A Strategic Cleaning Assessment Program: Cleanliness of the Menu at Restaurants

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ABSTRACT

The importance of clean food contact surface has been recognized however, the cleanliness of non-food contact surface such as menus is thought to be under-estimated. The aim of this study is to determine the cleanliness of menus at a restaurant, evaluate current cleaning protocols and provide recommendation for improving menu cleanliness. This study will use microbiological data to analyze the cleanliness of the menus. A pretest verified the most commonly touched areas of the menu by consumers. Based on the result of the pretest, menus will be collected from casual-family dining restaurants and analyzed for total microbial counts. Anticipated results will help guide restaurant managers establish effective cleaning protocols and improve food safety for the general public.

Key words: *restaurant menus, cleanliness, hygiene standards, microbiological data analyses.*

INTRODUCTION

Cleanliness of the environment in which food is being prepared and consumed is critical in avoiding the possibility of contracting a foodborne illness. Foodborne illness outbreaks can certainly create a bad reputation for the restaurant. Also, issues of food safety are especially critical for restaurant managers and owners; perceptions of poor sanitation might lead to consumers choosing a safer restaurant resulting in a loss of revenue. Previous research has found that 70 percent of respondents would no longer buy food from food service establishment where

they had concerns about hygiene (FSA, 2004). A study conducted by Knight, Worosz, and Todd. (2007) found that people who perceived that a restaurant was "not at all" committed to food safety were less likely to choose the restaurant when eating out. In fact, at least one study found that cleanliness was the most important determinant for consumers' perceptions of restaurant food safety (Henson, Majowicz, and Masakure, 2006).

Moore and Griffith (2002) said that "'Cleanliness' is, however a relative concept – what is acceptable as being 'clean' is one situation may be unacceptable in another" (p. 318). Consumers are likely to judge the cleanliness of the restaurant based on visual perceptions. In addition, although health inspectors use an inspection manual and the food code to inspect restaurants, their judgments also rely heavily on visual assessment. In fact, a previous study found health inspectors did show variations in regards to their opinions of cleanliness (Lee, Almanza, Nelson, & Ghiselli, 2009).

Microbiological assessment of restaurants is generally not done as part of the inspection process since traditional microbiological analyses take up to 48 hours after the sample is collected. Also the equipment that provides a real-time microbiological analysis is expensive. This has become an issue however, as bacterial and viral contaminations are not detectable by visual assessment. In fact, the results of using hygiene swabs and agar contact plates have shown that visual inspection is a poor indicator of cleaning (Griffith, Cooper, Gilmore, Davis, & Lewis, 2000; Moore & Griffith, 2002). Even further, consistent cleaning of certain surfaces outside the kitchen may not be done in all restaurants. This may be particularly true for furniture, equipment and other fequently used items such as menus. Cleanliness of the menu may be simply done by visual inspection or by touching the menu. Standards or protocols to clean menus or even to determine whether the menu needs to be cleaned have not yet been established.

The aim of this study is to determine the cleanliness of menus at a restaurant and provide a protocol to clean the menu for the restaurant staff. In order to assess the level of cleanliness of the menu, this study uses a quantitative microbiology data sampling method.

LITERATURE REVIEW

The cleaning of equipment or furniture in the restaurant depends on the protocols of that facility. Capable restaurant managers institute their own cleaning and sanitizing schedule for the restaurant to facilitate planned cleaning and sanitizing procedures. Factors influencing the choice of hygiene practice methods are cost, time, staff, ease of use, management needs, and nature of the food contact surfaces (Griffith, et al., 1997). Table 1 shows factors that might influence the choice of hygiene practice methods at food service establishments.

Table 1
Factors influencing the choice of hygiene monitoring methods

Factors	Comments
Cost	Cost of cleaning and the assessment of cleaning efficiency must be optimized especially for designated critical control points. This may include capital as well as operating costs.
Time	The speed with which results are required. For a designated critical control point this should be in time for corrective action to be taken.
Information required	Is information on residual surface microorganisms needed or is the level of surface cleanliness more important?
Staff & Ease of use	Level of training and availability of staff
Management needs	Requirements for due diligence defense, second or third party audits
Storage of menus	How the menu is stored may influence the selection of hygiene monitoring method

(modified from Griffith et al., 1997)

The importance of the cleanliness of the food contact surface has been recognized however the cleanliness of non-food contact surface such as menus is thought to be under estimated. A previous study (Holtby, Tebbutt, Grunert, Lyle, & Stenson, 1997) suggested that potential pathogens can multiply on surfaces and those surfaces can play a critical role in foodborne illness. These surfaces are mostly touched by staff or consumers and their hands can be the medium for bacterial or viral transfer to the menu or vice versa. A previous study found that, surprisingly, staff did not wash their hands well even when they were asked specifically to do so (Tebbutt et al., 2007). Staff at food service establishments are required to wash their hands after touching soiled materials, food, or after using a restroom. However, it is unknown whether consumers wash their hands in accordance with proper hands washing methods.

Cleaning may also not be done properly. In fact, one study found higher bacterial counts on tabletops in restaurants and bars that had already been cleaned with a dishcloth than before they were cleaned (Yepiz-Gomez, Bright, & Gerba, 2006). Hence, surface sampling has become important in determining the sanitary condition of environmental, food and hand contact surfaces (Scheusner, 1982).

Several studies have found microbiological contamination in foodservice kitchens. A previous study, for example, which investigated the cleanliness of cutting boards, faucet handles on sinks, refrigerator door handles, microwave oven controls and bin lids showed that the majority of visually clean surfaces failed to meet hygienic conditions. (Tebbutt, Bell, & Aislabie, 2007). In another study, 90% of the surfaces sampled in a cheese production facility appeared visually clean although 60% of these were found to be contaminated with bacteria (Moore & Griffith, 2002). A study of the cleanliness of surfaces in a hospital kitchen showed that cleaning and disinfection in a hospital kitchen should even be improved (Aycicek, Oguz, & Karci, 2006). Inadequate cleaning has also been found in small food businesses (Tebbutt et al., 2007). Finally, a study that examined the cleanliness of four food processing plants after their normal cleaning procedures had been carried out found that the number of surfaces revealed to be unacceptable using both ATP bioluminescence and traditional microbiological methods were more than those that were failed by visual assessment (Moore & Griffith).

The introduction of Hazard Analysis Critical Control Points (HACCP) into food operations has brought changes into the food industry (Griffith, Blucher, Fleri, & Fielding, 1994). HACCP requires identification and implementation of effective control and monitoring procedures at critical control points. Food operations then monitor the system in time for remedial action to be implemented. Implementation of HACCP into food service establishments has brought an increased consciousness of sanitation conditions necessary to avoid foodborne illness outbreaks.

METHODOLOGY

Pretest

In order to verify the most accessed area of the menu by consumers, a pretest was conducted. The purpose of the pretest was to determine the most appropriate surface area to sample for the main study. Because restaurants use a variety of different menu styles, this pretest included four different menus for testing. Two sizes of menu paper were tested (letter and legal), as well as single and multiple page formats. The single page menus listed a similar number of food items using the same font size and style. The multiple page menus also listed a similar number of food items using the same font size and style. The paper menus were made with a high quality glossy paper similar to that used by many restaurants. The first menu was letter size with one page printed on the front and the name of the restaurant on the back (A). The second style was a similar one page menu, except that it was printed on legal size paper (B). The third style was letter size, but contained four pages of printing in addition to the cover and back of the menu (C). The fourth style was again similar in that it also contained four pages, but was printed on legal size paper (D).

Four different versions of the menu were therefore presented to study participants. The research investigator and three field workers visited a class in a Hospitality and Tourism Management Department with 36 students. A total of 17 students were recruited. The participants were asked to rub their hands with UV reflective liquid (i.e. Glo-Germ) which left traces on the menus when they were touched. A menu was given to participants by a designated person as the participants were sitting at a desk. To ensure use of each of the menus, the participants were asked each time they were handed a menu to fill out a form that specified their choice of entrée, beverage, and dessert. After collecting the first menu from the participants, the second menu was presented to the participants. Similarly, after completing the second menu, then the third menu, and finally the fourth menu was presented. A coupon for a gourmet cookie was then given to the participants in appreciation for their participation.

Collected menus were analyzed visually using an UV lamp and a transparent grid marked with approximately 2.8 inch squares to determine which areas of the menus were the most touched by consumers. This data will then be used to map consumer contact areas on the menu. Patterns of areas touched by participants were determined by recording each time an area had been touched one or more times.

The version which was a one page letter size menu (A) did not show distinct patterns and was therefore excluded from the analyses (see Figure 1). Further testing is being conducted on menu A.

Figure 1. Mapping of the most accessed areas by participants
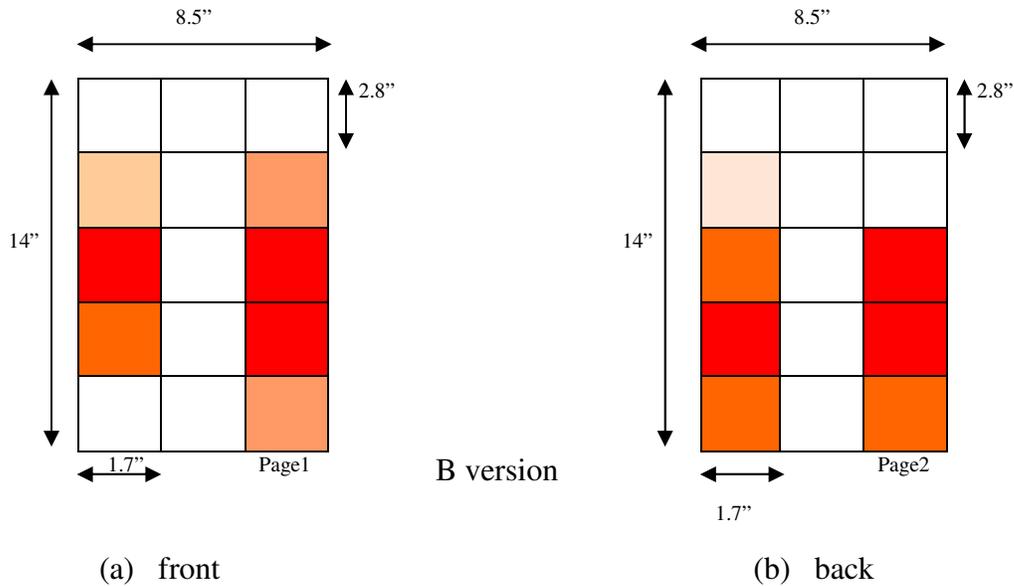
(a) front   (b) back

* Note: Darker color indicates a more accessed area as compared to a lighter color

(a) front   (b) back

* Note: Darker color indicates a more accessed area as compared to a lighter color

8.5"

2.75"

11"

1.7"   Page2   C version

8.5"

2.75"

11"

1.7"   Page3

8.5"

2.75"

11"

1.7"   Page4   C version

8.5"

2.75"

11"

1.7"   Page5

8.5"

2.75"

11"

1.7"   Page6   C version

8.5"

2.75"

11"

1.7"   Page7

8.5"

2.8"

14"

1.7"
Page1

D version

8.5"

2.8"

14"

1.7"
Page6

(a) front

(b) back

* Note: Darker color indicates a more accessed area as compared to a lighter color

8.5"

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14"

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Page2

D version

8.5"

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D version

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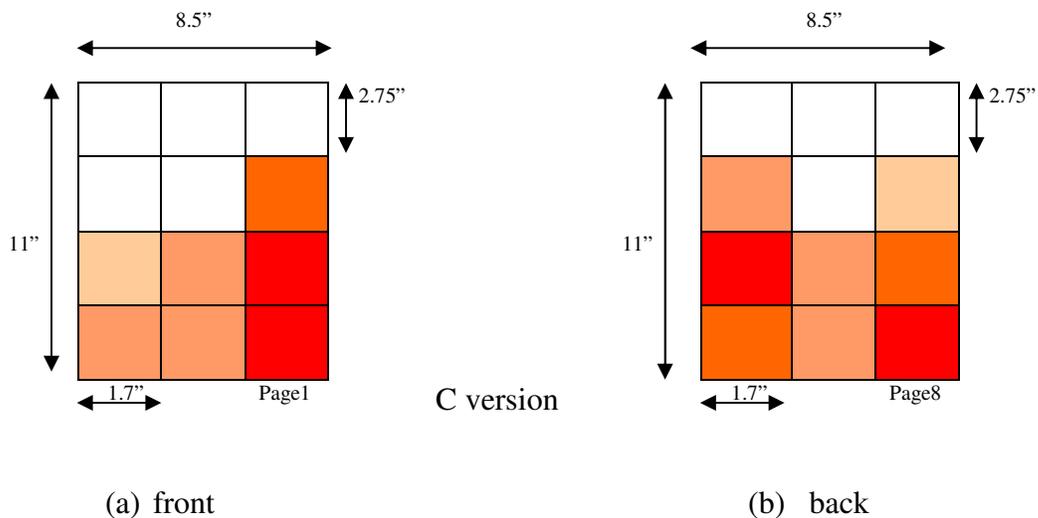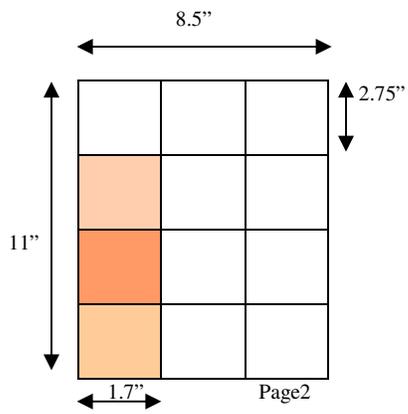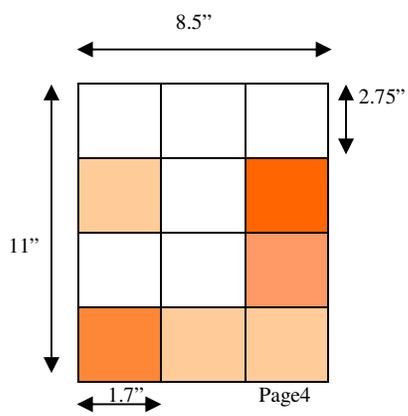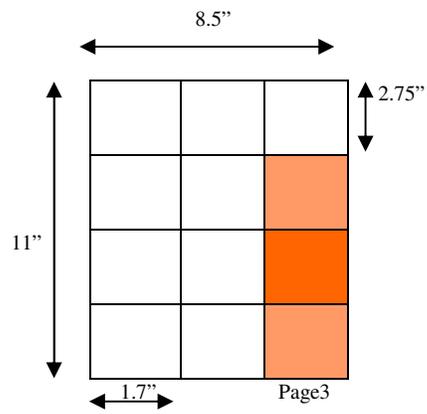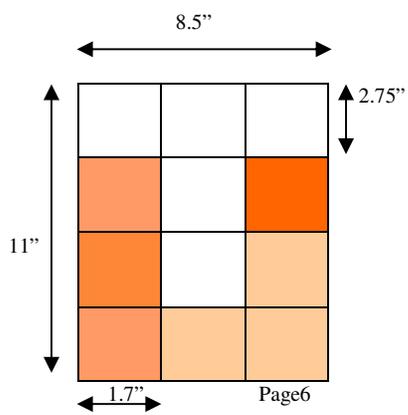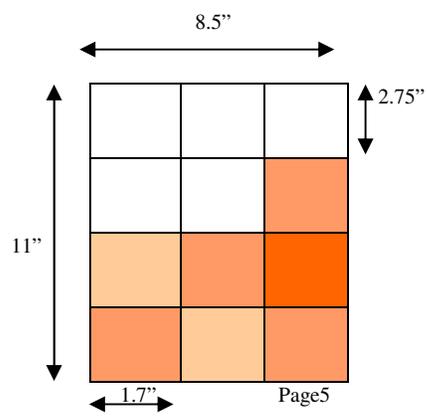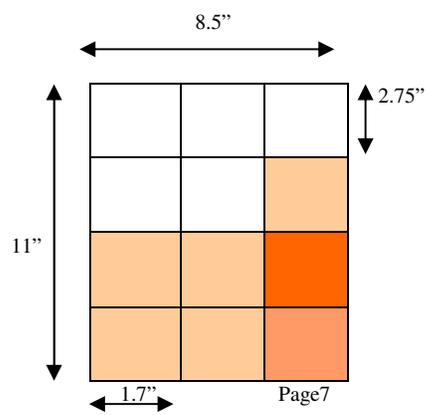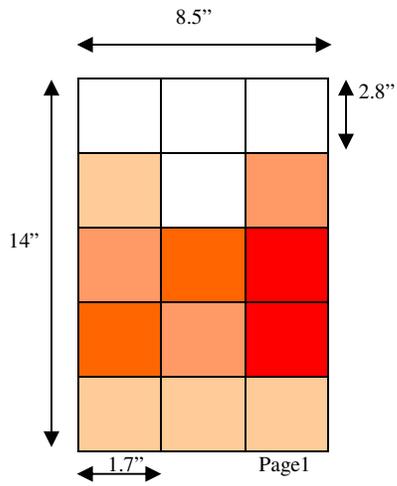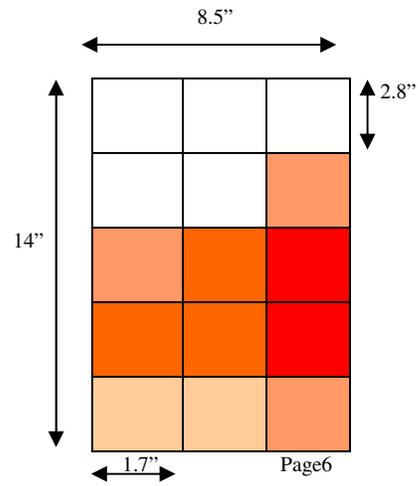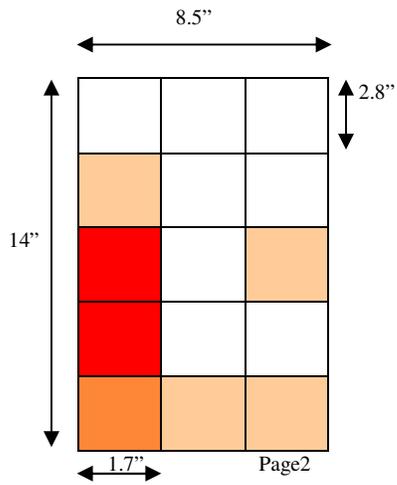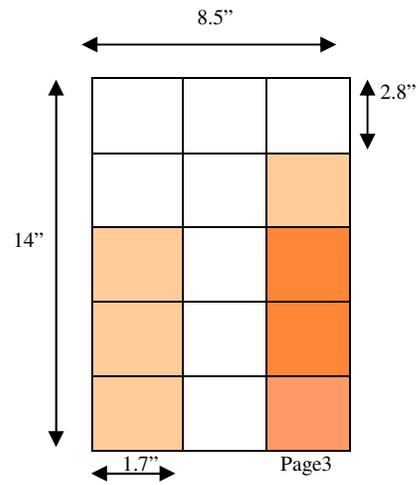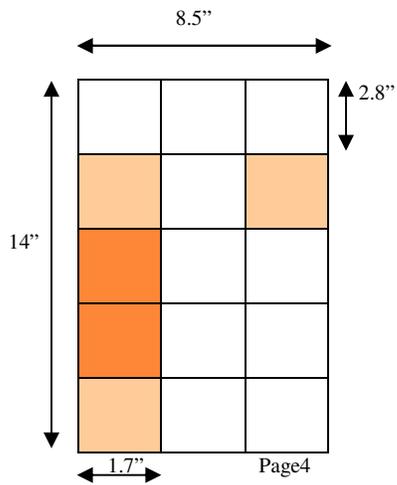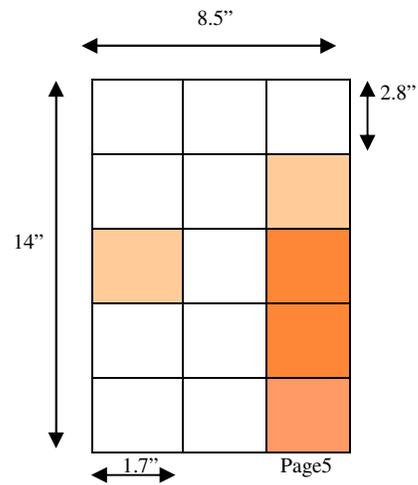
1.7"
Page5

After conducting the pretest, menus for the main study will be collected from casual-family dining restaurants upon managers' agreement to use their menus for the study. Information regarding the storage place for the menus, the staff who hand out and collect the menus, and menu cleaning procedures will be also gathered from the restaurants. Collected menus will be divided into squares measuring 10 cm X 10 cm (100 cm^2) of the area verified from the pretest (Moore & Griffith, 2002). Then the area will be swabbed for further analysesPrevious literature indicated several methods to detect microorganisms on the surface. Traditionally, microbial enumeration such as swabs, agar contact plates, or dip slides have been used to evaluate the effectiveness of surface cleanliness. An aerobic plate count (APC) is known to be the approved microbiological test to measure hygienic status on food contact surfaces. Surface swabs test for the presence of bacteria on food contact surfaces. Aerobic colony counts of < 2.5 CFU cm^{-2} indicates microbiological surface standards for both the food and healthcare sectors (Dancer, 2004; Griffith et al., 2000). In addition, microbes in general on food contact surfaces are limited to the food-processing industry, where total aerobic counts of > 10^6 per swab can be found before cleaning (Holah, 2003). In spite of the wide spread use of the swabbing technique, its efficiency is often poor since the recovery rates ranged from 25% to 0.1% of original the inoculums (Moore & Griffith; Taku, Gulati, & Allwood, 2002).

Adenosine triphosphate (ATP) bioluminescence primarily detects the presence of food residues and microorganisms in the surface within minutes. It is a more cost effective means to monitor surface cleanliness than traditional microbiology (Griffith et al, 1994). The ATP technique may be extended to the restaurant and foodservice industry to indicate the level of potential cross-contamination of food (Leon & Albrecht, 2007). An ATP value of 500RLU for a clean surface is a realistic upper critical limit (Griffith et al, 2000).

A comparison of ATP bioluminescence and traditional swabbing methods for the determination of surface cleanliness at a hospital kitchen showed both techniques were highly correlated (Aycicek, Oguz, & Karci, 2006). The ATP technique can be used successfully without laboratory and specialized staff while it is not a substitute for quantitation of microbial load on food contact surfaces (Aycicek et al., 2006). In addition, it is possible that some types of residual soil may remain undetected (Whitehead, Smith, & Verran, 2008). In comparison, traditional microbiological methods are able to detect the presence, on a wet surface, of < 10 CFU /cm^2 (Moore, Griffith, & Fielding, 2001). Also, traditional microbiological methods are less expensive than the ATP method. However traditional microbiology test requires more skills and time to analyze the data. Hence, this study will use Adenosine triphosphate (ATP) bioluminescence to measure hygienic status on food contact surfaces.

ANTICIPATED RESULTS AND DISCUSSION

The purpose of this study is to determine if the menus in restaurants are clean enough to meet hygienic standards and to help establish a protocol for cleaning menus. To investigate cleanliness of restaurant menus this study will use the ATP technique. Menus at restaurants are

one of the most accessed materials by consumers and staff, yet the hygienic status of the menu has been overlooked since menus are not a food contact surface. Visual inspection of menus should not be presumed to represent hygienic conditions of the menus. An integrated sanitation program should include monitoring and evaluation of non-food contact surfaces as well as food contact surfaces. Ineffective cleaning wastes time, money and energy. Anticipated results will guide restaurant managers as to how train their staff to clean the menus, how menus should be stored, and who should be responsible for cleaning the menus.

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