**Appendix**

Table A.1. Average oyster temperature ± standard deviation for companies in the Washington State and Chesapeake Bay oyster supply chains. P value for t-tests comparing each group. Samples sizes reported in Table A.2.

|  |  |  |  |
| --- | --- | --- | --- |
| Company type c | Washington | Chesapeake Bay | P-value |
| Producer | 3.2 ± 2.3 °C | 6.6 ± 2.6 °C | < 0.0001 |
| Wholesale | 4.2 ± 3.0 °C | 4.1 ± 1.2 °C | ns |
| Food retail/ Restaurant | 4.3 ± 2.6 °C | 3.8 ± 1.9 °C | ns |
| Freight carrier | 4.1 ± 2.8 °C | 5.0 ± 2.8 °C | 0.0003 |
| Total | 3.9 ± 2.7 °C | 5.0 ± 2.5 °C | < 0.0001 |

|  |  |  |  |
| --- | --- | --- | --- |
| Company type c | Washington | Chesapeake Bay | P-value |
| Producer | 38 ± 4 °F | 44 ± 5 °F | < 0.0001 |
| Wholesale | 40 ± 5 °F | 39 ± 2°F | ns |
| Food retail/ Restaurant | 40 ± 5 °F | 39 ± 3°F | ns |
| Freight carrier | 40 ± 5 °F | 41 ± 5 °F | 0.0003 |
| Total | 39 ± 5 °F | 41 ± 5 °F | < 0.0001 |

Same values as above, in °Fahrenheit

Table A.2. Percent of shipments with internal oyster temperatures above NSSP temperature criterium of 10 °C(50 °F)a (n)

|  |  |  |  |
| --- | --- | --- | --- |
| Supply Chain | Washington  State | Chesapeake  Bay | Total |
| **By Shipment** b |  |  |  |
| Domestic | 15% (48) | 17% (41) | 16% (89) |
| International | 100% (2) | -- (0) | 100% (2) |
| Total | 18% (50) | 17% (41) | 18% (91) |
| **By Company type** c |  |  |  |
| Producer | 2% (50) | 5% (41) | 4% (91) |
| Wholesale | 12% (34) | 0% (32) | 6% (66) |
| Food retail / Restaurant | 0% (30) | 3% (34) | 2% (64) |
| Freight carrier |  |  |  |
| All freight carriers | 8% (123) | 6% (69) | 7% (192) |
| Air freight | 35% (17) | -- (0) | 35% (17) |
| Ground freight | 4% (84) | 6% (66) | 5% (150) |
| Freight forwarder | 7% (14) | -- (0) | 7% (14) |
| Direct-to-consumer | 0% (8) | 0% (3) | 0% (11) |
| Total | 6% (237) | 3% (175) | 5% (412) |

a We categorized samples as over the criterium if they were above 10 °C (50 °F) for one hour or more.

b A shipment is a box or bag of oysters sent to a customer through a supply chain. There were 91 shipments with usable data in this study.

c There were 412 handlings of shipments in the study, and many companies handled multiple shipments during the study.

Table A.3. Percent of shipments with internal oyster temperatures below 1.67 °C (35 °F) a  (n)

|  |  |  |  |
| --- | --- | --- | --- |
| Supply Chain | Washington  State | Chesapeake  Bay | Total |
| **By Shipment** b |  |  |  |
| Domestic | 70% (48) | 29% (41) | 52% (89) |
| International | 50% (2) | -- (0) | 50% (2) |
| Total | 72% (50) | 29% (41) | 53% (91) |
| **By Company type** c |  |  |  |
| Producer | 34% (50) | 7% (41) | 23% (91) |
| Wholesale | 26% (34) | 13% (32) | 26% (66) |
| Food retail / restaurant | 30% (30) | 24% (34) | 27% (62) |
| Freight carrier |  |  |  |
| All freight carriers | 34% (123) | 6% (67) | 21% (190) |
| Air freight | 18% (17) | -- (0) | 18% (17) |
| Ground freight | 36% (84) | 9% (64) | 24% (148) |
| Freight forwarder | 21% (14) | -- (0) | 21% (14) |
| Direct-to-consumer | 75% (8) | 33% (3) | 64% (11) |
| Total | 32% (237) | 12% (175) | 24% (412) |

a We categorized samples as over the criteria if they were below 1.7 °C (35 °F) for one hour or more.

b A shipment is a box or bag of oysters sent to a customer through a supply chain. There were 91 shipments with usable data in this study.

c There were 412 handlings of shipments in the study, and many companies handled multiple shipments during the study.



Figure A.1. Strip plot of average internal oyster temperature for Washington State oysters by freight carrier type. Y-axes are in °F and °C.



Figure A.2. Strip plot of average internal oyster temperature for Washington State oysters in *Vibrio* Control Plan months (VCP, grey) vs a non-VCP month (purple). Y-axes are in °F and °C.



Figure A.3. Direct to consumer freight shipments. Two identical shipments from Washington State to a customer in California that arrived A) in two days and B) the next day. C) Five shipments that left a single producer in Washington State on the same day and shipped to customers in New York, Oregon, Pennsylvania, Tennessee, and Washington State. Shipments were in polystyrene-lined cardboard boxes with gel packs.