

a weak solution of lead acetate. This gave a plate showing a very definite dark discoloration. An account of this work was published in the *New Zealand Journal of Agriculture*, August, 1930, Vol. 41, No. 2.

Muddy Discoloration.—Soon after this the general question of muddy discoloration was judged to be a long-time problem and handed over to the Dairy Research Institute, Palmerston North. Meanwhile cultures isolated from cheese showing muddy discoloration had already been added to the curds of experimental cheese made in the Division's experimental dairy. These cheeses were cured in a cool, dark room for a period of four months, at the end of which period they were graded and examined for discoloration. No discoloration either muddy or bleached was seen. These cheeses were then held for another three weeks and re-examined. Re-examination showed that one cheese gave a very definite indication of muddy discoloration. This one cheese was a control of an experimental cheese made in connection with the trial carried out on the addition of a suitable quantity of iron rust to cheese-milk. Moreover, the sister cheese from the same vat showed no discoloration. Cutting and cross section of the cheese showed that the discoloration had commenced from the trier-hole and had spread through the body of the cheese by means of openness and slits.

This cheese had been made under practically sterile conditions from milk of excellent quality, and all other materials were identical with those used in the remaining experimental cheese. In this way the cheese showing discoloration was perfectly controlled by all the remainder, even the sister cheese from its own vat. The one point in which it differed from the other cheese was in the fact that mould had entered the neck of the trier-hole, and by cultural methods and the cutting of fine sections of discolored cheese it was seen that mould mycelia had spread through all the discoloured area.

Subsequent examination of discolored cheeses have shown that where the plugs have been closely fitting and well sealed, no discoloration has been seen. Further experimental work has been carried out on these lines in co-operation with the Dairy Research Institute.

EXAMINATION OF METHODS PROPOSED FOR THE GRADING OF MILK FOR CHEESEMAKING.

This experiment was commenced early in September, 1930. Arrangements were made for Mr. Syron, Dairy Instructor in the Wairarapa district, to obtain thirty suppliers' samples from cheese-factories selected by himself, and to forward them in boxes specially constructed to the Laboratory for examination. These samples are packed in ice and arrive at 5.30 p.m. An extensive examination of them is carried out throughout the night.

The experiment has brought to light a type of milk common at certain times of the year about which little has hitherto been heard, but which may be of considerable interest to the industry. A type of milk that clots at from 16 to 25 degrees acidity without souring or developing an acid flavour, producing a clot that does not incorporate any of the lime salts of the milk. This type of milk is still under investigation.

The reductase test alone is not likely to be sufficient for the grading of milk for differential payments. The soundest criterion of the factory milk for cheesemaking appears to be the curd test.

EXAMINATION OF WATER-SUPPLIES OF BUTTER-FACTORIES.

During the first half of 1930 a bacteriological survey was made of three hundred dairy-factory water-supplies with a view to creating some bacteriological standard that might be applied, and also with a view to noting the types of contamination that might be introduced through an impure supply. The results of this survey showed that the bacterial counts agar incubated at 37 degrees C. varied very considerably, some cultures giving only four colonies per c.c. of water and some having counts so high as to be uncountable in a 1 c.c. plate. The coliform content was in many cases far too high.

Count of Agar.	Number of Samples.	Number of Samples showing Equivalent Count on Gelatine.	Count of Agar.	Number of Samples.	Number of Samples showing Equivalent Count on Gelatine.
1-50	31	3	300-400 ..	9	5
50-100	5	3	400-500 ..	8	5
100-200	14	6	500-1,000 ..	24	5
200-300	7	4	1,000-10,000 ..	202	269

Mould counts: One hundred samples showed mould contamination.
One hundred and fifty-seven samples showed the presence of *B. coli* in 1 c.c.

EXAMINATION OF SAMPLES OF ANNATTO FOR THE PRESENCE OF LEAD.

Out of the forty-six samples submitted for analysis nineteen showed the presence of lead by Fairhall's micro-analytical method. In most of these cases the quantity was so small as to be considered harmless.

UNSALTED BUTTERS.

Fewer samples of unsalted butter have been received in 1931 as compared with 1930, most of those received coming from Auckland.

An experiment was tried out in which gelatine cultures were made of unsalted butters instead of agar cultures, and were subsequently incubated at 3-4 degrees C. This gave an indication of butters containing a high percentage of organisms capable of working at a low temperature, and therefore liable to deteriorate butter in cold storage.

STARTERS.

A mother culture of a very fine starter has been kept going at the Laboratory for the last eight months, and has given satisfaction to all those who have used it. Several requests have been made by Instructors for cultures, and all have done extremely well.

Starter-samples have been examined when forwarded from factories. Most of these show gross contamination, and in many cases the presence of *B. coli communis*.

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