



# Annual Costs and Returns of Raising Bighead Carp in Commercial Catfish Ponds

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Bighead carp (BHC) have been raised in catfish ponds in the United States for about 20 years and sold through the livehaul market as a live product. BHC grow rapidly in catfish ponds by feeding primarily on zooplankton and detritus which they filter out of the water. The feeding levels used to raise a catfish crop add sufficient nutrients to the pond to maintain a fertility level adequate for good growth of BHC.

This fact sheet presents estimates of annual costs and returns to produce BHC in commercial-scale catfish ponds. The information is based on studies done at the University of Arkansas at Pine Bluff to evaluate stocking densities of BHC in catfish ponds. However, it should be noted that livehaulers are more willing to purchase a load of BHC if they can buy grass carp at the same time. Grass carp are typically stocked in catfish ponds at 10 to 30 per acre.

A generalized 15-acre pond managed for commercial catfish production is used as the basis for estimating annual costs and returns. Catfish are stocked annually at 6,250 per acre with 5- to 6-inch fingerlings and fed to near satiation. Annual costs and returns for catfish production are shown in Table 1 (page 2).

Bighead carp fingerlings (50 pounds per 1,000 BHC) are stocked at 300 per acre, Table 2 (page 3). Catfish farmers often stock BHC at lower rates of 125 to 150 per acre, but if the

available fingerlings are as small as 50 pounds per 1,000, then it is necessary to stock at higher rates to allow for higher mortality. If large (50 pounds per 1,000 or larger) fingerlings are available, the lower stocking rates should be used. BHC fingerlings cost approximately 15 cents each, for a total pond (15-acre) cost of \$675. Since BHC consume primarily natural food, the only other additional cost of stocking BHC in a commercial catfish pond is the additional seining cost to harvest BHC separately from catfish. One additional seine haul costs \$300 per pond; however, if BHC are seined on a different day from catfish, there would be a \$500 minimum charge. The presence of BHC does not affect catfish yields or the amounts of feed, aeration, or other inputs into catfish production.

There are additional revenues obtained from sale of BHC. Fingerling BHC can grow to 5.3 pounds in one growing season in commercial catfish ponds. Minimum market size of bighead carp varies from year to year and can be as low as 4 pounds to as high as 7 pounds. Yields of 660 pounds per acre can be obtained that result in a pond (15-acre) yield of 9,900 pounds. At the average market price of 40 cents per pound, additional revenues of \$3,960 per pond are generated.

Returns above variable cost were \$15,734 for the 15-acre pond, or \$2,912 more than for catfish production

(continued on page 4)

**Table 1. Annual Cost and Returns for Catfish Production in a 15-acre Pond on a 320-acre Commercial Catfish Farm<sup>a</sup>**

Item	Description	Unit	Quantity	Price/unit (\$)	Total cost (\$)
<u>Gross Returns</u>					
Catfish		lb	75,000	0.70	52,500
<u>Variable costs</u>					
Catfish fingerlings	5 to 6 inch	each	93,750	0.07	6,562
Catfish feed	32% floating pellet	ton	82.5	225	18,562
Fuel					2,007
Chemicals					52
Telephone					132
Water testing					24
Labor					4,489
Management					1,849
Bird scaring					106
Accounting/legal					127
Harvesting/hauling					3,000
Interest on operating capital	10%, 9 months	dollars	27,682	0.10	2,768
Total variable costs	total	dollars			39,678
Returns above variable costs					12,822
<u>Fixed costs<sup>a</sup></u>					
Depreciation		dollars			5,231
Interest on investment		dollars			2,248
Taxes and insurance		dollars			211
Total fixed costs		dollars			7,690
Total cost		dollars			47,368
Net returns		\$/15-ac pond \$/ac			5,132 342

<sup>a</sup> Based on Engle and Killian. 1997. Costs of producing catfish on commercial farms in levee ponds in Arkansas. ETB 252. Cooperative Extension Program, University of Arkansas at Pine Bluff.

**Table 2. Annual Cost and Returns<sup>a</sup> for Catfish (5,000/ac) and Bighead Carp (300/ac) in a 15-acre Pond on a 320-acre Commercial Catfish Farm**

Item	Description	Unit	Quantity	Price/unit (\$)	Total cost (\$)
<u>Gross Returns</u>					
Catfish		lb	75,000	0.70	52,500
Bighead carp	5.3 lb, 660 lb/ac	lb	9,900	0.40	3,960
<u>Total Returns</u>					56,460
<u>Variable costs</u>					
Catfish fingerlings	5-6-inch	fingerling	93,750	0.07	6,562
Bighead fingerlings	50 lb/1000	fingerling	4,500	0.15	675
Catfish feed	32% floating pellet	ton	82.5	225	18,562
Fuel					2,007
Chemicals					52
Telephone					132
Water testing					24
Labor					4,489
Management					1,849
Bird scaring					106
Accounting/legal					127
Catfish harvesting/hauling					3,000
Bighead harvesting/hauling	1 seining event	seine pull	1	300	300
Interest on operating capital	10%, 9 months	dollars	28,414	0.10	2,841
Total variable costs	total	dollars			40,726
Returns above variable					15,734
<u>Fixed costs<sup>b</sup></u>					
Depreciation					5,231
Interest on investment					2,248
Taxes and insurance		dollars			211
Total fixed costs		dollars			7,690
Total cost		dollars			48,416
Net returns		\$/15-ac pond \$/ac			8,044 536

<sup>a</sup>Adapted from Engle, C.R. and D.W. Brown. In Press. Growth, yield, dressout, and net returns of bighead carp (*Hypophthalmichthys nobilis*) stocked at three densities in catfish (*Ictalurus punctatus*) ponds. Journal of the World Aquaculture Society.

<sup>b</sup>Based on Engle and Killian. 1997. Costs of producing catfish on commercial farms in levee ponds in Arkansas. ETB 252. Cooperative Extension Program, University of Arkansas at Pine Bluff.

alone. When the fixed costs associated with the pond and equipment were taken into consideration, net returns for BHC with catfish were \$536 per acre, \$194 per acre more than for catfish production alone. If BHC are seined separately from catfish, the seining cost would be \$500 to cover a custom harvester's minimum fee. This additional seining cost would reduce net returns by \$14 per acre. However, net returns would still be \$180 per acre more than for catfish production alone.

Market prices for BHC fluctuate widely. Table 3 presents a sensitivity analysis of price fluctuations.

Even at 25 cents per pound, the lowest prices observed in the BHC live market, net returns of catfish-BHC production were greater than net returns of catfish production alone.

Profits will increase by stocking BHC in catfish ponds. However, farmers who harvest catfish several times a year may not wish to spend the extra time removing BHC before loading out catfish. Others may not wish to develop the livehauler contacts needed to sell BHC. The farmer must consider all these factors before making the decision to stock BHC in catfish ponds.

**Table 3. Sensitivity Analyses of Price of Bighead Carp**

Bighead Price	Gross Returns	Variable Costs	Total Costs	Returns Above		
				Variable Cost	Total Cost	
\$/lb	\$/15-ac pond	\$/15-ac pond	\$/15-ac pond	\$/15-ac pond	\$/15-ac pond	\$/ac
0.25	54,975	40,726	48,416	14,249	6,559	437
0.30	55,470	40,726	48,416	14,744	7,054	470
0.35	55,965	40,726	48,416	15,239	7,549	503
0.40	56,460	40,726	48,416	15,734	8,044	536
0.45	56,955	40,726	48,416	16,229	8,539	569
0.50	57,450	40,726	48,416	16,724	9,034	602
0.55	57,945	40,726	48,416	17,219	9,529	635
0.60	58,440	40,726	48,416	17,714	10,024	668
0.65	58,935	40,726	48,416	18,209	10,519	701
0.70	59,430	40,726	48,416	18,704	11,014	734

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