

# seafood PROCESSOR



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Live transport revolution



# Live logistics: improving profit

The logistics of transporting live crustacean and molluscan species are complex, and considerable R&D has been put in over the last decade to reduce losses and ensure that the customer receives a live animal in prime condition and the producer receives maximum profit. **Nicki Holmyard** reports on a new system set to revolutionise the industry

Live lobster from Canada is a prime example of a species that has provided harvesters, dealers and transporters with a considerable number of challenges, and improvements in storage, handling, packaging and transportation are continuing to be researched.

Lobster dealers cope with seasonal changes in supply by making use of lobster pounds or other live holding systems, in which hard shell lobsters can be maintained in peak condition for up to six months. The pounds are intertidal areas where the water level can be controlled by floodgates to maintain a natural environment for lobsters until they are required for sale. These are being phased out in favour of indoor live holding systems where lobsters are held individually in trays in a stacking system. Chilled, filtered seawater is run constantly through the system, and a number of different arrangements have been developed that preserve the fresh caught quality of the lobster by ensuring it is kept in a state of reduced metabolism. The latest recirculation systems can hold several thousand pounds of live lobster in prime condition for many months.

Lobster specialists have found that seasonal differences in blood protein levels and shell hardness are important factors if the animals are to maintain condition, and simple tests have been

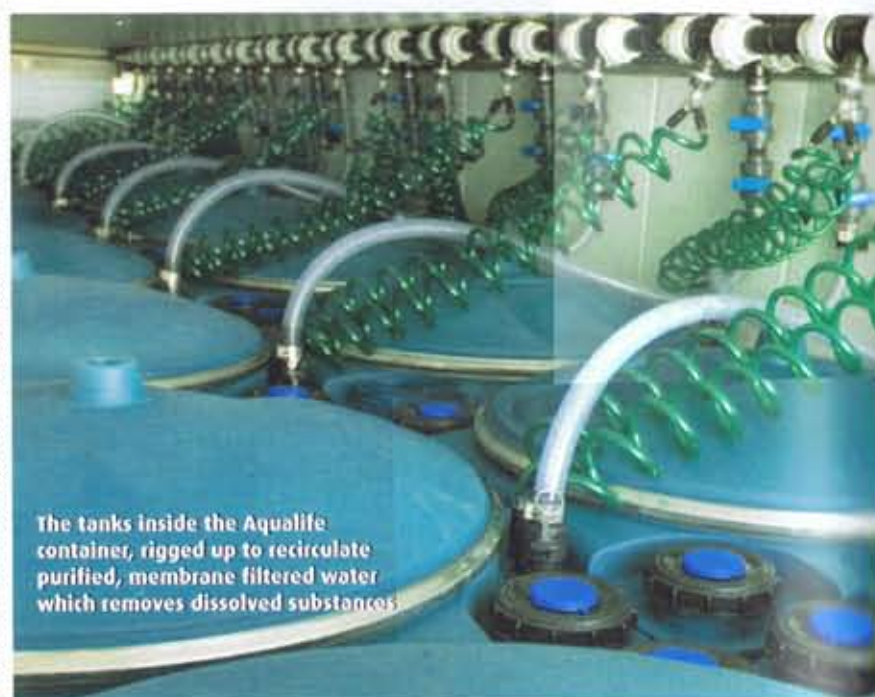
developed to ensure that only the strongest animals are stored, with the weaker ones culled and sent for processing.

Condition is vital if a lobster is to survive transportation to markets half way around the world, because they can suffer from stress and physical damage during this time. Every effort is made to reduce stress, but even small changes in temperature, low humidity, low oxygen, overcrowding, and rough handling can lead to altered enzyme levels, and thus to considerable variations in quality at the destination.

During travel the lobster loses weight and starts to accumulate nitrogenous waste materials, including ammonia. To prevent this happening, live animals are conditioned, or held without feeding for several days prior to shipment. This process has to be carefully timed as the lobster will begin to digest its muscle tissue after a short time, resulting in a build up of waste that the process was designed to avoid. Trials are ongoing with materials that can absorb ammonia or split the molecule into non-toxic substances.

Sophisticated packaging techniques have been developed for air freight, with live lobsters chilled in seawater before being packed individually with coolants, in boxes that aim to maintain local humidity at around 70%.

The shipping temperature will depend upon the species and the



The tanks inside the Aqualife container, rigged up to recirculate purified, membrane filtered water which removes dissolved substances

ambient temperature of the harvest area, but in general, coldwater species can be chilled to 4 deg C and shipped at temperatures ranging from 1-7 deg C. Tropical lobster species may be rendered dormant by temperatures of around 14 deg C.

Lobsters can be kept alive, out of water, in a high humidity environment for approximately 24 hours. Once the transport time increases beyond 24

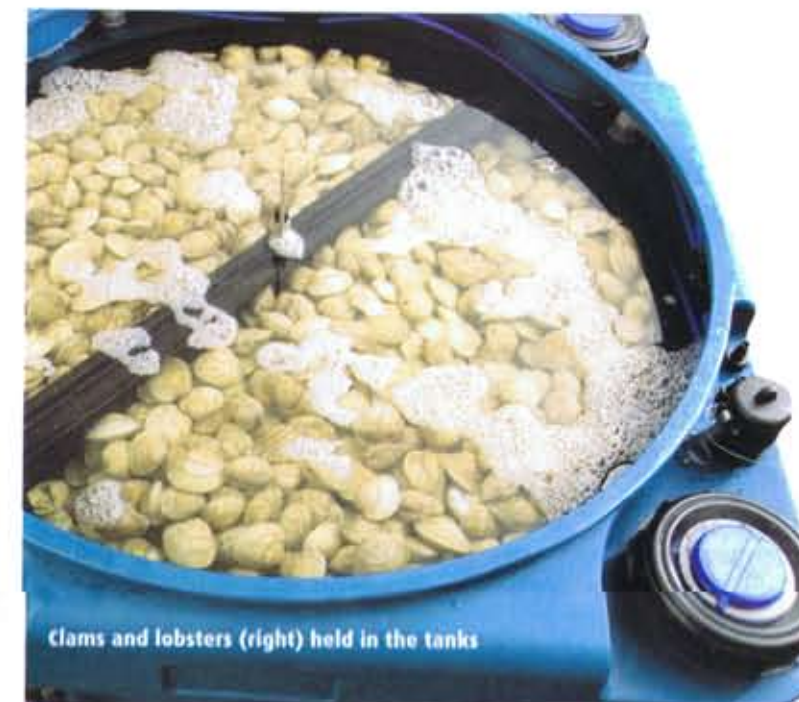
hours, mortality increases significantly, and beyond 48 hours losses can be considerable. It is therefore imperative to ensure that lobsters shipped interstate or overseas, travel with the relevant paperwork, to ensure they are not unduly held up by veterinary inspectors.

#### Sea versus air

AIR freighting of lobsters may have developed into a fine art, but a new ocean freight option has just been launched from Canada to challenge it. Danish company Aqualife Logistics has spent the past four years developing a live transportation system, and has successfully sent snow crab from Disco Bay in Greenland to Canada; lobsters from Canada to northern Europe; mussels from Denmark to southern Europe; and clams from New Jersey, US to Spain. 'We have proved the versatility of our new system and are now in the process of finalising hubs in a number of European countries including the Netherlands and Spain,' managing director Lars Nannerup explains to *Seafood Processor*.

'The Canadian lobster industry is worth \$600 million and has historically relied on air freight for live international transportation. This is now being affected by rocketing oil prices and an increased focus on carbon footprints and CO<sub>2</sub> pollution, which makes it less attractive. In addition, other important Canadian shellfish products such as mussels and

# profit



Clams and lobsters (right) held in the tanks

oysters are not competitive on the international fresh, live market due to the high cost of transportation, so our new system has been designed to help meet these challenges,' says Nannerup.

'Compared to air freight, shipping shellfish in our containers has 30 times less environmental impact, while freight costs are reduced by up to 50%. Measuring the CO<sub>2</sub> emissions shows that the impact per tonne of live shellfish is 120kg for sea freight,

#### An exterior view of one of Aqualife's tanks



compared with 3600kg per tonne of cargo for air freight,' he says.

#### Live by sea 'more competitive'

AQUALIFE has teamed up with Atlantic Canada to provide a distribution point in St Mary's Bay, Nova Scotia, from where initially, lobster shipments from all the Atlantic Canada provinces can be handled. An EU approved depuration system for mussels and hardshell clams is also

available in the vicinity, which will enable local producers to take advantage of the transportation facility.

Value chain analyses commissioned for Aqualife suggest that these lower priced commodities will be able to find their way onto the European market far more competitively than at present, if they travel live by sea. 'We looked carefully at the production and transportation costs, together with the required margins, and the overall price compares very favourably with local product already on the shelves, which is good news for bivalve shellfish producers,' explains Nannerup.

The secret of transporting shellfish across the Atlantic in perfect condition lies in the patented Aqualife container technology, which has been developed with Maersk Line. Using specially adapted containers, up to 15 tonnes of live shellfish submerged in water at hibernation temperature, can be kept in peak condition for around 30 days in a close-to-natural environment.

The first batch of 40ft containers has been in operation since last month, effectively launching the corridor between Atlantic Canada and Europe.

According to Nannerup, the new technology is being welcomed with open arms as a cheaper form of transportation and as a more environmentally friendly option. 'A number of UK supermarkets are already labelling products as air-freighted so that consumers can make an informed choice on food miles and carbon footprints, and retailers in other countries including Belgium are about to start,' he explains.

Richard Stead, Counsellor for Seafood at the Canadian Embassy in Brussels, says Atlantic Canada is pleased to spearhead the new live shellfish transportation corridor. 'We watched the trials with interest and see great potential for growing our market

## HOW DOES IT WORK?

SHELLFISH are loaded at a port-based docking station into specially adapted 40ft containers with 20 upright spherical holding tanks. These are all interconnected through a central piping system. During the voyage, the system operates automatically, recirculating purified, membrane filtered water which removes dissolved substances. It is also chilled to maintain the shellfish in a state of semi-hibernation, which discourages the build up of ammonia during transportation. Oxygen, carbon dioxide, temperature and ammonia gas are all constantly monitored. The tanks are designed using special materials to make them easy to clean and maintain, while the advanced filter technology allows the system to comply with the strict environment and food safety regulations of the EU.

When the ship docks, the containers are removed and plugged into a second docking station at the port, which ensures the shellfish are in perfect condition for onward transportation to the market, either by standard chilled transport, or by taking a container on a lorry.

To avoid the spread of any shellfish diseases, all shellfish for transportation will be certified disease-free, while filtered waste water undergoes a process to decompose and remove any potentially harmful bacteria, viruses or pathogens.

'Organisms and particles from an ecosystem in Canada must never be released into a different ecosystem, such as southern Europe, as it could cause all kinds of ecological devastation. Our technology removes all types of waste and keeps it in a closed system for safe disposal,' explains Lars Nannerup.



in Europe for a number of live species, including lobster and mussels,' he says. 'With demand increasing year-on-year, we are finding air-freight potential already overstretched, so adding an alternative form of live transport to complement it can only help us to grow the market further.'

'Another advantage of sea freight compared with air freight is its lower price, and this combined with an overall reduction in tariffs that we are currently working on with the WTO will help our exporters to improve their margins,' he adds.

'Whilst the initial phase will operate with around 30 containers, we hope to see four times that many in use within a few years, taking the transportation capacity to around 10,000 tonnes of lobster per year.'

His sentiments were echoed by Arthur Drysdale, senior planning & development officer with Nova Scotia Fisheries & Aquaculture, who explains that the new service was being promoted to shellfish producers as a complementary service and one that can help them to offer a unique point of sale for high quality, fresh products.

Lars Nannerup is keen to point out

other major advantages of the Aqualife system. 'We have reduced the wastage of shellfish to a minimum, as during both sea freight and storage, the shellfish are kept in their own environment until consumption. The system is designed so that the distributor can take the required quantity directly from the container, which can greatly reduce the price for the end user,' he says.

He sees the system as being particularly useful for producers in remote areas such as Labrador, where the logistics of transportation dictates supply primarily to the frozen market. 'Transportation time is no object with Aqualife as the shellfish can stay for long periods in the tanks and retain their natural freshness. Once established, our system should bring a more steady flow of products for the distributor, which in turn should lead to more stable prices,' speculates Nannerup.

'By minimising the environmental impact and optimising the amount fit for consumption, we have already established a huge amount of goodwill from distributors, and in several cases we have already gained government endorsements,' he states. ●

An Aqualife container filled with shellfish holding tanks onboard a truck

