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### The Importance of Safety Practices of Fresh Leafy Greens

One of the primary elements to living a healthy life is consuming fruits and vegetables. These foods offer benefits to the body that can have enduring effects. Vegetables can be consumed in several ways. These include salads, casseroles, appetizers, and even snacks. The most common are leafy greens. Leafy greens are widely consumed in the United States as produce purchases have increased. It represents a fast growing trade-dependent sector of this country's food system and continues to increase (1). There are different types of leafy greens that are consumed. They include spinach, iceberg, kale, romaine, collards, leaf lettuce, baby spinach, cabbage, arugula, and even endive. These leafy greens provide endless options and preparations for consumers including home kitchens and restaurants. One preparation involves the use of heat to cook them, but one of the most popular preparations is its utilization in fresh salads, sandwiches, and wraps in raw form. This pertains to its predominant use in these dishes as it provides the bulk of the product. Since this preparation doesn't have a cooking method to kill pathogens present, they fall victim to sources of food borne illnesses if proper safety practices aren't in place. These safety practices allow the consumer to eat safe leafy greens. It also allows the handler to avoid and harsh liability. This is the only way to reduce the risk associated with foodborne illness. In order to alleviate the chance of a foodborne illness within eating environments, food handlers need to participate optimal safety practices in restaurants and homes. This is in accordance to the prevalence of food borne illness stemmed from leafy greens, consumer awareness, and where consumers receive the bulk of their leafy greens. Salads, sandwiches, and wraps are going to continue to be consumed with the sole ingredient being leafy greens. This is why it is vital to recognize its safety and work towards a stop to foodborne illness outbreaks.

Produce has raised many concerns about the possibilities of contracting a foodborne illness. A foodborne illness is simply an illness caused by the consumption of food. An outbreak is collection of people contracting an illness from the same food source. Foodborne illness outbreaks can be very problematic and many believe that it stems from protein sources such as meat (1). However, produce should also be taken into caution. Numerous outbreaks in the United

States have been associated with produce, especially in recent years (2). It's been estimated that over one hundred foodborne illness outbreaks from 2004 to 2008 were caused by leafy greens (2). Over half of those outbreaks were caused by viral infections such as norovirus or hepatitis (2). Others attributed to the outbreaks were caused by bacterial pathogens and parasitic pathogens (2). There is even a concern in Canada. Over one thousand cases of foodborne illness erupted from 2001 to 2009 and leafy greens was a sole contributor (3). In fact, many of the leafy greens are imported from the United States due to public demand and climate (3). A lot of the outbreaks were caused by improper handling of leafy greens. The major outbreaks including the 2006 spinach outbreak is prime evidence.

Foodborne illness outbreaks has been made public nationwide. This is due to the prompt media system that delegates many of the major outbreaks associated in the United States. One of the major outbreaks that was highly publicized was the 2006 E-Coli outbreak associated with Spinach (4). In the fall of 2006, the FDA made a public announcement that bagged spinach should be recalled and not consumed (4). At the height of the outbreak, over two hundred illnesses, 104 hospitalizations, and three deaths were reported among twenty-six states and one Canadian province (4). This outbreak was highly publicized and was broadcasted extensively to the public. This includes coverage in television, radio and even print media (4). Another example of a massive coverage of a foodborne illness outbreak was Hepatitis A being linked to green onions from restaurant chain, Chi Chi's. Chi Chi's closed restaurants because of it. As the mass media crucified these outbreaks to consumers, public awareness and response was greatly affected. Consumers are very sensitive and their attitudes about certain issues affect their decisions (1). These consumers were aware of the outbreaks and safety precautions. Food confidence decreases when public announcements about food recalls increases (1). This is especially true for pre-bagged leafy greens. Pre-washed, bagged leafy greens have been in high demand in recent years (5). The FDA only recalled bagged spinach (4). Consumers were really concerned about bagged leafy greens that were supposedly pre-washed. Many practiced extensive food safety practices such as cleaning (4). Many also refused to purchase it. Spinach sales declined after the major 2006 outbreak (4). Good safety practices are essential for decreasing these risks. Bagged leafy greens don't require much processing and heat is not an application to fight off microorganisms (5). This can increase the growth of bacteria. Pre-washed, bagged leafy greens are going to continue to produce revenue, especially when our

culture continues to rely on convenience. Convenience may be a great way to reduce time in cooking, but it is more convenient to avoid a foodborne illness than to contract one.

Majority of the outbreaks were also caused in restaurants where leafy greens was consumed within dishes served (2). This shows that foodborne illness risks are associated with leafy greens and restaurants play a pivotal role. Restaurants' main objective to decrease risk is using proper handling practices with leafy greens. Receiving, storing, cleaning, and preparing are all ways to minimize the risk. Examples include checking the greens at purchase, ensuring proper temperatures below 45 degrees, thoroughly rinsing them, and storing them in optimal environments (2). Many restaurants require safety certification within their establishments (2). This allows extensive training of employees that would be helpful to the cause. Many restaurants also require certified managers who manage the receiving of any produce and only the manager (2). Over half of the leafy greens served in American restaurants are served cold without any cooking steps (2). Even though restaurants are inclined to follow stricter regulations and safety practices, this structure can work for private homes as well. The remaining 39 percent of the foodborne outbreaks were attributed to homes or other non-service food establishments (2). Leafy greens are sold in almost all grocery outlets. They have become a high commodity for consumers. Also the concept of farm to table has become a trend in the food industry. Farmer's markets are increasing in popularity (3). This eliminates all ways of convenient eating with pre-washed, bagged leafy greens. Proper food handling practices are essential for alleviating the risks, especially when data highlights its prevalence while leafy greens are still being consumed.

Leafy greens are going to continue to be consumed within our country. Not only in this country, but in other parts of North America including Canada. The restaurant industry is noticing the fact that produce needs to be analyzed and not only meat. They are making training more extensive, certifications are being bestowed among workers, and consumers are being aware. Highly publicized outbreaks are being wake-up calls for consumers. Many can owe changes to this platform to examples such as the 2006 spinach outbreak or the Chi Chi's outbreak. This structured platform will definitely help save people's lives and money. Being able to thoroughly check leafy greens for decay, storing them in proper environments, and washing them will go a long way in the food industry.

## References

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