

# UC San Diego

## Research Summaries

### **Title**

Accelerating Growth Rates in Shellfish with Bovine Growth Hormone

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## Accelerating Growth Rates in Shellfish with Bovine Growth Hormone

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### Summary

**M**arine biologist Dr. Ernest Chang of the Bodega Marine Laboratory and colleagues at the University of Hawaii investigated the possibility of using bovine growth hormone to increase growth rates of American lobster (*Homarus americanus*) and two species of shrimp—a cold-water California rock shrimp (*Sicyonia ingentis*) and the warm-water *Penaeus vannamei*.

In previous work, Dr. Chang was able to increase growth rates in shrimp by as much as 50 percent by surgically manipulating the animals' glands or by injecting them with hormones. Although these methods are not suited for commercial use, they do show the potential for dramatically enhancing growth rates and lowering shellfish production costs. Because some species may

metabolize food more efficiently when on hormones, hormone supplements could also reduce nitrogen waste at fish farms.

### Findings

Though their findings are preliminary, the researchers' experiments suggest that the shellfish are relatively unaffected by bovine growth hormone. In a series of experiments, neither cold-water shrimp nor American lobster specimens responded to hormone supplements. In one trial, warm-water shrimp specimens grew about 25 percent faster.

### Background

Seafood imports represent the single largest component of the nation's agricultural trade deficit. About \$9-billion-worth of seafood is imported each year. As a percent-



A cold-water California shrimp (*Sicyonia ingentis*). Experiments suggest this species does not respond to bovine growth hormone in feed. Photo: University of California, Davis.

age, about 60 percent of all seafood consumed each year comes from abroad.

The Department of Commerce looks to aquaculture as the future of domestic fish production. In the next 25 years, it is targeting a fivefold increase in the value of domestic aquaculture products—from \$1 billion a year in 2000 to \$5 billion in 2025. To accomplish this will require improved production systems, strategies and husbandry practices.

Bovine growth hormone is a synthetic hormone fed to cows to increase milk production. The Food and Drug Administration and the Environmental Protection Agency have approved the hormone as safe for human consumption and the environment.

### Cooperating Organizations

Monsanto Corporation  
University of Hawaii

### Publications

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Stentiford, G.D., E.S. Chang, S.A. Chang, and D.M. Neil. 2001. Carbohydrate dynamics and the crustacean



An American lobster (*Homarus americanus*). The photo shows a recently shed exoskeleton and a larger, newly molted animal. Photo: University of California, Davis.

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### Presentations

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Long Island Sound Lobster Health  
Symposium, Ronkonkoma, New  
York, November 2001.

Hormonal Regulation of crustacean  
growth, development, reproduction,  
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Marine Research and Cooperative  
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Hormones in the lives of crustaceans:  
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tive Biology. Chicago, Illinois,  
January 2001.

Endocrinology of lobster molting and  
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of Marine Biology, Charleston,  
Oregon, October 2000.

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