Indoor Shrimp Production Analysis

The excel file is divided into three sheets:

- **Start Here**
- **Analysis+Output**
- **Harvest Schedule**

This spreadsheet aims to provide a snapshot of input costs, output revenue, and estimated production capabilities for an indoor shrimp production operation. The document provides analysis based on biological factors and survey results from industry producers in the U.S. Midwest. We hope this tool helps you estimate the costs that may be associated with your project to enable you make informed decisions about indoor shrimp production.

Start Here

The "**Start Here**" tab is where you provide all the input and parameters for the project. The page is color coded in the following way:

Column Description	Can this cell be changed?
Inputs from the user (filled with suggested values)	Yes
Formula cells that return values based on inputs from user.	No
Intermediate calculations.	No

How many tanks do you intend to use? Input a number between 1 to 24. Suggested value is 8 or 16 for beginning farmers.

Biological Factors:

- Provide stocking size, desired harvest size, feed conversion, stocking density, anticipated survival rate for Years 1-3, after Year 3, and growth rate (green cells). The spreadsheet will calculate the weeks to grow (orange cells).
    - *Note that studies have found survival rate is significantly lower during the first 3 years due to the learning curve associated with indoor shrimp production.*
    - *The '**weeks to grow**' value is later used to determine how many weeks are between harvests in the "**Harvest Schedule**" sheet.*

Construction Factors

Tank Size

- Provide tank dimensions and fill rate (green cells), and the spreadsheet will return calculations for the tank system cost based on your inputs (orange cells).

- **Example of calculations**: For a 16-tank system with tank diameter of 8ft and tank depth of 5ft, the orange cells will return a value of 251.33 cubic feet of volume, 27,090 gallons of water, and a total cost of $24,000.

Room Size

- Provide cost per sqft and the desired office/sale room size (green cells), and the spreadsheet calculates the cost of each room and the total cost (orange cells).
- **Example of calculations**: For a 16-tank system based on the tank size above, $70 cost of construction per sqft, and 500 sqft desired office/sale room size, the spreadsheet will return a recommended value of tank room size of 2,530 sqft, tank room cost of $177,100 and a total space cost of $212,100.

Economic Factors

Sale Price: Provide the price at which you can sell your product.

Financing

- Amount needed is based on the total costs calculation from construction, tank system, and equipment.
- Provide percentage of amount needed that you are able to put down, interest rate and number of years you will need to finance the remaining balance.
    - The spreadsheet will use these values to calculate your payments over time.

Variable Costs

- Variable Cost items are calculated based on inputs from biological factors and construction factors.
- Examples of major variable cost items:

✓ PL for Stocking	✓ Heating	✓ Chemicals
✓ Feed	✓ Labor	✓ Salt
✓ Electricity	✓ Financing/Loan Payment	✓ Insurance

Fixed Costs

- Building and tank system costs are from calculations in "**Construction Factors**" table.
- Examples of major fixed cost items:

✓ Water Heater	✓ Pumps	✓ Computer
✓ Water Storage	✓ Monitoring Equipment	✓ Miscellaneous Equipment
✓ Emergency Generator	✓ Oxygen Cylinders	✓ System Setup Labor
✓ Purge Tank	✓ Water Quality Equipment	✓ Maintenance
✓ Agitators	✓ Fish Handling Equipment	✓ Management
✓ Blower	✓ Feed Storage	✓

Analysis+Output

This sheet uses the inputs from the "**Start Here**" sheet and analyzes the expected output, revenue, and costs. Note that this sheet uses 2 time frames: Year 1-3, which is the learning and adjustment period and from Year 4, when the operator has gained knowledge and experience about the system and shrimp growing process.

- This sheet provides a snapshot of an enterprise budget that shows the gross revenue, variable costs, fixed costs, and breakeven analysis. The analysis shows:
  - ✓ Breakeven Price using only total variable costs.
  - ✓ Breakeven Price using total costs (total variable costs + total fixed costs).
  - ✓ Breakeven lbs to produce using only total variable costs.
  - ✓ Breakeven lbs to produce using total costs (total variable costs + total fixed costs).

This sheet is an important analytical tool that shows the potential profitability of the project and should be used to inform your investment decisions.

- ✓ ***Example****: If your Breakeven Price using total costs is $15, then your selling price should be at least $15 to cover your costs and return a profit.*

Harvest Schedule

The "**HarvestSchedule**" sheet is one that is entirely dependent on the inputs of the other sheets and is a visualization of what date the operation begins, when each tank should be put into production, and when harvest should be conducted for each tank. The calculations are weekly and can be performed for a number of tanks from 1 to 24.

The first thing to recognize in the harvest schedule is that every cell in the table must return a value of 0, 1, 2, or "N/A" with the values representing the following:

0	Not in use or set aside for cleaning
1	Currently growing product
2	Ready for harvest
"N/A"	Not being considered for the project

Week 0 is the inception week of the project. You can change this date. The date associated with this week is referenced from the first page. Each week will then have a corresponding start date that is seven days after the previous.

'Weeks to Harvest' at the top of the page shows how long it will take to grow out the product, calculated in the "**Analysis+Output"** sheet. The calculation uses the difference between the final weight and the stocking density, divided by average growth per week.

'Tank number': Tanks will be numbered 1-*N* with *N* being the number of tanks the farmer has indicated will be part of the project in the "**Start Here"** sheet; all additional values will be returned "N/A."