

“Why are Chinese Restaurants So Nasty?": How Cultural Biases Influence Food Safety Standards in NYC

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Asian American Studies

Cornell University May 2014

Introduction

The New York City's Department of Health and Mental Hygiene (DOH) shape consumer perception on a cuisine's cleanliness because it is in charge of regulating and inspecting restaurants. Without the DOH, consumers would have little assurance that their food is prepared with good hygienic standards in mind. Since this assurance positively alter a consumer's preference, the DOH not only shape consumer attitudes on a cuisine's cleanliness, but also consumer attitudes on a cuisine.

What historical and demographic factors affect DOH restaurant inspection results? Do DOH restaurant inspections have certain biases? I analyze restaurant inspection results for different cuisines, focusing mainly on Chinese cuisine, and 2012 US Census demographic data to explain how certain historical and demographic factors cause certain cuisines have worse restaurant inspection results than other cuisines.

Inspection Score Calculation and Relevance

Since July 2010, the New York City Department Health has required restaurants to post letter grades showing sanitary inspection results. These grades determine how well it follows City and State food safety requirements for food handling, food temperature, personal hygiene, facility and equipment maintenance, and vermin control. “Restaurants with a score between 0 and 13 points earn an A, those with 14 to 27 points receive a B and those with 28 or more a C. The points for a particular violation depend on the health risk it poses to the public. Violations fall into three categories: ¹

Points	Classification	Example
7	Public Health Hazard	Failing to keep food at the right temperature
5	Critical Violation	Serving raw food such as a salad without properly washing it first
2	General Violation	Not properly sanitizing cooking utensils

The 2-point violations are from personal hygiene, and facility and equipment maintenance. The 5-point are violations from food handling and vermin control. The 7-point violations are from food temperature. These 5-7 point regulations are set by the Hazard Analysis and Critical Control Point (HAACP) system which addresses food safety through prevention of biological, chemical, and physical hazards in the food production process

Restaurant inspections grades are directly important to restaurants and consumers alike because it affects perceptions about cleanliness, consumer preference, and restaurant revenue. Consumers use DOH grades to generate perceptions about cleanliness for different restaurants and preferences for cuisine.

A 2011 public survey by Baruch College Survey Research, which was commissioned by the DOH, reported 70% of New York City adults notice grades in restaurant windows. Of those New York City adults, 88% of them consider grades when they are choosing a restaurant and 65% consider the grades all or most of the time². In fact, consumers are less likely to eat at restaurants if they have a C grade. A 2006 study by a Stanford professor and a the University of Maryland professor showed that an A or B grade directly leads to an increase in restaurant revenue, while C grade directly leads to a decrease in restaurant's revenue³. Because of the effects of DOH grades, it is important to examine biases in the grading system and find solutions.

Comparison of Violation Scores by Cuisine Type

Below is a table showing the 15 cuisine types with the highest average violation score, 15 cuisine types with lowest average violation score, and the overall average violation score. In addition, the bar graph below the tables compares the follow averages: violation score, score of each violation, and number of violations.

Top 15: Cuisine Types sorted Average Score

Cuisine Type	Number of Restaurants	Percent of A's	Average Score
Donuts	449	96.66%	8.056818182
Ice Cream, Gelato, Yogurt, Ices	316	95.57%	8.549520767
Sandwiches/Salads/Mixed Buffet	219	95.43%	8.555045872
Cafe/Coffee/Tea	1072	95.15%	8.747446611
Juice, Smoothies, Fruit Salads	212	93.40%	8.823529412
Soups & Sandwiches	48	97.92%	8.854166667
Sandwiches	460	95.00%	8.88691796
Hamburgers	446	95.96%	8.895089286
Bottled beverages	64	89.06%	9.608695652
Mediterranean	207	87.92%	10.69626168

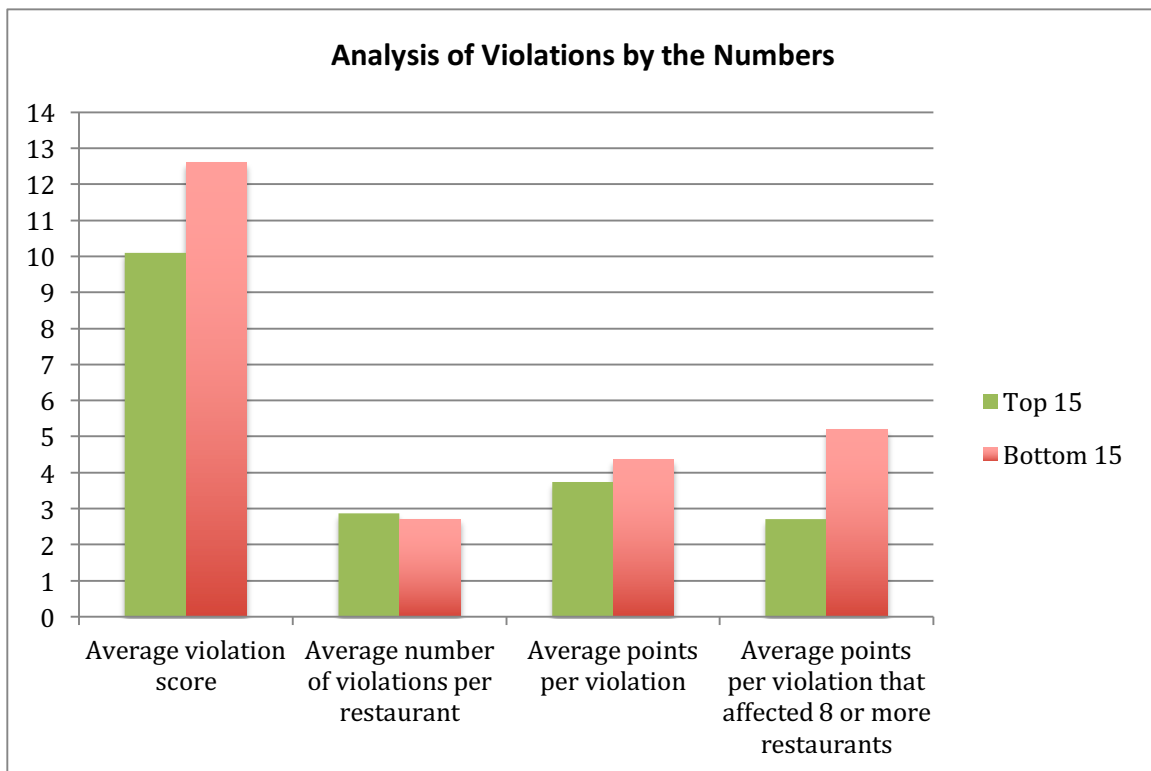
Irish	181	88.95%	10.71428571
Bakery	671	87.03%	10.72346786
American	5957	88.13%	10.74025538
Barbecue	47	93.62%	10.80851064
Tex-Mex	138	86.23%	10.94244604
Average		90.32%	10.09653211

Bottom 15: Cuisine Types sorted Average Score

Cuisine Type	Number of Restaurants	Percent of A's	Average Score
Chinese/Japanese	51	58.82%	16.24528302
Vietnamese	64	70.31%	13.78461538
African	69	75.36%	13.41428571
Korean	254	74.41%	13.38671875
Turkish	60	78.33%	13.34920635
Thai	272	77.21%	13.27536232
Japanese	715	75.10%	13.05082418
Peruvian	65	70.77%	12.78787879
Asian	312	74.04%	12.66876972
Russian	95	80.00%	12.61052632
Mexican	698	78.08%	12.47100424
Delicatessen	314	79.94%	12.4600639
Indian	300	79.67%	12.44117647
Chinese	2358	78.58%	12.32525084
Latin (Cuban, Dominican, Puerto Rican, South & Central American)	854	80.33%	12.26162791
Average		77.72%	12.59767648

Overall Average Score of all Cuisine Types

Cuisine Type	Number of Restaurants	Percent of A's	Average Score
Baseline	23571	85.41%	11.197176



From the data above, the top 15 cuisine types average 1.5 violation points less and 12% A grades more than the bottom 15. The top 15 average slightly more violations per restaurant than the bottom 15 (2.87 vs. 2.7), but averages 1 point less per violation. However, out of the violations that affected the majority of the restaurants (8 or more), the average points per violations for the top 15 is 2.5 points less than the bottom 15. This difference in average point per violation best explains the difference in overall violation score: despite having a similar number of violations, the points per violation are notably higher because there are a higher number of HACCP violations. Generally, the top 15 cuisine types are generally American fast-food restaurants that use a grill or oven. On the other hand, the bottom 15 cuisine types are generally ethnic sit-down restaurant that cook over a stove.

The disparity in HACCP violations is exhibited after comparing the most popular violations, of the top 15 cuisine types and bottom 15 cuisine types.

Top 15: Most Popular Violations

Points	Violation Description
2	Non-food contact surface improperly constructed. Unacceptable material used.
2	Toilet facility not maintained and provided with toilet paper, waste receptacle and self-closing door.
2	Accurate thermometer not provided in refrigerated or hot holding equipment.
2	Single service item reused, improperly stored, dispensed; not used when required.
2	Covered garbage receptacle not provided or inadequate, except that garbage receptacle may be uncovered during active use. Garbage storage area not properly constructed or maintained; grinder or compactor dirty.
5	Hand washing facility not provided in or near food preparation area and toilet room. Hot and cold running water at adequate pressure to enable cleanliness of employees not provided at facility. Soap and an acceptable hand-drying device not provided.
5	Live animals other than fish in tank or service animal present in facility's food and/or non-food areas.
2	Food contact surface not properly maintained.
2	Plumbing not properly installed or maintained; anti-siphonage or backflow prevention device not provided where required; equipment or floor not properly drained; sewage disposal system in disrepair or not functioning properly.
2	Lighting inadequate; permanent lighting not provided in food preparation areas, ware washing areas, and storage rooms.

Bottom 15: Most Popular Violations

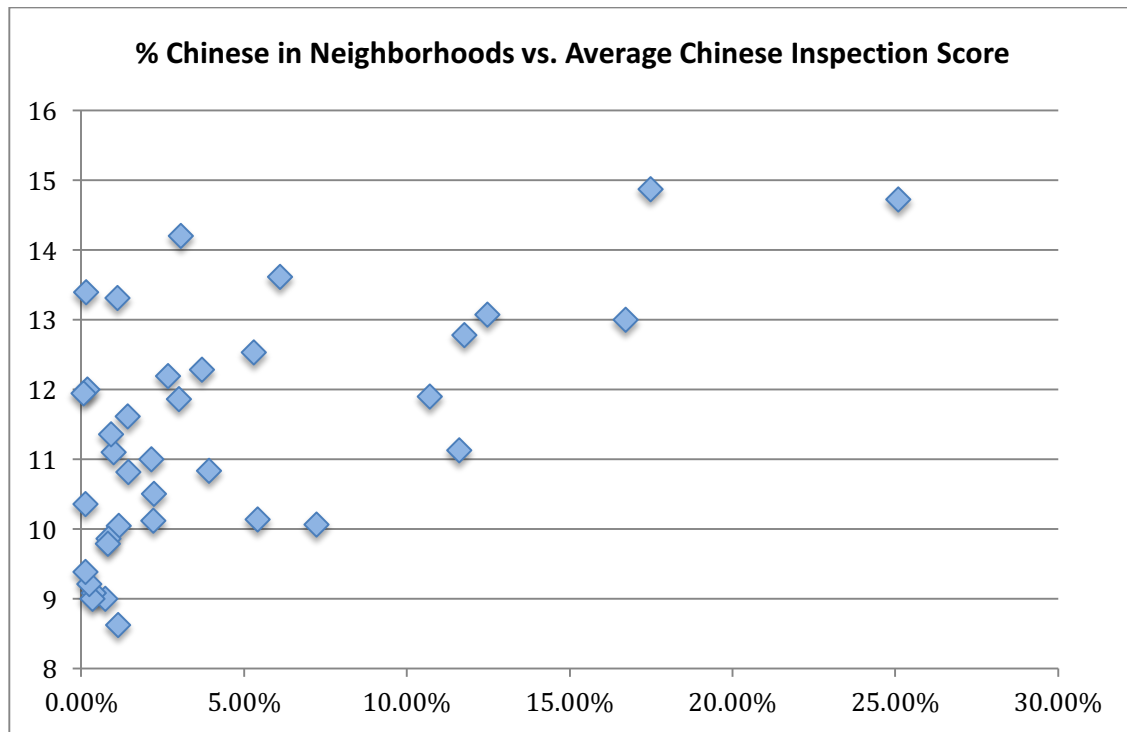
Points	Violation Description
5	Facility not vermin proof. Harborage or conditions conducive to attracting vermin to the premises and/or allowing vermin to exist.
7	Hot food item not held at or above 140°F.
5	Food not protected from potential source of contamination during storage, preparation, transportation, display or service.
7	Cold food item held above 41°F (smoked fish and reduced oxygen packaged foods above 38°F) except during necessary preparation.
5	Evidence of mice or live mice present in facility's food and/or non-food areas.
5	Food contact surface not properly washed, rinsed and sanitized after each use and following any activity when contamination may have occurred.

5	Live roaches present in facility's food and/or non-food areas.
2	Thawing procedures improper.
5	Wiping cloths soiled or not stored in sanitizing solution.
5	Personal cleanliness inadequate. Outer garment soiled with possible contaminant. Effective hair restraint not worn in an area where food is prepared.

Ethnic restaurants tend have higher violation score because it has more food preparation, leading to 7-point public health hazards regarding food temperature. American restaurants instead have facility infractions that lead to 2-point general violations.

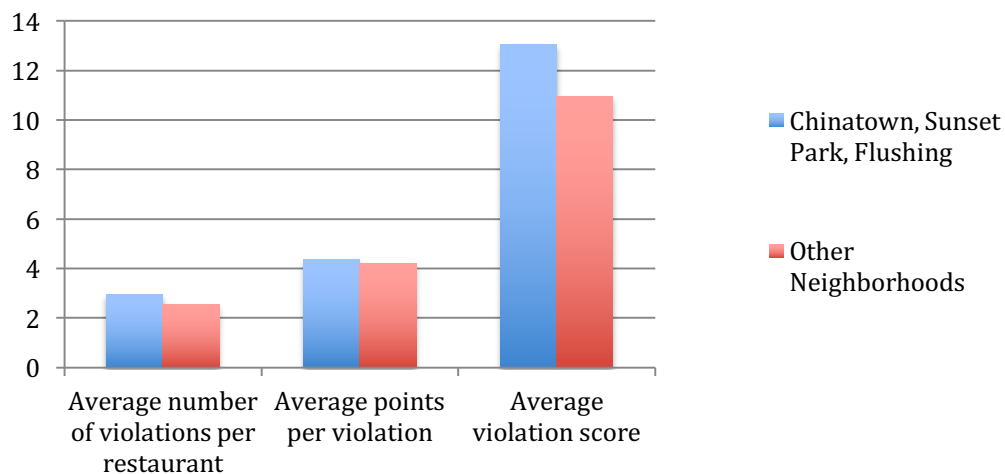
After further examination, some violations are shown to disproportionately affect the bottom 15 groups. For example, Vietnamese restaurants, despite accounting for 0.3% of all total restaurants, caused 5% of all violations for “Food not cooked to minimum temperature.” This 7-point violates targets Pho, a noodle soup where meat is cooked in boiling water. Similarly, Indian restaurants, despite accounting for 1.3% of all total restaurants, caused for 50% of all violations for “Flavored tobacco products sold.” This bizarre 2-point violation specifically targets Hookah, a popular flavored tobacco product that is popular among Indians. Although these violations do not explain all of the wide disparity in score, it shows systemic bias in the DOH restaurant inspections.

Analysis of Inspection Results for Chinese Cuisine



Examining the nuances for Chinese cuisine, in particular, allows for a deeper exploration into demographic and historical factors that cause a divide in schools. Chinese cuisine makes up 10% of all restaurants and 36% of the bottom 15 restaurants, making it a good proxy to examine trends for cuisine biases. By comparing the percentage of Chinese to the average violation score in different neighborhoods in Brooklyn, I discovered there was a strong correlation ($r = .61$) between percentage of Chinese in a neighborhood and violation score in Chinese restaurants. To ensure income did not skew the data, I checked to see that there was not a correlation ($r = -.14$) between a neighborhood's median income and violation score for Chinese restaurants.

Violations for Chinese Restaurants vs. Neighborhoods



Points	Popular Violations affecting Chinatown, Sunset Park, Flushing
7	Food contact surface not properly washed, rinsed and sanitized after each use and following any activity when contamination may have occurred.
2	Raw, cooked or prepared food is adulterated, contaminated, cross-contaminated, or not discarded in accordance with HACCP plan.
5	Pesticide use not in accordance with label or applicable laws. Prohibited chemical used/stored. Open bait station used.
7	Appropriately scaled metal stem-type thermometer or thermocouple not provided or used to evaluate temperatures of potentially hazardous foods during cooking, cooling, reheating and holding.
7	Shellfish not from approved source, improperly tagged/labeled; tags not retained for 90 days.

Points	Population affecting Other
2	Non-food contact surface improperly constructed. Unacceptable material used. Non-food contact surface or equipment improperly maintained and/or not properly sealed, raised, spaced or movable to allow accessibility for cleaning on all sides, above and underneath the unit.
5	Hot food item that has been cooked and refrigerated is being held for service without first being reheated to 165°F or above within 2 hours.
7	Eggs found dirty/cracked; liquid, frozen or powdered eggs not pasteurized.
5	Live animals other than fish in tank or service animal present in facility's food and/or non-food areas.
2	Food service operation occurring in room used as living or sleeping quarters.

The three neighborhoods in New York with the highest Chinese concentration, Chinatown, Flushing, and Sunset Park, stand out in particular since they encompass 23% of all Chinese restaurants and have on average a 2-point higher violation score than the rest of the neighborhoods. The most popular violations in “Chinatown” neighborhoods are similar to those from the bottom 15 cuisines because they both disproportionately failed HAACP violations. On the other hand, the most popular violations in the other neighborhoods are similar to most popular violations by the top 15 cuisines because disproportionately failed general violations. This data suggests a difference in preparation techniques and food served in “Chinatown” neighborhoods vs. other neighborhoods. Anecdotally, Chinese cuisine from “Chinatown” neighborhoods resemble traditional Cantonese cuisine while other neighborhoods resemble American Chinese or Chinese takeout cuisine because different the taste preferences of the different demographics. However, numerous menus from each neighborhood would need to be studied to make any statically relevant claim.

In addition to demographic factors, historical factors regarding Chinese cuisine’s lack of exposure to the HAACP system influence the violation score. The HAACP system was collaboratively developed by Pillsbury, National Aeronautic and Space Administration (NASA), the US Army, and US Air Force in the 1960’s to address food safety concerns. In 1974, the US Food & Drug Administration (FDA) became the first program to adopt principles from HAACP and continued to modify it to accommodate new food-related disease outbreaks. Many US food enterprises,

like McDonalds, started to adopt HACCP standards to ensure the safety of foods in their establishment⁴. By 1996, the FDA made HACCP standards mandatory for all seafood, meat, and poultry products across the United States⁵.

On the other hand, the Chinese government has only recently started to adopt the HACCP to enhance the safety of foods and to close the gap between Chinese and international food safety standards. Unlike in America, the policy still remains voluntary. In a 2006 study, Chinese researchers showed that adoption rates of this system by food enterprises still remained low. Out of 160 Chinese food enterprises interviewed in 2005, only 21.9% of them acknowledged adopting the HACCP standards⁶. While America cuisine gradually adapted to the HACCP standards, traditional Chinese cuisine has not adapted anywhere as much. This helps to explain the difference in average violation score between Cantonese Chinese cuisine in “Chinatowns” and America Chinese cuisine in other neighborhoods.

Because applying HACCP standards towards traditional Chinese cuisine is a relatively new and unfamiliar process, Chinese restaurants often violate these standards. Chinese restaurants, despite accounting for 10% of all total restaurants, caused for 22.62% of all violations for “thawing procedures improper.” HACCP standards stipulate that meat must thaw in running water or in a refrigerator⁷. China Wok, a Chinese restaurant cited for this violation, was cited for leaving chicken thawing in a bucket of standing water at room temperature⁸. Despite being considered unhygienic in America, this is a common practice in Hong Kong. A 2011 study by a Hong Kong Polytechnic University professor showed that despite cold

water thawing being the most popular method of thawing in Hong Kong, many people did not understand the process, leading to bad water and time management⁹. These cultural practices demonstrate some bias in why traditional Chinese cuisine has a lower average violation score than American cuisine.

Despite Chinese restaurant currently having a lower violation score than average, it's likely that HAACP standards have already influenced the way Chinese restaurants prepare and cook food. A 2012 study by the NYC DOH has shown the percentage of restaurants given A's have been steadily increasing since the program's inception², so Chinese restaurants have likely also adjusted its preparation and cooking methods to improve its scores. By adopting HAACP standards, Chinese restaurants are actively engaging cultural negotiation to improve their public perception.

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