

5437

Destruction of Yeast in the Small and Large Intestines.**B. E. MONTGOMERY, A. K. BOOR, L. ARNOLD AND O. BERGEIM.***From the Laboratories of Bacteriology and Physiological Chemistry, University of Illinois College of Medicine.*

Different varieties of yeast were incubated with a mixture of human pancreatic juice and bile for 4 hours at 37.5°. From 50 to 99% of the yeast cells were killed. One variety of yeast showed a destruction of 50% in 16 hours and 81% at 48 hours, indicating that a part of the cells were more resistant than others or that the activity of the pancreatic juice decreased rapidly on standing. The pancreatic juice killed yeast least rapidly at about pH 7 and somewhat more rapidly in slightly acid solution (pH 6) than at pH 8.

Dogs were given 12 gm. of yeast with 100 cc. of water or 100 gm. of moist meat. The animals were killed at 2 or 4 hours after ingestion of yeast, different segments of the gastrointestinal tract tied off, and microscopical and plate counts of cells in each segment made. At 2 hours after taking yeast with water over 80% of the cells were found in the ileum. At 4 hours 70% were found in the cecum and colon and of these 40% were alive. When given with meat the recovery from cecum and colon at 4 hours was 40%, of which about 40% were living.

Destruction of yeast in different sections of the intestines of dogs was studied by injection of yeast into tied off segments in the living animal. No pronounced differences in rate of destruction in different parts of the intestine were noted nor any influence of reaction of injected material on such destruction. The per cent of yeast cells killed varied from 12 to 45%.

Yeast was fed in 12 gm. portions to normal men, 3 times a day with meals or with water before meals. The fecal excretion of live cells for 6 day periods varied from 0 to 19.5%, in most cases being below 1%. The excretion was quite variable from day to day and appeared to be influenced by the length of time the yeast remained in the large intestine. A slightly greater average excretion was noted when the yeast was given with water before meals.

Yeast incubated with fresh human feces was in most cases almost completely killed in 24 hours and a majority of cells were killed in 12 hours. This supports the view that there is a destructive agent in the contents of the large intestine which plays a prime rôle in determining the final degree of destruction of ingested yeast and

probably also of other micro-organisms. This substance is apparently produced by bacterial action and its nature is being studied.

5438

Influence of High Protein Diets on the Kidney.

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According to Newburgh and Curtis¹ the type of protein fed, with respect to its amino acid content, appeared to be the most important element in the nephropathogenic action of a high protein diet. Intestinal putrefaction, however, may also play a rôle. In attempting to study these factors 36 rats were divided into 9 groups for feeding purposes. The diets contained: Salt mixture, 4%; sucrose, 14 to 15%; agar, 2%; yeast powder, 8 to 10%; 140 mg. cod liver oil per rat per day; butter fat, 15%, except in diets VII, VIII and IX; starch to make 100 parts after protein was added. The diets contained protein as follows:

- Group I. 20% casein (control).
- Group II. 50% casein.
- Group III. 30% egg albumin and 20% casein.
- Group IV. 30% meat powder and 20% casein.
- Group V. 30% powdered horn, 10% casein and 10% meat powder.
- Group VI. 30% hydrolyzed horn, 10% casein and 10% meat powder.
- Group VII. 60% casein and 10% meat powder.
- Group VIII. 50% predigested casein, 10% casein and 10% meat powder.
- Group IX. 60% casein (Harris) and 10% meat powder.

The horn was used because it was difficult to digest and should be the source of more putrefactive substances in the intestine. The hydrolyzed horn, predigested casein and finely divided casein (Harris) were used to see whether putting the proteins in a more rapidly absorbable form might have any effect.

One rat in each group was killed by chloroform after 19, 35, 70,

¹ Newburgh and Curtis, *Arch. Int. Med.*, 1928, **42**, 801.