

'WINTER': Sturgeon in a 'winter' tank. A much larger wintering unit will soon be finished

THE BEST CAVIAR YOU CAN'T BUY

Aquatir's struggle for world acceptance

A successful caviar producer situated in the break-away province of Transnistria, Aquatir is steps from the finish line, but is being held back by the inescapable politics of its location

Velo Mitrovich

Thomas Moth-Poulsen of the FAO is standing next to you. In front of you both is a 25 meter concrete tank, one of many inside the building. In its two meter deep water are around 6,000 large beluga sturgeon, looking like prehistoric versions of torpedoes as they propel themselves about. Moth-Poulsen asks if you've ever seen an indoor tank that big. "Tank?" you reply back. "That's no tank, that's a lake."

You might find your jaw dropping at the sheer size of Aquatir's sturgeon complex; 60,000 square meters of space, located within seven warehouse-size buildings and growing at a rapid pace – it's now almost the size of 14 U.S. football fields. Or the fact that the entire operation is state-of-the-art, or maybe even the business plan which went about turning this massive recircula-

tion aquaculture system (RAS) into a success, unlike a good portion around the world that go bust within a year.

But what really knocks you off your feet is where Aquatir is located – Transnistria, a break-away province of Moldova which has existed in a state of world-limbo for the last 21 years.

How, you ask yourself, did a caviar farm this high-tech end up here?

A financial balancing act

Dietmar Firzlaff, owner of Germany's AquaFuture, has been in the aquaculture business for 25 years and is quite well traveled, but even he admits he wasn't quite sure where Transnistria was when he was first contacted in 2004 by Sheriff Limited (the country's largest company) about building a sturgeon farm.

"I knew it was near Moldova but outside that...", he says, leaving the sentence hanging. "Still, I have learned over the years to always be open to that first meeting so I went."

What the aquaculture project manager saw and heard impressed him. "Caviar production is not for fish farmers, it's for investors," he says. "Investors need a clear, practical idea on their return and how long it will take. Sheriff came across as being in it for the long haul."

According to Firzlaff, due to the long time it takes to grow sturgeon – five, six, seven or longer years – you cannot cut corners and hope to make a profit.

"For example, I told a Russian company they could spend – let's say - \$6 million [€4 million] and have success, or \$5 million [€3.5 million] and have failure," he says. "They went with the cheaper option, bought low-quality parts and are paying for it now. Today, instead of growing fish, they are

spending money trying to correct mistakes.

"The opposite can happen as well. There is one company which has just spent \$80 million [€55 million] on a sturgeon farm. No matter how much caviar they sell, their investors will never recoup their money.

“ People think of growing sturgeon, think of what they can make selling caviar, see dollar signs in front of their faces and then make foolish decisions ”

Dietmar Firzlaff – Aquatir

"People think of growing sturgeon, think of what they can make selling caviar, see dollar signs in front of their faces and then make foolish decisions," he says. "But producing caviar is difficult and to produce quality caviar is very, very difficult."

However, Firzlaff is aware that even with all of the right planning and investment, there is still a missing factor. He asked himself if the Transnistria workers would be up to the challenge of constructing a successful farm, especially to the level of sophistication he wanted.

He was brought on a tour of a massive sporting complex which Sheriff owns and built with its construction company. The complex

consists of three soccer pitches – including one indoors – and a training complex for 2,000 athletes. Despite a very uneasy peace between Moldova and Transnistria, Moldova chooses to play its international games at the complex. Firzlaff was impressed by the workmanship he saw, enough so that he became a shareholder in Aquatir.

Firzlaff brought Billund Aquaculture Service of Denmark into the project to build the RAS system, along with Coppens of the Netherlands to tackle the feed requirements. Also joining the team was Russian sturgeon expert Svetlana Kasaeva, while Sheriff appointed Oleg Budak to be general director of the newly formed Aquatir.

In the best of countries and environments sturgeon growing is a challenge. In Transnistria this was even more so, in part because people do not have experience in RAS – let alone aquaculture. It was decided then to take a slow-slow approach to ensure that the idea was feasible, and to train up staff.

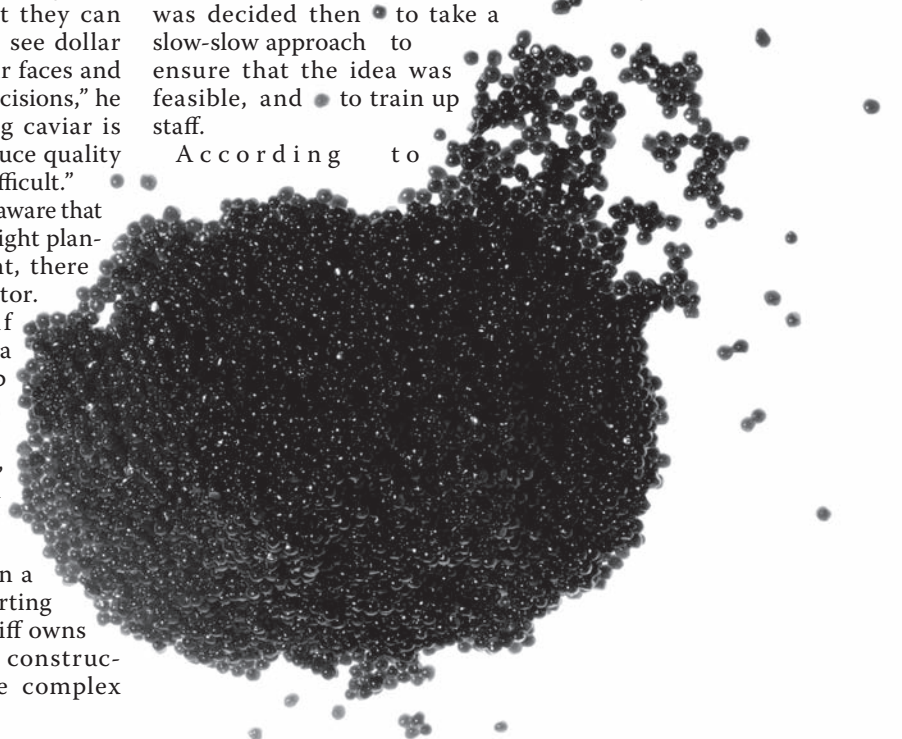
According to

Kasaeva, as part of this approach, it was decided to farm four different types of sturgeon: Russian sturgeon (*Acipenser gueldenstaedti*); Beluga (*Huso huso*); Sterlet (*Acipenser ruthenus*); and Bester, which is a hybrid variety. To initially stock the farm, fry were brought in from Russia that were certified disease free and farmed-raised. No eggs, fry or 'black' fish were taken from the wild.

"We decided to go first with sterlet - which is not well known - because it is the smallest fish from the sturgeon family and matures early," she says. "This way, while the other fish are growing more slowly, we are able to teach our workers how to care for and process sturgeon meat and caviar. Once the other three are producing caviar, we will drop sterlet."

Warm summer

Five industrial size bore wells bring water to the surface,



with around 90 percent to 95 percent of the water being reused, going first through a HydroTech mechanical drum filter and then through three biofilters, all designed by Billund Aquaculture. Each unit has its own identical filtration system making it easier for training and parts. The only exception to this is the fry unit which, in addition, sends its water through a UV filtration stage.

With a nearby river feeding into the aquifer system underneath the farm, water is not an issue. However, because it is heated to around 19-20 deg C for the sturgeon, it is more cost-effective to recirculate it as opposed to constantly heating water. This water temperature duplicates summer conditions when fish have maximum growth.

After Beluga and Russian sturgeon reach 10 kilos, salt is added to their water, bringing it up to 5ppm, which duplicates the brackish conditions that these sturgeon often live in.

Because sturgeon live in areas with moving water, an artificial current is created in the tanks. This ranges in speed from 0.5 to 1.5 meters per second (1 to 3 knots), depending on the size of the tank and the species.

All feed, except for a special homemade fish paste, comes from Coppens. Larvae are fed on Coppens' decapsulated artemia for two to three weeks and then are moved onto dry sturgeon feed. This feed varies in protein content depending on which phase of growth the fish are in, with egg production getting the highest percentage at slightly

“ Sturgeon are cannibals and it can be very stressful if you think you're always about to be eaten ”

Svetlana Kasaeva
—Aquatir

over 50 percent. In all the feeds, fishmeal makes up the majority of the proteins used.

Kaseva says that the fish paste is Aquatir's own secret recipe which is fed to the sturgeon during times of growth or stress. She says that she is not worried about disease or bacterial infection being introduced through the paste because it is frozen at a

very low temperature, which she says kills any bacteria.

As far as feeding goes, Kaseva believes in the importance of slow and steady growth.

“Sturgeon feed should not contain too much fat,” says Kasaeva. “If the fish grows too fast, too much of the weight is fat and not eggs. Also, from a technical point of view, it is very difficult to extract eggs and handle a large fish.

“We could grow Beluga to be 150 kilos. Trust me, we do not want to.”

Sterlet are raised to be about 2.5-3 kilos; bester to 10 kilos; Russian sturgeon to 15-25 kilos; and Beluga to 75-80 kilos. Feed conversion ratios vary from 0.6 to 3.0, depending, again, on the growth phase of the fish.

Firzlaff sees Coppens and Aller Aqua as making the best sturgeon feed on the market, but is not 100 percent satisfied with either.

“There are several problems. The first is the feed requirements for the different types of sturgeon differ to some degree so the feed should reflect this. In addition, sturgeon raised in a RAS environment need one type of feed as opposed to those growing in pond.

“But the market would be so small for these ultra-specialized feeds, no feed maker could make money with them.” That said, he adds though that both Coppens and Aller Aqua are engaged in research to optimize their sturgeon feeds. This differs from other feed manufacturers who basically make salmon feed and then slap a ‘Sturgeon Feed’ sticker on the bag.

For the most part Kasaeva says that sturgeon are disease resistant. “Keep a good water temperature, hygiene and oxygen level and your fish will be healthy. However, if you do not properly sort and grade fish while they are growing it can lead to stress.

“You see, sturgeon are cannibals and it can be very stressful if you think you're always about to be eaten. Only when the fish reach 100 grams can you stop worrying about them eating each other.”

According to Kaseva, there are three critical stages with farmed sturgeons. The first is when the



SORTING: If not sorted regularly, cannibalism can become a problem with sturgeon



Transnistria – a history as rich as its land

The soil of Transnistria is so black and rich that it looks like an apple seed spat out at night will grow into a full sized tree by morning. Unfortunately, since before Roman times, other people have noticed the richness of the land as well and today it's almost easier to list who hasn't invaded the region.

While a good portion of Moldova was part of Romania, the area east of the Dniester River (Trans-dnistria) was not, populated by ethnic Russians and Ukrainians. Match-made by the Soviet Union into the Moldovan Republic, like Yugoslavia it is was a marriage which should have never taken place.

When the Soviet Union broke up, Moldovan groups demanded the return of the Roman alphabet, the dropping of Russian as the main language, and even discussed reunifying with Romania and expelling ethnic Russians.

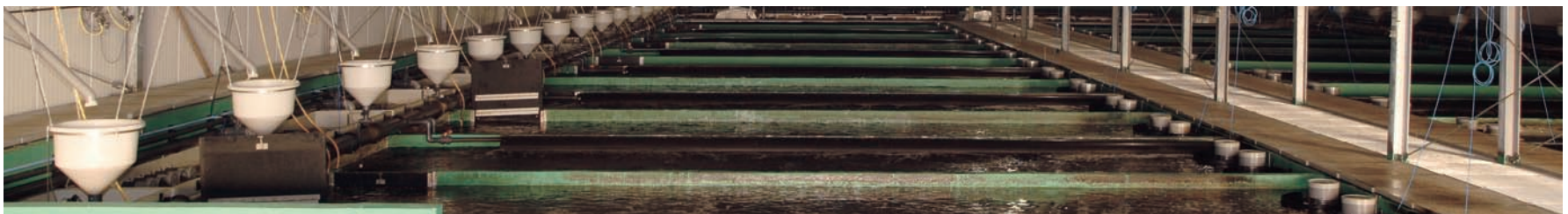
This was too much for the population of Transnistria which declared its independence from Moldova. A two-year war broke out which was ended by the Russian army, which maintains a presence today to keep the two sides at bay.

Transnistria sees itself as a separate nation with its own currency, stamps and passports – all completely worthless outside the country of 550,000. For international travel, Russia issues passports to Transnistrians.

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LONG-TERM INVESTMENT:
Sturgeon fry tanks at Aquatir's facilities

FACT FILE

Location: Transnistria – an enclave of Moldova

Species: Russian sturgeon (*Acipenser gueldenstaedti*); Beluga (*Huso huso*); Starlet (*Acipenser ruthenus*); and Bester, a hybrid

Farm size: 60,000 sq meters

Production: 700 kilos of caviar from starlet has been produced in the last two years. By 2016 production from its other species will bring production up to 5 metric tons a year.

Products: caviar and sturgeon meat

Markets: Potentially, Russia and Europe



larvae move from living on their egg sack to active feeding; the second is from when the fish are larvae to 0.5 kilos and developing their immune system; and the third is after eggs are obtained from a live fish.

“ You build Europe's largest and most complex sturgeon farm in Transnistria – not Moldova. Why? ”

Thomas Moth-Poulsen
– FAO Fisheries Officer

Winter chill

After the young fish leave the fry unit, they move to either of the two on-growing units. Sexing by ultrasound takes place anywhere from two to five years depending on the species. Males are slaughtered for meat while the females are moved to a broodstock tank. Fish, however, do not produce eggs at this stage.

Unless sturgeon go through a winter period, egg development does not take place. A special unit has tanks of water chilled to around 10 deg C where the fish are kept without feed for three months. In addition, photo-

manipulation is also used to duplicate winter conditions. The current winter unit is housed in the plant's first building. A second, much larger, is under construction and will be finished by October.

If there is winter, there must be spring and the females enter into a spring tank to bring about egg release.

At Aquatir, eggs are obtained by either of two ways. The first involves injecting the fish with a special hormone made primarily from carp. This allows the eggs to be taken in mass but without killing the fish. Although this method is commonly used in Russia, it is not allowed in the EU which only allows eggs to be taken from killed fish.

Aquatir plans on harvesting eggs once by use of hormones, letting the fish grow for another two years to produce more eggs and then harvest by killing.

One-way only

Workers on Aquatir's processing line start their shift following a very strict procedure, which is a necessity when dealing with a commodity as valuable as caviar.

In separate men/women changing areas, workers follow a one-way footway which begins with stripping off their outside clothes in one room, walking into a shower area, and then

entering another room where freshly cleaned work clothes are waiting for them. Dirty outside clothing never makes contact with clean. After dressing they are still not ready to enter the processing area; that requires walking through a high-tech boot scrubber.

But it's not only the workers that require the scrub down in the cool 8 deg C plant; even the air entering the unit is cleaned, going through a UV filter.

Depending on requirements, workers will either work the meat line or caviar. Male sturgeon destined for the meat line are brought to the plant live and killed in ice. Processing is done by hand and the flesh either sold fresh or smoked, thinly sliced and sealed in vacuum packs for the local or Ukraine market.

Sturgeon isn't cheap, selling for \$15 (€10.37) per kilo, in a country where the average state employee brings home around \$2,500 (€1,730) a year. Still, it sells well. However, to keep the processing plant busy until sturgeon production increases, frozen salmon and mackerel are also brought in, defrosted, cleaned and smoked.

Although the plant was built to accommodate automatic processing equipment, for the time being all is done by hand and will probably continue this way. Decent paying jobs are scarce in Transnistria and according to general manager Budak, providing jobs for locals is as important as producing caviar. Twenty workers are at the processing unit, working one shift a day, five days a week.

Eggs for the caviar line come from either live fish at the wintering unit or females slaughtered at the processing unit. Under the supervision of a caviar specialist brought in from Russia, the caviar is gently cleaned,



STURGEON EXPERT: Svetlana Kasaeva holding a jar of caviar

graded and then placed in jars with a brine content depending on the customer's desire. This can range from 2.5 to 5 percent. The type of salt can be varied also - such as using sea salt - all dependent on what the customer requires.

After pasteurization, finished caviar is placed in cold storage under lock and key. Outside of

the changing room and shower, the entire processing center is under close watch by a security team which utilizes cameras in all the rooms.

During the last two years 700 kilos of caviar from starlet has been produced. By 2016 all the other species will be producing as well, bringing production up to 5 metric tons a year.

A country in limbo

Thomas Moth-Poulsen, an FAO fisheries officer based in Budapest, is visiting Aquatir in regards to a gene bank for Black Sea and Caspian Sea sturgeon, along with seeing about starting a restocking program for sturgeon in the Black Sea and Danube River system. This will use fry from Aquatir.

In addition, after touring the farm he sees the potential of bringing in young people for training and to use Sheriff's facilities to hold workshops and seminars.

Moth-Poulsen says that he has never seen an RAS plant built to such quality, especially in Eastern Europe. But with the amount of trouble he had getting UN authorization to travel to Transnistria, he's more than aware of how much trouble it is to get anything out of the enclave.

"You build Europe's largest and most complex sturgeon farm in Transnistria – not Moldova. Why?" he asks Budak.

There is a long pause.

"Business chooses the most profitable place to be," says Budak.

"Which doesn't help if you can't sell your product," retorts Moth-Poulsen.

What is hurting Aquatir is a lack of export certifications, all dependent on countries or member states such as the EU, sending veterinarians to inspect the plant. Because in the eyes of the world Transnistria does not exist, requests for inspections and actual veterinarians have to come from Moldova. There are those in that country, however, who are not willing to forgive Transnistria for breaking away 21-years-ago.

Russia, wanting Aquatir caviar, sent a request to Moldova asking for a meeting of the two country's veterinarians at Aquatir to get the process moving. Moldova replied back in affect: 'Who are you to invite us to our own country?'

A request for an EU inspection is being held up in Moldova, and so on and so on.

Rumors abounded for years that Transnistria was a center for illegal arms due to stocks left behind by the Soviet army. While most of these proved to be just that – rumors – Western countries are not prepared to advance Transnistria's claims for



INSPECTING: FAO Fisheries Officer Thomas Moth-Poulsen, Svetlana Kasaeva and a translator

independence. With statues of Lenin in the capital, a hammer and sickle on the national flag and the Cyrillic alphabet used instead of the Roman like in Moldova, there also seems to be a lingering tension of the Cold War about. Indeed, the Russian army maintains a check point between the Moldova and Transnistria borders.

However, Russia, the country's long-time financial supporter, seems to be losing interest as well. At a recent meeting in Moldova, Russian foreign minister Sergei Lavrov spoke to his Moldovan counterpart about opening negotiations in regards to returning Transnistria to Moldova, with the enclave being given the status of an

autonomous region.

Stuck in the middle of all of this is Aquatir.

Today the company is waiting for its ISO 22000 and HACCP certification, and is registered at CITES. In an area with few good jobs, it employs 70 people and even has a program to send talented staff to Russia for further training. It is as open and transparent as it possibly can be and yet is being stopped by world affairs just inches away from the finishing line.

"Despite what problems there may be, what has struck me from the beginning is the sense of optimism people have in Transnistria and a can-

do attitude," says Firzlaflaff. "What you read on the internet and see first-hand are two different things. The people are friendly and have a high degree of education.

"The German embassy, the EU and FAO have been informed about the important steps being taken at Aquatir. It seems that a resolution regarding the country definitely seems to be in the works."

However, having been here since Transnistria's birth, you get from Budak a feeling of general weariness in discussing the country's status. He wants to talk sturgeon instead.

"The politics?" he says. "We just want to work."

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