Seafood Safety, Processing and Regulation

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Delaware Sea Grant Marine Advisory Service
2016 North Central Aquaculture Conference
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USA Per Captia Consumption

Rank	1990		2000		2010	
1	Tuna, C	3.7	Tuna, C	3.5	Shrimp	4.0
2	Shrimp	2.2	Shrimp	3.2	Tuna, C	2.7
3	Cod	1.4	Pollock	1.6	Salmon	2.0
4	Pollock	1.3	Salmon	1.6	Tilapia	1.5
5	Salmon	0.7	Catfish	1.1	Pollock	1.2
6	Catfish	0.7	Cod	0.8	Catfish	0.8
7	Clams	0.6	Clams	0.5	Crab	0.6
8	Flatfish	0.6	Crabs	0.4	Cod	0.4
9	Crabs	0.3	Flatfish	0.4	Pangasius	0.4
10	Scallops	0.3	Scallops	0.3	Clams	0.3

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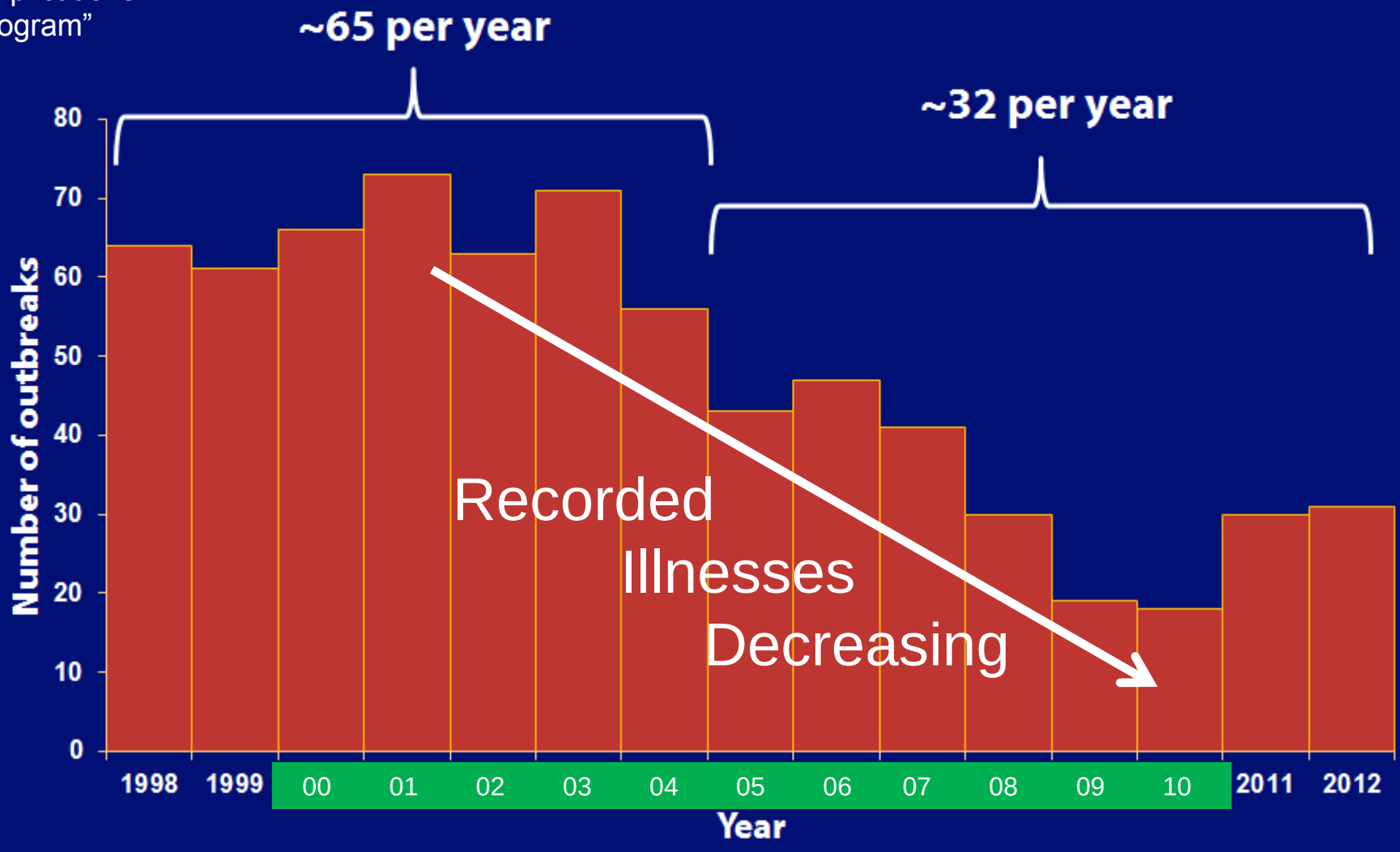
Fish-Attributed Outbreaks by Year, United States, 1998–2012

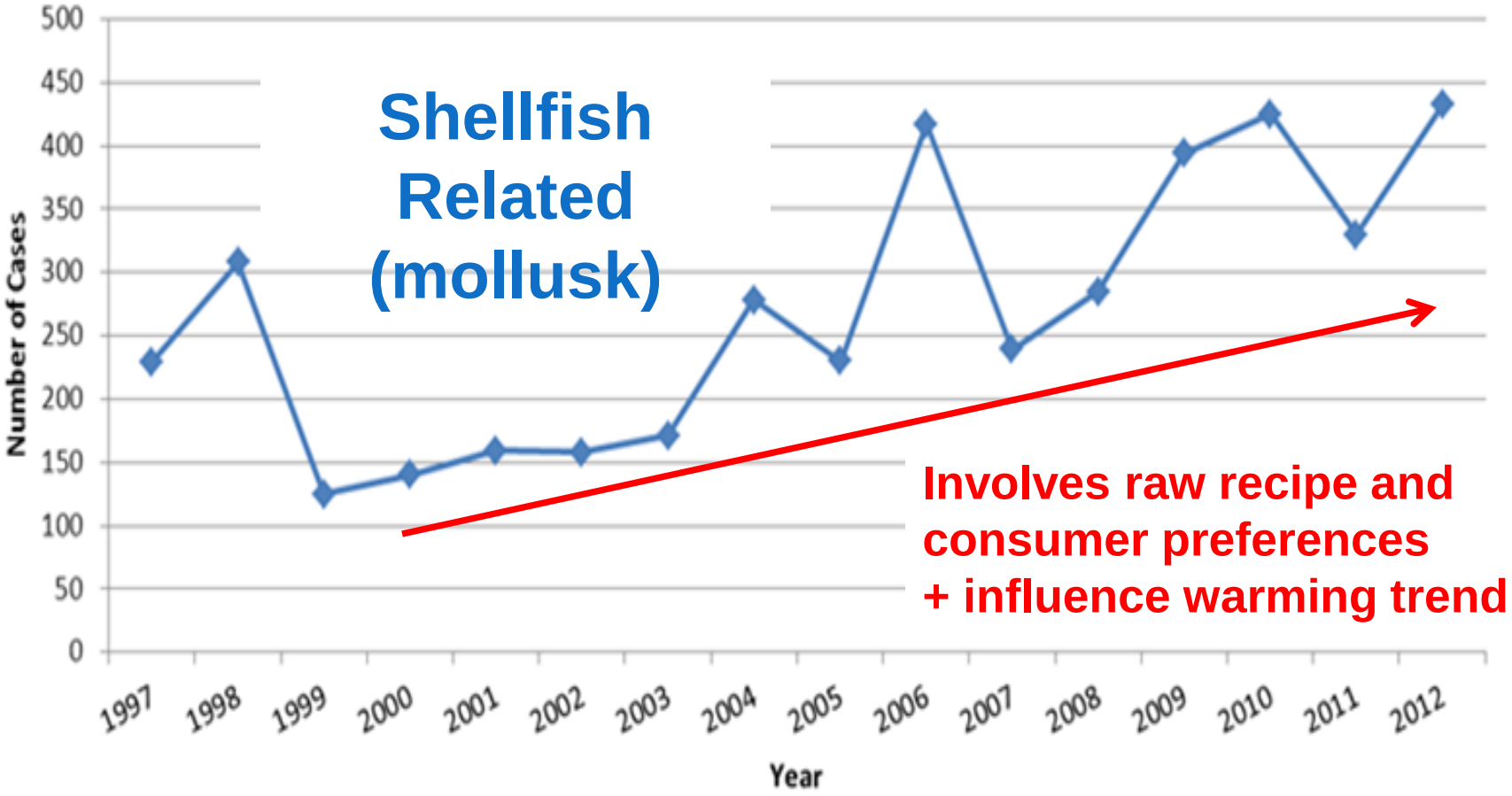
CDC Presentation
Aug 13, 2014
Baltimore , MD
"Implications Program"



Critics will suggest otherwise …

ISSC Presentation
Aug 13, 2014
Baltimore, MD
"Implications Meeting"

Total *Vibrio parahaemolyticus* Infections, 1997-2012, USA



Critics will suggest otherwise …

FY 2013 SEAFOOD* IMPORT REFUSALS

*wild & farm raised

REFUSAL CHARGES	ENTRIES REFUSED
FILTH	695
SALMONELLA	503
VET DRUGS	144
MFR HACCP ISSUE	135
LISTERIA	85
INSANITARY	60
HISTAMINE	50

- Focus is Risk Based
- Issues are Known

Primary Food Safety Risks
associated with seafood are known

BIG 3

1. **Microbial Contamination**

2. **Temperature Abuse for Microbial Growth**

3. **Chemical Contamination**

BIG 3

- Microbial Pathogens
  - General
  - *Salmonella*
  - *Vibrios*
  - *S. aureus*
  - *C. botulinum*
- Microbial Growth and Decomposition
- Environmental Chemicals
  - Water Quality
  - Exposure (pesticides, herbicides, & fertilizers)
- Therapeutic Drugs
  - Illegal Drugs
  - Improper Use

FOOD SAFETY PROBLEMS	RECOMMENDED CONTROLS		
	GAqP's (Farming)	GMP's (Processing)	GTP's (Transporting)
Microbial Pathogens • General • *Salmonella* • *Vibrios* • *S. aureus* • *C. botulinum*	Monitoring daily farm practices to reduce presence in growing waters and feeds, and potential growth after harvest	Sanitation Control Procedures and monitoring routine practices through processing steps	Sanitation Controls Procedures and monitoring transit time and temperatures
Microbial Growth and Decomposition	Controls for time and temperature exposure	Controls for time and temperature exposure	Controls for time and temperature exposure
Environmental Chemicals • Water Quality • Exposure (pesticides, herbicides, fertilizers, etc	Monitoring conditions Site selection, monitoring and maintenance	Monitoring at receiving, if suspect	
Therapeutic Drugs • Illegal Drugs • Improper Use	Monitoring selections and practices	Monitoring at receiving	
Parasites	Reduce exposures	Monitoring for presence and	Parasites
Natural Toxins • Algal Blooms	Reduce occurrence and exposure	Monitoring at receiving, if suspect	
Food Allergens		Proper product labeling for product identification and any additions	
Physical Contamination • Metal or Glass	Monitoring daily farm practices	Sanitation Control Procedures and monitoring routine practices	Sanitation Controls Procedures and monitoring transit time and temperatures
Processing Errors • Improper Use Food Additives • Improper Cooking		Monitoring specific processing steps	

← Controls

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FOOD SAFETY PROBLEMS	FARMING	PROCESSSING	TRANSPORT
'Germ' Contamination	CONTROLS for PREVENTION		
'Germ' Growth	GAqP's	GMP's	GTP's
Chemical Contamination			

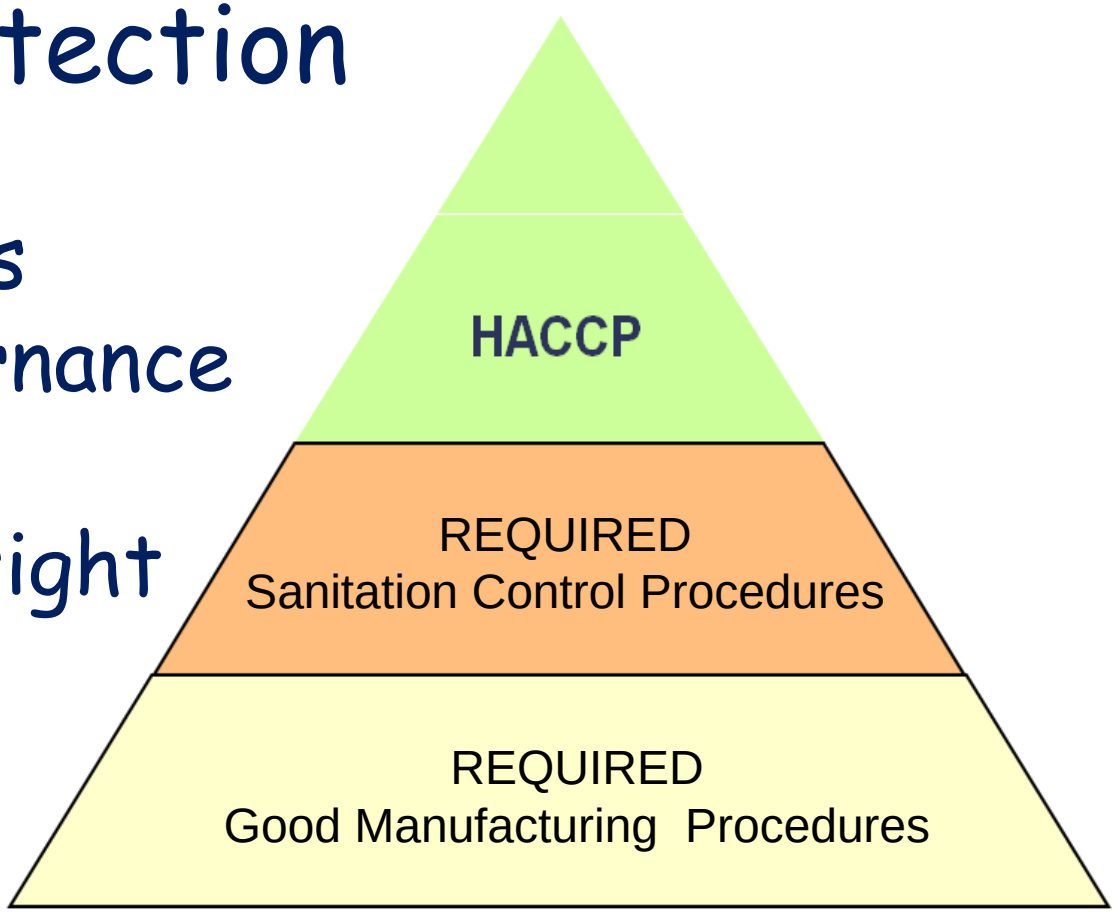
GAqP's - Good Aquaculture Practices

GMP's - Good Manufacturing Practices

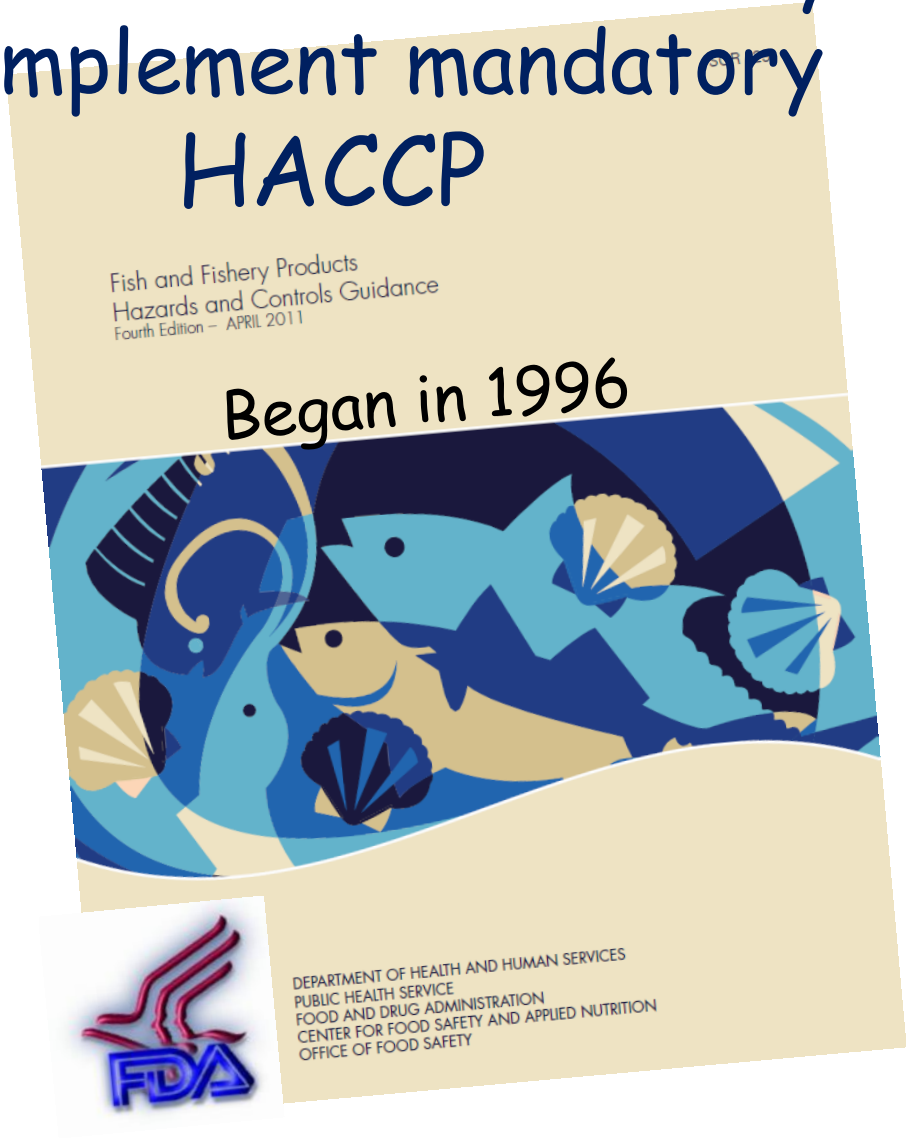
GTP's - Good Transportation Practices

Regulatory Network is 'layered' for prevention rather than sole reliance on detection

Layered mandates
and layered governance
by county, state
and federal oversight



First USA food industry to implement mandatory HACCP



Began in 1996

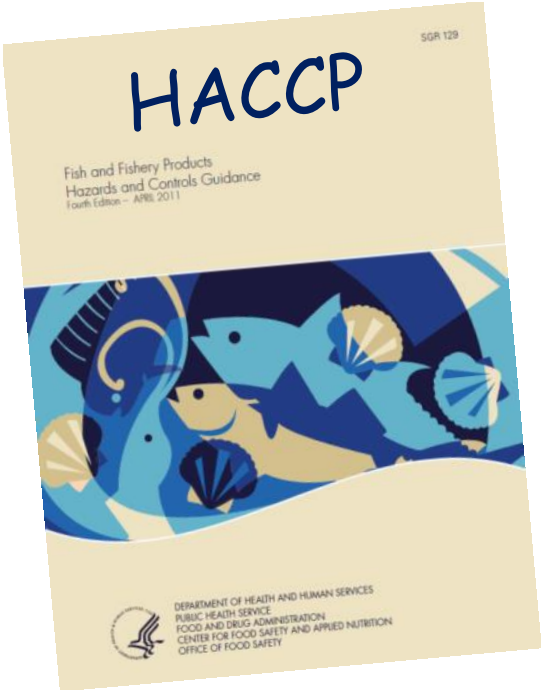
HA - Hazard Analysis

CCP - Critical Control Points

Mandated for all…

- Fishery Products
- Processors
- Importers

Mandate for all processors intending commerce in USA if…

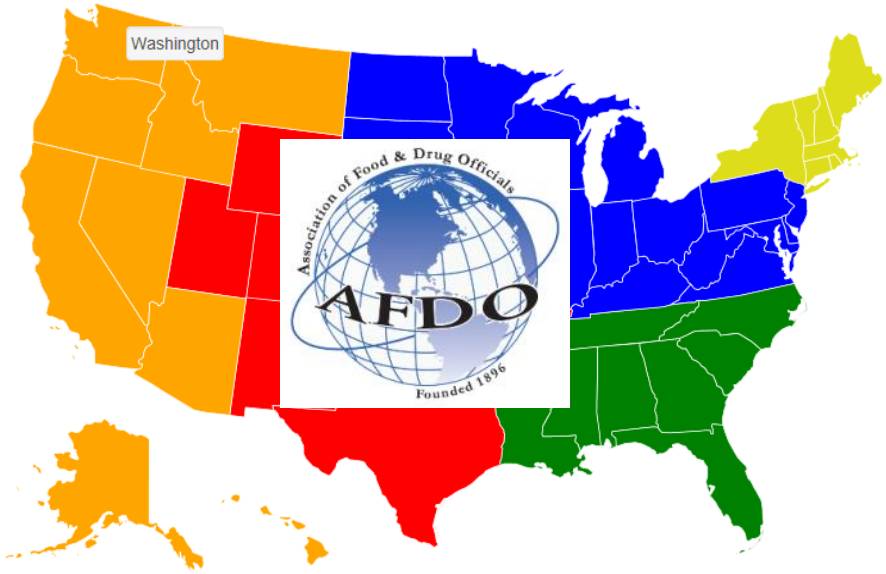


… handling, storing, preparing, heading, eviscerating, shucking, freezing, changing into different market forms, manufacturing, preserving, packing, labeling, dockside unloading or loading.

Seafood HACCP Alliance

Aligned with educational support for national and international commerce in the USA

Map for Trainers



What's Next …… HACCP +

Food Safety Modernization Act

Remains an 'ACT' since signatures in 2011

Actual rules are still pending

FSMA intends to add more Preventative Controls

- Accreditation of Third Party Auditors
- Sanitary Transportation of Foods
- Prevention of Intentional Adulteration (i.e., Food Defense)
- Preventive Controls for Animal Food
- Designating High Risk Foods
- Emphasis on Product Traceability

Seafood Exemptions in FSMA

- Sec. 103. Hazard Analysis and Risk-Based Preventive Controls (HACCP)

  …shall not apply to a facility if … required to comply with, and is in compliance with HACCP

- Sec. 301. Foreign Supplier Verification Prgm.

What in FSMA Applies to Seafood ?

- Mandatory facility registration
  - Biennial renewal
- Risk designation for all domestic food firms
  - Risk based resource allocation
- Mandated inspection frequency
  - At least once every 3 years for high-risk facilities
  - At least once every 5 years for non high-risk facilities

FSMA- Proposed Rule: Sanitary Transportation of Human and Animal Foods

Shippers, carriers by motor vehicle and rail vehicle, and receivers engaged in the transportation of food, …… to ensure the safety of the food they transport

USDA's New Farm Raised Catfish Regulation - Domestics & Imports

- **USDA/FSIS: Food Safety & Inspection Service**
- **CATFISH currently define as *Siluriformes***
- **Features Equivalence**

USDA's New Farm Raised Catfish Regulation - Domestics & Imports

- FSIS inspection based on 21 U.S.C. 606— processed products inspection— and other provisions
- Pre-harvest provisions
- Mandatory Sanitation SOPs and HACCP plans
- HACCP plan validation requirement
- Import requirements and other features similar to those for meat and meat food products

Controls for Persistent Issues

MERCURY

Updating Advice on
EATING SEAFOOD

Steve Otwell, Florida Sea Grant seafood safety and technology specialist, University of Florida/IFAS Extension

Sea Grant Florida

There are no two ways about it—deciding whether or how much seafood to eat can sometimes be confusing. That's because we hear a variety of messages that seem at times to oppose each other. We hear that seafood is good for us, but then we hear reports that seafood has dangerous levels of mercury. This publication will provide an update on this confusing topic in general terms with more current information. No food source is without risks. But this article makes the case that mercury risks can be managed to enable you to obtain the health benefits that seafood can offer and that might be lost if you choose to avoid eating fish. Note: When the article refers to mercury, it is actually talking about methylmercury, which is the form of concern in fish.

Shrimp is the most popular seafood eaten in the U.S. It makes up over a third of the average person's seafood consumption — and it has a negligible amount of mercury.

What are the potential major benefits from eating seafood?

Seafood is an excellent, typically low-calorie source of protein and essential nutrients. It also tends to be low in saturated fats (the bad stuff), and many selections are rich in long-chain polyunsaturated fatty acids, also known as the omega-3s (good stuff your doctor tells you to get more of). There is a lot of evidence that eating fish can help prevent cardiovascular disease—in fact, the American Heart Association has recommended for years that we should eat at least two servings a week for a healthy heart. Fish eaten during pregnancy has also been associated with proper neurological and eye development in children. Research published in 2012 found that the children of mothers who ate at least two fish servings a week during their pregnancies had a roughly 60 percent lower risk of developing behaviors such as hyperactivity associated with ADHD (attention deficit hyperactivity disorder). There is also evidence that when young children eat fish it improves their cognitive development.

Mercury contamination in seafood is largely misunderstood and often overstated. Eating a variety of fish will help you manage concerns for mercury in your diet.

Do healthy diet guidelines consider mercury in seafood?

Yes. Every five years the departments of Agriculture (USDA) and Health and Human Services (HHS) issue 'Dietary Guidelines for Americans,' a scientific evidence review that provides information and advice for choosing a healthy eating pattern. The current Dietary Guidelines recommend eating at least 8 and as much as 12 ounces of a variety of fish lower in mercury per week during pregnancy, for the visual and cognitive development of the unborn child. The guidelines further recommend that adults eat 8 ounces per week for heart health. The Dietary Guidelines recommend that at least some of these fish be high in omega-3 fatty acids. These guidelines were developed and issued by national health experts mindful of concerns about mercury in our nation's seafood supply.

What are the concerns tied to mercury in seafood?

Methylmercury, the type of mercury in seafood, can affect the nervous system when the amounts are high enough. The primary concern is for the developing fetus, which has been shown to be more sensitive to methylmercury than adults.

New EPA+FDA advisor regarding methylmercury in seafood aligning with USDA Dietary Guidelines calling for more seafood consumption based of recent risk-benefit assessments

Controls for Persistent Issues

MERCURY


Updating Advice on
EATING SEAFOOD
Sea Grant
Florida

"Eat 8 to 12 ounces of a variety of fish each week from choices that are low in mercury. The nutritional value of fish is important during growth and development before birth, in early infancy for breastfed infants, and in childhood"

Controls for Persistent Issues

Historical analytical efforts in terms of details and methodology find no significant food safety concerns with seafood subject to the 2010 oil spill in the Gulf of Mexico

Reflections on
GULF SEAFOOD

Steve Otwell, Florida Sea Grant seafood safety and technology specialist, University of Florida/IFAS Extension

Sea Grant Florida

Consumer confidence in the safety of seafood harvested from the Gulf of Mexico has largely recovered since the Deepwater Horizon oil spill in 2010, though for some, concerns still linger. Fortunately, the United States has one of the best systems in the world for testing food safety, but we all have to keep in mind that no food is risk free. We're reminded of that every time meat gets recalled, or bags of lettuce cause food poisoning. The key is to focus on reasonably minimizing risk. No one can tell you that Gulf or any other seafood is 100 percent safe—neither can they tell you that about your lettuce or your chicken. But Gulf seafood has now been scrutinized more extensively than most foods sold in the United States. Every scientific study has concluded that there is no sign of risk with Gulf seafood, and there are reams of publicly available data to back this up. As expected there is a segment of the population that is not going to believe anything or anyone making the case that Gulf seafood is safe. But for those willing to consider the evidence, this article offers some answers to the most common and most important questions on the topic.

Is Gulf seafood safe?

Yes. By all accounts, since the Deepwater Horizon oil spill, Gulf seafood has been and continues to be thoroughly tested. Even if you've heard statements like this before, you may have some doubts, so read on and we'll explain more about how the testing works and why it's effective.

Strict procedures were used to re-open Gulf of Mexico waters closed after the Deepwater Horizon spill. Open-water harvest rules apply to both inshore and offshore fisheries, and cover all types of fish at all depths.

All traditional fisheries in the Gulf of Mexico must comply with federal and state rules when harvesting fish.

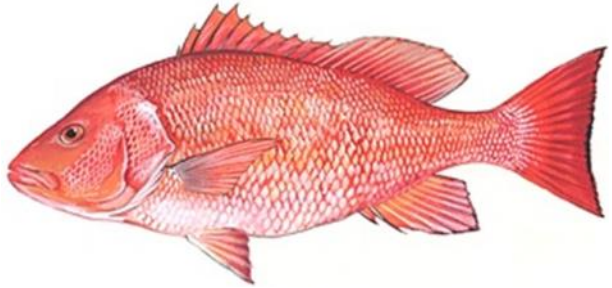
If Gulf seafood is safe, why can I find information on the Internet from seemingly well-informed people telling me it's best to avoid it?

The Internet offers the opportunity for individuals to say what they believe and have it accessible around the world. So we'd all do well to be initially skeptical of the things we read, particularly the more sensational things. Many negative claims about seafood were based on preconceived ideas about what to expect and "gut feelings." But science doesn't work like that. Science involves testing ideas and objectively assessing the available information. Such assessments have repeatedly supported the conclusion that Gulf seafood is safe.

How do we know that Gulf seafood is safe?

Soon after the Deepwater Horizon spill began, state and federal regulators met and agreed on a set of strict guidelines to follow for closing areas to fishing, deciding when they would be safe to reopen, and ensuring that seafood remained safe after opening. The monitoring and sampling procedures were based on the most current, science-based methods and the advice of leading authorities across the nation including the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), the National Marine Fisheries Service (NMFS), the Centers for Disease Control and Prevention (CDC), and relevant state agencies around the Gulf. The rules followed during the spill are based on well-established policies for seafood monitoring that are designed to err on the side of caution. If any oil at all was spotted on the surface in a given area, it was closed to fishing, regardless of whether the fish and other marine life showed signs of oil exposure. In addition to these spill-specific efforts with samples from fishable waters, the FDA and certain state agencies regularly

Who Gets What Fish ?

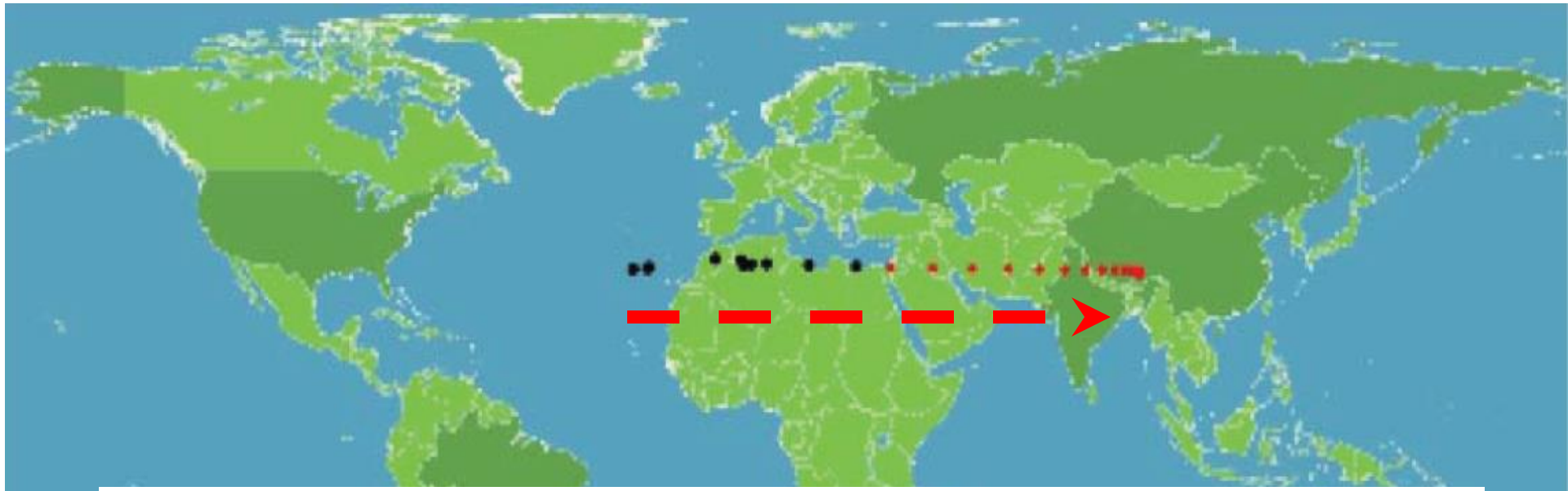


... a continuing debate

Recreational

Commercial & Consumers

Shifting Demand & Services



World's Center of Economic Gravity is shifting in favor of buying power

Source: Danny Quah, " Global Economy's Shifting Centre of Gravity", LSE 2010

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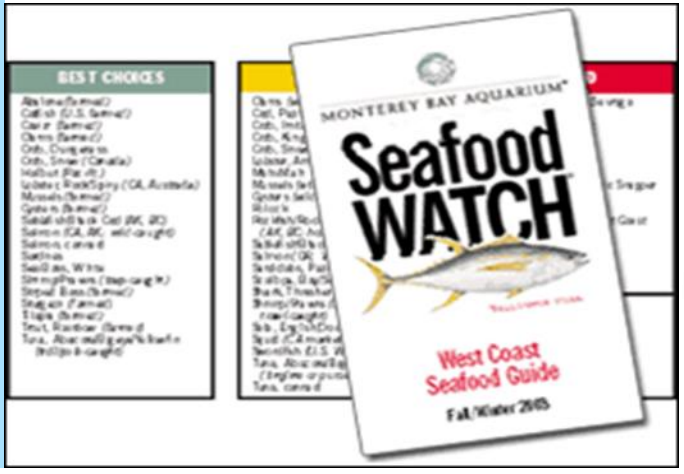
NAVIGATING SUSTAINABILITY
HOW TO MAKE THE BEST
SEAFOOD CHOICES
AT WHOLE FOODS MARKET®

GULF WILD

Seafood Choices:

Are You Confused ?



seafood choices ALLIANCE

Situation …

- Education can be an effective approach to ease apprehension and direct choice, but price will remain the dominant driver

- Seafood buyers trust their 'primary provider' more so than an agency or declared certification

Sustainable … vs … Full Utilization

If controlled to sustain the resource, then don't waste the harvested portion !

Estimates indicate US consumers waste 30-40% of their food supply

Expect new trends …

New product choices vs. traditional expectations

- Mode of introduction (convenience)
- New product forms
- Differences in shelf-life and preparations

"Seafood, as eaten in the USA, is the safest and healthiest source of muscle protein eaten in the world !"

Dr. Steve Otwell
University of Florida
4/20/15

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