REPORT

BY

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TO

THE HONORABLE THE PREMIER OF VICTORIA

ON

THE MUNICIPAL MILK SUPPLY OF THE CITY OF WELLINGTON, NEW ZEALAND.

FEBRUARY, 1922.

By Authority:

ALBERT J. MULLETT, GOVERNMENT PRINTER, MELBOURNE.
To the Honorable the Premier of Victoria.

Sir,

In accordance with your wishes I visited Wellington, New Zealand, and inspected the Municipal Milk Supply of that city. I left Melbourne on 26th January, 1922, and returned to Melbourne on 2nd February. During the seventeen days that I was in New Zealand I inspected some of the sources of the milk supply up to fifty miles from the city, the Rahui Butter and Cheese Factory at Otaki, the method by which the milk is transported to the city both by road and rail, and the Central Milk Station in Dixon-street.

I personally interviewed all the officials controlling the milk supply, both municipal and Governmental, also the Government Statist, the Dominion Analyst, the Meteorologist, the Chief Health Officer, the Director of Agriculture, the Director of Child Welfare, the Director of Public Hygiene, the President of the British Medical Association, Wellington Branch, and many doctors and other private citizens, dairymen, &c., &c.

I visited thirteen dairy farms and was present during milkings both by machine and by hand. I travelled both by rail and road to the sources of supply, and I visited the Central Milk Station on many occasions, and was present during the process of pasteurization, and saw the whole of the various details of the handling of the milk.

With the City Engineer I motored over many miles of the streets of Wellington and its environs, and obtained personal knowledge of the difficulties of distribution in that hilly city.

With Dr. Truby King, C.M.G., I visited one of the Plunket Centres of the Royal New Zealand Society for the Health of Women and Children, and noted the methods and means adopted by the Plunket nurses to instruct the mothers in the essentials of mothercraft and infant feeding.

Before dealing with the details of the Municipal Milk Scheme I propose to make a comparison between the conditions prevailing in Wellington and in Melbourne, statistical, physical, meteorological, and administrative. It will then be possible to form an opinion as to whether the details of the scheme devised to insure a reliable milk supply for Wellington can be made applicable to or are at all suitable for Greater Melbourne.

Conditions in Wellington compared with those of Melbourne—

(a) Population—

Greater Melbourne, 750,000.
Wellington and Suburbs, 100,000.
The Wellington Municipal Milk Supply only deals with 80,000 people.

(b) Situation—

Melbourne is comparatively flat, with good roads, and is laid out mainly in rectangles.
Wellington is very hilly, badly laid out, and with very steep gradients. The city proper is of crescentic shape and built largely upon land reclaimed from the sea. The residential areas are very steep, the hills rising abruptly from the town with irregular streets often not communicating one with the other except by long flights of steps or lengthy deviations.
The problem of economical delivery of daily foodstuffs is, therefore, an acute one in Wellington, not only with regard to milk, but to other household commodities.
The question as to whether this problem should be attempted by a municipal authority or not is, of course, a political one.

(c) Climate—

Melbourne has three to four hot months when the temperature is relatively high for days at a time, and the nights also are frequently hot.
In Wellington there is no real hot weather at all, and such a thing as a hot night is practically unknown.
These climatic influences also apply to the milk-producing districts, so that it is possible to keep milk for hours on a farm, mostly overnight, without the aid of artificial refrigeration, by simply standing the cans in shallow troughs of cold water.
The holding of milk on the farms in Victoria is one of the most difficult problems of the Milk Supply during the hot months.
In Wellington the highest shade temperature ever recorded is 88 degrees Fah.
In Melbourne the extreme maximum average for 64 years is 105·1 degrees.
In Wellington, for years 1917, 1918, and 1919, there were only two days in which the shade temperature exceeded 80 degrees Fah.; the extreme maximum being 81·5 degrees.

In Melbourne during the same years there was an average of 38 days during which the shade temperature exceeded 80 degrees Fah.

**Local Government—**

Melbourne has 22 separate municipalities.

Wellington has one only.

It is obvious, therefore, that the single control as far as the city is concerned in Wellington is not possible in Melbourne, unless the whole business were handed over to some such municipal body as the Melbourne and Metropolitan Board of Works.

Were each municipality in Greater Melbourne to establish a monopoly of the Milk Supply within its own boundaries, it is easy to foresee the intense competition that would arise between the various councils in the milk-producing districts and the consequent increase in the wholesale price of milk. This would be intensified during the scarce season and during local milk shortages due to drought or exceptional cold weather.

During these periods retailers in Melbourne frequently find it exceedingly difficult to keep up their supplies, and are driven very far afield in their search for milk. How rival municipalities would manage in such circumstances it is difficult to imagine.

**Communications—**

Melbourne has good road and rail communications running on a radiating manner from centre with good railway service and fair Sunday train service on five lines.

Wellington has very poor communications, being shut off from the good dairying lands, except in the Hutt Valley, by precipitous hills, over and through which the roads wind along steep grades, climbing in one instance to a height of 2,000 feet.

There are two railway lines with a slow milk service, and on Sundays only one line on which milk is transported to the city.

2. **Control of Milk Supply Divided.**

Within the city boundaries the municipality has complete control as to the method of handling and the distribution of the milk.

Beyond the city boundaries the municipality has no control at all. The conditions under which milk is produced, the methods adopted, the health of the herds, and the suitability of the premises are all controlled and supervised by the Agricultural Department of the Government.

The purity of the milk itself is a matter solely in the hands of the Health Department.

The rail transport and its conditions are handled by the Railway Department.

My observations led me to believe that these four organizations were not co-operating one with the other for reasons that I was unable to ascertain. The result of this is that the principal object aimed at by the municipalization of the supply, viz., the improvement of the quality of the milk, the insuring of a regular supply, and the cheapening of the price of this valuable foodstuff has been greatly hampered in its realization.

3. **Outline of Present Scheme.**

(a) The Milk Committee of the City Council purchases by contract its supply of milk from a large number of individual producers, who either singly or in conjunction contract to supply a definite quantity of milk for a stated period at varying prices based on the market price of the butter-fat content.

This is mostly conveyed by road in motor waggons at the cost of the farmer to the city depot once daily. The evening’s milk is retained on the farm overnight and despatched with the morning’s milk the next day.

On arrival at the depot the milk is weighed, tested for acidity, and, roughly by chemical means, for its bacterial content, pasteurized, cooled, and stored in a cool chamber until the following day, when it is handed over at an early hour in the morning to the distributing contractor, who removes it to his own depot for subsequent delivery, or delivers it direct to the consumer by the open-can method, on the block system, at a price fixed by the Milk Committee. The present price was fixed so as to provide for the compensation of the vendor at the end of two years from the inception of the scheme. This period has since been extended by another year, and expires in July next.

This milk, when it reaches the householder, is from 26 to 40 hours old, and consists of a mixture of the night and morning’s milk. Before the next supply is delivered this milk has reached the ripe age of from 50 to 64 hours from time of milking.
The city was originally divided into six blocks, which were handed over to five distributing companies formed from the former vendors in that area. These have now been reduced to four, of which—

One distributes half of the total supply;
One distributes one-third of the total supply;
One distributes a little under one-sixth; and
One distributes a small amount.

As these contracts all expire in July next, the municipality recently called for tenders for the distributing of the whole of the milk supply on the bottle system. No tenders were received, and the Council is now faced with the problem of taking over the distribution itself or altering the conditions under which the milk is to be supplied.

4. General Expressions as to the Working of the Scheme.

Producers, distributors and consumers are generally dissatisfied.

The price received by the producers and the conditions imposed have caused considerable dissatisfaction and even bitterness amongst the farmers that I visited. One district openly declares that it will revert to cheese and butter making as soon as the contract expires.

The distributors consider that the price allowed for providing for compensation is insufficient to recoup them for the taking over of their businesses. Many consumers consider that they are receiving a milk of no better quality at a greatly increased price, while the monopoly extended to the vendors renders all complaints for irregular and unequal service futile.

Many people who are in a position to do so prefer to get their milk from one of the few vendors who have a licence to sell milk (up to 30 gallons), which has been produced within 2 miles of the city boundaries and which is only from four to twelve hours old when delivered.

There was a general consensus of opinion amongst the people of all classes with whom I came in contact that the milk under the present scheme was far too expensive. The present prices being 7½d.—8d. per quart.

I was also informed that the milk did not keep well in warm weather and frequently went bad (not sour).

Against this the municipal milk authorities inform me that there are very few complaints received by them.

Litigation—

That there has been considerable friction between the Milk Committee and the various contractors, both producing and distributing, is shown by the fact that there has been quite a number of legal actions during the 2½ years which have elapsed since the inception of the scheme.

The following are examples:

1. An action by a Supply Association against the Corporation for £5,000 on a question of short payments. Compromised for £3,500.
2. An action by a Distributing Company for short delivery by the Corporation in winter months when milk was hard to obtain. Decision against the Council for £880, involving a total liability of £2,000. The Council is appealing against this decision.
3. Dispute with Carrying Companies. Settled for £500.
4. The Distributing Companies have had to be sued for non-payment for milk. In one case for £1,500. This case was settled out of Court.
5. Action against a distributor for non-compliance with contract. Council won case, but on an appeal to Chief Justice the matter was referred to arbitration.
6. Vendors have had to be sued for short delivery.

Difficulty of Obtaining Supplies—

A very serious shortage of milk occurs during the winter months, owing to many dairymen not having cows in milk during the cold, wet weather. There is no system of housing or of hand feeding practised to overcome this difficulty, and the Corporation has to go far afield for milk—up to a distance of from 80 to 100 miles. The difficulty of transport then becomes acute, as the railway service is poor and non-existent on one line on Sundays. This necessitates road transport by motor wagons over bad and mountainous roads, taking 7 to 8 hours to make the journey, at a cost of 6d. per gallon for a quantity of 800 gallons.
This shortage was very acute last winter, the Council being unable to obtain full supplies. This resulted in many householders being placed on short milk rations, and much discontent and dissatisfaction resulted in consequence.

So acute did the situation become that the Council was obliged, to obtain milk from unlicensed dairies, thus coming into sharp conflict with the Dairy Branch of the Department of Agriculture, one of whose regulations forbids the use of milk from an unlicensed dairy being used for human consumption. (See Appendix V.)

Thus the Council itself committed one of the very offences it had set out to prevent by obtaining a monopoly of the Milk Supply.

In order to meet this difficulty the Council obtained a lease of a butter and cheese factory at Rahui, near Otaki, on the West coast, about 50 miles from Wellington. The idea is to use this factory as a stand-by for milk when required, sending the milk to Wellington, and making the balance of the supply into butter or cheese as desired. As there are other factories in the district it was necessary to give the farmers an inducement to send their milk. This was done by paying 1s. per pound for butter fat over and above market rates. This has to be paid all the year round in order to retain the supplies, and, in consequence, Rahui factory was run last financial year at a loss of £3,000. At the present time the milk from Rahui is not being used in Wellington, and presumably the loss is still going on. I was informed that this state of affairs was brought about through overbuying milk in other centres of production.

There are at present 175 suppliers in all, who send, in round figures, 4,500 gallons daily to the city.

The Rahui factory is an ordinary butter and cheese factory, situated in a good dairying district, and calls for no special comment.

Transport--

The difficulties of transport from the milk producing areas are considerable. The railway facilities are lacking in all the essentials necessary for rapid and cool carriage. Trains are slow and no ice trucks, or even special trucks, are available. There are two lines—one, the main trunk line to Auckland, tapping the rich dairying country around Otaki and Palmerston North up to 100 miles from Wellington. There is one train from this district on Sundays, leaving Otaki at 4.30 p.m., and taking 3 hours on the journey. This milk would not be treated at City Depot until following day, and would be delivered the day after, being at least 48 hours old by the time it reached the consumer.

On week days this train leaves for city at 9.30 a.m. No milk is used from this source at present.

The other railway line runs up the Hutt Valley and over the Rimutaka mountains, through the valley of the Wairarapa to the Fetherston and dairying centres.

There is no train on this line on Sundays, and the milk has to be conveyed by road. At present milk up to 800 gallons comes in by this line on week days from a distance up to 86 miles.

The freight is paid by the producers, and runs up to 6d. per gallon, which is practically the same as is paid for a similar distance in Victoria.

Milk that is conveyed by motor waggon up to 25 miles, at present, is carried at railway freight rates paid by the producer, the loss, if any, being borne by the municipality.

Empty cans are carried by the railways free of charge, but are not consigned and frequently go astray, either being lost or put off at wrong stations. The railway officials take no responsibility. This constitutes a serious grievance to the Milk Supply Authorities.

The Council has two 5-ton and two 2½-ton motor wagons: the balance of the milk is carried by contract entered into by producers with carrying firms.

HISTORY OF THE SCHEME.

The first serious proposal that the City Council should take over the milk supply of Wellington was made by Dr. J. P. Frengley, the District Health Officer for Wellington, in the Public Health Department of New Zealand, in March, 1909. In his report to the Abattoirs and Milk Supply Committee of the City Council, Dr. Frengley strongly advocated Municipal Control from the cow to the consumer, and laid down the lines on which it should be carried out.

The report was a thoughtful and scholarly attempt to solve the problem looked at from the hygienist's point of view. To some extent it is a counsel of perfection, and lacks practical knowledge of the ordinary difficulties of milk production and distribution which beset the subject on all sides, especially when it is proposed to handle milk in large quantities.
Dr. Frengley in his report laid great stress upon certain conditions which he regarded as essentials for such a scheme. It is interesting to see to what extent the present scheme complies with these essentials.

**Dr. Frengley.**

1. Municipal control shall aim at having every gallon of milk analyzed and proved to be up to standard before it reaches the consumer.
2. Milk to be bought on a quality basis, at so much per pound of butter fat.
3. The Council shall require the herd of any of its milk suppliers to be examined by a fully qualified veterinarian.
4. The Council shall obtain aid and advice from a Medical Officer of Health as to the sanitary condition of the farm.
5. Pasteurization shall be no part of a Municipal Scheme.
6. There shall be no shilly-shallying as to the design, construction, and sanitary character of all milking sheds, &c.
7. The tuberculin test shall be applied to all cows under Municipal Control.
8. The cool stage shall be maintained on the railway journey.
9. Municipal Control shall insure that clean, raw, cooled milk be supplied to the consumers.
10. All milk vendors shall deliver milk twice a day.
11. Council shall pay something over the highest ruling price for butter fat in order to secure additional care on the part of the farmer.
12. The raison d'être of Municipal Control shall be that it initially demonstrate its ability to compete with existing distributing companies on fair business lines.
13. Municipal Control shall seek to lessen the cost of milk to the householders.
14. The Municipal Milk Station shall be central to the city as a whole.
15. The Municipal Milk Station shall have a railway siding.
16. The Municipal Milk Station shall subserve nine essentials, some of which are included in above, others being—
   (a) To prevent milk containing preservatives being sent into the city.
   (b) To enable outbreaks of milk-borne disease to be traced.
   (c) Finally and generally to safeguard the public health, more especially that of the children.

**Municipal Scheme.**

1. Qualitative analysis made in milk samples once in ten days.
2. This method of buying is in use.
3. The Council has no power to do this.
4. The Council has no power to do this, nor has the Health Department.
5. Pasteurization is an essential part of the scheme.
6. Council has no power, and actual condition of sheds is exactly what Dr. Frengley says they should not be. This is not done. The Council has no control over herds.
7. Not attempted either by rail or road.
8. The scheme does not provide for this.
9. Milk delivered once daily.
10. This is done to some extent to insure the supply, and no additional care is employed by the farmer.
11. The Council has taken a monopoly of the milk supply except for a few licensed vendors in the outer suburbs who are strictly limited to 30 gallons daily.
12. The consensus of opinion is that the milk up to the present is dearer than before the scheme was initiated. (See footnote.)
13. The station is central.
14. The railway stations are not central.
16. Not possible under present scheme.
17. The scheme does not insure this. There is no attempt at providing a special milk for infants. They take their chance with the adults.
17. The milk of the various suppliers shall, as far as possible, be kept separate till the time of delivery.

18. The Milk Station shall be in character that of an aseptic operating theatre of a modern hospital.

19. Municipal Milk Control shall seek to gradually but ultimately send out all milk in sealed cans and bottles.

Impossible under present scheme.

An unrealized ideal.

At present under consideration—extra cost.

N.B.—There are no bottles manufactured in the Dominion. New premises would be required. A totally different system of delivery would be required owing to extra weight of bottles and the necessity to gather the empty bottles.

Re 13—Cost of Milk.—The present high cost is in part due to the compensation to old vendors being paid by extra price spread over a term of three years ending in July next.

No decision has been as yet arrived at by the Council as to what system of delivery will be adopted after that date. Tenders were called for recently, but no tenders were received.

In 1910 the Dominion Parliament passed an Act giving the City of Wellington powers to, in some measure, control the milk supply, but owing to the scope and powers of the Act being considered inadequate no action was taken by the Council for some years.

In 1918 the Council commissioned Mr. R. H. Oliver, a dairy expert from Christchurch, to inspect and report upon the condition of and methods employed by the various dairies then supplying milk to the City of Wellington.

Mr. Oliver found that the city supply was in the hands of some eighty odd dairymen, whose dairies he classified into four groups—

(a) Where proper pasteurizing and cooling plants were in use.

(b) Where milk was scalded by steam from a steam boiler and cooled by standing the cans in a water trough.

(c) Where milk was scalded by placing cans of milk in a copper and cooling by transferring the cans to a water trough.

(d) Where vendors produced their own supply of milk from their own herds.

Except in class (d) Mr. Oliver did not apparently inspect the farms from which the other three classes obtained their supply of milk.

There are only three dairies within the city where pasteurizing plants were in operation. These three dairies supplied 2,400 gallons of milk daily or, roughly, about half the supply.

Mr. Oliver objected to these dairies pasteurizing already stale milk, keeping it sixteen hours before delivering, and delivering a milk to the householder at an age of twenty-four to thirty-six hours from the time of milking. All these objections apply with almost equal force to the present municipal supply.

Under heading (b) there were seven milk depots in the city and suburbs delivering about 1,070 gallons of milk daily.

These premises and the methods employed therein were generally condemned by Mr. Oliver as being unfit for keeping and handling milk.

Under heading (c) there were fourteen dairies handling 1,150 gallons of milk daily. The premises and methods for this group were strongly condemned.

Under heading (d) there were fourteen dairies all producing their own milk, and delivering same in from three to twelve hours after milking. These dairies produced about 700 gallons of milk daily. Eight out of the fourteen dairies were considered to be fairly satisfactory.

Mr. Oliver also condemned, very properly, the custom of pouring milk from one can to another in the open dusty street. This practice still prevails in Wellington under the municipal scheme, as I saw it being done in a main street by one of the contractor distributors.

This report was followed by two reports from the Chief Sanitary Inspector and one of his staff, who both protested strongly against Mr. Oliver's report as being incorrect and misleading.

In spite of this, however, I think there can be little doubt that the milk supply of Wellington prior to the scheme was unsatisfactory, and to some extent in the hands of many small retailers who handled milk in an unhygienic manner from unsuitable and poorly equipped premises.
Whether it was impossible to bring about the necessary reforms by a more stringent system of inspection and a rigorous insistence upon more modern methods I cannot say. But many of those responsible for the scheme informed me that things were so bad and the supplies so uncertain during the winter months that the Council had no option but to take over the supply itself.

So, in 1918, a monopoly was granted by the Government to the Council under the War Regulations, and in 1919 by an Act of Parliament conferring the necessary powers on the City of Wellington, known as the Wellington City Milk Supply Act 1919. (See Appendix I).

The scheme was inaugurated on 20th January, 1919. Milk was purchased on the butter fat content basis plus 2½d. per lb. for loss of the skim milk. In winter an additional 60 per cent. was paid to induce the farmer to keep up a supply.

I was informed, however, that this inducement was insufficient to enable the Council to obtain supplies of milk for its customers, and resulted in expensive litigation between the Council and the distributors, in which the vendors were successful, as I have stated elsewhere.

For form of contract with farmer, see Appendix II.

For prices paid for year ending 31st March, 1921, see Appendix III.

Distribution to the consumer was arranged for by contract with Companies formed from the existing vendors, who were licensed for two years to sell in the blocks allotted to them, at prices fixed by the Council.

For terms of contract, see Appendix IV.

These prices were arranged so as to allow 7d. per gallon to the vendors. This sum to provide for distribution estimated to cost 4½d. per gallon, and the balance as profit and compensation spread over two years. The capital value of the existing businesses being estimated at £18, per quart for goodwill. The price of a milk business in Melbourne is more than double this amount, but includes the value of rolling-stock and horses, &c.

This arrangement had to be modified by extending the term for three years, which period will expire in July next.

The Milk Committee has now under consideration two very important questions:

1. The system of distribution to be adopted on the expiration of the present contracts.
2. The substitution of sealed containers, bottles or compressed paper, for the present loose milk and dipping method.

The Committee recently called for tenders for the distribution of milk in bottles.

The specifications provided for a deposit of £500, with accompanying sureties. Tenderers were also required to enter into a bond of £2,000 to insure the carrying out of the contract. Non-compliance with any of the conditions laid down would render this sum liable to forfeiture.

No tenders were received.

During the next four months the Council will have to make arrangements for the delivery of milk itself, or find contractors who are willing to do so on more liberal terms or less stringent conditions, or both.

Should the Council undertake the distribution itself, it will, if the bottle system is used, require new premises, or else must greatly extend the present central station. The introduction of the bottle system will also require a complete re-organization of the system of delivery.

The present type of cart will be quite useless, and, owing to the extra weight of the glass, more than one horse will be necessary. Electric or petrol-driven motor waggons have been suggested, but in other countries the delivery of small parcels by motor waggons has proved unsatisfactory. In any case, the cost of the milk itself as well as its distribution must, in my opinion, be augmented considerably. Still, without the use of sealed containers the present scheme is undoubtedly unhygienic, and cannot in any sense be regarded as satisfactory or progressive.

It is hardly possible to obtain milk in any of the principal cities of the United States, except in a sealed glass bottle.

In Melbourne, pasteurized milk in bottles is delivered daily throughout the city and suburbs at a price which is no greater than the loose milk in Wellington under the Municipal Scheme.

Should the Wellington Council undertake the bottling system, a further expenditure of some £50,000 will have to be faced, which will bring the capital outlay to well over £100,000. For Greater Melbourne a similar venture would involve an expenditure of a sum somewhere in the region of £1,000,000 at least.

Wellington is the only city in the world of any size which has taken over the business of milk distribution as a monopoly.

In the Public Health Reports of the United States of America, 13th December, 1918, there is a description of "The Experimental Municipalization of the Milk Supply of Tarboro, Edgecombe County, North Carolina."

The objects of this scheme were to supply clean, safe, and whole milk at the lowest price consistent with working expenses.
I was informed, while in Wellington, that the Council had received a letter from Tarboro asking for information as to the details of the Wellington Scheme, which crossed in the post a letter from Wellington to Tarboro asking for similar information.

Manchester and Scarborough, in England, in 1919 and 1920, considered this question, and, after examination, turned the proposal down in each case.

In February of this year, the Auckland City Council, after consideration of a communication from the Chamber of Commerce, decided not to undertake the control of the milk supply.

The supply in Dunedin is in private hands: the bulk of the milk being distributed by a large Company.

City Milk Station—

This building was taken over with part of its plant from the Wellington Fresh Food and Ice Company, which was the most up-to-date milk company in Wellington before the inception of the Municipal Scheme. It had an output of 1,500 gallons per day, and had a refrigerating plant and large cool rooms. The station is centrally situated, and is a substantial brick building two stories high, and fairly well arranged. There is, however, considerable congestion caused by there being only one entrance for carts, so that milk is received and delivered from the same platform with a very narrow approach.

Cans of milk on arrival (9 a.m. to 1:15 p.m.) are conveyed by electric lift to a platform above the pasteurising floor where, if not obviously unfit for pasteurising, the milk is tipped into a weighing vat. Samples are now taken for testing, and the milk run into an all-metal containing vat, unopened, and with slowly moving mixing paddles; a valveless milk pump forces milk into a large regenerating pasteurizer, which consists of a double dome heated by distilled water from exhaust steam, the cold milk being warmed on the outside by the heated milk flowing over the outer of the two domes. Thence the milk is run into the holding vat where its temperature is maintained for 30 minutes. This vat is a rectangular metal container so designed that the milk is held at the temperature required (124 degrees Fah.) until it passes over the outer dome to the heater and gives up some of its heat to the cool milk inside. From this point the milk is pumped to the cooler which is of a circular, conical type, where the milk is rapidly cooled down to 49 degrees Fahr. The whole process is completed in four hours. In passing over the outer dome of the heater and over the surface of the cooler, the milk is exposed for a long time to the atmosphere of the room.

The milk is now run into cans and passed by gravity conveyors to the cool room, where it remains for about 16 hours before being passed out to the vendors for distribution at 4 p.m. It is estimated that the loss of milk in handling amounts to about 1.5 per cent.

The empty cans on the top platform pass by means of a conveyer to the floor below, where they are washed by a machine of American pattern.

This machine is operated by two men. If the washing were done by hand four more men would be required. After washing the cans are sterilized by being placed over jets of steam, which is a rough but fairly effective method. The cans are all the property of the Council, and the farmers are charged at the rate of 1 per cent. for their use. All cans that I saw were sound and in good order, except for a few of the lids which were rather badly cracked.

All water for cooling, washing, &c., is obtained by pumping through high pressure filters from wells beneath the building. Water for the boilers is obtained from the ordinary town supply.

Refrigeration for ice making, milk cooling, cool storage, &c., is provided by two large ammonia compression machines. One an old 30-ton Hercules machine driven by steam, and the other a new 80-ton machine consisting of two 40-ton compressors working in parallel and driven by a 180 h.p. electric motor. Only one of these twin compressors is in use at present. This plant was constructed in Victoria by Thompson's works in Castlemaine.

The electric power is supplied by the City Council at a special rate much below the market rate.

The effect of this is noticeable in the trading account, where the cost for power is set down at the extraordinarily low figure of 5176 per annum.

The floors of the rooms in which milk is handled are of impermeable material, chiefly Val de Travers asphalt, and are well graded and drained.

I was informed that no milk stocks were kept, the surplus and returns being separated and the cream sent back to Rahui for butter making.

I asked what was done with the skim milk, and I was informed that up to this year it was turned into casein, but that now it was sold to suppliers for pig-feeding. If this is so it involved the sending of the skim milk back some 20 to 50 to 80 miles by road or rail.

I was informed that rejected milk was thrown away if too bad for separating, otherwise it was separated and sent back 50 miles to Rahui, the farmer receiving approximately 6d per lb. for butter fat and being at a loss for the freight.

The average temperature of the milk on arrival is between 60° and 70° Fahr.
Laboratory

The Milk Station is provided with a well equipped laboratory where samples are tested by chemical and physical means for butter fat and other solid contents, acidity, and a rough estimate made as to the amount of bacterial contamination present. Although no bacteriological examinations are carried out, still by chemical means a fairly good estimate is made as to the freshness or otherwise and amount of contamination of each sample examined. These tests are occasionally checked by samples sent to the Dominion Analyst.

The butter fat content is estimated about once in ten days by means of the ordinary Babcock method.

The presence of added water in suspected samples is detected at the Dominion Laboratory by examinations carried out under the cryoscopic method, or the observation of the freezing point of milk, which varies directly with the amount of water added. Dr. J. S. MacLaurin, D.Sc., F.C.S., the Dominion Analyst, after examining over 2,000 samples of milk, concludes that "the cryoscopic method affords a simple and reliable means of testing the purity of milk, of detecting any adulteration with water, and of estimating the amount of water added."

The chemical test used to roughly estimate the amount of bacterial contamination is known as the "Reductase" method, which depends upon the presence in milk of a ferment of bacterial origin in greater or less amount according to the number of organisms contained therein. A solution containing $\frac{1}{2}$ per cent. of absolute alcohol saturated with methylene blue is decolorized at a rate which corresponds roughly with the number of organisms present, when incubated at $113^\circ$ Fahr.

The New Zealand Health Department requires a reduction time of not less than 180 minutes if milk is to be used for human consumption.

I am not quite clear what amount of numerical contamination this reduction time would represent, but according to some observers' methods a reduction time of 300 minutes would mean less than half-a-million organisms per c.c., while a reduction time of from 20—120 minutes would indicate from four millions to twenty million organisms per cubic centimetre.

During the winter months tests of consignments are carried out at least once in ten days, but during the warmer weather all consignments are tested at least three times a week.

Milk requiring less than 180 minutes to reduce is condemned and paid for at a lower rate the consignor being notified. A representative of the Council visits the farm and endeavours to ascertain the cause. Should no improvement occur in the milk condition after a reasonable time, this source of supply is discontinued. It is claimed that stale milk and dirty milk, although kept cool, will reduce in a short time, but as the nature of the bacteria present undoubtedly affect the speed of reduction, I am of opinion that these tests should be checked from time to time by a direct quantitative and qualitative bacterial analysis.

The ordinary acidity tests made out in terms of lactic acid are also carried out at regular intervals, the permitted acidity being 19.5 lactic acid.

I must say that I was distinctly impressed with the quality of the work done in this Laboratory, but it seems to me to be a matter for regret that regular and frequent examinations of the quality of the milk as it leaves the station for distribution are not also part of the ordinary routine.

I also think that regular bacteriological examinations of the milk at all stages from the cow to the consumer would be of immense value in estimating not only the purity of the milk as received from the country, but the efficiency or otherwise of the treatment to which the milk is subjected at the Central Station.

I do not think, while recognising the extra amount of work involved, that the number and frequency of the tests made is sufficient to insure a milk supply absolutely safe from the risk at times of serious contamination. As far as the checking of the quality of the milk entering the station is concerned, I think the system in use is ahead of any that I have seen elsewhere.

The testing of the milk on arrival and the method of pasteurizing are carried out on scientific lines up to a point, but after the milk has been raised to the temperature of pasteurization, 145° Fahr., and held there for 30 minutes, it is exposed to the risk of after contamination to a very serious extent. Both on the outer dome of the pasteurizer and in the process of cooling the milk is spread out on a very wide surface indeed. It is thus exposed to the dust and aerial contamination of the atmosphere of the Milk Station, which is situated in the heart of the city.

In addition to this risk, the milk is passed over wide surfaces of metal which are incapable of sterilization, however carefully they may be cleaned.

The milk treating room is clean, with impervious floors, and abundance of light, but there is no provision against contamination by flies.

Flies, however, do not seem to be so serious a menace as they are under similar circumstances in Melbourne.
Age of the Milk—

The treatment of the milk during the day, instead of overnight, means that it is from 26 to 40 hours old before it reaches the consumer. That is to say, Monday afternoon's milking and Tuesday morning’s milking arrive at the Central Station about 10 o'clock in the forenoon of Tuesday. Pasteurisation is concluded about 2.30 p.m., and the milk is kept in cool store until the early hours of Wednesday morning, reaching the consumer at, say, 7 a.m. to 9 a.m.

It is, therefore, 50 to 64 hours old before the fresh supply arrives.

The whole scheme would be greatly improved if the milk were conveyed to the city and treated overnight, the delivery taking place the following morning. In this way the milk would be saved sixteen hours of cold storage. Considering that the great bulk of the milk during the summer comes from a distance of less than 30 miles, it does not seem to be a very difficult matter to save this very valuable time.

In all milk supply questions time is undoubtedly one of the most important factors, and the age of the milk on delivery is, to me, one of the weakest points in the Wellington system.

The fact that the milk has been pasteurized and kept in cold storage does not make up for its want of freshness, as during the 24 hours that it is kept out of cold storage in the homes very rapid deterioration may take place, especially in warm weather. In a hot climate like Melbourne, it would not keep more than a few hours, if at all.

Production of Milk—

I visited the dairying district of the Upper Hutt Valley with two inspectors of the Agricultural Department, by favour of Colonel Young, Chief Inspector of Stock.

I visited twelve farms in all, mostly small and with very antiquated dairy premises. Both machine milking and hand milking were practised. The cattle were mostly cross-bred—Jersey, Friesian, and Shorthorn, with a few Ayrshire and Herefords.

All premises had cement floors, mostly in a good state of repair, but in all the drainage and arrangements for disposal of manurial washings, &c., were bad. There was no provision for keeping out flies. The water supply was plentiful and very cool. All milk is kept over night in cans standing in troughs of cold water, some of cement, some of wood. Recent whitewash was conspicuous by its absence, only traces being present. In many cases the very bad and much condemned system of storing hay in a loft over the milking bails was practised. In nearly all cases the drainage ended about 30 feet from the shed in a quagmire of filth overgrown to some extent with rank grass. In one dairy, the milking shed was very dark, under a hay loft, and only lit and ventilated from the doors at both ends. This farm had been supplying milk to Wellington for about 40 years, and was registered. All coolers were of the small circular type, some much soldered and the tin almost worn off and with narrow corrugations, rendering cleaning very difficult. There was no provision on any farm for steam sterilization or for washing the men's hands.

I did not see a single dairy which could in any sense be described as modern in construction, except, perhaps, a small four-stall shed and milk room made of cement concrete recently erected.

Dry milking was mostly practised, but the use of a prepared vaseline was almost universal, the hands of the milkers being lubricated therewith, and as leg-ropes, cows' tails, and bails were also handled by the same hands, the result may be imagined. I did not see any provision anywhere for washing the hands of the milkers, except under the nearest tap, and I am satisfied that it is not done except in the presence of the inspector.

Hutt Valley.

Washing of Udders—

Udders are not clipped, flanks of cows are not brushed, and the teats and udders are at best wiped over with a wet cloth which is dipped in an old rusty tin of varying kinds, and which does not present a clean appearance. The cloth used for this purpose was frequently slapped on the rail of the stall, which is liberally coated with dirt and manure, and subsequently used for the next cow. I am satisfied that even this doubtful procedure is not carried out in the majority of instances except in the presence of the inspector.

I did not see at any dairy any special heating appliance for the production of boiling water. There was no attempt at steam sterilization anywhere.

Water Supply—

On all farms there was an ample supply of fresh, clean, cool water, mostly from wells and springs in the surrounding hills. Average temperature 56°.

Utensils and Storage—

All utensils were apparently clean and sweet, but the method of storing left much to be desired. Racks for cans and buckets were not used. In many dairies the empty cans and buckets were ranged on the floor, with the lids off and right side up, thus allowing dust and flies to have easy access to the interior.
The milk room was often an adjunct to the milking shed and only separated by a wide door or incomplete partition. There was no attempt at protection from flies. Flies, however, were not very numerous though present in many cases both house, flies and blow flies.

The milking machines were on the whole well cared for, the parts being kept in tubs or troughs of cold clean water. In some cases the rubber connexions were old and cracked and required renewing. The metal pipes were clean and smelt fresh, but I am satisfied that in no case could the pipes and rubber fitments be considered sterile.

Cans—

The empty cans, which are cleaned and sterilized at the City Depot, were clean in appearance, but where the lids had not been removed had a close, milk-like smell and contained small quantities of condensed water. All cans were sound and in good condition, except some of the lids which were cracked badly.

Pastures and Cattle—

The pastures were clear and sound, there being a good growth of green grasses. The water supply of the cattle was chiefly running water.

The farms were all small. The cattle were in good condition and looked contented and healthy.

Hand feeding was not practised, except in a few cases in the winter months, and then not in the milking sheds, which were chiefly of the walk-through pattern.

Tuberculin testing is not carried out except in suspected cases. Reacting cattle are slaughtered, partial compensation being paid by the Government to the owner.

Distribution of Milk on Block System by Contract—

With the exception of a few vendors under special licence and limited to 30 gallons per day, the contractor in each area has a complete monopoly of the milk supply, and arranges his itinerary to suit his own and not the consumers' convenience. The terms of the contract provide that he must deliver the milk within six hours from the time of receipt from the Central Milk Station. If the hour of delivery does not suit the consumer he must put up with it; there is no appeal. I was informed by several consumers that the contractors refused to enter their premises, but insisted upon the jug or can being placed at the gate, where it was sometimes stolen. There is no remedy.

The terms are cash weekly to all. There is no credit, and the money must be placed at the gate with or in the receptacle. Otherwise no milk.

When milk is short, as it is during the winter months, consumers have to take what is given to them and be satisfied. The shortage cannot be made up from another milkman. There is no other milkman.

These occurrences are common to all monopolies, and when the monopolist happens to be a dissatisfied tradesman, who has been forcibly deprived of his business on terms which he does not consider just, it is not to be wondered at that he does not treat the public with the consideration that they have been accustomed to under the competitive system.

That these complaints are not captious and isolated is shown by the statement of the Chairman of the Milk Committee, Councillor Norwood, in his report to the Council on the Future Policy of the Milk Department, with reference to distribution. It reads as follows:—"In this I must frankly admit that I have been disappointed that the vendors have not entered more fully into the spirit of the Council's Milk Scheme. I had hoped that the Blocking System of the city would bring about economies that would make it possible, in the interests of the public, to enable the Council to keep the milk vendors in remunerative employment indefinitely; however, the treatment meted out to the public by the vendors has not been such as to induce the Council to go far out of its way to meet them, inasmuch as it must always be the sole object of the Committee to cater for the citizens."

I obtained from one of the vendors the following details as to the methods adopted in the delivery of the milk:

1. What is the average amount carried per cart per day? He stated—"We have our retail carts carrying from 50 to 100 gallons. Each cart starts off with a load of 75 gallons. It is fed up at intervals by one cart. We have six retail carts and one wholesale cart. The retail round averages from 80 to 100 gallons, and the wholesale averages from 250 to 300 gallons. From this you will see that the six retail carts distribute from 500 to 600 gallons daily. Each cart covers about 12 miles, the time occupied being from 6 to 7 hours. The amount delivered before the Blocking System amounted to from 35 to 60 gallons per retail cart."
The cost of delivery is estimated by the Council to be 4½d. per gallon. What it actually works out at I was unable to ascertain. The cost in Melbourne is approximately the same.

From my own observation of the working of the method of distribution, I am convinced that although it may be economical it is not hygienic.

The large ten-gallon containers are placed in some instances at intervals upon the kerb and from these the distributors fill their hand cans by pouring from one to the other. During the process the wide mouths of both cans are fully open. Wellington is a windy and dusty city, and the contamination that must occur is in my opinion sufficient to undo all the careful preliminary work carried out at the Station.

It is an essential with pasteurised milk that there shall be no after-contamination.

I believe that the City Council is fully aware of these defects in its system, but until they are remedied and the milk supply rendered as safe and pure as is humanly possible, it shoulds very serious responsibility in compelling 80,000 of its citizens to drink a milk that may carry disease and death.

The dipping system of milk delivery as practised in Wellington, and to a large extent in Melbourne, is filthy and insanitary, and one of the first steps in any up-to-date milk supply reform should consist in its abolition and the substitution of the sealed container.

**Prevention of Adulteration**

A perusal of the records of the Dominion Analyst reveals the fact that there has been a considerable improvement in the quality of the milk sold in Wellington of recent years.

### Average Composition of Milk supplied to Wellington, N.Z., Metropolitan Areas.

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<td>3·95</td>
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I am informed by the analyst that, previous to 1916, very few milk samples were taken in the city, and offenders were leniently dealt with by the magistrates. Adulteration by watering, skimming, and the use of preservatives was widely practised. In 1916 a whole time inspector was appointed, and at the same time magistrates commenced inflicting heavy penalties in milk cases. The Council also cancelled the licences of the worst offenders. The immediate effect was to reduce adulteration to a minimum. The introduction of the municipal scheme in 1919 still further improved matters, but the beneficial effect of vigorous supervision is strikingly demonstrated in the years prior to the inception of the scheme.
Prevention of Adulteration—

The Analyst is also of opinion that there will be no radical improvement in the sanitary quality of the milk supply until better conditions obtain at the farms, and improved transport is provided from farm to city, while the system of handling milk in the city could also be greatly improved.

Effect of the Scheme upon the Infant Mortality Rate—

The number of deaths in infants under one year of age per 1,000 births in New Zealand is the lowest in the world.

In Wellington the death rate in infants has always been high when compared with New Zealand as a whole and with the three other large cities, Auckland, Dunedin, and Christchurch, but generally speaking is, and has been, much lower than in Melbourne.

Dr. M. H. Watt, M.D., D.P.H., Director of Public Hygiene Department of Health, New Zealand, in discussing Infant Mortality in New Zealand in an article in the New Zealand Journal of Health and Hospitals, April, 1921, states that "it must be acknowledged that New Zealand is exceedingly fortunate as compared with other countries. A healthy stock, an equable and genial climate, a plentiful food supply, an absence in great degree of overcrowded centres of population and of industrial employment of women, and perhaps above all a lack of the depressing poverty seen in older lands, are all factors which favour a low infant death rate. Assisted by these natural advantages, State and voluntary effort have succeeded in reducing the infant mortality from 75 in 1900 to 45 per 1,000 births in 1919."

Dr. Watt attributes this decline in the period 1900-1906 to public health administration alone, and since 1907 to the efforts of the Royal New Zealand Society for the Health of Women and Children, in conjunction with the Department of Public Health.

The society mentioned above is better known in Australia under the name of its patron, Lady Plunket, and its President, Dr. Truby King, C.M.G. It was started as a "league for mutual helpfulness and mutual education with a full recognition of the fact that, so far as motherhood and babyhood were concerned, there was as much need for practical reform on the part of the cultured and well-to-do as there was on the part of the so-called poor and ignorant."

I found no evidence of any attempt on the part of the City of Wellington to co-operate with this splendid institution by supplying the local branch with any special supply of safe milk for infants.

In company with Dr. Truby King I visited one of the Plunket homes and saw the system at work. I was much impressed with the methods employed and the excellent results that have been obtained.

The activities of the Society extend all over New Zealand, no less than fifty Plunket nurses being at work in thirty-one towns of the Dominion, while 205 outstations were visited. During the year ending 31st March, 17,500 babies were under the care of these nurses, 70,571 visits were made to homes by nurses, and 121,371 visits were made by mothers and babies to Plunket rooms.

It is not, therefore, a matter for surprise that mortality rates in infants are materially affected by activities such as these. The Dominion Government subsidizes the Society to the extent of £125 per annum towards the salary of each Plunket nurse.

The total expenditure of all the branches was £15,794 for the year ending March, 1920, and £25,311 for the year ending March, 1921.

Table showing Infant Mortality Rate (Deaths under one year of age per 1,000 Births) in Melbourne and four chief centres of New Zealand each year 1908-1921.

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<th>Year</th>
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<th>Auckland Rate</th>
<th>Wellington Rate</th>
<th>Christchurch Rate</th>
<th>Dunedin Rate</th>
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<tr>
<td>1910</td>
<td>92·3</td>
<td>84·5</td>
<td>79·0</td>
<td>69·4</td>
<td>79·0</td>
</tr>
<tr>
<td>1911</td>
<td>78·2</td>
<td>73·3</td>
<td>62·9</td>
<td>43·4</td>
<td></td>
</tr>
<tr>
<td>1912</td>
<td>56·9</td>
<td>61·3</td>
<td>60·0</td>
<td>38·1</td>
<td></td>
</tr>
<tr>
<td>1913</td>
<td>76·3</td>
<td>80·8</td>
<td>60·2</td>
<td>73·4</td>
<td></td>
</tr>
<tr>
<td>1914</td>
<td>84·5</td>
<td>82·5</td>
<td>68·1</td>
<td>74·2</td>
<td></td>
</tr>
</tbody>
</table>

* Municipal Milk Scheme in operation.

In the fourteen years to which the above statistics relate, it may be noted that the infantile death rate for Wellington is high as compared with the other cities in New Zealand, while in some years it even exceeds that of Melbourne.
For the three years during which the Municipal Milk Scheme has been in operation, the rate is the highest in New Zealand, and is considerably higher than that of Auckland, where the climate is much hotter.

As this death rate may be due to causes other than those directly attributable to the milk supply, I have prepared a table showing the death rate from diarrheal diseases in Melbourne, Auckland, and Wellington for children under two years of age, in whom the principal article of diet is milk.

**Table showing for Melbourne, Auckland and Wellington, the Deaths of Children under two years of age per 1,000 Births from Diarrheal Diseases, 1908-1921.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Melbourne</th>
<th>Number</th>
<th>Rate</th>
<th>Auckland</th>
<th>Number</th>
<th>Rate</th>
<th>Wellington</th>
<th>Number</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1908</td>
<td>512</td>
<td>39·4</td>
<td>78</td>
<td>36·9</td>
<td>40</td>
<td>19·9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1909</td>
<td>389</td>
<td>29·0</td>
<td>39</td>
<td>18·4</td>
<td>41</td>
<td>20·6</td>
<td></td>
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<tr>
<td>1910</td>
<td>499</td>
<td>37·3</td>
<td>84</td>
<td>40·2</td>
<td>38</td>
<td>20·3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1911</td>
<td>368</td>
<td>25·5</td>
<td>56</td>
<td>24·6</td>
<td>25</td>
<td>13·6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1912</td>
<td>481</td>
<td>28·4</td>
<td>45</td>
<td>17·6</td>
<td>19</td>
<td>9·7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1913</td>
<td>365</td>
<td>21·0</td>
<td>49</td>
<td>30·6</td>
<td>22</td>
<td>12·2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1914</td>
<td>572</td>
<td>32·2</td>
<td>29</td>
<td>12·1</td>
<td>22</td>
<td>11·8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These three sets of statistics are only comparable as far as 1916, when those for Auckland and Wellington included both city and suburban boroughs. The average for nine years then being—Melbourne, 28·6; Auckland, 21·2; Wellington, 14·3.

From 1917 to 1921 they refer to the urban area only: the average for five years being Auckland, 6·4, and Wellington, 6·1.

It may be noted that since the inception of the Municipal Milk Scheme, the death rate in infants from diarrheal diseases has increased to a point higher than it has been since 1916.

I do not mean to infer that the increase is due to the introduction of the scheme, but I do maintain that no appreciable improvement has been brought about in the number of deaths from this disease in Wellington.

Impure milk is recognized as an important factor in the causation of diarrheal diseases in young children.

In studying the general infant mortality rate from all causes we find that the three groups of diseases from which the great majority of infants die are—

A.—Developmental diseases or diseases due to conditions present at birth. This class is the largest, and accounts for most of the deaths within the first month of life.

B.—Respiratory diseases, including deaths from measles, whooping cough, &c.

C.—Diarrheal diseases and enteritis.

The relative perponderance of B or C is mainly influenced by climatic conditions. W. H. Brend, in his work on *Health and the State*, in discussing epidemic diarrheaoa as a cause of death in infants, says—"It is definitely established that the disease is most prevalent and fatal in hot, dusty weather, the incidence always rising rapidly in the third quarter of the year (England) in all types of districts. Dr. Newsholme has repeatedly emphasized the injurious effect of dust blown up from dirty streets, ashpits, and privies in towns where scavenging is inefficient. It seems probable that the infection is conveyed into the system through food, and it is possible that the value of breast feeding arises not so much from an inherent superiority of human milk as from the fact that it affords a pure supply."

Dr. Ralph Vincent, writing on this subject in 1910, says—"The higher the temperature of the late summer, the greater the prevalence of the disease, especially if this high temperature is associated with but little rain. In other words, meteorological conditions involving a high temperature with much dust are those which promote the conditions which accompany the greatest incidence of the disease."

These conditions apply with great force in Melbourne and the faulty system of repeatedly exposing the milk to contamination by street dust in both Wellington and Melbourne is one that calls for radical and immediate reform.

Milk supply reform should commence on the farm and finish in the city with the sealed bottle.
Bacteriological Tests.

By courtesy of the Director-General of Health, Dr. Valentine, a series of bacteriological counts were made at different points in the life-history of the milk from the cow to the consumer.

In order to compare the Municipal supply with one of the "licensed" vendors whose milk is produced within 2 miles of the city, and delivered unpasteurized within a few hours of milking, both sources of supply were sampled at the same points in their history.

The full report of the Government Bacteriologist will be found in Appendix VI.

The results are, to say the least of them, startling.

The initial contamination at the farm is enormous, amounting to 500,000 organisms per cubic centimetre (fifteen drops). Kept overnight on the farm this count has increased to 5,640,000 by morning, although the cans of milk are kept standing in troughs of cool water.

By the time the milk has reached the City Milk Station the bacterial content has increased to 7,440,000 per c.c. Pasteurization reduces this to 13,000 per c.c., but before it reaches the household the count has gone up to 41,000. In 24 hours, in an open jug in the house, and in some cases before the next day's supply has arrived, this milk contains the astounding number of 270,000,000 organisms per c.c. The milk of the "licensed" vendor starts with a much lower initial contamination, viz., 70,000 per c.c. By the time it is delivered this milk contains 92,000 per c.c., and after being kept 24 hours in a jug in the house contains 300,000,000.

The Municipal milk sampled was machine milked, and that of the licensed vendor hand milked, and delivered unpasteurized.

FINANCE.

Up to date the Council has expended some £52,000 of loan money. This sum is represented by assets consisting of land, buildings, plant, and rolling-stock. Some of the money has been expended in structural alterations and extensions to buildings, some of which are only held on leaseholds. It therefore seems to me that the amount allowed for depreciation in the balance-sheet on these amounts, viz., 3 per cent., is very low. The same applies to the item of depreciation on plant. Ten per cent. is the amount usually written off for such plant as is used in a milk depot or butter factory, not 3 per cent.

Should it be necessary to obtain new premises closer to a railway station and capable of handling the whole business both of treatment and delivery, especially if bottles be employed, it is estimated that a loss of many thousands of pounds will be involved on a realization of some of these assets.

The new building is estimated with plant to cost about £40,000, and when the extra cost of rolling-stock is added, should the Council undertake the distribution, the amount will probably exceed £50,000, or over £100,000 in all. The extra interest and sinking fund on this capital, added to the extra cost of bottling (roughly 1d. per quart), will make it extremely difficult for the Council to keep the retail prices down to their present level. In addition to this, unless the money market changes very considerably in the next six months, it will not be possible to borrow money at anything like 5 per cent., which is the rate paid at present.

When compared with the position in Melbourne it should also be remembered that the extraordinary low costs for light, water, and power are not likely to be obtainable elsewhere as in Wellington. The average price paid to the farmer in New Zealand is evidently about 2d. per gallon less than in Melbourne.

THE COMMERCIAL AND TRADING ASPECT.

It must always be remembered that no Act of Parliament can compel a farmer to produce milk for human consumption, or for any other purpose, unless he is willing to do so. Consequently the Wellington City Council must buy milk in the open market as against the cheese, butter, or dried milk factory. And if the conditions under which milk is required to be produced are made too stringent, the farmer will dispose of his product elsewhere or go out of dairying altogether.

The only method a corporation can employ is to pay more than the market rate for milk as against the factories, or produce the milk itself. From a trial of the latter expedient the Wellington Council has so far, with great wisdom, refrained.

The plan of acquiring a factory of its own does not relieve the Council from the competition of factories in the same district, while the extreme seasonal fluctuations in the available supply in any one district has rendered yearly contracts necessary in other districts. This frequently results in overbuying and at a price which makes a loss a certainty.

The plan of buying on a butter-fat content basis adds another complexity to the question. The price of butter fat is fixed in London, not in New Zealand, and a plentiful milk season in the Dominion may occur when the price of butter is high in London or vice versa. This leads to intense dissatisfaction on the part of the farmer, whose unlicensed neighbours may be receiving relatively far

4611—2
better prices for their product than he does on account of his contract with the Council. I am not satisfied that this method of buying milk for liquid consumption is the best one. Butter fat represents only about half of the other foods present in milk which are of nutrient value, and milk is sold to the consumer on the liquid quantity basis irrespective of the butter-fat content provided that the standard laid down by regulation is complied with.

The milk sold in Wellington contains an average butter-fat content for eight months of 4.25 per cent., while the legal standard is 3.25 per cent. This would allow a margin of 1 per cent. for the very questionable practice of milk standardization.

The standards required for the methods of production, premises, coolness, storage and transport are all much lower when farmers produce for the butter and cheese market than when milk is wanted for direct human consumption, and the small extra price paid for whole milk does not in my opinion recoup the farmer for the considerable expense to which he would be put to produce milk of a high standard of purity.

These difficulties are every-day ones in the milk business, but they make the task of the Milk Supply Committee of the Council a very harassing one. Its members are often business men who can only give their spare time to the management of the affairs of the Milk Department. A large retailing milk business cannot be managed by any body of men, however enthusiastic they may be, in their spare time. Difficulties, not only of supply, occur almost daily, and need prompt decision on the part of the management. These decisions often involve the expenditure of considerable sums of money, and simply cannot wait until an honorary committee of a municipal Council can meet and find time to consider them.

That these disabilities are very real is shown by the proposal that has been made from time to time to the Council that they should substitute a highly paid Board of two business men and a doctor to take the place of the existing sub-committee of the Council. This proposal, which in my opinion is a very sound one, would of course involve further expenditure and would, I believe, require additional powers to be granted by Parliament.

It also emphasizes the fact that the Council is not altogether satisfied with the working of the scheme as far as it has gone, and that it is still looking for a solution of the problem of controlling and handling its milk supply.

SUMMARY.

1. Wellington differs greatly from Melbourne in its physical and climatic conditions.
2. Wellington's problems of supply, transport, and distribution differ essentially from those of Melbourne.
3. The milk delivered in Wellington is on an average sixteen hours older when it reaches the household than that delivered in Melbourne.
4. The present price of milk in Wellington is 7½d. per quart. The Melbourne price is 7d.
5. The prices paid to the farmer in 1920 averaged 13½d. per gallon net in Wellington. In Melbourne in the same year the price averaged 15½d. per gallon net.
6. Considerable dissatisfaction exists all round with regard to the working of the scheme amongst consumers, producers, and distributors.
7. There has been a great deal of litigation between the Council and the producers and the distributors.
8. Nothing has been decided yet regarding the Council's future policy as to distribution after the 1st July next, when present contracts expire.
9. There is divided control of the milk supply. The Council has no power outside the city boundaries.
10. There is no co-operation between the City Council, the Agricultural Department, and the Health Department.
11. The system of treating the milk leaves much to be desired. There are no safeguards against after contamination in the Milk Station, during distribution, and at the homes.
12. The sources of supply and methods of milk collection are unhygienic—the regulations of the Department of Agriculture being more honoured in the breach than the observance.
13. Railway transport is slow and infrequent, with no proper provision for the carriage of milk.
14. Road transport is difficult and in the winter very expensive.
15. There is undue delay in treating the milk at the Central Station, milk being held there for sixteen to eighteen hours.
16. There is no provision for a special supply of milk for infants.
17. The block system of delivery by contract has not proved satisfactory. The convenience of the public being a secondary consideration.
18. The scheme as it stands can only be regarded as an incomplete experiment. Good work has been done, but many serious mistakes have been made and some are still being made.

From an economic aspect the venture should, with careful and experienced management, pay its way, but I can see no prospect of any material reduction of price to the consumer. The scheme has helped to minimize the amount of milk adulteration.

The general infantile death rate and that in infants from diarrhoeal diseases has not been improved since the inception of the scheme—in fact there has been an increase.

I am of opinion that if the Wellington scheme, as at present operating, were applied to Melbourne and suburbs, the result would be a disastrous failure both from an economic and a sanitary point of view.

Before any municipalization with monopoly of the distribution is undertaken, the purity of the supply at its source must be insured, conditions of transport improved and organized, standards of purity arrived at, and effective methods of supervision devised. Producers, retailers, and, last but not least, the general public need to be educated as to the meaning of milk hygiene and the dangers of its neglect.

Municipal control of the purity of the milk brought within the city boundaries for consumption by its citizens is a legitimate function of local government; but, until a Corporation is in a position to guarantee the purity of the milk sold and its absolute freedom from the risk of conveyance of disease and death, it has no right, legal or moral, to compel those citizens to consume a dangerous foodstuff by the establishment of a municipal monopoly.

Wellington is the only city of any size in the world to attempt this experiment, and its progress will be watched with keen interest by all concerned with this exceedingly difficult problem.

At present the scheme is only on its trial, and it is possible that many of the defects pointed out in this report may be remedied in the near future.

It therefore behoves us in Melbourne, where the problems of the milk supply are more complex than those of Wellington, to follow carefully the progress of the venture, and, while profiting by any mistakes that may be made, utilize any methods that may be applicable to our own particular conditions.

In conclusion, I desire to express my appreciation of the courtesy and consideration shown to me by the Prime Minister of New Zealand, and the Permanent Heads of the Departments of Health and Agriculture and their Officers, by His Worship the Mayor of Wellington, and the members of the Milk Committee, the Acting Manager of the Central Milk Station and his Officers, the Dominion Analyst and the Government Statist. Every possible facility was given to me to obtain information, and no trouble was spared to show and explain to me the working of the scheme from every point of view.

If I have been critical it has not been without a full appreciation of the many difficulties that have had to be faced and overcome in this attempt to solve one of the many complex problems of modern civilization.

28th March, 1922.
WELLINGTON.

LINES OF THE MILK CHAIN.

Time.

<table>
<thead>
<tr>
<th>Cow</th>
<th>Diary</th>
<th>Wagon</th>
<th>Depot</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 16 hours</td>
<td>13½d.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Railway Station

<table>
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<tr>
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<tbody>
<tr>
<td>2½ hours</td>
<td>1d.</td>
</tr>
<tr>
<td>2d.</td>
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</tr>
</tbody>
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20 to 49 hours

<table>
<thead>
<tr>
<th>Wagon</th>
<th>City Depot</th>
</tr>
</thead>
<tbody>
<tr>
<td>½ hour</td>
<td>30d.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
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<th>Wholesale Waggon</th>
<th>Retailer</th>
</tr>
</thead>
<tbody>
<tr>
<td>4½ hours</td>
<td>Cart</td>
<td>House</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>House</th>
<th>Hotel</th>
<th>House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cart</td>
<td>House</td>
<td>House</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>House</th>
<th>House</th>
<th>House</th>
<th>House</th>
</tr>
</thead>
</table>

From cow to depot...

Hea. d.

| From cow to depot | 3-16 | 13¼ |
| From depot to truck | 1 | 1·6 |
| From truck to terminus | 2½ | 1·25 |
| From terminus to city depot | 16 | 2 |
| At city depot | 4½ | 7 |
| From depot to consumer | | |
| Total | 20-40 | |

To consumer...

| To consumer | 30-32 |
### MELBOURNE.

**Links of the Milk Chain.**

<table>
<thead>
<tr>
<th>Time</th>
<th>Cow</th>
<th>3 hours</th>
<th>Cart</th>
<th>Hotel</th>
<th>Cafe</th>
<th>Boarding House</th>
<th>4 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>From cow to depot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From depot to truck</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From truck to terminus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From terminus to city depot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At city depot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From depot to consumer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost per gallon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| From consumer |      |         |      |         |        |                |         |
| Hrs.         |      |         |      |         |        |                |         |
| Cost per gallon |      |         |      |         |        |                |         |

The evening milking, except from the most distant places, arrives by the same train, and is therefore only from 12-16 hours old when it reaches the consumer.
APPENDIX I.

NEW ZEALAND.

ANALYSIS.

11. Power to advance moneys to dairy farmers.
12. Supply of milk from dairies in and adjacent to the city.
13. Council may subsidize visiting nurses.
14. Council may supply milk to the poor.
15. Finances.
16. Officers.
17. Powers of Inspectors.
18. Power to make by-laws.
20. Powers to be additional.

1919, No. 17.—Local and Personal.

An Act to confer Additional Powers on the Corporation of the City of Wellington in relation to the Inspection and Control of the Milk Supply of the City of Wellington and other Matters.

BE IT ENACTED by the General Assembly of New Zealand in Parliament assembled, and by the authority of the same, as follows:

1. This Act may be cited as the Wellington City Milk Supply Act 1919.

2. In this Act, if not inconsistent with the context—

"City" means the City of Wellington or any city of which it shall form part:
"Corporation" means the Mayor, Councillors, and Citizens of the City of Wellington:
"Council" means the Wellington City Council:
"Dairy" means (a) a milk-house, milk-shop, dairy, factory, or any other place where milk is collected, deposited, treated, separated, prepared, or manufactured, or is sold or offered or exposed for sale; and includes (b) a farm, stockyard, milking-yard, paddock, shed, stable, stall, and any other place where cows are kept, milked, or kept:
"District Fund" means the District Fund as defined by the Municipal Corporations Act 1908:
"Prescribed" means prescribed by by-law made under the provisions of this Act:
"Milk" includes cream, but does not include condensed or dried milk:
"The Milk Supply Regulations 1918" means the regulations cited as such and made under the War Regulations Act 1914 on the tenth day of September, nineteen hundred and eighteen.

3. It shall be lawful for the Council to do all or any of the following things:—

(a) To buy and sell milk, and to manufacture and sell butter and other milk products and ice;
(b) To provide for the storage in cool chambers of milk, butter, and other products of milk, and other articles of human food of whatsoever kind or nature;
(c) Generally to carry on the business of a dealer in milk and butter;
(d) To buy and sell fodder for dairy cattle, and dairy utensils;
(e) To carry on business as a dairy farmer.

4. For the purposes of the last preceding section the Council may from time to time, in such manner and on such terms as it thinks fit—

(a) Appoint managers, engineers, agents, workmen, servants, and inspectors:
(b) Purchase or lease or take under the provisions of the Public Works Act 1908 or otherwise acquire any land required for the purposes of this Act, and sell and dispose of the same when no longer required, and purchase or sell stock:
(c) Construct, erect, lease, or purchase any buildings, plant, machinery, tramways, railway sidings, and other appliances or works of any description, and sell or otherwise dispose of the same when no longer required:
(d) Maintain and work any such buildings, plant, machinery, tramway, railway siding, or other appliances required for the manufacture, supply, transport, and delivery of milk, butter, and other products as aforesaid; or for providing cool storage for milk, butter, and other products of milk, and other articles of human food of whatsoever kind or nature.
5. In order to provide funds for the payment of all compensation moneys or purchase moneys payable in respect of any land or buildings or stock taken or purchased as aforesaid, or for the construction or erection or acquisition of buildings, plant, machinery, tramways, railway sidings, or other appliances or works required for the purposes of this Act, or for advances to farmers supplying milk to the Corporation, or for moneys provided from the District Fund for all or any of the foregoing purposes, the Council may from time to time borrow moneys by way of special loan raised under the Local Bodies Loans Act 1913 by special order and without taking the steps described in sections eight to twelve of the Local Bodies Loans Act 1913.

6. (1) After the passing of this Act it shall not be lawful for any person, whether as principal, agent, or otherwise (other than the Corporation and its servants or agents)—

(a) To sell milk in the city; or
(b) To deliver milk in the city pursuant of a contract of sale made, whether within the borough or elsewhere; or
c) To bring into the city for use, consumption, or sale milk purchased outside the city; or
d) To have milk in his possession for sale in the city save under a licence issued in that behalf by the Council and in accordance with the terms and conditions thereof.

(2) Nothing in this Act shall make it an offence to sell milk for consumption on the premises of the seller, or to have possession of milk for purposes of such a sale, provided such milk is purchased from the Council or its licences.

(3) Every licence granted under the Milk Supply Regulations 1918 which is subsisting or in force on the commencement of this Act shall, subject to the provisions of this Act, endure for the purposes of this Act as fully and effectually as if it had been granted under this Act, and accordingly shall, when necessary, be deemed to have been so granted.

(4) The period of every such licence is hereby extended until the eighth day of July, nineteen hundred and twenty-two, subject to the due observance and performance of the terms and conditions of such licence.

(5) The terms of the several agreements made between the Corporation and the milk vendors is hereby extended until the eighth day of July, nineteen hundred and twenty-two.

7. (1) For the purpose of securing for the inhabitants of the city an adequate supply of milk of good quality and at a reasonable price the Council may, subject to the provisions of section six hereof, grant, refuse, revoke any such licence as aforesaid, and may, in granting any such licence, grant it on such terms and conditions as the Council thinks proper for the purposes aforesaid.

(2) By such terms and conditions the Council may limit the exercise of the licence to a specified portion of the city only.

(3) Any person dissatisfied with the decision of the Council in refusing to grant or in revoking or cancelling any licence under this section may appeal on summons to a Judge in Chambers, and the decision of such Judge on such appeal shall be final.

8. Every person who is knowingly concerned in any breach, by himself or any other person, of the terms or conditions of any such licence as aforesaid shall be guilty of an offence against this Act and shall be liable accordingly.

9. Every person who willfully commits any breach of contract with the Corporation in respect of the sale or delivery of milk, and every other person who is knowingly concerned in any such breach, shall be guilty of an offence against this Act and shall be liable accordingly.

10. (1) No person licensed to sell milk under the provisions of this Act, or the servant or agent of such licensee, shall treat any milk so that the same shall be deemed to be adulterated within the meaning of section fifteen of the Sale of Food and Drugs Act 1908.

(2) No person licensed to sell milk under the provisions of this Act, or the servant or agent of such licensee, shall sell or have in his possession for sale any milk that is in such a condition that it is deemed to be adulterated under the provisions of section fifteen of the Sale of Food and Drugs Act 1908.

11. (1) The Council may, out of moneys belonging to the Milk Account, advance moneys to any dairy farmer supplying milk to the Corporation under contract for the purposes of improving the conditions relating to the production of milk on his dairy, the purchase of stock and plant, the provision of water supply, the sanitary improvement of the dairy, or the construction of necessary buildings and erections for dairy purposes.

(2) Such advances may be secured on instruments by way of security under the Chattels Transfer Act 1908 over stock, with or without collateral security by way of first or second mortgage of land, or on first mortgage of land.

(3) No advance shall exceed in amount sixty per centum of the value of stock and land comprised in the instrument by way of security or mortgage and over which such instrument or mortgage is a first charge.

(4) The value of stock comprised in any security and the value of land comprised in any mortgage shall be fixed by a valuer appointed by the Council, and his report as to value shall be conclusive.

(5) Every instrument by way of security and every mortgage securing moneys advanced under the provisions of this Act shall contain the following covenants on the part of the borrower:

(a) To expend the moneys advanced for one or more of the purposes specified in subsection one of this section;
(b) To use and cultivate his farm as a dairy according to the best practice obtaining in his district;
(c) To supply to the Corporation under contract executed before or contemporaneously with any such instrument or mortgage all milk produced on his farm, provision being made in each case for a minimum daily supply under such contract;
(d) Such other reasonable covenants as the Council thinks fit.
Supply of milk from dairies and adjacent to the city.

12. (1) Notwithstanding anything herebefore contained, milk produced at dairies in the city or situated within two miles of the city may be sold within the city, subject to the following conditions:—

(a) That any person supplying milk under the provisions of this section shall keep an exact record of the milk obtained by him at his dairy, and of the milk sold by him in the city, and shall from time to time furnish to the Council returns in the prescribed manner and form, verified by a statutory declaration, showing how much milk he has from time to time sold, and shall pay such fee, not exceeding two guineas per annum, as the Council shall prescribe:

(b) That any person so supplying milk shall from time to time be required by the Council to furnish samples of milk to the Council at any place to be fixed in the licence granted under paragraph (c) of this section:

(c) That no person shall sell milk in the city pursuant to the provisions of this section unless he is the holder of a licence granted for that purpose by the Council:

(d) That no person shall under any licence granted under paragraph (c) of this section sell more than thirty gallons of milk in any one day.

(2) Any person aggrieved by any decision of the Council in refusing to grant or in revoking or cancelling a licence under this section may appeal from such decision to the Senior Stipendiary Magistrate at Wellington, and the decision of such Magistrate on such appeal shall be final.

(3) Every licence granted under the Milk Supply Regulations 1918, shall be subject not only to the exceptions contained therein, but also to any licence granted pursuant to the provisions of this section.

13. The Council may, subject to the approval of the Minister charged with the administration of the Hospitals and Charitable Institutions Act 1909, pay out of its District Fund such money as it thinks fit to such persons as it thinks fit for the assistance and development of any scheme to provide visiting nurses for the city.

14. The Council may, out of its District Fund, purchase milk for the purpose of supplying the same to the poor, and may supply the same free or at such reduced charges as it thinks fit to such persons as it thinks fit.

15. (1) All moneys received under the provisions of this Act shall be paid into a separate account, to be called "The Milk Account," and all expenses of administering this Act shall be paid out of that account.

(2) The provisions of section one hundred and eight of the Municipal Corporations Act 1908 shall extend and apply to the separate account kept under this Act.

16. Every person is liable to a fine not exceeding ten pounds who, directly or indirectly, by himself, his agent, or servant—

(a) Resists or wilfully obstructs any officer under this Act in the performance of his duty;

(b) Refuses to give information or gives false information in answer to any inquiry made by any such officer in the performance of his duty;

(c) Commits any breach of any of the provisions of this Act.

17. Inspectors under this Act appointed with the approval of the Minister of Public Health shall, so far as relates to the milk supply of the city, have the powers of an officer within the meaning of the Sale of Food and Drugs Act 1908.

18. The Council may, subject to the approval of the Minister of Public Health, make by-laws for the following purposes:—

(a) For securing the sanitary construction and cleanliness of dairies and milk shops, and of milk vessels used in dairies and milk shops within the city;

(b) Proscribing precautions to be taken for protecting milk against deterioration, infection, or contamination, and regulating or prohibiting the sale of milk in cases where the public health would be likely to be endangered by such sale;

(c) Regulating the issue of licences under the provisions of this Act and the fees payable thereunder;

(d) Prohibiting the sale or purchase of milk except for coupons issued by the Corporation;

(e) Providing for the issue and control of such coupons.

19. The provisions of sections three hundred and forty-eight to three hundred and fifty-one inclusive of the Municipal Corporations Act 1908 shall be read together with and form part of this Act.

20. The powers to make by-laws vested in the Council by the provisions of this Act shall be in addition to all powers to make by-laws or to make regulations which are now or hereafter may be vested in the Council under or by virtue of the Municipal Corporations Act 1908, or any other Act.

21. The Wellington City Milk Supply Act 1910, sections three and six of the Wellington City Empowering and Amendment Act 1911, and the Wellington City Milk Supply Amendment Act 1914, are hereby repealed.
APPENDIX II.

PURCHASE CONTRACT.

MEMORANDUM OF AGREEMENT made the 23rd day of July, 1921, BETWEEN THE MANAWAKA DAIRY FARMERS CO-OPERATIVE ASSOCIATION OF NEW ZEALAND, and the Corporation of Wellington, this 23rd day of July, 1921, (hereinafter termed "the Vendor") and THE MAYOR, COUNCILORS, AND CITIZENS OF THE CITY OF WELLINGTON (hereinafter termed "the Corporation") of the one part, and THE MANAWAKA DAIRY FARMERS CO-OPERATIVE ASSOCIATION OF NEW ZEALAND, of the other part.

WHEREAS it is agreed as follows:

1. In this Agreement "gallon" means 10 lbs. avoirdupois weight of milk weighed at the Municipal Milk Depot, Wellington.

2. (1) During the year commencing on the 1st day of September, 1921, and ending on the 31st day of August, 1922, the Vendor shall daily sell to the Corporation and the Corporation shall daily purchase from the Vendor 700 gallons of milk, which quantity may on any day be decreased or increased by the Vendor to any extent not exceeding 10 per cent. either way.

   (2) Delivery shall be made at the Municipal Milk Depot, Wellington.

3. Payment for milk supplied shall be made as follows:

   (1) For milk supplied during the period commencing 1st September, 1921, and ending 31st March, 1922, the price shall be fixed thus:

      a. There shall be taken as a basis the average price of butter-fat for the season 1921 and 1922 by any three cheese or butter factories in the Wellington Provincial District, such three factories being selected by the Vendor subject to this restriction that no factory shall be selected from which milk or cream is sold for human consumption in Wellington, Palmerston North, or Masterton.

      b. Every gallon of milk shall be deemed to contain 4 per cent. of butter-fat, and the price per gallon shall be fixed on this assumption, subject to this that 1d. additional shall be payable per gallon.

   (2) For milk supplied during the period commencing 16th August and ending 31st August, and during the period commencing 1st April and ending 15th May, the price shall be the price as ascertained by sub-paragraph (1) of this paragraph, plus 25 per cent. of the amount ascertained under clause (a) thereof.

   (3) For milk supplied during the period commencing 16th May and ending 15th August the price shall be 1s. 10d. per gallon.

4. In respect of milk supplied during the period commencing 1st September, 1921, and ending 15th May, 1922, and the period commencing 16th August, 1922, and ending 31st August, 1922, the Corporation shall pay to the Vendor any further moneys payable to the Vendor in respect of milk so supplied during the next preceding calendar month. On the 30th day of September, 1922, the Corporation shall pay to the Vendor any further moneys payable by the Corporation in respect of those supplies, or the Vendor shall repay to the Corporation any moneys overpaid by the Corporation in respect of those supplies.

5. For milk supplied during the period commencing 15th May and ending 15th August, payment shall be made on the twelfth day of the months of June, July, August, and September, 1922, in respect of milk so supplied during the next preceding calendar month.

6. The selection of factories to be made by the Vendor under clause (a) of sub-paragraph (1) of paragraph 3 hereof shall be made not later than 31st August, 1922.

7. All milk shall be tested for acidity within half-an-hour from the time of its arrival at the Municipal Milk Depot. If on such testing it is shown that the milk contains a greater amount in weight of lactic acid than 195/1000ths per cent. of the milk, the milk shall be condemned and destroyed and no payment shall be made therefore.

8. All milk supplied under this Agreement by the Vendor shall be delivered in a pure and unadulterated condition and with all its cream, and shall conform in all respects to the provisions of the Sale of Food and Drugs Act 1908 and of any regulations made thereunder in respect of milk and to the provisions of any statute or regulations for the time being in force relating to milk. The Vendor expressly warrants that all such milk shall be in accordance with the requirements of this paragraph.

9. The decision of the Manager of the Municipal Milk Department as to matters covered by clauses 5 and 6 hereof shall be final.

10. All milk (other than milk condemned under the provisions of paragraph 6 hereof) shall be separated and its butter-fat content shall be ascertained. The only liability of the Corporation in respect of such milk shall be that it shall purchase the butter-fat therein contained. The price of such butter-fat shall be the butter-fat price per pound ascertained under clause (a) of sub-paragraph (1) of paragraph 3 hereof; and the same provisions as to advances and to payments in respect thereof shall apply as if it had been milk supplied during the period commencing 1st September, 1921, and ending 31st March, 1922.

11. Notwithstanding anything contained in paragraphs 5 or 8 hereof, any milk sold by the Corporation for human consumption as milk shall be paid for at the rate fixed by paragraph 3 of this Agreement for the period when such milk is supplied.

12. The morning's milking and the evening's milking of each farmer from whom the Vendor receives the milk so supplied shall be delivered each in a separate lot, and to the cans containing each such lot a particular distinguishing label shall be affixed as hereinafter specified.

13. All off milk (other than milk condemned under the provisions of paragraph 6 hereof) shall be separated, and its butter-fat content shall be ascertained. The only liability of the Corporation in respect of such milk shall be that it shall purchase the butter-fat therein contained. The price of such butter-fat shall be the butter-fat price per pound ascertained under clause (a) of sub-paragraph (1) of paragraph 3 hereof; and the same provisions as to advances and to payments in respect thereof shall apply as if it had been milk supplied during the period commencing 1st September, 1921, and ending 31st March, 1922.

14. The milk supplied daily shall be separated into different lots for the purpose of examination, so that the morning's milking and the evening's milking of each farmer from whom the Vendor receives the milk so supplied shall be delivered each in a separate lot, and to the cans containing each such lot a particular distinguishing label shall be affixed as hereinafter specified.

15. All labels to be attached to such cans shall be in the form now used by the Municipal Milk Department, and shall have marked on each the indicating number by which the farmer supplier is identified in the books of the Department. At the bottom of the label there shall be marked the number of cans contained in each lot.

16. The labels to be attached to the morning's milk shall be those printed in red, and the labels to be attached to night's milk shall be those printed in black, and a sufficient number of such labels shall be supplied by the said Department to the Vendor from time to time upon request.

17. The Vendor shall at all times supply such advice cards as are required by this Agreement and by the Regulations of the Department.

18. The morning's milking and the evening's milking of each farmer from whom the Vendor receives the milk so supplied shall be delivered each in a separate lot, and to the cans containing each such lot a particular distinguishing label shall be affixed as hereinafter specified.
11. The Corporation shall supply all cans necessary for the supply of milk under this Agreement. The charge to be made for such cans shall be 1 per cent. of the amount payable for the milk supplied under this Agreement. For the purpose of securing the payment of this amount to the Corporation, the Corporation shall be entitled to retain 1 per cent. of all moneys payable to the Vendor hereunder, whether by way of advance or otherwise, and the account under this head shall be settled by adjustment between the Vendor and the Corporation to be made on the 30th day of September, 1922.

12. During the continuance of this Agreement the Vendor shall daily supply on consignments of the previous night's milking and the morning's milking of that day provided, however, that the Vendor shall, if so required by the Manager of the Municipal Milk Department during the months of December, January, February, and March, supply each morning's milking and each night's milking on the same day as that on which it is milked.

13. The Vendor shall supply all milk to be delivered under the Agreement by means of motor lorries, provided by and at the expense of the Corporation, at times to be fixed by the Manager of the Municipal Milk Department.

14. No milk shall be supplied under this Agreement unless it is produced at dairies registered by the Department of Agriculture under the provisions of the Dairy Industry Act 1908 and the regulations in force thereunder.

15. The Vendor shall have the right to increase the amount of 700 gallons hereinbefore agreed to be supplied by notice in writing addressed to the Manager of the Municipal Milk Department, which must reach him on or before the 31st day of July, 1921, and on receipt of such notification of increase this Agreement shall be read as if the figures 70 in sub-paragraph (1) of paragraph 2 of this Agreement had been replaced by the figures representing the number of gallons stated in such notice, and this Agreement shall be modified accordingly, but not further or otherwise.

16. The Vendor shall pay to the Corporation by way of liquidated damages 7d. per gallon on each and every gallon that the Vendor fails on any day to supply of the minimum quantity to be supplied under the provisions of this Agreement.

17. The Corporation shall have the right at any time during the period commencing 1st September, 1921, and ending 31st August, 1922, on giving at least seven days' notice to the Vendor by registered letter, addressed to the registered office of the Vendor, to require the Vendor to deliver to the Corporation the whole or any part of the balance of the milk received by it from farmer suppliers for such time during such period as the Corporation shall fix by such notice, the commencement of the time when such extra supply is to start to commence immediately on the expiry of such notice.

Provided that the Corporation shall not be entitled under the provisions of this paragraph to require the Vendor to sell to the Corporation any milk that the Vendor requires for the purpose of carrying out existing contracts for the sale by the Vendor of cheese or butter.

In witness whereof these presents have been executed by or on behalf of the parties hereto the day and years first before written—

The Common Seal of The Mangaroa Dairy Farmers' Co-operative Association Limited was hereeto affixed in the presence of—

The Common Seal of the Mayor, Councillors, and Citizens of the City of Wellington was hereeto affixed at the offices of and pursuant to a resolution of the City Council in the presence of—

Mayors, Councillors.

Town Clerk.

APPENDIX III.

STATEMENT SHOWING AVERAGE PRICE PAID TO FARMERS SUPPLYING WELLINGTON CITY COUNCIL.

<table>
<thead>
<tr>
<th>Month</th>
<th>Net Price per Gallon after Deducting Fractions and Transhipment Charges.</th>
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* The price stated from 1st October onward must be treated as an estimate only, the price the Corporation eventually paying for this supply being based on next June and July supplies.
This Deed made the    day of    1919, between No. 1
Municipal Milk Distributing Company Limited, a Company duly incorporated and registered with limited
liability, having its registered office in the city of Wellington (hereinafter called "the Company") and the
Mayor, Councillors, and Citizens of the City of Wellington, a duly constituted Municipal Corporation
(hereinafter called "the Corporation") of the other part. Witnesseth as follows:—

1. That the Corporation will (unless prevented by any conditions preventing the performance by the Corporation
of the provisions of this Agreement) from and after the     day of    1919, for a
period of two years sell and supply to the Company at the Corporation’s premises in Dixon-street day by day all milk
and cream which the Company shall require for the supply of milk consumers supplied by it in the city of Wellington.
The Corporation shall be answerable to the Company for any failure to supply through negligence of the
Corporation’s servants.

2. The Corporation warrants that all milk and cream so sold and supplied shall be of the quality salable by
law, and such milk and cream sold retail shall, except in cases of inevitable delay, be delivered by the Company within
six hours of the receipt of same by the Company; and in no case other than cases of emergency or shipping supplies
after noon of the day on which the same shall be supplied to the Company by the Corporation.

3. The Company shall purchase all such milk and cream from the Corporation at prices to be fixed from time
to time by the Corporation.

4. The Company will deliver the said milk and cream to milk consumers requiring the same in the same
condition as it in which it is delivered by the Corporation.

5. (1) The Company shall sell and deliver milk to retail consumers requiring the same at such prices as shall
allow a difference by way of increase of sevenpence (7d.) and no more per gallon between the price to be paid to the
Corporation and the price to be paid by such consumers.

   (2) The Company shall sell and deliver milk to wholesale consumers as follows:—

       (a) To such consumers ordinarily requiring deliveries of 10 gallons or less at such prices as shall allow a
difference by way of increase of threepence (3d.) and no more per gallon between the price to be paid to
the Corporation and the price to be paid by such consumers.

       (b) To such consumers ordinarily requiring deliveries of more than 10 gallons but not more than 20 gallons
at such prices as shall allow a difference by way of increase of threepence (3d.) and no more per
gallon between the price paid to the Corporation and the price to be paid by such consumers.

6. In selling or delivering milk or cream to the consumers the Company shall observe
the following covenants by the Company with the Corporation:—

   (1) All milk or cream sold and delivered to consumers by the Company shall be sold and delivered only through
or by a driver or other person licensed by the Council under War Regulations of the 11th day of September, 1918, or
such provisions of war regulations or statute as may be substituted therefor or any by-law made by the City Council
thereunder.

   (2) All persons employed in handling or delivering milk or cream shall be certified by some medical officer
to be free from disease; and shall be of clean habits and honest to the satisfaction of the Company’s Managing Director.

6. The Corporation may, notwithstanding anything herein contained, supply with milk and cream to the shop
vendors now selling in the block or blocks allotted to the Company, and also consumers in such block or blocks
ordinarily requiring more than 10 gallons of milk per day.

7. (1) (a) Milk and cream supplied by the Corporation to the Company shall be delivered between the hours
of 3 a.m. and noon; but the Company undertakes to accept delivery of its supply for delivery to retail consumers
before 7 a.m.

   (b) Emergency and shipping orders will be delivered up to 4 p.m.; but in case of ordinary shipping orders
24 hours’ notice shall be given.

   (2) (a) All cans for delivery of milk and cream shall be supplied by the Company and cleaned by the Corporation,

   (b) All servers and small utensils for the delivery of milk or cream shall be supplied by the Company and shall
be cleaned by the Corporation at a reasonable charge to the Company.
(c) The condition and construction of all servers and utensils shall be subject to the approval of the officer in charge of the Milk Depot, and such officer shall be entitled accordingly to refuse to use any server or utensil which he considers unfit for use.

(3) The Company shall not be entitled to delivery of milk until at least twelve hours after the same for the delivery of same have been deposited with the Corporation; but in no case shall such cans be received after 2 p.m. on any day.

(4) All supplies sold by the Company shall be delivered to the consumer on the day on which it is received from the Corporation. On no condition shall the Company hold surplus milk from one day for sale on any other day.

8. The Corporation shall advertise the prices to be paid by consumers for milk and cream, and every variation of price shall be similarly advertised, but every such advertisement shall be in accordance with the provisions of this Agreement and in conformity with its time intent and meaning.

9. The Corporation shall issue to each driver dockets for all supplies and returns, and shall furnish the Company with a daily statement of all such supplies and returns. All dockets shall be signed by the receiver of supplies and returns. Mere initialling will not be sufficient.

10. The Company shall be allotted a block or blocks in the city, and shall have an absolute monopoly of sales of milk and cream within such block or blocks; subject to the right of the Corporation to sell milk and cream as hereinafter provided and subject to the rights of shop vendors to sell milk and cream in their respective shops.

11. The Corporation shall advertise a description of the block or blocks allotted to the Company.

12. Cream shall, if required, be delivered to the Company in containers approved by the Corporation and supplied by the Company at such charge as may be agreed upon by the parties hereto.

13. The Company shall during the continuance of this Agreement, whenever required so to do by the Corporation, distribute with all possible despatch to each consumer supplied by the Company any circular relating to the milk business of the Corporation that the Corporation desires to be transmitted to such consumers.

14. On a petition duly signed by 30 bona fide householders resident in any locality the Corporation may require the Company to provide a suitable milk shop in such locality; and if the Company shall make default in complying with such requisition the Corporation may open a milk shop in such locality and sell milk from such shop notwithstanding anything in this Agreement contained provided always that sale at such shop shall be made in accordance with prices advertised pursuant to the provisions of paragraph 8.

15. The Corporation shall, if it is required so to do by the Corporation, at any time during the continuance of this Agreement deliver such portion of its milk supply as the Corporation thinks fit, including the whole of such milk supply in containers to be supplied by the Corporation; if and when milk is so supplied in containers the Company shall be responsible for any loss of or damage to such containers incurred by any negligence by the Company, its servants, or agents.

16. The Company may, with the consent of the Corporation, transfer all its rights and liabilities under this Agreement to any person or company approved by the Corporation.

17. The Company's business shall be valued at £3 per gallon of daily deliveries of its members at the average for the year 1918. The Council may, if it so desires, terminate this Agreement on paying to the Company the excess of such valuation (if any) over the profit made by the Company during the operation of this Agreement after deducting all expenses of working and management and a yearly depreciation of 20 per cent, on milk delivery plant and 5 per cent, on office plant; but no such money shall be payable to the Company if the Company commits any breach of this Agreement entitling the Corporation to rescind the same.

18. The Corporation shall not sell milk or cream to any person or company on terms as to price more favorable than are contained in this Agreement.

Is Witness whereof these presents have been executed by and on behalf of the parties hereto the day and year first before written.

The Common Seal of the Mayor, Councillors, and Citizens of the City of Wellington was hereto affixed at the offices of the Corporation in the presence of:

Mayor.
Councillor.
Town Clerk.

The Common Seal of the No. 1 Municipal Milk Distributing Company Limited was hereto affixed in the presence of: 

...
APPENDIX V.

The Dairy Industry Act 1908.

REGULATIONS AS TO INSPECTION, ETC., OF DAIRIES.

Inspection, &c., of Da iries.— Notice No. 616.

RANFURLY, Governor.

Order in Council.

At the Government House, at Wellington, this twenty-fourth day of December, 1900.

Present:

His Excellency the Governor in Council.

Whereas by the twenty-eighth section of the Dairy Industry Act 1908, it is enacted that the Governor may from time to time, by Order in Council gazetted, make regulations for the purpose of the registration and inspection of dairies, and otherwise: And whereas it is expedient to make and prescribe the regulations hereinafter set forth:

Now, therefore, His Excellency the Governor of the Colony of New Zealand, in pursuance and in exercise of the powers and authorities contained in the above-mentioned Act, and of all other powers and authorities in anywise enabling him in this behalf, and acting by and with the consent of the Executive Council of the said colony, doth hereby declare that such regulations shall on and after the first day of January, One thousand nine hundred and one, apply to and be in force throughout the colony.

Regulations.

In these regulations the following words and expressions shall have the meaning hereby assigned to them, unless there be something in the subject or context repugnant to such construction:—

Interpretation.

1. “Dairy” means
   (a) A milk-house, milk-shop, dairy factory, and any other place where dairy produce is collected, deposited, treated, separated, prepared, or manufactured, or is sold or offered or exposed for sale; and includes—
   (b) A farm, stock-yard, milking-yard, paddock, shed, stable, stall, and any other place where cows from which the milk-supply of a dairy is obtained are departed or kept.

“Owner” means the owner, whether jointly or severally, and includes the owner’s agent or manager: it includes also, in the case of a company, the manager, secretary, or other principal officer thereof.

Registration of Dairies.

2. Every owner of a cowshed or other building or place where cows are stalled or kept for the purpose of milking (whether now in existence or hereafter to be constructed), the milk or cream from which is disposed of by sale solely or partly for consumption in the colony, shall register such building as a dairy with the Inspector of Stock for the district in which the building is situated.

3. The application for registration shall be in the Form No. 1 set forth in the Schedule of these regulations. Such form may be obtained at the office of any Inspector of Stock.

4. Every application for registration in respect of buildings now existing shall be lodged annually with the Inspector of Stock for the district not later than the 1st day of March in each year, but no certificate shall be issued in respect of such buildings prior to the 1st April following the date of such application; and in the case of new buildings erected or dairying operations commenced after the 1st March in any year, then at least one month prior to the completion of such building or the commencement of such operations, as the case may be.

5. Every certificate of registration shall be in the form set forth in No. 2 of the forms contained in the Schedule hereto, and the certificate of registration may be withheld pending the completion in accordance with these regulations of the premises sought to be registered.

6. The fee to be paid on the grant of every certificate of registration shall be the sum of 10s. annually. Every registration shall continue in force until the 31st March following the date of registration.

7. In any case where an owner or occupier, having obtained a certificate of registration, fails to comply with the requirements of these regulations, or commits a breach thereof, any Inspector may, by writing under his hand, call upon such person to show cause why his certificate should not be cancelled. If upon inquiry the Inspector is satisfied that the certificate of registration should be cancelled, he shall call upon the owner thereof to deliver up the same, and, upon receipt, cancel such certificate by writing across the face thereof the word “Cancelled,” and adding the name of the Inspector and date. It shall be the duty of the Inspector to retain every certificate so cancelled, and to make entry in the register of the fact of such cancellation. Any person refusing so to deliver up such certificate shall be guilty of an offence against these regulations. Any owner or occupier whose certificate has been cancelled may subsequently apply again for a fresh certificate, on proof of compliance with these regulations in all respects. The cancellation of a certificate shall in no way control the right to proceed for a breach of these regulations, if the Inspector so elects.

Construction, &c., and Water Supply of Dairies.

8. It shall not be lawful for any person to occupy or use any premises as a dairy, whether so occupied or used at the commencement of these regulations or not, except in conformity with the following provisions:—

(a) In every building where cattle are stalled over the night the available air-space for each animal shall not be less than 500 cubic feet.

(b) The ground-space of every such building, including the stalls, shall be floored to the satisfaction of the Inspector, and shall be constructed with open drains or gutters running the whole length thereof along and immediately behind the stalls, and extending beyond the cowshed.

(c) Every shed or stable where cows are kept shall be lighted, ventilated, and cleansed to the satisfaction of the Inspector.
(d) Each shed or stable where cows are kept shall have the walls and roof thoroughly coated with a sufficient coating of lime whitewash, and shall be re-coated in a similar manner at least every three months, or oftener if directed by the Inspector.

(e) All droppings, manure, excreta, filth, and other impurities or offensive matter shall be scraped, swept, or otherwise collected together and removed immediately after each milking from cowsheds used merely for the daily milking of cattle, and in the case of all other cowsheds at intervals throughout the day, and always immediately before milking is commenced. Every stock-yard or milking-yard shall at all times be kept drained, cleaned, and in a sanitary condition to the satisfaction of the Inspector.

(f) Every cowshed and every milk-house or building where milk is kept or stored shall be well and properly cleansed to the satisfaction of the Inspector. No such shed, house, or building shall drain into any place into which any offensive matter shall be discharged, or directly into any sewer, unless such sewer be properly trapped to the satisfaction of the Inspector.

(g) Every farm shall be provided with a supply of pure water, to the satisfaction of the Inspector, for the purposes of watering the stock kept thereon, and for the cleansing of the milk-vessels and dairy utensils.

(h) If the Inspector shall at any time consider that the water used in or upon any dairy for any purpose, or that the food supplied to the cattle in or upon any dairy, is unfit for use, he may, by notice in writing to that effect, signed by him, call upon the owner or occupier to remedy the defect within the time specified, or to abstain from using such water in or upon such dairy for all or any of the purposes connected therewith, and also to abstain from using such food.

(i) Immediately on the receipt of such notice the owner or occupier, as the case may be, shall proceed to comply with the requirements thereof.

9. No person shall allow to remain within any milk-house or building used for milking purposes any article of a character likely to endanger the purity of the milk deposited or stored therein.

10. All cans or other vessels whatsoever used in or about any dairy, whether for receiving or storing or in the distribution of milk, shall be thoroughly cleansed within four hours of having been used for any purpose whatsoever, by first being rinsed with cold water, then scalded with hot water (or steam), scoured, and afterwards rinsed with clean water and carefully dried.

11. All conveyances used in or about any dairy for the conveyance of milk shall from time to time be thoroughly cleansed to the satisfaction of the Inspector.

12. Every conveyance used for the conveyance of milk for sale shall have the name of the owner legibly printed thereon.

13. No person shall take milk from any cow whose milk is intended to be sold or used for human food, nor permit any such milk to be taken, until the udder and teats of such cow have been thoroughly cleansed.

14. Before conveging to milk any cow the hands of the person milking must be thoroughly washed and kept cleansed until the milking and handling of milk is finished for the time being.

15. Every owner or occupier of a dairy shall provide in, upon, or about his dairy premises, and shall upon demand show to the Inspector, sufficient facilities for boiling the water required for all purposes mentioned in these regulations.

16. All milk intended for human food shall, immediately after milking, be removed from the milking-shed or stock-yard, and once at least carefully strained through some apparatus sufficient for the purpose, and then cooled to a temperature of not more than 65 degrees.

Miscellaneous.

17. It shall not be lawful for any owner or occupier of a dairy—

(a) To allow any person suffering from an infectious disorder, or having recently been in contact with a person so suffering, to milk any cow or to handle any vessel used for or containing milk for sale, or allow such person in any way to take part or assist in the conduct of the trade or business of the dairyman or milk-vendor so far as regards the production and distribution of milk; or

(b) If himself so suffering or having recently been in contact as aforesaid, to milk any cow or handle any vessel used for containing milk for sale, or in any way to take part in the conduct of his trade or business so far as regards the production, distribution, or storage of milk, until in each case all danger of the communication of infection to the milk, or of its contamination, has ceased.

18. It shall be the duty of every owner or occupier of a dairy forthwith to notify the Inspector if any member of his family or any person employed about a farm is attacked by or is suffering from any contagious disease; and similarly if any of the cows of such owner or occupier appear to be suffering from any disease or disorder of any nature tending to contaminate or injuriously affect the milk.

19. If the Inspector considers it advisable in the interests of the public health, he shall notify the owner or occupier of such dairy, as the case may be, that the dairy produce of such dairy shall not be removed therefrom; or may give such other notification as the Inspector thinks necessary in the interests of public health. Such notification shall remain in force until cancelled by the Inspector.

20. No dairyman or purveyor of milk shall purchase, supply for sale to others, sell, or expose in or about any dairy premises for sale, or mix with milk produced for sale on any dairy premises occupied by him, any milk from any cow which is or is suspected to be diseased or in an unhealthy condition, or from any cow which has calved less than four clear days.

21. No person or company shall sell or offer for sale any milk or cream other than that obtained from a registered dairy, and in any proceeding for breach of this regulation the onus of proof shall be upon the person or company charged.

22. It shall not be lawful for any person following the trade of a dairyman or purveyor of milk to use any milk-store, or permit the same to be used, as a sleeping apartment, or for any purpose incompatible with the preservation of the cleanliness of the milk-store and of the milk-vessels and the milk therein, or in any manner likely to cause contamination of the milk therein.

23. It shall not be lawful for any owner or occupier to keep or permit to remain any swine in any cowshed or milk-house, or any other place where dairy produce is collected, deposited, treated, separated, prepared, or manufactured, or sold or offered or exposed for sale, or within a distance of 50 yards from any part thereof.
24. It shall not be lawful for any owner or occupier to erect, construct, or permit to remain any low-house, manure-camp, closet, or urinal in or about, or within a distance of 50 feet from any part of any cowshed or milk-house. Nor shall it be lawful for such person to construct or permit to remain any sewage-drain or gully or other drain trap in or about any such cowshed or milk-house.

25. No conveyance used for or in connexion with the transport, carrying, or distribution of milk from or about dairy premises shall be used for the purpose of carrying any manure, excrement, or filth, pig's wash, pig's food, or to her animal or decaying vegetable matter, or for the purpose of carrying bournes' grains; and, in case any such cart shall be so used contrary to these regulations, the owner or occupier of such dairy premises, and also the owner of such cart, shall be guilty of an offence for each occasion on which such cart shall be so used.

26. No owner or occupier shall purchase, supply for sale to others, sell, or expose in or about any dairy premises, milk-shop, or store for sale, or mix with milk produced for sale on any dairy premises occupied by him, any milk, produced at, in, upon, or about any dairy premises, cowshed, or dairy which is not registered in accordance with these regulations.

27. Any notice or other document required to be served upon any owner, occupier of premises, or purveyor or milk under these regulations shall be deemed to be sufficiently served either by giving the same to him personally or by leaving the same at his usual or last-known place of abode with any person appearing to be over the age of fourteen years.

28. Any person who commits a breach of any of the foregoing regulations, or in anywise obstructs any Inspector, shall be deemed guilty of an offence, and shall be liable on conviction to a penalty not exceeding £20, and the certificate, if any, held by such person shall, ipso facto, be cancelled.

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**SCHEDULE.**

**APPLICATION FOR REGISTRATION OF A DAIRY.**

(Form 1. Regulations 3.)

[Form 1. Regulations 3.]

1. I, do hereby apply to register the undermentioned premises as a dairy under the Dairy Industry Act 1898. The particulars of such premises are as follows:—

<table>
<thead>
<tr>
<th>Premises to be registered.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situated on Section, Block, Borough [or County] of</td>
</tr>
</tbody>
</table>

- **Nature and Materials of fence:**
- **Milk-house:** Material of building:
  - Distance from cowshed: feet.
  - Distance from stockyard: feet.
  - Distance from other buildings: feet.
  - Whether closed or partly open: |

- **Calf-pens:** Material of building:

- **Fodder-shed:** Distance from stockyard: feet.

- **Drainage:**
  - **With this application the following particulars are forwarded, viz.:**
  - **With this application the following particulars are forwarded, viz.:**
    - **Distance from cowshed:** feet.
    - **Distance from stockyard:** feet.
    - **Distance from milk-house:** feet.

- **Dated this day of 19. [Signature of Applicant.]**

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**CERTIFICATE OF REGISTRATION.**

(Application No. 1.)

(Form 2. Regulation 3.)

I hereby certify that [full names, or abode and occupation] is hereby authorized to use certain premises described in application dated [date], Block in the County [or Borough] of [Block], and numbered [Block number], and consisting of a [size] feet long, [size] feet wide, and a [size] feet long, [size] feet wide, as a dairy, subject to the provisions of the Dairy Industry Act 1898, and the regulations for the time being in force thereon. Dated the [date].

[Signature of Inspector.] [District.]

[Note.—Attention is directed to the accompanying regulations, subject to the provisions of which this certificate is issued.]

J. F. ANDREWS,
Acting Clerk of the Executive Council.
APPENDIX VI.

REPORT BY THE GOVERNMENT BACTERIOLOGIST, WELLINGTON, NEW ZEALAND, 17TH FEBRUARY, 1922.

SAMPLES FOR BACTERIOLOGICAL EXAMINATION—WELLINGTON MILK.

Sample No. 1.—Taken at J. J. Geange's farm, Upper Hutt, immediately after milking. Time 5.30 p.m., 13th February, 1922 (night's milk).

No. 2.—Same milk after straining and cooling. Time 5.35 p.m. Temperature 71.6 degrees Fahr.

No. 3.—Morning's milk before cooling. Time 7.10 a.m., 14th February, 1922.

No. 4.—Morning's milk after straining and cooling. Temperature 69.8 degrees Fahr. Time 7.15 a.m.

No. 5.—Night's milk of the 13th after standing in trough of running water all night. Temperature 64.4 degrees Fahr. Time 7.15 a.m., 14th February, 1922. Same milk as Samples Nos. 1 and 2.

No. 6.—Taken at City Council's Depot in Dixon-street on arrival by motor lorry from above farm, and from the same can that Samples Nos. 2 and 5 were taken from. Temperature 72 degrees Fahr. Time 10.30 a.m., 14th February, 1922.

No. 7.—Taken at City Council's Depot in Dixon-street on arrival by motor lorry, and from the same can that Sample No. 4 was taken from. Temperature 72 degrees Fahr. Time 10.30 a.m., 14th February, 1922.

No. 8.—From bulk at the Depot before pasteurization. Temperature 69 degrees Fahr. Time 10.40 a.m., 14th February, 1922.

No. 9.—At Depot after pasteurization and cold storage, and immediately before delivery to distributors. Temperature 46 degrees Fahr. Time 8.15 a.m., 15th February, 1922.

No. 10.—Taken at time of delivery by retailer to householders. Temperature 62.6 degrees Fahr. Time 8.15 a.m., 15th February, 1922.

No. 11.—Same as Sample No. 10, but to be kept in a jug and under ordinary household conditions for 24 hours before examination.

Mr. Geange milks by machine, strips by hand, and cools by circular cooler, using Upper Hutt Town Board water. He supplies approximately 100 gallons per day from a mixed herd, and the conditions of the farm can be classed as fair.

Milk is collected from his farm daily between 8 and 8.30 a.m., and conveyed by motor lorry to the City Depot. The journey takes about two hours, during which time the milk cans are uncovered.

It will be noticed that in cases where the retailer serves a householder after breakfast time, Monday night's milk is consumed on the following Thursday morning.

Sample No. 12.—Taken at J. Purchases' farm, Newlands, immediately after milking. Time 8 a.m., 16th February, 1922.

No. 13.—Same milk, after cooling and bottling, and immediately prior to being carted on to the City Temperature 59 degrees Fahr. Time 10 a.m., 16th February, 1922.

No. 14.—Same as Sample No. 13, but to be kept in jug and under ordinary household conditions for 24 hours before examination.

No. 15.—Taken on delivery to customer in City. Temperature 46.6 degrees Fahr. Time 1.30 p.m.

No. 16.—Same as Sample No. 15, but to be kept in jug under ordinary household conditions for 24 hours before examination.

Mr. Purchases milks by hand, and distributes about 30 gallons of morning milk daily. The conditions surrounding the milking-shed and dairy are not satisfactory. The milk is strained, filtered through cotton wool, and placed in a trough of running water to cool. Spring water is used, the temperature of which was 59 degrees Fahr., and the milk cooled down to 65.6 degrees Fahr. The cooled milk is then bottled and capped and placed in boxes. Ice is placed around the bottles, and the boxes covered with sacks.

**Weather Conditions.**

Afternoon of the 13th was very hot, followed by a cool night.

The early morning of the 14th was warm and sunny; a southerly breeze, with cloudiness, set in about 9.30 a.m.

The morning of the 15th was very windy, dusty, and cool.

The night of the 16th was wet and cold.

The morning of the 16th was bright and cool, but became hot before mid-day.

All samples, after collection, were kept in a special carrier at a low temperature until delivery at the Laboratory.

(Sgd.) J. H. COWDREY, Inspector.
Examinations for Bacterial Counts of Samples of Milk Received from Inspector Cowdrey on the 14th, 15th, and 16th February were as follows:

<table>
<thead>
<tr>
<th>Date Received at Laboratory</th>
<th>Notes as Received with Specimen</th>
<th>Number of Organisms per c.c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14th February</td>
<td>No. 1. Night's milk (14th February) before cooling, 5.30 p.m.</td>
<td>584,000</td>
</tr>
<tr>
<td></td>
<td>No. 2. Night's milk (14th February) after cooling, 5.35 p.m.; temperature 22 degrees Cent.</td>
<td>856,000</td>
</tr>
<tr>
<td></td>
<td>No. 3. Morning's milk before cooling, 7.10 a.m.</td>
<td>415,000</td>
</tr>
<tr>
<td></td>
<td>No. 4. Morning's milk after cooling, 7.15 a.m.; temperature, 21 degrees Cent.</td>
<td>480,000</td>
</tr>
<tr>
<td></td>
<td>No. 5. Night's milk (15th February), taken 1.20 a.m., 14th February. Same can as No. 2; temperature, 18 degrees Cent.</td>
<td>5,600,000</td>
</tr>
<tr>
<td></td>
<td>No. 6. Night's milk (15th February), taken on arrival at Dixon-street, 10.30 a.m., 14th February; temperature, 69 degrees Fahr. Same can as No. 2 and No. 5</td>
<td>7,440,000</td>
</tr>
<tr>
<td></td>
<td>No. 7. Morning's milk, taken at Dixon-street Depot at 10.30 a.m., 14th February; temperature, 72 degrees Fahr. Same can as No. 6</td>
<td>585,000</td>
</tr>
<tr>
<td></td>
<td>No. 8. Sample taken at Dixon-street Depot at 10.40 a.m., 14th February, from bulk milk. No relation to other samples; temperature, 60 degrees Fahr.</td>
<td>15,000</td>
</tr>
<tr>
<td></td>
<td>No. 9. Taken at Dixon-street Depot at 2.20 a.m., 15th February (temperature, 49 degrees Fahr.). before being taken by motor lorry to various places in City and Suburbs</td>
<td>18,000</td>
</tr>
<tr>
<td>15th February</td>
<td>No. 10. Taken during delivery at 8.16 a.m., 15th February; temperature, 17 degrees Cent.</td>
<td>41,000</td>
</tr>
<tr>
<td></td>
<td>No. 11. Taken on delivery at 8.15 a.m. 15th February, after being kept at Laboratory temperature for 24 hours</td>
<td>278,000,000</td>
</tr>
<tr>
<td>16th February</td>
<td>No. 12. Taken before cooling, 8 a.m., 16th February; hand-milking</td>
<td>34,000</td>
</tr>
<tr>
<td></td>
<td>No. 13. Same as No. 12, but after cooling, 10 a.m.; temperature, 15 degrees Cent.</td>
<td>75,000</td>
</tr>
<tr>
<td></td>
<td>No. 14. Same as No. 13, but kept at Laboratory temperature for 24 hours</td>
<td>300,000,000</td>
</tr>
<tr>
<td></td>
<td>No. 15. Taken on delivery in City at 1.30 p.m., 16th February; temperature, 7 degrees Cent. (steel). Same milk as No. 13</td>
<td>92,000</td>
</tr>
</tbody>
</table>

Examinations of 1/10 c.c. of the Samples for Gas-producers in Glucose Broth at 37 Degrees Cent. were as follows:

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Notes as Received with Specimen</th>
<th>Gas-producers</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>No. 9 on arrival at Laboratory</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>No. 9 after 24 hours at room temperature</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>No. 10</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td>No. 11 after 24 hours at room temperature</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>No. 12 on arrival at Laboratory</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td>No. 13 after 24 hours at room temperature</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td>No. 16 on arrival at Laboratory</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Average room temperature, 18 degrees Cent.

By Authority: ALBERT J. MELLETT, Government Printer, Melbourne.