This project helped expand capacity and increase the energy efficiency of a crab shell processing operation at Cape Freels, Bonavista Bay, with the assistance of the Fisheries Diversification Program (FDP).

Crab processing plants discard both the shell left from meat extraction and the shell from the butchering process. Now shell ‘waste’ has become a valuable resource. It is cooked and dried for further processing into chitin and shipped to customers and users around the world.

Background

Aqua Shell Processors Ltd.’s operation in Cape Freels had been processing crab shell for several years but, after researching the matter, found they could purchase a more fuel-efficient dryer than the propane dryer they were using.

The company was drying leg shells from a nearby crab processing plant, while the carapace shell was being dumped.
The existing equipment at Cape Freels could not handle the uncooked back shell or carapace, so the company was losing a potential new source of raw material.

Furthermore, the company had identified a new customer for the dried shell who had particular product specifications which the new machinery could produce.

Crab shell is essential in the production of chitin (which is second to cellulose as being the most abundant natural biopolymer in the world). Chitin (and its derivative chitosan) has many modern applications. Like cellulose, it is used in areas like food production, health care, agriculture, water treatment and cosmetics. More specifically, chitin or chitosan is used with other substances for a food preservative and an anticholesterol, as well as a wound dressing or ointment, to help purify drinking water, a treatment for seed and skin, hair and oral care.

**Methodology**

Aqua Shell Processors Ltd. already had years of experience in the processing of crab shell. They identified new technology which they saw as a way to incorporate shell cooking (using the carapace and shell from crab), a de-watering drum to get rid of initial moisture, a crusher to give more surface area, a meat separation drum, a boiler unit and a belt dryer.

**Results**

When the new equipment was purchased, it expanded the plant’s capacity to 60,000 to 80,000 pounds of raw material per 18-hour shift. However, a reduced capacity of about 40-50,000 pounds per 18-hour shift was actually obtained because of a need for training on the new processing equipment.

There were no rejects or any other problems reported with the shipments sent from the plant using the new equipment.

**Conclusion**

According to the company there are two main benefits to this new processing equipment: it is more energy efficient and it can more readily produce specialized product requirements. They are confident actual production levels will rise next season to meet the potential capacity.

The company expects a long-term, viable operation as a result of this FDP-assisted upgrade in ‘crab shell’ technology.

A transfer conveyor which moves the product outside