

Farmed cod do not need to escape to spread their genes

Photo: Terje van der Meeren

Escaped farmed salmon that mix with wild fish have recently received a good deal of attention. But cod, our next important farmed species, can spread its genetic material without even escaping, since they spawn inside their sea-cages. The Institute of Marine Research is studying the consequences of this situation for wild cod.

BY KJARTAN MÆSTAD

Cod farmers on the coast of Norway now produce about 7,500 tonnes of fish a year. Cod farming is a growth area and more than 500 permits have been issued. The total potential production capacity of these permits come to 300,000 tonnes.

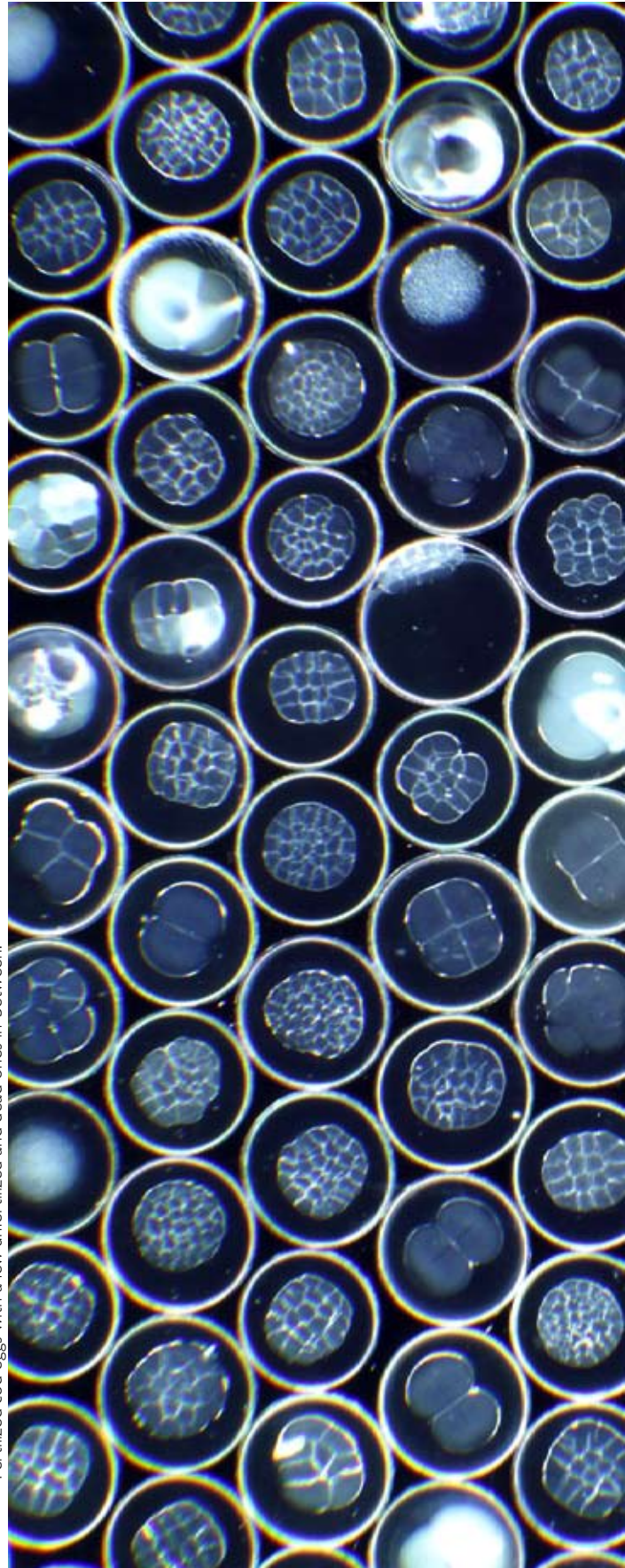
Cod are keener to escape than salmon, and have occasionally even gnawed their way through the nets to reach freedom. But cod can spread their genes even in captivity.

“Farmed cod can be ready to spawn at only one and a half to two years of age, and they are not harvested until they are three or four years old. Eighty percent of all farmed cod have spawned at least once before they are harvested, says Terje van der Meeren, a scientist at the Institute of Marine Research’s station at Austevoll in Hordaland.

This leads to a large-scale dispersal of genetic material from the farmed fish to the environment around fish farms.

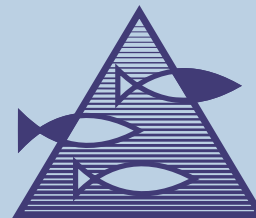
GENETICALLY TAGGED FISH

At the Austevoll Research Station, van der Meeren is working on a research project that aims to learn more about what happens when farmed cod release fertilised eggs into a natural environment. The scientists have produced a broodstock in which all the individual fish possess a particular genetic property that occurs extremely seldom in nature. This year was the third spawning season in which fertilised eggs from this stock were released in Heimarkspollen in Austevoll, a semi-enclosed fjord arm (poll) that is



Fertilized cod eggs with a few unfertilized and dead ones in-between.





INSTITUTE OF MARINE RESEARCH
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Terje van der Meeren fills up a transport tank with cod eggs.



a natural spawning ground for wild cod in this area. “In the course of this year’s spawning season, we have released about a billion eggs”, says the scientist.

FARMED JUVENILES SURVIVE

In order to follow the development of the genetically tagged juveniles, weekly checks of their dispersal are made at fixed sampling stations inside and outside Heimarkspollen. In the first year of the experiment, 1,000 broodstock fish spawned in the poll. At that point in time, the genetically tagged farmed juveniles made up around 20% of the fry in Heimarkspollen. Last year, some 4,500 broodstock fish contributed to the spawning population, and the genetically tagged juveniles made up 35% of the total in the poll itself.

“This has confirmed that the farmed juveniles are capable of surviving and developing. We have caught a 18 cm-long juvenile which comes from either the 2006 or 2007 year-class. It came from just outside the poll. These juveniles can travel far. We probably ought to search for these juveniles along the whole west coast of Austevoll”, says van der Meeren.

The Research Council of Norway is funding three more years of this project, which Terje van der Meeren, Terje Svåsand and project

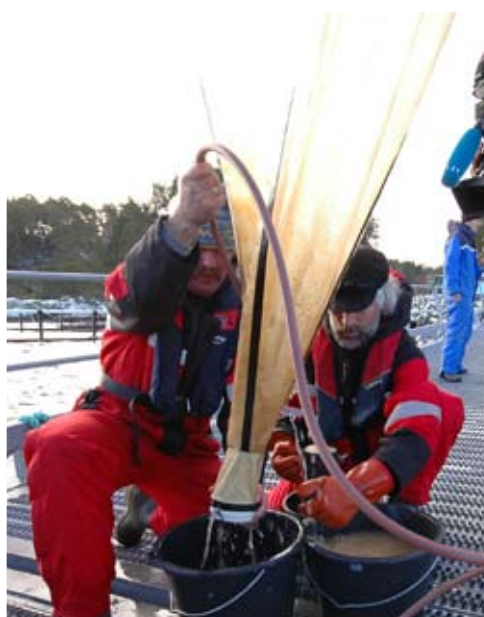
manager Knut Jørstad are working on. A large-scale trial is also planned.

MANY QUESTIONS, FEW ANSWERS

The primary aim of this project is to see whether the eggs of farmed cod contribute to the existing wild stock. It remains to be seen whether the farmed fish will manage to grow and become sexually mature in a natural environment. If they do so, will this affect the wild stock? Will the farmed fish manage to be in the right place at the right time? Would this be positive or negative? van der Meeren has many questions and few answers.

“Farmed fish might be of help to local strains of cod that are struggling to survive. On the other hand, wild fish may possess characteristics that might be lost when they become genetically mixed with farmed cod. Farmed cod can also carry infectious diseases, which they could spread to the wild fish,” says van der Meeren.

No matter what the answers might be, given that farmed cod are already spawning in their sea-cages, the scientist believes it is important to determine whether this could have effects on wild cod, and if so, what consequences this might lead to.



Arve Kristiansen and Terje van der Meeren collect cod eggs produced over the last 24 hours.

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Population Genetics

