USDA NAHMS - AQUACULTURE 2020

- PRE-ASSESSMENT SURVEY RESULTS
  - TOP 5 HEALTH TOPICS
    - INFECTIOUS DISEASES IN THE U.S.
    - REGULATORY REQUIREMENTS
    - DOMESTIC ANIMAL MOVEMENT
    - ENVIRONMENTAL STEWARDSHIP/SUSTAINABILITY
    - BIOSECURITY AND INFECTIOUS DISEASES NOT IN THE U.S.
  - GREATEST HEALTH RISKS TO YOUR AQUACULTURE FARM
    - EMERGING DISEASES
    - REGULATORY CONFUSION
  - GREATEST HEALTH RISKS TO U.S. AQUACULTURE
    - INADEQUATE KNOWLEDGE/TRAINING ON HEALTH ISSUES
    - EMERGING DISEASES
    - REGULATORY CONFUSION
Potential Impact of a Uniform Model for Fish Health

Baitfish and Sportfish

A Federal Model for Fish Health?

55% : YES

35% : NO

10% : NO RESPONSE

Based on 7 scenarios that modelled the potential impacts of a uniform model for fish health, it was estimated that such a model could reduce the average regulatory cost per farm by **$83,000**.

**Estimated Regulatory Cost per Farm**

The potential recovery of lost markets is the largest benefit of a uniform code for fish health. Followed by a reduction in manpower costs of compliance to manage the many state regulations and license/permit renewals.

**Average regulatory costs accounted for $148,588 per farm; or 25% of all farm costs.**

- **Lost Sales**: 60%
- **Changes due to regulations**: 23%
- **Manpower**: 11%
- **Permits**: 1%

**Fish health testing accounted for 5% of average regulatory cost. ($7,285 / farm)**

COMMERCIAL AQUACULTURE HEALTH PROGRAM STANDARDS (CAHPS)

A MODEL FOR FARMING HEALTHY AQUATIC ANIMALS

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CAHPS IS
AN ANIMAL HEALTH MANAGEMENT PLAN
FOR AQUACULTURE BUSINESSES
WHY?

• ASSURANCE OF HEALTH OF FARM RAISED AQUATIC ANIMALS
  • ANIMALS ARE LOWER RISK FOR SPECIFIC DISEASES BECAUSE OF BIOSECURITY AND SURVEILLANCE

• FACILITATES ANIMAL TRADE AND MOVEMENT
  • LEVERAGE INTERNATIONAL TRADE
  • REDUCE HURDLES FOR INTERSTATE MOVEMENT

• MARKETING AND BRANDING
  • INCREASE PUBLIC TRUST
  • DEMONSTRATES AWARENESS OF STANDARDS FOR CONSUMERS

• COMPLEMENT TO OTHER PROGRAMS BASED ON BUSINESS GOALS
  • FOOD SYSTEM BIOSECURITY
  • FOOD SAFETY
  • CERTIFICATION PROGRAMS
  • ANIMAL WELFARE
DEFINING HEALTH

• ANIMAL HEALTH
  • INDIVIDUAL VS. HERD
  • LOT VS. FARM

• SYSTEM HEALTH
  • CLOSED VS OPEN
  • RESPONSE VS PREVENTION

• “FARM” HEALTH
  • THE BIG PICTURE
FARM HEALTH

- BROAD SENSE OF FARM SECURITY
- DEPENDENT ON REGION AROUND FARM
  - ENDEMIC DISEASES
  - NATURAL DISASTERS
- DEPENDENT ON BIOSECURITY
SYSTEM HEALTH

- REARING UNITS OF THE ANIMALS
  - DESIGN
  - SUITABILITY
- DEPENDENT ON WATER SUPPLY
  - PROTECTED VS. UNPROTECTED
- DEPENDENT ON MANAGEMENT
  - MAINTENANCE
    - WATER QUALITY MONITORING
    - CLEANING
ANIMAL HEALTH

- **HEALTH** – THE STATE OF BEING FREE FROM DISEASE OR INJURY (GOOGLE)
  - AND,
    - GENETICS
    - NUTRITION
    - HUSBANDRY
    - IMMUNITY

- HEALTH IS A CONTINUUM
CAHPS APPROACH

• COMPREHENSIVE HEALTH MANAGEMENT OF LIVESTOCK

• DEVELOPED WITH INDUSTRY

• NON-REGULATORY

• AUDITABLE SYSTEM
  • OVERSIGHT
  • DOCUMENTATION

• SCIENCE-BASED & FLEXIBLE AND RESPONSIVE
  • SCALABLE SURVEILLANCE STRATEGIES
  • EMERGING PATHOGENS
  • DIAGNOSTIC TECHNOLOGY
PRINCIPLES OF CAHPS

1. AQUATIC ANIMAL HEALTH TEAM
   - KNOWLEDGE & SKILLS

2. RISK EVALUATION
   - SCIENCE & METHOD

3. SPECIFIC PATHOGEN SURVEILLANCE
   - STRATEGY AND TESTING

4. INVESTIGATION AND REPORTING
   - PROCESS & PROTOCOLS

5. RESPONSE & RECOVERY
   - CONTINUITY OF BUSINESS
HEALTH TEAM

• FORM A TEAM
  • VETERINARY, NUTRITION, REPRODUCTION, AQ EXTENSION, AG-ECON, MARKETING, SUBJECT MATTER EXPERT
  • ACTIVELY ENGAGED WITH SITE
  • DETERMINE A LEADER FOR THE TEAM
  • ESTABLISH COMMUNICATION PLAN
  • PRIORITIZE GOALS
RISK EVALUATION – 3 STEPS

1. RISK IDENTIFICATION
   • PATHOGENS OF CONCERN FOR SPECIES BEING CULTURED AND FOR SPECIES IN PROXIMITY TO SITE
   • PATHWAYS OF INTRODUCTION OR SPREAD
     • FARM MAP INCLUDING FLOW OF ANIMALS AND WATER

2. RISK CHARACTERIZATION
   • DEGREE OF RISK
   • SCOPE OF RISK
   • IMPACT OF RISK – EXOTIC VS ENDEMIC PATHOGENS

3. RISK MANAGEMENT
   • PROCEDURES TO MITIGATE IDENTIFIED RISKS
     • BIOSECURITY
       • MANAGEMENT PRACTICES THAT PREVENT THE INTRODUCTION AND THE PROLIFERATION & SPREAD OF PATHOGENS ON THE FARM AND FROM LEAVING THE FARM
       • “NOT ALL FOOTBATHS ARE CREATED EQUALLY”
FARM WATER FLOW
BIOSECURITY

• BIOSECURITY NEEDS TO BE A **WAY OF THINKING AND DOING** AT CRITICAL CONTROL POINTS (CCPS) ON THE SITE AND BEYOND.
  • KNOW RISKS SPECIFIC TO SITE
    • OPERATION GOALS
    • TARGET SPECIFIC PATHOGENS
      • WHAT ARE YOU PROTECTING AGAINST?
      • HOW DOES IT MOVE? HOW DO DETECT IT? HOW DO YOU DISINFECT FOR IT?
  • PREVENTATIVE MEDICINE PRACTICES
    • **WHY DO YOU USE OR NOT** THE FOOTBATHS, HAND SOAP AND NET DIP?
  • PRACTICES TO MATCH THE LEVEL OF RISK FOR THE SITE
BIOSECURITY ON ONE HAND…

• ANIMALS
  • INCOMING, SICK, MOVEMENT, DISPOSAL

• WATER
  • SOURCE WATER, SHIPPING WATER, RECEIVING WATER

• FEED
  • SOURCE, DISTRIBUTION

• VECTORS
  • PEOPLE AND PESTS
  • MOVEMENT, EXPOSURE

• FOMITES
  • EQUIPMENT, SHIPPING MATERIALS
  • MOVEMENT, IDENTIFICATION
PATHOGEN SURVEILLANCE

• PURPOSE AND BOUNDARIES OF SURVEILLANCE
  • FREEDOM OF DISEASE, KNOWN DISEASE STATUS
  • SPECIFIC VS GENERAL
  • SITES AND ZONES

• STRATEGIES
  • SELECTION BASED ON GOALS AND DIAGNOSTICS
    • OBSERVATIONAL
      • EARLY DISEASE DETECTION SYSTEM
    • RISK BASED
      • ENHANCED ROUTINE MORIBUND SAMPLING
      • REPEATED COLLECTIONS; SEASONAL
      • DIAGNOSTICS – AT LEAST 80% SENSITIVITY
      • USE HISTORICAL DATA
OTHER SURVEILLANCE CONSIDERATIONS

• PATHOGEN VIRULENCE AND “BEHAVIOR”
  • SUSCEPTIBLE SPECIES
  • CLINICAL EXPRESSION
  • PATHOGEN TRANSMISSION
  • CARRIER STATES

• DIAGNOSTICS
  • AVAILABLE, ROBUST, REPEATABLE
  • SENSITIVITY AND SPECIFICITY
FARM SURVEILLANCE PLAN EXAMPLE

- Presumed SE of 85% for diagnostic assays
- Identified pathogens of concern
  - Flavobacterium spp., Francisella spp., S. iniae, Tilv
- Unreliable mortalities so need to collect healthy fish, which means we need to aim for a lower detection prevalence
  - 1, 2 and 5% prevalence are common targets. The default is often 2%.
    - At 2% design prevalence, we’d need to collect 163 fish per facility.
    - Because population is naïve 5% is justifiable.
      - At 5% design prevalence, we’d need to collect 69 fish per facility. Ideally split over two seasons.
- May change with changing risks
- Scalable once established
  - Target testing in moribunds and fresh dead
ANIMAL FLOW CCPS

Source Farm

Grower 1
- Quarantine
- Nursery
- Hatchery
- Live Market

Grower 2
- Quarantine
- Nursery
- Hatchery
- Live Market

Grower 3
- Isolation
- Hatchery
- Live Market

Grower 4
- Live Market

Grower 5
- Live Market
INVESTIGATION

• KNOW THRESHOLDS
  • SITE SPECIFIC ACCEPTABLE THRESHOLDS FOR MORBIDITY OR MORTALITY
    • SEASONAL OR INDUCED

• TRIGGERS FOR INVESTIGATION
  • ACCEPTABLE THRESHOLDS ARE EXCEEDED
  • SCOPE DEPENDS ON PATHOGEN AND IMPACT
  • DIAGNOSTICS
MORBIDITY AND MORTALITY THRESHOLDS

FARM MORTALITY THRESHOLD

• 0.03% IS SITE ACCEPTED THRESHOLD – OVER 5 DAYS
• 69,500 FISH ON THE FARM
• 21 MORTALITIES PER DAY FOR 5 DAYS

PAST 5 DAYS ON THE FARM

• LAST 5 DAYS
  • 102 MORTALITIES TOTAL
• 68 MORTS JUSTIFIED
  • AUGUST SPAWN GROUP
  • POST SPAWN RECOVERY
  • POST SORTING STRESS
PATHOGEN REPORTING

• WHAT DOES THIS MEAN?

• LISTS OF PATHOGENS
  • STATE, REGIONAL, FEDERAL AND GLOBAL
    • OIE - HTTP://WWW.OIE.INT/ANIMAL-HEALTH-IN-THE-WORLD/OIE-LISTED-DISEASES-2016/

• RESPONSE DEPENDS OF STATUS AND IMPACT OF PATHOGEN
CONTINGENCY PLAN

“IN PREPARING FOR BATTLE I HAVE ALWAYS FOUND THAT PLANS ARE USELESS, BUT PLANNING IS INDISPENSABLE.” — DWIGHT D. EISENHOWER

PATHOGEN RESPONSE

TREAT? VACCINATE? DEPOPULATE?

RECOVERY AND ASSISTANCE

WHAT IS NEEDED FOR CONTINUITY OF BUSINESS

REVIEW AFTER CRISIS

WHAT WENT WRONG?

UPDATE OR CHANGE PLANS

INVESTIGATE MORE
MEASURING SUCCESS

• COLLECT DATA TO MEASURE THE SUCCESS OF THE PLAN

• MONEY MANAGEMENT
  • COST-BENEFIT ANALYSIS

• PRODUCTION MANAGEMENT
  • YIELD VERIFICATION STUDIES

• ESTABLISH SMART GOALS
  • CRITICAL SUCCESS FACTORS
  • KEY PERFORMANCE INDICATORS
  • TARGETS
THE IMPORTANCE OF CAHPS

- TEAM APPROACH
- BIOSECURITY AND SURVEILLANCE PRACTICES ESTABLISH FARM HEALTH STATUS
- NATIONAL ADOPTION OF UNIFORM STANDARDS MINIMIZES REDUNDANCY AND MEANINGLESS HEALTH REGULATIONS FOR ANIMAL MOVEMENT
- PROVIDES LEVERAGE FOR TRADE NEGOTIATIONS
- OFFERS BRANDING AND MARKETING OPPORTUNITIES
CAHPS CHALLENGES

- DEVELOPING SITE SPECIFIC HEALTH PLANS
- DATA MANAGEMENT AND ANALYSIS
- ACCESS TO EXPERTS
- RECOGNITION
WHAT CAN YOU DO?

- BE PART OF THE SOLUTION - WE CAN IF…
- TALK ABOUT CAHPS
- SHARE IDEAS ON HOW TO MAKE IT WORK
- FIND PRODUCERS INTERESTED IN PARTICIPATING