Some observations, evaluations and worries after 40 years of hygienework in landbased animal husbandry and aquaculture

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After 40 years - the last 20 mainly with aquaculture, always with the goal of preventing healthproblems, close infection routes, evaluate vaccinations, immunity, technical pathologies etc., it feels wright to express some personal views and hopes around these problems, in a national and international connection.
This is not ment to be critical towards persons or companies, but tries to pinpoint some areas, or open questions that remain in my mind regardless of all the dedicated professionals, objective progress and good economical earnings which is found in the salmon growing industry.

Staff treatment

The goal of all preventive work is that problems/disease/mortality do not appear. It is however, when you succeed, not easy to convey such a good result within an organization. This goes for larger international operations as well as smaller local ones.
In other words: It is difficult to get recognition, status, bonuses, etc for a job which gives a non dramatic result like absence of disease problems and low mortality. At the same time that result has been dependent upon the meticulously routines of hygienic relevance followed by the staff that work close to the fish.
I am alarmed about the lack of attention this group often gets – last not least from a work psychology angle.

Use of time – man hours

Ship owners and skippers of well boats, service boats, rafts and similar units have a natural interest in anything that can reduce the amount of working hours used. Therefore automatization of the cleaning and disinfection process is met with eager interest.
Installation of such systems do however not remove the need for a bacterial control of the result, that either will result into the need for a rewash – often manually, which then again have to be controlled. At the same time there are crevices, corners and bends that the automatic systems did not reach that have to be cleaned manually anyway.
The interest for automatic cleaning systems will stay and develop, but sofisticated technical solutions combined with biological and physical realities like organic load, material surfaces and biofilm are complicating factors.
One of my wishes would be that a new well boat or another support vessel for aquaculture would be built for cleaning and the control of cleaning and disinfection already from the drawing board, and with a person who has been doing such jobs at sea level giving suggestions. This might prevent some of the secondary half way solutions one can find today.

Choice of disinfectants

The attention from management towards hygiene is sometimes limited to the price for detergents and disinfectants. Some older investigations from the company Lilleborg show that the labour costs dominate with 80-90% of the total. To compare costs of disinfectants you also have to compare effect equivalent concentrations for the job at hand.
In Norway the disinfectants for use in aquaculture have to be officially licensed. They are tested against a salmon relevant bacterial panel, and against IPN virus, for effect within half an hour at +4 degrees C.
At the time Agronor AS went through this documentation process more than 15 years ago, it was regarded as important that the licensed disinfectants also were tested in salt water. Strangely enough this is not included in the authority guidelines and demands of today.

The coastline for all – feeling of freedom

It is a new feeling for the costal population that the freedom of movement along the coast has to be more limited than before.

This can probably not be prevented if we recognize that the spread of infections amongst salmon growing operations follow the natural currents and the movements of other fish in the environment together with other infection carrying/transmitting organisms.

With the increasing biomass density of salmon growing and the movements of smolt and fish for slaughter, feed transports and service boats, open possibilities of disease transmission far above the levels of earlier times.

As we also have a history with infected imports of parr of foreign origin, or with transport across borders for example in the spot market, we open up possibilities of disease transmission at a far higher scale than before.

With the expansion in salmon growing we are discussing in Norway these days it is my conviction that the preventive hygienic measures up till now, have to be potentially intensified in relation to the growth we see ahead of us.

These stronger hygienic measures will have to be thorough and thoughtfully developed routines, with demands on disciplined stocking and slaughter activities in defined regions. Here the means of transportation and their movements will have to be regulated consequently, and under strong control of authorities. Regionalization may be a key word.

Recirculation - parr growing operations.

Older parr growing sites often need to expand and find the available amount of freshwater a limitation.

Addition of saltwater from the environment, and/or recycling of the freshwater are solutions that open for introduction of infectious agents, or to conserve an agent which already has found its way into the circulation system.

While on the one side many recirculation units can give excellent quality of parr leaving the premises, others have quality and mortality problems they cannot get rid once these unwanted pathogens have invaded the system.

To shut down the operation, cleaning and disinfecting the system is a complicated and costly.

Restocking the bacterial population, hopefully balanced, can seem like artistry.

We hope for the development of balanced starter cultures, or also of the development of correcting bacterial components for the future.

Finally

These were some obvious ones. There are many more and new ones will pop up, so the area of salmon growing will never become boring.

Example of criteria for licensing disinfectants for use in aquculture in Norvegian.

Godkjenningsordningen for desinfeksjonsmidler ligger under Legemiddelverket, og etter ”Forskriften om rengjøring og desinfeksjon av akvakulturanlegg mv” endret med hjemmel i lov av 19 desember 2003 nr 124 om matproduksjon og mattrygghet forskriftens § 7.

AGRONOR sine produkter er testet ved universitet i Bergen og Veterinærinstituttet i Oslo og Trondheim. Agronors tester er gjennomført også i saltvann.

Bakterier det er testet mot:

Aeromonas salmonicida subsp. salmonicida ATCC 14174

Yersinia ruckeri ATCC 29473

Staphylococcus aureus ATCC 6538

Carnobacterium piscicola NCIMB 2264

Virus er testet ved Universitetet i Bergen forInfeksiøs pancreasnekrose (IPN – stamme N1)