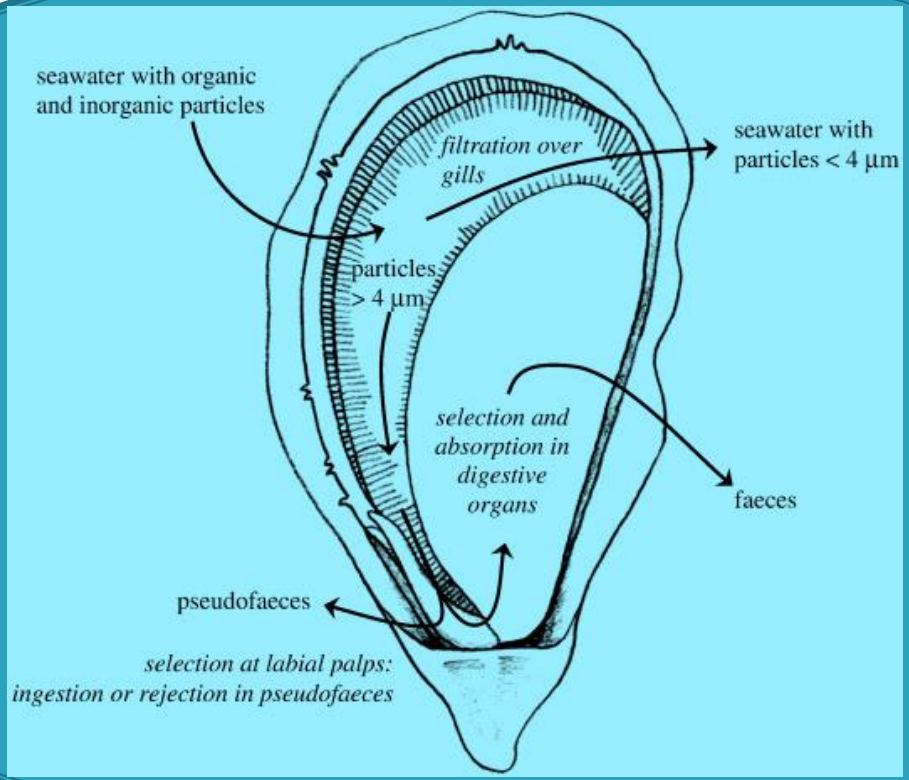
BIOSECURITY
A FARMERS PERSPECTIVE

MAINE AQUACULTURE ASSOCIATION

ANIMAL ENVIRONMENTAL CONNECTIONS

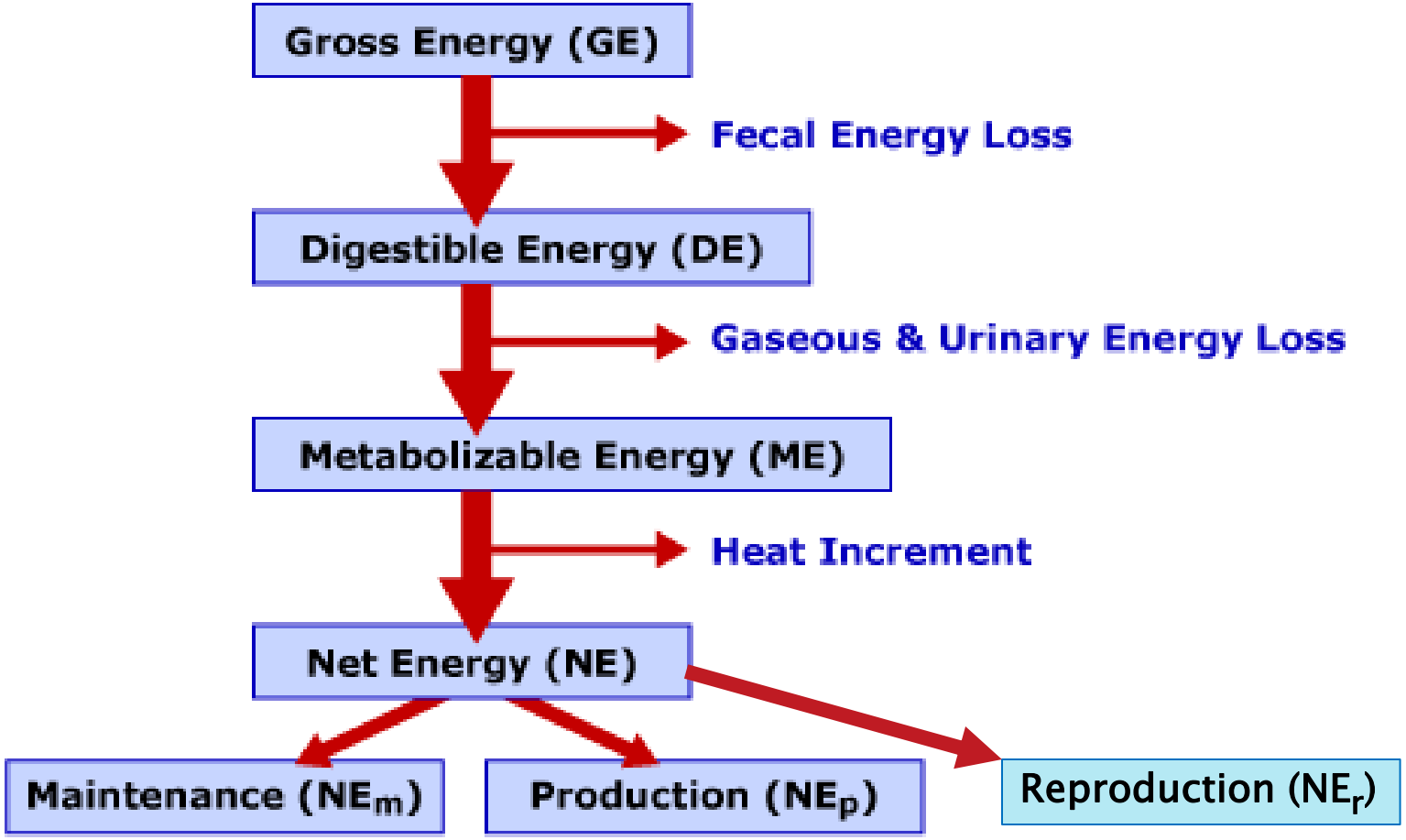
AQUEOUS



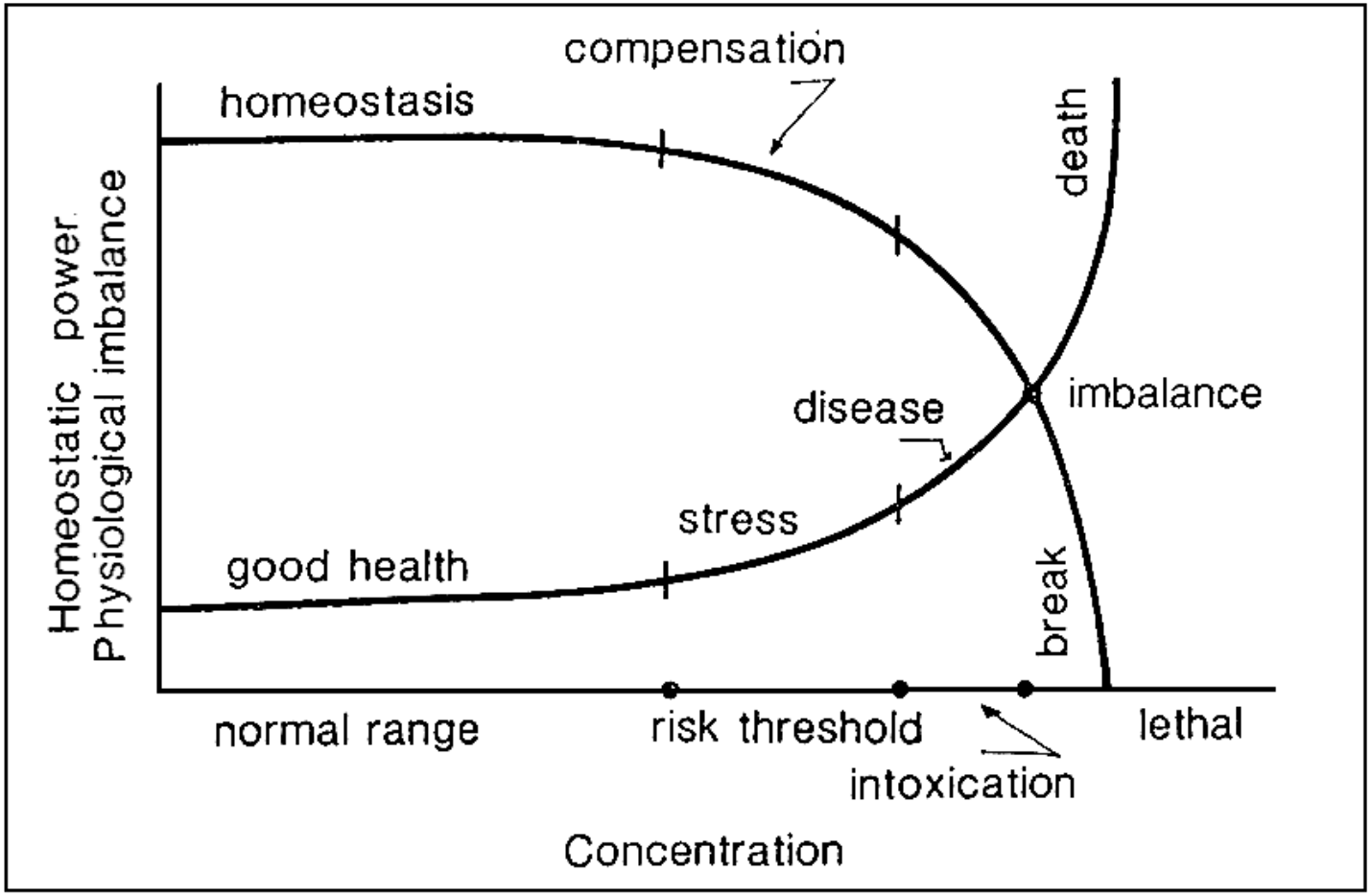
ENVIRONMENT

WHETHER YOU HAVE FINS OR A SHELL YOU ARE WHAT YOU GROW IN

ENERGY BUDGETS



ANIMAL ENVIRONMENTAL LINKAGES



HIERARCHY OF DISEASE IMPACTS

REDUCED CONVERSION EFFICIENCY

REDUCED GROWTH

LOST GROWTH

REDUCED PRODUCT QUALITY

INCREASED MORTALITY

Biosecurity

Practices, procedures and policies to prevent or reduce the risk of introduction and spread of infectious diseases or infestations. Biosecurity may also include measures designed to mitigate impacts of outbreaks and/or infestations.

- Pathogens
  - Bacteria, viruses, fungi
- Parasites
- Pests

Subasinghe and Bondad-Reantaso 2006

CURRENT MAA LOSS CONTROL INITIATIVES

- BIOSECURITY PLANS AND AUDITS
- PATHOGEN SPECIFIC ACTION PLANS
- INTEGRATED PEST MANAGEMENT PLANS
- CODES OF PRACTICE
- AREA MANAGEMENT AGREEMENTS

COOPERATIVE MANAGEMENT PROGRAMS

MAA CODE OF PRACTICE

MAA FINFISH
CONTAINMENT MANAGEMENT SYSTEM

MAA FINFISH
HEALTH AND BIOSECURITY AGREEMENT

AREA MANAGEMENT AGREEMENT

PATHOGEN
ACTION PLANS

IPM PLAN

BIOSECURITY TEMPLATE
AND AUDITS

MAA AREA MANAGEMENT AGREEMENTS

MINIMUM OPERATIONAL STANDARDS AND GUIDELINES

- TRANSITION MECHANISM GUIDELINES
- COMMUNICATIONS GUIDELINES
- HEALTH MANAGEMENT AND BIOSECURITY PROTOCOLS
- INTEGRATED PEST MANAGEMENT GUIDELINES
- WASTE MANAGEMENT GUIDELINES
- DISINFECTION PROTOCOLS

BIOSECURITY AUDITS

- PROACTIVE TOOL
- THIRD PARTY INSPECTION AND DIRECT FARMER FEEDBACK
- UNANNOUNCED AND REPETITIVE
- SYSTEMATIC REVIEW OF POTENTIAL VECTORS AND RISK FACTORS
- BETWEEN 77-121 QUALITATIVE AND QUANTITATIVE MEASURES
- WEIGHTED FACTOR ANALYSIS
- SPECIFIC REMEDIAL RECOMMENDATIONS
- QUANTITATIVE SCORE

PATHOGEN SPECIFIC ACTION PLANS

- CLARIFICATION OF DEFINITION OF CONFIRMED POSITIVE STATUS AT TEST, INDIVIDUAL ANIMAL, CAGE AND FARM LEVELS
- OUTLINE POTENTIAL ECONOMIC IMPACTS OF CLINICAL OUTBREAKS
- PRIORITIZED PATHOGEN AND DISEASE MANAGEMENT OBJECTIVES
- SPECIFIC BIOSECURITY AND SURVEILLANCE PROTOCOLS
- SPECIFIC RESPONSE ACTIONS
- SPECIFIC GUIDANCE ON REPORTING OBLIGATIONS

USE OF BIOSECURITY

- Reduce risk of introduction
- Minimize spread on-farm or to new areas
- Promote animal and plant health
- Protect economic investment
  - Reputation
  - Reduce mortalities
- Protect against new triple P challenges
  - Oyster Herpies, mussel “wasting” disease
- Protect human health

HACCP

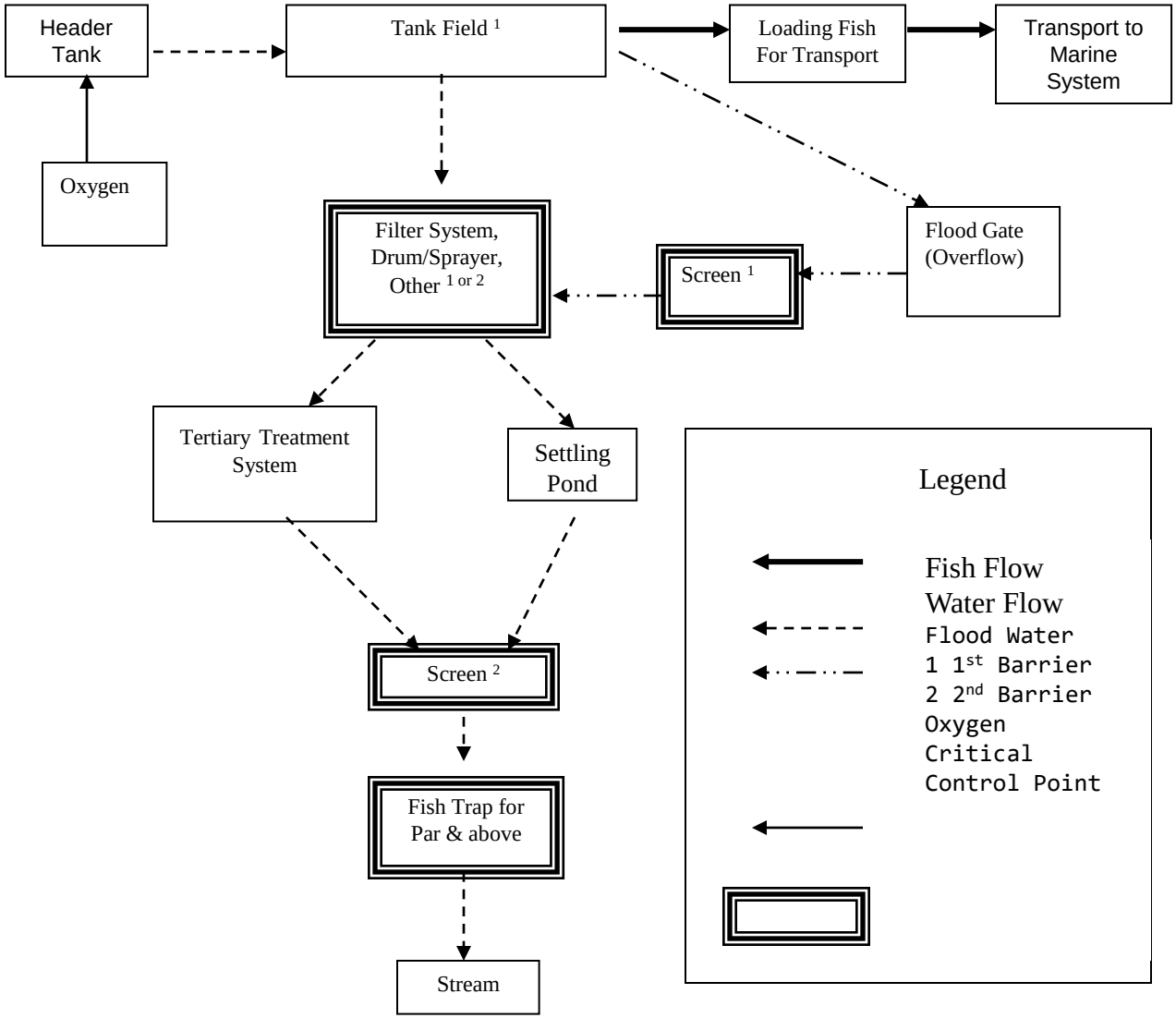
Hazard
Analysis and
Critical
Control
Point

Seven HACCP Principles

1) Hazard analysis
2) Identify critical control points (CCP)
3) Establish controls for CCP
4) Establish CCP monitoring req.
5) Establish corrective actions
6) Establish HACCP system verification
7) Establish record-keeping system

Why Have a Written Plan?

- Goal is to provide a complete and systematic risk analysis
- Each facility is unique
- Processes, products, facilities and risks change over time


Header Tank
Tank Field 1
Loading Fish For Transport
Transport to Marine System
Oxygen
Filter System, Drum/Sprayer, Other 1 or 2
Screen 1
Flood Gate (Overflow)
Tertiary Treatment System
Settling Pond
Screen 2
Fish Trap for Par & above
Stream
Legend
Fish Flow
Water Flow
Flood Water
1 1st Barrier
2 2nd Barrier
Oxygen
Critical Control Point

Written Plans: Risk Analysis

Hazard Analysis

Hazard Analysis Worksheet

(1) Identify potential hazard or pathogen	(2) Route of entry onto farm	(3) Is the potential hazard significant? (Yes/No)	(4) Justify your decision for column 3	(5) What control measures(s) can be applied to prevent the significant hazard?	(6) Is this step a CCP (Yes/No)

Written Plan: Chart Format

HACCP PLAN FORM

Firm Name: Salmon Hatchery
Site Location: .
Firm Address: P.O. Box
Spruce Head, Me.
Type of Site: Land Based Hatchery.
Date Excepted:
Signature:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Critical Control Point (CCP)	Significant Hazard / Defect	Critical Limits for Each control Measure	Monitoring				Corrective Actions	Verification	Records
			What	How	Frequency	Who			
Filters (List drum filters and other types of filters separately according to the flow chart)	Fish Escape	In place and operational	Filter System	Visually	Daily	Site Manager or designee	-A plugged filter will be cleared and down stream filter or fish trap …	-Daily records review -Annual plan review	- Screen - Filter Log or Daily Ops Log -Corrective Action Report

Written Plan: Narrative Format

3.2 Hatchery Site Salmon HACCP – Narrative Template

Filters (list the filters separately according to your flow chart)

Critical Control Point:
Yes

Hazard or Defect:
1. Fish Escape

Critical Limits:
1. Filters are in place and operational

Monitoring Procedures:
1. Filters will be visually checked once a day by the site manager or designee.

Corrective Actions:
1. If a filter is observed is not operational, the filter will be cleared and down stream filter or fish trap monitored to detect potential fish escape. If a fish escape is suspected due to failure of integrity of the screen a replacement will be installed and notification of the appropriate agency will be completed within 24 hours or by the next working day.

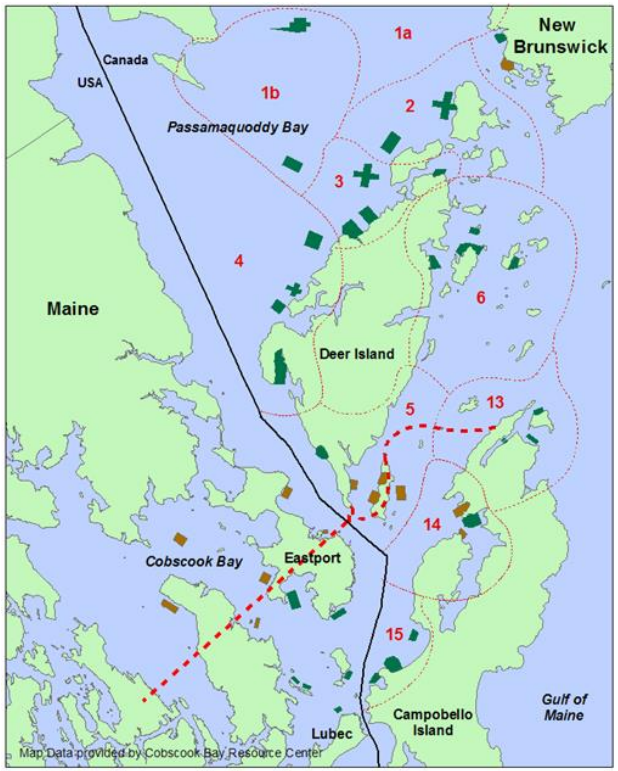
Verification Procedures:
1. Daily records review
2. Annual plan review

Record Keeping Procedures:
1.

Records:
1. Screen/Filter or Daily Ops. Log
2. Corrective Action Report

Narrative Format
Some operators may prefer to develop the description of the controls established at each Critical Control Point in a Narrative rather than a Chart format. The next six pages represents a template of the Narrative format.

Public/Private Partnerships, Bay Management Areas, All-in All-out, Inter-grower Agreements



- CONSOLIDATION OF BAY MANAGEMENT AREAS (BMA)
- FALLOW ALL SITES IN A BMA CONCURRENTLY, NO CARRYOVERS
- PROHIBIT MOVEMENT OF FISH BETWEEN SITES
- RESTRICT MOVEMENT OF VESSELS, EQUIPMENT AND PERSONNEL BETWEEN SITES AND BMAS
- SINGLE YEAR-CLASS OF FISH PER BMA
- INDEMNIFICATION CRITICAL
- STRICT BIOSECURITY AUDITING
- OPEN COMMUNICATION BETWEEN GROWERS
- AGGRESSIVE PATHOGEN SURVEILLANCE
- AGGRESSIVE CONFIRMED POSITIVE RESPONSE
- CONTINUOUS ANALYSIS AND PRODUCTION EVOLUTION

LESSONS LEARNED

- EVERY TRIPLE P CHALLENGE IS UNIQUE BUT SOMETIMES LESSONS FROM ONE HELP
- EVERY SPECIES, FARM, FARMER AND PRODUCTION METHOD IS DIFFERENT
- GROWER “BUY IN” IS VITAL
- INDEMNIFICATION IS CRITICAL
- NEW PATHOGENS CAN BE CHALLENGING FROM A POLICY PERSPECTIVE
- NEW DETECTION TECHNOLOGIES HAVE LEARNING CURVES
- SURVEILLANCE AND EPIDEMIOLOGY CRITICAL TO EFFECTIVE MANAGEMENT
- MULTIPLE TESTING METHODS IMPORTANT FOR REGULATORY CERTAINTY
- LAB CERTIFICATION IMPORTANT BUT SO IS RING TESTING
- USED CAREFULLY, MOLECULAR TESTING IS POWERFUL TOOL
- USED IN A VACUUM OR BY THE INEXPERIENCED OR UNTRAINED, IT CAN KILL MORE FISH/SHELLFISH THAN A TRIPLE P