



Cooling Oysters Within the New
10 Hour Required Time Frame
from the Environment to 50 °F or
Below in a Refrigerated Storage Area

for

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by

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What is the issue?

Risk of *Vibrio parahaemolyticus* for Consumers of Raw Oysters

According to the FDA *Vibrio parahaemolyticus* Risk Assessment, an assumption is made that

1. Oysters are cooled to 50°F (10°C) within 10 hours after placement in refrigeration.
2. Controlling growth after initial refrigeration is a key factor affecting the risk of illness

Why is there concern?

1. Cooling systems for shellstock are diverse and little is known about their individual cooling performance under the variety of circumstances in which they are used
2. Without measures to ensure that oyster shellstock is cooled to 50°F (10°C) within 10 hours, the level of protection intended by the ISSC, the *Vibrio parahaemolyticus* Control Plan will not be achieved.

Who is Responsible?

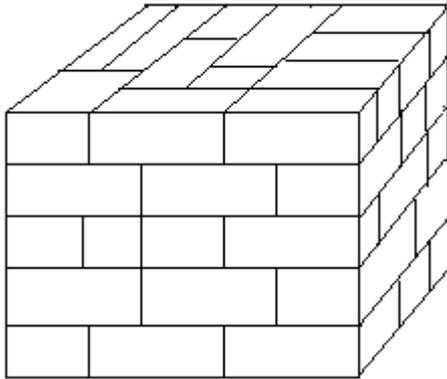
In Virginia that plan will be in place beginning next year from May 1, 2011 through September 30, 2011

It will require the original dealer to cool oysters to an internal temperature of 50°F (10°C) or below within 10 hours or less as determined by the Authority after placement into refrigeration.

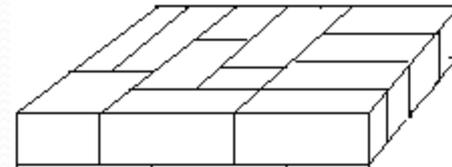
Question: How do we determine what measures can be achieved?
Answer: Measurement of oyster temperature over time within the time frame from harvest to cooling.



Pallet Cooling Example

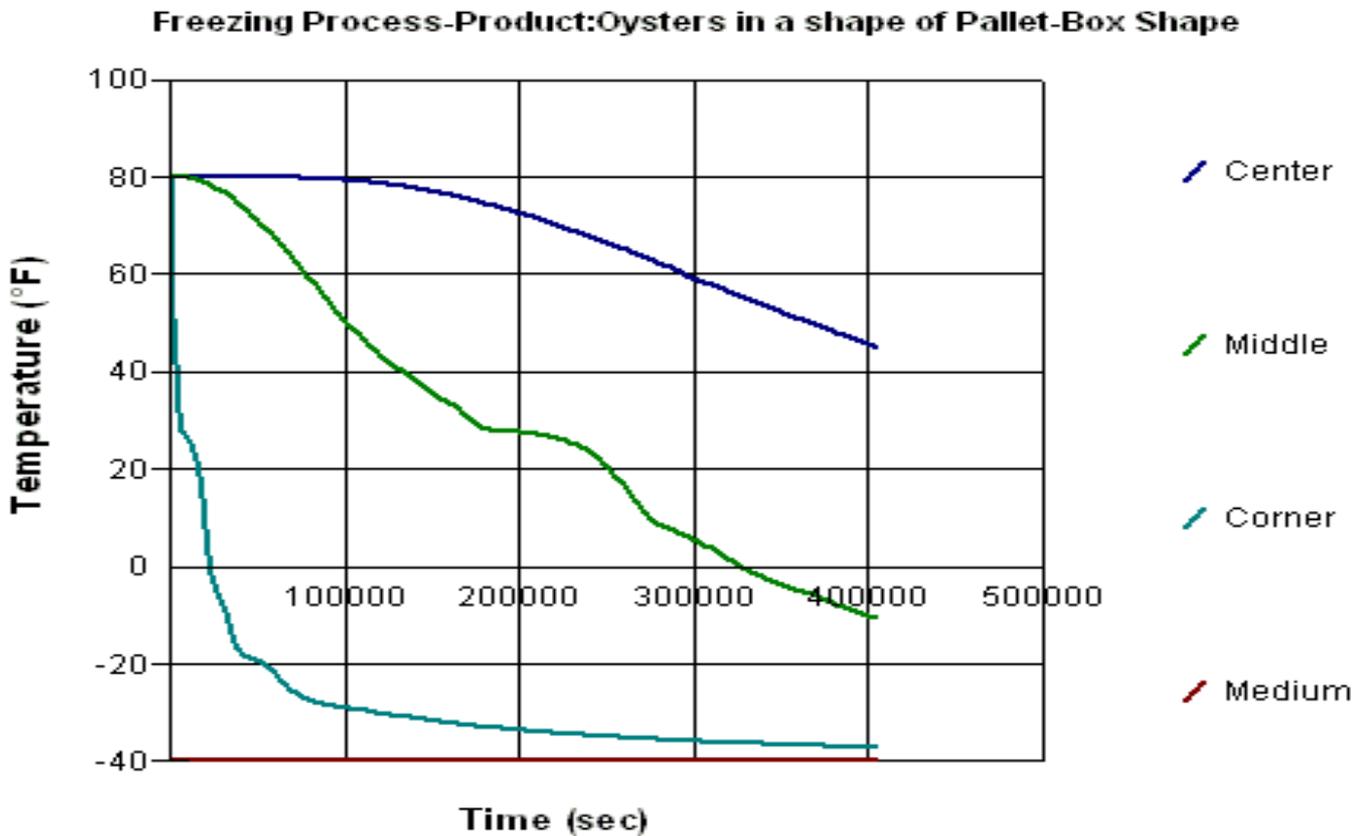


60 inches tall

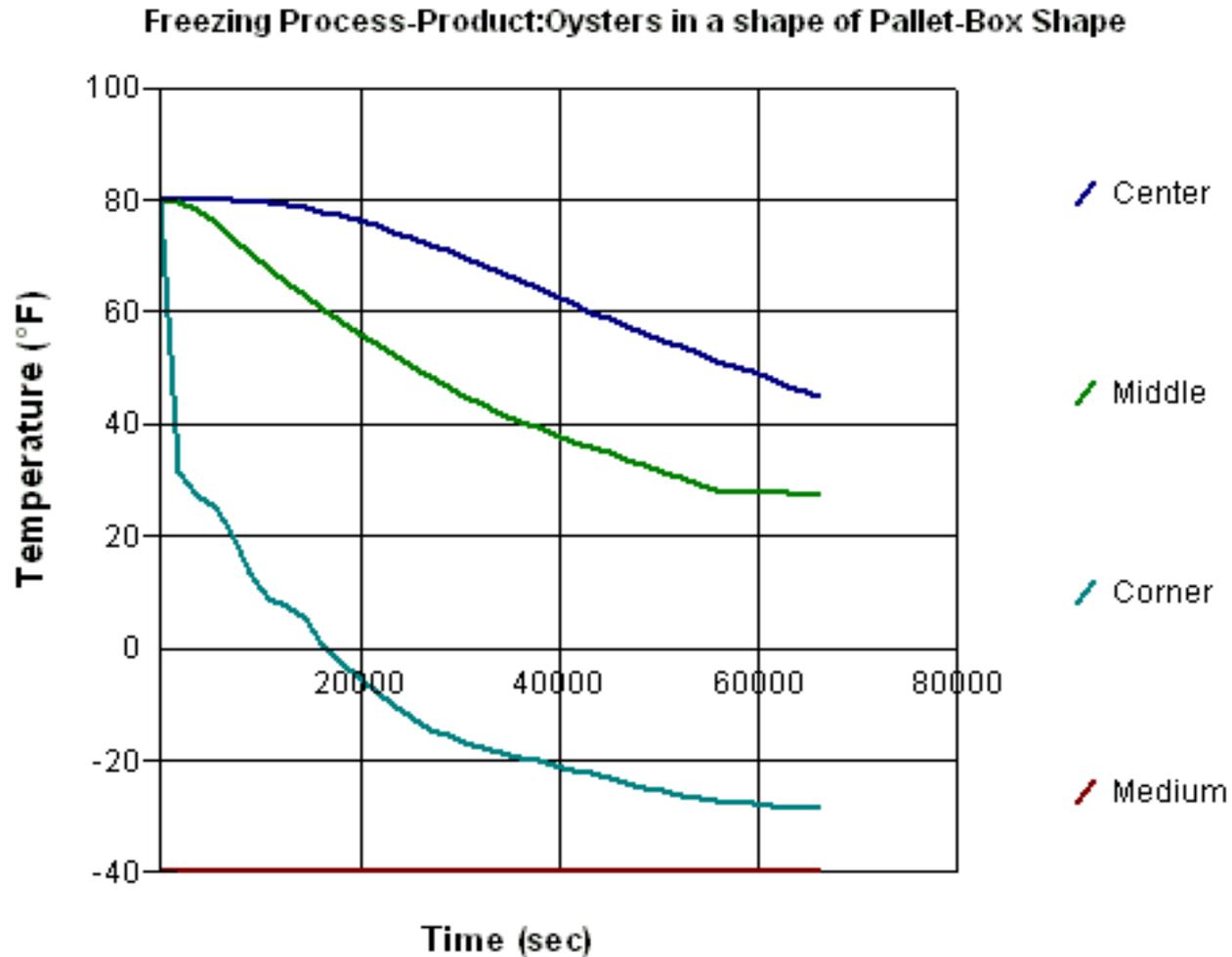


12 inches tall

Oysters on a pallet 48"x40"x60" with air movement at 2000 ft/min and an air temperature of -5°F (80°F to 50°F required 125.5 hrs)



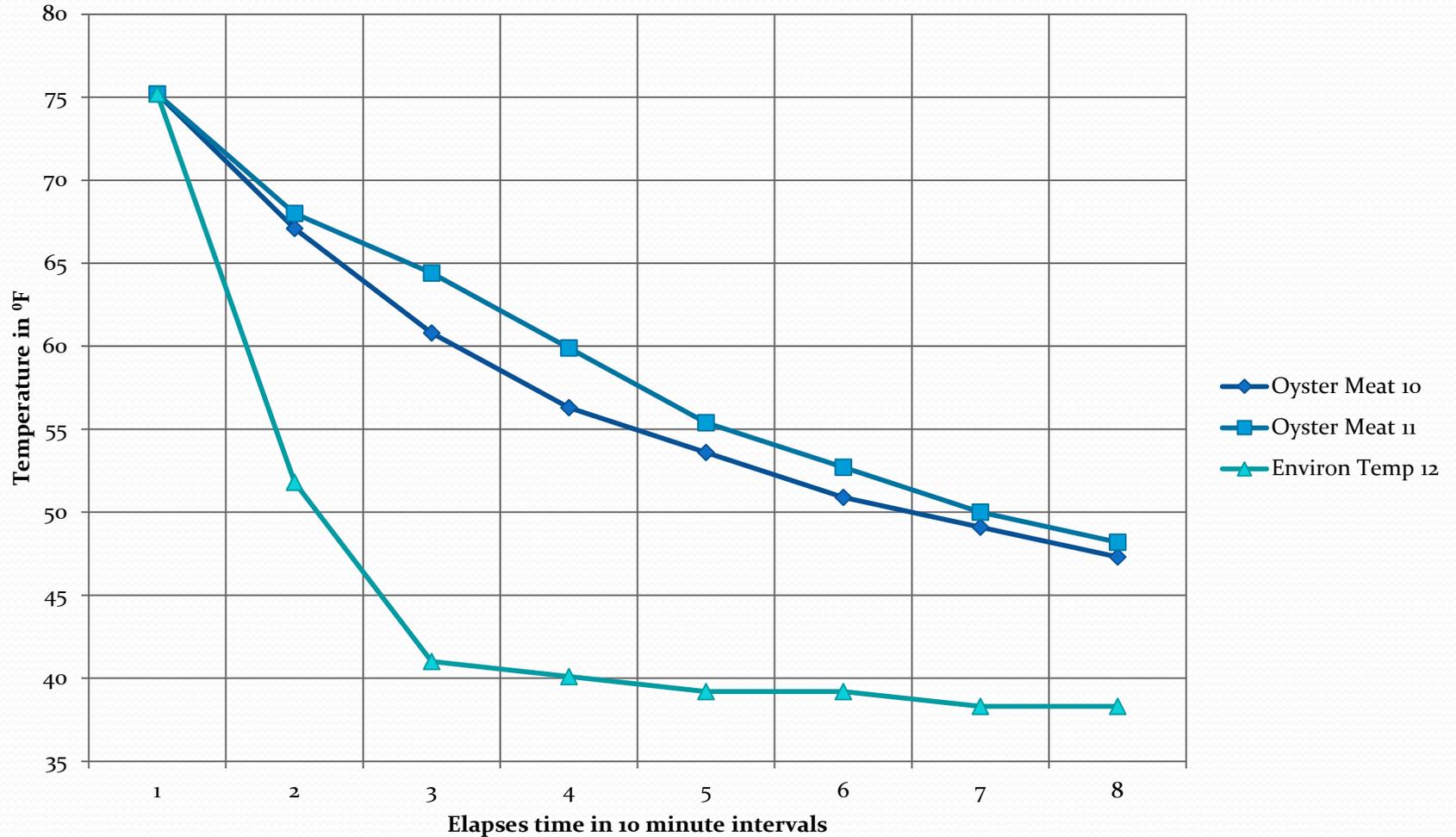
Oysters on a pallet 48"x40"x12" with air movement at 2000 ft/min and an air temperature of -5°F (80°F to 50°F required 20.5 hrs)



Oyster Cage with two oysters containing button logger in spatial center of 20 bu cage



Oyster Cooling Curve 2 June 15, 2010 Oyster in center of 20 bushel cage



Time Needed to Cool Oysters in Cage Going Directly into the Cooler

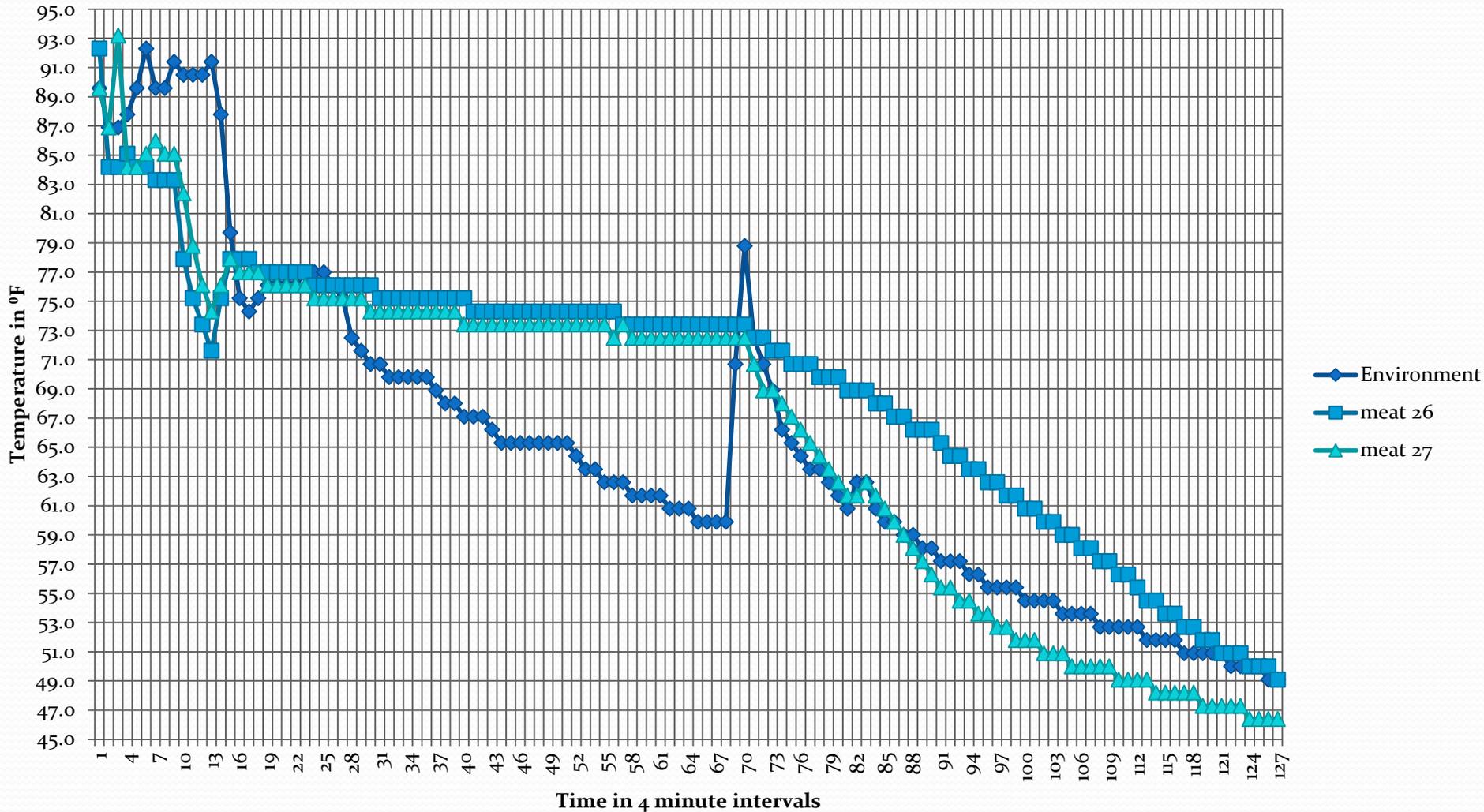
Maximum temperature of oyster was 82.4 °F

Maximum time going to 50 ° F or below was 1 hr 54 min in the cooler of approximately 33 ° F

Buy boat to truck with open pile then truck to oyster processor



Environment and Oyster Temperature Measurement from Boat to Dock to Truck to Cool Room July 16, 2010



Cages and Piles



Conclusions

1. Oysters can be cooled to below 50 °F in within 10 hours when environmental temperatures observed are above 95 °F in the following order, loose oysters, oysters in in cages.
2. Oysters in all completed trials reached 50 °F or below within the 10 hour time frame. 2 truck trials 4 dock to cooler trials
3. Maintaining shade and keeping truck cooler doors closed as much as possible will keep loose oysters from gaining heat. Acknowledging, the shorter the time frame from dock to cooler the more quickly the oysters will reach 50 °F or below.
4. The temperature of oysters loose are easiest to change which can be positive when trying to cool or negative when having cool oysters exposed to warm environments.
5. Oysters placed in open boxes in the cooler will reach minimum temperatures more quickly than cooling with boxes closed over them.



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Questions?

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