

## Survey of pet stores regarding medical advice provided for pet fish and the potential impact on welfare

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### Abstract

**Background:** Much of the work on fish welfare focuses on areas prior to arrival at the home aquarium. Fish owners may have questions regarding the health and well-being of their fish, and they likely return to the point of purchase to get relevant fish health information. **Methods:** A phone survey was administered to a random sample of North Carolina stores that sell pet fish. The purpose was to determine the role of pet store personnel as primary care providers and the frequency with which pet store personnel were likely to offer a medical opinion for a sick fish. **Results:** Of the 27 pet store employees that provided consent, 23 (85.2%) provided a medical opinion, one employee (3.7%) was unsure and offered no opinion, and the other three (11.1%) recommended a referral to an avian/exotics veterinarian. For the 23 locations that suggested a medical opinion, the most common recommendation was an over-the-counter medication (73.9%). Three (13%) felt the issue described needed no additional treatment while two (8.7%) recommended changes to husbandry or environment. Only one (4.3%) respondent that provided a medical opinion or presumptive diagnosis recommended a veterinarian. **Conclusion:** Some pet stores may provide information that may negatively impact pet fish welfare.

**Keywords:** Pet fish, Welfare, Veterinarian

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## Introduction

Fish are widely used globally for sport, food, research, and public display. Fish are also the most numerous and widely maintained group of pets. Each year approximately 1 billion ornamental fish are sold worldwide (Whittington and Chong, 2007). Based on estimates from the United States pet industry, approximately 11.5 million households own 139.3 million freshwater fish and 1.6 million households own saltwater fish representing approximately 18.8 million saltwater fish (Statista, 2018). When using Dr. Broom's definition of animal welfare as "welfare of animal is its state as regards to its attempts to cope with its environment encompassing both the physical and mental well-being of the animal" (Broom, 1986), fish in home aquariums can have numerous opportunities for poor welfare outcomes.

Husbandry knowledge of pet fish owners is quite variable and may negatively impact the welfare of these fish (Walster *et al.*, 2015). For example, the Siamese fighting fish (*Betta splendens*) are a common species found in the home. This species is a native of Thailand that lives in shallow water ponds and rice paddy fields with enough cover to avoid predators. Their habitat often has pH range of 5.28 to 5.80 (average of 5.47), temperature range of 27.0°C to 31.5° (average of 20.9 °C), and a depth ranging from 2.0 to 9.4 cm (average of 5.0 cm) (Jaroensutasinee and Jaroensutasinee, 2001). Bettas are a member of the family Anabantidae that are known for

their labyrinth organ, which allows them to consume oxygen from the air (Tate *et al.*, 2017). Unfortunately, this unique characteristic allows bettas to survive at oxygen levels that would likely result in death of other species. If a new fish owner is not aware of this unique characteristic, a lethargic betta may be identified as normal when in fact the oxygen levels in the aquarium are dangerously low.

Additionally, pet fish owners often rely on non-scientific manuals, experience, and/or peers to gather sufficient knowledge to optimally care for their fish pets (Lim and Loh, 2016). Often the point of purchase is the first attempt at acquiring this knowledge. When problems arise, it has been estimated that 9 out of 10 pet fish owners will go to the pet store for assistance (Smith, 1994). Most pet stores and their employees are not licensed to diagnose or prescribe medications. Often the recommendation is focused on brand name over the counter products for treatment (Anderson *et al.*, 1995).

Finally, veterinary involvement is often not considered. Although there are likely many reasons for this, some common issues include: lack of veterinary knowledge or interest, availability of veterinary support, perceived desire to limit financial outlay on an inexpensive pet, and ease of replacement (Lim and Loh, 2016). Therefore, the purpose of this research was to evaluate the role of pet store personnel as primary care providers, determine the frequency with which pet store personnel were likely to offer a

medical opinion for a sick fish, and discuss some of the potential welfare implications that may occur.

### Materials and methods

A study intended to survey pet store personnel's response to an inquiry about a sick fish was performed in the summer of 2020. The study protocol involved 1) identifying a convenience sample of pet stores in North Carolina that sell fish; 2) calling each pet store with a prepared script that presented symptoms of a Siamese fighting fish (*Betta splendens*); 3) asking pet store personnel what the fish owner should do to treat the fish. Upon soliciting a response (typically from the individual that oversees the fish department or a manager), MA would then reveal the actual reason for calling (a research project intended to understand the advice pet stores give for treating sick fish) and ask the participant if s/he would provide (verbal) consent for his/her confidential response to be included as part of the research. The study protocol was approved by the North Carolina State University's Institutional Review Board (Protocol #21140). The concept for the case description was based on the identification of a chromatophoroma (a pigment cell tumor) identified in a *Betta splendens* (Ciambrone *et al.*, 2019). Additionally, it was a further review of pet store employee's diagnosis and treatment of freshwater fish completed in 1995 to determine if any changes have occurred (Anderson *et al.*, 1995).

The study began by attempting to contact a random sample of 53 pet stores using a phone interview script (Appendix A). Eight stores did not answer the telephone, as some were closed due to COVID-19. Of the 45 remaining stores, four recommended contacting other stores. Of the remaining 41 stores, 13 provided a response but ended the call before the researcher could ask for consent to use his/her responses as part of the research. One pet store employee indicate s/he was not authorized to provide consent. The remaining participants that were asked to provide consent agreed, resulting in a final sample frame of 27 independent interviews.

Data analysis consisted of calculating counts/percent for the number of pet store employees that 1) provided a medical opinion (advice, treatment or recommendations), 2) were unsure and offered no opinion, 3) recommended referral to a veterinarian.

### Results

Of the 27 pet store employees that provided consent, 23 (85.2%) provided a medical opinion or presumptive diagnosis. Of the four remaining sites, one employee (3.7%) was unsure and offered no opinion, and the other three (11.1%) recommended a referral to an avian/exotics veterinarian. Of the 23 locations that suggested a medical opinion, 17 (73.9%) suggested an over-the-counter treatment while two (8.7%) suggested some form of husbandry or environmental alterations. Of the

remaining four locations that offered a medical opinion, three (13%) felt that it was an abnormality that needed no additional treatment and one (4.3%) felt that it was likely a tumor and should go to a veterinarian.

### Discussion

Surprisingly with limited information provided, many locations provided a medical opinion or presumptive diagnosis. Unfortunately, diagnoses were not consistent among the locations. Diagnoses included injury, bacterial infection, viral infection, parasites, tumor, toxin, genetic defect or likely not a problem. Not surprisingly the treatment options also varied considerably. Although many of the treatment options offered (such as over-the-counter natural tank natural additives) may not harm the fish, other options such as parasiticides or surgery could severely impact or potentially kill the fish. Although an incorrect diagnosis may delay the identification of an effective treatment for the fish, diagnosing and development of a treatment plan should be a veterinarian's responsibility. Not including a veterinarian in the discussion could be practicing veterinary medicine without a license and may place some liability on these locations. A limitation to this survey is that it represents a small sample size in a narrow geographic region. However, the results overwhelmingly indicate that pet store employees frequently provide medical information to clients that had questions about the health of their fish.

Despite the small size of the survey, the results of this survey are likely similar in other states. The lack of routine veterinary services for pet fish and the willingness of the pet industry to provide recommendations for medical care may have deleterious impact on welfare of pet fish.

The area that could potentially have the greatest positive impact on welfare for these fish is the environment where they are housed. Although participants were told that water quality was fine during the interview, only two respondents requested additional information regarding the fish's environment (including results of water quality tests, water changes, methods to minimize stress on the fish, and feeding regimen). Also, no participants mentioned ideas for environmental enrichment which is often seen as a key component of any welfare discussion associated with a positive welfare state (Sullivan *et al.*, 2016).

Until recently, animal welfare has mostly focused on terrestrial animals (Sloman *et al.* 2011). Fish welfare can be challenging as there are still debates regarding whether fish are sentient beings (Volpato *et al.*, 2007; Volpato, 2009) and can these teleost brains experience pain, fear and suffering (Ashley and Sneldon, 2008; Braithwaite and Boulcott, 2008). When fish welfare discussion does occur, it often focuses on fish that are part of aquaculture, recreation angling, commercial wild capture, or aquatic research (Huntingford *et al.*, 2006; Message and Greenhough, 2019). Ornamental fish

welfare often focuses on capture, transportation, or water quality at a point prior to arrival at the home aquarium (Huntingford *et al.*, 2006; Pleeing and Moons, 2017). Pleeing and Moons provide a review of welfare issues specific for *Betta splendens* that include description of the species, environmental-related factors (water quality, food and nutrition, aquarium size, social housing with conspecifics, and environmental enrichment factors) and disease related concerns that are specific to this species (Pleeling and Moons, 2017). Unfortunately, there are over 30,000 species (Fish Base, 2020), and this information is not available for all species that may enter a home aquarium.

Limited research is available for fish once they reach the home aquarium, and many welfare issues can arise such as lack of pharmaceuticals licensed for fish or products packaged in volumes not appropriate for small hobby aquariums (Walster *et al.*, 2015). Additionally, the lack of veterinary involvement either due to availability of veterinarians or veterinarians not feeling equipped to care for fish has had significant negative impact on this taxonomic group (Waslter *et al.*, 2015) and veterinary education regarding aquatic medicine varies significantly between institutions and countries (Weber III *et al.*, 2009). Similar to our findings, diagnoses, treatments and procedures may be performed by untrained personnel (Walster *et al.*, 2015). Veterinarians and pet stores

could partner to consider telemedicine as a method that might be potentially less costly and increase the likelihood of improving welfare of the fish (Widmar *et al.*, 2020).

Although health of fish is a key welfare attribute, veterinarians are not experts on all aspects of piscine natural history and health management, and the veterinary profession must keep the dialogue open with biologists for key indicators of positive welfare attributes, and vice versa (Huntingford *et al.*, 2006; Buis *et al.*, 2019; Stevens *et al.*, 2017). Fish may not be held in as high a regard by the public as other pets (Iwama, 2007). Some research does indicate that fish may provide positive wellbeing outcomes for people such as stress reduction and increased relaxation (Clemens *et al.*, 2019). Consequently, we have a responsibility to understand the complexities associated with fish's intelligence, sentience, sensory perception, cognition and pain perception to attempt to provide good welfare alternatives for pet fish (Brown, 2015).

The purpose of this study was to evaluate the role of pet store personnel as primary care providers, determine the frequency with which pet store personnel were likely to offer a medical opinion for a sick fish, and discuss some of the potential welfare implications that may occur. Results indicate that approximately 85% of pet stores contacted provided a medical opinion or presumptive diagnosis and approximately 10% recommended a

referral to a veterinarian. Implications stemming from these findings are relevant for pet fish, pet fish owners, veterinarians and pet store employees. Additional research is needed in this area of animal welfare.

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## Appendix A

### 21140 semi-structured phone interview script and debriefing

Researcher: "Hi, my name is \_\_\_\_."

Does your store sell pet fish?

If "no" response from interviewee:

Researcher: "Who does sell pet fish that I could call and talk to?"

[researcher records recommendation and concludes the call]

If "yes" response from interviewee:

Researcher: "I have a betta fish with a bump on his head. Can I talk to someone about what to do?"

Researcher: "I noticed a black bump above his right eye about a month ago. It seems to be getting larger. My fish is about 18 months old, lives alone in a 5 gallon tank, and is eating and swimming normally. I have tested the water and it appears to be fine.

[Researcher will record in the spreadsheet for research purposes whether employee:

1. Recommends product purchase and if so, what product(s) (e.g. Melafix) and why the products are suggested

2. Recommends consultation with a veterinarian and why they're recommending the vet visit

3. Provides other recommendation(s) to student, what those are, and reasoning given]

Researcher: "Thank you so much for this information. This was super helpful information. At this point, it's important that I tell you the real reason for my call. I am calling stores that sell fish for a research study to understand the advice that people give to people with sick fish. Do you mind if I use what we talked about for a research project? I will not record your name or the name of your store. Any information that I use from our conversation will be in numbers. No one will be able to figure out that you are a part of this project."

If "no" response from interviewee:

Researcher: "That's okay, thank you." [Researcher hangs up]

If "yes" response from interviewee:

Researcher: "Thank you." [Researcher hangs up]