Potential Health Hazards Associated with Reusable Foodservice Utensils

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ABSTRACT

Health hazards of reusable foodservice utensils are reviewed, beginning with Crumbine’s studies in Kansas City in 1907. Reports of transmission of communicable diseases through improperly sanitized utensils are included. Despite determined efforts by public health personnel and foodservice managers, utensil washing practices in public eating places continue to be unsatisfactory, with many utensils exceeding bacterial limits.

Cognizant of the continuing demand for improved management of the nation’s solid waste problem, the Environmental Protection Agency (EPA), in its Third Report to Congress, recommended “source reduction” as one solution to the problem. The report (11) noted that generation of waste could be reduced by restricting consumption of materials and products and product reuse was offered as one of the technological options. Although a preliminary comparison between reusable plates and paper plates was included in the report, the EPA has contracted with Midwest Research Institute for a comparative study of the environmental impacts of reusable and disposable food service utensils, including cups and plates. Because public health aspects are frequently overlooked in these kinds of studies, we believe it is important to provide a review of the literature dealing with the health hazards of reusable food service utensils.

EARLY STUDIES

In 1907, Crumbine (6) made daily swabbings from the common drinking cups and glasses of all trains entering Union Station at Kansas City and from cups used at a suburban public school. He found that the cups “were a grave potential danger, for many who used them were capable of transmitting disease and undoubtedly did so.”

Other isolated reports (32) were found in the early medical/health literature concerning the transmission of communicable diseases through improperly cleaned and disinfected eating utensils. Lynch and Cumming (21) described experiments conducted with Army troops during World War I which demonstrated that improperly washed and sterilized (“sanitized”, as currently defined) dishes could carry bacteria, and were conveyors of disease. Cumming et al. (7, 8, 9) investigated transmission of influenza, pneumonia, and tuberculosis and concluded that one of the foremost avenues of transmission of these saliva-borne diseases at that time was through eating utensils. Other investigators (29) described the extremely poor methods of hand dish cleansing practices prevalent in many public eating places. Such reports led many public health officials to conclude that there was a lack of appreciation on the part of the public of the possible danger of disease transmission through improperly sterilized eating utensils, and that the sanitation of many restaurants, hotels, etc. was far below the accepted standard of cleanliness and safety.

CLEANING METHODS INADEQUATE

By the 1930’s it was realized (23) that a definite need existed for development of methods for effective cleaning and sterilization of public eating utensils as well as educational and regulatory programs to insure the appropriate use of these methods. Repeal of Prohibition and proliferation of taverns and roadhouses in the mid-30’s was accompanied by poor sanitary practices in the dispensing of alcoholic beverages. Concurrent with revelations by Mallmann (28) of inadequacy of cleansing techniques for drinking glasses in taverns were reports of a marked increase in Trench mouth among the general population, a disease that can be transmitted by inadequately cleaned eating utensils and glassware. Surveys (22) of glassware in alcoholic beverage dispensing places showed the presence of the bacteria which caused Trench mouth in significantly large numbers, even in places that were making every effort to clean glassware effectively.

In the late ‘30’s many articles appeared in the literature discussing the ineffectiveness of commercially available “disinfectants” (10, 25, 24); the continued widespread ignorance concerning proper and effective methods of sanitizing dishes and glassware (5, 16); and the lack of a reliable method to enable the public health investigator to determine whether glasses and dishes have been properly handled (12). Another problem was
the frequency of improper operation of mechanical
dishwashers due to ignorance of the most effective
holding time and temperature of the wash and rinse
waters, and the type and amount of chemical disinfectant
to use. Despite determined efforts by public health
personnel and some restaurant proprietors to improve
sanitizing operations, most food service personnel felt
that dishwashing was satisfactory as long as the dish
appeared reasonably free of visible soil and few
complaints were made by the clientele. Many of the
articles (26) published in the '40's focused on the
importance of proper dishwashing procedures.
Techniques for obtaining bacteriological standards
were sought (13). Surveys (15) of dishwashing practices
in public eating places still showed that the quality of
washing (as measured by bacteriological tests) was
generally very poor throughout the country. Occasional
instances of disease outbreaks in institutional popula-
tions were traced (21) to inadequate sanitization and
storage of dishes.

MINIMUM STANDARDS

In 1950, the official minimum requirements for
effective machine dishwashing were promulgated (30) as
not more than 100 microorganisms per utensil surface,
and it was felt that this standard could be consistently
maintained by proper machines or manual methods.
Although minimum dishwashing standards were now
set, there were many instances (3, 27) where manage-
ment failed to train and supervise food service workers
in proper cleaning operations.

Since restaurants are frequented for the most part by
persons in good health, the danger of infection from
eating utensils is relatively low, except during epidemics.
In hospitals, however, the possibility of infections from
eating utensils is much greater because patients may
carry large populations of infectious bacteria. Therefore,
emphasis shifted toward sanitation problems in the
dietary departments of hospitals (I). Articles (17)
exploring this problem in hospitals stressed the
importance of proper sanitary habits of kitchen workers.
Reports (19) in the '60's suggested that the increasing
number of illnesses in hospital patients might be traced to
consumption of foods that were contaminated during
preparation and service. Many workers failed to employ
basic principles and practices of sanitation (2, 18) and
the unsanitary storage of clean dishware (14, 20) was
another problem which emerged.

RECENT OBSERVATIONS

More recent reports indicate the existence of many of
the same unsanitary practices noted in the past. Walker
(23), in a bacteriological study of reusable beverage
glasses in 66 American hotels and motels, found that
over 80% of the "washed and sanitized" glasses exceeded
the standard of 100 organisms per glass. Sub-standard
glasswashing practices were identified as a major factor
in the bacterial content of the 430 glasses tested. In an
extensive survey, conducted in 1974 at the request of the
Comptroller General of the United States (4), the Food
and Drug Administration (FDA) inspected 185 restaur-
ants selected at random in nine metropolitan cities and
found 90% unsanitary, 54% with inadequate facilities for
washing and sanitizing equipment and utensils. They
concluded that "equipment and utensils that are not
thoroughly cleaned, sanitized, and maintained in good
repair can harbor accumulations of food and other
residues that support harmful bacterial growth, which
may be transmitted to customers and employees."

It is extremely difficult to develop epidemiological
evidence to support the thesis that lack of sanitization
and cleanliness in handling utensils in food establish-
ments is likely to result in demonstrable disease. The
contacts are transitory, the sources are not readily
identified, and the illnesses are frequently not properly
diagnosed or reported. Further, as Walker (33) notes,"Questions involving the health effects of environmental
bioloads are particularly prone to uncertainty and the
health impact of various environmental levels of
microorganisms on food or beverage contact surfaces are
often unknown." Yet, as Walker states, "public health
students recognize that the larger the number of bacteria
present, the greater the probability of some of them
being harmful."

We believe that the potential health hazards
considered above must be included in any comparative
study of disposable and reusable food service utensils.

REFERENCES

1. Anonymous. 1953. Scientific criteria in procedures for cleaning
eating utensils. Hospitals 27:115-117.
2. Cabot, E. E. 1971. These careless practices pose bacterial hazards
3. Cain, R. M. 1951. Personnel: the key to successful cleaning of
eating utensils used in public eating and drinking establishment.
restaurant sanitation found largely ineffective. Report to
Congress. 36pp.
5. Cox, W. C. 1938. Use of dishwashing machines: pasteurization of
7. Cumming, J. G. 1919. Influenza-pneumonia as influenced by
dishwashing in 370 public institutions. Amer. J. Public Health
9:849-853.
8. Cumming, J. G. 1920. Can the tuberculosis transmission rate be
borne infections: their transmission through eating utensils. Mod.
and products for sterilization of beverage glasses. Amer. J.
Public Health 26:165-166.
11. Environmental Protection Agency. 1975. Third report to congress:
resource recovery and waste reduction. Pub. No. SW161, GPO
Wash., D.C.
logical examination of glassware or china for sanitary quality.
Public Health 26:1211-1214.