

## Testing Equipment—A Practical Aid to Efficient Sanitation

LEE H. MINOR

*Technical Service Department, Wyandotte Chemicals Corporation, Wyandotte, Michigan*

THE quality of food products as well as the health of the nation depends much on the proper use and control of cleaning and sanitizing materials. Through the proper use of suitable cleaning materials and effective yet safe germicides, food processing equipment and food containers are easily made physically clean and bacteriologically safe. In order to assist food processors and manufacturers in obtaining these necessary results, the use of efficient testing equipment is almost indispensable.

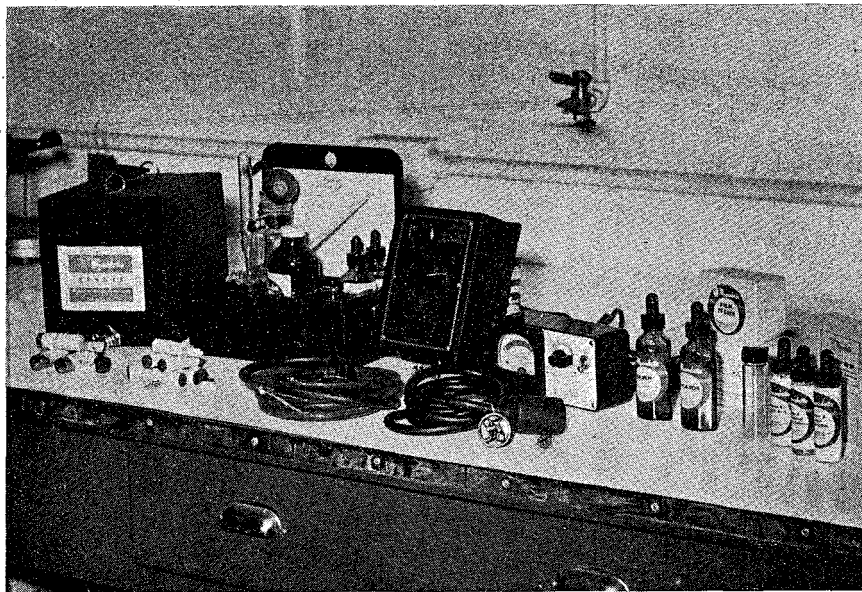
The Service Testing Equipment, shown in the accompanying photograph, reading from right to left is:

Germicidal Test Kit  
Film Tester

Control Meter  
Alkamefer  
Titration Teskit  
Germicidal Test Papers  
Alkacid Papers

The germicidal Test Kit is used for determining the amount of available chlorine in parts per million in germicidal rinse solutions. The test is based on the standard laboratory method used for the determination of available chlorine using starch potassium iodide, acetic acid, and a tenth normal solution of sodium thiosulphate.

A germicidal water rinse solution containing available chlorine turns blue in color upon the addition of starch potassium iodide. The acetic acid is used to liberate chlorine which may be



This testing equipment may be easily and quickly operated by regular plant personnel

chemically combined with alkaline materials such as sodium or calcium. Chlorine combined in such a manner, according to a report from Michigan State College by Mallman and Ardrey, "is not free to act in a germicidal capacity."\*

However, when testing a solution of a germicide containing chloramine-T for available chlorine, it is not necessary to make use of the acetic acid. This germicide containing chloramine-T dissolves rapidly and completely in water and all of its chlorine is immediately available for germicidal purposes.

Note that for hypochlorite solutions this test shows the amount of available chlorine present in the germicidal rinse solution from which the sample was taken, plus that chlorine which was chemically combined and not free to act in a germicidal capacity until it was released by the addition of acetic acid. The use of an acid to release chemically combined chlorine in calcium and sodium hypochlorite germicidal rinse solutions increases the corrosive action of these materials on metal and other surfaces.

This determination of the amount of available chlorine with sodium thiosulphate is approximately equivalent to 10 p.p.m. of available chlorine for each drop of the sodium thiosulphate used. When the chlorine is combined or "locked in," this test may show a higher strength of available chlorine than is present in actual use for germicidal purposes.

Intelligent use of a Germicidal Test Kit will aid the staff to maintain efficient sanitation.

Films which are sometimes found on equipment, glasses, and dishes following the cleaning and germicidal treatment are not only unsightly but have been found to harbor bacteria. High bacetria counts as well as some off-flavors in food products have been eliminated by the removal of these inno-

cent appearing films on equipment. To remove and to prevent the reoccurrence of these undesirable films it has been found advantageous to locate the source responsible for the film formation. The use of a Film Tester aids in determining whether the source of the film is:

1. A precipitate deposited by the reaction of the minerals in the wash water with some of the chemicals in the cleaning materials, or
2. Oily or greasy substances which were not completely removed because of improper cleaning procedure.

In some instances it has been found that rinse solutions containing the recently introduced quaternary ammonium compounds produce films which adhere tenaciously to the surfaces of equipment and glasses due to a reaction with food products present.

Use of a Film Tester in many instances has aided in locating the sources of possible insanitary conditions.

The Control Meter is an electrical instrument which automatically registers on a dial the concentration of a cleaning solution by percentage. With its use uniform concentrations of cleaning solutions are constantly maintained in can and dishwashing machines. The instrument is also used to determine whether an excess amount of the solution in bottle washing machines is being carried over and lost in the rinse water.

In machine bottle washing operations the proper caustic concentration of the washing solution is necessary to provide physically clean and bacteriologically safe bottles. The Alkameter is an electrical instrument which registers on a dial the percentage of caustic concentration in the washing solution.

The Titration Teskit shown here is a miniature laboratory equipped with a burette, standardized acid solution, indicator solutions, and other chemicals used for making chemical tests and titrations. The Teskit is easily hand carried and is convenient to use near a bottle-washing machine or other

\* Bul. No. 91 (1940). Michigan Eng. Exp. Station.

equipment where samples of solutions to be checked are obtained.

Germicidal rinse solutions can be quickly checked for the approximate parts per million of available chlorine with the use of Germicidal Test Papers. These papers are impregnated with starch potassium iodide and turn blue in color when dipped into rinse solutions containing available chlorine. After dipping the test paper into the germicidal solution the approximate number of parts per million of available chlorine contained in the solution can be ascertained by matching the blue color of the test paper with the colors on a standard color chart.

Since chloramine-T germicidal solutions do not bleach, the color of the test paper does not change. However, as solutions of sodium and calcium hypochlorite chlorine have a bleaching ac-

tion, the blue color of the test paper bleaches or fades soon after it is used for checking the available chlorine content.

Many times it is of interest to know whether a solution is alkaline or acid in reaction, or whether a surface has been completely rinsed free of cleaning solution. This information can quickly be obtained with the use of an Alkacid Test Paper. These papers have a range from a pH of 2, a strongly acid reaction, to a pH of 10, a strongly alkaline reaction.

Just as the "rule of thumb" days have passed in dairy plant operation so too have they passed in checking sanitary procedures. Testing equipment of this type has been well proved over a period of years as a practical aid to efficient sanitation.

## Amendments to USPHS Milk Code

*(Continued from page 155)*

The lip-cover cap requirement has been changed so as to require that single-service containers shall be so constructed that nothing on top thereof can contaminate the contents or the pouring lip when the container is opened.

A new provision is made in the ordinance governing milk tank cars and tank trucks, and detailed specifications covering construction, cleaning, bactericidal treatment, storage and handling will appear in the Code.

Many other changes have been adopted to improve the specifications of items 16p and 17p on insurance of adequate holding time, regenerator pressures, other features of automatic systems, equipment tests, and pasteurizer valves, but these are too technical and lengthy to discuss at this time.

## SUMMARY

In June 1947 the USPHS Milk and Food Sanitation Advisory Board met to consider several hundred proposals from public health officials and the dairy industry for amending the 1939 edition of the USPHS Milk Ordinance and Code. The most important changes adopted have been discussed. A tentative draft of the revised ordinance, subject to change, was issued in mimeographed form in August 1947, and the complete revised ordinance and code will be issued as a printed bulletin by the middle of 1948. It is believed that certain changes contributed by the Committee on Milk Regulations and Ordinances of the International Association of Milk Sanitarians will make this ordinance more universally acceptable, thus promoting national uniformity of milk standards to the benefit of both the public health and the industry.