Food and Agriculture Organization of the United Nations

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Stakeholder Consultation on Progressive Management Pathway (PMP)
to
Improve Aquaculture Biosecurity

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Some Thoughts on Biosecurity in Animal Production Systems

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My Role at Merck Animal Health

- Technical services veterinarian for North American Aquaculture Business Unit
- Primarily support products & usage:
  - Product decision
  - Product usage
  - Product implementation
  - Product efficacy, monitoring
  - Product training
- Resource to Customers: projects, diagnostic, research, production site visits & reviews
- Previously involved in swine medicine & integrated swine production systems

Biosecurity Definition…FAO (2007)

- A set of preventative measures designed to reduce the risk of transmission of:
  - Infectious diseases & pests
  - Living modified organisms & their products
  - Invasive alien species

Bio-Security Definition

- All of the programs, processes, and procedures in place to prevent or reduce the likelihood of introducing a new pathogen into an animal facility or to reduce the spread of a new or existing pathogen within an animal facility

Bio-security Program Impressions & Opinions

1. Biosecurity is essential to livestock production operations and systems
2. Biosecurity is difficult
   - Development…no two farms are the same
   - Implementation…time, $$
   - Education, Training…existing & new employees
   - Evaluation…audit
   - Maintaining
   - Revising
   - Must change people's behavior & habits
   - Must be designed to be performed correctly every time
   - Important not to create issues or problems for producers/clients/customers

Bio-security Program Impressions & Opinions

3. Data to make the biologic & financial case for biosecurity is hard to find & to generate
4. New & emerging diseases: truly new pathogen or new test (PCR primer) with new result?
5. Biosecurity is science & art
6. Must be in writing
7. Must be understood by everyone & implementable
8. Details are system / farm dependent
9. Focus by farm management is critical

US Swine Industry

- Mature industry
- High pig density in select geographic areas
- Profitable with capital available
- Lots of excellent veterinarians
- Excellent diagnostic labs & diagnosticians
- New diseases emerged/introduced into national swine herd & spread quickly into epizootics

US Swine Industry Biosecurity

- Developed intensity & importance with emergence of "Mystery Swine Disease" in middle 1980's
- Continued to develop & expand with understanding of Porcine Reproductive & Respiratory Syndrome (PRRS):
  - Arterivirus
  - Identified as cause of Mystery Swine Disease in 1990's

US Swine Industry Biosecurity BMP's

- Shower-in: Shower-out
- Disinfect, dry inputs to farm
- Mortality handling on-site:
  - Incineration
  - Composting
  - Off-site hauling
- Replacement gilts:
  - Single source
  - Known health status
  - Quarantine & testing
- PRRSV effect

Response to Airborne PRRS Introductions

- Filter incoming air to breeding herds
- Not quite HEPA
- Example: 1600 sow breeding herd in Iowa
  - PRRS break every 10-12 months
  - $235/sow cost
  - Retrofit unit: air filtration system installed
  - Cost $275/sow ($440,000USD)
- Results: 1 PRRS outbreak past 54 months

Aquaculture Biosecurity Issues & Challenges

1. Varying degrees of bio-security plans

- Salmon producers in Canada, elsewhere
- Minimal biosecurity in some other operations, industries
- Need basic minimum biosecurity recommendations & program to start

Canadian Salmon Producers

- Extensive biosecurity programs
  - Corporate priority
  - Process & Procedure Manuals:
    - Saltwater phase
    - Freshwater phase
    - Warehouse
    - Contractors
  - Content of Manuals:
    - Basics, definitions, principles
    - Mandatory requirements
    - SOP's
  - Audits, reviews

Canadian Salmon Producers: Partial List of Focus Areas

- Fallow periods
- Stocking practices
- Siting
- Smolt quality
- Transport
- Effluent
- Broodstock
- Cleaning & disinfection
- Mortality removals
- Handling
- Visits

Aquaculture Biosecurity Issues & Challenges

2. Water quality, water source
   - *Aeromonas*
3. Fish source(s):
   - unknown health status
   - Testing…?
   - Mixing
   - No quarantine
   - International movements
4. Shared equipment & fish transport vehicles & equipment
   - seines
   - tanks
   - Vehicles/trucks

Aquaculture Biosecurity Issues & Challenges

5. Birds

6. Lack of All-in: all-out production scheme

7. Diagnostic lab access & trust

8. Need data for biologic & economic justification of biosecurity programs

9. Need for new/emerging pathogen response team for industries/species

10. Need diagnostic lab excellence & preparation

Elements of Basic Biosecurity

- Written program, part of company culture
- Education, training, re-training
- Signage
- Farm zones
- Visitor & contractor control
- Sanitation & disinfection
- Gloves, hand sanitizer, footbaths, coveralls
- Pest management
- Sick, dead disposal
- Healthy replacement stock source, quarantine

Merck/MSD Participation

- Products
- Programs
- Industry knowledge:
  - large producers
  - Veterinarians
  - Academicians
  - Trade associations
  - Production systems, management, functionality
- Dairy Care 365 & AquaCare365

Merck/MSD Participation

- Development, Focus
- Practicality, Implementation
- Consensus building
- Training
- End-user support system in field
- Conduit or interface between development, regulatory, etc. & industry/producers
- Work to avoid creating problems & issues for producers