

### EM: Bringing New Luster to the Akoya Pearl Oyster Business

Ago Bay in Ise-shima, Mie Prefecture is famous for its Akoya pearls. Yet, it is being contaminated by domestic wastewater and sewage from pearl farming and resorts, leading to the death of many pearl oysters being cultivated in the bay.

Yamamoto Fisheries Ltd. has been in the pearl business here for 60 years and is a leader in the pearl farming industry. It has been featured in TV shows and magazines.

Yamamoto Fisheries Ltd. decided to use EM Technology to solve its pollution problem on a large scale. Among the results that they have seen: pearl oysters are growing more quickly, mortality is dropping and break-up of the sludge on the seabed.



#### ■ Pearl Farming Process with EM Technology



●1 month old oysters

The pearl oysters grow to be about 1cm long in baskets suspended in the sea. About 250cc EM rice rinse solution is applied into the culture area every 10 days.

●2 month old oysters

A tank is filled with 1 part EM rice-rinse solution to 2000 part of water. The 2cm long oysters are placed in it for 10 minutes. EM ceramics are also placed in the tanks.

●Setting to frames

The oysters are soaked in water mixed with EM rice-rinse solution diluted 1000 times for 30 minutes. They are then set on window-sized metal frames with nylon netting.

●Transfer to the bay

The metal frames are then placed in an area in Ago Bay which has fast current and rich with plankton. The frames are suspended in the water using a rope and black plastic balls.

●Oyster cleaning

Seaweeds and shells get attached to the suspended nets. These help the pearl oysters grow. During the harvest time, the nets are collected and cleaned using a cleaning solution. This is to remove the foul odor from the oysters in the collection tank. Also, the oysters are soaked in EM rice -rinse solution diluted 800 times for 20 minutes.

●Pearl harvesting

The shells are opened and the contents are placed in a separator. The meat is another source of revenue for the company. Since the meat of the pearl oyster is very sticky, it is usually washed using caustic lime. However, caustic lime has a bad effect on the natural environment. Instead, the company makes use of EM rice-rinse solution diluted 50 times as a washing alternative.



# Wastewater

### Great savings from the application of EM Technology

Activated EM is being applied to the wastewater treatment plant of the Towada District Meat Processing Center since 2000. The major benefits that have been observed are as follows:

- Reduction of bad smell
- Savings from the reduction in the use of disinfectants for coliform bacteria count in the water
- Savings from the reduction in the amount of chemicals used in the sludge dehydrator
- Reduction in the amount of discharged sludge
- Savings from the reduction of electricity costs due to shortened use of the aerator

#### ■ Details

1. Wide-scale reduction in the foul smell.
2. No release of bubbles. Reduction in the use of antifoaming agents.
3. Reduction by half of the amount of expensive flocculating agents. Annual savings of about 540,000 JPY (about 4,600 USD).
4. Reduction in the use of disinfectants.
5. Improvement in the wastewater quality in the treatment tanks. The water pass wastewater standards, hence safe for release to the river.
6. After the application of EM Technology, there was a reduction in the treatment tank load and an improvement in the treatment efficiency. As of now, only two of the three septic tanks are being used.
7. The equipment remain in good condition. So, it could be expected that these could be used for a long time. Annual electricity savings by about 1.7-1.8 M JPY. (14,700-15,700 USD)
8. Uncomplicated application of EM Technology. Easy handling. Activated EM is applied automatically by drip system only at the first phase of the wastewater treatment process.
9. Reduction in the amount of sludge released; improvement in the quality of the sludge.



Top: Wastewater treatment facility  
Above left: Septic tanks  
Above right: Activated EM  
Right: Automated drip injection unit