

# Dairy Waste Disposal Plants Could Be Smaller

Pollution removed at high rate by nonoxidative storage of nutrients by sludge microorganisms

WEST LAFAYETTE, IND.—By designing activated sludge plants for disposal of dairy wastes on the basis of purification rate rather than the rate of oxidation it should be possible to reduce the size of the equipment considerably. In experiments reported by S. R. Hoover, Eastern Utilization Research Branch, USDA, at the 9th Industrial Waste Conference at Purdue University here May 10 to 12, it was found that the rate of purification is about 10 times the rate of oxidation of waste by microorganisms. This high ratio indicates that there is an accumulation or storage of nutrients in the sludge organisms for later oxidation.

Hoover's experiments were carried out in 20-liter, mechanically stirred aerators at 30° C. using an active culture and adding skim milk solids daily. Chromic acid oxidation determined the amount of oxidizable material present in the mixed liquor, while the same method applied to centrifuged samples determined the amount of oxidizable material not yet removed by the microorganisms. Warburg techniques using aliquots of the mixed liquors provided oxidation rates.

These measurements made it possible to determine the two reaction rates. First order reactions were assumed, although in reality this was only an approximation of what was actually taking place.

High purification rates such as these inform the sanitary engineer that "detention times" (in the treatment plant) for the removal of pollution could be

in the range of 3 to 4 hours, in contrast with currently employed values of 24 to 36 hours, said R. R. Kountz, Pennsylvania State University. It might be possible to reduce the plant to a size limited only by the minimum space needed for pumps and aerators and limited theoretically by the maximum crowding of bacteria. A dairy with a milk capacity of 40,000 pounds per day would require only a 1000-gallon-capacity treatment tank instead of the 20,000-gallon tanks currently in use.

**Aerators.** Dairy wastes, especially from cheese plants, have high BOD's as well as very high immediate oxygen de-

mands. To obtain adequate transfer of oxygen to such wastes, Karl Schulze, Yeomans Brothers Co., has developed an aeration unit similar to fermentors used in the feed yeast industry.

In these units a hollow rotating disk with nozzles at its circumference is placed near the bottom of the aeration tank. Rotation at sufficient speed draws air down through the hollow drive shaft connected to the disk. On leaving the nozzles the air is finely dispersed and intimately mixed with the liquid. A larger fixed tube, the downdraft, surrounds the drive shaft. Its bottom does not quite touch the rotating disk while its top is just below the surface of the liquid. Liquid and any foam formed flows down the downdraft and is also dispersed by the disk.

## Cheese Industry Seeks Sales Increase Through Fall Cheese Festival

Market research on retail sales helps put advertising and merchandising campaign on a firm basis

CHICAGO.—The cheese industry is doing its share in the current campaign to promote an increase in the sale of dairy products. At the "Cheese Festival Rally" held here April 28 and sponsored by the National Cheese Institute and the American Dairy Association and following the annual meeting of the NCI on the previous day, H. E. McSweeney, ADA, said that over \$2 million will be spent by the cheese industry in setting up the Fall Cheese Festival here

in October. In 1953 one large grocery chain reported that during the month of the festival cheese sales were up 27% over the previous month and 40% over the same month the year before.

The ADA has a growing program to help sell cheese. Market research has helped give substance and power to the advertising campaign. On April 1 a cooperative program with the Department of Agriculture was started to measure continuously the retail sales of cheese along with other dairy products. A government contract with Market Research Corp. of America provides for a measure of actual cheese purchases by a cross section of the U. S. population; monthly sales reports and quarterly sales reports by regions will be made.

**Cheese for Dieters.** The industry was advised by Wilda A. Coleman, Mick-or-Mack Stores, to take advantage of the public's interest in proper foods by reminding them that cheese provides protein in a palatable form for people on reducing diets. Such persons should not reduce protein intake. There are also many people who do not like milk; they should supplement their diets with more cheese to obtain valuable nutrients present in milk. Proper diet is especially important for older people and they should be encouraged to use more cheese. The baby food industry seems an almost untouched field for the cheese industry. Only one baby food manufacturer now offers a strained cheese food, she said.

S. M. Hoover (left), Eastern Utilization Research Branch, USDA, and R. R. Kountz, Penn State, answer questions on biochemical oxidation of dairy wastes

