

APPENDIX B

ENTERPRISE BUDGETS
LITERATURE SEARCH

Citation	Species	Production System	Measure of Return
*Brannan, Darrell, Kenneth Roberts, and Walter Keithly. <i>Louisiana Alligator Farming: 1991 Economic Impact</i> . Louisiana Sea Grant College Program and the Louisiana Department of Wildlife and Fisheries. October.	Alligator	Alligator	Profit \$5.33 - \$60.06 per animal depending on size.
*Dodson, D.L. and R.L. Degner. 1984. <i>Budgets and Financial Analyses for Various Alligator Enterprises</i> . Florida Agricultural Market Research Center, University of Florida, Gainesville. July.	Alligator	Alligator	Internal Rate of Return depending on low, medium, and high sales values: High-cost farm: - 171% to 13% Low-cost farm: -135 to 27% High-cost feedlot: - 175% to 17%
Heykoop, Jerry and Darren Frechette. 1999. A Dynamic Model of the U.S. Alligator Industry: Lessons for Sustainable Use and Farm Management. Selected paper at the <i>American Agricultural Economics Association Annual Meeting</i> , Nashville, TN. August.	Alligator	Alligator	An abstract model; not an enterprise budget
* Adams, Chuck, Stephen G. Holiman, and P.J. Van Blokland. 1993. <i>Economic and Financial Considerations Regarding the Commercial Culture of Hard Clams in the Cedar Key Area of Florida</i> . Food and Resource Economics Department, Institute of Food and Agricultural Sciences, University of Florida. May.	Hard Clams	Bottom culture	Net returns to owner/operator for capital, management, labor, and risk: \$25,313
Riepe, Jean Rousscup. 1997. <i>Enterprise Budgets for Yellow Perch Production in Cages and Ponds in the North Central Region, 1994/95</i> . Purdue University. School of Agriculture. Department of Agricultural Economics. Technical Bulletin Series #111. May.	Yellow Perch	Cage and Ponds	Break-even costs \$1.92 to \$2.80 per lb

Citation	Species	Production System	Measure of Return
Riepe, Jean Rosscup, Paul B. Brown, and LaDon Swann. 1993. <i>Analyzing the Profitability of Hybrid Striped Bass Cage Culture</i> . Aquaculture Extension, AS-487, Illinois-Indiana Sea Grant Program. March.	Hybrid Striped Bass	Cages in Ponds	Break-even price is \$1.27 per pound
Yohn, Craig W. No date. <i>Budget for Raising Trout in Pond Cages</i> . West Virginia University Extension Service. < www.wvu.edu/~agexten/aquaculture/budget.html > Downloaded 12 October 2000.	Trout	Cages in Ponds	Net income of \$227 in year 1, \$878 in year 2, and \$865 year 3 onwards
*JSA. 2001. Joint Subcommittee on Aquaculture. Aquaculture Effluent Task Force (AETF). Economics Subgroup. Trout Enterprise Budget. Delivered by the AETF Economics Subgroup to the AETF Co-chair on 20 June 2001 for transmittal to EPA.	Trout	Flow-through	Per-Pound Profit Margin: NC: \$0.06 ID: \$0.08 VA: \$0.01-\$0.21 Profit as % of Sales: NC: 5% ID: 11% VA: 0.5% to 10%
Bacon, J.R., C.M. Gempesaw II, W.W. Lussier, and J.W. Dunn. 1996. Economic Viability and Animal Health Regulation Effects on a Large Scale Trout Hatchery. <i>Aquaculture</i> 143(3-4):245-255.	Trout Egg	Flow-through	Internal Rate of Return: 5% to 15%
Bacon, J.R., C.M. Gempesaw II, I. Supitaningsih, J.A. Hankins. 1994. The Economics of Broiler, Grain, and Trout Production as a Risk Diversification Strategy. <i>Aquaculture</i> 127:91-102.	Trout	Flow-through	Internal Rate of Return: Without trout: 7% to 7.5% With trout: 7.7% to 8.7%

Citation	Species	Production System	Measure of Return
<p>Engle, R. Carole and Diego Valderrama. 2002. The Economics of Environmental Impacts on Aquaculture in the United States. <u>In</u> Tomasso, J.R., <i>Aquaculture and the Environment in the United States</i>, U.S. Aquaculture Society, A Chapter of the World Aquaculture Society.</p>		Flow-through Ponds	<p>Unit cost (\$/kg) increases for pollution control Settling basin \$0.01 to \$0.10 Storage pond up to \$0.02 Constructed wetlands \$0.11 Quiescent zones and settling basins for flow-through systems \$0.08 to \$0.18</p>
<p>Hinshaw, Jeffrey M., Lindsay E. Rogers and James E. Easley. 1990. <i>Budgets for Trout Production</i>. Southern Regional Aquaculture Center. SRAC Publication No. 221. January.</p>	Trout	Flow-through	<p>Returns to land, overhead, and management: Small: 15% Large: 21%</p>
<p>Shelton, James L. 1994. <i>Trout Production</i>. Aquaculture Technical Series. Georgia Cooperative Extension Service. 94-53-5-94. May.</p>	Trout	Flow-through	Descriptive only (i.e., what costs to consider)
<p>Belle, Sebastian. 1998. The Move Offshore: Costs, Returns and Operational Considerations from the Entrepreneurial Perspective. <u>In</u> Stickney, Robert R. (compiler). <i>Joining forces with industry: open ocean aquaculture 1998</i>. Corpus Christi, Texas. TAMU-SG-99-103. Page 61.</p>	Salmon	Net Pen Systems	Abstract only - paper not presented
<p>Forster, John. 1996. Cost and Market Realities in Open Water Aquaculture. <u>In</u> Polk, Marie (ed.). <i>Open Ocean Aquaculture: Proceedings of an international conference, May 8-10, 1996, Portland, ME</i>. New Hampshire/Maine Sea Grant College Program. Report # UNHMP-CP-SG-96-9. Pp. 137-149.</p>	Salmon	Net Pen Systems	<p>Profit-per-Pound: \$0.16 Profit as a percent of sales: 8%</p>

Citation	Species	Production System	Measure of Return
Engle, Carole R. and Nathan Stone. 1996. <i>Baitfish Production: Enterprise Budget</i> . Southern Regional Aquaculture Center. SRAC Publication No. 122. October.	Baitfish	Ponds	\$275 (Net returns/acre)
Pounds, Gayle L., Larry W. Dorman and Carole R. Engle. 1991. <i>An Economic Analysis of Baitfish Production in Arkansas</i> . Arkansas Agricultural Experiment Station. Division of Agriculture. University of Arkansas. December.	Baitfish (golden shiner, goldfish & fathead minnow)	Ponds	5 acre ponds in 160 water acre farm: \$(87.26) 5 acre ponds in 320 water acre farm: \$(93.92) 20 acre ponds in 160 water acre farm: \$153.48 20 acre ponds in 160 water acre farm: \$148.57 20 acre ponds in 640 water acre farm: \$168.71 (Net returns/ acre)
Stone, Nathan, Eric Park, Larry Dorman, and Hugh Thomforde. 1997. <i>Baitfish Culture in Arkansas: Golden Shiners, Goldfish, and Fathead Minnows</i> . Arkansas Cooperative Extension. Publication MP 386.	Baitfish	Ponds	Annual returns can be \$137/acre if the yield is 400 pounds per acre and the price is \$2.75 per pound
Engle, Carole R. 1998. <i>Annual Costs and Returns of Bighead Carp Stocked in Fertilized Earthen Ponds</i> . University of Arkansas. Cooperative Extension Service. FSA 9079. September	Bighead Carp	Ponds	Net returns are \$(127) per acre
Engle, Carole R. 1998. <i>Annual Costs and Returns of Raising Bighead Carp in Commercial Catfish Ponds</i> . University of Arkansas. Cooperative Extension Service. FSA 9078. September.	Bighead Carp	Ponds	Raising both Bighead carp and catfish yields returns of \$536 per acre (returns for catfish alone are \$342)

Citation	Species	Production System	Measure of Return
Dunning, R. No Date a. North Carolina Department of Agriculture and Consumer Services. Division of Aquaculture and Natural Resources. Aquaculture in North Carolina. <i>Catfish: Inputs, Outputs, and Economics</i> . Plymouth, NC.	Catfish	Ponds	\$562 (Returns above total costs per water acre) \$0.12 (profit per pound)
Engle, Carole R. and P.-Justin Kouka. 1996. <i>Effects of Inflation on the Cost of Producing Catfish</i> . Report submitted to The Catfish Bargaining Association. Pine Bluff, AR.	Catfish	Ponds	Data from 1977 through 1995 show real profit of \$0.00 to \$0.33 per pound (1982 dollars) Fitted trend line for real margins has negative slope.
Engle, Carole R. and Gregory N. Whitis. No Date. <i>Costs and Returns of Catfish Production in Watershed Ponds</i> . Arkansas Cooperative Extension Program.	Catfish	Ponds	1 levee - \$102 2 levees - \$65 3 levees - \$6 (net returns/acre)
Engle, Carole R. and H. Steven Killian. 1996. <i>Costs of Producing Catfish on Commercial Farms in Levee Ponds on Arkansas</i> . Cooperative Extension Program, University at Pine Bluff.	Catfish	Ponds	Breakeven price \$0.70 to \$0.73 per pound
Kouka, Pierre-Justin and Carole R. Engle. 1994. <i>Cost of Alternative Effluent Treatments for Catfish Production</i> . Southern Regional Aquaculture Center. SRAC Publication No. 467. June.	Catfish	Ponds	Break-even price will be an additional \$0.03/lb to \$0.05/lb depending on method of effluent treatment
Kouka, Pierre-Justin and Carole R. Engle. 1996. Economic Implications of Treating Effluents from Catfish Production. <i>Aquacultural Engineering</i> . 15(4):273-290.	Catfish	Ponds	break-even prices increase up to \$0.05/lb from incremental pollution control costs
Rode, Robert A. and Carole R. Engle. 1997. <i>Catfish Production Cost Estimates for Farms with Level Land</i> . University of Arkansas. Aquaculture/Fisheries Center.	Catfish	Ponds	Breakeven prices range from \$0.61 to \$0.65 per lb.

Citation	Species	Production System	Measure of Return
Stone, Nathan, Carole R. Engle, and Robert Rode. 1997. <i>Costs of Small-Scale Catfish Production</i> . Arkansas Cooperative Extension Program.	Catfish	Ponds	Breakeven prices: Total costs \$0.85/lb Operating costs \$0.61/lb
Wynne, Forrest. 1997. <i>Budgets for Small Scale Catfish Production to Supply a Fee Fishing Operation</i> . National Aquaculture Extension Conference. <ag.ansc.purdue.edu/aquanic/publicat/state/ky/catfish.htm> Downloaded on 16 August.	Catfish for fee-fishing operations	Ponds	Profit ranges from \$0.12 to \$0.67 per lb. Net returns to acre: \$306 - \$2,213
Avery, Jimmy L., Robert P. Romaine, and W. Ray McClain. 1998. <i>Crawfish Production: Production Economics, Pond Construction and Water Supply</i> . Southern Regional Aquaculture Center. SRAC Publication No. 240 revised.	Crawfish	Ponds	For new operations, break-even prices vary from \$0.27 to \$0.83 per pound
Boucher, Robert W. and J.M. Gillespie. 2001. <i>Projected Costs and Returns for Crawfish and Catfish Production in Louisiana, 2001</i> . Louisiana State University. Dept. of Agricultural Economics and Agribusiness. A.E.A Info. Series No. 187.	Crawfish and Catfish	Ponds	Breakeven prices Crawfish \$0.27 to \$0.77 per pound. Catfish \$0.43 to \$0.73 per pound Returns per acre \$820 - \$853
de la Bretonne, Larry W. Jr. and Robert P. Romaine. 1990. <i>Crawfish Production: Harvesting, Marketing and Economics</i> . Southern Regional Aquaculture Center. SRAC Publication No. 242. January.	Crawfish	Ponds	Break-even prices vary from \$0.37 to \$1.9 depending on acreage devoted to production and production in pounds
Dunning, R. No Date b. North Carolina Department of Agriculture and Consumer Services. Division of Aquaculture and Natural Resources. Aquaculture in North Carolina. <i>Crawfish: Inputs, Outputs, & Economics</i> . Plymouth, NC.	Crawfish	Ponds	\$662 in Yr 2 (Returns above total costs per water acre) [\$1.02 per lb \$6,619 per farm]

Citation	Species	Production System	Measure of Return
Masser, Michael, Gregory Whitis, and Jerry Crews. 1997. <i>Production of Crawfish in Alabama</i> . Alabama Cooperative Extension System. ANR-891. May.	Crawfish	Ponds	Break-even cost per pound is \$0.75 including variable and fixed costs but not labor costs
Lutz, Greg C. and Jimmy L. Avery. 1999. <i>Bullfrog Culture</i> . Southern Regional Aquaculture Center. Publication No. 436. March.	Frog	Ponds	Descriptive only (discussion of culture and breeding)
Dunning, R. No Date c. North Carolina Department of Agriculture and Consumer Services. Division of Aquaculture and Natural Resources. Aquaculture in North Carolina. <i>Hybrid Striped Bass: Inputs, Outputs, and Economics</i> . Plymouth, NC.	Hybrid Striped Bass	Ponds	Year 2 = (1,251) Year 3 = 3,272 (Returns above total costs per water acre) [=(0.67) Yr 2 =0.87 Yr 3 per pound]
Wynne, Forrest. <i>Outlook for Hybrid Striped Bass Production in Kentucky</i> . Kentucky State university Cooperative Extension Program.	Hybrid Striped Bass	Ponds	Break-even price ranges between \$2 and \$3 per pound
Riepe, J. Rosscup. 1997. Costs for Pond Production of Yellow Perch in the North Central Region, 1994-1995. North Central Region Aquaculture Center. Fact Sheet Series #111	Perch	Ponds	Breakeven Prices ranges from \$2.14 to \$3.48 per pound. Prices range from \$2.00 to \$3.00 per pound
* Hughes, David W. 1999. <i>The Impact of the Louisiana Pet Turtle Industry on the State Economy</i> . Department of Agricultural Economics and Agribusiness, Louisiana State University.	Pet Turtles	Ponds	Not an enterprise budget. Examines impact on gross state product through input-output model.
* JSA. 2001. Joint Subcommittee on Aquaculture. Aquaculture Effluent Task Force (AETF). Economics Subgroup. <i>South Carolina Shrimp Farm Budget Adaptation</i> . Delivered by the AETF Economics Subgroup to the AETF Co-chair on 20 June 2001 for transmittal to EPA.	Shrimp	Ponds	Internal Rate of Return: 14.16% - 7 years 13.70% - 12 years

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D'Abramo, Louis R. and Martin W. Brunson. 1996. <i>Production of Freshwater Prawns in Ponds</i> . Southern Regional Aquaculture Center. Publication No. 484. July.	Shrimp	Ponds	Expected rate of return can be as high as \$2,000 to \$2,500 per acre
Griffin, Wade L. and Granvil D. Treece. 1999. <i>A Guide to the Financial Analysis of Shrimp Farming, 1999</i> . Texas A&M University (TAMU), TAMU-SG-99-502	Shrimp	Pond	Internal Rate of Return 45% to 47%
Chaves, P.A., R. M. Sutherland, and L. M. Laird. 1999. An Economic and Technical Evaluation of Integrating Hydroponics in a Recirculation Fish Production System. <i>Aquaculture Economics & Management</i> 3(1):83-91.	Catfish	Recirculating Systems	Internal Rate of Return is 27.3%
Martens, Bradley P. and Ernie W. Wade. 1996. Aquaculture in Rural Development: The Economic Impact of Recirculating Aquaculture Systems on Rural Communities. Paper presented at the <i>First International Conference on Recirculating Aquaculture Systems</i> . Symposium 2: Business Plans and Management. 12 pages. (Papers are not paginated consecutively.)	Catfish, striped bass, trout	Recirculating Systems	Net income: Catfish - \$128,494 Striped Bass - \$190,758 Trout - \$66,250
Adams, Charles M. and Robert S. Pomeroy. 1992. Economics of Size and Integration in Commercial Hard Clam Culture in the Southeastern United States. <i>Journal of Shellfish Research</i> . 11(1):169-176.	Hard Clams	Recirculating system for hatchery, land-based upflow for nursery, and bottom culture for grow-out	Minimum output for profitability.
Van Wyk, Peter. 2000. Economics of Shrimp Culture in a Freshwater Recirculating Aquaculture System. Paper presented at the <i>Third International Conference on Recirculating Aquaculture Systems</i> . Special Session 1—Economics/Computers. 6 pages.	Shrimp	Recirculating Systems	Internal Rate of Return: 12%

Citation	Species	Production System	Measure of Return
Bailey, D.S., J.E. Rakocy, W.M. Cole, and K.A. Shultz. 1997. Economic Analysis of a Commercial-Scale Aquaponic System for the Production of Tilapia and Lettuce. <i>In Natural Resource, Agriculture, and Engineering Service (NRAES), Tilapia Aquaculture: Proceedings from the Fourth International Symposium on Tilapia in Aquaculture.</i> NRAES-106. Ithaca, NY. Volume 2: 603-612.	Tilapia	Recirculating Systems	Negative unless paired with lettuce production with 24 tanks
Lutz, C. Greg. 1998. <i>Greenhouse Tilapia Production in Louisiana.</i> Arkansas Cooperative Extension. Publication 2705.	Tilapia	Recirculating Systems	Production costs \$1.19/lb. Three-year payback period
Lutz, C. Greg and Kenneth J. Roberts. 1998. Investment and Management Aspects of Owner/operator Scale Greenhouse Tilapia Systems. Paper presented at the <i>Third International Conference on Recirculating Aquaculture Systems.</i> Pp. 98-105.	Tilapia	Recirculating Systems	Production costs \$1.19/lb. Three-year payback period
O'Rourke, Patrick D. 1996. The Economics of Recirculating Aquaculture Systems. Paper presented at the <i>First International Conference on Recirculating Aquaculture Systems.</i> Symposium 2: Business Plans and Management. 19 pages. (Papers not paginated consecutively.)	Tilapia	Recirculating Systems	Net profit: \$3,260 Break-even volume: \$93,528
Timmons, Michael B. and Paul W. Aho. 1998. Comparison of Aquaculture and Broiler Production systems. Paper presented at the <i>Second International Conference on Recirculating Aquaculture Systems.</i> Pp. 190-199.	Tilapia	Recirculating	Cost per kilogram produced Tilapia \$1.62 Catfish \$1.56 Broiler \$0.65
Dunning, Rebecca D., Thomas M. Losordo, and Alex O. Hobbs. 1998. <i>The Economics of Recirculating Tank Systems: A Spreadsheet for Individual Analysis.</i> Southern Regional Aquaculture Center. SRAC Publication No. 456. November.	—	Recirculating Systems	Price for tilapia set to \$1.25/lb to make costs

Citation	Species	Production System	Measure of Return
Wade, Edward M., Steven T. Summerfelt and Joseph A. Hankins. 1996. Economies of Scale in Recycle Systems. Paper presented at the <i>First International Conference on Recirculating Aquaculture Systems</i> . AES Technical Session 2: Open Papers. 13 pages.	—	Recirculating Systems	Break-even prices Calculated (\$/lb): \$1.04 to \$2.64

* Enterprise budget submitted to EPA from JSA AETF.