

Analysis of food storage guidelines



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Abstract

This paper analyzes current food storage guidelines for fridges and shows why a more stringent practical implementation of these guidelines is necessary to enhance the health safety in communal fridges such as offices. This paper furthermore establishes specific actions that should be undertaken by the office of the Arts Corporation to reduce the risk of fridge users contracting foodborne illnesses. The topics discussed can be extrapolated to a general audience as well. With the number of domestic refrigerators in circulation, safe food handling practices are of the utmost importance for ensuring public health. However, many people are unaware of the proper procedures for safely storing food. Oftentimes food is left inside past the point of safe consumption, leading to the spread of disease-causing bacteria and possible infections.

Keywords: food, preservation, refrigeration, guidelines, safety, bacteria

Introduction

Throughout human history, food preservation has been a topic of utmost importance because it meant the difference between life and death. To our ancestors, whether we refer to those who lived thousands of years ago or those who lived a hundred years ago, the ability to preserve food could have been the difference between dying and surviving under nature's challenging conditions. Presently, what with the basically on-demand nature of acquiring food in America (whether that be at a restaurant or a supermarket), domestic food storage is not quite a life-or-death situation as it used to be.

Obtaining food is meaningless if there is too much to immediately consume and there is no way to save it, although one could get by without owning any means of preservation. Of course, the ability to do so is facilitated by the massive infrastructure required to create, transport, and store food before the consumer eventually buys it, and that infrastructure is extremely reliant on several methods of preservation. Whether indirectly or by ownership, the vast majority of people have access to preservation techniques, perhaps the most important of which is refrigeration. However, the refrigerator cannot do all the work. There are several safety guidelines that must be followed if one wishes to reduce the incidence of foodborne illness. Oftentimes these guidelines are not followed. Communal spaces in particular are suspect to lax standards because of a reduced sense of individual responsibility. One specific communal space, that of the, is the source from which we draw several examples of failure to follow recommended guidelines and will be the specific space we seek to address with our suggestions. A thorough implementation of the safety standards we will analyze are necessary to improve the health safety of this office and others like it.

Discussion on Refrigeration

While it is possible to live without one, 99.9% of American households own a refrigerator (U. S. Energy Information Administration, n. d.). Since the refrigerator's inception, it has grown to be seen as nothing short of a necessity. It has been instrumental in lowering the risk of foodborne illness. It has enabled food to last longer, to be transported across countries while remaining fresh. It is a tool of incredible utility; but it can only do so much.

Tools require people to use them, and even if the tool itself functions as it should, the person using it may be using it incorrectly.

Client and Project

One such example of the improper use of refrigerators can be witnessed at our client's office at the Arts Corporation. Our engineering design team has been tasked by our client, Kali , with improving the condition of the refrigerators (, Personal Communication, April 2019). More specifically, our goal is to design an easy-to-use solution that will help the office keep their two communal fridges organized, clarify what food is personal versus communal, and minimize the amount of spoiled food. Improved safety is not a specific demand of the client; however, by reducing the amount of time food spends in the refrigerators a successful solution will improve safety. Perhaps it also deserves to be stated that regardless of a project's requirements, safety should be a foremost concern of the design team. Therefore, if we can take extra steps to further improve the safety of the refrigerators, we should. Currently, the office's standards for refrigerator safety are practically nonexistent – Ms. has communicated that there are no enforced rules in place concerning refrigerator use (, Personal Communication, April 2019). Solving the problem of the office fridge kerfuffle goes beyond aesthetics and people's sensibilities. Effective solutions will address the very real safety issues posed by old food and disorganized food containers in both the refrigerators' current states.

Bacteria

To begin our discussion of refrigeration practices, we will layout the mechanisms through which refrigerators preserve food. The primary purpose of a refrigerator is to keep food its contents cold (below 40 degrees Fahrenheit, according to the U. S. Food and Drug Administration). Cooler temperatures make it harder for bacteria to grow. It should be noted that there are different kinds of bacteria and the presence of different types has different effects on food. The main distinction is that between pathogenic and spoilage bacteria.

Pathogenic bacteria. Pathogenic bacteria are the classic disease causing bacteria that can multiply on food with no visible signs of spoilage. These are the common danger if, for example, one were to leave their food out in room temperature for too long (Food Safety and Inspection Service, 2015).

Spoilage bacteria. The other category, spoilage bacteria, are not as dangerous as pathogenic bacteria. According to the United States Food Safety and Inspection Service, “ they [spoilage bacteria] cause food to develop off or bad tastes and smells. Most people would not choose to eat spoiled food, but if they did, they probably would not get sick” (Food Safety and Inspection Service, 2015). The categories of spoilage and pathogenic are not mutually exclusive—bacteria can be both pathogenic and cause spoilage (Magoulas, 2016). The important fact, Magoulas reiterates, is that both families of bacteria grow quickly on food that is left in temperatures warmer than the recommended levels, and that the safety of a food item is not equivalent to its sensed quality.

Non-perishables

Bacteria are present everywhere, but the dangerous sort require a certain food source to thrive. Just by walking down the aisle of a supermarket one can see that many foods do not require refrigeration. It may be possible to cut down on refrigerator storage space required and improve organization if people avoid storing non perishable or otherwise long lasting foods in the fridge. Many uncut or unpeeled fruits and vegetables do not require refrigeration (Lewis, 2015). In fact, Lewis suggests, cool temperatures will often interfere with the natural ripening process of many fruits and reduce their quality. The main exception to this rule is for jelly and similar products, which should be refrigerated. The foods that truly require refrigeration are meat and dairy products; though there are still some that do not. For example, hard cheeses and certain cured meats may not need cool temperatures to remain safe (Lewis, 2015). When in doubt, the fridge is safer.

UHT Milk. A possible exception to the dairy rule is milk. Opened milk should always be refrigerated, but unopened, recently purchased milk may not need it depending on how it was processed or obtained. A minority of milk in the United States goes through ultra-high temperature processing (UHT), which kills a larger percentage of bacteria than normal pasteurization. Sealed UHT milk has an unrefrigerated shelf life of up to six months. While it is by far the most popular form of milk in many European countries, it is still less common in the U. S., so chances are the milk one buys still requires refrigeration (Robb, 2014).

Safety Guidelines

Temperatures and Spills. Now we will move on to an examination of food storage safety practices and how they are by and large disregarded by the office in question. The purpose of a refrigerator is to keep things cold, but what qualifies as cold? The FDA recommends keeping temperatures at or below 40 degrees Fahrenheit and checking often to ensure this temperature is being maintained (U. S. Food and Drug Administration, 2018). Neither of the two refrigerators in the office have a thermometer. Given the lack of care given them, it is doubtful that their temperatures have ever been checked. They could easily be above the safety limit and no one would know. In fact, based on a study in the Journal of Food Protection, “ 59% [of refrigerators] were found to operate, on average, at temperatures above the recommended 5°C” (Kennedy et al., 2005). If most of the refrigerators in this study operated above the recommended temperatures, then there is a grave risk that these unmaintained and forgotten fridges are as well. Bacteria are able to reproduce at much higher rates at these temperatures, some species doubling in population in as little as 20 minutes. The many spills and general unsanitary condition of the fridges presents a health threat as well. According to the FDA, uncleaned spills provide an ideal habitat for bacteria such as Listeria to grow rapidly (U. S. Food and Drug Administration, 2018). Combined with the possibility of unsafe temperatures, spills present a major threat. For the safety of the office both fridges should be equipped with internal thermometers, and these should be checked regularly to ensure proper operation. Spills should be cleaned as soon as they happen, and the fridge should receive a general cleaning with some regularity.

Storage Time. The final aspect of refrigerator safety is the length of time food can be safely stored. Food with sell-by or best-by dates can often be easily judged or otherwise removed based on the listed dates. For foods without explicit dates, the suggested length of time tends to be less than a week. The items of most interest are leftovers, as they comprise a large amount of the food stored in the office fridges. It suggested, for example, that leftover pizza be kept no longer than 3 to 4 days. The same length of time is suggested for any leftovers that include meat (Foodsafety.gov, 2009). Based on communications with our client and with other members of the office, food is routinely allowed to remain in the fridge until it presents a visible (or smellable) problem (Personal Communications, April/May 2019). Therefore, given the safety hazard of leaving food too long and the small number of foods that both require refrigeration and can last more than a week in a refrigerator, the fridges should be emptied of all foods not otherwise marked for safekeeping on a weekly basis.

Conclusion

It is clear that there are several steps that can be immediately taken to enhance the health safety of the refrigerators in the Arts office. Throwing out spoiled food is always good, but it is often too late if the aim to prevent dangerous bacteria from multiplying and potentially contaminating surfaces or other food. Oftentimes one cannot even tell food is dangerous by sight or smell. Given the lack of thermometers in the fridges, we do not even know if stored food will remain safe for the length of time it would under recommended conditions in a space below 40 degrees Fahrenheit. The threat can be partially eliminated by keeping non-perishable foods, of which there

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are many, outside the fridge and away from possible contaminants.

Meanwhile a system to clean the fridge and empty all perishable foods every week would stop the proliferation of bacteria and return the state of the fridge to one of cleanliness. Office members should be educated on the proper guidelines for food safety, especially on how long food is safe for. Otherwise people will remain ignorant of the fact that week old leftovers are considered unsafe, and the risk of contracting foodborne illnesses will remain higher than it could be.

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