FISHERIES DIVERSIFICATION PROGRAM

Emerging Fisheries Development

Project Summary: FDP 421-2

Product and Market Development of under 55 count Shrimp (Pandalas borealis)

Introduction
The objective of the project conducted by the Centre for Aquaculture and Seafood Department (C-ASD), Marine Institute of Memorial University of Newfoundland, was to prepare shrimp products, from 55 count and under shrimp for market assessment in locations in Canada and beyond our borders.

Background
The northern shrimp (Pandalus borealis) is the primary shrimp harvested in Newfoundland and Labrador and it is estimated that 70,000 tonnes was landed in 2001. The average size of northern shrimps varies from 5 to 10 cm in length. Typically, Pandalus borealis has been marketed to Japan, China, the United States and European Countries. Product forms are varied and are generally directed to retail or wholesale markets within these countries. These shrimp are traditionally harvested by large factory freezer trawlers, which processed and packaged individually quick frozen (IQF) cooked, shell-on shrimp and a few varieties of raw whole frozen shrimp. Generally speaking, the larger size shrimp fetch the higher price in the marketplace.

Newfoundland shrimp plants have been processing Pandalus borealis since 1996 and counts have generally ranged between 70 and 150 count per pound. The two regions in Newfoundland and Labrador where fishermen have been harvesting larger shrimp are the Fortune Bay and Burgeo areas. The average size of Pandalus borealis, caught in the waters adjacent to these two regions are in the range of 30 - 40 count per pound, plac-
ing them in a larger size shrimp pack which, with proper marketing may prove to be more lucrative for the provinces processing companies and fishers.

**Methodology**

Prior to the harvest of shrimp for this project, a shelf life study on shrimp test samples from Fortune Bay area was performed based on using the total volatile base nitrogen (TVB-N) determination and sensory analysis using a 6 person taste panel. The sample entailed head-on and headless shrimp held up to a 9 days storage period on ice.

The harvesting of shrimp was carried out by licenced processors on contract with the Department of Fisheries and Aquaculture (DFA) in three trips to Fortune Bay and Borgeo areas in Fall, 2002. Staff of C-ASD accompanied the harvesters to ensure proper onboard handling procedures were complied with since the quality of the shrimp product was paramount in this project. The harvested shrimp were cleaned and placed in slush ice, with a temperature sensor and shipped to the Marine Institute where the product preparation was performed. The shrimp were graded, followed by preparation of headless and whole shrimp in raw and cooked forms, then glazed and individually quick frozen.

**Results**

The shelf life study of shrimp stored in ice over a 9-day period indicated that the headless shrimp had TVB-N levels lower than 30 mg N/100 g during the 9 days storage days in ice. (TVB-N values above 30 mg N/100 g indicate unacceptable quality.) The head-on samples reached unacceptable or reject quality after 7 days in ice. Differences in TVB-N values of head-on and headless were noted for all samples during the storage period, but these differences effect flavour and colour of the products, as no significant differences between the samples during the initial spoilage increments were noted in the sensory evaluations. Sensory analysis, using paired comparisons tests, also indicated that there is no significant difference in flavour and colour between head-on and headless shrimp during the first 4 days of shrimp storage in ice.

Approximately 1100 lbs of shrimp landings was obtained during the three trips and the average count was 31-48 per pound. The processed shrimp were packaged in 2 pound packages and further packaged in 10 pound master boxes.

**Conclusions**

The time line obtained from the TVB-N results could be achieved by local processors, allowing delivery of fresh shrimp to retailers in Eastern Canada and the United States. There are more options available to the processors, than cooked and peeled. This may mean alternate approach towards non-traditional product forms and developing new processes. Some examples of product mix and categories are headless, peeled or head-on shrimp. These may be graded into various sizes, (ie) 30 to 40 count per pound and may be of interest to Japanese companies that traditionally buy larger shrimp and process them whole, bulk pack or plate frozen.

The buyers may also be interested in purchasing peeled or even partially peeled shrimp. There is less waste when purchasing peeled shrimp and they can be in tail-on, tail-off, butterfly or round, de-veined or vein-in. The pack variations are traditionally I.Q.F. (Individually Quick Frozen), or block frozen.