

germs are capable of producing bad flavours in butter. The yeast count and also the coliform content give an indication of the bacteriological state of the factory equipment, particularly of the churns, as these types are among the most easily destroyed by heat. The types which have been called "heat resistant" consist chiefly of yellow cocci such as are frequently found upon dairy equipment in deposits of slime and milk stone, which are located in pockets such that they escape the usual washing processes. Regular and thorough washing followed by steam sterilizing is necessary to avoid them. In many cases such heat-resistant types amount to a large proportion of the total count. The method of estimating this type proved in practice to be less reliable than the other methods. A longer time of incubation usually increased the figure, but, in the case of samples with high agar counts, the heat-resistant types failed to develop their characteristic colour, and could not be counted. For these reasons they are not included in the table. Moulds were found in only a very few samples.

Present factory methods of cream pasteurization at high temperatures yield cream which is almost sterile. Thus the various counts considered together may be assumed to reveal the extent of recontamination of the cream and butter subsequent to pasteurization, so that the results obtained should be a valuable indication of the sanitary condition of the factory plant. High figures provide definite evidence of the need for a "clean-up," even if the butter quality shows no signs of being adversely affected. A heavy infection of harmless germs may easily include one day a large number of types capable of doing serious damage.

From the figures given it is apparent that the bacteriological condition of a great many samples is satisfactory. Some 20 per cent., however, are not what they ought to be, on account of either excessive numbers, or bad types of organisms being present. In view of the fact that so much of the butter is turned out in satisfactory bacteriological condition, it should be possible for all butters to be of this standard.

As to the relation of these results to the grade of the butter, in the first place it should be emphasized that such tests are not intended to be used to grade the butter. In a few cases lower-grade butter was found to be of unsatisfactory bacteriological condition, and it was a fair assumption that the bacteria present were the major cause of the defective condition. But it is well known that besides bacteria a variety of other causes can be responsible for inferior quality. On the other hand, a number of cases occurred when finest butter was unsatisfactory in its bacterial content. This cannot be regarded as a desirable state of affairs, even if the butter suffers no apparent harm. The keeping-quality of such butter may be unsatisfactory. Bacteriological testing should serve a useful purpose in checking factory conditions and drawing attention to potential causes of trouble.

More samples are being examined during the present season, and these will be the subject of a further report. A more detailed account of the new methods together with the modifications and improvements developed by the laboratory will also be published later.

REFERENCES.

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