

**Economic Implications of Using Horizontal Substrates  
in Intensive Freshwater Prawn *Macrobrachium  
rosenbergii* Pond Production**



**Benedict C. Posadas, Assistant Marine Economist, MSU-CREC  
Aquaculture America 2000**

**Objectives:**

- Develop hypothetical farms - **single-enterprise**
- Compare revenues and costs - **ponds with and without substrates**
- Conduct sensitivity analysis - **changes in prices, costs & yield**



## Data Sources



- 2-year pond grow-out experiments: **MSU-Coastal Aquaculture Unit**  
(<http://www.msstate.edu/dept/crec/caumain.html>)
- Pond design, construction & operation: **Mississippi Delta, Black Belt Area, Coastal Area**
- Wholesale markets : **Northern Gulf of Mexico**

January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

3

## Single-enterprise Farm



\$217,229 per farm,  
\$8,689 per pond or  
\$4,344 per water acre

- 25 two-water-acre ponds
- harvesting sumps
- aeration equipment
- feeding equipment
- well & pump
- weed control equipment
- truck & storage building

January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

4

## Pond Construction Cost



- Earth moving  
(adjacent ponds)
- Drainage structure
- Gravel
- Vegetative cover

**\$57,084 per farm,  
\$2,283 per pond or  
\$1,142 per water acre**

January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

5

## Costs of Horizontal Substrates



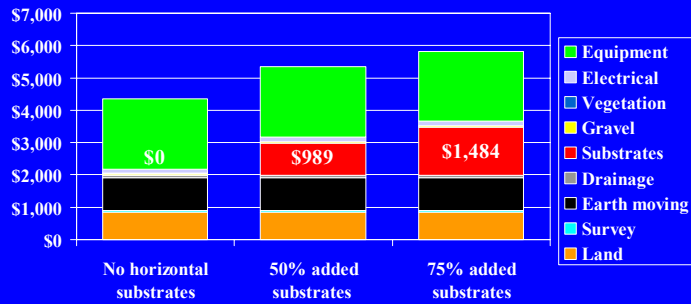
- Additional 50% of pond  
bottom area  
**\$49,456 per farm,  
\$1,978 per pond or  
\$989 per water acre**
- Additional 75% of pond  
bottom area  
**\$74,184 per farm,  
\$2,967 per pond or  
\$1,484 per water acre**

January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

6

## Average Initial Investment (Per water acre)

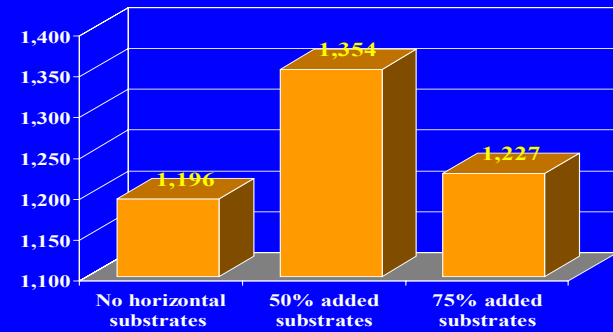


January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

7

## Freshwater Prawn Yield (Pounds, heads-on per water acre)

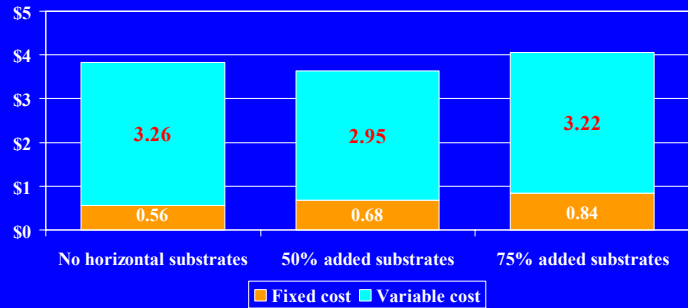


January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

8

## Average Production Cost (Per pound, heads-on)

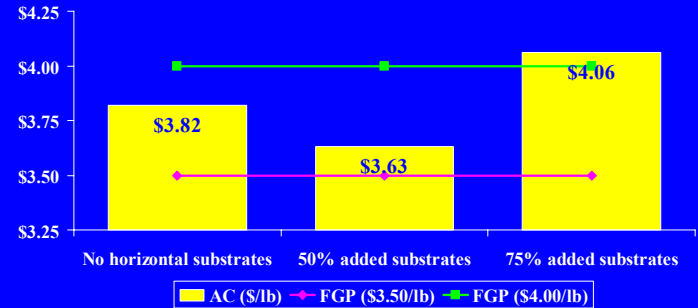


January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

9

## Farm-Gate Prices (Per pound, heads-on)

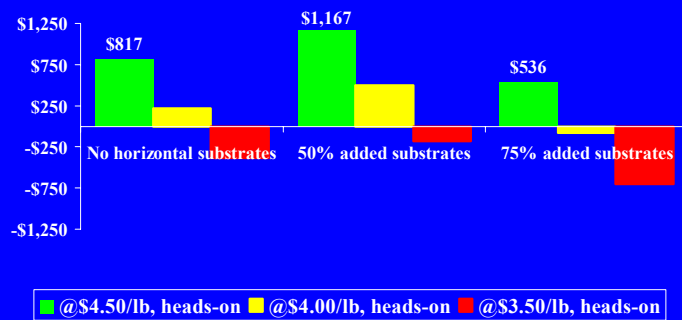


January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

10

## Net Returns (Per water acre)



January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

11

## Conclusions



- The cost of PL's ranged from \$1.60 to \$1.80 per pound, about 55% of total variable costs.
- What is the optimal stocking density?
- What is the limit to a pond's holding capacity?

January 2000

MSU-COASTAL RESEARCH AND  
EXTENSION CENTER

12

## Conclusions



- To some extent, the use of artificial horizontal substrates may lead to higher yields of freshwater prawn.
- What is the optimum increase in pond growing area?