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THE USE AND ACCEPTABILITY OF MEDICATED FISH FEED IN AQUACULTURE

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ABSTRACT

Medicated feed in animal production systems is essential to economically produce healthy and high quality product, as it can be used to control bacterial disease. The paper review, outline the available common medicated fish feeds used in aquaculture such as; Terramycin, Romet and Homemade medicated feeds. This paper also review Common Anti-parasitic medicinal foods on the Nigeria market, such as; Jungle Anti-Parasite Medicated Fish Food and MetroMed. It also emphasizes on how to select proper medication for use in aquaculture and how to store medicated feed. Medicated feed is recommended to control bacterial disease outbreaks which may be controlled by antibiotics. There are only two widely accepted and approved antibiotics available in medicated feeds for food fish. However, early diagnosis and treatment are necessary because once fish are sick they are unlikely to eat, and prevention through good management practices is the best control measure for bacterial diseases.

Keywords: Medicated feed, Aquaculture, Terramycin, Romet, and Nigeria.

INTRODUCTION

Fish farming in Nigeria is increasingly becoming a lucrative venture. However, most farmers have little or no knowledge of their health management. Because of crowding and associated stressors, encountered in modern aquaculture, fishes are more susceptible to diseases than free ranging-animals (Ruth and Peggy, 1995). Common causes of fish death are bacterial diseases, but early detection and control can help to minimize or prevent losses. There are a wide range of bacterial infections that may affect our fish such as dropsy, exophthalmia (popeye), finrot, columnaris or saddleback, ulcers, enteric septicemia of catfish etc. Many of these infections will have external signs but originate internally and can be addressed by feeding food containing antibiotics. The development of medicated feeds in fish culture, has helped to promote optimal fish growth and health, and thus supports the aquaculture (fish farming) industry as it expands to satisfy increasing demand for affordable, safe, and high-quality (healthy) fish and seafood products. Therefore, this review outlines the available common medicated fish feeds used in fish culture, how to select proper medication for use in aquaculture and how to store medication feed.

Medicated Feeds

Medicated feed implies a prepared (commercial) feed which contains an antibiotics. Antibiotics are drugs specifically designed to control bacterial infections, but they do not control parasitic, viral or fungal diseases (Durborow and Francis-Floyd, 1996). In other words, it is any fish feed that contains drug ingredients intended for the care, treatment or prevention of animal disease. When fish reduce or stops growing, it is a signal to look for problems. Off-feed behavior is the first signal of trouble such as disease or water quality deterioration in the fish growing system. Fish often stops eating as bacterial disease progresses; therefore it is so essential to ensure that infected fish are treated (Ruth and Peggy, 1995). Medicated feed is frequently recommended to control bacterial disease outbreaks. Although, using medicated feeds is one of the easiest ways to treat fish, they should be used immediately.

There are different types of antibiotics in medicated feed for fish culture, amongst they are: Aquaflor, Chorulon, Jungle Anti-Bacteria Medicated Fish Food, Ultra Cure BX, Medi-Gold and Medikoi, Metromed, Garlic, Terramycin and Romet (Helfrich, 2009). He also noted that, the most widely accepted and approved two for use in food fish culture are Terramycin and Romet.

Types of Medicated Fish Feeds

Terramycin medicated feed

Terramycin has been used for treatment of food fish for many years. It contains the drug oxytetracycline. This drug is usually effective against many bacteria which cause disease in food fish. Terramycin is specifically approved for control of *Aeromonas hydrophila* (*A. liquefaciens*) and *Pseudomonas* sp. infections in catfish and *Aeromonas salmonicida*, *A. salmonicida achromogens* (*Haemophilus piscium*), *A. hydrophila* (*A. liquefaciens*) and *Pseudomonas* sp. in trout. *A. hydrophila* causes motile aeromonas septicemia, *A. salmonicida* causes furunculosis, and *A. salmonicida achromogens* causes ulcerative disease in trout and goldfish. Terramycin is incorporated into the feed by commercial mills and fed at a rate of 3.75 grams (g) of the drug per 100 pounds of fish per day. Terramycin must be fed for 10 days to control the infection. The fish must be held for an additional 21 days before they can be marketed for food to allow complete elimination of the drug from the fish, i.e. this 21-day withdrawal period assures that the drug will be absent from fish intended for human consumption. Marketing plans must be considered before treating fish with Terramycin. Once treated, fish cannot be sold for at least 31 days (10 day treatment period plus 21-day withdrawal period). An additional consideration when feeding Terramycin is that it is only available from commercial mills as a sinking feed. The drug is broken down by the higher temperatures needed to make an

extruded (floating) pellet. Feeding a sinking food is a major disadvantage for sick pond fish because it is difficult to determine if they are eating the medicated feed.

Romet medicated feed

Romet (Romet-30, Romet-B) is also approved for use in both trout and catfish as well as in salmon. This product contains two drugs, sulfadimethoxine and ormetoprim. These drugs in combination are more effective than either drug used alone. Romet is specifically approved for treatment of *Edwardsiella ictaluri* infections in catfish (*E. ictaluri* causes enteric septicemia of catfish) and *Aeromonas salmonicida* infections in trout and salmon. Romet is considered ineffective against *F. columnaris*. It is recommended that Romet not be used if catfish have a primary or secondary infection with *F. columnaris*.

Romet medicated feed is produced by commercial feed mills and should be fed at a dosage of 23 milligrams (mg) of drug per pound of fish (50 mg of drug per kilogram of fish) per day for 5 days. If the feed contains 33.3 pounds of Romet-30 premix per ton, then the fish need to consume at least 1 percent of their body weight to achieve a therapeutic dose of the drug. At varying Romet concentrations, the proper feeding rate can easily be calculated. For example, feed mixed with 11.1 pounds of Romet-30 per ton of feed should be fed at 3 percent of body weight. The withdrawal period for Romet is only 3 days for channel catfish. This is considerably less than that for Terramycin. With a 5-day treatment period and a 3-day withdrawal period, catfish treated with Romet can be slaughtered only eight days after the drug treatment is initiated. Trout, however, are required to have a 42-day withdrawal period from Romet before being slaughtered. Another advantage of Romet is its availability from commercial mills in a floating pellet. This allows direct observation of the fish eating the medicated feed. However, early diagnosis and treatment are necessary because once fish are sick they are unlikely to eat. (Ruth and Peggy, 1995)

Homemade medicated feeds

If commercial medicated feed is not readily available in your area, it is possible under emergency circumstances to mix your own feed in small quantities. Both Terramycin® and Romet® can be used in this manner. (Ruth and Peggy, 1995) FDA approval and for an extra-label prescription by a determination are necessary before using this treatment. The powdered premix is combined with the binder and then added to the feed. A 5 percent gelatin solution as well as vegetable or fish oil work well as binders. The feed and antibiotic must be mixed thoroughly to assure even distribution of the drug to all the pellets. The coated feed should then be spread out to air dry. After several hours of drying, the feed can be re-bagged and stored under proper conditions (Liv, 2009).

Storage of Medicated Feed

As with all fish food, medicated feed is stored in a cool, dry place. Antibiotics and important nutrients will break down more rapidly if kept in a warm, moist environment. Older feed should be used first, and all feed should be regularly inspected for mold prior to feeding. Excessive breakdown of antibiotics because of improper storage can be an important reason for unsuccessful treatment (Jim, 2006). All moldy feed should be discarded immediately. Mice, rats, roaches and other pests should be strictly controlled in the feed storage area, because they consume and contaminate feed and transmit diseases. Unused medicated feed after 3 to 4 months should be discarded (Durborow and Francis-Floyd, 1996).

How to Select Proper Medication for Use

To optimize the response to antibiotics provided in feed, producers should correct other problems which may have predisposed fish to the bacterial infection. This should include checking water quality parameters and submitting fish and water samples to a diagnostic laboratory. If the fish have a bacterial disease and the causative agent has been identified, a sensitivity test should be performed to ensure that the correct medication is used (FJSA, 1994). A sensitivity test shows the resistance of the disease-causing bacteria to various antibiotics. If bacteria are unable to grow in the presence of a particular antibiotic, a zone of inhibition or clear area is present surrounding the area treated with that drug. If the drug has no effect on the bacteria, they will grow all over the area containing the drug. The area will then have a cloudy appearance. A fish health professional can perform a sensitivity test for you and recommend which antibiotic to use (NAA, 2003).

Common Anti-parasitic medicinal feeds in the market

Jungle Anti-Parasite Medicated Fish Food: *Active ingredients:* Metronidazole, Praziquantel, and Levamisole. *Instructions:* "Feed exclusively for 5 to 10 days as required. Do not use other foods during this period. Feed 1 or 2 times daily as much as the fish will eat. May be used with external water treatments, antibiotic/fungal or parasite treatments. This food seems to address the three common type of internal parasites. The product is becoming available in more local fish stores and chains and is a recommended treatment if internal parasites are suspected or diagnosed.

MetroMed: *Active ingredients:* Metronidazole, Ormetoprim-sulfa and Oxytetracycline
Comments: It is marketed by the Goldfish Connection and according to the product information "Metro-Med is a krill based food that contains Metronidazole and an antibiotic used for treating Hexamita (hole in the head) in Goldfish."

CONCLUSION

In aquaculture, medicated feeds are effective in the control of bacterial diseases if administered appropriately and immediately. Although the results of treatment may only be temporary unless underlying problems are also corrected. However, early diagnosis and treatment are necessary because once fish are sick they are unlikely to eat, and prevention through good management practices is the best control measure for bacterial diseases.

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