

?? Brand-new industry potential in western Finnmark

Description

The goal is to turn a problem into not just an asset, but a luxury product. Barely a year and a critical molt later, Nofima's crab researchers are keen on feeding small red king crabs until they reach commercial size.



Project manager Grete Lorentzen can conclude that the crabs in the research project "Helt Konge" are growing well and have made it through their first, critical molt with brilliant results. Photo: Lars Åke Andersen, Nofima

By *Anne-May Johansen, Nofima*

NORWAY — THE KEY words for success are the right food, the right environment and the right conditions – and currently, all pieces seem to be falling into place.

"The crab has turned out to be a good candidate for rearing, and has now become a farm animal, which we have gradually learned how to manage. We know much more about what it takes for crabs to thrive in captivity: to eat, grow and be nice to each other. And we are now in the process of determining the right feed as well," says Sten Siikavuopio, a long-time crab researcher at Nofima.

"If we succeed, we will potentially have laid the foundation for a completely new industry in western

Finnmark,” says Grete Lorentzen, who is also an experienced crab researcher and head of the «Helt Konge» (crab is king) research project.

The red king crab migrates south and west

The story is as follows: In the 1960s, red king crab – *Paralithodes camtschaticus* – was released into the Murmansk fjord, just east of the coast of Finnmark. About 15 years later, the crab was captured in the Varangerfjord. Since then, this long-legged crustacean has spread along the coast of Finnmark until the Troms county.

The red king crab is still migrating west and south, eating everything on its way across the seabed. However, from being an intruder and causing irritation and despair for the established fisheries, the red king crab is now considered a lucrative delicacy.

The 26th east meridian starts approximately at Honningsvåg, east of which, the red king crab fisheries are highly lucrative, and regulated by quotas.

However, west of the North Cape, the red king crab is considered an invasive species – that is, it spreads to areas outside its natural habitat and impacts all other living organisms there. Norwegian fisheries authorities intend to reduce its presence west of the quota-regulated area and have therefore established a free fishing zone west of Honningsvåg. In the free fishing zone, the crabs can be captured and brought onshore regardless of size.

The problem is that this is not an attractive fishery for professional fishermen – the crabs caught west of Honningsvåg are generally too small for buyers in the international market, who want Norwegian king crabs weighing at least 1 to 2 kilograms.



Stepping out of its shell. It looks like two crabs on the prowl – but in fact there’s only one. The bottom one is an empty shell which the crab has just left in order to grow larger in a new shell. The crabs in the Nofima project have to go through 3-4 such critical molts, and the first molt has exceeded all expectations. Photo: Anette Hustad, Nofima

Vulnerable during molting

A year ago, researchers started feeding small crabs, weighing about 250 grams, obtained from the free-fishing area. This is a part of the research study, and the aim is to reach a weight of 1.6 kilograms or more after three years of the project.

“Before we get that far, the crabs have to undergo multiple changes of the shell – molting, that’s how they grow. The molting stage is a critical phase for the crab, as that’s the time when they are the most vulnerable”, says Sten Siikavuopio.

The crabs in the Nofima project have to go through 3-4 such critical molts to reach commercial sizes. After achieving an initial successful molt, the researchers are optimistic.

“So far, the results have exceeded all expectations. The molting indicates the crab grows well, and the mortality rate associated with the molting was less than ten per cent, which are excellent numbers”, says Siikavuopio.

The extent of the increases in size and weight per molt is an indication of how well the crab is doing.

Knowledge about live storage and feeding of small king crabs will be in high demand

The Nofima scientists believe that knowledge on how live storage and feeding of small king crabs should be done, will be in high demand both in Norway and abroad. Developing such knowledge is also in line with Nofima’s goal of being a leading business-oriented research institute that conducts research and development for the aquaculture, fisheries and food industries.

“Nofima’s strength lies in its interdisciplinarity. We have biologists who understand what it takes to make the animals thrive, and our colleagues at the research station in Bergen produce the feed we use based on our knowledge of what works best for crabs. In addition, we have expertise in product quality and consumer perceptions, which allows us to have an approach where we consider the entire value chain in our work”, says Siikavuopio.

As with all animal farming, time and feed costs are critical factors in terms of profitability. By starting with wild-caught small crabs, it is possible to save both time and feed costs.

“And if we start with slightly larger crabs than we used in the study, less feed will be required before the crab reaches a size that’s attractive to the market, thereby avoiding large feed expenses”, states Grete Lorentzen.

Food fit for kings from residual raw materials

The great thing about the king crab is that it will eat practically anything, making it a great candidate for farming. Running in parallel with the “Helt Konge” project is the research project “Kongemat” (Food for kings), where scientists are busy investigating how residual biomass from other marine species can be used as a feed source for farmed crabs. Shrimp shells and lumpfish are key words here.

It is important to find the feed that generates the least waste and maximum growth.

“You see, the crab eats like a four-year-old – half the meal ends up on the floor. We are therefore working to develop a feed with a structure that minimises spillage,” explains Sten Siikavuopio.

The traditional approach in aquaculture has been to feed animals on a daily basis. Our scientists believe we might benefit from reconsidering this approach. A theory which can be worthwhile to try out is that the crab might better utilise the feed if it is served less frequently.

“For example, three times a week instead of every day. In theory, that would make it ingest everything it spills to the floor during the first ‘serving’”, says the crab researcher.

Facts about red king crab

- The crab is known for its delicate leg meat, can weigh up to 12 kilograms and have a leg span of up to 1.5 metres. Specimens like this are over ten years old.
 - Currently, the crabs that are caught and exported mainly weight between 2 to 3 kilograms.
 - Red king crab is one of the most exclusive seafood products Norway exports, and can fetch up to NOK 1000 per kilogram.
 - The annual total quota east of Honningsvåg is approximately 2000 tons, and the export value for 2021 was nearly NOK 1 billion.
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