

## TUNA



Yellowfin broodstock.



Yellowfin larva.

## Oceanic Tuna takes step-by-step approach to closing tuna lifecycle

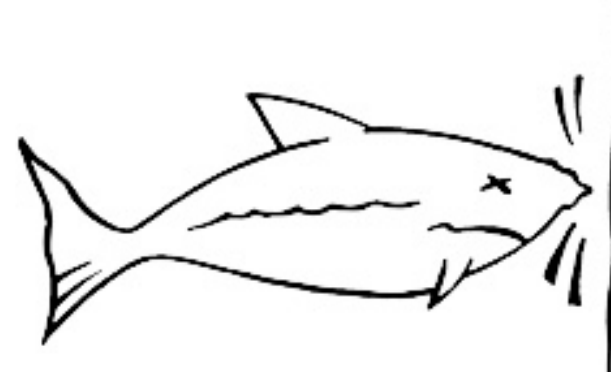
### “Walling” a focus of attention

**W**hile other companies in the Mediterranean and Australia approach the issue of closing the lifecycle on bluefin tuna through ongoing efforts at broodstock spawning, a company based in Scotland says it's approaching closing the tuna lifecycle from a very different direction.

As Alex Muhlholzl, managing director for Oceanic Tuna Limited (OTL), says, it's just as crucial – if not more so – to deal first with a major bottleneck to do with the successful rearing of juvenile tuna, a problem which he said seems to have received very little attention from would-be tuna farmers to this point.

Muhlholzl said the research that OTL has done over the last four years or so convinces him that until tuna farmers come up with a genuine, workable solution to massively reduce the issue of “walling,” it just isn't going to be possible for any aquaculture company to truly close the lifecycle on tuna and move ahead into any commercial-scale tuna-farming operation.

Muhlholzl explained that walling relates to the tendency of juvenile tuna to spook easily to extraneous noise or other perceived potential threats such as a sudden extreme change in light. This causes the powerful little fish to suddenly race off at incredibly high speeds.



“Walling” is described as the tendency of quick-swimming juvenile tuna to crash into the side of hatchery tank walls when spooked.

In an ocean setting, said Muhlholzl, this isn't a problem, but in an aquaculture environment spooking ends up with the young, not-yet-fully-developed fish smashing into other juveniles and into the walls of their holding tanks.

This causes huge mortality rates and heavy rates of serious injury to those which survive the impacts.

Muhlholzl said walling is a significant problem among juvenile tuna in their first few months of life before they develop their directional fins, and that happens at different times for different species.

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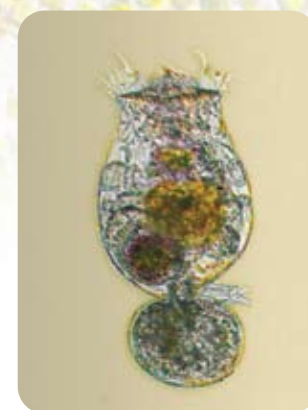
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# TUNA

Muhlholzl also explained that one of the attractive features of tuna for aquaculture is that they develop body-mass very quickly, indeed right from day one.

"It's also that," he said, "which gives them the ability to go into instantaneous bursts of very high speed from very early on, in some cases as much as 80 days before the directional fins which allow them to swerve away from obstacles are properly developed."

"Pretty much from a standstill they can suddenly reach speeds of anywhere between about six and 10 times their own body length a second," he said of the yellowfin tuna he's been working with. "At about 15 to 30 cms, they can do instant bursts of between 40-55 km/h (25 and 35 mph), and that'll take them across a very large pool in a second or two."

Muhlholzl, who described the early juvenile tuna as looking and behaving rather like a torpedo without their directional fins, said to date, to his knowledge, none of the groups attempting to close the tuna lifecycle has apparently been able to get commercial-scale numbers of fish through the crucial stage of developing their directional fins.

Only a group of scientists at Japan's Kinki University have obtained offspring from hatchery-bred Pacific bluefin and have started selling what Muhlholzl described as comparatively small numbers of those fingerlings to companies for growout.

Muhlholzl said that as far as he's aware, the 16-country Inter-American Tropical Tuna Commission (IATTC),

based out of Panama and La Jolla, California, is the sole research body which has been able to breed the smaller and faster-developing yellowfin successfully.

That's why OTL is working with yellowfin and has developed a Memorandum of Understanding with the IATTC, said Muhlholzl.

The yellowfin, he noted, starts developing its steering fins after about 40-50 days, compared to about day 80 in the bluefin.

And that, said Muhlholzl, is only *if* the research staff can get the tuna past the critical first 10-day larval period and then the equally touchy three weeks or so after that, by successfully dealing with such issues as cannibalism, larval-feeding and weaning.

Muhlholzl also emphasized that even when they are much larger and older, less domesticated or less-acclimatized tuna can still remain quite sensitive to being spooked into bursts of high-speed swimming. That makes them race round the walls of their big tanks, sometimes grazing themselves against the surface in the process.

That can cause cuts and other damage, he said, and frequently those will develop fungal and bacterial infections which will often kill the fish as they grow towards maturity and harvest size.

Muhlholzl said there are also other hurdles which he regards as currently standing in the way of developing tuna farming on an industrial scale, including the serious difficulties to date in getting even a single spawning a year

– and no more than that – from the northern or southern bluefin.

Muhlholzl acknowledged that the northern bluefin is OTL's ultimate goal or "end game" as he put it, but he said that unlike others, his approach is to work towards that by solving shared obstacles by way of the more readily spawned and easier-domesticated yellowfin.

Looking ahead, Muhlholzl said significant interest has already begun developing in regard to the technology OTL is working on with the aid of various research institutes and organizations.

That has resulted, he said, in talks with "several" tuna-related groups in different parts of the world, including the Mediterranean, South America and the Caribbean.

That's on track, he said, with plans the company has for hopefully developing "two or three hatcheries and growout facilities" over the next five years, with the aim of producing up to 50,000 metric tonnes a year within that time frame.

The objective from discussions with these groups and from seeking further investors is to help in developing and refining the company's systems, "not only for the financial rewards but also for the export dollars that this type of project injects into a region" he emphasized.

– Quentin Dodd

## Is albacore the next tuna?

Photo courtesy FAO

**O**ceanic Tuna Ltd.'s Alex Muhlholzl has confirmed a new cooperative agreement with Viking Fish Farms at Scotland's Ardtoe Marine Laboratory to seek funding for breeding albacore tuna.

Muhlholzl told *Hatchery International* that talks have been going on between the two organizations for close to a year – with a new intensity in the last six months or so. Central to those talks has been the idea of taking advantage of some large unutilized tanks at Ardtoe, on the Scottish west coast, to concentrate on breeding and closing the lifecycle on albacore.

Muhlholzl did not go into details about the proposed project, which breaks away from the main tuna-production focus on bluefin and, to a lesser degree, on yellowfin.

He said that he's seeing indications that the wild-catch fishery may be about to move increasingly down the tuna chain: from the high-value bluefin, through yellowfin, to albacore.

Muhlholzl said that as talks have progressed on albacore, he has also reached an agreement with the main fish-producing organization in Cornwall, southwest England, to eventually catch some 100-150 broodstock for the project with Viking.

Muhlholzl said he's now working toward the final stages of putting together a proposal to the European Union's Fisheries Fund for money to develop albacore as a new aquaculture species in Scotland.

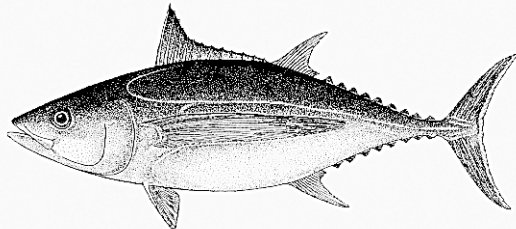
That depends though, he acknowledged, on getting matching funds from governments prepared to support the effort.

Muhlholzl readily acknowledged that albacore command a much lower price in the market than bluefin and yellowfin.

He said though that albacore have a number of characteristics which make them attractive to him as a potential tuna-breeder and farmer. He said that they are more tolerant of a fairly wide range of temperatures, covering a broad expanse of the globe, and appear to thrive in cooler temperatures than northern or southern bluefin, at just 10-12°C.

Muhlholzl said that this would be good for a program in Scotland and only minor arrangements would be needed for heating the water at a new revamped hatchery at Ardtoe. The facilities are currently flow-through, said Muhlholzl, so the main change would be that a new water-recirculation system would have to be installed.

Muhlholzl also added that from his point of view, one of the main advantages of albacore is that they apparently grow to reach market size within about a year – and he feels it should be possible to spread production throughout the year.



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