Using Seafood HACCP on Retail Sushi Inspections

Eugene Evans, CFP
NYSDAM Food Inspector 2
AFDO/SHA Seafood HACCP Trainer
AFS Certified Fisheries Professional
Seafood Processing Subject Matter Expert

Seafood HACCP Regulations

- 21 CFR 123 “Seafood HACCP Regulations”
- Fish and Fishery Products Hazards and Controls Guidance Document- April 2011- 4th edition (The Hazards Guide)
- http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm2018426.htm
- Wholesale seafood regulation enforced by FDA and states which adopt the regulation.

State and Local Retail Regulations

- Depends on location and jurisdiction of retail establishment.
- Generally drafted from a version of the FDA Food Code.
- Not prescriptive in controlling hazards unique to sushi establishments.
- Cannot enforce Seafood HACCP regulations at retail.

The Hazards Guide

- Fish and Fishery Products Hazards and Controls Guidance- 4th Edition- April 2011
- Chapter 3-2 page 29 Species List
- Look for your species by recognized common name and scientific name when possible. Look across from the name and whatever boxes are checked are your hazards (if any).
- Each box has a chapter corresponding to the species related hazard.

Hazards

- Parasites (species related) Ch.5
- Histamines (species related) Ch.7
- Pathogens (species and process related) Ch.12
- Toxin forming pathogens (process related) Ch 12/13
- https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm2018426.htm#Downloads

Parasites

- Reference species via FDA Species List, American Fisheries Society, or www.fishbase.org
- Chapter 5 (Hazards Guide)- Parasites
- Documentation for freezing
- ****Wild salmon vs. farm raised salmon****
- 99.9999% of Atlantic salmon (Salmo salar) is farm raised.
- Pacific salmon (Oncorhynchus spp.) can go either way but mostly are wild.

Parasites continued

- **<u>Documentation from supplier (Letter of guarantee)</u>**

Name of supplier

Processed under 21 CFR 123

Name of specie(s) (scientific name(s) if possible)

Brand names if applicable

Wording indicating that the fish was frozen under a recognized freezing regime for parasite destruction.

Dated within 1 year from the date of purchase.

Make sure the receipts match.

Ask management to get a copy of the supplier's Seafood HACCP Plan. See what it says for **<u>END USER</u>**.

Freezing for parasite destruction

- Ambient temperature -4F or below for 7 days total
- Ambient temperature of -31F or below until solid and storing at -31F or below for 15 hours
- Ambient temperature of -31F or below until solid and storing at -4F or below for 24 hours
- Might not be suitable for large fish (thicker than 6 inches)
- Can be done in house if a capable freezer is present.

Freezing (quality)

- *SUSHI GRADE*???
- Sushi chefs claim frozen fish tastes horrible when defrosted and freezing bursts cells…… ***WHY?????***
- **"CRITICAL FREEZING ZONE" p 235 The Seafood Industry*****32F to 23F***** The less time fish spends in this zone, the less cellular water loss due to freezing occurs.
- Longer time, larger ice crystals, more time for concentrated salts and minerals to cause cell membrane damage which causes water loss.

Freezing (quality) continued

- "**Critical freezing rate** is defined as the time required from the internal temperature of a fish product to drop from… (32F to 23F)" p235 The Seafood Industry.
- *Slow freezing* (deep freezing)- freezing at 0F or less without any regard to time. (common)
- *Quick or fast freezing* - 2 hours or less through the critical freezing zone. (blast tunnels- plate freezers, blast chillers, etc) (moderately rare)
- *Ultrarapid freezing* - Using liquid nitrogen or liquid carbon dioxide. (extremely rare)

Histamines

- **<u>Chapter 7- (Hazards Guide)</u>**
- “Certain bacteria produce the enzyme histadine decarboxylase during growth. This enzyme reacts with **histidine**, a naturally occurring amino acid that is present in larger quantities in some fish than in others. The result is the formation of scombrotoxin (**histamine**).” Chap 7 page 113.
- Scombridae, Clupeidae, Carangidae, Engraulidae, Pomatomidae, etc families are histamine forming families of fish.

Histamines continued

- Rapid chilling upon harvest.
- Make sure all species enter facility at 41F or less depending on your regulations.
- Keep fish cold at all times, regulations state 41F or less but the closer to 32F the better.
- Washing, rinsing, proper evisceration.
- After processing, immediately refrigerate and/or use time/discard at ambient temperatures.

Pathogens

- Bacterial pathogens are present on raw fish.
- Many day boats lack running potable water for handwashing or equipment washing.
- Many fishermen smoke cigarettes.
- Many day boats lack toilet facilities and fishermen urinate/ defecate in buckets and on deck, then hose down with seawater!!!
- Unsanitary fishing practices lend themselves to the spread of pathogens to the surface of the fish.

Pathogens continued

Pathogens continued

- Processors/ Distributors are required to *adequately* identify the end user especially when directly selling to a known sushi establishment.
- Seafood HACCP Plan encompassing the raw fish shall indicate the product is ready to eat. Many times this does not happen and the sushi establishment *knowingly/unknowingly* produces a RAW/NOT READY TO EAT product.
- Control at retail????

Treatments for pathogens

- Listeria monocytogenes, salmonella, etc.
- Surface pathogen elimination treatments for logarithmic levels of pathogen reduction.
- Acidified sodium chloride 21 CFR 173.325
- Ozone 21 CFR 173.368
- Peroxyacetic acid 21 CFR 173.370
- Bacteriophages
- Washing, scrubbing, and hurdles!!!!!

Toxin forming pathogens

- CBOT- ROP environments (ie: raw vac-pack hamachi), smoked/cured fish, caviars, etc…..

Toxin forming pathogens continued

- *Bacillus cereus*- ***Acidified rice****

Sushi products use acidified rice which is prepared and used warm in order to adequately roll the sushi without it falling apart and cooking the fish.

Brown Rice vs. White Rice

- Brown Rice- *husk removed only*
- White Rice- husk, bran and germ removed
- The bran and germ on *brown rice* have the tendency to inhibit uniform acid penetration during normal acidification procedures.
- This is only a problem with white rice when the acid is added after the rice has cooled.

Brown Rice vs White Rice continued

- Sushi made with brown rice needs to have the rice properly cooled and prepared while cold **unless** the establishment has a recognized process authority conduct a process review or develop a scheduled process for acidification.
- Educate establishments to overcook brown rice to make it tacky so when rolled cold, it doesn't fall apart.

De-germed brown rice/short grain

- Future advances- degermed brown rice
- Short grain brown rice

References

- Fish and Fishery Products Hazards and Controls Guidance, 4th Edition, April 2011 USDHS, FDA, CFSAN
- The Seafood Industry: Species, Products, Processing and Safety, Second Edition- edited by Granata, Flick, and Martin- 2012 Blackwell Publishing Ltd.
- www.affleap.com (tuna boat photo)

QUESTIONS

Eugene E. Evans, CFP

fourchu@msn.com