The U.S. Food and Drug Administration's Role in Ensuring Food Safety in the United States

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Abstract

Today, the United States has some particular laws dealing with food safety, and they are subject to no less than 30 federal laws and regulations. Within their legal framework, there are specific responsibilities related to the security of the country's food supply. The U.S. Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) are the two foremost food safety authorities. The FDA has primary responsibility for other foods, but the USDA has secondary responsibility for certain foods such as milk, meat, eggs, and poultry. The Food Safety and Inspection Service (FSIS), a division of the USDA, is responsible for products containing processed egg products and is subject to Federal Meat Inspection Act (FMIA) and the Poultry Products Inspection Act (PPIA) regulations. This paper's aim is to analyze the role of the FDA for ensuring quality and safety food in the U.S's territory.

Keywords: FDA, Genome Tracker, Labelling, Food policy, Food safety

1. Introduction

Today the world is the sternest, most authoritarian country in terms of security and security. Consumers in the United States have provided very safe and healthy supply in the world. They take care of all aspects of food safety, ensuring food production, distribution, animal and plant cultivation, processing, transport, and preparation **(*U.S. Department of State*, 2021)**. Healthy food helps us maintain our overall physiological condition and keeps us away from diseases and disorders. In the United States, there are three Federal Governmental Organizations and two State Governmental Organizations which control food safety:

(i) The Food and Drug Administration (FDA):

Food and Drug Administration is responsible for protecting U.S. public health by ensuring the safety, efficiency and safety of human and veterinary drugs, biological products, medical products etc. Harvey Washington Wiley and Theodore Roosevelt founded it on June 30, 1906[3].

(ii) The Food Safety and Inspection Service (FSIS):

Food safety, an inspection service, also known as FSIS, is a U.S. Department of Agriculture agency. It ensures public health and reviews eggs, meats, poultry products, production, packaging,

labeling, etc. John Rustling Block sounded on March 14, 1977. It currently employs 10,000 people every day to ensure U.S. people's safety (**WHO, 2020**).

(iii)The Center for Disease Control and Prevention (CDC):

Disease Control Standards, or better known as CDC, is the United States Health Protection Agency; CDC saves lives and protects people from health and safety threats. This Federal agency lies under the Department of Health and Human Services and has headquarters in Atlanta, Georgia. It is directed by Robert R. Redfield and currently employing more than 10,000 people (**WHO, 2020**).

2. Methodology of research

In order to analyze the role of FDA relating to food safety domain in the U.S, the methodology is employed to do this research that is to analyze the related laws of the United States regulations on food safety policy, and numerous related articles, books, cases, and research are referenced and analyzed to provide readers with a wide range of perspectives.

3. Importing Food

According to **Ribera and et al (2012)**, the U.S. ensures that no impurity is added to their country and allows no one to bring food or snacks from other countries. Look at U.S. airport security – every day, 43,000 passengers travel through New York's John F. Kennedy Airport (JFK). By counting travelers, it is the United States' largest international airport of entry, with approximately 1,000 bags per hour checked and those suitcases contain a lot of stuff, some of which are banned in the United States, 120 pounds of food are found in those bags every day and must be confiscated. Let's see what happens to all the confiscated items?

That is how JFK places and destroys unlawful objects. If you flew into JFK in the 90s, getting some trouble in the U.S. was much more comfortable. But after September 11, a dialog began on defending the United States from Dangerous Foods, Tablets and Human Beings and U.S. Customs and Border Protection. It is now recognized to be once as quickly and quickly formed. Two types of CBP officers are common at airports: officers like Steve (in this case) and farm specialists like Ginger (in this case).

Their job is to find, entice, and smash many heaps of food every 12 months that do now not belong in the United States. It is a massive job, requiring the sidekick now and then, a sidekick on 4 legs; (Dogs). Dogs like Belgian Malinois are knowledgeable in narcotics, and they probably seized over four hundred excellent series at some element of their profession's duration. CBP officers like Steve find out high-risk people trying to enter the U.S., as well as drugs and firearms, and because they are such excessive-stakes domestic dogs like spike are educated in a remarkable way, in What is known as "Passive Response" that means if they sniff out drugs they do not scratch, they do not bark anymore, they do not make a scene. They sit, and if they are right, they receive rewards. Narcotics are then seized and dispatched to be incinerated. The area of the incinerator is saved as a U relies upon. S. Important security. Now, specifically an outstanding deal, everyone is aware that narcotics are no longer allowed on the U.S. borders.

On the other hand, drugs are no longer the most seized object at JFK on different hand food. When an everyday traveler arrives in the United States, they must declare any meal objects they bring in, or face up to $ 1,000 for the first offense. These gadgets are no longer taken as sellers want to devour them. It is because sellers are responsible for defending American agriculture from any foreign places pests or illnesses that affect their existing shares for vegetation, and that is the region agricultural specialist like Ginger. Everything receives destroyed to shield closer to the pest danger they are defending the country's agrarian interest, protecting it in opposition to bioterrorism, where everybody ought to intentionally attempt to deliver in objects to wreak havoc in the United States. Foreign bugs are hitchhiking baggage wreak havoc in the U.S. before. From 2007-2014, orange and grapefruit growers in Florida misplaced 2.9 billion greenbacks (**Narishkin, 2019**).

Even trying to ship illegal items in the U.S. can be very hectic. Even if you are responsible or not, you will be asked thousands of questions and testified in every way; they will check every detail about your background. You will have to pay thousands of dollars, even if you have nothing to do with it. In terms of Safety and Security, FDA does not want to lose any threads because even food can create a disaster, which many of us already know about the U.S. government do not tend to repeat mistakes. Therefore, every step is very crucial and done with a lot of effort and prior registrations. They check everything, including what kind of food it is if it is labeled already or not an animal item or plant-based item. Each package's weight is quality, and if it has been checked or not by the food security association of the following country. After considering numerous questions and dealing with multiple tasks, only a portion of food can be transferred.

Suppose you wonder why all that trouble so you can see many examples that raged havoc in the U.S. before just because imported food was brought to enhance bioterrorism. Food poisoning, skin diseases, health problems, viruses, and what cannot be transferred with only one small grape, so they have to be very careful about importing food. Even after importing food, it is checked twice at transit in airports to minimize the risk and make it almost negligible or as much insignificant as possible.

Biotechnology these days also helps us determine where the bacteria, virus or any other organism-creating disease is found. But we still have no technology-based idea to stop bioterrorism. We can see where the bioterrorism route came from, but we cannot prevent it before it spreads. Scientists work on many different types of projects to enhance food safety. Recently, they developed Genome Tracker that changed the world by searching for the root causes of bioterrorism **(Sandra Hoffmann, 2011)**.

4. Genome Tracker

According to **Food Safety Network (2020)**, the Disease Control Centres, foodborne disease outbreaks are responsible for about 48 million diseases, 128,000 hospitalizations and 3,000 deaths each year. As the world becomes more interconnected, maintaining a safe food supply has become a growing challenge, and food and drug administration has pioneered innovative responses to their challenges. Working with federal and state public health labs, the FDA has created a genome track pathogen identification network. It uses whole-genome Sequencing to look at the DNA fingerprint

left behind by disease-causing bacteria and alloy, enabling the FDA to identify the source of an outbreak in greater detail and clarity than ever. Whole-genome Sequencing is much like a radar gun to a police officer or state troops seeking speeders. Whole-genome Sequencing can now monitor pathogens' food supply. Like a radar running from the ocean's surface to the edge of space, they can detect outbreaks when it happens early, and they can stop them in their tracks before they become a public health crisis.

The network tracks genome has three different elements. The first is to build a database of known pathogens from known foods from known locations. They know it from the examples they have tested to tell Salmonella, whether it is from California or China. That information can help an investigation in determining where the contaminants entered into the food supply. So they have an extensive surveillance program at FDA, of course, and they test many foods that come and enter ports and try many domestic foods before they go into the food supply. Sometimes they find pathogens like Salmonella or e-coli or listeria, and when they do, they sequence them to see if they are related to a foodborne outbreak and then to see if they can track it back to the same source it came from. Pathogens evolve rapidly, with thousands of genetic variations. After spending time in a particular geographic location, a pathogen such as Salmonella begins to acquire unique genetic signatures, such as fingerprints, that identify it from that location. An excellent example of where the entire genome sequence showed its extraordinary power was in 2012 when the U.S. had an outbreak related to Sushi-related spicy tuna. So they knew people got sick, and some of them said they had eaten at a sushi place, but we did not know which ingredient was responsible. They initially thought it was in the hot sauce, so what they did was the sequence that does not isolate from their features from food from Around The World that was related to this particular bacterium when FDA compared the patient's bacteria back to the samples in the genome track database, the culprit turned out to be a pathogen called Salmonella Bareilly and unfortunately.

When they applied whole-genome Sequencing to those isolates of Salmonella that they collected from all over the world, they could link it directly back to reference Asia Lage that came within 6 miles of the actual to another facility in Southeast Asia where they firm was contaminating the food supply. This was a significant finding because it should that pairing genomic information with geographic information could arrow the search for the source of a toxic ingredient; even when the head was located Halfway Around The World, no one ever knew that Sequencing isolates from a port of entry that was found five years before that event would tell them the potential source of the outbreak. And whole-genome Sequencing reveals them things they never thought they could learn about killing the pathogen. Things like certain Salmonella are now resistant to heavy metals, and they live in the sea where heavy metals accumulate. These adaptations of changes in the germs that they never knew existed, and learning how the embryo itself is evolving and changing, will enable better preventive controls for food supply and food producers to stop contamination in their plants, in their facilities, before it spreads. In 2014, the genome tracker network played a role in a regulator reaction by the FDA and traced the source of a multi-state listeriosis outbreak rights to the firm that made the contaminated product a query style cheese. Their pasteurization process did

not work correctly, so the cheese was not sterilized if we managed to keep the pathogens out. Once the list area was established in the facility, it was in everything. Almost every batch of cheese was contaminated with listeria so that anyone with a particular suspicious ability for organisms got sick. FDA was able to sequence listeria isolates from cheese collected from the form and compare them with isolates collected from ill patients by CDC. Typically, what happens to people get sick is that they present themselves to a physician, and in this case, listeriosis is said to have disease x y or Z.

It is pretty rare, so general doctors upload information. In this case, they would sequence it. Then we start to compare the word about this case in the past; it would have happened over several months now because of the digital sharing of information. We were able to move much faster with this type of technology. So we can now say that we have a match like a criminal case where we have DNA evidence. Whole-genome Sequencing reinforced FDA's evidence linking outbreak strain with cheese products. The FDA saw the facility down, and another outbreak occurred. They noticed diseases associated with peanut butter or no butter, and they were in different states and parts of the country, and it was not clear that they were related. Simultaneously, FDA field inspectors surveyed a plant that made nut butter and found Salmonella in the facility. When we sequenced the Salmonella and put them in the database, they were almost perfect matches across 4.6 million data points to the diseases in different parts of the country. In this case, they had used it to detect the source of an outbreak just as the attack started. They were able to stop food products from going further into food supply consumers and stop the outbreak before it spread as many dozens or hundreds of diseases. The second element of genome tracker is collecting global samples to collaborate with Federal, State and international partners to build the database, as bacteria are distributed globally, and food is traded globally. So any food we could buy from our local grocery store or local Itarsi restaurant Ne came from anywhere around the world, so we need global connections to be included. Surprisingly, collecting all this genomic data does not take that much time. It takes a little less time than a week, and the process has many components. The first is that it isolates the bacteria from the actual food, so the way we soak tomato and get the bacteria out of it is different from how we treat avocado or peanut butter. There is a whole FDA group specializing in how best to get passengers out of different food types. Once what pathogen they have discovered makes the data and metadata public in real-time and makes the data analysis public (**Food Safety, 2020**).

The U.S agency is building and analyzing the database pipeline to match the genome data in the new genome data against the exciting database. It is made to reveal the evolutionary relationships of all the bacteria in the database. As we can see or imagine, the tree is enormous right now, so when a new isolate comes in, it is like adding a new one to that big Revolutionary Pathogens tree. The application of this probably something that they cannot even foresee right now. But the actual genes and variations that arise in these pathogens could be used for many other useful tools full stop for examples, new vaccines or new understanding of pathogens, new ways of controlling bacteria to get them out of a farm or a manufacturing facility by making the data publicly available,

allowing a large group of people to see and explore it and then come up with wit And the FDA wants more people in Walt. They are keen to find a new stage, national and international partners. We can help in many ways that we have a large set of resources as well as the experiences of setting up a network and so they are happy to help us stop that education, maybe sequencing isolate, or may just integrate into their data analysis process they're happy to work with us in any way they can help. Genome cracker is only in its infancy, but it has already profoundly impacted food society. It started with the database of pathogens such as Salmonella bacteria or equalized. According to **Food Safety (2021)**, ttill, in the years ahead, it will include data on any bacteria or viral pathogens, not only foodborne pathogens but infectious agents such as infections acquired by SARs Hospital classes and even those affecting animals. Bringing whole-genome Sequencing into the laboratory FDA and its growing numbers of domestic and global partners is truly pushing back the frontiers of outbreak responses.

5. FDA's role in improving nutrition: labelling and other authorities

Background, many people are unfamiliar with FDA's responsibilities. So some facts you might find exciting relative — relevant to their nutritional work. Twenty-five percent out of every U.S. consumer dollar spent on FDA-regulated products. FDA regulates the safety and labeling of 80% of all food consumed in the U.S., most of the rest coming from the U.S. Department of Agriculture. Its job is to ensure consumers receive accurate and useful food labeling information. Food product reformulation is also encouraged to create healthier products. It works closely with many other federal partners, CDC, NIH, and USDA, to name a few, in our nutrition work (**USDA, 2015**).

Background the Center for Food Safety and Applied Nutrition (CFSAN) has responsibilities for food safety and nutrition, and both are mutually dependent. And the reason for that is that many of the foods we recommend that Americans consume more—such as fruits and vegetables—are also some of the food items we have concerns about from a food safety perspective. And that's because commodities like fruits and vegetables are often consumed raw, so if there is any bacterial contamination, there is no so-called killing step to make sure those foods stay safe. So, for consumers to follow the dietary guidelines, food safety is a critical aspect of that. FDA uses food safety inspection and compliance. It also has a robust regulatory science research program that works very hard to prevent food safety outbreaks and solve outbreaks using state-of-the-art science earlier. Today, FDA is going to focus primarily on nutrition and not on the food safety side of the CFSAN's work.

FDA has robust data from controlled feeding studies, full data from prospective cohort studies, consistent results highlighting that trans-fats are unhealthy. This was followed by several consensuses reports from various scientific organizations underscoring the risk of cardiovascular disease trans fats in the food supply. So, what did FDA do with science? It has been working on it for several years. First, in 1999, the FDA proposed efforts to label trans-fats. The final labeling rule was published in 2003, and trans fats were added in 2006 as a line on the nutrition facts label (**Haley Oliver, 2021**). By using the labeling authorities to inform consumers about the trans-fat content in the foods they purchased. In response to providing that information to consumers, trans

fat intake in the U.S. declined nearly 80%. And that is due to two things: (i) That is because food companies reformulate their products to reduce trans fat in those products; (ii) Also, due to the fat, consumers chose products with lower trans fat levels. So, reducing trans-fat exposure was an essential public health game. About 20% of that trans-fat exposure, however, persisted in the food supply. Hence, as of June 2018 (**FDA, 2018**), artificially produced trans fats are no longer permitted in the food supply unless companies enter the FDA through a food additive petition process to indicate any low-level exposures they could prove safe to FDA.

This is essential work that the FDA has done to reduce the risk of cardiovascular disease. To highlight the book's importance, the American Public Health Association identified the FDA removing artificial trans fat from the nation's food supply as one of the top 10 most important public health stories from 2015. Another aspect FDA does to affect nutrition here is looking at the labeling authorities. And its job is to ensure consumers have access to accurate, useful new information to make healthy food choices. At the end of May 2016, FDA updated the nutrition facts label and released the updated nutrition facts label. This is the first significant nutrition label update in about 20 years. It was time to update the nutrition facts label. And why FDA will echo is that the nutrition facts brand has stood the test of time. Still, the changes that FDA is making and will be making moving forward with the nutrition facts label reflect the emerging science and the science that has been changing over the last several years.

FDA had a supplemental proposed rule issued in 2015, and two final rules, again, were published at the end of May in 2016. The first one is on the nutrition facts label itself—the second updated serving size requirements. And the serving size requirements rule says what the current serving sizes are that Americans are consuming. By statute, FDA must ensure that serving sizes reflected on nutrition facts label reflect what Americans consume. These two rules were published simultaneously in late May 2016. In terms of compliance, most manufacturers have about two years to update the nutrition facts labeling. Small businesses, having less than $10 million in annual revenue, have an extra year to comply. Thus, over the next two to three years, consumers will see the updated nutrition facts label launched in May 2016. So what are some of the critical nutrition facts label changes?

It would be to highlight the significant changes that FDA has made. One of the most important differences is that FDA has now mandated the added sugar declaration. Added sugars are a new element with the updated format on the nutrition facts label. Besides having added sugars, there is also a percent daily value, and the percent daily value is based upon 10 percent of calorie intake coming from added sugars. FDA also upgraded the format to give much greater prominence to things like calories and size information, and updated the footnote to highlight the brief statement about 2,000 calories being the basis of a standard, typical diet. Two new food labels, labels of nutrition facts, are vitamin D and potassium (**FDA, 2020**). They are taking vitamins A and vitamin C, which are no longer considered public health nutrients of great significance.

Some of the tools that FDA has recently released to help with our educational efforts on nutrition facts labeling include one interactive nutrition facts label game targeted to children ages eight to

15 to help them understand nutrition facts labeling. FDA has a couple of different games in this, but this FDA Snack Shack in Whyville, two games for tweens. The first one is called the Snack Shack. They are two different games that teach Whyville citizens how to understand the nutrition facts label. There is a module that includes label lingo to teach teens, tweens information about the brand. And there is also a module on snack sorting, which helps tweens rank and choose different types of foods, based using the nutrition facts label for reference. And during the first six weeks after the launch of this nutrition education initiative, more than 8,000 games were played by tweens who are learning about using the nutrition facts label (**Countryman, 2016**). FDA has also developed an online tool, virtually an interactive brand that allows consumers to explore the different parts of the title to focus on the nutrients they are specifically interested in.

Furthermore, FDA is working with health care professionals to help communicate how to use the nutrition facts label in educating their patients. For example, recently, in collaboration with the American Medical Association, FDA produced a video, a continuing CME education video for physicians about using the nutrition facts label in terms of helping patients make healthful choices. While physicians are knowledgeable about nutrition's role in health, they may be familiar with the nutrition facts label, but this walks physicians through examples, right on the video of how to work with them on different label elements that may help their patients. So it is targeted for general health and combat obesity, reducing the risk of other chronic illnesses, such as cardiovascular disease. The video and the companion patient educational materials are all available for health care professionals on the FDA and the AMA website. And the FDA will be updating all of these educational resources that reference the nutrition facts label to reflect the transition to the new brand.

To date, FDA received over 6,000 comments concerning natural labeling, and the team will be sifting through the comments as we work to move forward concerning the label term raw on a food label. And anything we do will, of course, be the result of a very public process. Some other labeling activities that FDA has been engaged in that are relevant to nutrition include our menu labeling and our vending machine labeling initiatives—beginning with menu labeling. The Affordable Care Act stipulated that certain chain restaurants and similar retail food establishments must disclose nutrition information for standard menu items. And what that means is it means a disclosure of calories in everyday menu items on menus and menu boards. It also means providing consumers, upon request, other nutrition information that they might want to have made available. And it also says that, along with menu labeling, there has to be a brief statement about suggested calorie intake, so a consumer would know how many calories in a food, how that might relate to total daily information.

The proposed rules were published in 2011. Final regulations were published in December of 2014. A final guidance document came out in May of 2016, and now the compliance date was one year from that or May 5 in 2017. Starting on May 5 of 2017, menus and menu boards need to include calorie content and calorie information. For menu labeling, the covered establishments include those with a chain of 20 or more locations, and specific other criteria are detailed in the rule. So

this will be a big step forward for consumers in having access to calorie and nutrition information made available upon request to foods eaten in restaurant settings and similar retail food establishments. Concerning vending machines, a similar statute, a similar stipulation came from the Affordable Care Act. And basically, it said that for vending machine operators that have 20 or more vending machines, they must disclose calorie information at the point of purchase. And the compliance date for that is December 1 of 2016 for most vented items. So again, tools giving the consumer access to information that can help them choose healthier diets, in this case, at the point of purchase (**Countryman, 2016**).

6. Conclusion

The United States is putting efforts and new technologies every day. From importing to exporting, rules and regulations are followed without exception. Today, the U.S. has some particular food safety laws and is subject to no less than 30 federal laws and regulations. Within its legal framework, the country's food supply security has specific responsibilities. The Food Safety and Inspection Service (FSIS), an FDA division, is responsible for products containing processed eggs and is subject to FMIA and PPIA regulations. The FDA and USDA often overlap in food safety functions, such as imported food. The federal government must ensure that imported food meets the same safety standards U.S. requires. The FDA is expected to review the results of food safety in importing countries to date. Still, the changing public attitudes to food safety, the changing nature of the food industry, and the environmental impact of climate change are among the additional factors that call into question the U.S. Food and Drug Administration's ability to control imported foods. The food safety bill proposed today by Congress needs support, but it does not consider the existing multi-agency system. The Food Safety and Inspection Service (FSIS) and the Food and Drug Administration (FDA) are part of an existing multi-government, a multifunctional system for food safety. Relying on farmers to move production abroad to protect American food safety is a disaster recipe.

Further research will conduct a deeply study on the U.S regulations relating to import conditions of agriculture products.

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