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Coho growth test in SEA System™ bag in Departure Bay

The SEA System™ bag was developed by Future SEA Farms Inc. to create a controlled environment for salmon farming. The enclosure is supplied with water that can be drawn from a chosen depth to control quality current speed and temperature. A growth test was conducted at the Department of Fisheries & Oceans Experimental Mariculture Facility in Departure Bay to investigate the production of coho salmon in the bag system in comparison with a conventional netpen. In early March 1997, coho salmon were transported from a commercial farm and stocked into the bag and an adjacent netpen. Table 1 summarizes the conditions in the test.

Table 1 Comparison of bag vs. netpen

	Bag	Netpen
Volume	875m ³	324m ³
Stocking number	9554	1043
Starting weight	627.7g	621g
Stocking density	6.8kg/m ³	2kg/m ³

Both groups were fed to satiation on a commercial diet by the same personnel. Fish were measured at monthly intervals until the end of the study in mid July 1997.

Water temperature varied much less from day-to-day in the bag than in the netpen. Figure 1 summarizes the mean temperature in each of the four sampling periods. Although the temperatures were slightly higher in the bag in March, they were considerably lower than in the netpen in June and July.

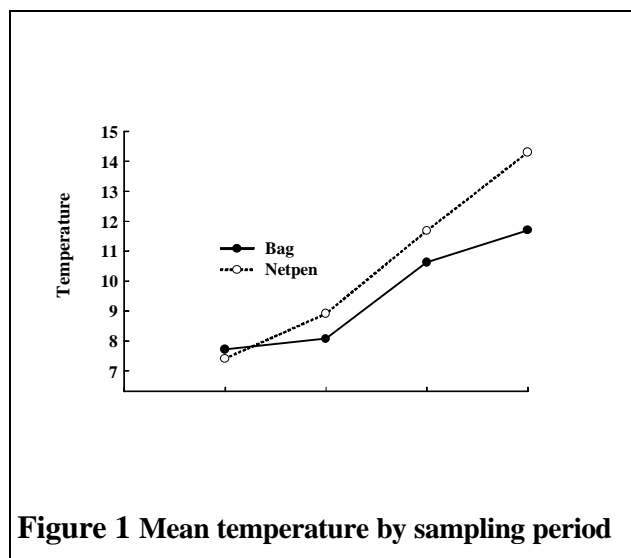


Figure 1 Mean temperature by sampling period

Despite the lower water temperatures, growth in the bag was faster than in the netpen (Figure 2).

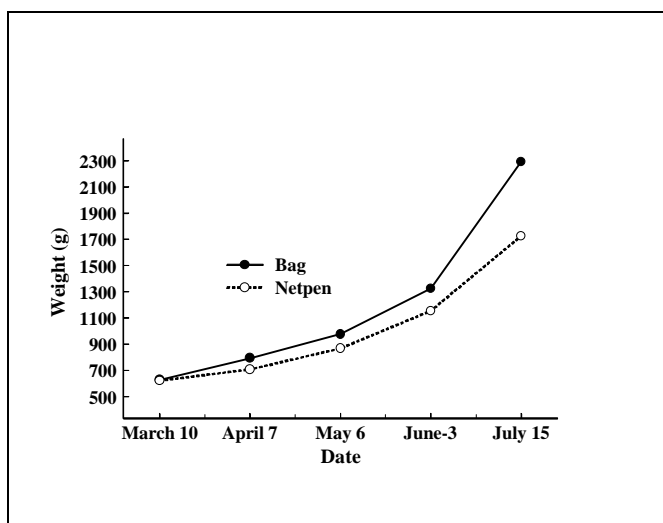


Figure 2 Average weight during the test

The key measures of performance are listed in Table 2.

Table 2 Performance traits

	Bag	Netpen
FCR (simple economic)	1.22:1	1.75:1
Mortality (%)	1.58	4.10
Harvest Weight (grams)	2292.5	1725.6
Accumulated Thermal Units (ATU)	1237	1379
Mean Temperature	9.74	10.86
Specific Growth Rate	1.02	0.80
Growth Coefficient	3.74	2.51

The fish in the bag grew better as evidenced by lower mortality, more efficient food conversion and higher specific growth rate. The growth coefficient takes into account fish size and water temperature (Iwama and Tautz 1981; Iwama 1996). Thus, the greater growth coefficient for the fish in the bag confirms that growth is faster in the bag under comparable conditions*. Fish in the netpen were not fed for a total of three days due to the presence of toxic phytoplankton, which remained low or absent from the bag during the trial.

Additional analyses of physiological condition and flesh quality will be performed on samples taken at the time of harvest. These will include plasma levels of several compounds, proximate composition, pigmentation, muscle development and organoleptic properties.

* The source group of coho, which remained at the supplying commercial farm under normal netpen conditions and were not a part of this study, were reported to average 2580g at harvest in mid-July 1997 (growth coefficient 3.10). Causes for the difference would likely include differences in environmental conditions.

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