



# Baitfish Production

## Enterprise Budget

**Carole R. Engle**  
 Aquaculture/Fisheries Center  
 University of Arkansas at Pine Bluff

**Nathan Stone**  
 Aquaculture/Fisheries Center  
 University of Arkansas at Pine Bluff

Oklahoma Cooperative Extension Fact Sheets  
 are also available on our website at:  
<http://osufacts.okstate.edu>

The baitfish industry is the fourth largest aquaculture industry in the United States in dollar sales. Yet little work has been done on the economics of this important industry.

An enterprise budget provides annual cost and return information and capital investment requirements for a particular crop. The following budget is based on recommended management practices and conservative estimates of baitfish yield, prices, and cost. Individual farmers will have different costs and yields.

### Market Determines Price

The following budget is based on an assumed price of baitfish, as well as on the assumption that all baitfish produced will be sold. Price is determined by fish species and size, as well as market conditions and structure. The quantity of baitfish that an individual producer can sell will depend upon developing contacts with potential buyers. A farmer considering the development of a baitfish enterprise should thoroughly investigate market conditions and potential before beginning to produce baitfish.

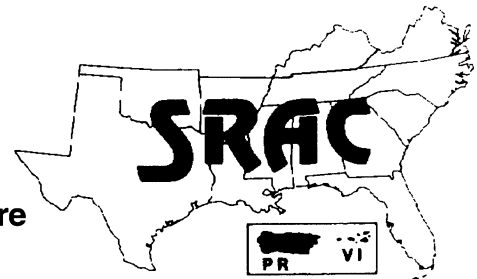
This budget was developed for a representative, 160-water acre baitfish farm divided into sixteen 10-acre ponds. All equipment purchased was assumed to be used exclusively for baitfish production. Annual cost and returns were developed for the entire farm. Grow-out ponds were stocked with 50 mats with eggs per acre in the spring for harvest in the late summer through winter. A growing season of approximately 200 days was assumed. Average yield of baitfish was assumed to be 450 pounds per acre. At an average price of \$2.75 per pound, total revenue or gross receipts is equal to \$198,000 (Table 1).

### Variable Costs

Variable costs are those expenses related directly to the quantity of baitfish produced for market. The cost of mats with eggs is based on the cost of broodstock, feed, chemicals, water, equipment, and labor used in the 2-month spawning period. The mats with eggs are transferred from spawning ponds to grow-out ponds. Three 10-acre spawning ponds generally produce sufficient eggs to stock a 160-acre farm.

The feed is a 32 percent protein floating feed, and baitfish

**Southern  
 Regional  
 Aquaculture  
 Center**



farmers feed daily during the primary growing months of April through October. Fertilizer (11-37-0) is applied at 2 gallons/acre. Pumping cost is based on filling the pond completely once a year and replacing 1 foot of water per year. An average depth of 4 feet is assumed.

Labor is hired for feeding, harvesting, and pond maintenance. Tractor and equipment repair costs were adapted from estimates of the Alabama Cooperative Extension Service. Interest on operating capital is a charge for use of the capital required to purchase these production inputs. Even if the farmer did not borrow funds from a commercial lender, this charge represents income that could have been earned by investing that money in a bank or some other investment opportunity. Total variable cost is the sum of all the variable costs. Income above variable cost represents income above the direct or cash cost. However, for a farmer to stay in business, the baitfish operation must generate sufficient revenue to eventually replace worn-out equipment and cover general overhead. Feed accounts for about one-third of total operating expenses. Spawning fish (matted eggs), aeration, pumping up ponds, labor, and levee repairs are other relatively major expenses.

### Fixed costs

Fixed costs are those costs that a farmer will have whether or not any baitfish are produced. Depreciation, for example, is a charge that represents the amount of money that would have to be earned each year by the enterprise to eventually replace all the equipment when it wears out. It is not a cash cost, but if equipment cannot be replaced, the farmer will eventually go out of business. Interest is charged for the same reasons as described above for interest on operating capital.

**Table 1. Annual cost and returns for a 160-water acre baitfish farm with 10-acre ponds.**

<i>Item</i>	<i>Unit</i>	<i>Quantity</i>	<i>Price or Cost/Unit \$</i>	<i>Value or Cost \$</i>
<b>Gross Receipts</b>				
Baitfish (450 lb/acre)	lb	72,000	2.75	198,000.00
<b>Variable Cost</b>				
Matted eggs	mat	8,000	1.00	8,000.00
Feed, floating, 32%	ton	102	275.00	28,050.00
Fertilizer, bag lime, etc.	total	1	10,592.00	10,592.00
Pumping	acre-feet	800	20.00	16,000.00
Electricity (aeration)	hour	6,720	0.71	4,771.00
Labor (part-time)	hour	1,126	5.00	5,630.00
Equipment maintenance and repair	total	1	1,932.00	1,932.00
Levee repair	total	1	6,319.00	6,319.00
Interest on operating capital (9 months)	dollars	60,970	0.11	6,707.00
<b>Total Variable Cost</b>				<b>88,001.00</b>
<b>Income Above Variable Cost</b>				<b>109,999.00</b>
<b>Fixed Costs</b>				
General overhead	acre	160	20.00	3,200.00
Taxes, insurance	acre	160	15.00	2,400.00
Depreciation	dollars	1	19,075.00	19,075.00
Interest charges (buildings, ponds, equipment, land)	dollars	1	41,349.00	41,349.00
<b>Total Fixed Cost</b>				<b>66,024.00</b>
<b>Total Cost</b>				<b>154,025.00</b>
<b>Net Returns to Operators Labor and Management</b>				<b>43,975.00</b>
<b>Net Returns/Acre</b>				<b>275.00</b>
<b>Breakeven Price (per lb sold):</b>				
	To cover variable costs			1.22
	To cover total costs			2.14

Table 2 lists the capital investment items that would be required for a 160-acre farm composed of sixteen 10-acre ponds. A total of \$718,520 is estimated as the required capital investment for this farm. Annual depreciation is calculated for items that have a definable useful life. Items such as land, earth-moving, and well-drilling are not depreciable, in a strict sense, because if properly maintained, land, ponds, and wells will continue to exist for an indefinite period. Valves, pipes, and equipment, on the other hand, will wear out and must be replaced.

Fixed costs, on an area basis, are higher for baitfish than for catfish production. Pond construction and water supply costs alone are estimated to be \$2,263/acre for this 160-acre (water acres) farm. Equipment for a 160-acre farm is estimated to cost over \$109,000 (Table 3). With land costs of \$1,000/acre, total investment per acre would be \$4,491 for a 160-water acre farm. At average yields, annual fixed costs alone are over \$.90/lb of fish raised.

### Total costs

To obtain total cost, add total fixed cost to total variable cost. Operating a baitfish farm costs approximately \$963/acre each year. Variable costs are about \$550/acre with the remainder due to fixed costs (overhead, depreciation on equipment, interest charges for land, construction, buildings, and equipment).

### Net returns

To figure net returns, subtract total annual cost from gross receipts. In this budget, net returns were calculated to operator's labor and management. Annual returns, based on an average yield of 450 lb/acre and a price of \$2.75/lb, were \$275/acre. This 160-acre farm provides an owner/operator with an annual income of \$43,975. The breakeven price to cover variable costs was \$1.22/lb and the breakeven price to cover total cost was \$2.14/lb.

**Table 2. Capital investment costs for a 160-water acre baitfish farm with 10-acre ponds<sup>1</sup>.**

<i>Item</i>	<i>Unit</i>	<i>Quantity</i>	<i>Cost/Unit \$</i>	<i>Total Cost \$</i>
<b>Land</b>	acre	200	1,000.00	200,000.00
Grading Shed Building	building	1	15,000.00	15,000.00
Slab, vats	total	1	10,000.00	10,000.00
Well, 4"	well	1	12,000.00	12,000.00
<b>Pond Construction</b>				
Earthmoving	cubic yd	361,109	0.70	252,776.00
Pipes, fittings	ft	1,120	6.43	7,202.00
Gravel, grass	total	1	16,080.00	16,080.00
<b>Water Supply</b>				
Wells	well	4	15,000.00	60,000.00
Power source	each	4	2,500.00	10,000.00
Pipe	ft	320	10.00	3,200.00
Initial fill	acre-feet	640	20.00	12,800.00
<b>Feed Bins</b>	each	2	5,000.00	10,000.00
<b>Total Long-Term Investment</b>				609,058.00
<b>Equipment Cost (Table 3)</b>				109,462.00
<b>TOTAL INVESTMENT PER WATER ACRE</b>				718,520.00 4,491.00

<sup>1</sup> Based on the construction of 16 ponds in 4 separate, 4-pond units.

**Table 3. Equipment required for a 160-water acre baitfish farm with 10-acre ponds.**

<i>Item</i>	<i>Cost Quantity</i>	<i>Useful \$</i>	<i>Life Year</i>	<i>Annual Depreciation</i>
Feeder (1 ton, gas)	1	4,625.00	10	462.50
Boat (16 ft)	2	1,400.00	10	140.00
Motor (15 hp)	2	4,100.00	5	820.00
Boat trailer	2	1,100.00	10	110.00
Paddlewheel aerator (PTO)	1	2,800.00	10	280.00
Electric aerators with service (3 HP)	16	19,520.00	5	3,904.00
Tractor 50 HP (100%)	1	18,800.00	10	1,880.00
Chemical kit	1	185.00	2	92.50
Dissolved oxygen meter	1	743.00	3	247.67
Truck (1 ton flatbed)	1	22,000.00	5	4,400.00
Hauling tank (3 compartment)	1	1,925.00	10	192.50
Liquid cylinder	1	1,800.00	5	360.00
Flow meter, hose	3	543.00	5	108.60
Spawning mats	800	4,000.00	5	800.00
Waders	4	400.00	1	400.00
Pick-up (1/2 ton; 4-WD)	1	18,000.00	5	3,600.00
Air blower (0.5 HP)	2 878.00	5	175.60	
Generator (4 kw)	1	1,500.00	20	75.00
Airline, hose, stones (5 vats)	1	650.00	5	130.00
Grader box	1	170.00	10	17.00
Grader baskets	5	575.00	10	57.50
Drag graders	5	300.00	10	30.00
Buckets	10	50.00	1	50.00
Scales	2	256.00	4	64.00
Seines (400 ft.)	2	1,904.00	5	380.80
Seines (50 ft.)	2	238.00	5	47.60
Miscellaneous for 5 vats	1	1,000.00	4	250.00
<b>TOTAL</b>		\$109,462.00		\$19,075.27

## **The Oklahoma Cooperative Extension Service**

### ***Bringing the University to You!***

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0607