



Newsletter No. 14

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Fish Veterinary Society Conference, Norton House Hotel, near Edinburgh Airport, 22nd & 23rd March, 2016

If it is March, it must be Fish Veterinary Society conference. After last year's theme of parasites, it was decided to concentrate on another theme – recirculating water systems, or RAS, as many speakers referred to them. This year we welcomed some members of World Aquaculture Veterinary Medical Association (WAVMA), some of whom were speakers.

The theory of Recirculation Systems is simple – instead of sending the water back to the river/lake/sea after one pass through the tanks, it is sent back through filters, biofilters, and then sterilised by ozone and/or UV before being reused. This means that less water is needed to raise the same tonnage of fish (or more fish can be raised on the same water input), the system is less vulnerable to anything happening upstream and control of the system is better. However, theory and practice don't always coincide.

This was reflected by our first speaker, Nick Stinton of CEFAS. He gave us a review of land based recirculation systems in England and Wales. Many of these had started in recent years, mainly for tilapia, but many have failed. The main reasons cited were system design, teething problems, marketing, and getting staff with expertise to run the systems. In one system mentioned, belts had to be replaced often, at the cost of several thousand pounds each, and

taking two men some hours to install. Veterinary help, however, was not a problem, which is reassuring.

Nick Bridel told us next about setting up an RAS, and through the different options for biofilters and other pieces of equipment. One thing to note is that although Ultraviolet (UV) kills most bacteria at the standard dose of 30,000 $\mu\text{W}/\text{cm}^2$, *Saprolegnia* requires more – at least 35,000 $\mu\text{W}/\text{cm}^2$.

After a break, veteran FVS member Ronnie Soutar told us about medicine availability in the UK, including use of the cascade. He also looked at some other current issues, including the reclassification of formaldehyde. Jimmy Turnbull followed, and told us about FishMedPlus coalition, a group which aims to facilitate new veterinary medicinal products.

Next, it was time for the students to give us a brief description of their posters. They were on a variety of topics, and both oral presentations and the posters were all of a high standard. No rapping this time, however.

After lunch, Nick Saint-Erne followed up Ronnie's topic and told us about approved drugs for fish in USA. The equivalent of the Small Animal Exemption Scheme is the MUMS (Minor Use Minor Species) Act. Treatment options, including injection routes, were considered.

Next, we heard from Keith Davenport of OATA (Ornamental Aquatic Trade Organisation) told us about the social and economic benefits of wild caught ornamental fish, or "How the ornamental fish trade is saving the world". He concentrated on the Cardinal Tetra trade in Brazil, which is giving people in two areas of Amazonia a sustainable living, which helps ensure the forest is preserved where there are few other means of employment, and the threats to the environment are many.

Back to the USA next, where Julius Tapper has successfully used a treatment tank which includes a plant to clean up the water for Koi suffering from Koi ulcer disease. Plankton such as *Vorticella* in this system were also considered, as were snails.

Staying on the other side of the Atlantic, Nick Saint-Erne took us through the recirculation filtration system used in his company's ornamental fish tanks. They have devised larger systems for distribution centres and smaller ones for their stores. Visitors to the stores often said they liked seeing the tanks of fish when they entered the stores, even if they were only there for cat and dog stuff!

That concluded the first day's proceedings. In the evening, we had the conference dinner, which was a good meal, and an opportunity to put the world to rights. At the dinner, Matt Longshaw and Neil Robertson presented the awards for the student posters. The winner was Ana Herrero from Moredun for her poster on "Comparing different histological methods to

detect *Desmozoon lepeophtherii* in the gill of Atlantic salmon (*Salmo salar*). Special mentions went to Philip Lyons of Stirling and Jamie Lam of Nottingham.

Day 2 started off early, and it fell to Rod Wilson to start us off by telling us about water chemistry and physiology. High CO₂ leads to acidification of the water. This can lead to neurosensory and behaviour changes (the fish's sense of smell is affected, making wild fish less able to detect predators until it is too late), developmental changes in cod larvae, and changes to the metabolic rate in sea bass larvae. This has implications in RAS where CO₂ levels are high. Feeding is a stressor, as Cl⁻ ions excreted into the stomach are exchanged for HCO₃⁻, raising the blood pH (the "alkaline tide") which takes 72 hours for the excess bicarbonate to be excreted via the gills. This means that farmed fish are almost always in this alkaline state, and partly explains why starving fish makes them less susceptible to stress.

Oh, by the way, high concentrations of Ca²⁺ in seawater triggers secretion of bicarbonate into the gut of marine fish, which is precipitated out as calcium carbonate (i.e. limestone) and excreted by the fish. This prevents the fish absorbing excess calcium, and is a mechanism for absorbing water from seawater, which is more salty than fish blood. This means CO₂ is removed from the water, and accounts for a significant proportion of calcium carbonate production in the sea – more than shellfish or coral. So, marine fish are helping to save the world!

Jean-Philippe Mocho told us next about laboratory RASs, and about seeding the biofilters with Nitrosomas and Nitrobacter cultures to kick start them. He felt that water quality was an issue, as was biosecurity, and this could impact on research. Staff not being knowledgeable enough in aquaculture could be an issue.

Next, to recirculation in wellboats for a change. Morag Clinton did a project on plankton monitoring of well boat water before it went past another farm site and had to close its valves. She picked up a variety of species, with one location being bad for *Pseudonitzschia* and *Chaetoceros*.

Clinical Club followed. J-P Mocho told us about the detection of *Pseudocapillaria tomentosa* in tank debris, and Pieter Van der West presented *Aphanomyces invadens*, an oomycete which is spreading all over Asia and affecting a wide variety of species.

After lunch came the A.G.M. The committee assembled at the front (with an empty chair for President!). The main issues were a new website (up to £10,000 was budgeted for this) and new committee members. Ronnie Soutar was elected new President, with Matt Matselaar Senior Vice-President and Nikolaos Steiropoulos as Senior V-P. Chris Walster is Treasurer, and Morag Clinton secretary. I am still Publications Officer. I apologise for my coughing on a couple of occasions in the conference – this was entirely pathological and involuntary!

After a break, we were onto the last session. Kari Attramadal spoke about microbial control in RAS and r/K theory. The former happened when conditions were unstable and unpredictable, favouring opportunists which may cause disease. K-selection occurred in stable environments

and favoured more benign bacteria. Therefore, stable conditions should be encouraged in an RAS by letting bacteria from biofilters into the rearing tanks.

Matt Longshaw told us about parasite control in RAS. He pointed out that good biosecurity was essential in keeping down on disease in recirculation systems. The range of treatments is more limited, as some have an adverse effect of biofilters. Also, once a pathogen got into a system, it is difficult to get rid of it.

Chris Mitchell finished off the conference by telling us about pathogen detection in RAS systems, telling us that it wasn't his material. Chris told us about some of the pathogens we might encounter, and the variety of PCR tests which are available to detect them (PCR tests definitely seem to be the present test of choice for fish diagnostics!). He told us about one time when he was a Fish Health Inspector, and he found a fish with kidney lesions, which he described as a "good day at the office" (I know what you mean Chris, but the farmer may not have been so happy!).

Well, another good conference, which had good attendance, and everybody seemed to enjoy it, although the weather wasn't as good as we what we have come to expect. It is proposed that the theme for next year's conference is viruses, so expect lots of abbreviations for TLDs (Three Letter Diseases). I hope we all now know a bit more about Recirculation Aquaculture Systems, but there is one question I have that remains unanswered – WHERE WERE YOU TONY?

David Sutherland