

BACTERIOLOGICAL, PHYSIOLOGICAL, ETC.

Method of Counting bacteria in Raw or Pasteurised Milk. P. Allen.
(*J. Infect. Dis.*, 1918, **3**, 245 ; through *Rev. Sci. and Pract. of Agric.*, 1918, **9**, 1370.)
—At least twenty-four hours are required to obtain a count of bacteria in milk by the usual method of isolation on plates. A quicker result may be obtained by

adding an aqueous suspension of alumina to the milk and centrifuging the mixture, when an alumina clot is obtained containing all the bacteria free from fat and casein. The residue is spread thinly on a slide and stained with dilute methylene blue, which does not affect the alumina particles, while the bacteria can easily be counted.

H. F. E. H.

Estimation of the Nuclein Content of Yeast. C. A. Lubsen. (*Pharm. Weekblad.*, 1918, 55 (50), 1625-1628; through *J. Chem. Soc.*, 1919, 115, ii., 124.)—In analysing foodstuffs for nuclein content, pepsin-hydrochloric acid hydrolysis is employed (in which the nucleo-proteins are insoluble) to remove other proteins. The nucleins are then determined in the residue by estimating the phosphoric acid, which constitutes 4 to 7 per cent. of the nucleo-protein. The strength of the hydrochloric acid is of importance, for, if it be only 0.1 per cent., low results are obtained, but accurate results are yielded by 0.24 and even 0.35 per cent. acid, showing that with acid of this strength the nucleins are not further hydrolysed, as was suggested by some workers.

H. F. E. H.

Free Lactic Acid in Sour Milk. L. L. van Slyke and J. C. Baker. (*J. Biol. Chem.*, 1918, 35, 147-178; through *Inter. Rev. Sci. and Pract. Agric.*, 1918, 9, 1495-1496.)—Not much free lactic acid will be found in souring milk until the practical completion of the reactions of the lactic acid, first with the basic phosphates and citrates of calcium, magnesium, sodium, and potassium, and, second, with calcium caseinate. The main products of these reactions are monocalcium phosphate, free casein, and calcium lactate. From estimations of the amount of lactic acid in sour milk (1) by measurement of hydrogen-ion concentration, (2) double electrometric titration with lactic acid and hydrochloric acid, and (3) partial extraction with ether, the following conclusions have been drawn: In sour milk most of the lactic acid is in the form of lactate. Part of the free acid is in solution, and a smaller amount is adsorbed by the casein. On inoculating fresh skim-milk, pasteurised at 62° C. and cooled to 25° C., with *B. lactis acidii*, only 0.1 c.c. of free lactic acid in $\frac{N}{10}$ solution was present in 100 c.c. after twenty hours, after which the amount increased fairly rapidly and reached 20 c.c. after forty-eight hours. In milk soured at 25° C. after pasteurisation, or treatment with *B. lactis acidii*, *B. bulgaricus*, or *Streptococcus lacticus*, the total acidity varied from 70.5 to 220 c.c. of $\frac{N}{10}$ acid per 100 c.c.; the free lactic acid from 8.6 to 104 c.c.; the acid as lactate from 51.8 to 92 c.c.; and the hydrogen-ion concentration from 3.70 to 4.56. In milk soured under ordinary conditions the total acidity varied from 70.5 to 107.5 c.c., the free lactic acid from 13.1 to 34.5 c.c., and the hydrogen-ion concentration from 4.02 to 4.43. The casein begins to coagulate when the hydrogen-ion concentration reaches 4.64 to 4.78, and about 20 per cent. of the free lactic acid is adsorbed by the coagulated casein. The hydrogen-ion concentration remains constant during coagulation, the duration of which varies from thirty to sixty minutes. The characteristic odour and taste first perceived in souring milk is due to a volatile compound formed in the process, and not to lactic acid. There does not appear to be any relationship between the hydrogen-ion concentration or the acidity by titration and the first development of this compound.

C. A. M.

Detection of Urobilin in Urine. Guyot. (*Ann. Chim. anal.*, 1919, 1, 94-94.)—Ten c.c. of the urine are shaken with 5 c.c. of a 5 per cent. solution of zinc sulphate, and then, after five minutes, 5 c.c. of a 5 per cent. solution of potassium carbonate are added. The resulting zinc hydrocarbonate precipitates biliary and hæmatic pigments, and on filtering the liquid the presence of urobilin in the filtrate is indicated by the characteristic green fluorescence, the intensity of which increases with the proportion of urobilin. Most urines show a slight fluorescence, due to the presence of chromogen, which becomes partially oxidised in the course of this test. The fluorescent filtrate may be examined spectroscopically, and, when urobilin is present in large proportion, the absorption band appears at the junction of the green and blue. The fluorescence test described, however, is more sensitive than the spectroscopic method.

C. A. M.

Autolysed Yeast as a Culture Medium for *B. coli*. F. Dienert and A. Guillerd. (*Comptes rend.*, 1919, 168, 256-257.)—The liquid obtained by the autolysis of yeast can be used for the cultivation of *B. coli* in place of peptone, the price of which has steadily increased since 1914. About 500 grms. of pressed yeast are left for twenty-four hours at 50° C., and the resulting liquid (about 400 c.c.) is diluted with water to 2 litres, boiled for thirty minutes, neutralised, filtered, and diluted to 7.5 litres. The number of *B. coli* germs developing in this medium in twenty-four hours is greater than those developing in 3 per cent. peptone bouillon. The number is not increased by adding mineral salts to the solution. From 20 to 30 mgrms. per litre of indol are produced in twenty-four hours, and the same results are obtained on adding phenol to the liquid as in the case of peptone bouillon. Solid culture media are prepared by adding gelatin, lactose, etc., to the liquid. The composition of the autolysed liquid is fairly constant (amino acids as glycocoll 1.8, and tryptophane 0.15 per cent.). Peptones, on the other hand, vary greatly in composition, and often contain sulphurous acid, which has an influence on the characteristics of the cultivation.

C. A. M.