Cleansing Studies
Conditional Classifications

NESSA Meeting
4/10/2019
Mike Hickey
Mass. Division
of Marine Fisheries

NSSP MO, Chapter IV @.03C.

- **C. (2) (c) (iii)** Sufficient time has elapsed to allow the shellstock to reduce pathogens that might be present to acceptable levels. **STUDIES** establishing sufficient elapsed time shall document the interval necessary for reduction of coliform levels in the shellstock to **PRE-CLOSURE LEVELS**. The study may establish criteria for reopening based on coliform levels in the water

STUDIES 1

- No NSSP Guidance or criteria for cleansing studies.

- Just: “reduce pathogens … “to acceptable levels”.

STUDIES 2

- What constitutes an adequate study?
- What number of shellfish samples and stations in an area?
- Are studies required in every conditional area?
- What are the environmental parameters?

STUDIES 3

- What are acceptable levels?
- There is no NSSP shellstock FC harvest standard.
- The 230 FC wholesale market standard for all certified shellstock from Approved waters was abandoned in the nineties.
- Shellfish can accumulate bacteria up 100 x the level in the water or more.

The Problem and Sampling Burden

- Requires shellstock sampling during open period.
- Requires shellstock sampling after pollution events.
- Laboratory effort and time (2 days) causes reduction in water sampling capacity.
- Pre-closure levels in shellstock can be variable both temporally and spatially.
- As such it is ambiguous.

Past studies - 1980's and early 1990's

- Shellstock were sampled one or two days after water reached the standard for Approved or Restricted classifications.

- A fecal coliform level of less than 230 FC in shellstock, usually about 150 FC or less, was considered adequate to re-open.

- Generally two days was more than enough to reduce FC bacteria to a level well below 230 FC.

Two day Depuration time

- Well established for FC bacteria.
- Literature supports elimination of greater than 95% of FC bacteria from shellstock in less than 24 hours.
- NSSP Workshop studies.
- Endorsed by FDA Shellfish Specialists when policy was established.
- Validated by MA state studies conducted by DMF and predecessor DEQE.

Examples of reductions

- Soft shelled clams: MPN 10,000 FC/100 reduced to values below 50 in 48 hours (Arcisz, et al, 1955)
- Hard clams
- Oysters: At MPN 39,000 FC/100 g can be reduced to values below 50 in 48 hours
- Blue mussels

Environmental Factors

- Temperature is the most important factor affecting elimination of bacteria.

- ***Naturally contaminated shellfish can eliminate fecal coliform levels in 48 hours to levels below most market standards over a range of environmental conditions…(Perkins, et al, 1979).***

Possible alternatives

- Establish criteria for reopening based on coliform levels in the water.

- Accept two day elimination of FC bacteria after water reaches classification criteria if the conditional management plan is based on the effects of non-point sources of pollution such as rain events and/or storm water runoff.

- Allow sampling after an event to demonstrate elimination of FC in shellstock to a pre-determined or established acceptable level.

Possible alternatives continued

- Eliminate or modify the current requirement to eliminate FC bacteria to pre-closure levels.

- Establish an acceptable level of FC bacteria in shellfish at time of harvest.

- Provide guidance for studies to document the interval necessary for reduction of coliform levels in shellstock to acceptable levels.