APPENDIX 11: APPROVED ANIMAL DRUGS FOR AQUACULTURE USE

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APPROVED ANIMAL DRUGS FOR AQUACULTURE

Animal Drugs for aquacultured food fish must meet human food safety standards assessed during the approval process. When a fish producer (farmer) or hatchery manager uses an approved drug for food fish as directed on the label, the treated fish are safe to eat.

The FDA-approved animal drugs for use in aquaculture, with information on their approved sponsor/supplier, species for which the approval has been granted, required withdrawal periods, and other conditions are listed below. Additional details on provisions of use (e.g., administration route, dosage level) can be obtained from the Code of Federal Regulations (CFR) as cited below; the labeling for the drug; and the FDA CVM Website, (the Animal Drugs @ FDA database: https://animaldrugsatfda.fda.gov/).

FDA's determination that these veterinary products are approved aquaculture drugs does not exempt facilities from complying with other federal, state, tribal, territorial, and local environmental requirements. For example, in the United States, facilities using these substances would still be required to comply with the National Pollutant Discharge Elimination System requirements.

- **Route of Administration: Immersion**
  - **Chloramine-T powder**

    Proprietary Name: HALAMID® AQUA (NADA 141-423)

    Active Ingredient: Chloramine-T trihydrate

    Supplier: Axcentive SARL, France

    Species/Class: Freshwater-reared salmonids, walleye, and freshwater-reared warmwater finfish

    Indication for Use (21 CFR 529.382):

    - For the control of mortality in freshwater-reared salmonids due to bacterial gill disease associated with *Flavobacterium* spp.
    - For the control of mortality in walleye due to external columnaris disease associated with *Flavobacterium columnare*.
    - For the control of mortality in freshwater-reared warmwater finfish due to external columnaris disease associated with *Flavobacterium columnare.*

    Conditions of use:

    Marketing Status: This drug is approved as an Over-the-Counter (OTC) product, and a prescription is not required for uses consistent with the product label instructions.

    Extra-label use: A prescription from a licensed veterinarian is required to prescribe an extra-label use of Halamid® Aqua **to treat diseases or species not listed on the product label (21 CFR 529.382)**.

    Mandatory withdrawal time before harvest: Not established

    Tolerance Level: The tolerance for para-toluenesulfonamide (marker residue) is 0.90 ppm (900 ppb) in fish muscle/skin (21CFR556.118).

○ Formalin

Proprietary Name:	Supplier:
Formalin-F (NADA 137-687)	Natchez Animal Supply Co., USA
Formacide-B (ANADA 200-414)	B.L. Mitchell, Inc., USA
Parasite-S®(NADA 140-989)	Syndel USA, USA

Active Ingredient: Formalin: approximately 37% by weight of formaldehyde gas

Species/Class: All finfish and penaeid shrimp- as a parasiticide, and the eggs of all finfish and freshwater-reared finfish as a fungicide.

Indication for Use (21 CFR 529.1030):

Added to the environmental water as follows:

- All finfish-for the control of external protozoa (*Chilodonella* spp., *Costia* spp., *Epistylis* spp., *Ichthyophthirius* spp. *Scyphidia* spp. and *Trichodina* spp.) and the monogenetic trematode parasites (*Cleidodiscus* spp., *Dactylogyrus* spp., and *Gyrodactylus* spp.);
- All finfish eggs- for the control of fungi of the family Saprolegniaceae;
- Penaeid shrimp- for the control of protozoan parasites (*Bodo* spp., *Epistylis* spp., and *Zoothamnium* spp.); and
- Freshwater-reared finfish-for control of mortality due to saprolegniasis associated with fungi in the family Saprolegniaceae.

Conditions of use:

Marketing Status: This drug is approved as an Over-the-Counter (OTC) product, and a prescription is not required for uses consistent with the product label instructions.

Extra-label use: A prescription from a licensed veterinarian is required to prescribe an extra-label use of Formalin-F and Parasite-S® **to treat diseases or species not listed on the product label (21 CFR 529.1030)**.

Mandatory withdrawal time before harvest: Not established

Tolerance Level: Not established (formalin does not bioaccumulate in animal tissue)

○ Hydrogen peroxide

Proprietary Name: 35% PEROX-AID® (NADA 141-255)

Active Ingredient: Hydrogen peroxide

Supplier: Syndel USA, USA

Species/Class: Freshwater-reared adult finfish, fingerlings and eggs

Indication for Use (21 CFR 529.1150):

- For the control of mortality in freshwater-reared salmonids due to bacterial gill disease associated with *Flavobacteriurn branchiophilum*,
- for the control of mortality in freshwater-reared warmwater and coolwater finfish and channel catfish due to external colurnnaris disease (Flexibacler columnaris) associated with *Flavobacterium columnare*.
- For the control of mortality in freshwater-reared finfish eggs due to saprolegniasis associated with fungi in the family Saprolegniaceae,
- For the control of mortality in freshwater-reared warmwater and coldwater fingerling and adult finfish due to saprolegniasis associated with fungi in the family *Saprolegniaceae*, and
- For the treatment and control of mortality in freshwater-reared salmonids associated with *Gyrodactylus* spp.

Conditions of use:

Marketing Status: This drug is approved as an Over-the-Counter (OTC) product, and a prescription is not required for uses consistent with the product label instructions.

Extra-label use: A prescription from a licensed veterinarian is required to prescribe an extra-label use of 35% PEROX AID® **to treat diseases or species not listed on the product label (21 CFR 529.1150)**.

Mandatory withdrawal time before harvest: Not established

Tolerance Level: Not established

○ Oxytetracycline hydrochloride

Proprietary Name:	Supplier:
Tetroxy® 343 (ANADA200-247)	Bimeda Animal Health Limited, Ireland
Tetroxy® Aquatic (ANADA200-460)	Bimeda Animal Health Limited, Ireland
Pennox 343® (ANADA200-026)	Pharmgate Inc., USA
TERRAMYCIN-343®, TERRAMYCIN®, TERRAMYCIN® Soluble Powder Concentrate (NADA 008-622)	Zoetis Inc., USA
OXYMarine™, Oxytet® Soluble (ANADA 130-435)	Huvepharma EOOD, Bulgaria

Active Ingredient: Oxytetracycline hydrochloride

Species/Class: Finfish/fry and fingerling

Indication for Use (21 CFR 529.1660):

- To provide a new indication for the marking of skeletal tissues in finfish fry and fingerlings as an aid in identification.

Conditions of use:

Marketing Status: Federal law restricts this drug to use by or on the order of a licensed veterinarian (21 CFR 529.1660)

Mandatory withdrawal time before harvest: None.

Tolerance Level: The tolerance level of 2 ppm has been established for the sum of tetracycline residues (including oxytetracycline, chlortetracycline, and tetracycline) in finfish muscle tissue and lobster (21 CFR 556.500).

○ Tricaine methanesulfonate (MS-222)

Proprietary Name: Tricaine-S (ANADA 200-226)

Active Ingredient: Tricaine methanesulfonate

Supplier: Syndel USA, USA

Species/Class: For fish intended for human consumption, the use of drug is restricted to the following families: Ictaluridae, Salmonidae, Esocidae, and Percidae. In other fish, the drug should be limited to hatchery or laboratory use (21 CFR 529.2503).

Indication for Use (21 CFR 529.2503):

- For the temporary immobilization of fish, amphibians, and other aquatic, cold-blooded animals. Tricaine methanesulfonate is used as an aid in the handling of these animals during manual spawning (fish stripping), weighing, measuring, marking, surgical operations, and transport.

Conditions of use:

Marketing Status: This drug is approved as an Over-the-Counter (OTC) product, and a prescription is not required.

Mandatory withdrawal time before harvest: 21 days of harvesting fish for food.

Tolerance Level: Not established

• Route of Administration: Injectable

○ Chorionic gonadotropin

Proprietary Name: Chorulon® (NADA 140-927)

Active Ingredient: Chorionic gonadotropin

Supplier: Intervet Inc., USA

Species/Class: Finfish

Indication for Use (21 CFR 522.1081):

For the use as an aid in improving spawning function in male and female brood finfish. The drug may be administered by intramuscular injection. The total dose should not exceed 25,000 I.U. chorionic gonadotropin in fish intended for human consumption.

Conditions of use:

Marketing Status: This drug is a prescription (Rx) product and the Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian (21 CFR 522.1081).

Mandatory withdrawal time before harvest: Not established.

Tolerance Level: Not established (21 CFR 556.304).

- **Route of Administration: Medicated Articles/ Feeds**

  - **Florfenicol**

Proprietary Name: Aquaflor® Type A Medicated Article (NADA 141-246)

Active Ingredient: Florfenicol

Supplier: Intervet Inc., USA

Species/Class:

- Salmonids, Freshwater-Reared
- Finfish, Freshwater-Reared
- Warmwater Finfish, Freshwater-Reared
- Catfish

Indication for Use (21 CFR 558.261):

- Warmwater Finfish- For the control of streptococcal septicemia associated with *Streptococcus iniae*.
- Salmonids- For the control of mortality due to coldwater disease associated with *Flavobacterium psychrophilum* and furunculosis associated with *Aeromonas salmonicida*.
- Finfish- For the control of mortality due to columnaris disease associated with *Flavobacterium columnare*.
- Catfish- For the control of mortality due to enteric septicemia of catfish associated with *Edwardsiella ictaluri*.

Conditions of use:

Marketing Status: This drug is approved as veterinary feed directive (VFD) product to use by or on the order of a licensed veterinarian. The expiration date of VFD for florfenicol medicated feeds for fish must not exceed 6 months from the date of issuance. Type A medicated articles and medicated feeds intended for use in fish shall bear the following: "Not for use in animals intended for breeding purposes." (21 CFR 558.261)

Extra-label use: Extra-label use of medicated feed containing florfenicol is prohibited (21CFR 558.6(a)(4) and (6). See Compliance Policy Guide (CPG) 615.115 for more information about extra-label use.

Mandatory withdrawal time before harvest: Feeds containing florfenicol must be withdrawn 15 days prior to slaughter (21 CFR 558.261).

Tolerance Level: The tolerance for florfenicol amine (the marker residue) in the target tissue (muscle or muscle/skin) is 1 ppm (21 CFR 556.283)

  - **Oxytetracycline dihydrate**

Proprietary Name: Terramycin® 100 for Fish and Terramycin® 200 for Fish (NADA 038-439)

Active Ingredient: Oxytetracycline dihydrate

Supplier: Phibro Animal Health Corp., USA

Species/Class:

- Salmonids
- Freshwater-Reared Oncorhynchus Mykiss
- Lobster
- Catfish, Reared
- Freshwater-Reared Salmonids
- Freshwater-reared salmonids weighing up to 55 grams
- Pacific Salmon, Reared

Indication for Use (21 CFR 558.450):

- Salmonids- for the control of ulcer disease caused by *Haemophilus piscium*, furunculosis caused by *Aeromonas salmonicida*, bacterial hemorrhagic septicemia caused by *Aeromonas hydrophila*, and pseudomonas disease.
- Freshwater-reared salmonids-for the control of mortality due to coldwater disease associated with *Flavobacterium psychrophilum*.
- Freshwater-reared Oncorhynchus mykiss-for the control of mortality due to columnaris disease associated with *Flavobacterium columnare*.
- Catfish-for the control of bacterial hemorrhagic septicemia caused by *Aeromonas hydrophila* and pseudomonas disease.
- Lobster-for the control of gaffkemia caused by *Aerococcus viridans*.
- Pacific Salmon-For marking of skeletal tissue.
- Freshwater-reared salmonids weighing up to 55 gram-For marking the skeletal tissue

Conditions of use:

Marketing Status: This drug is approved as veterinary feed directive (VFD) product to use by or on the order of a licensed veterinarian. The expiration date of VFD for oxytetracycline medicated feeds for fish must not exceed 6 months from the date of issuance (21 CFR 558.450).

Extra-label use: Extra-label use of medicated feed containing oxytetracycline dihydrate is prohibited (21CFR 558.6(a)(4) and (6). See Compliance Policy Guide (CPG) 615.115 for more information about extra-label use.

Mandatory withdrawal time before harvest: Withdrawal times vary with indication as follows:

- for marking skeletal tissue in Pacific salmon, 7 days;
- for disease control for catfish, salmonids, freshwater-reared salmonids, and Oncorhynchus mykiss, 21 days;
- for lobster, 30 days before harvesting lobsters (21 CFR 558.450).

Tolerance Level: The tolerance level of 2 ppm has been established for the sum of tetracycline residues (including oxytetracycline, chlortetracycline, and tetracycline) in finfish muscle tissue and lobster (21 CFR 556.500).

○ Sulfamerazine

Proprietary Name: Sulfamerazine Fish Grade (NADA 033-950)

Active Ingredient: Sulfamerazine

Supplier: Zoetis Inc., USA

Species/Class: Trout (Rainbow, Brook and Brown)

Indication for Use (21 CFR 558.582):

- For control of furunculosis caused by *Aeromonas salmonicida*.

Conditions of use:

Marketing Status: This drug is approved as veterinary feed directive (VFD) product to use by or on the order of a licensed veterinarian. The expiration date of VFD for sulfamerazine medicated feeds for fish must not exceed 6 months from the date of issuance (21 CFR 558.582)

Extra-label use: Extra-label use of medicated feed containing sulfamerazine is prohibited (21CFR 558.6(a)(4) and (6). See Compliance Policy Guide (CPG) 615.115 for more information about extra-label use.

Mandatory withdrawal time before harvest: Feeds containing sulfamerazine must be withdrawn 21 days before slaughter (21 CFR 558.582)

Tolerance Level: The tolerance of zero is established for residues of sulfamerazine (N1 -[4-methyl-2-pyrimidinyl] sulfanilamide) in the edible tissues of trout (21 CFR 556.660).

○ Ormetoprim/Sulfadimethoxine combination

Proprietary Name: Romet-30® (NADA 125-933)

Active Ingredient: Sulfadimethoxine and Ormetoprim combination (5:1)

Supplier: Pharmaq AS, Norway

Species/Class: Salmonids (trout and salmon), Catfish

Indication for Use (21 CFR 558.575):

- For the control of bacterial infections in catfish caused by *Edwardsiella ictaluri* (enteric septicemia of catfish).
- For control of furunculosis in salmonids (trout and salmon) caused by *Aeromonas salmonicida*.

Conditions of use:

Marketing Status: This drug is approved as veterinary feed directive (VFD) Type A medicated product to use by or on the order of a licensed veterinarian. The expiration date of VFD for sulfadimethoxine/ormetoprim medicated feeds for fish must not exceed 6 months from the date of issuance. VFDs for sulfadimethoxine and ormetoprim shall not be refilled (21 CFR 558.575).

Extra-label use: Extra-label use of medicated feed containing sulfadimethoxine and ormetoprim is prohibited (21CFR 558.6(a)(4) and (6). See Compliance Policy Guide (CPG) 615.115 for more information about extra-label use.

Mandatory withdrawal time before harvest: Feed containing sulfadimethoxine/ormetoprim must be withdrawn before slaughter as follows: salmonids - 42 days; catfish -3 days (21 CFR 558.575).

Tolerance Level:

- The tolerance for sulfadimethoxine in the edible tissue is 0.1 ppm (100 ppb) (21 CFR 556.490).
- The tolerance level for ormetoprim in the edible tissue is 0.1 ppm (100 ppb) (21 CFR 556.640).

BIBLIOGRAPHY

We have placed the following references on display in the Division of Dockets Management, Food and Drug Administration, 5630 Fishers Lane, rm. 1061, Rockville, MD 20852. You may see them at that location between 9 a.m. and 4 p.m., Monday through Friday. As of March 29, 2011, FDA verified the website addresses for the references it makes available as hyperlinks on the Internet copy of this Guidance. FDA is not responsible for any subsequent changes to Non- FDA Web site references after April 2018.

- U.S. Food and Drug Administration. Implantation or injectable dosage form new animal drugs. In Code of Federal Regulations, 21 CFR 522. U.S. Government Printing Office, Washington, DC. (https://www.ecfr.gov/cgi-bin/text-idx?SID=569e121f743184a034ffff345ce6efab&mc=true&node=pt21.6.522&rgn=div5)

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- U.S. Food and Drug Administration. New animal drugs for use in feed. In Code of Federal Regulations, 21CFR 558 U.S. Government Printing Office, Washington, DC. (https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=558%0C)

- World Health Organization. (2017). WHO guidelines on use of medically important antimicrobials in food-producing animals. World Health Organization. (https://apps.who.int/iris/handle/10665/258970) License: CC BY-NC-SA 3.0 IGO

NOTES: