

appears to be of little consequence when sucrose is used as the sole source of carbohydrate, while dextrinized corn starch offers the possibility of introducing serious errors and incorrect conclusions if rats resort to coprophagy when this carbohydrate is used.

Experiments are now in progress in which an attempt is being made to find an explanation for the results described, and the study is being extended to include other types of carbohydrates.

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Death of a Yeast Culture, as Registered by the Electric Resistance.

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The method used for estimating the vitality of tissues by measuring their electric resistance has been applied, in the present investigation, to a suspension of yeast heated gradually until all the cells were killed.

A suspension of 3 gm. of yeast (Fleischmann's yeast) in 3 gm. of a N/5 solution of NaCl, was heated from 15°C. to 93° and then cooled to 15° in an Ostwald's conductivity cell immersed in a water bath, and the electric resistance of the suspension was taken at each degree. The time between 2 readings was one minute. A microphone Hummer, working on a 6 volts battery, delivered the alternating current of 1000 cycles, used in the conductivity bridge. The suspension was stirred before each measurement by moving the electrodes up and down. Previous tests showed that the concentration N/5 did not affect the resistance of the cells to an appreciable amount.

The results, plotted on the curve (Fig. 1), show:

1. From 15° to 62° and from about 60° to 15° the resistance behaves like the resistance of a salt solution, and the curve coincides with the resistance curve of a salt solution of convenient concentration.

2. From 62° to 67° the resistance falls abruptly. This irreversible drop is probably due to the death of the majority of the cells.

3. From 67° to 93° and from 93° to about 60° the curve shows a resistance higher than would be expected from a salt solution; at about 60° it coincides again with the typical curve of such a solution. This phenomenon suggests that above 67° the few surviving cells are killed.

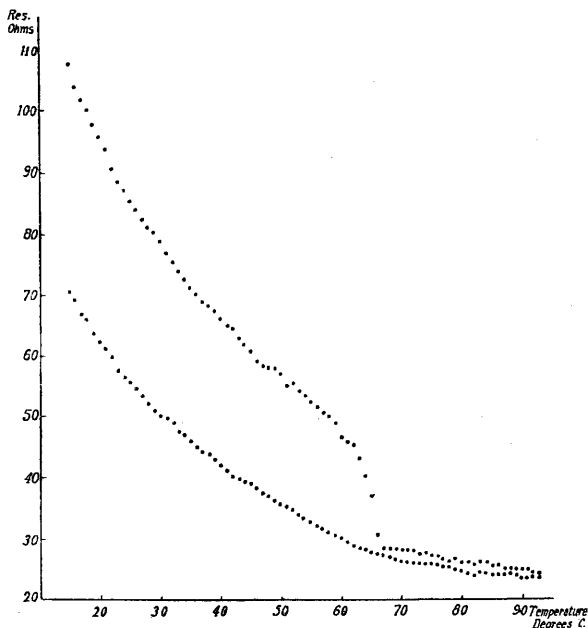


FIG. I.

Specific resistance of the yeast suspension when heated from 15° to 93° (upper curve) and when cooled from 93° to 15° (lower curve).

Yeast subjected to temperatures ranging from 40° to 95°, at intervals of 5°, during 5 minutes for each interval, and then cultured on agar plates, gave a gradually decreasing growth for temperatures extending from 50° to 75°, but traces of growth were found in specimens heated at 80°, 85° and 90°.

A 2% eosin solution did not penetrate the cells when the latter were exposed to temperatures lower than 55°. In suspensions heated at 55°, 60°, 65°, and 70° for the length of time above mentioned, the number of stained cells increased gradually. After treatment at 75° and above, all the cells took the stain readily.

The drop of resistance seems to delimitate the extension of the lethal effect of heat in yeast cells more sharply than any other indicator of death.