

SIMPLE FINANCIAL ANALYSIS FOR A SMALL FISH PROCESSING PLANT



by

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I. INTRODUCTION

This paper is a reprint of selected material from two editions of a publication entitled *A Village Fish Processing Plant: Yes or No? A Planning Handbook*. This handbook was written to provide practical to people interested in starting fish processing plants in Alaska villages. The handbook focuses on small locally owned fish processing operations in western Alaska, but much of the handbook is relevant to any fish processing operation.

The first edition of the handbook was written in 2001 by Gunnar Knapp of the University of Alaska Institute of Social and Economic Research, Craig Wiese of Economic Consulting Services, and Jude Henzler of the Bering Sea Fishermen's Association. The second (revised and updated) edition of the handbook was written in 2008 by Gunnar Knapp and Terry Reeve of the University of Alaska Marine Advisory Program.

The purpose of this paper is to bring together selected material from the two editions relating to financial analysis for a small fish processing plant. Chapter II (Fish Processing Financial Basics) is a reprint of Chapter 4 of the 2008 edition. Chapter III (Financial Analysis for a Hypothetical Small Fish Processor) is a reprint of Chapter 10 of the 2001 edition.

Both editions of the handbook, as well as an Excel file with the "Financial Analysis Form" discussed in Chapter III, are posted on Gunnar Knapp's website:

www.uaa.alaska.edu/iser/people/knapp

II. FISH PROCESSING FINANCIAL BASICS

Analyzing your finances is a critical part of planning a fish processing business: Two kinds of financial analysis are most important:

- **Profit and loss analysis.** This is thinking about your revenues and your costs, which determine how much money your plant is likely to make or lose.
- **Cash flow analysis.** This is thinking about *when* you'll be earning and spending money, and whether you'll have enough cash on hand when you need it.

This chapter describes the basics of these two kinds of financial analysis. In all the other planning you do for your fish plant—from how you will buy fish to how you will process, transport and sell it—you need to think about how each step will affect your costs, revenues, and cash flow.

In analyzing your finances, you'll need to use your best judgment. Until you actually build your plant, you won't know for sure what your facilities and equipment will cost. Until you actually operate your plant, you won't find out how many fish you can buy, or what you have to pay fishermen to be competitive, or what prices you can sell your products for.

As you begin planning your fish plant, it's OK to start simple, with ballpark estimates of your costs, revenues and cash flow. A simple analysis may be enough to tell you whether you have a reasonable chance of achieving your financial objective. As you continue planning, you'll need to do a progressively more detailed analysis, with more careful estimates of your costs, revenues and cash flow. You'll need this to write a business plan and to apply for a grant or a loan.



“You need to think about the finances before you even get to the fun stuff, which is laying out your plant and buying all the shiny equipment.”—An experienced Alaska fish processor.

Profit and Loss Analysis

Profit and loss analysis is thinking systematically about your revenues and your costs, which determine how much money your plant is likely to make or lose. The table below shows a simple example of a profit and loss statement (also called a P&L or a “pro-forma” statement) for a hypothetical fish processing plant.

Financial accounting terminology can be confusing. Not everyone uses the same terms. The table shows terms commonly used in the fish processing business, as well as corresponding standard accounting terms.

The plant in this example buys 1 million pounds of fish each year. The processing yield is 60%, so the total product weight is 600,000 pounds. The plant’s products sell for \$3.00/lb, so the total sales are \$3.00/lb x 600,000 lbs = \$1,800,000 (Row 1).

**Summary of a Profit and Loss Statement for a Hypothetical Fish Processing Plant
Processing 1,000,000 Pounds with a 60% Yield**

Row	Terms			Sales, costs and profit		
	Common term used in fish business	Standard accounting term	What the component includes	Total	Per round pound	Per processed pound*
1	Sales	Revenues	Sales value of finished products	\$1,800,000	\$1.80	\$3.00
2	Fish cost	Cost of raw material	The total cost of the fish you buy, including payments to fishermen, the cost of services for fishermen (such as ice), tendering, and taxes	\$700,000	\$0.70	\$1.17
3	Processing cost	Production cost	Direct costs of processing your fish, such as processing worker wages, packaging, utilities, storage and freight.	\$1,000,000	\$1.00	\$1.67
4	Gross profit	Gross profit	Sales - fish cost - processing cost	\$100,000	\$0.10	\$0.17
5	Overhead	Operating expenses	Costs not directly related to processing fish, such as management, insurance, professional services, office supplies, repairs, replacement and maintenance.	\$250,000	\$0.25	\$0.42
6	Net profit	Net profit	Gross profit minus overhead	-\$150,000	-\$0.15	-\$0.25

Note: The costs and prices used in this example are for illustration only. Actual costs and prices may vary widely.

How well is this plant doing financially? The table shows two measures:

Gross profit (line 4) shows the sales value of the fish minus the direct costs of buying and processing the fish. In this example, the plant is making a gross profit of \$100,000, or \$.10 per round pound. Unless you’re willing and able to lose a lot of money, it’s essential to have a positive gross profit (rather than a gross loss). Otherwise you’re losing money on every fish you buy.

Net profit (line 6) shows the sales value of the fish minus all the costs of operating the plant. These costs include overhead, or the costs not directly associated with processing

fish, such as management and insurance. In this example, the plant is losing \$150,000, or $-.15$ per round pound. It won't make money operating at this scale. But if it processed more fish, so that the overhead costs per pound were lower, it might be possible for the plant to make money.

As you begin planning your fish plant, you should do a profit and loss analysis like that shown in the example. At first you will have to base your analysis on rough estimates of your revenues and costs. As your planning becomes more detailed, your estimates should become more accurate, and you should get a better understanding of how much money your plant is likely to earn or lose.¹

Important Things to Remember in Thinking about Your Finances

As you think about your expected costs, revenues and profits, here are seven of the most important things to keep in mind.

1. Make sure you compare costs and revenues on the same weight basis.

In the example, the plant's total costs are $\$1.95$ per round pound ($\$.70$ /lb fish cost, $\$1.00$ /lb processing cost, and $\$.25$ /lb overhead cost).

The plant's products are selling for $\$3.00$ per processed pound. Since $\$3.00$ /lb is a lot more than $\$1.95$, it might sound like this plant is very profitable. But $\$3.00$ per processed pound works out to only $\$1.80$ per round pound—which is less than the total cost of $\$1.95$ per round pound. So the plant is actually losing money.

The plant's costs add up to $\$3.25$ per processed pound ($\$1.17$ /lb fish cost, $\$1.67$ /lb processing cost, and $\$.42$ /lb overhead cost)—which is more than the $\$3.00$ /lb that the product is selling for.

As you think about your plant's finances, you can measure costs and revenues either per round pound or per processed pound—but it's important to compare them using the same measure.

2. Processing yield matters!

Processing yields are very important for a fish plant. You don't sell the same weight of fish as you buy. As you remove fish heads, guts, bones and other parts, the weight of the final products you get from a fish is typically only about 50-70% of the "round weight" of the fish that you buy from fishermen—depending on the product.

Our fish plant is buying 1 million pounds of fish every year, and selling its product for $\$3$ per pound. Every 1% loss in yield is a 1% loss in revenue. If the yield goes down by 1% the plant's revenues go down by $\$30,000$.

¹ A useful reference for preparing a profit and loss analysis may be *Simple Financial Analysis for a Small Fish Processing Plant*, by Gunnar Knapp, available at www.iser.uaa.alaska.edu/iser/people/knapp.

If the plant was able to increase its yield from 60% to 70%, its total revenue would go up from \$1,800,000 to \$2,100,000—and it would go from losing \$150,000 to making a profit of \$150,000. So everything you can do to improve processing yield at your plant is important. Even a relatively small change in your revenues can make a big difference in your profit.

Effect of Processing Yield on Revenues and Profits for a Hypothetical Fish Processor

	Total		Per round pound	
	60% yield	70% yield	60% yield	70% yield
Total round pounds	1,000,000	1,000,000		
Total processed pounds	600,000	700,000		
Wholesale Price	\$3.00	\$3.00		
Revenue	\$1,800,000	\$2,100,000	\$1.80	\$2.10
Fish cost	\$700,000	\$700,000	\$0.70	\$0.70
Processing cost	\$1,000,000	\$1,000,000	\$1.00	\$1.00
Gross profit	\$100,000	\$400,000	\$0.10	\$0.40
Overhead	\$250,000	\$250,000	\$0.25	\$0.25
Net profit	-\$150,000	\$150,000	-\$0.15	\$0.15

3. Production volume matters!

Your fish plant’s direct costs—which include fish costs and processing costs—stay about the same per pound regardless of how much fish you process. The more fish you process, the more you have to pay fishermen and the more you have to pay for labor and boxes.

However, your fish plant’s *overhead* costs don’t go up as much when you process more fish. For example, you’ll have to pay your plant manager about the same regardless of how much fish you process. So if you process three times as much fish, the manager will cost you only one-third as much per pound.

If your plant processed and sold three times as much fish, and spent three times as much for fish cost and processing cost but held the overhead costs the same, it would go from losing \$150,000 to making \$50,000.

Effect of Volume on Revenues, Costs and Profits for a Hypothetical Fish Processor

	Total		Per round pound	
	Plant processes 1,000,000 round pounds	Plant processes 3,000,000 round pounds	Plant processes 1,000,000 round pounds	Plant processes 3,000,000 round pounds
Yield rate	60.0%	60.0%		
Total processed pounds	600,000	1,800,000		
Wholesale Price	\$3.00	\$3.00		
Revenue	\$1,800,000	\$5,400,000	\$1.80	\$1.80
Fish cost	\$700,000	\$2,100,000	\$0.70	\$0.70
Processing cost	\$1,000,000	\$3,000,000	\$1.00	\$1.00
Gross profit	\$100,000	\$300,000	\$0.10	\$0.10
Overhead	\$250,000	\$250,000	\$0.25	\$0.08
Net profit	-\$150,000	\$50,000	-\$0.15	\$0.02

The more fish you process, the more money you earn to help cover your overhead cost. This is one reason why it's difficult for small processing plants to compete with large plants that can spread overhead costs out over more fish.



The more business you do, the more absolute profit you make in a good year. It is heavily scale-dependent. People think, well I'm just going to do a small one. Well, they probably won't because of scaling issues. They probably won't make enough to satisfy themselves.
—An experienced Alaska fish processor

4. Product mix matters!

In thinking about the finances of a fish plant, people often forget that not every fish you sell is a #1 and not every fish gets a #1 price. Some fish are lower quality and can only be made into products which sell for lower prices. That cuts into your revenues and your profitability.

In our example we assumed that the plant's products all sold for \$3.00/lb so that it earned total revenues of \$1,800,000. But if 30% of production was #2 product which sold for a lower price of only \$2.00/lb, then the average sales price would only be \$2.70/lb.

Effect of Product Mix on Revenues of a Hypothetical Fish Processing Plant

	100% #1	70% #1 and 30% #2		
	Total	#1 product	#2 product	Total
Production volume	600,000	420,000	180,000	600,000
Sales price	\$3.00	\$3.00	\$2.00	
Sales revenue	\$1,800,000	\$1,260,000	\$360,000	\$1,620,000
Average sales price	\$3.00			\$2.70



Keep in mind that that the market doesn't want every fish that you can buy or catch. There's going to be fish that the market will not take. However, your costs of handling even those non-marketable fish is going to be close to the same. That is really going to cut into the bottom line.
—An experienced Alaska fish processor

5. If the price you can sell your products for goes up, the price you have to pay fishermen will probably go up too.

One of the challenges in the fish processing business is that when markets for your products are good, they're also good for your competitors. If you get a good price for your products, your competitors will too—if they're producing similar quality.

If prices go up and your competitors are making money, they will probably try to buy more fish—by raising the price they pay fishermen. You're probably going to have to match the prices your competitors pay. That's good for fishermen, but it makes it harder for fish processing plants to make a profit.

Remember to allow for this as you plan your finances. If you think the prices for your products are going to go up, that doesn't necessarily mean your plant will get more profitable—because if the price you pay fishermen is probably going to go up too.



“The reality is you’re going to have to pay the cash buyer price. And you’re probably going to have to pay the cash buyer price for most of the season. And that’s why you lose money. There’s no easy way to skin the cat.”—An experienced Alaska fish processor.

6. Plan for unexpected extra costs.

As you do your financial analysis, remember that not everything goes according to plan in the fish processing business. All kinds of problems can happen. Machines can break, so you may lose several days of production. Bad weather can keep planes from flying—so that you have to freeze your fish rather than selling them fresh. Customers may not pay their bills—leaving you with less money than you had been promised.

While you can't predict *what* will go wrong, you can be pretty sure that *something* will go wrong. As you do your financial planning, it's a good idea to build in contingency factors for unexpected costs and for bills that don't get paid. Even though these problems may not be your fault, they will still affect your costs and revenues and whether your plant can be profitable. So plan for them.

7. Focus on the big costs.

Some costs are much more important than others for your financial planning. In particular, costs of fish, labor, utilities and transportation will probably be the biggest costs for your plant. As you think about your finances, focus on the costs that are going to be most important. Every cost matters. But it's much more important to have an accurate estimate of what wages and transportation will cost you than it is to have an accurate estimate of what insurance or office supplies will cost you.



“To start thinking about the cost of your plant, look at the big costs that make up the top 80% or so. Wages and the cost of fish—those are the two biggies by far. And then utilities and shipping costs. If you looked at no others and just did those four, you would know pretty much whether your plant was going to be feasible.”--An experienced Alaska fish processor.

Cash Flow Analysis

As you plan your fish plant finances, it isn't enough to think about your total costs and revenues over the year. It's also very important to think about your cash flow—when you will need to spend money and when you will be earning money. If you don't have money when you need it, you won't be able to stay in business.



If the money comes in four months after you go broke, it doesn't help. More businesses have gone under because they couldn't get the cash when they needed it.—An experienced Alaska fish processor

Cash is king. It doesn't matter how much money you're going to make on paper. If you don't have it in your pocket when you need it, you're dead.—An experienced Alaska fish processor

*All you gotta do is be a couple weeks late paying your fishermen and you're not going to get any volume.
—An experienced Alaska fish processor*

A lot of people tend to manage by what's in their wallet. 'If I have money in my wallet, I must be doing fine.' Well, that is one level of cash flow management. But if you've got a big thumping bill coming up, and you haven't got enough to pay it, you're dependent on more money coming in the door between now and then. It's really common sense. But a lot of people don't do that step or they don't think about it seriously. They don't think about the risks associated with not getting the cash when you think you're going to get it.—An experienced Alaska fish processor

Cash flow is very important in the fish processing business because you need to spend a lot of money before you get paid for your fish. You have to spend money before the season to ship in supplies and fly in workers. Usually you need to pay the fishermen, plant workers and airlines who catch or handle your fish before you get paid by the customer who finally buys the fish.

To analyze your cash flow, think about each kind of cost your plant will face and when you'll be spending the money. You'll have to spend a lot of money gearing up before the season, buying and shipping in supplies such as packaging, and getting the plant ready to process. You'll spend a lot of money during the season buying fish and paying workers. Some of your costs will be spread over the entire year, such as the manager's salary.

Also think about when you'll have money coming in from fish sales. The money will probably come in from fish sales later than the money goes out to pay fishermen and processing workers.

The table shows an example of a cash flow analysis for a hypothetical fish plant. The plant has total costs of \$1,950,000 (like in our other examples) but \$2,000,000 in sales—so it has the potential to be a profitable plant.

The plant has to spend \$600,000 before the season to gear up. So if it starts the year with only \$500,000 in cash, by the end of May it won't have enough cash to pay its bills—and it will go out of business. Even if it starts the year with \$700,000 in cash, it will still run out of cash by the end of June, because not enough money will have come in from sales yet to pay fishermen for the fish they delivered in June and to pay processing workers for the work they did in June. The plant needs to start the year with \$800,000 in cash to get through June with \$75,000 in cash—which isn't very much of a reserve in case something goes wrong and the plant faces an unexpected major expense.

Cash Flow Analysis for a Hypothetical Fish Processing Plant

	Money going out				Money coming in from fish sales	Cash balance at the end of the month		
	Before the season to gear up	During the Season	Year round	Total		Starting cash balance of \$500,000	Starting cash balance of \$70,000	Starting cash balance of \$800,000
Fish cost		\$700,000		\$700,000				
Processing cost	\$500,000	\$500,000		\$1,000,000				
Overhead cost	\$100,000	\$100,000	\$50,000	\$250,000				
TOTAL	\$600,000	\$1,300,000	\$50,000	\$1,950,000	\$2,000,000			
January	\$0	\$0	\$4,167	\$4,167	\$0	\$495,833	\$695,833	\$795,833
February	\$0	\$0	\$4,167	\$4,167	\$0	\$491,667	\$691,667	\$791,667
March	\$0	\$0	\$4,167	\$4,167	\$0	\$487,500	\$687,500	\$787,500
April	\$300,000	\$0	\$4,167	\$304,167	\$0	\$183,333	\$383,333	\$483,333
May	\$300,000	\$0	\$4,167	\$304,167	\$0	-\$120,833	\$79,167	\$179,167
June	\$0	\$433,333	\$4,167	\$437,500	\$333,333	-\$225,000	-\$25,000	\$75,000
July	\$0	\$433,333	\$4,167	\$437,500	\$666,667	\$4,167	\$204,167	\$304,167
August	\$0	\$433,333	\$4,167	\$437,500	\$666,667	\$233,333	\$433,333	\$533,333
September	\$0	\$0	\$4,167	\$4,167	\$333,333	\$562,500	\$762,500	\$862,500
October	\$0	\$0	\$4,167	\$4,167	\$0	\$558,333	\$758,333	\$858,333
November	\$0	\$0	\$4,167	\$4,167	\$0	\$554,167	\$754,167	\$854,167
December	\$0	\$0	\$4,167	\$4,167	\$0	\$550,000	\$750,000	\$850,000

Getting enough operating capital—cash to get you through the season—can be a major hurdle for a new processing plant. An established plant with a track record of successfully processing fish can get a “pack loan” from a bank. But banks are much less likely to lend to a new business. So you will probably have to use your own money or that of other investors for operating capital to get your plant started. And it will be your own money that's at stake if your business isn't profitable.



What do you bring to the table? Do you bring empty pockets? There's no substitute for energy and creativity, but there's no substitute for hard cash. —An experienced Alaska fish processor

III. FINANCIAL ANALYSIS FOR A SMALL FISH PROCESSOR

The previous chapter provided a short description of profit and loss analysis and a simplified example of a profit and loss statement for a fish plant. This chapter provides a more detailed example of how you can do a profit and loss analysis for a fish plant, which we refer to here as a “financial analysis,” by making systematic assumptions about the different factors which will affect your costs and revenues.

To do a financial analysis, you need to use your best judgment. Until you actually build your plant, you can't know for sure what your facilities and equipment will cost. Until you actually operate your plant, you won't find out how many fish you can actually buy, or what you have to pay fishermen to be competitive, or how much you can earn from selling the products you make. So for planning purposes you make your best guesses, or assumptions, about what your costs and revenues will be. Doing a financial analysis means systematically laying out assumptions about your plant's costs and revenues.

Financial Analysis Form

The table on the next page shows a blank "financial analysis form" which you can use to do a financial analysis for your fish processing plant. You don't have to use this particular form. There are many other ways to show a financial analysis. But they all involve the same kinds of calculations—they just show them in different ways. We designed this financial analysis form to fit all the assumptions and calculations on one page, and to show the calculations as simply as possible.

Our financial analysis form simplifies many of the steps of financial planning. For example, it only asks you to provide an estimate of the labor cost per pound in processing fish. Before someone would give you a grant or a loan to help build a fish processing plant, you would probably have to do a more detailed financial analysis showing how many workers you would actually hire and the total amount you expect to pay for their wages and their unemployment insurance each month. But our financial analysis form is a good starting point for comparing your likely costs and sales revenues and seeing whether your plant is likely to be profitable.

The page after the blank form explains how to fill out the financial analysis form. All the blank spaces without shading are for assumptions, which you provide. If you have worked through the planning steps in this handbook, then you have already prepared these assumptions. All the shaded spaces in the form are for calculations based on your assumptions.

It is much easier to do a financial analysis if you use a computer spreadsheet. An Excel file with the financial analysis form discussed in chapter (which includes the formulas for the calculations) is posted on the website of Gunnar Knapp:

www.iser.uaa.alaska.edu/iser/people/knapp.

Financial Analysis Form for a Village Fish Processing Plant

OVERHEAD COSTS	1	Loan payments	
	2	Fixed labor costs	
	3	Building maintenance	
	4	Equipment maintenance	
	5	Insurance	
	6	Professional services	
	7	Other fixed costs	
	8	Total overhead costs	

The blank spaces in the form are for assumptions which you provide. The shaded spaces are for calculations based on the assumptions.

FISH COSTS	9	Species	
	10	Round pounds purchased	
	11	Price paid to fishermen per pound	
	12	Tendering and ice cost per pound	
	13	Combined fish taxes rate	
	14	Payments to fishermen	
	15	Tendering and ice costs	
	16	Fish taxes	
	17	Total fish cost	

PROCESSING AND SELLING COSTS	18	Products					
	19	Round pounds processed					
	20	Product yield					
	21	Direct labor cost per pound					
	22	Utilities, packaging & supplies cost/lb					
	23	Cold storage cost per pound					
	24	Freight cost per pound					
	25	Sales commission (%)					
	26	Production (finished pounds)					
	27	Direct labor cost					
	28	Utilities, packaging & supplies cost					
	29	Cold storage cost					
	30	Freight cost					
	31	Sales commission cost					
32	Total processing and selling costs						
SALES REVENUES	33	Sales price per pound					
	34	Sales revenues					

TOTAL COSTS, REVENUES, AND PROFIT	35	Total overhead costs	
	36	Total fish cost	
	37	Total processing and selling costs	
	38	Total costs	
	39	Total sales revenues	
	40	Profit or loss	

COSTS, REVENUES, AND PROFIT PER ROUND POUND	41	Products				
	42	Overhead cost per round lb				
	43	Fish cost per round lb				
	44	Processing & selling cost per round lb				
	45	Roe profit per round lb				
	46	Total cost per round lb				
	47	Sales price per round lb				
	48	Profit per round lb including overhead				
	49	Profit per round lb excluding overhead				

How to Fill Out the Financial Analysis Form for a Village Fish Processing Plant

OVERHEAD COSTS	1	Loan payments		Write in your best estimates of these fixed costs.
	2	Fixed labor costs		
	3	Building maintenance		
	4	Equipment maintenance		
	5	Insurance		
	6	Professional services		
	7	Other fixed costs		
	8	Total overhead costs		Add up Lines 1-7

FISH COSTS	9	Species		Write in the species you will purchase. Use as many columns as necessary.
	10	Round pounds purchased		Write in your best estimates for each species
	11	Price paid to fishermen per pound		
	12	Tendering and ice cost per pound		
	13	Combined fish taxes rate		Write in the total tax rate (usually 3.3%)
	14	Payments to fishermen		Multiply Line 10 x Line 11
	15	Tendering and ice costs		Multiply Line 10 x Line 12
	16	Fish taxes		Multiply Line 13 x Line 14
17	Total fish cost		Add up Lines 14-16	

PROCESSING AND SELLING COSTS	18	Products		Write in the products you will make. Use as many columns as necessary.
	19	Round pounds processed		Write in the round pounds you expect to process into each product. The total for each species should equal Line 10. Leave this row blank for roe products.
	20	Product yield		Write in your best estimates for each product
	21	Direct labor cost per pound		
	22	Utilities, packaging & supplies cost/lb		
	23	Cold storage cost per pound		
	24	Freight cost per pound		
	25	Sales commission (%)		
	26	Production (finished pounds)		Multiply Line 19 x Line 20. For roe products, multiply Line 10 by Line 20.
	27	Direct labor cost		Multiply Line 21 x Line 26
	28	Utilities, packaging & supplies cost		Multiply Line 22 x Line 26
	29	Cold storage cost		Multiply Line 23 x Line 26
	30	Freight cost		Multiply Line 24 x Line 26
	31	Sales commission cost		Multiply Line 25 x Line 34
	32	Total processing and selling costs		Add up Lines 27-31
33	Sales price per pound		Write in your best estimates for each product	
34	Sales revenues		Line 26 x Line 33	

TOTAL COSTS, REVENUES, AND PROFIT	35	Total overhead costs		Same as Line 8
	36	Total fish cost		Same as Line 17
	37	Total processing and selling costs		Same as Line 32
	38	Total costs		Add up Lines 35-37
	39	Total sales revenues		Same as Line 34
40	Profit or loss		Subtract Line 38 from Line 39	

COSTS, REVENUES, AND PROFIT PER ROUND POUND	41	Products		Write in the products you will make, but don't include roe products. Use as many columns as necessary.
	42	Overhead cost per round lb		Divide Line 8 by Line 10
	43	Fish cost per round lb		Divide Line 17 by Line 10
	44	Processing & selling cost per round lb		Divide Line 32 by Line 10
	45	Roe profit per round lb		For the roe column for this species, subtract Line 32 from Line 34. Divide the result by Line 10.
	46	Total cost per round lb		Line 42 + Line 43 + Line 44 - Line 45
	47	Sales price per round lb		Same as Line 33
	48	Profit per round lb including overhead		Subtract Line 46 from Line 47
	49	Profit per round lb excluding overhead		Subtract line 42 from Line 48

An Example of Financial Analysis for a Village Fish Plant

To explain how to do a financial analysis, we will work through an example for a hypothetical village fish processing plant, which we call the “Salmon Island Fish Plant.” **You can do the same kind of financial analysis for a Fish Plant in your own village—but you will have to use different assumptions! The assumptions that would be right for your Fish Plant may be very different from those we use for our example.**

The “Salmon Island” Fish Plant

For our example of how to do a financial analysis, we will use a hypothetical value-added fish processing plant in the imaginary village of "Salmon Island." The Salmon Island Fish Plant plans to buy 1,000,000 pounds of chum salmon per year and process it into fresh headed and gutted salmon, frozen vacuum packed fillets (pin-bone-out, skin-on), frozen vacuum-packed smoked fillets, and chum salmon ikura. Other parts of this handbook show estimates of equipment and supplies costs and other production assumptions for this Fish Plant.

Remember that a plant in your village might be similar to the "Salmon Island" plant, or it might be very different. You can do your financial analysis in the same way as our example. But you will have to use different assumptions that make sense for your plant.

Scenarios

The results of any financial analysis depend on the assumptions you make. Some assumptions are very important, but they depend on factors that are difficult to predict, such as the run size and market conditions. So it's a good idea to rely on not just one financial analysis but instead do several different financial analyses to see how your financial results might vary in different circumstances with different assumptions. Each different analysis is called a "scenario."

For our financial analysis of the Salmon Island Fish Plant, we do analyses for five different scenarios. Scenario #1 is a financial analysis for our "most likely" assumptions.

The financial analysis form provides a way of comparing your costs and revenues over a given time period. The most common time period is a year. When you do a financial analysis for your Fish Plant, you should specify what time period it is for. You may want to do different financial analyses for different years of operation of your plant, if you expect that the plant will be changing—for example, processing more fish or producing different products.

Financial Analysis for "Salmon Island Fish Plant"

Scenario #1: "Most likely" assumptions

OVERHEAD COSTS	1	Loan payments	
	2	Fixed labor costs	\$65,000
	3	Building maintenance	\$16,000
	4	Equipment maintenance	\$6,000
	5	Insurance	\$22,000
	6	Professional services	\$5,000
	7	Other fixed costs	\$40,250
	8	Total overhead costs	\$154,250

FISH COSTS	9	Species	<i>Chum salmon</i>
	10	Round pounds purchased	1,000,000
	11	Price paid to fishermen per pound	\$0.12
	12	Tendering and ice cost per pound	\$0.17
	13	Combined fish taxes rate	3.3%
	14	Payments to fishermen	\$120,000
	15	Tendering and ice costs	\$170,000
	16	Fish taxes	\$3,960
	17	Total fish cost	\$293,960

PROCESSING AND SELLING COSTS	18	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Ikura</i>	TOTAL
	19	Round pounds processed	300,000	600,000	100,000		1,000,000
	20	Product yield	74%	50%	35.0%	5%	
	21	Direct labor cost per pound	\$0.18	\$0.45	\$0.50	\$1.00	
	22	Utilities, packaging & supplies cost/lb	\$0.21	\$0.40	\$0.43	\$0.68	
	23	Cold storage cost per pound	\$0.00	\$0.06	\$0.06	\$0.00	
	24	Freight cost per pound	\$0.22	\$0.22	\$0.22	\$0.22	
	25	Sales comission (%)					
	26	Production (finished pounds)	222,000	300,000	35,000	50,000	607,000
	27	Direct labor cost	\$39,960	\$135,000	\$17,500	\$50,000	\$242,460
	28	Utilities, packaging & supplies cost	\$46,620	\$120,000	\$15,050	\$34,000	\$215,670
	29	Cold storage cost	\$0	\$18,000	\$2,100	\$0	\$20,100
	30	Freight cost	\$48,840	\$66,000	\$7,700	\$11,000	\$133,540
	31	Sales commission cost	\$0	\$0	\$0	\$0	\$0
32	Total processing and selling costs	\$135,420	\$339,000	\$42,350	\$95,000	\$611,770	
SALES REVENUES	33	Sales price per pound	\$0.90	\$1.75	\$4.00	\$7.00	
	34	Sales revenues	\$199,800	\$525,000	\$140,000	\$350,000	\$1,214,800

TOTAL COSTS, REVENUES, AND PROFIT	35	Total overhead costs	\$154,250
	36	Total fish cost	293,960
	37	Total processing and selling costs	\$611,770
	38	Total costs	\$1,059,980
	39	Total sales revenues	\$1,214,800
	40	Profit or loss	\$154,820

COSTS, REVENUES, AND PROFIT PER ROUND POUND	41	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Average</i>
	42	Overhead cost per round lb	\$0.15	\$0.15	\$0.15	\$0.15
	43	Fish cost per round lb	\$0.29	\$0.29	\$0.29	\$0.29
	44	Processing & selling cost per round lb	\$0.45	\$0.57	\$0.42	\$0.52
	45	Roe profit per round lb	\$0.26	\$0.26	\$0.26	\$0.26
	46	Total cost per round lb	\$0.64	\$0.76	\$0.62	\$0.71
	47	Sales price per round lb	\$0.67	\$0.88	\$1.40	\$0.86
	48	Profit per round lb including overhead	\$0.02	\$0.12	\$0.78	\$0.15
	49	Profit per round lb excluding overhead	\$0.18	\$0.27	\$0.94	\$0.31

Overhead Costs

In the first part of the financial analysis form (Lines 1-8) you calculate your "overhead costs." These are costs that you will need to pay to operate the plant, regardless of how much fish you end up buying or processing. Overhead costs may also be referred to as "fixed costs" or "indirect costs."

Overhead costs can be a big part of the total costs for a small Fish Plant. Overhead costs make it important to think carefully about how much fish you will be able to buy and process. The less fish you process, the higher your overhead costs per pound will be. Overhead costs can make it difficult for a small Fish Plant to compete with big companies, which can spread their overhead costs over large volumes of fish.

Loan payments (Line 1) to repay loans for your building or equipment or season start-up costs can be a big part of overhead costs. However, in our first scenario the Salmon Island Fish Plant doesn't have any loan payments to make (perhaps because a grant paid for the plant and equipment).

"Indirect labor cost" (Line 2) includes the cost of the plant manager and other administrative and maintenance personnel not directly associated with fish processing operations. The Salmon Island Fish Plant has indirect labor costs of \$65,000 (most of which is for the manager's salary and a part-time secretary).

Write in your other overhead costs in Lines 3 through 7. See the chapter in this handbook on "Plant Operations" for more information on these other kinds of overhead costs.

Add up your total overhead costs in Line 8. In Scenario #1, the Salmon Island Fish Plant has total overhead costs of \$154,250.

Fish Costs

In the second part of the financial analysis form (Lines 15-23) you calculate your "fish costs." These are all the costs involved in buying fish and getting them to the plant. Your fish costs will depend mostly on how much fish you buy and the prices you pay.

In Line 9, write in the names of the fish species you will buy. If you buy more than one species, you will need to add more columns to your "Fish Costs" section of the form, including a "Total" column to add up your fish costs for different species.

In Line 10, write in the total pounds of fish you plan to purchase. You multiply the volume of fish by the price per pound you will pay fishermen (Line 11) to calculate the total payments to fishermen (Line 14). You multiply the volume of fish by the cost per pound of tendering and icing (Line 12) to get total tendering and icing costs (Line 15). You multiply payments to fishermen (Line 14) by the combined fish taxes rate (Line 13) to calculate your fish taxes. Calculate your total fish costs by adding up lines 14 through

16. In Scenario #1, the Salmon Island Fish Plant has total fish costs of \$293,960, including \$120,000 for payments to fishermen and \$170,000 for tendering and icing.

Processing and Selling Costs

In the third part of the financial analysis form (Lines 18-32) you calculate your "processing and sales costs." These are all the costs of processing and selling fish.

In Line 18, write the names of the fish products you will produce. You will need a column for each product, as well as a "Total" column. This will allow you to compare the profitability of different products you produce and to see how changing your mix of products might affect your profits.

In Line 19, write in how many round (unprocessed) pounds of fish you plan to process into each product. The total round pounds you process for each species should add up to the "round pounds purchased" for each species shown in line 10. Don't write anything in the columns for your roe products (because your roe is from the same fish as your other products). In Scenario #1, the Salmon Island Fish Plant is processing 300,000 pounds of fish into fresh H&G salmon, 600,000 pounds into frozen fillets, and 100,000 pounds into smoked fillets.

Write the yields that you expect for each product in Line 20. Multiply Line 20 by Line 19 to calculate the final product weight (Line 26). For roe products, multiply Line 10 (total round pounds processed) by Line 20 to calculate the total product weight. In Scenario #1, the Salmon Island Fish Plant is processing 300,000 round pounds of fish with a 74% yield into 222,000 finished pounds of headed and gutted fish. It is processing ikura from 1,000,000 pounds of fish purchased with a 5% yield, for a total ikura production of 50,000 pounds.

Write the direct labor cost per finished pound for each product in Line 21. Multiply Line 21 by the product weight (Line 26) to calculate the direct labor cost for each product (Line 27). In Scenario #1, the Salmon Island Fish Plant has direct labor costs of \$242,460.

Write the combined utilities, packaging and supplies cost per finished pound for each product in Line 22. Multiply Line 22 by the product weight (Line 26) to calculate the combined utilities, packaging and supplies cost for each product (Line 28). In Scenario #1, the Salmon Island Fish Plant has direct utilities, packaging and supplies costs of \$215,670.

Write the cold storage cost per finished pound for each product in Line 23. Multiply Line 23 by the product weight (Line 26) to calculate the cold storage cost for each product (Line 29). In Scenario #1, the Salmon Island Fish Plant has cold storage costs of \$20,100. It only pays cold storage costs for frozen fillets and smoked fillets, because the fresh headed and gutted fish and the ikura are sold right away.

Write the freight cost per finished pound for each product in Line 24. Multiply Line 24 by the product weight (Line 26) to calculate the freight cost for each product (Line 30). In Scenario #1, the Salmon Island Fish Plant has the same freight cost of 22 cents per pound for each product, for a total freight cost of \$133,540.

Write the sales commission percentage for each product in Line 25. Multiply Line 25 by your sales revenues (Line 34) to calculate the sales commission cost for each product (Line 32). In Scenario #1, the Salmon Island Fish Plant is not paying any sales commissions. (The manager is handling all of the sales, so the costs of sales are included in "fixed" labor costs.)

Calculate your total processing and selling costs (Line 32) by adding up Lines 27 through 31. In Scenario #1, the Salmon Island Fish Plant has total processing and selling costs of \$611,770.

Sales Revenues

Write the sales price you expect for each product in Line 33. Multiply Line 33 by your finished product weight (Line 26) to calculate your sales revenues (Line 34). In Scenario #1, the Salmon Island Fish Plant has total sales revenues of \$1,214,800.

Total Costs, Revenues, and Profit

Now that you've written in all of your assumptions and calculated your different costs, you can compare your costs and revenues to see if your plant is profitable. In Lines 35 through 37, write in your total overhead costs (from Line 8), fish costs (from Line 17) and processing and selling costs (from Line 32). Add up these costs to calculate your total costs (Line 38). Write in your total sales revenues in Line 39. Your profit (Line 40) is your total sales revenues (Line 39) minus your total costs (Line 38). In Scenario #1, the Salmon Island Fish Plant is making a profit of \$154,820.

Costs, Revenues, and Profit per Round Pound

To compare how much profit you are earning from different products, it is useful to calculate your costs, revenues, and profit per round pound. This way you can find out whether you could earn more money by producing a different mix of products.

In Line 41, write in the names of the products you are producing. But don't include columns for your roe products. Because you produce roe when you produce your other products, you can think of the profits you earn from roe as adding to your profits for other products (or reducing your costs). Instead of a "total" column, include a column for calculating your "average" costs, revenues, and profit per round pound.

Calculate your overhead cost per round pound (Line 42) by dividing your total overhead costs (Line 8) by the total round pounds of fish you will purchase (Line 10). In Scenario #1, dividing the Salmon Island Fish Plant's total overhead costs of \$154,250 by

1,000,000 pounds of fish works out to an overhead cost of 15 cents per round pound. This overhead cost per round pound is the same for all of your products.

Calculate your fish cost per round pound (Line 43) by dividing your total fish costs (Line 17) by the total round pounds of fish you will purchase (Line 10). In Scenario #1, dividing the Salmon Island Fish Plant's total fish costs of \$293,960 by 1,000,000 pounds of fish works out to a fish cost of 29 cents per round pound. This fish cost per round pound is the same for all of your products.

Calculate your processing and selling cost per round pound (Line 44) by dividing your total processing and selling costs for each product (Line 32) by the total round pounds of fish you used to produce each product (Line 19). These processing and selling costs per round pound are different for each product. For example, in Scenario #1, the Salmon Island Fish Plant's processing and selling costs per round pound are 45 cents/lb for fresh headed and gutted fish, compared with 57 cents/lb for frozen fillets.

There are two reasons why processing and sales costs per round pound are different for each product. One reason is that the processing and selling costs per finished pound (Lines 21-25) are different for each product. The other reason is that the product yields (Line 20) are different for each product. In Scenario #1, even though the processing and selling costs per *finished* pound are much higher for smoked fillets than for fresh headed and gutted fish, the processing and selling costs per *round* pound are lower for smoked fillets (42 cents/lb) than for fresh headed and gutted fish (45 cents/lb). This is because the yield for smoked fillets (35%) is much lower than for fresh headed and gutted fish (74%).

Calculate your roe profit per round pound (Line 45) by subtracting your total roe processing and selling costs (Line 32) from your total roe sales revenues (Line 34), and dividing by the total round pounds of fish you will purchase (Line 10). In Scenario #1, subtracting total roe processing and selling costs of \$95,000 (Line 32) from total roe sales revenues of \$350,000 (Line 34) works out to total roe profits of \$255,000 (this number isn't shown on the form). Dividing total roe profits by 1,000,000 round pounds of fish works out to a roe profit of 26 cents per round pound. This roe profit per round pound is the same for all of your products.

Calculate your total cost per round pound (Line 46) by adding up your overhead cost, fish cost, and processing and selling costs per round pound (Lines 42 through 44) and subtracting your roe profit per round pound (line 45). You can think of the profits you earn from roe as reducing your costs in processing other fish. In Scenario #1, the Salmon Island Fish Plant's total costs per round pound are 64 cents/lb for fresh headed and gutted fish, 76 cents/lb for frozen fillets and 62 cents/lb for smoked fillets. All the difference between products is because of differences in processing and selling costs per round pound.

Calculate your sales price per round pound for each product (Line 47) by dividing your total sales revenue (Line 34) by the total round pounds of fish you used to produce each product (Line 19). Another way to calculate the sales price per round pound is to multiply

the sales price per finished pound (Line 33) by the product yield (Line 20). For example, in Scenario #1, the sales price per *finished* pound for smoked fillets is \$4.00/lb (Line 33). Multiplying this sales price by the product yield of 35% (Line 20) gives a sales price per *round* pound of \$1.40 per pound.

Finally, you can calculate your profit per round pound including overhead (Line 48) by subtracting your total cost per round pound (line 46) from your sales price per round pound (Line 47) for each product.

In Scenario #1, the Salmon Island Fish Plant's profit per round pound is 2 cents/lb for fresh headed and gutted fish, 12 cents/lb for frozen fillets and 78 cents/lb for smoked fillets. Smoked fillets are much more profitable per round pound than frozen fillets because they have a much higher sales price per round pound (\$1.40/lb compared with 88 cents/lb) but a lower total cost per round pound (62 cents/lb compared with 76 cents/lb). This shows that the Salmon Island Fish Plant could theoretically make more money by making more smoked fillets and less of other products, which are less profitable per round pound. (However, other factors such as smoking capacity may limit whether it is actually possible to switch to making more smoked fillets.)

Calculating your profits per round pound can help to show you which products would be most profitable for your plant to produce. Comparing profits per *round* pound (rather than per finished pound) is important because it takes account of differences in product yields. A product which is more profitable per finished pound won't necessarily earn you more money if it has a lower yield so you can't produce as much of it.

You can calculate your profit per round pound excluding overhead (Line 49) by subtracting your overhead cost per round pound (Line 42) from your profit per round pound including overhead (Line 48). Later in this chapter we will discuss why it is useful to calculate your profits per round pound excluding overhead.

Other Scenarios: Financial Analysis With Different Assumptions

After you have prepared a financial analysis based on your "most likely" assumptions about how much fish you will buy, what you will produce, and your costs and sales prices per pound, you should calculate other scenarios to see how your financial analysis is affected by changing your assumptions.

As an example of how to do this, the next four pages show four alternative scenarios for the Salmon Island Fish Plant that use different assumptions than our first scenario. After those pages is a summary table that compares the key assumptions and calculations for all five scenarios. In reading through this section, you should look at each alternative scenario as well as the summary table to see how the different calculations work out and why each scenario is different.

Financial Analysis for "Salmon Island Fish Plant"

Scenario #2: LOW RUN

OVERHEAD COSTS	1	Loan payments	
	2	Fixed labor costs	\$65,000
	3	Building maintenance	\$16,000
	4	Equipment maintenance	\$6,000
	5	Insurance	\$22,000
	6	Professional services	\$5,000
	7	Other fixed costs	\$40,250
	8	Total overhead costs	\$154,250

FISH COSTS	9	Species	<i>Chum salmon</i>
	10	Round pounds purchased	400,000
	11	Price paid to fishermen per pound	\$0.12
	12	Tendering and ice cost per pound	\$0.17
	13	Combined fish taxes rate	3.3%
	14	Payments to fishermen	\$48,000
	15	Tendering and ice costs	\$68,000
	16	Fish taxes	\$1,584
	17	Total fish cost	\$117,584

PROCESSING AND SELLING COSTS	18	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Ikura</i>	TOTAL
	19	Round pounds processed	120,000	240,000	40,000		400,000
	20	Product yield	74%	50%	35.0%	5%	
	21	Direct labor cost per pound	\$0.18	\$0.45	\$0.50	\$1.00	
	22	Utilities, packaging & supplies cost/lb	\$0.21	\$0.40	\$0.43	\$0.68	
	23	Cold storage cost per pound	\$0.00	\$0.06	\$0.06	\$0.00	
	24	Freight cost per pound	\$0.22	\$0.22	\$0.22	\$0.22	
	25	Sales commission (%)					
	26	Production (finished pounds)	88,800	120,000	14,000	20,000	242,800
	27	Direct labor cost	\$15,984	\$54,000	\$7,000	\$20,000	\$96,984
	28	Utilities, packaging & supplies cost	\$18,648	\$48,000	\$6,020	\$13,600	\$86,268
	29	Cold storage cost	\$0	\$7,200	\$840	\$0	\$8,040
	30	Freight cost	\$19,536	\$26,400	\$3,080	\$4,400	\$53,416
	31	Sales commission cost	\$0	\$0	\$0	\$0	\$0
32	Total processing and selling costs	\$54,168	\$135,600	\$16,940	\$38,000	\$244,708	
SALES REVENUES	33	Sales price per pound	\$0.90	\$1.75	\$4.00	\$7.00	
34	Sales revenues	\$79,920	\$210,000	\$56,000	\$140,000	\$485,920	

TOTAL COSTS, REVENUES, AND PROFIT	35	Total overhead costs	\$154,250
	36	Total fish cost	117,584
	37	Total processing and selling costs	\$244,708
	38	Total costs	\$516,542
	39	Total sales revenues	\$485,920
40	Profit or loss	-\$30,622	

COSTS, REVENUES, AND PROFIT PER ROUND POUND	41	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Average</i>
	42	Overhead cost per round lb	\$0.39	\$0.39	\$0.39	\$0.39
	43	Fish cost per round lb	\$0.29	\$0.29	\$0.29	\$0.29
	44	Processing & selling cost per round lb	\$0.45	\$0.57	\$0.42	\$0.52
	45	Roe profit per round lb	\$0.26	\$0.26	\$0.26	\$0.26
	46	Total cost per round lb	\$0.88	\$0.99	\$0.85	\$0.94
	47	Sales price per round lb	\$0.67	\$0.88	\$1.40	\$0.86
	48	Profit per round lb including overhead	-\$0.21	-\$0.11	\$0.55	-\$0.08
	49	Profit per round lb excluding overhead	\$0.18	\$0.27	\$0.94	\$0.31

Financial Analysis for "Salmon Island Fish Plant"

Scenario #3: LOW SALES PRICE

OVERHEAD COSTS	1	Loan payments	
	2	Fixed labor costs	\$65,000
	3	Building maintenance	\$16,000
	4	Equipment maintenance	\$6,000
	5	Insurance	\$22,000
	6	Professional services	\$5,000
	7	Other fixed costs	\$40,250
	8	Total overhead costs	\$154,250

FISH COSTS	9	Species	<i>Chum salmon</i>
	10	Round pounds purchased	1,000,000
	11	Price paid to fishermen per pound	\$0.12
	12	Tendering and ice cost per pound	\$0.17
	13	Combined fish taxes rate	3.3%
	14	Payments to fishermen	\$120,000
	15	Tendering and ice costs	\$170,000
	16	Fish taxes	\$3,960
	17	Total fish cost	\$293,960

PROCESSING AND SELLING COSTS	18	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Ikura</i>
	19	Round pounds processed	300,000	600,000	100,000	
	20	Product yield	74%	50%	35.0%	5%
	21	Direct labor cost per pound	\$0.18	\$0.45	\$0.50	\$1.00
	22	Utilities, packaging & supplies cost/lb	\$0.21	\$0.40	\$0.43	\$0.68
	23	Cold storage cost per pound	\$0.00	\$0.06	\$0.06	\$0.00
	24	Freight cost per pound	\$0.22	\$0.22	\$0.22	\$0.22
	25	Sales commission (%)				
	26	Production (finished pounds)	222,000	300,000	35,000	50,000
	27	Direct labor cost	\$39,960	\$135,000	\$17,500	\$50,000
	28	Utilities, packaging & supplies cost	\$46,620	\$120,000	\$15,050	\$34,000
	29	Cold storage cost	\$0	\$18,000	\$2,100	\$0
	30	Freight cost	\$48,840	\$66,000	\$7,700	\$11,000
	31	Sales commission cost	\$0	\$0	\$0	\$0
32	Total processing and selling costs	\$135,420	\$339,000	\$42,350	\$95,000	
SALES REVENUES	33	Sales price per pound	\$0.72	\$1.40	\$3.20	\$5.60
	34	Sales revenues	\$159,840	\$420,000	\$112,000	\$280,000

TOTAL COSTS, REVENUES, AND PROFIT	35	Total overhead costs	\$154,250
	36	Total fish cost	293,960
	37	Total processing and selling costs	\$611,770
	38	Total costs	\$1,059,980
	39	Total sales revenues	\$971,840
	40	Profit or loss	-\$88,140

COSTS, REVENUES, AND PROFIT PER ROUND POUND	41	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Average</i>
	42	Overhead cost per round lb	\$0.15	\$0.15	\$0.15	\$0.15
	43	Fish cost per round lb	\$0.29	\$0.29	\$0.29	\$0.29
	44	Processing & selling cost per round lb	\$0.45	\$0.57	\$0.42	\$0.52
	45	Roe profit per round lb	\$0.19	\$0.19	\$0.19	\$0.19
	46	Total cost per round lb	\$0.71	\$0.83	\$0.69	\$0.78
	47	Sales price per round lb	\$0.53	\$0.70	\$1.12	\$0.69
	48	Profit per round lb including overhead	-\$0.18	-\$0.13	\$0.43	-\$0.09
	49	Profit per round lb excluding overhead	-\$0.03	\$0.03	\$0.59	\$0.07

Financial Analysis for "Salmon Island Fish Plant"
Scenario #4: MORE VALUE ADDED PRODUCTION

OVERHEAD COSTS	1	Loan payments	
	2	Fixed labor costs	\$65,000
	3	Building maintenance	\$16,000
	4	Equipment maintenance	\$6,000
	5	Insurance	\$22,000
	6	Professional services	\$5,000
	7	Other fixed costs	\$40,250
	8	Total overhead costs	\$154,250

FISH COSTS	9	Species	<i>Chum salmon</i>
	10	Round pounds purchased	1,000,000
	11	Price paid to fishermen per pound	\$0.12
	12	Tendering and ice cost per pound	\$0.17
	13	Combined fish taxes rate	3.3%
	14	Payments to fishermen	\$120,000
	15	Tendering and ice costs	\$170,000
	16	Fish taxes	\$3,960
	17	Total fish cost	\$293,960

PROCESSING AND SELLING COSTS	18	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Ikura</i>	TOTAL
	19	Round pounds processed	100,000	700,000	200,000		1,000,000
	20	Product yield	74%	50%	35.0%	5%	
	21	Direct labor cost per pound	\$0.18	\$0.45	\$0.50	\$1.00	
	22	Utilities, packaging & supplies cost/lb	\$0.21	\$0.40	\$0.43	\$0.68	
	23	Cold storage cost per pound	\$0.00	\$0.06	\$0.06	\$0.00	
	24	Freight cost per pound	\$0.22	\$0.22	\$0.22	\$0.22	
	25	Sales commission (%)					
	26	Production (finished pounds)	74,000	350,000	70,000	50,000	544,000
	27	Direct labor cost	\$13,320	\$157,500	\$35,000	\$50,000	\$255,820
	28	Utilities, packaging & supplies cost	\$15,540	\$140,000	\$30,100	\$34,000	\$219,640
	29	Cold storage cost	\$0	\$21,000	\$4,200	\$0	\$25,200
	30	Freight cost	\$16,280	\$77,000	\$15,400	\$11,000	\$119,680
	31	Sales commission cost	\$0	\$0	\$0	\$0	\$0
32	Total processing and selling costs	\$45,140	\$395,500	\$84,700	\$95,000	\$620,340	
SALES REVENUES	33	Sales price per pound	\$0.90	\$1.75	\$4.00	\$7.00	
	34	Sales revenues	\$66,600	\$612,500	\$280,000	\$350,000	\$1,309,100

TOTAL COSTS, REVENUES, AND PROFIT	35	Total overhead costs	\$154,250
	36	Total fish cost	293,960
	37	Total processing and selling costs	\$620,340
	38	Total costs	\$1,068,550
	39	Total sales revenues	\$1,309,100
40	Profit or loss	\$240,550	

COSTS, REVENUES, AND PROFIT PER ROUND POUND	41	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Average</i>
	42	Overhead cost per round lb	\$0.15	\$0.15	\$0.15	\$0.15
	43	Fish cost per round lb	\$0.29	\$0.29	\$0.29	\$0.29
	44	Processing & selling cost per round lb	\$0.45	\$0.57	\$0.42	\$0.53
	45	Roe profit per round lb	\$0.26	\$0.26	\$0.26	\$0.26
	46	Total cost per round lb	\$0.64	\$0.76	\$0.62	\$0.72
	47	Sales price per round lb	\$0.67	\$0.88	\$1.40	\$0.96
	48	Profit per round lb including overhead	\$0.02	\$0.12	\$0.78	\$0.24
	49	Profit per round lb excluding overhead	\$0.18	\$0.27	\$0.94	\$0.39

Financial Analysis for "Salmon Island Fish Plant"

Scenario #5: HIGH OVERHEAD

OVERHEAD COSTS	1	Loan payments	\$200,000
	2	Fixed labor costs	\$65,000
	3	Building maintenance	\$16,000
	4	Equipment maintenance	\$6,000
	5	Insurance	\$22,000
	6	Professional services	\$5,000
	7	Other fixed costs	\$40,250
	8	Total overhead costs	\$354,250

FISH COSTS	9	Species	<i>Chum salmon</i>
	10	Round pounds purchased	1,000,000
	11	Price paid to fishermen per pound	\$0.12
	12	Tendering and ice cost per pound	\$0.17
	13	Combined fish taxes rate	3.3%
	14	Payments to fishermen	\$120,000
	15	Tendering and ice costs	\$170,000
	16	Fish taxes	\$3,960
	17	Total fish cost	\$293,960

PROCESSING AND SELLING COSTS	18	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Ikura</i>	TOTAL
	19	Round pounds processed	300,000	600,000	100,000		1,000,000
	20	Product yield	74%	50%	35.0%	5%	
	21	Direct labor cost per pound	\$0.18	\$0.45	\$0.50	\$1.00	
	22	Utilities, packaging & supplies cost/lb	\$0.21	\$0.40	\$0.43	\$0.68	
	23	Cold storage cost per pound	\$0.00	\$0.06	\$0.06	\$0.00	
	24	Freight cost per pound	\$0.22	\$0.22	\$0.22	\$0.22	
	25	Sales commission (%)					
	26	Production (finished pounds)	222,000	300,000	35,000	50,000	607,000
	27	Direct labor cost	\$39,960	\$135,000	\$17,500	\$50,000	\$242,460
	28	Utilities, packaging & supplies cost	\$46,620	\$120,000	\$15,050	\$34,000	\$215,670
	29	Cold storage cost	\$0	\$18,000	\$2,100	\$0	\$20,100
	30	Freight cost	\$48,840	\$66,000	\$7,700	\$11,000	\$133,540
	31	Sales commission cost	\$0	\$0	\$0	\$0	\$0
32	Total processing and selling costs	\$135,420	\$339,000	\$42,350	\$95,000	\$611,770	
SALES REVENUES	33	Sales price per pound	\$0.90	\$1.75	\$4.00	\$7.00	
34	Sales revenues	\$199,800	\$525,000	\$140,000	\$350,000	\$1,214,800	

TOTAL COSTS, REVENUES, AND PROFIT	35	Total overhead costs	\$354,250
	36	Total fish cost	293,960
	37	Total processing and selling costs	\$611,770
	38	Total costs	\$1,259,980
	39	Total sales revenues	\$1,214,800
	40	Profit or loss	-\$45,180

COSTS, REVENUES, AND PROFIT PER ROUND POUND	41	Products	<i>H&G</i>	<i>Frozen fillets</i>	<i>Smoked fillets</i>	<i>Average</i>
	42	Overhead cost per round lb	\$0.35	\$0.35	\$0.35	\$0.35
	43	Fish cost per round lb	\$0.29	\$0.29	\$0.29	\$0.29
	44	Processing & selling cost per round lb	\$0.45	\$0.57	\$0.42	\$0.52
	45	Roe profit per round lb	\$0.26	\$0.26	\$0.26	\$0.26
	46	Total cost per round lb	\$0.84	\$0.96	\$0.82	\$0.91
	47	Sales price per round lb	\$0.67	\$0.88	\$1.40	\$0.86
	48	Profit per round lb including overhead	-\$0.18	-\$0.08	\$0.58	-\$0.05
	49	Profit per round lb excluding overhead	\$0.18	\$0.27	\$0.94	\$0.31

Effects of Changing Key Assumptions on Financial Analysis for "Salmon Island Fish Plant"

Scenario		1 "Most likely" assumptions	2 Low run	3 Low sales prices	4 More value added	5 High overhead
Key Assumptions	Total overhead costs	\$154,250	\$154,250	\$154,250	\$154,250	\$354,250
	Round pounds purchased	1,000,000	400,000	1,000,000	1,000,000	1,000,000
	Price paid to fishermen per lb	\$0.12	\$0.12	\$0.12	\$0.12	\$0.12
	Round pounds processed:					
	H&G	300,000	120,000	300,000	100,000	300,000
	Fillets PBO skin-on	600,000	240,000	600,000	700,000	600,000
	Smoked fillets PBO	100,000	40,000	100,000	200,000	100,000
	Sales price per pound					
	H&G	\$0.90	\$0.90	\$0.72	\$0.90	\$0.90
	Fillets PBO skin-on	\$1.75	\$1.75	\$1.40	\$1.75	\$1.75
Smoked fillets PBO	\$4.00	\$4.00	\$3.20	\$4.00	\$4.00	
Chum ikura	\$7.00	\$7.00	\$5.60	\$7.00	\$7.00	
Total costs, revenues, and profit	Total overhead costs	\$154,250	\$154,250	\$154,250	\$154,250	\$354,250
	Total fish cost	293,960	117,584	293,960	293,960	293,960
	Total processing & selling costs	\$611,770	\$244,708	\$611,770	\$620,340	\$611,770
	Total costs	\$1,059,980	\$516,542	\$1,059,980	\$1,068,550	\$1,259,980
	Total sales revenues	\$1,214,800	\$485,920	\$971,840	\$1,309,100	\$1,214,800
	Profit or loss	\$154,820	-\$30,622	-\$88,140	\$240,550	-\$45,180
Costs, revenues, and profits per round pound	H&G					
	Total cost per round lb	\$0.64	\$0.88	\$0.71	\$0.64	\$0.84
	Sales price per round lb	\$0.67	\$0.67	\$0.53	\$0.67	\$0.67
	Profit per round lb inc. overhead	\$0.02	-\$0.21	-\$0.18	\$0.02	-\$0.18
	FILLETS PBO SKIN-ON					
	Total cost per round lb	\$0.76	\$0.99	\$0.83	\$0.76	\$0.96
	Sales price per round lb	\$0.88	\$0.88	\$0.70	\$0.88	\$0.88
	Profit per round lb inc. overhead	\$0.12	-\$0.11	-\$0.13	\$0.12	-\$0.08
	SMOKED FILLETS PBO					
	Total cost per round lb	\$0.62	\$0.85	\$0.69	\$0.62	\$0.82
	Sales price per round lb	\$1.40	\$1.40	\$1.12	\$1.40	\$1.40
	Profit per round lb inc. overhead	\$0.78	\$0.55	\$0.43	\$0.78	\$0.58
	AVERAGE					
	Total cost per round lb	\$0.71	\$0.94	\$0.78	\$0.72	\$0.91
	Sales price per round lb	\$0.86	\$0.86	\$0.69	\$0.96	\$0.86
Profit per round lb inc. overhead	\$0.15	-\$0.08	-\$0.09	\$0.24	-\$0.05	

Scenario #2: Low Run

To see how a lower than expected run would affect the financial analysis for the Salmon Island Fish Plant, in Scenario #2 we reduced the total round pounds purchased (Line 10) to 400,000 pounds, compared with 1,000,000 pounds in Scenario 1. We assumed that the plant would continue to produce products in the same proportions (Line 19).

Buying less fish results in lower fish costs, lower processing and selling costs, and lower sales revenues. However, the overhead costs for the plant remain the same. As a result, in Scenario #2 the Fish Plant has a loss of \$30,662.

A different way to look at the effects of buying less fish is to look at costs, revenues and profits per round pound (Lines 42-49). The only thing that changes from Scenario #1 is the overhead costs per round pound, which increase from 15 cents/lb in Scenario #1 to 39 cents/lb in Scenario #2. Overhead costs per pound go up because the same total overhead costs are being spread over a smaller volume of fish.

With higher overhead costs per pound, the plant loses money on headed and gutted fresh fish (-21 cents per round pound) and frozen fillets (-11 cents per round pound, but it still makes money on smoked fillets (55 cents per round pound). On average it loses money (-8 cents per round pound).

Scenario #3: Low Sales Prices

To see how lower sales prices would affect the financial analysis for the Salmon Island Fish Plant, in Scenario #3 we reduced the sales price for each product (Line 33) by 20%. With lower sales prices, the plant earns less sales revenues, and instead of making a profit the plant has a loss of \$88,140.

All the costs per round pound are the same, but the roe profit per round pound is lower and the sales prices per round pound are lower. The plant loses money on headed and gutted fresh fish (-18 cents per round pound) and frozen fillets (-13 cents per round pound, but it still makes money on smoked fillets (43 cents per round pound). On average it loses money (-9 cent per round pound).

Scenario #4: More Value Added Production

To see how doing more value added production would affect the financial analysis for the Salmon Island Fish Plant, in Scenario #4 the plant produces less headed and gutted fresh fish and more frozen and smoked fillets (Line 19). Because these products are more profitable, the plant's profits increase to \$240,550.

The costs and the sales price per round pound are the same for each product. But because production shifts towards the more profitable products, the average profits per round pound are higher (24 cents/lb compared with 15 cents /lb in Scenario #1).

Scenario #5: High Overhead

To see how higher overhead costs would affect the financial analysis for the Salmon Island Fish Plant, in Scenario #5 we assumed that in addition to its other overhead costs the plant also has to make a loan payment of \$200,000 (Line 1). This increases total overhead costs to \$354,250 (Line 8).

Without the loan payment, the plant was making a profit of \$154,820 (Scenario #1). Having to pay a \$200,000 loan payment means that the plant instead has a loss of \$45,180.

Higher overhead costs for the same volume of fish cause the overhead costs to go up from 15 cents per round pound to 35 cents per round pound. The plant loses money on headed and gutted fresh fish (-18 cents per round pound) and frozen fillets (-8 cents per round pound), but it still makes money on smoked fillets (58 cents per round pound). On average it loses money (-05 cents per round pound).

Other Scenarios

The five scenarios we have looked at are only a few examples of the scenarios we could calculate for the Salmon Island Fish Plant. If your financial analysis is in a computer spreadsheet, you can quickly and easily see how your Fish Plant's profitability would be affected by many other kinds of changes in your assumptions. For example, you could see how profits are affected by changing your yield, costs, or price assumptions for just some products. You may also wish to see how changing several different assumptions at once affects your profits—for example, if you bought less fish but prices were higher.

Using Financial Analysis for Planning Your Fish Plant

Once you have prepared a financial analysis spreadsheet for your Fish Plant you can use it to help plan your plant and to make important decisions.

Understanding Your Plant's Finances

A financial analysis is a very useful tool in understanding your plant's finances and seeing how they are affected by different factors. Putting together all your assumptions about costs, sales prices, how much fish you will buy, and what you will produce can help you see things you might not have thought of. For example, it may show you that a particular product isn't profitable because your yields are too low, or transportation costs are too high. It may show you that making your plant bigger won't pay because it will add too much to your overhead costs—or that it will pay because it will allow you to install machinery that will reduce your labor costs. It may help you to spot areas where your costs are unusually high. You can use this kind of information to change your plans so your plant can be more profitable.

As you prepare your financial analysis, get other people to review it. They may spot mistakes you have made or think of things you have forgotten. They can provide a reality check for your assumptions about costs, yields, and sales prices.

Deciding Which Products to Produce

In addition to showing whether you can meet your financial objectives, your financial analysis can help you decide which products your plant should produce. Your calculations of profits per round pound (Line 48) can help show you which products are most profitable. For example, Scenario #4 showed that the Salmon Island Fish Plant could make more money by producing more value added products.

However, your plant won't necessarily be able to produce only the most profitable products. What you can produce may be limited by the availability of transportation, freezer capacity, equipment capacity, the number of workers you have, and many other factors. So you may have to produce some products which earn you less profit per round pound, but can be processed fast and can keep up with peak deliveries.

Your financial analysis may show that you are losing money on some products when you include overhead costs per pound. For example, in Scenario #2, the Salmon Island Fish Plant is losing 21 cents per round pound on fresh headed and gutted fish (Line 48).

However, even if you are losing money when you include overhead costs per pound, it may still make sense to produce that product if you don't have the option of producing other, more profitable products—as long as the product is profitable when you don't include overhead costs. That's because your overhead costs are fixed: you have to pay them regardless of what you produce. If you are going to operate the plant anyway, as long as you make more money from selling a product than the cost of buying the fish and processing and selling it, it makes sense to produce the product even if you don't earn enough to fully cover the overhead costs per pound.

For example, in Scenario #2, the Salmon Island Fish Plant would be making profits of 18 cents per round pound on fresh headed and gutted fish if overhead costs were not included (Line 49). If the plant is going to operate anyway, and if the plant doesn't have the option of switching to more profitable products, it still makes sense for it to continue to produce fresh headed and gutted fish. Even though the plant will lose money, it won't lose as much money.

Raising Financial Support

A very practical use of your financial analysis is that you can show it to people and organizations you are asking for loans or other financial assistance. Government and lending organizations will almost always want to see a financial analysis before they will be willing to give you grants or loans. They will want to see whether your financial analysis shows that your Fish Plant is likely to meet its financial objectives. They will also use the financial analysis as a measure of how careful you have been in your

planning. If you have done your financial analysis well, they are more likely to think your Fish Plant will be run well, and they will treat your request for financial assistance more seriously.

Deciding Whether or Not to Build and Operate Your Plant

The most important decision, of course, is whether or not you should build your plant and operate it. This depends on your financial objectives.

You should use your financial analysis to think carefully about whether or not you are likely to be able to meet your financial objectives. Is your Fish Plant likely to make profits, break even, or lose money? How much money are you likely to make or lose compared with your financial objectives?



As our different scenarios for the Salmon Island Fish Plant showed, how much money your Fish Plant is likely to make or lose will depend on factors that may be hard to predict, such as how much fish you can buy and your sales prices. Your financial analysis may show that your plant is neither a sure success nor a sure failure. Whether you can meet your financial objectives may depend on what happens to fish runs, fish prices, and other factors beyond your control.

In deciding whether or not to go ahead with the plant, you will need to balance how likely it is that you will or won't be able to meet your financial objectives against what kind of risk you are willing to take.

In deciding what kind of risk you should take, you also need to think about the potential consequences of not meeting your financial objectives. If you didn't make enough money, who would be hurt, and by how much? If you are building and operating the plant with your own money, then you probably want to be very careful about risking your money if the plant doesn't meet your financial objectives.



If someone else is giving you a grant or a loan to start the plant, then you may not care as much if the plant doesn't meet its financial objectives. But, whoever is providing the grant or loan may care a great deal. That is why lenders will probably want to see a careful financial analysis that demonstrates the plant is likely to be able to meet its financial objectives and that you will be able to pay back any loans they make for the plant.

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Under your "most likely" assumptions, will your plant make a profit, break even, or lose money? What is your "most likely" level of profits or losses?

How would your plant's financial performance be affected by low fish runs in your area?

How would your plant's financial performance be affected if the prices you receive for your products are lower than your "most likely" assumptions?

What other factors that are difficult to predict might affect your plant's financial performance? How would they affect it?

What are the biggest financial risks your plant faces?

Compare the results of your financial analysis with your financial objectives. Is the plant likely to meet your financial objectives?

What circumstances might keep the plant from meeting your financial objectives? How likely or unlikely is it that those circumstances could occur?

If the plant doesn't meet your financial objectives, what will the consequences be? Who will be affected, and how will they be affected?



Have you done a careful financial analysis for your Fish Plant?

Are your assumptions about fish purchases, yields, costs, and selling prices realistic? Did you avoid wishful thinking?

Have you thought about how your plant's financial performance would be affected if fish harvests or prices are lower than you assumed?

Have you thought about how likely you are to meet your financial objectives?

Have you thought about the consequences if you don't meet your financial objectives?

More Detailed Financial Analysis

Our financial analysis form is a useful way to start financial planning for your Fish Plant. But to get a loan or grant to help build a Fish Plant, you will probably need to do a more formal financial analysis as part of a business plan. Here are some other financial estimates you may need to prepare for your business plan:

Profit and Loss (“Pro Forma”) Projections. This shows your projected annual expenses, revenues, and profit or loss. It is similar to our financial analysis form except that it lists expenses and revenues by standard accounting categories (A "pro forma" financial statement is one that shows how the actual operations of a business will turn out if certain assumptions are realized.)

Pro-Forma Monthly Cash Flow Statement. This shows your monthly projected cash receipts, spending, and cash balances. For a seasonal business like a Fish Plant, often you have large expenses—such as buying supplies and starting up the plant—before you start getting income from selling your fish. A cash flow statement shows the timing of your projected income and expenses, including when you may need to borrow money and when you will pay it back.

Break-Even Analysis. This shows the sales price and volume levels at which all of your Fish Plant’s expenses would be met, including your overhead costs, fish costs, and processing and selling costs.

Capital Equipment List. This shows the facilities and equipment you have, or will need to buy, to begin operating your plant and what each item is worth or will cost.

Sources and Uses of Funds Estimate. This shows where you will get your funding to start the plant and what you will use it for.

Balance Sheet. This shows the assets, liabilities and net worth of your Fish Plant business. It provides a snapshot of the financial condition of the business at one point.

You will probably need to get help from an accountant or financial consultant in preparing these kinds of financial estimates. But if you have done the financial analysis described in this chapter, you will have already done much of the work for preparing these estimates.