



Health management of carps, use of chemicals and veterinary drugs

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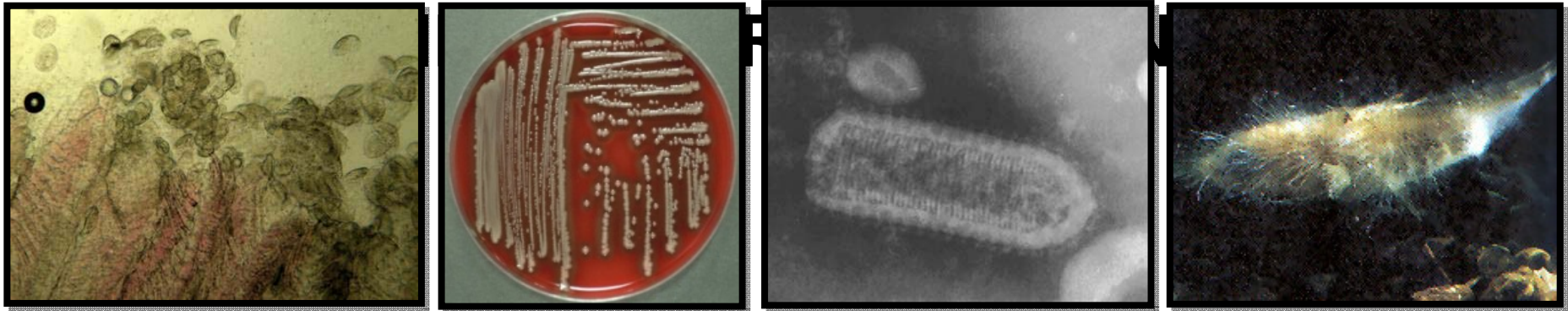
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RESPONSIBLE USE OF ANTIMICROBIALS



- Fish farmers have a responsibility to safeguard the health of the fish on their farm.
- Where appropriate farmers may ask their veterinary surgeon to help them discharge this responsibility.
- Farmers and fish keepers can play a major role in ensuring the responsible use of medicines on fish farms.



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SUBSTANCES DANGEROUS FOR THE HUMAN



HEALTH Malachite Green

- In Europe and the United States its use **is strictly prohibited** in farmed fish for human consumption. Residues of malachite green and its metabolite leucomalachite remain permanently in the tissues (which may take the characteristic greenish). Studies in rats and mouse show carcinogenic and mutagenic effects with the formation of lung adenomas, thyroid cancer, liver and mammary gland.
- S.J. Culp et al. (2002). *Mutagenicity and carcinogenicity in relation to DNA adduct formation in rats fed leucomalachite green.*
- (2005). *Toxicology and Carcinogenesis Studies of Malachite Green Chloride and Leucomalachite Green (CAS Nos. 569-64-2 and 129-73-7)*

Formaldehyde



The carcinogenicity has been found in rodents, where formaldehyde causes an incidence rate of cancer of the nose and throat much higher than normal. Formaldehyde is able to interfere with the links between DNA and proteins. The International Agency for Research on Cancer (IARC) since 2004 has included formaldehyde in the list of **substances considered for certain carcinogenic for humans.** **Must be carefully valued the risks to workers at industrial processes that use formaldehyde.** In 2006, the American agency of Neurology showed that formaldehyde can cause sclerosis in humans



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The types of chemicals and veterinary drugs used in aquaculture include
CHEMOTHERAPEUTANTS, PESTICIDES, OXIDANTS, DISINFECTANTS, ALGICIDES, HERBICIDES and

Type of agent	Usage	Method of application
Chemotherapeutants	Treatment of bacterial fish diseases	Oral –medicated feed; injection; topical; bath
Parasiticides	Control of sea lice on salmon; treatment of parasites in ornamental fish ponds; control of protozoa and trematodes on finfish	Oral –medicated feed; bath; dip; flush
Oxidants	To kill disease organisms and phytoplankton in pond systems	Direct; flush
Biocides, algicides and herbicides	Reduce plant growth in pond systems; antifouling treatment for fish farm cage netting	Direct; flush



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Legal issue

- It is the responsibility of those using, prescribing, and/or recommending the use of regulated Products to know which products can be legally used and with what restrictions under local regulations.
- Remember, regulated product uses may vary by location, Species, life stage, and culture conditions or methods.
- The chemical products are often registered as disinfectants and sanitizers, then those can be used on all structures (tanks, walls, etc) and tools (nets, boots, etc)
- **Check if the current legislation allow for the direct use over the fish of every product that we will discuss.**



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CHEMOTHERAPEUTANTS for aquaculture in Europe

APPROVED

Amoxicillin,
Florfenicol,
Flumequine,
Oxolinic Acid,
Oxytetracycline,
Sarafloxacin
Sulfadiazinetrimethoprim.

SPECIFICALLY PROHIBITED

Chloramphenicol,
Nitrofurans



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In Carp-farming bacterial diseases of fish can be successfully treated with **medicated feeds**

APPROVED

Amoxicillin,
Florfenicol,
Flumequine,
Oxolinic Acid,
Oxytetracycline,
Sarafloxacin
Sulfadiazinetrimethopr
im.



Carp erythrodermatitis;
ulcer disease
Aeromonas salmonicida



Columnaris disease
Flexibacter columnaris

Bacterial gill disease
*Flavobacterium
branchiophyla*



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Examples of possible dosage rates for some common antibiotics or drugs

Antibiotic/drug	Dosage rate (g/100 kg fish/day)
Potentiated sulphonamide	7.5 g for 5-7 days
Oxolinic acid	1 g for 10 days
Oxytetracycline	7.5 g for 5-0 days

1. The feed is then administered for a recommended treatment period, according to the specific disease to be treated and the **instructions of a veterinary practitioner**.
2. Important that treated fish must not be harvested for food use until a specified withdrawal period has elapsed
3. Medicated feed needs to be kept under adequate storage conditions, such as in a cool dry place kept separate from other feeds, to avoid any deterioration of the feed quality and drug efficacy



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The use of the Biocides

- The administration of biocides and disinfectants in the water directly is the most common method for therapy in fish health.
- We must keep in mind that the chemical and physical components of the water, greatly modify the effectiveness of the molecules used, in particular:

➤ Temperature
➤ Hard water



➤ Salinity
➤ PH



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The use of the Biocides

Dips (medicinal baths)

a) Dip in continuous b) Short dip c) Permanent dip



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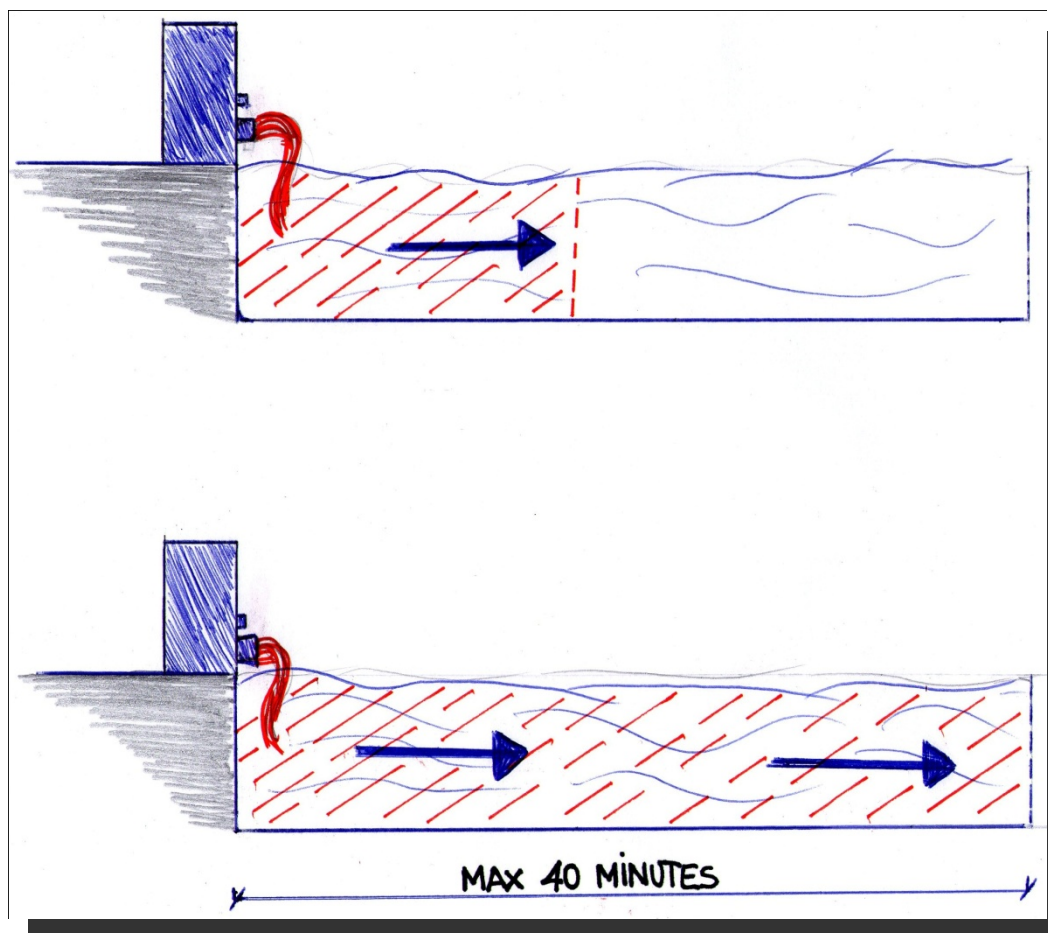
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Dip in continuous

- This method is used when you can not stop the flow (rivers or streams). The product should be placed in a container with valve on top of the channel. Important to calculate well the water flow.
- The product must come to the end of the canal in up to 40 minutes



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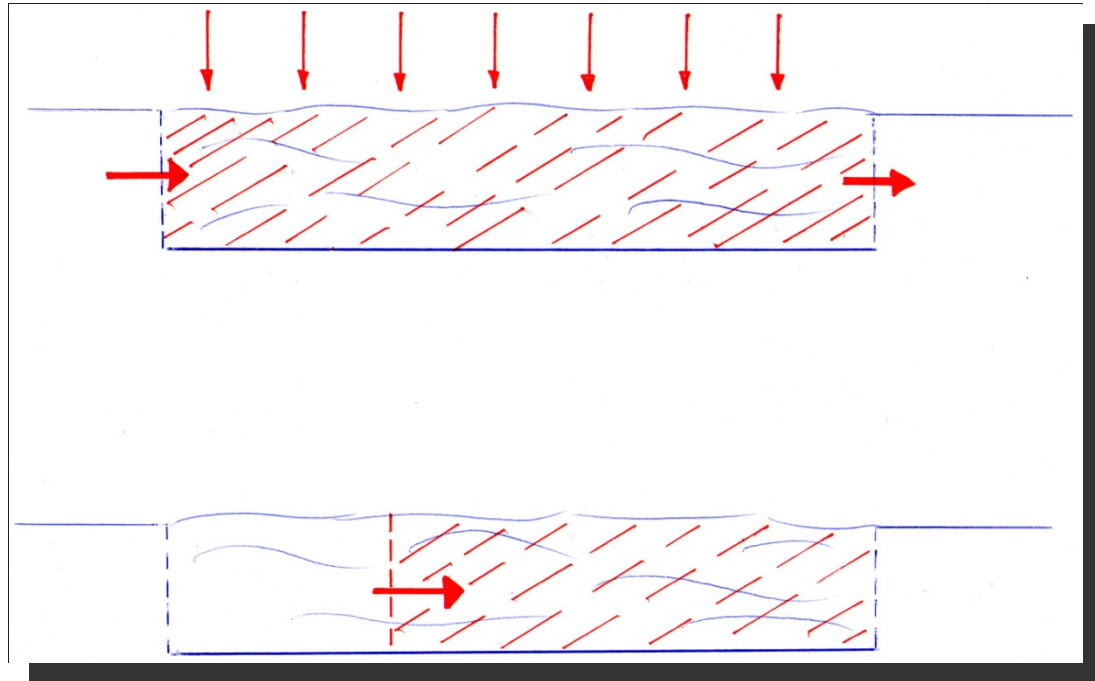
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Short dip

- The treatment
- must be done
- simultaneously on all channels. Spread evenly over the surface.
- You can do a little refill on top of the channel, if necessary.



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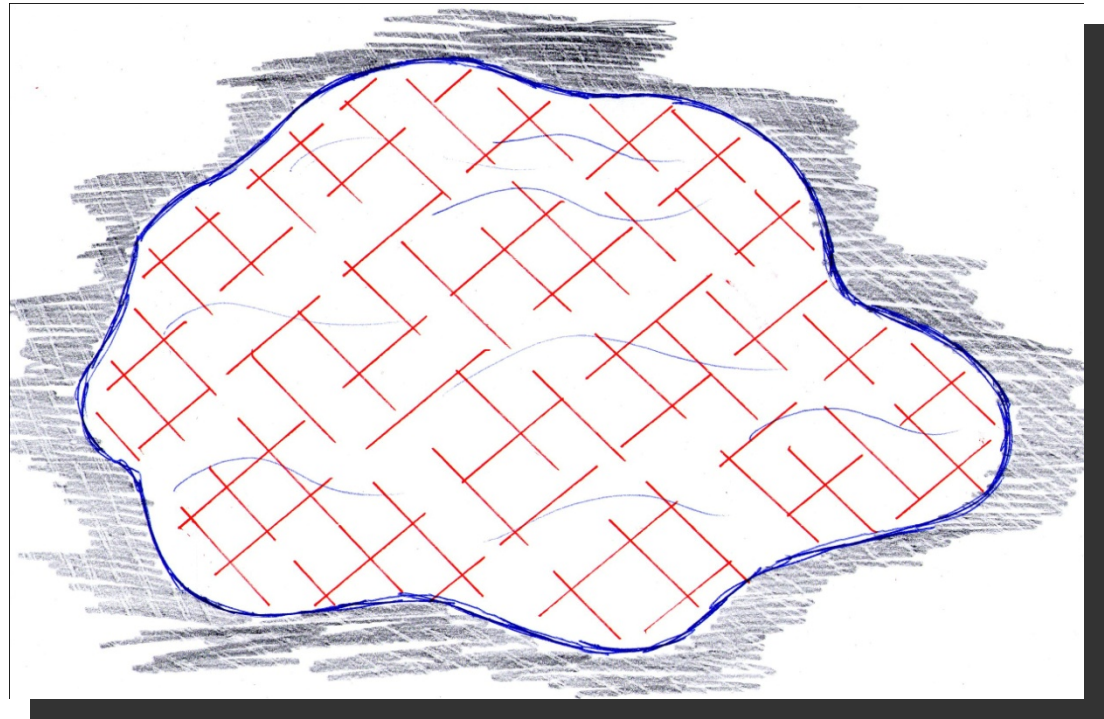
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Permanent dip

- If you treat a large basin with regular changes less than 2-3 per day, pay attention to dosages.
- Normally the lower doses, will remove only the free forms of the parasites and young. Hardly the treatment can solve a serious infestation.



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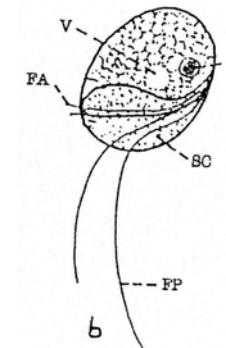
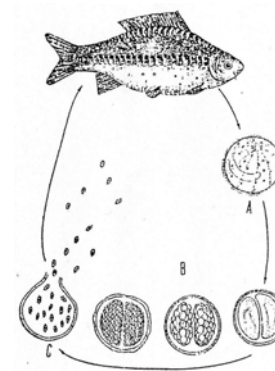
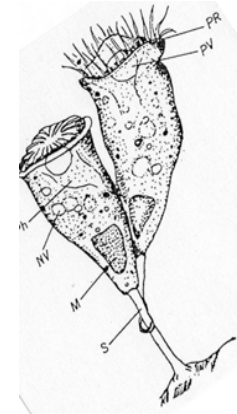
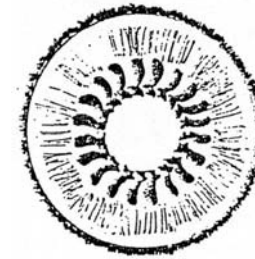


BIOCIDES making an example

Mix of hydrogen peroxide (H_2O_2) and peracetic acid (CH_3COOOH).

kill viruses, bacteria gram+ and gram-, mold, yeast, micelia and most of the parasites.

- Gill bacteria disease
- Saprolegnia (*Saprolegnia* spp.)
- Ictio (*Ichthyophthirius multifiliis*)
- Tricodina (*Trichodina* spp. *Trichodinella* spp.)
- Ciliates (*Epistylis* spp. *Apiosoma* spp.)
- Costia (*Ichthyobodo necator*)
- Chilodonella (*Chilodonella piscicola*)



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BIOCIDES making an example

Mix of hydrogen peroxide (H_2O_2) and peracetic acid (CH_3COOOH).

Dosage

All these organism and generally for all the eggs and free stages of the life circle of many other parasites may be removed by:

1. Dip in continuos for 40 minutes with dosage 15 -30 ppm.
 2. In a short dip use 15-25 ppm.
 3. In permanent dip the correct range is 10-15 ppm.
- Repeat the treatment for a few days.



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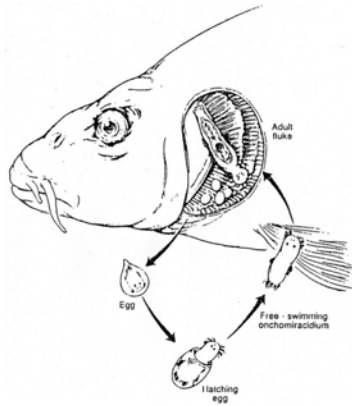
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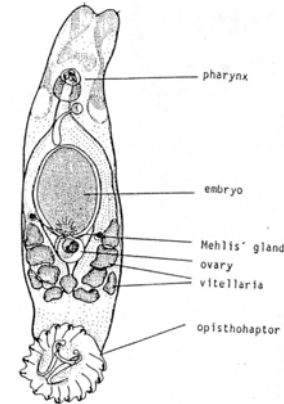


BIOCIDES making an example

Mix of hydrogen peroxide (H_2O_2) and peracetic acid (CH_3COOOH).



- ✓ Girodattilo (*Gyrodactylus* spp.)
- ✓ Dattilogiro (*Dactylogyrus* spp.)



In these cases is very difficult to remove with bath during the day because these parasites are hooked. But during the night shift and try a body part undamaged better vascularized.
Can be removed with a nigh-time treatment.



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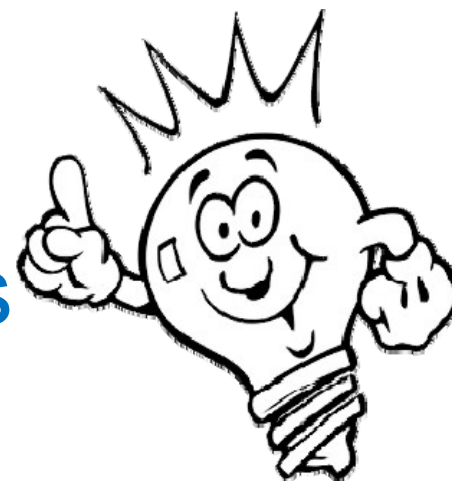


BIOCIDES making an example



Mix of hydrogen peroxide (H_2O_2) and peracetic acid (CH_3COOOH).

Precautions and tips



- First treatment half dosage.
- Always use rubber gloves and goggles.
- After 40 minutes the product is strongly inactivated (more than 80%) so check if the treatment is in a channel if the product arrive at the end in 40 minutes.
- Keep in the shade and away from heat sources.

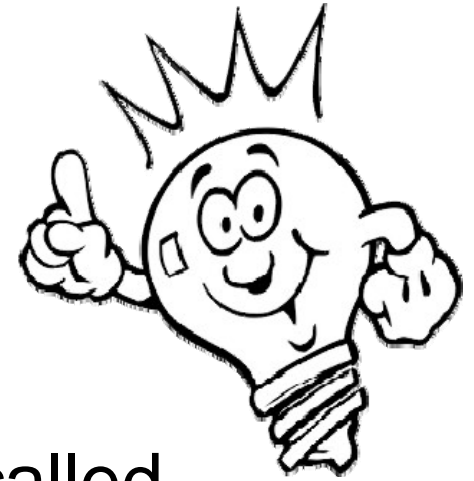
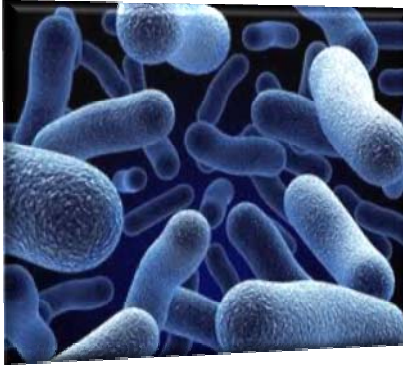


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All live microorganisms,
are subject to the phenomenon called
chemoresistance.

Microorganisms change over time, some of
their characteristics to become resistant
to disinfectants they come in contact.

**For this reason it is necessary to
alternate the active ingredients.**



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management of viral disease

- Spring vireamia of carp (SVC).
Its pathogen is the *Rhabdovirus carpio* (RNS virus).
- Koi herpes virus (KHV).
It is caused by a DNA virus, which was first described in 1998.

VACCINATION HAS A MAJOR PROPHYLACTIC ROLE IN PROTECTION OF FISH
IN CARP CULTURE VACCINATION AGAINST VIRAL DISEASES **IS EXPENSIVE**

**THE EFFICIENT MEASURE FOR KEEPING FISH HEALTHY IS THROUGH
PREVENTION which includes:**

- the maintenance of a proper rearing environment,
 - ensuring adequate feeding
 - and fish friendly handling.



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Thanks! Hvala! Grazie!



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