BACTERIOLOGICAL, PHYSIOLOGICAL, ETC.

Determination of Diastatic Power of Malt by Lintner's Method. G. C. Jones. (*Journ. Inst. Brewing*, 1908, **14**, 12-32.)—The author deals with some of the factors which tend to produce discordant results in the estimation of diastatic powers when carried out by different operators, even when working on the standard system approved by the Committee of the Institute of Brewing.

In the first place, the reaction of the soluble starch employed, whether acid or basic, has a considerable influence on the results, and the Committee's specification "neutral to litmus" is not sufficiently precise. The author finds alizarin paste (1 gram in 200 c.c.) a satisfactory indicator for the purpose; when the starch is neutral, 2 drops of this indicator, when added to 200 c.c. of a boiling 2 per cent. solution, give a clean yellow colour, which is changed to an incipient purple by 1 drop of $\frac{N}{10}$ alkali. The maximum diastatic action is obtained when 0·1 c.c. of $\frac{N}{10}$ acid is added to 200 c.c. of a neutral solution of starch. The reaction of the starch should always be determined and adjusted before it is taken into use. According to the author's experience, the use of water distilled in glass vessels from alkaline permanganate for preparing the starch solution is a superfluous refinement. The temperature at which the diastatic digestion is carried out has a very great influence on the results, and the prescribed temperature of 70° F. must be rigidly maintained; the specified quantity of 3 c.c. of malt infusion must also be adhered to.

In the preparation of soluble starch by digestion with hydrochloric acid, the viscosity and cupric reducing power of the product may vary greatly according to the temperature of the room in which the digestion is carried out. It is probable that the different viscosities are not of practical importance owing to the rapid liquefying action of the malt, but the different reducing powers may affect the results to the extent of 0·5°. One of the most serious and obscure causes of discrepancies between the results of different chemists is the manner of filtering the malt; it would appear that the later portions of the filtrate sometimes have a higher diastatic power than the early and less brilliant portions. The author describes the procedure he adopts in the following terms: 25 grams of malt are extracted in a beaker with 500 c.c. of water for three hours, and the well-stirred mixture is transferred to a 24-cm. filter, so that from the start a fair proportion of the grains go forward. The filter holds about half the quantity; more is added as filtration proceeds, until the whole contents of the beaker have been transferred to the funnel. A clean 200-c.c. beaker is used to collect the next 20 c.c. or so of filtrate, which is used to rinse out the 200-c.c. beaker in which the next 100 c.c. of filtrate are collected for the test. To ensure a maximum result it would be necessary to pass a portion of the filtrate a second time through the filter. It is to be noted that if a strong infusion of malt be diluted so as to represent a 5 per cent. extract, higher results are obtained than if a 5 per cent. infusion be prepared direct.

J. F. B.

The Examination of Commercial Preparations of Rennet. A. Burr and F. M. Berberich. (*Chem. Zeit.*, 1908, **32**, 313-314.)—Commercial samples of the fluid preparations and of rennet powder gave analytical results of which those shown in the following table are typical. All the samples had an acid reaction, that of the liquid preparations being much more pronounced. The ash consisted largely of sodium chloride, due to the brine used in the original extraction. The ash of five liquid preparations gave only a weak boric acid reaction, whilst the solid preparations were free from that acid. The strength was determined at 35° C. upon mixed fresh milk derived from several large herds, the values representing the number of c.c. coagulated in forty minutes; but as the same rennet may vary with different milks as widely as 1:200,000 and 1:300,000, they must only be regarded as approximate values.

	Acid Value. 100 c.c. or 100 Grams Neutralised by $\frac{N}{10}$ NaOH.	Dry Substance.	Ash.	Sodium Chloride.	Organic Substances.	Nitrogen.	Nitrogen in Organic Substances.	Strength.		Acid Value of the Milk used.
								1 c.c. or 1 gram of the Preparation in Milk at 35° C.	1 Gram of the Organic Substance in Milk at 35° C.	
	c.c.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	c.c. coagulated.	c.c. coagulated.	
Liquid Preparations:										
1	95·0	16·21	12·17	—	4·04	0·56	13·86	15,584	385,742	6·8
2	95·0	13·82	9·48	8·58	4·34	0·56	13·06	14,285	329,149	8·0
3	—	11·00	6·87	4·18	4·13	0·38	9·32	19,753	478,281	7·1
Rennet Powders:										
1	25·0	99·93	92·93	88·34	7·00	0·82	11·7	237,624	3,394,628	7·0
2	40·0	99·60	93·00	83·07	6·60	0·80	12·2	186,040	2,818,787	7·2
3	37·5	99·80	92·96	84·24	6·84	0·75	11·0	120,040	1,754,386	7·2
4	25·0	99·90	97·50	95·94	2·40	0·35	14·6	88,889	3,703,708	6·2

C. A. M.

The Hydrolytic Enzyme in the Resting Seeds of Some Gramineæ. Y. Tanaka. (*Journ. Coll. Engineering, Imp. University, Tokyo*, 1908, **4**, 39-52.)—The diastase of glutinous millet (*Setaria italica*) and of common millet (*Panicum miliaceum*) has a higher optimum temperature of hydrolysis (50° to 55° C.) than that of barley diastase investigated by J. L. Baker (*Trans. Chem. Soc.*, 1902, 1177). It rapidly liquefies starch paste, and hydrolyses the soluble starch through successive dextrins to achroo-dextrin, with the simultaneous formation of only a relatively small amount of maltose. Owing to its strong liquefying, but weak saccharifying power, equal amounts of maltose are formed by it from starch paste and soluble starch at equal intervals. The dextrins formed as intermediate products in the hydrolysis consist of erythrodextrin and α-erythrodextrin. The latter, which is probably more complex than erythrodextrin, gives a red coloration with iodine, and is very slowly saccharified by millet diastase. The starch paste of glutinous millet and other varieties of glutinous starch are liquefied more rapidly, but saccharified more slowly than ordinary starch paste by millet diastase. A greater yield of maltose is produced from starch paste by the combined action of barley and millet diastase than by the action of either diastase by itself. C. A. M.