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THE MICROBIOLOGY OF DISHCLOTHS IN THE HOME KITCHEN

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Introduction

A continuing question is, "How contaminated are the dishcloths in our home kitchens, and what is the correct way to keep them adequately safe?" You do not need to waste money doing expensive microbiological tests when personal hygiene and/or food handling behaviors of foodservice workers is inadequate. Employees must be educated and trained, and the behavior of employees must be measured to provide quality assurance.

Let me add some facts to the discussion about dishcloths and sponges. Recently, 3M introduced a new O'Cello sponge (which does not kill bacteria; it just does not let them multiply) based to an extent on the reference work of Enriquez et al. (1997). Actually, the key individual in this is Chuck Gerba (the last author). He has been looking at household microbial contamination for years. He reminded us a few years ago that the bathroom toilet had less microbial contamination than the kitchen sink, because most people sanitize the toilet more often than the kitchen sink. Gerba helped ABC, about 2 years ago, with a "60 Minutes" segment on sponges and rags in the home. This study, presented on television, showed the presence of some *Salmonella*, a lot of *Staphylococcus*, and some other pathogens in household sponges and rags. The 1997 study presents results of the microbiology analysis of sponges and cotton dishcloths.

There has also been discussion about using the microwave to reduce microbial counts in dishcloths and sponges. This is a scientifically validated method, but the item must be covered with a paper towel, or in a plastic bag. Otherwise, the fan that removes the steam during microwaving cools the surface of the cloth or sponge so much that there is not good microbial inactivation. (This is a real critical control point.) There are excellent data from a study done about 30 years ago on the problems of microbial inactivation associated with food surface evaporative cooling.

Tests by HITM

In the winter of 1996-1997, we did some work with a TV station here in the Twin Cities to see if we saw the same problems in the homes of the people who work at the station. These people were average Americans, and the data on the dishcloths were obtained from their kitchens. The following table shows the test results.

DISHCLOTHS
(20 ml of sterile water was added to each dishcloth)

Dishcloth #	APC CFU / ml	Coliform CFU / ml	<i>E. coli</i> CFU / ml	<i>Staph.</i> (Coag +) CFU / ml	<i>Salmonella</i> CFU / ml	<i>B. cereus</i> CFU / ml
1	500	<10	<10	<10	negative/cloth	30
2	3,300,000	1,800	<10	<10	negative/cloth	<10
3	1,600	<10	<10	<10	negative/cloth	<10
4	300,000	50	<10	<10	negative/cloth	<10
5	25,000,000	100,000	<10	5,000	negative/cloth	110,000
6	26,000,000	14,000	<10	60,000	negative/cloth	1,100,000

What do the data show? The aerobic plate count (APC) of the dishcloths ranges from 500 CFU/g to 26,000,000 CFU/g. However, no one was getting sick. When we looked at practices in the kitchen to explain the differences in microbial populations found on the dishcloths, it was the same as it is most of the time. The dishcloth containing the lowest count came from a household that replaced used dishcloths each day. Dishcloths containing high microbial counts had been used in household kitchens 5 days or more, and were never dried out during that time. There are usually enough nutrients remaining in dishcloths and sponges to support the growth of most bacteria. If the sponges and dishcloths are dried after use, the bacterial growth is halted. However, the best practice is to use a clean sponge or dishcloth each day, and to also use a brush for washing dishes and kitchen utensils. The brush can be rinsed out easily and dried rapidly.

Among other answers to this problem is the FDA food code recommendation: "Keep the cleaning cloths in the sanitizer bucket." This practice does not prevent the microbial population from increasing, because after an hour or so, the organic material obtained from cleaning neutralizes the sanitizer and the microorganisms begin to multiply.

Reference

Enriquez, C. E., Enriquez-Gordillo, R., Kennedy, D. I., and Gerba, C.P. 1997. Bacteriological survey of used cellulose sponges and cotton dishcloths from domestic kitchens. Dairy Food Environ. Sanitation. 17:20-24.