



Exploring the Potential of ChatGPT
in Enhancing Public Health Activities:
AI-Assisted Retail Food Establishment
Inspections



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Public health activities encompass a wide range of efforts aimed at improving the overall health and well-being of communities. These activities include health promotion, disease prevention, surveillance, and response to emerging health threats. Given the rapidly evolving nature of health challenges, it is essential to adopt innovative tools and technologies to augment the efficiency of public health efforts across a broad spectrum of practices.

This project aims to explore the potential of ChatGPT, an advanced artificial intelligence (AI) language model, in enhancing various public health activities.

Objectives:

1. Investigate the potential applications of ChatGPT in diverse public health activities, such as health promotion campaigns, disease prevention initiatives, outbreak tracking, and health education.
2. Evaluate the effectiveness of ChatGPT in supporting the development of targeted health strategies by analyzing its ability to consider historical data, emerging health threats, and local vulnerabilities.
3. Assess the potential of ChatGPT in providing valuable insights and information on best practices, guidelines, and relevant resources for public health practitioners, enabling stakeholders to make informed decisions in planning and implementing health initiatives.
4. Examine the role of ChatGPT in facilitating collaboration and communication between various public health stakeholders, such as healthcare providers, policymakers, and community members.
5. Explore the potential challenges and drawbacks associated with the integration of ChatGPT in public health activities, including data privacy concerns, technical expertise requirements, potential biases, and overreliance on AI.

Methodology: The project will adopt the following methodology:

1. Use case experimentation: Conducting a series of experiments with ChatGPT in a range of public health activities to assess its effectiveness and potential impact.
2. Case studies: In-depth analysis of selected public health initiatives to explore how ChatGPT can be integrated and assess its potential impact on various aspects of health initiatives.
3. Prototype development: Creating, testing, and sharing prototypes of ChatGPT-enhanced public health tools, such as health promotion platforms, outbreak tracking systems, and educational modules.

Expected Outcomes:

1. Identification of key areas where ChatGPT can be integrated into public health activities to optimize their impact and effectiveness.
2. A comprehensive understanding of the potential benefits and challenges associated with the integration of ChatGPT in public health efforts.
3. Recommendations for best practices and strategies for incorporating ChatGPT into public health activities, addressing potential drawbacks and challenges.
4. Insights into the perspectives of various public health stakeholders on the role of AI in health initiatives, informing future research and policy development.

Direct any questions regarding this product to:

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About SGNL Solutions

SGNL Solutions (SGNL), a service-disabled veteran-owned small business corporation, connects across research, policy, and practice communities to identify, understand, and solve complex health security challenges. We undertake collaborative projects involving stakeholder engagement, process facilitation, data collection, analysis, evaluation, scientific writing, and product development. Our team of experienced consultants provides cross disciplinary expertise and perspectives, which fosters better understanding and integrated solutions to address our nation's most pressing issues. We become issue experts and get excited about what matters to our clients. We sift through noisy data and distractions to get at the core of persistent problems to find the signal – the real information and approaches needed to finally address problems. We work across disciplines, think creatively, and break apart silos that oftentimes prevent progress. We then work with clients to make these important issues approachable and actionable.

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AI Use Example: AI-Assisted Retail Food Establishment Inspection

In this experiment, I sought to assess the capabilities of an AI language model (GPT-4 by OpenAI) in analyzing food code violations and providing recommendations based on the Massachusetts Food Code and HACCP guidelines. This experiment aimed to determine the potential of AI in assisting food establishment inspectors and ensuring public health and safety.

The AI language model was provided with a fictional scenario where it played the role of a government food establishment inspector in Acton, Massachusetts. The task involved inspecting a seafood restaurant named Ocean's Bounty and identifying various violations. The AI model successfully identified numerous violations, ranging from high to low priority, and demonstrated a solid understanding of the food code and HACCP principles.

Some of the key high priority violations identified by the AI model included:

1. Improper holding temperatures for raw and cooked foods.
2. Cross-contamination risks due to inappropriate storage practices.
3. Inoperable handwashing sink and poor employee hygiene practices.
4. Non-functioning dish machine and thermometers in refrigeration units.

The AI model not only identified the violations but also provided a comprehensive table with details on the code(s) violated, descriptions of the violations, public health risks, immediate and other necessary remediation steps, and the level of priority. This table proved to be a valuable tool for communicating the findings and necessary actions to the fictional restaurant.

Moreover, the AI model generated an appropriate letter to the establishment, including a brief summary of the high priority violations and the risks they posed to the public. This letter emphasized the importance of immediate action and ongoing compliance with food safety regulations.

In conclusion, this experiment showcased the potential of AI-powered language models in the field of food safety inspection and compliance. The AI model demonstrated a strong understanding of the food code and HACCP guidelines and provided actionable insights and recommendations. By harnessing the power of AI, food establishment inspectors can enhance their efficiency, ensuring that food establishments adhere to the highest standards of food safety and public health.

I instructed ChatGPT with the following prompt:

You are a government food establishment inspector in Acton, Massachusetts and an expert in the merged food code and HACCP. You have inspected a seafood restaurant named Ocean's Bounty and you find violations. You find the following concerning practices:

- *Raw fish held at 50°F (10°C) in the walk-in cooler*
- *Raw shrimp stored above cooked crab cakes in the walk-in cooler*
- *Inoperable handwashing sink in food preparation area.*
- *Employees handling food without gloves or proper handwashing.*
- *Improper sanitizing of cutting boards and utensils.*

- Presence of pests in the dry storage area.
- Use snow from the parking lot to keep raw fish cold
- Damaged ceiling about food preparation area
- Exhaust hood sticker not visible
- Dish machine not operating
- internal thermometers in refrigeration units not operable
- Raw chicken and fish stored with cooked foods
- 3 lightbulbs burnt out
- Holding temperature: White rice at 100F, seafood stew at 87F
- Use of residential ice cooler
- Shrimp in container of water thawing

Then produce a table with 5 columns: 1) code(s) violated, 2) description of what was found in violation, 3) describe the public health risk, 4) provide immediate and other necessary remediation steps, 5) note level of priority (low to high).

After that, produce an appropriate letter to the establishment with the inspection findings, including a brief summary of all of the high priority violations and risk to the public.

Here are the results:

ChatGPT:

Table of Violations (Ordered by Priority):

Code(s) Violated	Description of Violation	Public Health Risk	Immediate and Other Necessary Remediation Steps	Level of Priority
3-501.16(A)(2)	Raw fish held at 50°F (10°C) in the walk-in cooler.	High risk of bacterial growth	Adjust cooler temperature to 41°F (5°C) or below, discard affected food items. Regularly monitor temperatures.	High
3-302.11(A)(1)	Raw shrimp stored above cooked crab cakes in the walk-in cooler.	High risk of cross-contamination	Store raw seafood below cooked and ready-to-eat items to prevent contamination.	High
5-202.12(A) & 6-301.11	Inoperable handwashing sink in food preparation area.	High risk of contamination	Repair or replace the handwashing sink. Ensure it has hot and cold water, soap, and paper towels.	High

Code(s) Violated	Description of Violation	Public Health Risk	Immediate and Other Necessary Remediation Steps	Level of Priority
3-301.11	Employees handling food without gloves or proper handwashing.	High risk of contamination	Train employees on proper handwashing techniques and require gloves when handling food.	High
3-305.11	Use snow from the parking lot to keep raw fish cold.	High risk of contamination	Discard affected fish, store raw fish at proper temperature (41°F/5°C or below) using appropriate methods.	High
4-501.112	Dish machine not operating.	High risk of contamination	Repair or replace the dish machine to ensure proper cleaning and sanitization of dishes and utensils.	High
7-204.11 & 4-502.11(B)	Internal thermometers in refrigeration units not operable.	High risk of temperature abuse	Replace non-functioning thermometers to ensure accurate temperature monitoring.	High
3-302.11(A)(2)	Raw chicken and fish stored with cooked foods.	High risk of cross-contamination	Store raw and cooked foods separately to prevent contamination.	High
3-501.16(A)(1)	Holding temperature: White rice at 100°F, seafood stew at 87°F.	High risk of bacterial growth	Reheat food items to 165°F (74°C) and maintain a hot holding temperature of 135°F (57°C) or above. Regularly monitor temperatures.	High
3-501.19(B)	Shrimp in container of water thawing.	High risk of bacterial growth	Thaw shrimp using approved methods, such as under refrigeration or under cold running water.	High
4-501.114(A)	Improper sanitizing of cutting boards and utensils.	Moderate risk of contamination	Train employees on proper sanitizing procedures for cutting boards and utensils.	Moderate
6-501.111(A)	Presence of pests in the	Moderate risk of	Contact a licensed pest control	Moderate

Code(s) Violated	Description of Violation	Public Health Risk	Immediate and Other Necessary Remediation Steps	Level of Priority
	dry storage area.	contamination	company to address infestation and maintain ongoing pest control measures.	
4-204.11	Use of residential ice cooler.	Moderate risk of contamination	Replace residential cooler with a commercial-grade cooler approved for food storage.	Moderate
6-201.11	Damaged ceiling above food preparation area.	Low risk of contamination	Repair or replace damaged ceiling to prevent potential contamination from debris.	Low
4-204.112	Exhaust hood sticker not visible.	Low risk	Place a clearly visible and up-to-date exhaust hood sticker on the hood.	Low
6-202.11	3 lightbulbs burnt out.	Low risk	Replace burnt-out lightbulbs to maintain adequate lighting in the food establishment.	Low

Letter to the establishment:

Ocean's Bounty Seafood Restaurant
123 Ocean Drive Acton, MA 01720

Dear Owner/Manager,

Following a recent inspection of your Ocean's Bounty Seafood Restaurant located at 123 Ocean Drive, Acton, MA, we have identified several violations of the Massachusetts Food Code. These violations pose a risk to public health and require immediate and ongoing remediation.

Among the most concerning high priority violations are:

- Raw fish held at 50°F (10°C) in the walk-in cooler, posing a high risk of bacterial growth.
- Raw shrimp stored above cooked crab cakes in the walk-in cooler, resulting in a high risk of cross-contamination.
- Inoperable handwashing sink in the food preparation area, leading to a high risk of contamination.
- Employees handling food without gloves or proper handwashing, which poses a high risk of contamination.
- Use of snow from the parking lot to keep raw fish cold, posing a high risk of contamination.
- Dish machine not operating, resulting in a high risk of contamination.
- Internal thermometers in refrigeration units not operable, leading to a high risk of temperature abuse.
- Raw chicken and fish stored with cooked foods, causing a high risk of cross-contamination.
- Holding temperature of white rice at 100°F and seafood stew at 87°F, posing a high risk of bacterial growth.
- Shrimp in a container of water thawing, resulting in a high risk of bacterial growth.

These high priority violations may directly impact the safety of the food served to the public and must be addressed immediately.

Please find the detailed list of violations, their public health risk, and remediation steps in the attached table. We urge you to take immediate action to address these violations and prioritize the necessary steps based on their level of priority.

In addition to these immediate actions, it is crucial to establish and maintain proper food handling practices, employee training, and preventive measures to ensure ongoing compliance with the Massachusetts Food Code and HACCP guidelines.

We will schedule a follow-up inspection within the next two weeks to assess the progress of the remediation steps. Failure to address these violations may result in further regulatory action, including fines, license suspension, or closure of the establishment.

Please contact our office at (123) 456-7890 or email us at foodinspection@actonma.gov to discuss any questions or concerns about the inspection findings or remediation steps. Our goal is to work together with you to ensure the highest level of food safety for the public.

Sincerely,
[Your Name]
Food Establishment Inspector
Acton, Massachusetts Health Department