

Summary

The objective of the project is to develop landbased farming of European lobster (*Homarus gammarus*) using geothermal energy. The project is based on collaboration between Svinna verkfræði ehf in Iceland, the innovation company Norwegian Lobster Farm AS in Norway and the University of Iceland. Norwegian Lobster Farm AS has since 1999 developed land-based farming of European lobster in collaboration with a broad team of researchers in Norway. In 2013 the European Lobster Centre of Excellence was established now representing researchers and innovation companies from six European countries.



Figure 1 Reykjanes Geothermal Power Plant

Site selection

The selected locations for geothermal lobster farming in Iceland are based on access to geothermal energy, clean sea water, land space, minimal transport and other infrastructure. Iceland has got incredible opportunities to increase sustainable food production with the access to clean water, land and renewable energy.

Aquaculture of new high valued species is maybe the biggest opportunity, but also a challenge as the land is small and relatively far from the main markets. The aim of this project is to import European lobster to Iceland and build up competence and know-how in collaboration with European partners.

The project will answer questions about the competitiveness of Iceland compared with other European countries to start up the first commercial land-based lobster farms. Iceland exhibits many suitable sites for aquaculture where geothermal heated water is readily available. It is of great interest to further investigate their aptitude for farming crustaceans in contained systems, since geothermal energy represents a competitive edge for Iceland.

European lobster

European lobster (*Homarus gammarus*), is closely related to the American lobster (*Homarus americanus*). European lobster lives in the eastern Atlantic Ocean, Mediterranean Sea and parts of the Black Sea. Compared to other lobsters, the *Homarus* species are considered very robust with a simple and abbreviated larval period. They feed readily on natural and artificial feeds, are resistant to disease and exhibit rapid growth in warmed water. European lobster can reach sizes of 250-300 g in 24-30 months as long as constant 20° C is provided.



Figure 2 European lobster imported from Norway in April 2014

Culture system design

Because of large growth variations and high losses due to cannibalism and injuries when kept communally, the cultured lobsters have to be kept in individual containers. This provides huge challenges for culture system design. The system needs to be relatively inexpensive to construct and operate, simple to maintain and based on automatic feeding and self-cleaning. Also, the water quality conditions need to be maintained to obtain high survival and the system should allow easy access to the livestock for inspection and control. Norwegian lobster farm has developed a patented concept as the only successful design so far for landbased lobster farming.



Figure 3 European lobster needs single cages

Market value

Presently, there is a huge global gap between supply and demand for European lobster, with a correspondingly increasing demand and prices. The wild catches have been dramatically reduced the last few decades, and thus, wild stocks are already in danger.

Due to the fact that wild catches lobster catches have been varying between approximately 400 - 500 NOK/kg of European lobster are very small there are no specific statistics for this species (only general crustacean statistics). However, Norwegian Lobster Farm has investigated different information from various sources. During the last decade, the consumer prices for wild caught lobster catches have been varying between approximately 400-500 NOK/kg.

Next steps

European lobster has been imported from the National Lobster Hatchery in Padstow, UK and the Institute of Marine Research in Norway. Growth rate and metabolism studies will be carried out in the summer 2014 and used for further development of the culture system design and technology.

The project includes training and competence building and if the results are successful a lobster farming company will be established in Iceland. However, some critical questions regarding survival rates, other biological challenges, as well as the overall economy of the system design needs clarifications before further steps towards commercialization are taken.



Figure 4 European lobster from Norwegian lobster farm AS

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