PART C.—GOVERNMENT ANALYST'S REPORT ON MILK-STANDARDS.

In February, 1908, the following regulation with regard to cow's milk was gazetted under the Sale of Food and Drugs Act :—

"Milk shall not contain less than twelve (12) per cent. of total solids, not less than eight and one-half (8·5) per cent. of solids not fat, not less than three and one-quarter (3·25) per cent. fatty solids (milk-fats), and not more than one (1) per cent. of ash."

Objections to this standard were at once raised by milk-vendors, who asserted that milk of the required quality could not be supplied during certain months of the year. In order to test this assertion the Public Health Department decided to have analyses of genuine milks made during the spring and early summer months (September, October, November, and December), the time of the year at which milk is poorest in quality.

In carrying out this investigation herds were selected as being generally representative of the various districts (care being taken that the best herds were not chosen), and morning and evening samples were taken from the same herds each month of the experiment. The districts so represented were Auckland (including Thames and Waikato districts), Taranaki, Wairarapa, Wellington, Christchurch, and Southland.

The cows were milked under the direct supervision of, and the samples taken by, the District Inspectors of the Public Health Department, who took every precaution to prevent tampering with the milk. Properly cleaned bottles containing a few drops of formalin were supplied by the Laboratory, and all samples were securely sealed, and either forwarded by post or personally delivered by the Inspector.

To make the test as severe as possible, samples were taken regularly, and regardless of weather-conditions, and the milk of the whole herd was not mixed, but each sample taken from the mixed milk of from four to ten cows (that being the quantity required to fill one of the ordinary cans).

With the milk from each herd information was forwarded as to date and time of taking samples, yield of milk, number of cows represented by each sample, weather-conditions for previous twelve hours, and also as to the breed and general condition of the cows.

In making the analyses the fat was determined in duplicate by the Leffmann-Beam process, the specific gravity by weighing in a bottle at 15·5° C., and the total solids and solids not fat calculated from Hehner and Richmond's formula. All samples below the standard were checked by gravimetric methods.

On examining these tables it will be seen that a total of 1,598 samples were analysed, and, of these, 3·69 per cent. were below the standard in total solids, 4·13 per cent. were low in solids not fat, and 3·88 per cent. were low in fat. As will be seen, however, many of these were only very slightly below the standard. Moreover, these figures include analyses of the milk from several herds which the Inspector's report showed were in very poor condition at the time of taking samples, and therefore could not be expected to give satisfactory results. (Seventy-eight samples taken under such circumstances gave forty-six—or about 3 per cent. of all samples received—below the standard, some of them being low in all three constituents.)

While the investigation was not comprehensive enough to prove beyond doubt the composition of New Zealand milk under present conditions, it was quite sufficient to show,—

(1.) That the composition of the milk varies but little in different parts of the country.

(2.) That the great majority of the herds gave only a very small percentage of samples below the standard, even when these were taken—as stated above—from a few cows only. When the analyses were averaged so as to represent the mixed milk of the herd, in every case (except in the cases quoted where the condition of the cows was poor) the result was above the standard.

(3.) A lack of sufficient good food, want of shelter, or any other cause resulting in poor condition of the cows was always followed by deterioration in the quality of the milk.

It therefore follows that if cows be judiciously selected and properly fed there will be no difficulty in meeting the requirements of the regulations under the Sale of Food and Drugs Act.

A. TABLE SHOWING THE NUMBER AND PERCENTAGE OF SAMPLES UNDER THE STANDARD IN TOTAL SOLIDS RECEIVED DURING EACH MONTH OF THE EXPERIMENT.

——	Total Analysed.	Above Standard.	Below Standard.	12·0 to 11·9	11·9 to 11·8	11·8 to 11·7	11·7 to 11·6	11·6 to 11·5	11·5 to 11·4	11·4 to 11·3	11·3 to 11·2	11·2 to 11·1
September (morning), number of samples ..	151	133	18	4	5	1	2	2	4	..	..	..
„ „ percentage ..	..	88·66	11·34	3·66	3·33	0·66	1·33	1·33	2·66	..	..	..
October (morning), number of samples ..	328	305	23	9	7	1	2	1	1	1	..	1
„ „ percentage	..	90·70	9·30	2·74	2·13	0·30	0·61	0·30	0·30	0·30	..	0·30
November (morning), number of samples ..	226	215	14	5	2	1	1	1	1	..	..	..
„ „ percentage ..	..	95·00	5·00	2·22	0·90	0·45	0·45	0·45	0·45	..	..	..
December (morning), number of samples ..	91	88	3	1	1	..	..	1	..	..	..	..
„ „ percentage	..	96·67	3·33	1·11	1·11	..	..	1·11	..	..	..	..
Whole period (morning), number of samples	796	741	55	19	15	3	5	5	6	1	..	1
„ „ percentage ..	..	93·13	6·87	2·37	1·87	0·37	0·62	0·62	0·75	0·12	..	0·12
„ (evening), number of samples	802	798	4	..	..	1	2	..	1	..	..	..
„ „ percentage ..	..	99·50	0·50	..	..	0·12	0·24	..	0·12	..	..	..
„ (morning and evening), number of samples	1,598	1,539	59	19	15	4	7	5	7	1	..	1
„ (morning and evening), percentage	..	96·31	3·69	1·19	0·93	0·25	0·44	0·31	0·44	0·06	..	0·06