the milk supply, particularly the compositional quality, is very desirable in the interests of national health and well-being. To achieve this the payment for supplies on the basis of quality is suggested. It is suggested that payment be based on a standard milk of 4.3 per cent butterfat content which passes a 5 hour methylene-blue dye-reduction test. Price differentials should then be applied, on a gallonage basis, in respect of each .1 per cent variation in butterfat content with maximum and minimum levels for differential payment of 5.0 per cent and 3.6 per cent, the differentials to be related to the value of butterfat as if supplied to creameries for manufacture into butter, less separation costs. The differentials for bacteriological quality on the basis of 4 and 6 hour reduction-time standards should be of equal magnitude as penalties or premiums. The safety of milk supplied to consumers should be increased by extending pasteurisation and bottling under the guidance and encouragement of the Central Milk Council. In this connection the public should be educated to appreciate fully the qualities of bottled pasteurised milk, such that they request it if it is not available to them. When the level of consumption of pasteurised milk is high in any area it is suggested that the Central Milk Council direct that only pasteurised milk be made available from treating houses for consumption in that specific area. Producer-distributors should be permitted to continue to sell raw milk but conditional upon it being of good bacteriological quality and produced under good conditions from cows free of tuberculosis.

Lastly, economic considerations must be dealt with. To promote milk consumption at the highest level price must be kept to a minimum compatable with efficiency and the fulfilment of the requirements of the liquid milk industry.

Various aspects of promoting efficiency in production have already been discussed. In association with the suggestions of making the liquid milk market available to all producers of milk and reducing premium payments for surplus production to the four months of lowest production it is suggested that contracts be made in which prices are fixed for milk supplied at the buyers' station. The restoration of organised but limited competition in the field of production, the continuation of the present regulative control in this field, differential payment on the basis of quality of supply, and co-ordination of the section of the dairy industry supplying milk for liquid consumption with the dairy industry as a whole could result in cheaper milk of high compositional and bacteriological quality being available to consumers.

In the field of milk treatment the margins available must be considered in association with the services given and should be at levels which promote efficiency and ensure the maintenance of the quality of the milk supply. Progress in this field may be made, as intimated, by the extension of pasteurisation and bottling. Further progress will result from an increased use of laboratory control necessary to enable differential payments to be made for milk supplied for liquid consumption. It is suggested that the Central Milk Council encourage the training of technical personnel to undertake laboratory work associated with the control of milk treatment processes and that the personnel engaged as managers and in key positions in milk treatment stations be similarly trained. The present policy of centralising milk treatment operations may not necessarily permit milk treatment in all areas to be undertaken with the greatest effic-

iency and if economies can be effected as a result of decentralising milk treatment operations then additional progress would be effected.

The desirability of the introduction of standardisation and homogenisation, as part of milk treatment practices, are matters which should be investigated by the Central Milk Council, especially the former if, as suggested, differential payment on a butterfat basis is incorporated in the price paid to producers for liquid milk. Milk is not desired as a fat providing food, particularly in New Zealand, but as a source of protein of high biological value and certain minerals. Standardisation, at say 4.0 per cent butterfat content, would not detract from this and encouragement of the supply of milk of high butterfat content would indirectly encourage the supply of milk of high non-fatty-solids content, since increases in one constituent are associated with increases in the other. Homogenisation may not increase milk consumption, it would only be a non-essential service to consumers.

Mention has been made of the desirability of increased rationalisation of distribution under the guidance of Milk Authorities and for the distribution of milk to consumers to be encouraged as a full-time occupation for those engaged in this business. The practices pursued in this field of the liquid milk industry are now generally satisfactory but there is still a need for further appreciation by distributors of the nature of the work in which they are engaged. During distribution the quality and safety of milk should be maintained and a regular delivery of the milk requirements of consumers made. Prices paid by consumers could be reduced still further if economies in distribution were effected. The present agencies of distribution are adequate but economies could be achieved by reducing the number of persons engaged in distribution and encouraging the following economic practices and services,

compatable with consumer satisfaction. In addition to re-zoning distributors it is suggested that, as a policy, consumers be required to pay for household breakages of bottles, that the minimum number of bottle sizes be used and that these be standardised, that daylight and front-gate delivery be encouraged for economy and that the use of the most efficient transport for distribution be encouraged. Though the margins required for distribution through milk-shops or at less frequent intervals than once a day may be reduced, consumer preference may not accept these practices. These latter changes and treating house or public operation of the business of milk distribution could be investigated by the Central Milk Council and policies formulated as a result of its findings.

In New Zealand where such a low proportion of total milk production is utilised for liquid consumption there should be available for liquid consumption, at all times, adequate quantities of milk of good quality. Though, as indicated in this and earlier Chapters, considerable progress has been achieved in this century, further progress may be achieved as a result of the above suggestions. Existing legislation would permit these suggestions to be implemented but changes would be facilitated by amendments to the constitution of the Central Milk Council.

CHAPTER XX

SUMMARY

The development of the Market Milk Industry in New Zealand since the early days of colonisation is discussed, with particular reference to changes in the current century. The present organisation and practices of the industry are described and suggestions advanced which may prove worthwhile in endeavours to achieve the ideals required of the liquid milk industry.

After describing the early development of the dairy industry in New Zealand and the state of the liquid milk trade in the nineteenth century a brief account is given of the growth of the dairy industry in the twentieth century. The extent of total dairy production throughout this period utilised as butterfat consumed in liquid milk and cream (p.12) and the volume of milk consumed in the liquid state in the period for which statistics are available (p.14) are also given. An evaluation is made of the effect of increases in population, more particularly "urban" population, and the effect of advances in the state of knowledge upon the liquid milk industry and the total volume and "per capita" levels of liquid milk consumption. An account is given of the development of the Market Milk Industry in the absence of co-ordinated planning and organisation in the period 1900-1944 and of subsequent changes under national organisation and co-ordinated milk marketing. The practices and methods employed and circumstances existing in these various periods of development differentiated by wars and economic conditions are described. The organisation of the milk trade in the Wellington and Auckland areas prior to World War 11 as a result of inadequate or unsatisfactory supplies in these areas and the organization of the milk supply to other areas in this period are described. A description is also given of the chaotic conditions and shortages of supply which occurred during World War 11 and

the regulative control of the Market Milk Industry in New Zealand in the period 1900-1944 reviewed.

The general adverse supply situation which arose during World War 11 resulted in the appointment of the Milk Commission of 1943. The objects and recommendations of the Commission are described. The provisions of the Milk Act, 1944, which was enacted as a result of the recommendations of the Milk Commission, 1943, and the basis of the present organisation of the Market Milk Industry in New Zealand are given together with the reasons for and the provisions of amending legislation.

It is shown that the milk supply prior to 1900 consisted of a raw milk supply, delivered loose. The trade was largely conducted by producer-distributors who produced milk within or in close proximity to centres of consumption and maintained a happy producer-consumer relationship. The keeping quality of milk was not good and with keen competition between distributors several deliveries of milk were made daily to deliver milk to consumers in as fresh a condition as possible. As far as can be judged few milk shortages occurred.

Population increases within centres of consumption increased the demand for milk and the price of producing milk within or in close proximity to these centres. Consequently the supply areas spread to greater distances. This brought a specialisation into the liquid milk trade and reduced the extent of producer-consumer contact. At the same time advances in the state of knowledge were responsible for increased efficiency in the industry, the introduction and increased use of milk treatment, an increased "per capita" consumption of milk and a gradual improvement in the keeping quality of milk delivered to consumers. Simultaneously legislation and regulative control were introduced to protect the standards of composition and keeping quality of milk delivered to consumers for liquid consumption and the condit-

ions under which this milk was produced and distributed.

Prior to 1944, however, there was no nation-wide organisation or co-ordination in the liquid milk industry. There were shortages of supply and deficiencies in the quality of milk delivered to consumers. The many individuals and several sections of the industry sought maximum economic gain and under laissez-faire conditions the prices received and paid for milk and the margins received for services varied widely. Stability was required in the industry to satisfy the demands of consumers. The Milk Act, 1944, and subsequent amending legislation has promoted this stability and treated the many individuals and several sections of the industry uniformly and fairly. Under the National Milk Scheme there have been less milk shortages than previously and with State subsidisation of the industry considerable progress has been achieved in the Market Milk Industry in New Zealand since 1944.

A Chapter is devoted to reviewing the progress achieved in the industry in the current century, and suggestions for reconstitution of the Central Milk Council and for policies to be pursued by the Council and the various organisations of the Market Milk Industry are advanced. The policy suggestions are:

(1) Ensure efficiency of liquid milk production.

(2) Differential payment for milk supplies on the basis of composition and bacteriological quality.

(3) Increased treatment of milk.

(4) General increased efficiency in the industry to endeavour to provide a supply of safe milk of higher food value and good keeping quality to consumers at the lowest cost.

They are intended, when allied with an adequate supply of milk at all times, to ensure a high "per capita" consumption of milk by all sections of the population of New Zealand and national satisfaction in every way with the Market Milk Industry in New Zealand.

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