

NEHA/UL Sabbatical Exchange Program Report

To Glove or Not to Glove?

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## Introduction

Both the United States (US) and the United Kingdom (UK) have seen decreases in the number of lab confirmed foodborne illness outbreaks since the 1990's (CDC , 2012; HPA, 2012). This is especially impressive considering the fact that the surveillance and reporting of foodborne illnesses has improved since then with electronic surveillance systems like FoodNet in the US and Electronic Foodborne and Non-foodborne Gastrointestinal Outbreak Surveillance System (eFOSS) in the United Kingdom. Despite some differences, The United States and the United Kingdom have a very similar approach to retail food safety in order to protect the public from foodborne illness. This is reflected in their food safety regulations: the US Food and Drug Administration (FDA) Food Code and the UK Food Standards Agency (FSA) Code of Practice. These standards change with advancements in science and technology, as well as changes in society such as the recent increased focus on nutrition and food allergies. On both sides of the pond, we must be ever vigilant of continuing to improve food safety and prevent foodborne illness outbreaks. There is a universal consensus that hand washing is the most important practice to prevent the spread of illnesses. So, during my sabbatical to the UK, I sought to compare and contrast how each country regulates and enforces hand hygiene and glove use.

Hands of food workers are easily contaminated with bacteria and viruses that can then be spread through direct contact with food consumed by the general public. But is hand washing enough to prevent contamination of food and beverages by food service workers? The United States promotes wearing gloves as a barrier between potentially contaminated hands of food service workers and ready to eat foods. However, the United Kingdom has a different point of view. The FSA and Chartered Institute of Environmental Health (CIEH) discourages glove use as they may become a source of contamination through improper use. Through review of previous studies on this matter and the opportunity to visit the UK to observe their inspection process, I hoped to come to a consensus on which method is more effective. At the very least I wanted to understand the implementation of this concept in the UK. Perhaps both countries have something to learn from each other. Are clean hands and properly used gloves achievable goals, or are clean bare hands better than dirty gloves?

In the United States, glove use with ready to eat food is an integral component of preventing contamination of food because gloves create a barrier between contaminated hands and food to be consumed. Additionally, regulators are trained to enforce the FDA Food Code which reads as follows (FDA, 2013):

“3-301.11 Preventing Contamination from Hands.

(A) FOOD EMPLOYEES shall wash their hands as specified under § 2-301.12.

(B) Except when washing fruits and vegetables as specified under §3-302.15 or as specified in (D) and (E) of this section, FOOD EMPLOYEES may not contact exposed, READY-TO-EAT FOOD with their bare hands and shall use suitable UTENSILS such as deli tissue, spatulas, tongs, single-use gloves, or dispensing EQUIPMENT.

(C) FOOD EMPLOYEES shall minimize bare hand and arm contact with exposed FOOD that is not in a READY-TO-EAT form.”

This section of the FDA Food Code was added in response to outbreaks of foodborne illness caused by food that had been contaminated with pathogens transmitted by food preparation workers (Guzewich and Ross 1999), and is based on studies showing that gloves function as an effective means of preventing the spread of illness via ready to eat food. While the authors noted the issues that can lead to contamination of gloves (material, permeability, duration of wearing, and hand washing prior to donning), they also noted that proper hand washing and glove use provides more protection than either method alone (Paulson, 1997).

The FSA in the UK also promotes limiting bare hand contact with ready to eat foods, but warns business about the risks associated with improper glove use. The European Union Regulation (EC) 852/2004 on the hygiene of foodstuffs; Annex II, Chapter VIII states: “every person working in a food handling area shall maintain a high degree of personal cleanliness and shall wear suitable, clean and where appropriate, protective clothing.” This is very general, but the Safer Food Better Business plans created by the FSA in the UK, which establishments are required to have and use, states in its hand washing portion:

“Think Twice! If you use disposable gloves in your business, they should never be used as an alternative to effective hand washing. When using disposable gloves, make sure you:

- Wash your hands thoroughly before putting them on and after taking them off.
- Always change them regularly, especially when handling raw and ready-to-eat food.
- Throw them away after use or if damaged.

Hygienic hand rubs and gels can be useful when used as an additional precaution, but should **never** be used as a replacement for effective hand washing.”

Thus, the FSA emphasizes that glove failure may lead to contamination of food. A single glove hole can release tens of thousands of bacteria from the moist environment inside the glove (Guzewich and Ross, 1999). Considering the fact that the infective dose of some of the most infectious foodborne illnesses is very small (FDA, 2012), this is a major factor to consider. When hands are not washed properly before gloves are worn, bacteria multiply inside the glove, especially when they are not changed frequently (Paulson, 1998). Because proper hand washing and glove use requires a great deal of time, training, education, availability of resources, and active managerial control, many professionals feel that the process required for gloves to act as an effective barrier to prevent contamination of food from hands is not achievable (Green, 2012). A literature review in 1998 by Fendler et al. concluded that there was a lack of scientific evidence to support the use of gloves as a means to prevent contamination of food with pathogens. They went on to say that gloves may provide a false sense of security, and encouraged more studies to be done in a food handling setting. However, studies that have been done in a food handling setting have shown the use of gloves to be counterproductive (Lynch et al., 2005, Green et al., 2006). When food workers are stressed for time and not properly educated on proper glove use and hand washing, the barrier that gloves are supposed to provide can be compromised (Green and Selman, 2005).

## **Sabbatical**

In 2014 I was awarded the NEHA/UL Sabbatical Exchange Award, which allowed me to travel to the UK to investigate and study this question. My goals for this study were as follows: to

compare and contrast how the US and the UK regulate and enforce hand hygiene and glove use, to understand how the UK's ideas about glove use are reflected in their inspection and enforcement strategies, to learn more about the logistics of their inspections process, to learn the opinion of industry in the UK on glove use, and to understand more about the environmental health profession in the UK and their required training.

I was in the UK for three weeks from 8/30/14 to 9/23/14, during which time I visited the following locations listed by category to speak with professionals and my counterparts (EHPs):

#### Industry

- Benugo
- McDonalds training headquarters
- Aramark

#### Regulatory Authorities

- CIEH (and the Academic Conference)
- FSA

#### Local Jurisdictions

- Tower Hamlets in London
- Islington in London
- Port Authority in London
- Pendle (England)
- Bury (England)
- Cardiff

#### Universities

- Middlesex University
- Leeds Metropolitan University
- Liverpool John Moores University

Environmental Health Professionals (EHPs) are trained very differently in the UK. They attend a university accredited by the CIEH where they will obtain an undergrad Environmental Health Degree in 3 years. The program is currently tailored towards training EHPs for local government work by incorporating enforcement of Code of Practice and other environmental health regulations. Additionally, EHPs are required to complete a portfolio about a work experience that they would typically get from a work placement at a local jurisdiction as an intern. However, these placements are difficult to find with jobs being lost due to local budget cuts. I attended an education conference with representatives from accredited universities and the CIEH where there was much discussion about moving from a vocational program geared towards local government employment towards a more academic program focused on public health, which is generally what we have in the US. I was able to offer my insight coming from a background in biology and moving into a career in environmental health.

On a broader food safety scope, I was able to get a clearer picture of how food regulations are written and implemented from my visit with the FSA and local jurisdictions. Basically, all the countries in the European Union have their own set of food safety regulations based on the very general European Union Regulation. In the UK, the FSA created their Code of Practice which is more prescriptive. These are the regulations that are enforced throughout the UK. Additionally, each jurisdiction has their own procedures and policies for enforcement and inspections. This can lead to some variation between jurisdictions in their enforcement and inspection procedures. That is why the FSA provides standardized documents and reference guides to help ensure that regulations are enforced similarly across the country. This is important because violations to the Code of Practice are a criminal offense in the UK.

Local jurisdictions are typically located in a City Hall or other government building, and are often housed with or near Health and Safety (like OSHA or local Building Code in the US) since their duties are related. Local jurisdictions also inspect manufacturers as part of their retail food safety program, unlike the US where manufacturers are often inspected at the state or federal level. Many local borough directors expressed that budget constraints are very challenging, and have led to a decrease in staff, as many in the United States have experienced. They are still feeling much of the pressure of having to do more with less in addition to complying with the business friendly government initiative to cut red tape for businesses. Food establishments are not licensed in the UK. Rather, they are required to register about a month after opening, at which point an inspection would be conducted. All of the EHPs I talked to were intrigued by the plan review and permitting process required in the US as a way of alleviating issues related to structure. Many local boroughs have had to decrease inspection frequency while trying to focus their efforts on the establishments that need the most help coming into or staying in compliance. This is partly achieved through the newly implemented Food Hygiene Rating (FHR) scheme.

Annex 5 of the Code of Practice details the FHR system and how it should be implemented. During an inspection, the establishment receives a rating of 0-5 (0 being the worst, 5 being the best). This score incorporates the level of (current) compliance with food hygiene and safety procedures, the level of (current) compliance with structural requirements, and confidence in management/control procedures. Standardized scoring rubrics also help the EHP to determine a risk assessment for the establishment with ratings A-C (A being low risk, and C being high risk). This risk assessment takes into account risk, compliance, and confidence in management, and will determine the inspection frequency for the establishment. An establishment with a high score and low risk rating may only be inspected every 18 months. The FHR is meant to act as an incentive for establishments to be in compliance. However, these ratings are not yet required to be posted in every jurisdiction as the program is slowly being phased in. Cardiff was the only jurisdiction I visited that requires them to be posted, and they reported positive results. In addition to the FHR system, Cardiff is also piloting a training program for establishments that perform poorly. It focuses on employee health and hand hygiene, and their hope is to share it nationally if it proves effective.

Establishments are also required to have a HACCP based plan which includes hand hygiene. This can be prepared by the establishment /company, or the FSA has prepared a resource for establishments called Safer Food Better Business. It is a generic HACCP plan that can be filled in with all of an establishment's specific information and procedures. It still requires them to have their own individualized plan, but it guides them through the process, and provides

reference materials that are more visual and picture based for those that do not speak English. In addition to a HACCP plan, establishments are also required to have employees that are trained in food safety. The CIEH offers training in 4 different levels commensurate with the tasks of the worker, the most basic one focusing on hand hygiene and employee health. In order to get a high FHR, all of these things must be in place in addition to general cleanliness, structural maintenance, and confidence in management. In theory, an establishment with a FHR of 5 and risk assessment rating of A would need less frequent inspections since they are controlling food safety without intervention from an EHP.

HACCP plans, different levels of training for food workers, risk assessment to determine inspection frequency, and Food Hygiene Ratings all play a role in the enforcement of hand washing and glove use. Hand washing is promoted in the Safer Food Better Business plans, in CIEH training, in resources provided by the FSA including picture based posters and videos in various languages. Glove use however, is not encouraged. In fact, many resources warn against their use, but provide guides on how to use them properly. When I asked why they were using disposable gloves, some of the food service workers reported that customers want to see the food handlers wearing gloves. The same is true in the US, but many of the major food service companies in the US do not require glove use with ready to eat foods. During my visit to the McDonalds training headquarters in London, I learned that they do not require glove or utensil use for ready to eat foods for immediate service, but do require them for ready to eat foods that have a shelf life and for raw meats. The theory behind this is that items with a longer shelf life have more opportunity for bacterial growth, and are prepared ahead of time so there is less time pressure that can lead to glove misuse. I also spoke with representatives from the CIEH and Aramark who planned and executed the food service for the London Olympics. They did not want disposable gloves to be used at this event because they had concerns about glove misuse due to their cost and a lack of knowledge about how to use them properly. They also felt that it discouraged frequent hand washing, and that gloves may transfer more bacteria than regularly washed hands if used incorrectly.

## **Conclusion**

Should the US reconsider the promotion of gloves for ready to eat food? It may not be advisable to ignore the studies showing that a combination of properly washed hands and properly used gloves is better than either method alone. But is that an achievable goal? It might be easier to focus on just hand washing considering the fact that other studies show that food workers often misuse gloves. The UK certainly has a functional food safety program without restricting bare hand contact with ready to eat foods, but it is not directly comparable with the program in the US. Further studies should be done on bacteria transfer on gloved vs. bare hands in a real world, industry setting. ATP test technology can now be used for such studies to measure growth of microorganisms. We need to know more about glove use in good and poor performing establishments, and consider other factors that affect proper glove use such as active managerial control and support or interventions from regulators. Glove use does not only affect food establishment. These types of studies would also be applicable to medical settings where a closer look at glove misuse may be needed.

## References

- 2013 Food Code (Food and Drug Administration), 3-301.11 Preventing Contamination from Hands, 65 (2013).
- Bardell, D. (1995) Herpes simplex virus type 1 applied experimentally to gloves used for food preparation. *Journal of Food Protection*, 58, 1150-1152.
- Chartered Institute of Environmental Health (CIEH). (2013) Becoming an EHP Practitioner. Retrieved from  
<[http://www.cieh.org/professional\\_development/becoming\\_an\\_EHP.html](http://www.cieh.org/professional_development/becoming_an_EHP.html)>
- Food and Drug Administration (FDA). (2012) Bad Bug Book, Foodborne Pathogenic Microorganisms and Natural Toxins. Second Edition.
- Food Standards Agency. (n.d.) Safer Food Better Business, 21. Retrieved from  
<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/publication/sfbb-tagd-retailers-fullcol-pack0513.pdf>
- Foodborne Diseases Active Surveillance Network (FoodNet): FoodNet surveillance report for 2011 (Final Report). Atlanta, Georgia: U.S. Department of Health and Human Services, CDC. (2012).
- Green, Aliza. (2012) The gloves can come off, as far as I'm concerned. *The Washington Post*.  
<[http://www.washingtonpost.com/lifestyle/food/the-gloves-can-come-off-as-far-as-im-concerned/2012/06/11/gJQAR7YuXV\\_story.html](http://www.washingtonpost.com/lifestyle/food/the-gloves-can-come-off-as-far-as-im-concerned/2012/06/11/gJQAR7YuXV_story.html)>
- Green, L. and Selman, C. (2005) Factors impacting food workers' and managers' safe food preparation practices: A qualitative study. *Food Protection Trends*, 25(12), 981-990.
- Green, L., Selman, C., Radke, V. (2006) Food Worker Hand Washing Practices: An Observational Study. *Journal of Food Protection*, 10, 2417-2423.
- Guzewich, J. and Ross, M.P. (1999) Evaluation of risks related to microbiological contamination of ready-to-eat food by food preparation workers and the effectiveness of interventions to minimize those risks. *FDA White paper*
- Health Protection Agency. (2013). Electronic Foodborne and Non-foodborne Gastrointestinal Outbreak Surveillance System (eFOSS). Foodborne outbreaks by year (1992-2012). Retrieved from  
<<http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/FoodborneOutbreakSurveillanceAndRiskAssessment/FoodborneOutbreaks/eFOSSFoodborneoutbreaksbyyear/>>
- Larson EL. (1989) Hand washing: It's essential—even when you use gloves. *American Journal of Nursing*, 934-939.

Lynch, R.A., Phillips, M.L., Elledge, B.L., Hanumanthaiah, S., Boatright, D.T. (2005) A preliminary evaluation of the effect of glove use by food handlers in fast food restaurants. *Journal of Food Protection*, 1, 187-190.

Paulson D.S. (1997) Foodborne disease: Controlling the problem. *Environmental Health*, 15-19.

Paulson, D.S. (1998). Handwashing and gloving for food protection Part I: Examination of the evidence. *Dairy, Food and Environmental Sanitation*, 18(12), 814-823