THE DETERMINATION OF THE NUMBER OF BODY CELLS IN MILK BY A DIRECT METHOD.

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(ABSTRACT.)

The methods in general use for determining the number of cells present in milk are all based on the use of the centrifuge. The assumption is that all but a small fraction of the cells are precipitated and also that this fraction is a fairly constant proportion of the whole and can safely be neglected. An investigation carried on in the Boston Biochemical Laboratory during the past summer has shown both of these assumptions to be incorrect. By the use of a new method, it has been found that the distribution of the cells in a given sample of milk after centrifuging varies greatly in different samples of milk, although their distribution is approximately the same in different samples of the same milk. Usually more than half are present in the cream, one-fourth or less in the precipitated slime, and the remainder in the skim milk.

The variation in position of cells in different samples is apparently due to the variable percentages of cream present. The distribution of the cells in a centrifuged sample corresponds closely to the previously known distribution of bacteria in similar samples.

The new method by which these facts have been ascertained is as follows: a measured drop (.01 c. c.) of milk to be examined is spread evenly over a measured area (1 sq. cm.) on a glass slide, dried with gentle heat, the fat dissolved out with xylol, fixed with alcohol for a few minutes, the slide again dried and over stained with methylene blue and partially decolorized with alcohol. The number of cells present is then determined by examination with the microscope. Results done in duplicate

* Read before the Laboratory Section of the American Public Health Association at Richmond, Va., October, 1909.

show a small percentage variation proving that the practical error is not a large one.

A series of tests of milk show that much larger numbers of cells are normally present in milk than has been supposed. The average number of cells present in the samples examined is approximately 1,500,000 per cubic centimeter, while numbers less than 100,000 per c. c. are uncommon.