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The Mouth of the Bay Vibrio Controls Can Strengthen Markets



Executive Director Bob Rheault

The holidays are upon us and I hope you have all been enjoying oyster stuffing and chowder with family and friends.

The warmest October ever recorded left many growers holding plenty of inventory as wild harvests opened up and demand shriveled — as it usually does in the fall. New growers anxious to generate revenue were confronted with typically weak fall prices.

But those who have been in the business for a while know that even though fall markets are weak, in the spring demand surges, and those who can wait will be rewarded with strong demand. This issue of our newsletter is dominated by *Vibrio* news. Keeping markets strong depends on avoiding illnesses, so I see educating members about *Vibrio* issues as one of my top priorities.

I prepared a summary of a two-day workshop on *Vibrios* held by the Interstate Shellfish Sanitation Conference (ISSC) in Baltimore in September, and I have included a wrap-up of the five-day ISSC biennial meeting held in Myrtle Beach, S.C., in October. It is a lot of information to assimilate, but I strongly believe our best hope of controlling this challenge lies with a well educated workforce.

I also want to update everyone on our efforts to lobby for legislative changes in Washington, D.C. As I explained in our last newsletter, we have hired a professional lobbyist, Matt Mullin of High Street Strategies, to help us push through our top priorities. I feel as if we are making real progress on several fronts, but these efforts are costly and we will need your help if we are going to see these initiatives through.

ISSC Wrap-Up

by Robert Rheault, ECSGA Executive Director

In early October I had a chance to attend the 2017 biennial meeting of the Interstate Shellfish Sanitation Conference (ISSC) in Myrtle Beach, S.C. Although it is tough to sum up a week of debates in a few hundred words, I have done my best to identify some highlights that I think are worthy of your attention.

The ISSC has been vilified by many as arcane, confusing, cumbersome and glacial. It may be all of these, but it is certainly better than the alternative where the regulators just tell us how it is going to be. The ISSC gives our industry a voice in developing regulations and an opportunity to try to convince regulators to see things our way.

They often don't agree, but occasionally we find common ground in regulations that are more workable and less onerous than if we hadn't had a seat at the table. The process may be ugly, and the outcome is rarely satisfying, but it could be a lot worse.

Model Ordinance changes

So what did we accomplish? As usual we scored some wins and some losses. We finally pushed



through a new aquaculture chapter for the Model Ordinance. Although far from perfect, it is better than what we had. A couple of notable points:

✓ If you are growing (or harvesting) seed in prohibited or unclassified waters, the period of time for on-growing in approved waters before harvest was reduced from six months to four. I was pushing for one or two months, but four months is still better than six.

✓ Each state needs to define a "maximum seed size" for holding seed in less than approved waters, with the goal of preventing the sale of shellfish before it has grown at least four months in approved waters.

✓ Regulators have observed large populations of birds on gear, leading to local coliform counts high enough to trigger harvest area closures (as happens in some wild harvest areas). Curiously, we have not had reports of illnesses from bird guano, but we are also pretty sure that guano has the potential to make people sick, and at the very least poses a public perception problem. State authorities will be asking growers with bird problems to develop mitigation measures in their operational plans. This may mean bird repellants, or requirements to sink your product for a week before sale.

Mooring fields

In New England the Food and Drug Administration (FDA) has started to crack down on mooring fields, insisting that we need prohibited zones around all mooring fields, just as we do for marinas.

Two proposals would have allowed state regulators to determine whether there were people actually living on those boats, or if they were simply a bunch of moorings for day-sailors and skiffs without heads. The FDA nixed those proposals, potentially forcing states to close mooring fields and stretches of the shore lined with docks.

This could force the closure of many highly productive harvest areas and hundreds of current shellfish leases (like Duxbury Bay, Mass., and much of New England). The potential impacts are unacceptable.

- Continued on page 8

Does a Flip-Bag System Produce a Better Eastern Oyster?

by Dale Leavitt, Matt Griffin and Toby Adams-Cook, Roger Williams University, Bristol, R.I.

In 1987, John Moxham of New South Wales, Australia, was awarded a U.S. patent (#4,704,990) for a container that "is rotated so the oysters are regularly moved in the container. Rotation is caused by mechanical or tidal movement of the water."

At about the same time, Rowan Jacobson in his book, *A Geography of Oysters*, reported that John Lentz, owner of Chelsea Farms on the Eld Inlet (at the southern end of Puget Sound in the state of Washington), was also developing a "flip–flop" growout system that allowed the tides to tumble his oysters for him, using a device very similar to Moxham's.

Our first exposure to the concept of tumbling oysters with the tide was while attending the National Shellfisheries Association annual meeting in Seattle, Wash., in 2012. There Ray RaLonde mentioned the Lentz flip–flop system in his report on oyster culture in Alaska.

Our immediate thought upon hearing Ray speak was, "Can this technique work on the Eastern oyster to produce a deeper–cupped version of our farmed oyster?" To answer that question, we initiated



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DALE LEAVITT/ROGER WILLIAMS UNIVERSITY A Seapa and BST basket configured to flip with the tide.

a multi-year study that eventually involved 20 commercial farms in five states, with the research managed by five aquaculture extension agents plus our team at Roger Williams University. The project was supported by a 2013 NOAA Sea Grant Aquaculture Extension and Technology Transfer grant.

The study involved growing oysters in a device (we tested conventional oyster bags, Seapa baskets and BST baskets) that was hung on a fixed line placed at the mid– tide level, so that the bag could rotate on the line. The side opposite the fixed attachment point was configured with a flotation device so that the entire bag or basket would flip through a 180° arc as the tide rose and fell. With this design, the oysters were tumbled twice a day due to our semi-diurnal tides in the Northeast.

Our objective was to evaluate the applicability of tide–flipped bags or baskets to produce a more attractive and commercially valuable Eastern oyster for the half-shell market, given that the West Coast oyster growers using this technique were charging 60 percent more per oyster for Pacific oysters on the retail market.

Following is a snapshot summarizing the results of our study on the flip–bag method for growing Eastern oysters:

□ When placed in the flip–bag system at a near–market size (60mm), the flip–bag oysters grew slower (0.03mm/day) through the summer season than their static counterparts in a rack–and–bag system (0.12mm/ day) or in a floating–bag system (0.19mm/day).

□ Too much tumbling retarded growth. But is growth the entire story in producing half-shell oysters?

□ Flip-bag oysters and floating-bag oysters had significantly deeper cups than oysters grown

- Continued on page 3



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Continued from page 2 Flip-Bag Oyster Study

in a rack–and–bag system, while the basket– flipped oysters had significantly wider fans than the others.

□ The flip-bag oysters had heavier shells relative to their length than static oysters (an average 3" flipped oyster shell weighed 41.3g, while the static oyster shell averaged 35.0g).

□ Flip-bag oysters had significantly higher meat weight per length than static oysters (an average $2\frac{1}{2}$ " flipped oyster had a dry-meat weight of 2.01g *vs.* a 3" static oyster at 1.69g).

□ Shell fill (the proportion of the half–shell that is covered with meat) is always larger in flip–bag oysters.

□ The incidence of blister worms was reduced from 100 percent in the static oysters to 30 percent in the flip–bag oysters.

□ We didn't touch the flip-bag oysters all summer long and there was no impact of fouling on the bags or baskets, as compared to continual fouling maintenance on the submerged, static-grown oysters.

An Eastern oyster grown in a flip-bag is a very different product from one produced by a more static growout system. While they do grow more slowly, flip-bag oysters have a unique shape — with a wider fan and deeper cup have a heavier shell, are less fouled and yield more meat. In addition, they require much less labor to maintain than static systems. If your farm site is amenable to setting up a flip-bag system and you are looking to differentiate your product from other growers while com-



MATT GRIFFIN/ROGER WILLIAMS UNIVERSITY

Above left, Eastern oysters (*Crossostrea virginica*) grown in flip-bags have a unique shape, with a deep cup compared to those grown in static systems such as rack-and-bag. Above right, the degree of shell fill in a flipped oyster is much greater than in oysters grown in static systems.

manding a higher price for your oysters, then you may want to consider trying a flip–bag system for your farm.

For more details, contact the authors at <u>oysters@rwu.edu</u>.



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ISSC/FDA National *Vibrio* Workshop Sheds Light on a Vexing Problem

by Robert Rheault, ECSGA Executive Director

In early September I traveled to Baltimore for a workshop on *Vibrio parahaemolyticus* (V.p.) that focused on reviewing recent research and control plans to refine controls for this challenging bacterial pathogen. The meeting was well attended by federal and state regulators, health officials, research scientists and industry representatives.

V.p. occurs naturally in seawater and is not associated with pollution. Each year in the U.S. around 200-500 confirmed cases of V.p. infection are associated with seafood consumption (crab, shrimp, lobster, clams and primarily oysters), and another 100 or so are associated with wound infections. Approximately 1 percent of V.p. infections are fatal (typically victims who succumb are immuno–compromised due to liver disease, cancer, or other conditions requiring them to take immuno–suppressive drugs). The Centers for Disease Control and Prevention (CDC) estimates that the vast majority of cases — around 45,000 — go unreported and undiagnosed each year.

Several presentations gave me great hope, but many made me feel as if our attempts to get a better handle on this illness are nearly futile.

At the workshop the CDC presented data showing a large bump in V.p. infections in 2013, with slight increases in 2014 and 2015. Although incidence numbers for 2016 were down substantially, they are expected to increase once all the data are collected. There was quite a bit of debate about whether the number of infections is still increasing or if new harvest controls are working to reduce illness risk (as data from many states seem to indicate).

The CDC's Erin Burdette presented data indicating that illnesses continue to climb. Around 41 percent of cases had some form of pre–existing medical

condition, 63 percent were oyster-related, and 17 percent were clam-related. Most troubling to me was that only 20 percent of illness tracebacks successfully identified a harvest area, while an additional 19 percent were "multisource illnesses" implicating shellfish (or other seafood) from multiple harvest areas.

So why is the CDC concluding that V.p. illnesses are on the increase, while every coastal state has numbers indicating that illnesses seem to be actually declining? The discrepancy stems from how V.p. illnesses are diagnosed: states are counting "culture-confirmed" cases, while the CDC is counting "probable" cases.

Rapid test method

One of the more disturbing trends in V.p. diagnosis is the increased use of "culture independent diagnostic testing," or CIDT, to identify





ERIN K. BURDETTE, MPH/CDC

the pathogen causing illness in a patient. CIDT is essentially a DNA sequencing tool that looks for antibodies or DNA fragments from 22 of the most common pathogens. It's rapidly gaining popularity because the tests are fast (two hours), cheap, simple and require little training.

If a stool sample tests positive for V.p. it will sometimes be sent out to be cultured to confirm the presence of V.p., but this step is costly, time–consuming and requires special skills. And because *Vibrios* are notoriously difficult to culture, even if nothing grows V.p. can't be ruled out. The downside of the rapid test method is that many times CIDT will show that a patient is positive for several pathogens, and if a patient has eaten oysters in the past week it is automatically assumed that *Vibrio* is the causative agent. We also know that a perfectly healthy oyster consumer can test *Vibrio*– positive using the CIDT test, so there is some

understandable concern about the rapid growth in the popularity of this test. (For a wonky rundown of the subject, visit: <u>www.cdc.</u> <u>gov/mmwr/volumes/65/wr/</u> <u>mm6514a2.htm</u>)

As more hospitals buy these CIDT DNA sequencers we are likely to see more V.p. cases and more "shellfish-probable" cases, even as we continue to see a decline in culture-confirmed cases. But even more troubling is the fact that we have poor estimates of the numbers of shellfish being eaten. While the raw number of cases may be increasing, it is likely that the risk per serving is actually declining because of several factors. Production has doubled in the past five years; the industry has experienced substantial shifts from shucked product to whole, in-shell animals for raw consumption; and a greater percentage of the harvest is being eaten in summer (when Vibrios are present) than ever before. Unfortunately, the CDC doesn't believe we have the data to prove these trends.

— Continued on page 9

shop Vibrio parahaemolyticus Incidence 2007-2015

ECSGA Membership Categories and Dues

Growers, dealers and equipment suppliers enjoy full voting rights. (If you are both a grower and a dealer simply ask yourself where most of your revenue comes from.) If you don't fall into one of these industry categories please consider joining as a non-voting associate member.

Member Type	Gross Annual Sales	Dues
Grower	\$0 to 50,000	\$100
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Grower	\$100,000 to 300,000	\$500
Grower	\$300,000 to 3 million	\$1,000
Grower	Over \$3 million	\$1,500
Shellfish Dealers and Equipment Suppliers		\$250
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ECSCA NEWSLETTED ISSUE 4 DECEMBED 2017 DAGE 5

Member Profile Barrier Island Oyster Co.

Tn case you hadn't noticed, oyster aquacul-L ture production has been exploding. The development of new gear and the clearing of

regulatory hurdles is unleashing the entrepreneurial spirit of hundreds of innovative, hard-working folks in coastal communities up and down the Eastern seaboard.

Production has really been taking off recently in many of the southern states, where regulations are finally being fixed to allow intensive aquaculture to develop. I wanted to share some of this excitement by interviewing a new member from South Carolina: Jared Hulteen, owner of Barrier Island Oyster Co.

Jared and his partner Josh Eboch started their farm in 2016 and now operate 100 OysterGro cages outside Charleston, S.C. They raise

a mix of diploid and triploid oysters in the only floating gear in the area. Jared says, "Our goal is to grow an ultra-clean, single oyster for





JOHN HEINSOHN

Jared Hulteen hand-grades seed oysters to be redistributed to the farm.

> in growing waters with a seven-foot tidal range.

"We had to develop a counterweight system in conjunction [with] the typical daisy-chain arrangement for our OysterGro cages. This helps the lines remain tight and straight, even at low tide. It is important to us to maintain a tidy gear layout so we don't negatively impact the public opinion of mariculture in South Carolina," he explained.

direct sale to local restaurants." Their company

motto is, "Taste This Place," an homage to the

Even though South Carolina waters produce

before he could even begin

'Getting public approval

region," Jared said. He

added that one of the big-

gest challenges was figuring

out how to anchor the gear

a great oyster really quickly, like most farm-

ers, Jared had to overcome many hurdles

merrior of the growing area.

Jared is also proud of a seed-sorting innovation he named "Darth Grader," made with box sieves and a Sawzall. "My back is grateful that we don't have to hand-sieve all of our seed anymore," he noted.



JARED HULTEEN

Josh Eboch, John Heinsohn, and BJ Kochis return bags to floating gear.

And after all those hours of planning, Jared says, "It is natural to second-guess yourself if something goes wrong. We have found that all that planning really pays off and you need to have faith. 'Trust the system' is something we say almost every day out there."

Like many growers, Jared comes from a conservation background. He believes that "being able to build a farm that is restorative to the waterways is immensely rewarding. I also appreciate that no two days are ever the same. I'm wired to do what it takes to overcome any obstacle. Whether it's an engineering issue or a marketing strategy, the challenge of working through the endless issues that arise makes the job fun."

Jared says that while permitting remains the biggest obstacle to growth in South Carolina, there are signs the situation is improving. "We were really excited that summer harvest was finally approved this past summer for cultured triploid oysters. Summer sales are critical to our marketing plan," he said. (See story on p.7)

I asked Jared why he joined the ECSGA with less than two years in the business. He replied that the association "allows us to connect with

> more experienced growers who share our challenges and values. Membership gives us access to their vast experience, which is an incredibly valuable resource."

> We here at the ECSGA are happy to see southern states joining the rest of the country in producing quality oysters for eager consumers, and I for one look forward to tasting Barrier Island's Sea Clouds when I come down for the next Oyster South conference in February 2018.

-RBR



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Summer Harvest Now Allowed in South Carolina

One of the obstacles faced by South Carolina growers has been that state's ban on the summer harvest of oysters. For years regulators had prohibited all oyster harvests during the summer months to protect the wild resource and to eliminate illnesses related to *Vibrio*. Since wild oysters are typically in poor condition over the summer (especially down south), there was little demand for product anyway.

Three years ago ECSGA members Frank Roberts (Lady's Island Oysters) and Julie Davis (South Carolina board member) succeeded in developing a native line of tetraploid



Frank Roberts now sells his Lady's Island oysters year-round at restaurants in Charleston, Hilton Head and Beaufort, South Carolina. oysters, ensuring that growers had access to sterile triploids. Since triploids don't spawn, this eliminates concerns about summer meat quality. But growers still needed to change the regulations before they could access lucrative summer markets.

In 2015 Roberts and other growers who were just starting out began talking with state legislators about a bill to allow summer harvest. Even though studies conducted by scientists at the Food and Drug Administration and the South Carolina Department of Natural Resources (SCDNR) showed that summer *Vibrio* levels were acceptable in shellfish meats, SCDNR regulators lined up in opposition to lifting the ban because they feared that *Vibrio* illnesses would result. Nevertheless, Roberts was able to convince 25 legislators to cosponsor a bill that passed unanimously and was signed by the governor in May 2017.

That bill allows growers to harvest triploids in summer, but harvest of diploids still remains closed until October. Growers have strict time-to-temperature requirements, but all the growers were extra cautious and exceeded the regulatory limits by using ice slurry dips to expedite the process of getting oysters down to an internal temperature of 50°F in under two hours.

Regulators were predicting illnesses and were poised to shut the harvest down, but to date no one has reported an illness and it appears that the summer harvest experiment has been a huge success!

— RBR



JAY FLEMING

Another worthy entry in the ECSGA Photo Contest, taken by Jay Fleming. It shows workers on Patrick Hudson's 10-acre farm in St. Jerome's Creek, in the middle of the Chesapeake Bay. Hudson founded True Chesapeake Oyster Co. and says, "I think my company is one of the best examples of what happens when folks support each other. I'm not an engineer or a biologist or a waterman [but I] sure feel lucky to have some of those types on my team."



Website Input Wanted

Work has resumed on the upgrade of the ECSGA website and we would like to hear from you!

What new features do you want to see, what should we keep from the current site, what do you find most useful, what could be improved?

The new site will be responsive, so it should look a lot better on tablets and smart phones than the current site does.

We are also looking for photos, so if you have any good ones to share, please send them along with any other feedback you'd like to offer.

Thanks for your input, Ann Rheault <u>annrheault@gmail.com</u>.

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- Continued from page 1 ISSC Wrap-Up

Subsequent discussions between the FDA and state regulators leave us cautiously hopeful that impacted states can negotiate workable solutions to give them some wiggle room in deciding which mooring areas pose legitimate public health threats and which are simply "parking lots" for day-sailors and Boston whalers.

V.p. illness response

We defeated an FDA proposal that would have forced more closures and recalls following a handful of *Vibrio parahaemolyticus* (V.p.) illnesses. A few years ago we developed a matrix of illness responses that triggers a closure if you have between four and 10 illnesses in 30 days, and a recall if you have more than 10 illnesses.

The FDA wanted to trigger more recalls with fewer illnesses. Since it usually takes three to five weeks for illnesses to be traced back to a harvest area, we believe we are closing areas after the risk has subsided, and are instituting recalls on product that has been long since consumed.

Until we can speed up the traceback, or identify environmental triggers or V.p. measurement methods that can be correlated with illnesses, we cannot justify closures and recalls based on a few sporadic illnesses. The Conference voted to appoint a workgroup to amend the *V.p. Illness Response Guidance* document for anticipated interim approval by the executive board.

Data collection, education and BMPs

Each harvester (or dealer) will be required to submit monthly production data to the state authority, which should report those data to the ISSC annually no later than March 1. The authority is encouraged to provide a breakdown of whether the product was shucked, post–harvest–processed or served raw.

38th Milford Aquaculture Seminar January 8-10, 2018

Courtyard Marriott, Shelton, Conn.

The Milford Aquaculture Seminar is a forum for technology transfer among researchers at the Milford Lab, the aquaculture community, the scientific and academic communities, regulators and the public. In 2019, and in other odd-numbered years, it will be held jointly with the Northeast Aquaculture Conference and Expo (NACE).

For more info visit: www.nefsc.noaa.gov/nefsc/Milford/mas.html or contact: Lisa Milke, <u>lisa.milke@noaa.gov</u>

Dealers need to educate their employees. The specifics are not yet clear, but at a minimum employees need to know about hand washing, keeping shellfish cold and not handling food if they are sick.

Although the Shellfish Restoration Committee drafted Best Management Practices (BMPs) for restoration activities in 2011, they were never formally adopted by the Conference. The committee acknowledged that shellfish restoration is occurring in prohibited waters despite an acknowledged risk to public health and markets.

While the Conference does not condone or encourage this activity, the committee acknowledged that some states will continue to place restoration projects in closed waters. The committee has been charged with revising restoration BMPs to provide guidance that will minimize risks to public health.

Bacterial control mechanisms

The Re-Submergence Committee recommended (and the Conference adopted) language mandating that state authorities establish mechanisms to ensure that when pre-harvest activities (such as off-site culling or desiccation for fouling control) have exceeded the timeto-temperature control requirements of that state's Vibrio *Control Plan*, there is a potential to elevate *Vibrio* levels in shellfish. The authority must establish control measures to ensure that shellfish are re-submerged for a period of time adequate to return *Vibrio* levels to background. Record keeping and a control plan may be elements of such a control.

The Reduced Oxygen Packaging proposal (15-208) would have required new oxygen-permeable packaging requirements for shucked product to limit the growth of the anaerobic bacterium, *Clostridium botulinum*. No action was taken on this proposal, but it is not dead yet. The FDA has allocated funds to study the issue further. I anticipate no action on this subject under this administration.

Shellstock received by dealers must now be iced or refrigerated within two hours of receipt (unless it is geoduck or hard clams intended for tempering, or product destined for shucking, relay or wet storage).

New tag requirements will go into effect on Jan. 1, 2019, mandating all shellfish tags display in bold print the new required Food Code language: "THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY OR IS RETAGGED AND THERE-AFTER KEPT ON FILE IN CHRONOLOG-ICAL ORDER, FOR 90 DAYS. RETAIL-ERS: DATE WHEN LAST SHELLFISH FROM THIS CONTAINER WAS SOLD OR SERVED _____."

Proposal 17-224 provides updated guidance for shipping on common carriers or in trucks owned by dealers. Shipments exceeding four hours must be accompanied by a temperature– recording device. Trucks must be pre–chilled to below 45°F prior to loading, and product can be iced. Dealers must show the internal temperature was cooled to below 50°F before reshipping.

More to come

I have presented here just a tiny fraction of the work that went on at the biennial ISSC meeting. The FDA can veto any of the changes we agreed upon, but if they don't, these changes will become regulatory requirements when the next National Shellfish Sanitation Program (NSSP) *Guide for the Control of Molluscan Shellfish* manual is printed (usually in about six to eight months). Of course it may take your state longer to implement changes, so check with your local authorities.

I also want to raise the alarm about a couple of emerging threats that may become serious challenges at the next ISSC biennial meeting slated for 2019. First, the Centers for Disease Control and Prevention (CDC) continues to insist that the number of V.p. cases is on the increase, while every coastal state has numbers showing that illnesses are actually declining. The difference is that states are counting "cultureconfirmed" cases while the CDC is counting "probable" cases. (For more details, See the *Vibrio* Workshop story on page 4).

The second challenge that I predict will be a big battle in the years ahead relates to the FDA definition of "adulterated." Their working definition suggests that if they are able to detect fragments of Norovirus RNA in food, this indicates that the food is "adulterated" and must be destroyed.

Norovirus is the leading cause of foodborne illness in the U.S. and is highly contagious. Fortunately, many of our wastewater treatment plants (WWTPs) do a good job of disinfecting sewage with ultraviolet light, which means that shellfish harvested in open areas downstream of WWTPs is safe for consumption, but often will have detectable fragments of Norovirus RNA in the tissue.

Last fall in New England we experienced an outbreak of Norovirus that occurred just before a major shellfish festival. Hundreds of thousands of oysters had just been harvested to serve the eager crowd. When the outbreak was detected just days before the festival, state authorities decided to let the growers return the oysters to the leases they had just been harvested from. The growing area was closed and the shellfish were allowed to naturally purge the pathogens over the next month and a half, after which they could be harvested. But the FDA had wanted all of those oysters to be destroyed.

We tried to put in a proposal at the ISSC to make this natural purging a legal procedure, but the FDA strenuously objected and the proposal failed. We need to find a way for shellfish to be excluded from the FDA definition of adulterated. Destroying live shellfish when we know we can safely purge the pathogens is simply punitive.

If you have never been to an ISSC meeting, please take a moment to thank those in our industry who take precious time away from their lives and their livelihoods to participate in the Conference. They travel at great personal expense to represent you and to protect your interests in a challenging and important venue.

- Continued from page 4 Vibrio Workshop

More virulent strain

If you have been following the *Vibrio* situation in New England over the past four or five years you have likely heard about the introduction of a new, more virulent "West Coast" strain, sometimes called O4:K12, or more recently, ST36. This new strain has caused several outbreaks and closures since 2012 and has forced the entire New England industry to drastically change its harvest practices and to reduce the time to refrigeration.

We know that the new strain is more virulent, we just don't know how much more virulent. We know that 85 percent of illnesses in New England were related to two highly virulent strains of Vibrio, and if we didn't have these in our waters no one in New England would be talking about the few sporadic V.p. infections that used to be typical.

What is working?

We believe that new harvest controls have been effective in reducing illnesses in New England and in Washington state. Connecticut reduced their illness rate to one or two a year with the adoption of "rapid cooling" (icing and slurry dips to achieve a 50°F internal temperature within one hour of harvest). Massachusetts has reduced illnesses by speeding the time to ice and refrigeration. In 2015 Washington state implemented a novel system of pre-emptively closing areas with a history of illnesses based on water and air temperatures.

Wild clam harvesters in New York were getting tagged with several V.p. and Vibrio vulnificus illnesses a year until they got on board with a

variety of novel approaches to cool their harvests while on the water. In Katama Bay on Martha's Vineyard, Mass., growers have been able to avoid closures by holding market-sized animals in deeper, cooler waters outside the bay for a few weeks prior to harvest.

Similar efforts in Washington state allowed one grower to keep Vibrio levels down below a target of 100 colony-forming units/g. Locally targeted approaches allowing a range of control techniques, rather than a single, blanket, coast-wide control plan appear to be having the greatest success, despite being resource-intensive to develop and challenging to enforce.

What is not working?

We have only detected the outbreak strain in the environment once! Testing is still very expensive, with individual samples costing hundreds of dollars, making for costly experiments. The techniques we use now can give highly variable counts even on replicate samples. We see a pretty good correlation with temperature most of the time,

but we are a long way from being able to predict when V.p. is going to cause illnesses based on water or air temperatures or any other environmental variables like salinity or chlorophyll.

We also know that our consumer population is becoming more susceptible to infection. Taking antacids or proton pump inhibitors (PPIs) like Nexium or Prilosec can make shellfish consumers 10 times more likely to contract food-borne illnesses. And the rate of consumption of these drugs is exploding. One report showed a tenfold increase in PPI prescriptions in just the past four years! States reported that 10-60 percent of V.p. outbreak patients reported using PPIs or antacids.

Also, the prevalence of diabetes and heart disease in the population is increasing, and the general population is living longer despite suffering from various health conditions that should lead them to avoid raw foods.

In addition to Americans' becoming less tolerant of foodborne illness, they are more likely to visit a doctor for a case of the trots than they used to be. Press reports of foodborne illness outbreaks often often trigger a flood of people calling to report that they too had experienced gastric distress.

We still have only a vague idea of our harvest numbers in all but a handful of states. If we don't know how many oysters are being served we will never be able to calculate the risk per serving to determine if rates are getting better or worse. If harvests and raw consumption rates are actually increasing, as many suspect, then our risk may actually be declining even as illness numbers go up.

Tracebacks are still not working. According to the CDC fewer than 20 percent of illness diagnoses trace back to a single harvest area. Restaurants are not keeping tags or can't identify when a bag was served. People can't remember where they ate, and more oysters are being served with oysters from multiple harvest areas. If we can't do a better job with traceback, we won't be able to identify what control measures are working and which growers may be falling down on the job.

What is on the horizon?

We have a lot of smart folks working on several of the problems outlined above. Our detection ability is getting better and new techniques to pinpoint the pathogenic strains in a haystack of benign, non-pathogenic Vibrios are being developed. Our industry has gotten the message and growers are protecting themselves by dropping a dime on harvesters and dealers who might be cutting corners. Folks are coming to realize that using ice is far preferable to an area closure and the expensive recall that a few illnesses will trigger.

The ISSC has uploaded the presentations from the workshop at: www.issc.org/issc--fda-national-vibrio-parahaemolyticus-workshop.





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What's Happening in Washington, D.C.

Despite all the turmoil on the nightly news, we continue to advance key initiatives that should save members thousands of dollars. Having a professional lobbyist working on our behalf has been a big help, and I feel as if we are closer than ever to attaining victory on several fronts.

□ At our request several of our allies in congress have written letters to the Food and Drug Administration (FDA) to compel the agency to resolve the issues that have blocked our ability to sell into the European Union (EU). We are cautiously optimistic that the FDA may finally do what it has promised to do for the past two years. Initially the agreement would reopen trade between two U.S. states and two EU countries. Only product from EU "Class A" waters and U.S. "Approved Status" waters would be allowed. We expect other states and EU nations to be approved relatively quickly. Access to lucrative



EU markets could help smooth out seasonal demand spikes.

□ We are working with Agriculture Committee staff to develop better crop insurance options for aquaculture producers for inclusion in next year's Farm Bill. Non–Insured Crop Disaster Assistance is inexpensive, but it hardly compensates a grower for a real disaster. Other insurance programs are not designed to deal with multi–year crops or have other serious flaws. The U.S. Department of Agriculture (USDA) recognizes that farming is risky, and in order to ensure a healthy, sustainable aquaculture community we need subsidized crop insurance products similar to those available for other crops.

□ We are seeking a legislative carve–out that would exempt aquaculture farmers working in state waters from provisions of the Jones Act. If successful, this could save members thousands in insurance costs while limiting liability in lawsuits brought by injured workers to less than \$1 million. Jones Act lawsuits currently have no cap on liability.

We are greatly encouraged by the progress we are making on these efforts, but success in D.C. will require a significant effort to train congressional staffers about the issues and get them on board. This effort has put a serious dent in our budget. If we want to be successful we will need more members to step up with donations to our political action fund, and many more of the 1,000 growers who are not association members to join up. If each of you could convince one non-member to join we would be in great shape. Is that too much to ask?

-RBR



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Regulatory Outrage of the Month

Ever since the *Vibrio parahaemolyticus* (V.p) illness outbreaks associated with the new "West Coast" O4:K12 strain (ST36) hit New England four years ago, I have been hearing from growers and resource managers who are concerned about the potential introduction of the outbreak strain into their waters via a seed transfer. The New Hampshire Department of Health and Human Services decided to "cease issuing permits [for seed transfers] from these waters historically linked to V.p. human illnesses."

I certainly understand the fear. The new strain has caused a world of hurt for growers and managers in states where it has become established. Those states have had to go from five or 10 hours-to-refrigeration down to one or two hours. The cost to industry has been estimated at well over \$1million. But bacteria don't care about state boundaries, and the West Coast V.p. strain seems to have made its way across New England in just a few years.

Nevertheless, seed importations are only one of many potential pathways enabling V.p. to move around. I would be surprised if natural tides and currents have not already brought the new strain to New Hampshire and Maine waters. Natural currents, ballast water, boat hulls and birds are all plausible vectors.



Even more likely, a New Hampshire oyster lover might order some West Coast or New England oysters online and hang them off the dock hoping to keep them fresh. This is likely how the virulent strain made its way across the country in 2012.

Clearly we cannot eliminate the obvious paths for introduction, so why should we penalize shellfish growers? We cannot test every batch of seed — the costs are too high and the limits of detection can't ensure that a few cells are not present. Where will New Hampshire growers get their seed when regulators realize that all New England hatcheries are in waters "historically linked to illnesses?"

There are certainly prudent steps that regulators could consider to minimize the risk of *Vibrio* transfers. They could limit transfers to months when water temperatures are below 50°F and *Vibrios* are no longer detectable. They could restrict the size of seed to limit the amount of biomass being moved.

This decision to completely block seed importation appears to be capricious and arbitrary, and potentially violates the Interstate Commerce Act. This is the sort of regulatory over–reach that could strangle the budding New Hampshire industry before it even has a chance of getting established.

-RBR



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Get on the ECSGA Listserv

If you're not taking advantage of the ECSGA Listserv you're missing out on one of the best services offered by our association. Essentially an e-mail discussion group, our Listserv has about 700 listeners representing a wide range of growers, academics, regulators, grower wannabes and researchers. There are even a few anti–aquaculture folks lurking in the shadows.

The best part about the list is that if you have a question, the odds are good that someone out there has an answer. Many members have found it to be a tremendously helpful tool to solve problems or find solutions from someone else who has already made the same mistake. Sometimes a thread will draw several veterans into long–winded discussions about a vexing issue. For instance, a few weeks ago we were treated to a half–dozen inventive solutions to farm management and mapping.

One of the best features of the Listserv is that messages are archived and searchable by keyword, so if you want to go back and read ten years of wisdom on controlling mud blisters, it is just a few keystrokes away. (See screenshot at right) We try to keep the traffic shellfish-relevant. On average, there are about 10 posts a week, but if that's too much mail in your inbox you can sign up for a weekly or daily digest as opposed to receiving each post as it comes in. We have only a few rules: be civil, don't disparage others, and please don't clutter the list with jokes, holiday g

the list with jokes, nonday	
greetings, "atta boys," etc.	There are 700 busy
people on the receiving en	d.

We welcome posts to the ECSGA Listserv of job offerings, interesting articles or announcements, members offering seed for sale, and questions about growing. We also have set up another Listserv called ECSGA-SWAPMEET,

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where members can buy and sell used gear or inquire about seed availability.

To sign up for either Listserv, click on the Join Listserv button at <u>ECSGA.org</u> and follow the links. After you've signed up, you might want to find all relevant posts on a certain topic. Click on the Join Listserv button at ECSGA.org, then click on the link to join the Listserv. This

will take you to a page showing that you're already signed up. Click on the ECSGA Home link on the upper far right. On the right side of this new page (ECSGA Home) is a list of each week's posts going back to 2002. On the upper left side of this page is a search box where you can enter a search term or click on advanced search for more options.

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by Barton Seaver

American Seafood is a narrative history of this nation's seafood industry, as told through anthropological and culinary sketches of every species landed in the United States.

It is a work of scholarship resulting from of 20 years of boots on the dock and clogs in the kitchen. It is a love letter not only to seafood but also to the seafaring men and women who nobly labor to put food on our tables.

This narrative runs the course of our history, from independence through industrial revolution, the influence of immigrant waves, to the cultural shifts in post World War America.

It is an ethnography of the myriad coastal communities by whose labors this country was in no small part founded. It is a remembrance of cultures, cuisines, preservation methods lost to time or antiquated by technology, and ultimately a celebration of fisheries in our modern time.

A note to ECSGA members from Barton Seaver:

In America, seafood lacks story; we don't connect with fisheries the way we associate and identify with the iconic family farm. I took on such a massive undertaking because



I believe we need to foster dialogue that connects us to fisheries. It is through knowing the role of seafood in our history that we may begin to appreciate why seafood matters to our society and to us as citizens.

It is men and women like you in the thick of the industry to whom this work is dedicated. I am humbled to have had the opportunity to write this book. It is a work I am deeply proud of and eager to share.

Thank you for all you do.

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