

CONTRARIAN'S REPORT - VIRAL HEMORRHAGIC SEPTICEMIA VIRUS TYPE 4B

PART TWO – Primary or Secondary Pathogen?

June 29, 2009

Introduction

Part Two of the series *Contrarian's Report* asks questions about the quality of evidence the aquatic livestock industry faces within the current interstate commerce regulations. The *Contrarian's Report* supports the mission of the Aquatic Livestock Alliance (ALA): *To Promote the Interstate Commerce of Aquatic Livestock.*^a Part Two takes a look at a basic question regarding a prominent trade barrier of aquatic livestock in the North Central portion of the United States – the regulation(s) in place for Viral Hemorrhagic Septicemia virus Type 4b (VHSV Type 4b).

So many authors at several levels have written about VHSV Type 4b. Reporters from the public press, to regulatory reports and scientific publications have reported from 'eye witnesses', 'experts', and 'regulators' observations of this invading alien. The reader has heard the virtually unanimous announcement about VHSV Type 4b being:

- A potent, dangerous, devastating pestilence of aquatic livestock producers and wildlife/conservation programs!
- A severe pathogen in aquatic species in and around the Great Lakes basin in North America.
- A threat so enormous it will escape into the rest of America's waters to kill every fish without the total prohibition on interstate commerce of aquatic livestock.
- A conundrum requiring involvement by every regulator there is in the country!
- An Ebola virus of fish!

So were the frantic claims, pleas, and emergency proclamations from national associations, journalists, and regulators respectively.

However, what does this RNA virus really look like in the real world? Such a minimal unit of life, a virus is; that it cannot procreate itself at its level of existence but must aspire to engineer itself upon and into higher forms to propagate. The world never knows the tiny virus by its generations but at best by its fluid and changing strains. Can we move outside the 'glass houses' of journalists, 'ivory towers' of regulators, and the 'groves' of academics to examine the evidence of this 'greatest of threats'? Are we capable of examining the VHSV Type 4b situation from the perspective of reality? What is really going on with VHSV Type 4b?

PART TWO: Primary or Secondary (Opportunistic) Pathogen?

A quick list of definitions will help the reader.

Disease: Illness or sickness often characterized by typical symptoms and physical findings.¹

Gradient of infection: the range and variety of response repertoire of the host and pathogen. The balance of which determines degree of illness in the host and the extent of spread for the pathogen.²

Infection: is the invasion of the host tissues by micro-organisms with or without clinical disease. Pathogens can cause a multitude of different infections, ranging in severity from inapparent to fulminating.

Opportunistic pathogen: microbes able to cause disease in individuals with compromised host defense mechanisms. These can be secondary, environmental, and other designations indicating the microbes need assistance from other microbes, environmental factors, or life stage stressors, etc., to be pathogenic.³

Overt infection: those infected cases that are apparent.

Pathogen (path'ō-jən) any disease-producing agent or microorganism. adj., pathogen'ic., adj.⁴

Pathogenic: Causing disease or capable of doing it.⁵

Pathogenicity: is a pathogen's capacity to cause disease.⁶

Pathognomonic: sign or symptom that is so characteristic of a disease that it makes the diagnosis.⁷

Primary pathogens: microbes able to establish infections in normal hosts.

Is VHSV Type 4b a PRIMARY or a SECONDARY pathogen and described as an opportunistic creature? The actions and reactions from experts would presently indicate VHSV Type 4b qualifies for the Pathogen's Hall of Fame, if there was one. Based on what? What genuine concern does VHSV Type 4b, acting as a pathogen, give various stakeholders?

The reservoirs of previously identified VHSV strains are fish infected clinically or covert carriers among cultured, feral or wild fish (OIE, 2006), with covertly infected fish being much more difficult to detect by conventional procedures.⁸ Most regulators and academics currently assume that VHSV Type 4b is a primary pathogen!

^a www.aquaticlivestock.org - accessed on June 13, 2009

At this point one must muster the courage to ask at least two questions very relevant to the situations where VHSV Type 4b has been found:

**WHAT REALLY KILLED THE FISH?
WHERE ARE THE REST OF THE DEAD FISH?**

The isolation of a microbe in the laboratory does not make a microbe into a pathogen OR the etiologic agent of a mortality event! VHSV Type 4b was present in some of the fish sampled. Laboratory isolation as demonstrated in 4 out of 27 Muskellunge originating in Lake St. Clair, found to be positive for VHSV Type 4b⁹, does not demonstrate an etiology. Over a century ago, the principles of Koch's Postulates¹⁰ required more than isolation of a microbe from a sick animal to demonstrate the etiology. If microbe isolation demonstrated etiology, what killed the other 23 out of 27 Muskellunge from Lake St. Clair that did not have VHSV Type 4b isolated? VHSV Type 4b can be isolated from healthy-looking animals; from clinically normal animals as finally demonstrated and announced in July 2008 from samples of clinically normal yellow perch, goby and rock bass taken from lower Lake Michigan by the WI DNR and IL DNR¹¹. Isolation of a pathogen does not make it the etiology of the illness or death unless there is clinical association. The clinical findings ascribed to VHSV Type 4b are not pathognomonic. The real life findings to date do not clearly portray a monster pathogen. Clinical findings are lacking for support of VHSV Type 4b being equivalent to the hypothetical instigating event of the Federal Order.

The regulatory situation surrounding VHSV Type 4b could be comical to watch, as VHSV Type 4b does not live up to its hyped reputation, except for the huge financial burden on both private and public aquatic livestock producers that comes with regulatory oversight (as in 'over done'). Is the regulatory stance by the Federal Order a farcical notion? To help the reader prepare a genuine answer to that question please seek out the information asked for in the following questions addressed in future *Contrarian's Reports*:

1. How do we know the difference between an emerging disease and a previously unidentified microbe?
2. Are sporadic fish die offs indicative of some new emerging Ebola-like virus?
3. Does VHSV Type 4b allow survivors? Does it take prisoners for lifelong servitude to spreading the infection?
4. Would we want to call VHSV Type 4b a menace to the Great Lakes according to the number of fish that have died?
5. Are fish die offs inflated or exaggerated? What do the pictures show? What do the diagnostic lab tests show?
6. Aquatic livestock moved into and out of the Great Lakes basin in at least two or more years unfettered with VHSV regulations on commerce. Why does VHSV Type 4b need regulation now?
7. Is VHSV Type 4b a pathogen of economic concern? Is it a concern to whom?
8. Are Federal and State Regulations protecting or pillaging the aquatic livestock industry?
9. Are there any alternative explanations for the presence of VHSV Type 4b in the Great Lakes?
10. Is there a method of evaluating events for the cause and effect after the event occurs?

The reader may enjoy a short quote of Sherlock Holmes while musing the future writings to unravel this modern riddle:

"It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts." - Sherlock Holmes, A Scandal in Bohemia, Sir Arthur Conan Doyle (1891)

¹ Webster's New World Medical Dictionary, <http://www.medterms.com/script/main/art.asp?articlekey=3011> - accessed on June 22, 2009

² Veterinary epidemiology, M. V. Thrusfield, http://books.google.com/books?id=3DEdCz2NAeEC&pg=PA46&lpg=PA46&dq=overt+disease+definition&source=bl&ots=UkVAd_oM-Lw&sig=PxGolhMxmjEqYiWeHcpYv5Ouvz4&hl=en&ei=LD9ASumRJKwIAfQ2pTLAQ&sa=X&oi=book_result&ct=result&resnum=4 - accessed on June 22, 2009

³ Medical Microbiology, fourth edition, <http://gsbs.utmb.edu/microbook/ch075.htm> - accessed on June 22, 2009

⁴ Dorland's Medical Dictionary, http://www.mercksource.com/pp/us/cns/cns_hl_dorlands_split.jsp?pg=/ppdocs/us/common/dorlands/dorland/six/000079338.htm - Access on June 22, 2009.

⁵ Webster's New World Medical Dictionary, <http://www.medterms.com/script/main/art.asp?articlekey=6384> - accessed on June 22, 2009

⁶ Medical Microbiology, <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=mmed.section.545> - accessed on June 22, 2009

⁷ Webster's New World Medical Dictionary, <http://www.medterms.com/script/main/art.asp?articlekey=6386> - accessed on June 23, 2009

⁸ OIE (Office International des Epizooties). Manual of Diagnostic Tests for Aquatic animals 2006. http://www.oie.int/eng/normes/fmanual/A_00022.htm - accessed on June 29, 2009.

⁹ Viral Hemorrhagic Septicemia in the Great Lakes July 2006 - Emerging Disease Notice, http://www.aphis.usda.gov/vs/ceah/cei/taf/emergingdiseasenotice_files/vhsgreatlakes.htm - access on June 23, 2009

¹⁰ Koch's postulates are four criteria designed to establish a causal relationship between a causative microbe and a disease. http://en.wikipedia.org/wiki/Koch%27s_postulates - accessed on June 29, 2009.

¹¹ Illinois Announces Emergency Regulations to Stop Spread of Fish Virus, July 2, 2008, <http://dnr.state.il.us/pubaffairs/2008/July/vhsvirus.html> - accessed on June 29, 2009