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Freshwater Shrimp Enterprise Cost and Return Estimates for Kentucky

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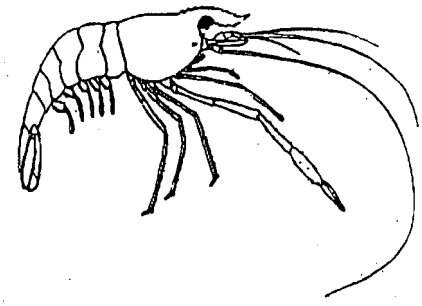

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FRESHWATER SHRIMP COST AND RETURN ESTIMATES FOR KENTUCKY

INTRODUCTION

This publication contains budgets for the commercial production of freshwater shrimp (*macrobrachium rosenbergii*) in ponds on farms in Kentucky. Cost and return estimates are based on the 1998 growing season. The purpose of these budgets is to provide the reader with a tool and framework that may be useful in managerial decision making for those currently operating or considering operating a freshwater shrimp production effort. Producers are encouraged to adapt these budgets to their specific circumstances. Columns have been provided within the worksheet to customize the budgets. Producers should recognize decisions will likely be based on access to different resources as well as special resource needs.

These budget estimates are based on the most current information available on price and cost and reflect actual estimates provided by commercial producers. It should be noted that commercial production is relatively new in Kentucky and that production approaches have changed each season as better "best management practices" continue to be identified. Stratification systems within the pond that allow for a greater production surface area, for example, look very promising in preliminary research findings. Higher stocking rates and higher yields have been realized under certain stratified conditions. These may become adopted soon as conventional, but are not included in these budgets.

This particular budget assumes the stocking prawns are shipped in from a commercial hatchery, grown out in a pond specifically prepared for freshwater shrimp, growout is maintained by the operator, additional labor is employed to help during harvesting activities, and prawns are sold whole at pondside to a wholesale market. Management intensity, scale of production, and marketing intentions, however, vary across current producers resulting in quite different cost and return schedules.

Price, cost, and yield expectations are likely to change over time. Many factors can contribute to producers realizing actual outcomes that differ widely from these estimates. This is a new product in Kentucky and a relatively new product in many of the markets into which producers have been marketing. These annualized estimates, however, should provide a baseline that can and should be updates periodically as new production and marketing information becomes available.

ENTERPRISE BUDGETING AND COST CONCEPTS

An enterprise budget is a summary of projected income and expenses associated with producing one unit of the enterprise. In the case of freshwater shrimp, income and expenses are organized on a per pond-acre basis. Most enterprise budgets will contain an income section and two cost sections. This budget also includes a section to lay out some baseline assumptions, specifically those relating to pond size, excavation costs, equipment costs, stocking rate, and yield.
The budget call for an estimation of **GROSS RETURNS**, an estimate to total revenue one might

expect, given a certain yield and price. In the case of freshwater shrimp, both the yield and price are based on whole animal weight. There is currently little pre-sizing or processing, although some markets will require it..

The two cost sections of the budget represent **VARIABLE COSTS** and **FIXED COSTS.** These costs are often referred to as direct costs and indirect costs or operating and overhead costs. **VARIABLE COSTS** are those costs that are incurred only if production takes place and changes along with the level of production. These "out-of-pocket" expenses are typically annual cash costs that include items such as nursery stock, feed, utilities, and labor. Hired labor costs are assumed to include the operator's share of federal and state income taxes, social security, and Medicare taxes.

VARIABLE COSTS also can include any interest charge on all other variable costs. If a farmer is using his/her own funds to produce the crop, this charge represents a non-cash "opportunity cost" of the interest that could have been earned had the money not been tied up in the enterprise. If the money had been borrowed to finance the variable expenses, some or all of the interest charge represents an actual cash expense. The budget assumes four months of interest to be charged for production expenses and two months interest on harvesting and marketing expenses. A conservative annual interest rate of 10.00% is used to calculate the interest expense.

FIXED COSTS in this budget includes depreciation on excavation costs, machinery, and short and long term equipment specifically used for the shrimp production. Short term equipment is depreciated on a straight line 5 year basis; excavation costs and long term equipment on a 10 year basis. Excavation costs of $5,000 assume a dozer operator rate of $45 per hour under normal excavation conditions. Actual establishment costs vary considerably over current operations.

The budgets in this publication do not include land, buildings, and general farm equipment that may be used in this enterprise. These are not intended to represent total cost budgets. This enterprise budget assumes that the farmer has already invested in the land and buildings necessary for farming in general. The farmer is committed to owning these resources for a given year independent of the level of production pursued.

Several important net return figures are calculated in each budget and provide important information to the current and prospective producer. The **RETURN ABOVE VARIABLE COSTS** is an estimate of the funds available after all "out-of-pocket" expenses have been paid. This return may be used to (1) pay the operator and family for their labor, (2) pay new or previously existing debt obligations, and/or (3) pay any other expenses or overhead not shown as a variable or fixed cost to the enterprise.

The **RETURN TO OPERATOR LABOR, LAND, CAPITAL AND MANAGEMENT** is the **RETURN ABOVE VARIABLE COSTS** minus depreciation and interest. An allowance for operator and family labor, estimated in these budgets at $8.00 per hour, yields the **RETURN TO LAND, CAPITAL, AND MANAGEMENT.** This amount should exceed the annual equivalent cost of owning the land (land rent), an annual return one might expect from investing the incurred establishment/equipment costs elsewhere (in another 5-10 year investment, for example) , and a return

to the operator's management ability that also could have been otherwise employed in something other than shrimp.

MARKETS AND MARKETING

Careful planning should be undertaken in anticipation of the marketing task. Freshwater shrimp are highly perishable after harvesting and a relatively narrow marketing window exists at the end of the production period. Arrangements for specific needs of certain kinds of customers should be made well before harvest. Indeed, a thorough investigation of the marketing alternatives should be made even before pond construction. The harvesting, handling, and distribution that takes place during the fall at the end of the approximately 100 day growout period can profoundly determine the overall profitability of this enterprise.

The shrimp prices used in these budgets reflect the current amount paid for pond-side pickup by live-haul wholesale distributers. There are currently only a few live haulers that source out of Kentucky currently. Producers have had some success selling whole shrimp live or chilled on ice to selected restaurants. Others have sold to individuals simply bringing coolers to the pond on a designated harvesting day. Direct sales have typically brought higher prices, but also require additional resources during harvest; ice, storage, delivery, and coolers. Additional resources required to market the shrimp into various markets should be included in the enterprise budgets.

Research is currently underway to examine the demand for freshwater shrimp in selected markets, including certain ethnic, regional, and institutional markets. While preliminary findings suggest some promising market segments, the product is either new or the market channels are non-traditional for most Kentucky farmers. Arrangements with a seafood wholesaler might be explored as a possibility for distribution of a large amount of product or perhaps some manner of cooperative marketing effort.

A NOTE ON FRESHWATER SHRIMP INPUTS

The budget presents selected inputs that will likely be necessary to successfully raise freshwater shrimp. The inputs and rates listed represent those being used by current producers, which again have widely different growing conditions. The input prices employed represent estimates of the going rates as determined by the producers and various input suppliers. The products and rates should not be considered as blanket recommendations. **The use of trade names does not constitute endorsement of these products or discredit similar products not mentioned.**

Nursery stock is currently brought in to the state from outside nursery production. Some nursery production is being explored in the state, but it is still largely in the development stage. The $0.10/prawn cost includes a shipment charge and accounts for some loss resulting from transportation stress. More mature prawns can be purchased that have a higher survival rate, but also typically involve a higher shipping cost and per/prawn fee from the nursery.

New producers are encouraged to develop a network of information sources that would include production expertise in the state. Other producers, as well as production resource professionals, are valuable contacts to help map out input needs that may be specific to a new production site.

RISK

There are a number of different sources of risk associated with freshwater shrimp production. Uncertain markets and prices, adverse weather and pond conditions, yield variability, predators, and uncertain labor supplies can all add to the risk of producing freshwater shrimp. Market planning, access to backup equipment, and production management experience can all reduce these risks to a certain extent. Production and market planning, arranging for contingencies, and drawing on experience will go a long ways toward making freshwater shrimp a viable enterprise.

A risk matrix is presented at the end of the budgets that represents a range of expected returns above variable costs over different yields and prices. The ranges selected represent both conservative and optimistic levels for both price and yield. Again, these are returns within a wholesale marketing context. The returns listed in this table represent income remaining to pay fixed costs (pond establishment and long-term equipment), family/operator labor, and debt obligations

Freshwater Shrimp

Baseline Assumptions

		YOUR FARM			YOUR FARM
Acres of Ponds	1		**Per Acre Pond Excavation**	5000	
Stocking Rate (prawns/ac)	16000		(includes piping)		
Cost Per Prawn ($)	0.1		**Long Term Equipment**	721	
Total yield (in lbs.)	1000		**Years of Use (Long Term)**	10	
Sale Price ($ per lb. whole)	6.75		**Short Term Equipment**	71	
			Years of Use (Short Term)	5	

Estimated Enterprise Costs and Returns

DESCRIPTION	AMOUNT	UNIT	PRICE	TOTAL	
GROSS RETURNS/ACRE					
Prawns	1000	lbs.	$6.75	$6,750	
VARIABLE COSTS/ACRE					
Stocking Rate (prawns/ac)	16000	each	$0.10	$1,600	
Feed Cost ($/ 50lb)	40	bags	$14.50	$580	
Diesel fuel and oil (water quality)	1	mix	$5.00	$5	
Utilities	100	days	$1.70	$170	
AguaShade	1	gallon	$50.00	$50	
Fertilizer for pond	1	gallon	$6.00	$6	
Chemicals to kill pond	1	unit	$5.00	$5	
Miscellaneous cost	1	unit	$250.00	$250	
Total Production Cost				**$2,666**	
Feeding, Harvesting, and Marketing:					
Operator Labor (Feeding) [A]	35	hours	$0.00	$0	
(20 minutes a day for 100 days)					
Operator Labor (Harvesting)	8	hours	$0.00	$0	
Hired Labor	32	hours	$6.00	$192	
Ice for harvest	0	lb.	$0.30	$0	
ZipLock & Styrofoam boxes	0	unit	$50.00	$0	
Total Harvesting and Marketing Cost				**$192**	
Note: If live-haul is implemented no ice or packaging products are needed.					
Total Variable Cost				**$2,858**	
Interest on Variable Cost	0.10	%	$2,858.00	$92	
TOTAL VARIABLE COSTS				**$2,950**	
RETURN ABOVE VARIABLE COSTS				**$3,800**	

	AMOUNT	UNIT	PRICE	TOTAL	YOUR FARM
FIXED COST					
Short-Term Cost Depreciated					
Paddlewheel motor	1	yr.	$60.00	$60	
Seine	1	yr.	$5.00	$5	
Castnet	1	yr.	$6.00	$6	
Total Short-Term Fixed Cost				**$71**	
Long-Term Costs Depreciated					
Excavation Cost	1	yr.	$500.00	$500	
(Includes piping)					
Fertilizer and seeding of pond	1	yr.	$7.50	$8	
Electric Paddlewheel	1	yr.	$75.00	$75	
Oxygen meter	1	yr.	$70.00	$70	
Barrel to hold feed	1	yr.	$1.00	$1	
Five-Horse water pump (2inch)	1	yr.	$30.00	$30	
Holding tank	1	yr.	$12.50	$13	
Scale for weighing shrimp	1	yr.	$25.00	$25	
Total Long-Term Fixed Cost				**$721**	
TOTAL FIXED COSTS				**$792**	
Return to Operator Labor, Land, Capital and Management				**$3,008**	
Operator Labor	43	hours	$8.00	$344	
Return to Land, Capital, and Management				**$2,664**	

Notes:

All estimates are based on the most current production costs/revenues that producer cooperators have experienced during the 1998 growing season.

The budget compiles the estimated costs and returns for a one acre pond for a one-hundred day production season. The production parameters at the top of the page are items can have a significant affect on the overall viability of the enterprise and should be carefully estimated before committing to production.

Land:

Land costs vary widely but can be a major factor in the overall establishment cost. Although land may not depreciate in value, annual returns should be targeted to adequately cover an annual rent rate.

Pond Construction:

Pond construction cost include all earth moving, piping, and basin preparation. However, any cost associated with electricity hook-up or well construction are omitted.

Feeding and Harvesting:
All feeding and harvesting costs are associated with manual feeding, not with mechanical feeders. Large production enterprises (Over ten acres) may need to invest in more mechanical means of feeding. Feeding by hand gives producers a better knowledge of what the pond is experiencing and can better detect any production problems. An allotment of twenty minutes for feeding a one acre pond is sufficient.

Miscellaneous Cost:
Miscellaneous cost will include any additional cost associated with a personalized marketing strategy or custom costs in production.

Depreciation:
Depreciation is the annualized cost associated with the ponds and equipment utilized in production. Short-term assets are depreciated over a five year period, while long-term assets are depreciated over a ten year period. However, some long-term assets may have a useful lifespan longer than ten years.

[A] Operator and Hired Labor:
Operator labor is estimated at 43 hours, this includes all feeding and harvesting. Shrimp production has very low labor requirements compared to other farming enterprises. In addition, hired labor is only acquired at harvest time. Total operator labor (production & harvest) is charged at the end of the budget to allow an estimate of returns to operator labor.

Marketing:
The marketing strategy used in the budget is for pondside sales of live-whole freshwater shrimp to wholesale markets. There are many different marketing strategies depending on producer circumstances, but many sell at least a portion of their harvest pondside. Forward planning can provide producers with some degree of price assurance.

Generator:
Producers may want to purchase a generator for emergency purposes. Estimated cost of generator $1,000.

Return to Land, Capital, and Management:
Return to Land, Capital, and Management is the return to these resources for their use in the enterprise.

In short, producers should develop their own budget according to their enterprise. By using the YOUR FARM column producers can ascertain a good sense of what to expect.

Risk Matrix

PER ACRE RETURNS ABOVE VARIABLE COST AT VARIOUS PRICES AND YIELDS

Total Variable Cost Involved in Shrimp Production **$ 2,950**

	Pounds/Acre						
$/lb.	700	800	900	1000	1100	1200	1300
$4.00	($150)	$250	$650	$1,050	$1,450	$1,850	$2,250
$5.00	$550	$1,050	$1,550	$2,050	$2,550	$3,050	$2,550
$6.00	$1,250	$1,850	$2,450	$3,050	$3,650	$4,250	$4,850
$7.00	$1,950	$2,650	$3,350	$4,050	$4,750	$5,450	$6,150
$8.00	$2,650	$3,450	$4,250	$5,050	$5,850	$6,650	$7,450
$9.00	$3,350	$4,250	$5,150	$6,050	$6,950	$7,850	$8,750
$10.00	$4,050	$5,050	$6,050	$7,050	$8,050	$9,050	$10,050

Notes:

The values in the risk table are returns above all variable cost and are returned to service previous/existing debt and other fixed production cost. The highlighted value is an estimate of current returns above variable cost. Estimates are based on small-scale growers that sell at **wholesale prices**. Producers that sell through retail outlets or have a large-scale operation should make the appropriate changes. These costs do not include a charge for operator labor.

PER ACRE RETURN TO LAND, CAPITAL, AND MANAGEMENT

Total Variable and Fixed Costs Involved in Shrimp Production **$ 4,086**

	Pounds/Acre						
$/lb.	700	800	900	1000	1100	1200	1300
$4.00	$ (1,286)	$ (886)	$ (486)	$ (86)	$ 314	$ 714	$ 1,114
$5.00	$ (586)	$ (86)	$ 414	$ 914	$ 1,414	$ 1,914	$ 2,414
$6.00	$ 114	$ 714	$ 1,314	$ 1,914	$ 2,514	$ 3,114	$ 3,714
$7.00	$ 814	$ 1,514	$ 2,214	**$ 2,914**	$ 3,614	$ 4,314	$ 5,014
$8.00	$ 1,514	$ 2,314	$ 3,114	$ 3,914	$ 4,714	$ 5,514	$ 6,314
$9.00	$ 2,214	$ 3,114	$ 4,014	$ 4,914	$ 5,814	$ 6,714	$ 7,614
$10.00	$ 2,914	$ 3,914	$ 4,914	$ 5,914	$ 6,914	$ 7,914	$ 8,914