

**Aquarium Veterinarians -- who needs them ( ! or ? ):**  
**A discussion of the pros and cons of utilizing veterinarians in public  
aquariums**

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## **INTRODUCTION**

Historically, veterinarians and biologists have locked horns with, and flared gills at, each other over animal husbandry, medical care and animal health management issues for decades. This somewhat confrontational interaction between the professions, in reference to cultured animals, has a long history in this country. There are many examples of this from the early developing poultry and cattle industries, and more recently in the related aquaculture industry and, of course, the public aquarium community.

## **DISCUSSION**

### **The Controversy**

The utilization of veterinarians in public aquariums, and particularly those facilities which do not display marine or other mammals, has been a heated issue, long debated in the aquarium profession. Recently, this issue has become even more controversial with the publication of two zoo and aquarium community documents which mandate the utilization of veterinarians in the direction and supervision of animal health management programs, from initial animal quarantine through final necropsy. The most recent of these, and the most controversial, is the "Quarantine Procedures Recommended for

AAZPA (American Association of Zoological Parks and Aquariums) Accredited Institutions" published in the June 1991 issue of the AAZPA newsletter, *Communiqué* (Baker, 1991). This document, which includes a separate section pertaining to fish, mandates that the quarantine program for all AAZPA accredited institutions be under the supervision of a veterinarian. This document also includes quarantine procedures specifically required for fish, one of which includes a requirement for obtaining multiple fecal samples. Understandably, the aquarium community responded rapidly, passionately, and some of us not-so-diplomatically, to the AAZPA Accreditation and Animal Health Committees with our concerns over these proposed requirements. Fortunately, a group of well-respected, managerial-level aquarium biologists solicited comments from the rest of the aquarium community, and drafted a far superior document entitled "Quarantine Standards for Fish" which was recently published, also in an issue of the AAZPA *Communiqué* (Andrews et al., 1992). [Author's note: Andrews et al., 1992 was published after abstracts were due for the Third International Aquarium Congress, which is why there is no reference to it in the abstract]. The key points to be gleaned from this well-written, common sense guideline are: 1) that given the tremendous diversity of fish species, all with varying environmental, physical, nutritional, spacial, and other requirements, it is unreasonable to lump them into a single group along with their terrestrial counterparts for the purpose of simplifying quarantine and/or accreditation policy, and more importantly 2) that management of the quarantine and animal health program be under the supervision of the person or persons that the institution feels is the most qualified, and that may or may not be the veterinarian.

The second document entitled "Guidelines for Zoo and Aquarium Veterinary Medical Programs and Veterinary Hospitals" (Joslin, et al., 1990) was published as a supplement to the *Journal of Zoo and Wildlife Medicine*, the scientific journal of the American Association of Zoo Veterinarians (AAZV), in 1990. This document, albeit not nearly as dictatorial as the June 1991 AAZPA *Communiqué* (Baker, 1991), also mandates specific animal health management concerns solely to, or under the direction of, a veterinarian. Interestingly, this document does allow for non-

veterinarian coordination of institutional medical care in the case of institutions which cannot afford or otherwise justify a full-time veterinarian position. However, this responsibility is apparently too great or complex for the usually highly educated curatorial/animal husbandry staff and is stated to be given to "...a licensed veterinary technician or a medical technologist who reports to the veterinarian." Assigning this responsibility to a technician with limited, vocational, albeit specific, training such as a veterinary or medical technician, to the exclusion of the presumably superior talent available in each facility's husbandry staff, seems irresponsible. This document also mandates that the veterinarian administer quarantine policy and procedures.

Most of this controversy seems to originate from the continuing attempts by some in the zoo and aquarium community to lump aquarium animals in with their zoo animal counterparts in every respect ranging from requiring multiple fecal samples during quarantine to individual identification of each fish. Zoos and aquariums are inherently different in the way they operate and their respective animals are significantly different in almost every conceivable way in their biology, physiology and medical health-care. Few aquariums employ veterinarians in a full-time capacity for a variety of reasons, and to mandate their inclusion in the management of aquarium animal health is unrealistic.

It should be obvious to anyone who has studied this subject, even briefly, that these documents, although specifically mentioning "fish" and "aquariums", were probably not intended to include or encompass fish or other cold-blooded vertebrates. It is also apparent, by looking at the names of the various committee members from both organizations which produced these documents, that not one person from the public aquarium community was involved in their drafting. In defense of my veterinarian colleagues, however, I suspect that these documents were prepared 1) primarily for zoos, and those aquariums which display marine mammals, and 2) to document philosophical and organizational compliance with the Animal Welfare Act of 1976, and other Federal and State regulations which may apply. Obviously, institutions such as most zoos and those aquariums which display marine mammals and other warm-blooded

vertebrates, must comply with Federal Laws such as the Animal Welfare Act.

Public aquariums are not alone in this controversy, and have been recently joined by most academic and private research facilities which obtain funding from certain Federal agencies such as the National Institutes of Health (NIH), which mandate compliance with the "Public Health Service (PHS) Policy on the Humane Care and Use of Laboratory Animals". This revised PHS policy does not differentiate between warm and cold-blooded vertebrate laboratory animals, and has been interpreted by academic institutional animal welfare committees to include fish.

Historically, laws relating to the humane care of laboratory animals has been fairly straightforward, and pertained primarily to classical laboratory animals such as rats, mice, rabbits, etc., all of which fell into the classification of warm-blooded vertebrate laboratory animals. This non-specific inclusion of fish as vertebrate laboratory animals has presented many problems for aquatic research facilities which conduct experiments utilizing fish. These institutions now must submit semi-annual Animal Welfare Assurance certificates, which require information such as the total number of gross square footage, the number of animals and number of species. Consequently one could theoretically house a 250 lb. fish in a 500 gallon aquarium, as long as the aquarium comfortably fit inside the animal room or service area.

Fortunately, enforcement of this PHS policy is carried out by a different federal agency, the U.S. Department of Agriculture (USDA), and specifically the Animal and Plant Health Inspection Service (APHIS). This agency is only interested in enforcing the Animal Welfare Act which only pertains to warm-blooded animals, and they have shown no interest in expanding their enforcement role to include fish. Not too surprisingly, the PHS policy which includes all vertebrate animals (and presumably fish) also mandates the inclusion of a veterinarian in each institution's animal care and use committee.

## **The Question**

Given this historical controversy, particularly as it pertains to aquariums and fish health, the question must be asked, are veterinarians the most qualified persons to oversee and make decisions about aquatic animal, and in particular fish, health?

Although this is starting to change somewhat, most schools of veterinary medicine offer very little or no training in exotic animal medicine, and those that do, put little emphasis on fishes or the management of their complex environment. Moreover, this exotic animal medical training is often elective and usually limited to a single course. Consequently, few veterinarians are trained or have experience in closed-system aquarium management, water quality theory and analysis, species compatibilities, fish and invertebrate physiology, fish disease diagnosis, and therapies unique to cold-blooded, water-breathing, completely aquatic animals.

Conversely, many aquatic, fisheries and marine biologists in the employ of public aquariums and academic research facilities do have specific and extensive post-graduate (often doctoral level) training and experience in these and other areas pertaining to the medical, physiological, and husbandry-related components of aquatic animal health management. It is these professionals who have been intimately involved in providing quality animal care, from both a husbandry and medical standpoint, including quarantine and disease control, for decades. Many fish hatcheries and most fish disease diagnostic and fish health certification laboratories are staffed entirely by Ph.D. fisheries biologists and pathologists. These facilities have historically successful and internationally recognized fish health programs.

On the other hand, veterinarians are highly skilled, extremely knowledgeable medical professionals with a unique perspective to offer to the aquarium community. Their training in epidemiology, parasitology, pathology, microbiology, anatomy, physiology, pharmacology, nutrition and clinical approach to disease diagnosis and treatment, give these individuals tremendous potential for successful inclusion in the animal health programs at any aquarium. Although they may not be formally trained in "fish medicine" per se, they can use their clinical experience to at least

draw on analogous situations with other animals to provide the aquarium biologist with additional insight into a medical situation.

### **Parallels from Agriculture**

The evolution of the veterinarian is an interesting part of our American history. Veterinarians initially were horse doctors. As the economic importance of livestock grew, the veterinarians' practice expanded to include these animals as well. This same process seems to be happening for aquatically cultured species.

The effect of the developing aquaculture industry on the veterinary medical profession in some ways parallels that of the developing poultry and egg industry. In the past, diseases of poultry, and indeed the entire poultry industry, were largely ignored by the veterinary profession, even during the expansion of this industry after World War II. The poultry industry then, similar to the fish and shellfish aquaculture industry now, had to rely on biologists and other so-called "lay persons" for animal health research, knowledge and advice. Consequently, it was very difficult for the veterinary profession to ultimately gain acceptance in this industry (Miller, 1975; Baldwin, 1991). Similarly, veterinarians initially ignored the needs of companion avian medicine, and were slow to gain acceptance in this area as well. Veterinarians eventually earned the respect of bird owners and breeders, and have made amazing advances in avian medicine (Dulin, 1977).

### **Examples from Aquaculture**

These examples from the avian area seem to set the precedent for veterinary involvement in aquaculture and other fish health areas such as aquariums. Before fishes became an economically important food source leading to the explosive growth in the aquaculture industry, farmers and aquaculturists concerned about their fish health had to seek help from fisheries biologists and pathologists. Veterinarians not only were not trained in aquatic species, but apparently were not interested in this field either. Fisheries biologists have done an excellent job over the years in

this "extension agent" role, and I know many of them are resentful that some veterinarians are attempting to take over this role in this country, with some force and governmental support, simply by virtue of possessing a license. Some veterinarians feel that an important difference exists between biologists and veterinarians, namely "that a biologist is trained to observe, but a veterinarian is trained to intervene" (Baldwin, 1991).

Other veterinarians feel differently, however. John Pitts, a Pacific Northwest veterinarian interested in aquaculture, recently published an article for his professional veterinary peers that states:

*"Traditionally, most health care for farmed aquatic animals has been provided by fisheries' pathologists and biologists. These trained professionals do a good job, but are limited by the lack of comprehensive medical training in areas of disease, epidemiology, nutrition, and animal husbandry. I strongly believe that veterinarians and fisheries [biologists] have a great deal to learn from each other and that mutual cooperation will best serve private and public aquaculture and the professions as well. However, education is necessary before veterinarians will gain acceptance and understanding by farmers and by government agencies. Most farmers rely on fisheries' biologists or personal experience for their farm health-care strategies. Veterinary medicine must invest in this industry by providing educated professionals who will set the tone and establish the future for our profession in a growing national and international aquaculture industry."*  
(Pitts, 1991)

## **Aquatic/Marine Veterinary Education**

Until fairly recently, veterinary students desirous of aquatic medical training usually had to supplement their normal required coursework with internships, summer programs or graduate training in their chosen specialties. Supplemental programs such as the popular Aquavet course, taught during summers at Woods Hole, MA. and cosponsored by the Veterinary schools of the University of Pennsylvania and Cornell University, were the only available formal training program. These programs are short-term,

usually four weeks, and although billed as being intense, often only cover subjects cursorily. However, since 1977, over 400 persons, primarily veterinary medical students, have completed Aquavet coursework. According to Dr. Donald A. Abt, Director of the Aquavet program, *"From the beginning, our hope was that we would eventually put ourselves out of business, that as colleges and institutions recognized the need, they would begin to offer courses on their own."*

This apparent lack of formal veterinary training and education is beginning to change, however. According to a recent article in the *FDA Veterinarian* (July/August 1992), a survey entitled "Aquatic Medicine Survey of U.S. and Canadian Colleges of Veterinary Medicine" was conducted for the American Veterinary Medical Association (AVMA) in April of 1992. Results of this survey indicate that two-thirds of the 31 AVMA-accredited colleges of veterinary medicine in the U.S. and Canada now offer aquatic medicine coursework to veterinary students. Additionally, vet schools at seven institutions, including Louisiana State University, Mississippi State University, North Carolina State University, Ontario Veterinary College, Atlantic Veterinary College, Tuskegee University, and the Virginia-Maryland Regional College, include aquatic medicine as a portion of the required curriculum. Currently this represents some 104 students enrolled in post-graduate aquatic medicine studies at 17 colleges of veterinary medicine.

### **Economic Impetuses & Obstacles**

These significant, albeit slow, advances in the expansion of veterinary training to include aquatic animal health is commendable and long overdue. However, the public aquarium field alone does not provide enough demand for trained aquatic veterinarians for this to evolve at faster rate. Perhaps Dr. Abt of Aquavet has put it best by stating *"Remember, aquatic veterinary medicine is still in its infancy."* (Baldwin, 1991). Other veterinarians concur that aquatic animal medicine is certainly still in the pioneer stage and that many barriers must be crossed before



the practicing veterinarian is accepted as a fish doctor (Dulin, 1977).

As our population increases, the only available option for increased seafood production will be through aquaculture. This forced growth in the aquaculture industry will be a significant economic impetus for trained veterinary involvement in aquatic animal medicine (Pitts, 1991). Another possibility is in the food inspection arena, such as that which already exists for meat and poultry. The FDA recently announced plans for a comprehensive "boat-to-table" seafood inspection program, to begin as quickly as possible. This seafood inspection program may be the key economic and legislative impetus needed for veterinary schools to begin rigorous training programs in aquatic animal medicine.

Presently, little formal training is available, but this is rapidly changing similarly to the way it did in other agricultural industries, such as poultry, and specific exotic and companion animal medicine such as avian medicine. Much more research needs to be done; the basic physiology, genetics and behavioral aspects of existing cultured species is far from complete, and even less is known about other species with culturable potential. Problems facing aquacultural expansion are social, political, and economic as well as biological.

## **CONCLUSIONS**

### **Team Approach**

Veterinarians and biologists have a great deal to learn from each other and mutual cooperation and respect will best serve the public aquarium community, the aquaculture industry and the respective professions. This team approach is already being successfully utilized in the aquaculture industry of the Pacific Northwest. Professionals from both colleges of veterinary medicine and schools of fisheries biology have teamed up to work together to provide a better health-care delivery system to fish farmers (Pitts, 1991). In the aquarium community, this approach has been slower to take effect, partially due to the egos involved in this field, but

more due to the failure of each institution to clearly define the role of the aquarium veterinarian, and illuminate where he/she fits in the animal health management program.

As the aquaculture industry expands to meet the increasing need for seafood production, the need for professional aquatic animal health-care will become more complex and increasingly vital. Public aquariums, which are increasingly striving to become self-sufficient animal breeders and growers, and not animal collectors, are evolving into large-scale aquatic animal culture facilities. Aquariums, along with the aquaculture industry, will need veterinary medicine and all of the services this profession has to offer. Conversely, veterinarians and schools of veterinary medicine, will need aquatic, marine and fisheries biologists to help supply the education, training and experience for this new breed of aquatic veterinarian in areas of fish physiology, water quality, specific captive care criteria, and general aquatic animal husbandry. The common thread here is obvious. The continued advancement of both professions is absolutely dependent upon and, inextricably linked, to each other. Mutual cooperation, trust and respect are mandatory for this advancement to occur.

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