Aquafarmer Information Sheet #152

Feasibility of Direct Marketing Hawaii's Cultured Freshwater Ornamentals

CENTER FOR TROPICAL AND SUBTROPICAL AQUACULTURE

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Executive Summary

Hawaii's freshwater ornamental farmers could experience an increase in net revenues by marketing and selling products directly to West Coast retailers. Still, producers face a mix of challenges and opportunities, and direct sales may not be appropriate for every business. For our investigation of freshwater ornamental wholesaling, we looked at two distribution levels for three scales of production.

The impact of an enterprise's size on profitability was examined at farms of small, large, and co-operative sizes that respectively were producing eight, 26, and 40 ornamental fish product lines with corresponding water capacities of 27,000 gallons, 180,000 gallons, and 540,000 gallons. We conducted a partial budget analysis for each farm to investigate the feasibility of a change in business strategy from farmgate sales to secondary wholesaling or to primary wholesaling. Secondary wholesaling was defined as a farm selling products to a mainland wholesaler that combines products to distribute to retailers in and around the state of Washington. Primary wholesaling was defined as a farm selling products directly to retailers in the Washington region.

Partial budget analyses were conducted using a spreadsheet model for each freshwater ornamental operation. A major component of this model was a product mix module, which we used to optimize selection of ornamental freshwater fish cultured by a farm based on sale price, farmgate price, pack density, water consumption, variety of species, and demand. Since sale prices of mainland competitors were not available, a straight markup on all products was assumed for each set of analyses. The freshwater ornamental product mixes used in our analyses were based on a secondary wholesaler scenario with annual farmgate sales of $57,649, $227,066, and $703,732 for small, large, and co-operative farms respectively.

Based on a 33% markup on farmgate prices, none of the farm scenarios benefit from a shift from farmgate sales to secondary wholesaling. The results of our partial budget analyses indicate negative effects with a net change in income of -$30,597, -$65,224, and -$3,956 for small, large, and co-operative farms respectively (or -159%, -86%, and -2% of the change in revenue). Considering the farm scenarios and added marketing costs, it is not profitable for any farm to sell directly to a regional wholesaler distributing to retailers in the Washington State area. Small, large, and co-operative scale farms would require markups of 101%, 70%, and 34% respectively on farmgate prices in order to breakeven.

At the primary wholesaler level, a farm enterprise was assumed to be able to command a markup of 200% on its farmgate price and to absorb the cost of shipping products directly to retail customers using a private carrier. At a markup of 200% (67% gross margin), it is not feasible for a small farm to market directly to retailers. The outlook for small farms is even more discouraging given the difficulty faced by a small farm to maintain eight high-value species and to find retailers interested in a distributor with a small catalog of freshwater ornamentals. In contrast, large- and co-operative-scale farms benefit from a change in business strategy to primary wholesaling, as results indicate a respective net change in income of $45,176 and $391,169 (or 12.02%, and 33.75% of the change in revenue). Small, large, and co-operative farms require markups of 207%, 174%, and 135% respectively on their farmgate prices in order to breakeven.

The analyses suggest that selling directly to retailers is only possible for large freshwater ornamental farm enterprises or through co-operatives. Given the impact of an industry discount on direct carrier shipping, however, it is feasible for even a small farm to sell directly to retailers. This investigation also suggests that collaborative efforts, in general, may provide the industry with leverage to obtain discounts on equipment, supplies, and services — discounts that could potentially improve profitability and increase Hawaii's market share of West Coast demand for freshwater ornamentals.

Introduction

Previous research on the Hawaii ornamental aquaculture industry indicates that the business is profitable at varying production levels (Brown, et al. 1994). Increasing fuel and shipping costs, however, continue to make it more difficult for Hawaii distributors to compete with the landed costs (costs after shipping) of mainland and Asian distributors. As a consequence, ornamental producers are under pressure to lower their product prices and, in some cases, are considering selling their products directly to West Coast retailers.

Direct marketing, ornamental aquaculturists hope, is an avenue with the potential to boost their profit margins and prosperity. Producers could increase their sales revenues by tapping the West Coast market that is predominantly served by distributors in Southeast Asia and Florida, explains Prabha Natarajan in an article about ornamental fish farming (*Pacific Business News*, June 28, 2002). Yet farmers must be willing to take on the added risk and responsibilities of shipping and marketing their products directly to retailers and hobbyists.

In this publication, the second of two reports, we present and discuss the results of a partial budget analysis that investigates the feasibility of direct marketing freshwater ornamentals to the West Coast. The first report, Aquafarmer Information Sheet #151, also published by and available from CTSA, described the scope and concerns of Hawaii's freshwater ornamental aquaculture industry and provided a brief outlook on the potential for direct marketing.

Methodology

A partial budget spreadsheet model reflects the additional costs and revenues that result from a shift to direct marketing to retailers or regional wholesalers. Costs considered in this partial budget analysis included changes to shipping and marketing expenses associated with West Coast distribution. The Washington region was used in this study to provide a reasonable analysis that reflects actual costs for shipping and handling.

Expenses for each farm scenario reflected volume discounts on shipping and packaging as well as size economies from marketing and sales activities. Our conservative analysis, however, did not consider additional co-operative savings or discounts on other operating expenses like feed. Risks due to losses from shipping and retailer nonpayment were considered. Local producers provided production capacity and cost information that served as the basis for determining the optimal product mix for each farm size.

In the sections that follow, we describe the mainland distribution market, product pricing and revenue, farm scenarios, and direct marketing expenses — all part of the breakeven and partial budget analyses in our feasibility study.

Mainland Market for Ornamental Products

According to mainland ornamental retailers responding to a 2002 survey (Pacific Tropical Ornamental Fish Program and Hawaiian Marine Enterprises 2002), the majority of retailers receive their ornamental fish from California, Florida, and local sources. Of the stores surveyed, 26% said they receive fish from Hawaii, with the majority (60%) of those retailers located in California and a combined 33% in Oregon and Colorado (Tamaru, Corbin, and McGovern-Hopkins 2003). Some polled retailers revealed concern about shipping, although many of them said they were satisfied with the services of their suppliers. Specifically, mainland retailers said they were concerned with fish mortality and health.

Mainland retailers recognize the high quality of Hawaii's ornamental fish, an attribute that contributes to a lower incidence of disease (Tamaru, Corbin, and McGovern-Hopkins 2003). Since shipping costs traditionally pass directly to retailers, Hawaii ornamentalists must account for this "landed cost" in their price lists to retailers. When forming their competitive pricing strategy, they must consider not only product price but also shipping, handling, and box charges incurred by West Coast ornamental retailers. Landed costs are proportionately higher for fish with low pack densities and proportionately lower for highly valued fish.

Mainland wholesalers can ship products to retailers located in major hubs more easily than their Hawaii counterparts. Consequently, Hawaii ornamentalists typically seek to market their products to retailers that are located outside of major hubs and willing to pay for the convenience of direct shipping through carriers such as FedEx.

Many national chain stores can stock approximately 80 "bread-and-butter" varieties in large volumes, and they try to minimize the number of vendors in their regular supply chain (Tamaru, Corbin, and McGovern-Hopkins 2003). A network of fewer than five producers fulfills their inventory needs on a weekly or monthly basis. If suppliers can reliably deliver quality fish, however, retailers would consider ordering from a pool of vendors larger than their typical provider list.

Revenue and Product Pricing

To remain profitable, Hawaii ornamentalists must price their ornamental products at levels that are competitive with mainland and international suppliers. Since price lists of wholesalers selling to retailers were not publicly available, we calculated expected revenues based on a markup on farmgate prices. Hawaii freshwater ornamental industry members provided and reviewed our assumed farmgate prices.

In Hawaii, more than 65% of freshwater ornamental products are distributed through wholesalers and bound for the mainland (Kam, Leung, and Tamaru 2005). Most backyard farmers sell their products at farmgate prices to secondary wholesalers (wholesalers who, in turn, sell to other wholesalers that sell directly to retailers, referring to the latter as "primary wholesalers"). Secondary wholesalers apply a farmgate price markup as their fee for services rendered to primary wholesalers, resulting in a margin of about 25% of the sale price. Such a gain is a reasonable transshipper margin (Brown, et al. 1994). A 25% gross margin (33% markup on farmgate price) was used in the first set of analyses to investigate the potential role of local farmer as a secondary wholesaler.[1]

Competitive product prices were determined based on differences between the landed costs of Hawaii producers and of Los Angeles wholesalers selling directly to Washington. Our second series of analyses considered a farmer's profitability as a primary wholesaler after taking into account landed costs resulting from direct carrier services. Since wholesale price lists were not

available, we assumed that Los Angeles wholesale prices are three times Hawaii farmgate prices (200% markup on farmgate price, i.e., a 67% gross margin), and inclusive of shipping and handling costs. Based on our discussions with local ornamental industry members, this markup level is a conservative estimate.[2]

Description of Farm Scenarios

Three production levels were considered to reflect three farm sizes: small, large, and co-operative. The production capacities by Brown, et al. (1994) served as a reference point for the farm scenarios. Constructed for each farm size, partial budgets are useful in examining the feasibility of a shift to direct marketing because they only take into account additional revenue and expenses associated with a change in business strategy. Since the partial budgets in our study do not include actual production expenses and capital outlays, which may vary according to farm practices, the results of our analysis can be generalized to farms of comparable size.

The capacity assumed for our hypothetical small facility (Farm A) reflects a total farm capacity of 27,000 gallons (or 12 tanks of 2,250 gallons), with a minimum product mix of eight varieties and a maximum monthly harvest volume of 6,750 gallons (based on a four-month cycle). This minimum product mix of eight varieties is a compromise between a small-scale farmer's ability to maintain multiple lines of fish and a retailer or wholesaler's demand for larger variety.[3] A small-scale facility is expected to support the sale of approximately two boxes to five retailers (or 10 boxes weekly). A half-time marketing person is responsible for marketing activities. Overpack allowances offset mortalities expected during transport and have become a common practice in the ornamental fish business. A risk factor of 5% was assumed for small and large scale farms (Farms A and B) to account for mortality claims beyond our overpack allowance. A 10% risk of nonpayment also was assumed for small and large farms.

For the second scenario (Farm B), we considered an operation with a capacity of 180,000 gallons (50 tanks) and the ability to support 20 to 50 species. In a given month, then, Farm B could have 45,000 gallons of ornamental products available for distribution (25% of total water volume, based on a four-month cycle). Shipping costs were based on weekly orders of six boxes to 10 customers (or an average of 60 boxes per week). Farms B and C both employ a full-time marketing person with an annual salary and fringe benefits at a total cost of $54,675.

In the co-operative scenario (Farm C), an enterprise has a total capacity of 540,000 gallons and supports at least 40 species by combining products from small-scale farmers. Such a collective can harvest approximately 135,000 gallons of ornamental products in a month (25% of the total capacity, based on a four-month cycle). Farm C, we presumed, has more leverage in its selection of buyers, resulting in less risk for

Table 1. Farm scenarios reflecting changes in facility capacity, market distribution, risk, and marketing activities.

Farm Characteristic	Small A	Large B	Co-op C
Facility			
Tank Size (Gallons)	2,250	2,250	2,250
Total Production Size (Gallons)	27,000	180,000	540,000
Volume Harvested Monthly (Gallons)	6,750	45,000	135,000
Tanks Harvested Monthly (qty)	3	20	60
Total Tank Capacity (qty)	12	80	240
Minimum Species	8	20	40
Maximum Species	20	50	80
Distribution			
Est Boxes/Order	2	5	5
Customer Accounts	5	10	30
Est. Boxes/Week	10	50	150
Monthly Cost to Maintain Each Specie	$10	$10	$10
Risk Assumptions			
Risk of Non-Payment (% Gross Revenue)	10.0%	10.0%	5.0%
Risk of Fish Mortality Claims beyond Overpack Allowance (% Wholesale Revenue)	5.0%	5.0%	2.5%
Marketing Activities			
Farmer's Expected Gross Margin	25%	25%	25%
Website Hosting Monthly Fee	$25	$40	$90
Website Monthly Updates & Maintenance	$25	$50	$75
Postage resulting from Direct Marketing (Annual)	$200	$300	$500
Direct Marketing Advertising (Annual)	$500	$1,000	$1,500
Agricultural Marketing Manager (Salary + Fringe)	$27,338	$54,675	$54,675
Other Marketing Overhead (% Wholesale Revenue)*	5.0%	5.0%	5.0%
* misc professional services, office supplies, telephone, etc for marketing			
Electronic Payment Service Fee per Transaction	$0.30	$0.30	$0.30
Electronic Payment Service Fees	Fee Schedule		
	Minimum Monthly Sales		**Rate**
		$0	2.90%
		$3,000	2.50%
		$10,000	2.20%
		$100,000	1.90%

nonpayment (5%) and reduced mortality claims (2.5%) beyond the overpack allowance. Shipping costs are based on weekly orders of five boxes to 30 customers (or about 150 boxes per week). Table 1 summarizes the details of the farm scenarios.

Direct Marketing Expenses

Depending on an entity's pricing strategy, a farm can either pass shipping and handling costs on to buyers or reflect them in the landed cost of products. In the analyses that follow, we considered both pricing strategies. Only shipping and box costs were assumed to be passed on to buyers for the first set of analyses, which explore the role of farmers as secondary wholesalers. As a result of direct marketing, a farm absorbs the additional costs of packaging materials and handling. Handling costs in our analysis included time to prepare each bag of fish, chemicals used, and packaging required. Costs for packaging materials included chemicals and inner and outer bags.

Depending on the size of fish and pack, a Florida double box can hold anywhere from 100 to 1,000 fish. A Florida double box (80 x 42.5 x 25 cm^3 or 31.4 x 16.7 x 9.8 in^3) has molded styrofoam or fiberglass insulation inserts and holds two 7 L plastic bags. For retailers seeking variety, a single box can carry several bagged varieties, if producers are willing to sell their products in small lots. For the purpose of this analysis, we assumed the use of four bags per box, which reduces the risk of potential loss due to bag wear and reflects demand for a greater variety of fish per order.

A half-time marketing person for Farm A and a full-time marketing person for Farms B and C are responsible for product marketing and promotion. We based salary levels on the median farm manager salary published by the U.S. Bureau of Labor Statistics (2004). Table 1 reflects Web-based promotion, postage, and advertising costs for each farm scenario. Based on estimates from farm co-operative financial statements (Rotan 2002), we set additional marketing expenses at 5% of wholesale revenue. A 30-cent transaction fee and a fee schedule based on monthly sales (Table 1) served as the basis for estimating costs for credit card transaction services.

Costs for boxes included the frequency of orders, freight charges ($85 per box order), and any discounts based on order quantity. We assumed that a facility would try to order quantities of more than 200 pieces in order to benefit from a bulk discount at a frequency of no more than once a month. Table 8 lists rates for cardboard and styrofoam containers (before general excise taxes).

Shipping options included airline cargo and direct carrier services (e.g., FedEx). Table 9 gives an example of the shipping rates used in our secondary wholesaler analysis. We used the cargo rate in the first set of analyses because it is the cheapest method of transport even after considering a carrier discount of 50% for industry members. For our second set of analyses, we considered direct carrier services, since primary wholesaling strategies involve shipping products directly to retailers.

In the section that follows, we provide the results of our partial budget analysis for each farm scenario under different pricing and shipping strategies.

Analysis

We conducted two series of partial budget analyses to investigate changes in marketing strategies. Our first analysis examined the prospect of farmers acting as secondary wholesalers, using assumptions outlined in Table 1. Based on a previous survey, retailers feel that delivery by carrier services like FedEx can be a value-added service and that they may be willing to pay for this added convenience (Tamaru, Corbin, and McGovern-Hopkins, 2003). Since retailers may be willing to pay more for direct shipping services, our second set of analyses focused on primary wholesalers who ship directly to retailers. Table 2 summarizes the major assumptions underlying the two series of analyses used in this study, referred to as "secondary wholesaler analysis" and "primary wholesaler analysis."

Partial budget analyses compared changes in revenues and expenses due to a transition from farmgate sales to wholesaling and assumed no significant changes to farm

Table 2. Assumptions used to analyze a farm's transition to the role of secondary or primary wholesaler.

Parameter	Secondary Wholesaler Analysis	Primary Wholesaler Analysis
Shipping	Shipping costs passed onto buyers.	Shipping costs included in sale price.
Pricing	Pricing strategy based on a markup of farmgate prices. Base scenario: Sale price yielding a 25% gross margin (33% markup).	Competitive pricing strategy based on landed cost of mainland wholesalers. Base scenario: mainland wholesaler price equal to 200% markup of Hawaii farmgate prices.[2]
Product Mix	Farm produces ornamental fish product lines which maximize wholesale revenue.	Based on product mix from secondary wholesaler analysis.

infrastructure. An optimal product mix was selected for each farm scenario that maximized wholesale revenue (see Appendix Part B for details and the landed cost for airline cargo). A breakeven analysis was also conducted, determining the minimum markup on farmgate prices required to compensate for the added costs associated with secondary and primary wholesaling activities not typically faced by farmers.

In our secondary wholesaler analysis, shipping costs were passed on to buyers directly. This exercise is consistent with current practices of Hawaii farmers selling to wholesalers on the mainland. Local farmers add shipping and box charges to their wholesaler's invoice. The landed cost of each product in our secondary wholesaler scenarios is listed in Appendix Part B. In our primary wholesaler analysis, farm revenues were based on Hawaii prices that would be competitive to Los Angeles wholesaler rates after taking into account direct-shipping costs from Hawaii.[2] Primary wholesaler analysis, thus, permitted a comparison of the effect of farm size and direct shipping when competing with Los Angeles wholesalers shipping via airline cargo. This setup represents a conservative estimate based on the largest shipping differential in comparison with other methods.

Secondary Wholesaler Analysis

Based on our secondary wholesaler analysis (Table 3), none of our farm scenarios benefit from secondary wholesaling activities (i.e. selling directly to a mainland wholesaler as a secondary-wholesaler). Results indicate negative changes in income of -159%, -86%, and -1.7% of their change in revenue for small, large, and co-operative farms respectively. To compare the relative impact of direct marketing on facilities of different sizes, we calculated the net change in income (NCI) as a percentage of the change in revenue for each farm. The farmgate price markups required for small, large, and co-operative farms to breakeven were 101%, 70%, and 34% respectively. Figure 1 illustrates the expected loss of income for each farm as a secondary wholesaler. For detailed partial budgets for our secondary wholesaler analysis, see Appendix Part C.

Farmers who sell directly to retailers eliminate intermediaries, letting them markup their products higher than the 33% we assumed for a primary wholesaler. Achieving gross margins that are higher than their breakeven margin reveals favorable implications for farms considering primary wholesale activities, selling directly to retailers. According to local ornamentalists, a typical fish with a farmgate price of 15 cents can be sold for 45 to 60 cents to a retailer (i.e., a 200%-300% markup). If a farm enterprise can provide a regular supply of quality fish and maintain gross margins that offset direct retailing expenses, then it may find profitability in selling directly to mainland retailers as a primary wholesaler. The next set of analyses explores the possibility of engaging in primary wholesaling activities for each farm scenario.

Primary Wholesaler Analysis

The primary wholesaler partial budget analyses were conducted for each farm scenario, assuming direct shipping to retailers and the same optimal product mixes that we determined in our secondary wholesaler analysis. For a small farm (Farm A) with

Table 3. Summary of the partial budget analysis for farms engaging in secondary wholesaling activities.

Farm Characteristics	Small Farm A	Large Farm B	Co-op Farm C
Avg. No. Fish per Week	2,677	16,186	48,980
Avg. No. Boxes per Weekly Order	2	5	5
Fish Product Variety	8	26	40
Est. No. of Customers	5	10	30
Avg. Shipping Weight per Weekly Order (lbs)	59	144	148
Annual Performance			
Wholesale Revenue[a]	76,866	302,755	938,309
Farmgate Revenue[b]	57,649	227,066	703,732
Change in Revenue[c]	19,216	75,689	234,577
Total Positive Impacts	40,622	144,449	448,111
Total Negative Impacts	71,219	209,673	452,068
Net Change in Income (NCI)[d], 33% farmgate markup	**($30,597)**	**($65,224)**	**($3,956)**
NCI as a % of Change in Revenue[e]	-159%	-86%	-1.7%
Breakeven Analysis			
Markup on farmgate price to breakeven	101%	70%	34%
Gross margin to breakeven	50%	41%	25%

[a] *Wholesale revenue = gross revenue based on products sold at secondary wholesaler prices - (shipping costs + box charges)*
[b] *Farmgate revenue = revenue based on products sold at farmgate prices*
[c] *Change in revenue = wholesale revenue – farmgate revenue*
[d] *Net change in Income (NCI) = total positive impacts – total negative impacts*
[e] *NCI as a % of the change in revenue = NCI / change in revenue*

prices competitive to mainland wholesalers, the resulting net change in income is a loss of $3,100 (-3.3% of the change in revenue) for direct shipping to mainland retailers. Again, it is debatable whether a small farmer could support eight product lines and unlikely that a retailer would buy products from a farmer selling as few as eight products.[3] Consequently, results of our primary wholesaler analysis for Farm A are conservative, based on our assumptions, and may be even more discouraging for a small farm interested in selling directly to retailers as primary wholesalers.

Farm A is not able to benefit from discounts for direct carrier services to a single address because it ships an average of 59 pounds to each retailer, less than the 100 pounds necessary for a discount. Currently, talks are underway to give the ornamental fish industry a discount on direct-carrier shipping rates. In some cases, discounts can be as much as 50%, a significant savings. Given a 50% industry discount from shipping carriers, the overall change in farm income is $21,583 (20% of the change in revenue). Based on our partial budget analysis (Table 4), markup on Hawaii farmgate prices must be at least 207% for a small farm to breakeven when shipping products directly to retailers, assuming a demand for the limited catalog of products offered by a small farm.

Our hypothetical large farm (Farm B) is profitable assuming prices competitive to mainland wholesalers

Figure 1. Farm performance as a secondary wholesaler.

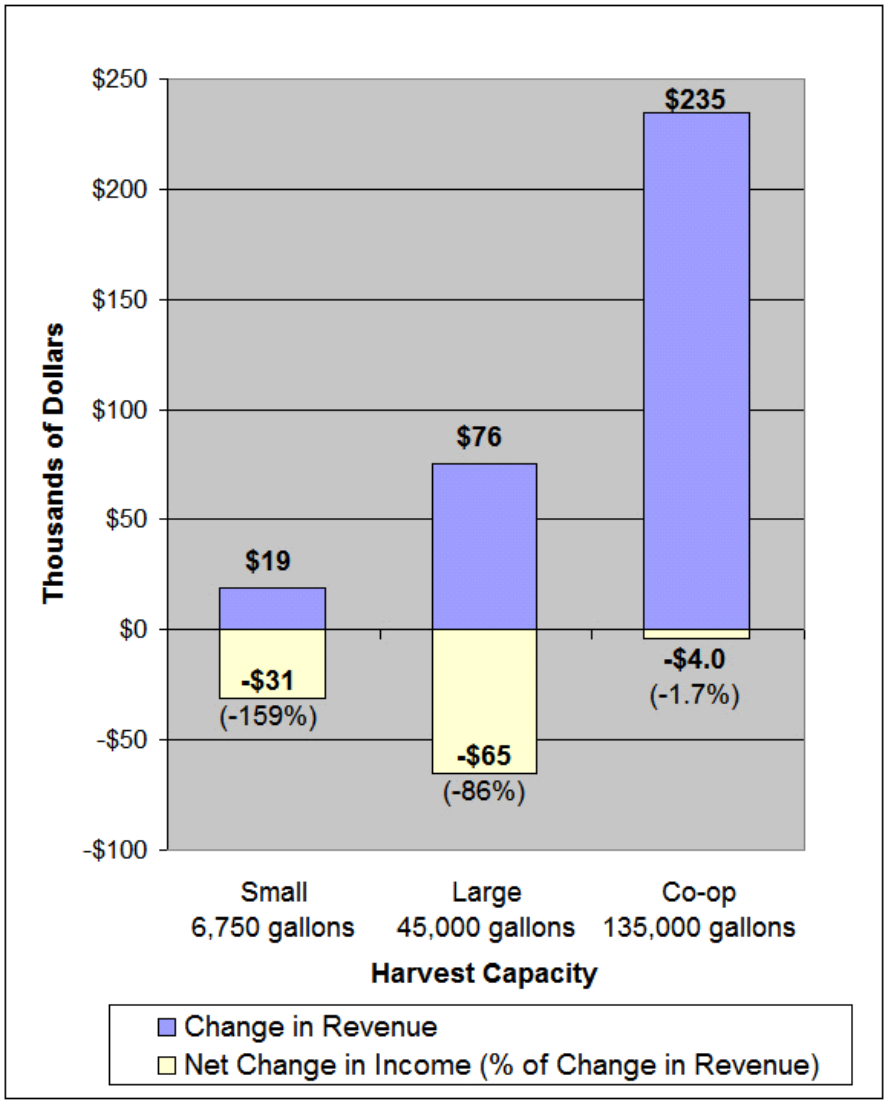


Table 4. Partial budget analysis summary for a small farm (Farm A) shipping directly to retailers as a primary wholesaler.

Annual Performance Measures	No Discount	50% Discount	Breakeven
Wholesale Revenue*	151,264	164,361	136,698
Farmgate Revenue	57,649	57,649	57,649
Change in Revenue	93,615	106,712	79,049
Total Positive Impacts	93,615	106,712	79,049
Total Negative Impacts	96,714	85,129	79,049
Net Change in Income (NCI)	($3,100)	$21,583	$0
NCI as a % of Change in Revenue	-3.31%	20.23%	0.00%
Mainland Wholesaler Rate			
(% Markup on Hawaii Farmgate Price)	200%	200%	207%
Gross Margin on Sale Price	67%	67%	67%

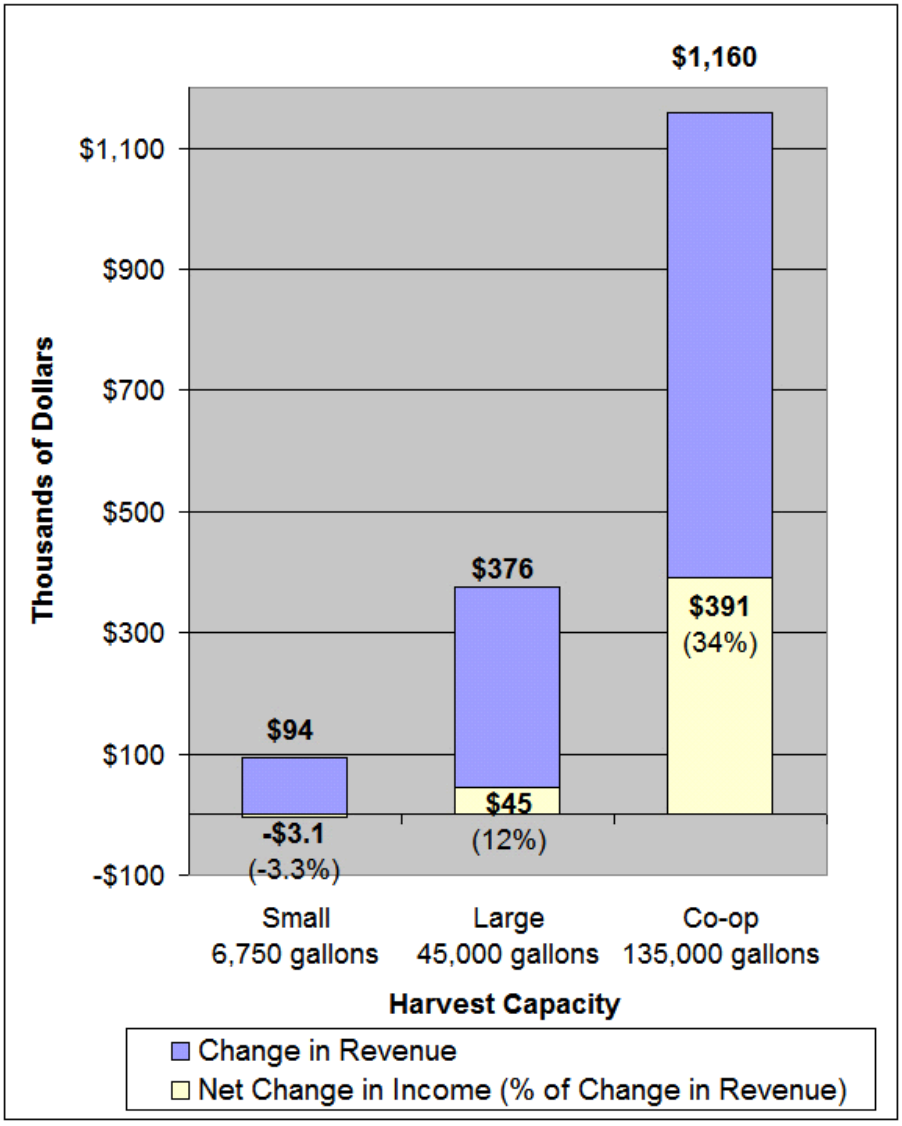
**Wholesale revenue = gross sales, which includes shipping and box charges in the primary wholesale scenarios*

(200% markup on Hawaii farmgate price). This large farm experienced a positive change in income of $45,176 (12% of the change in revenue) in our analysis (Table 5). Farm B is able to benefit from a bulk discount because it frequently ships orders that weigh more than 100 pounds. A hypothetical 50% direct carrier discount for the industry improves the scenario for large farms, with an expected change in income of $140,071 (32% of the change in revenue).

For a large farm to breakeven from selling directly to retailers, the minimum markup on its farmgate price must be 174% (a 64% gross margin). Figure 2 compares the net change in income (NCI) among primary wholesalers.

For farm co-operatives (Farm C), our hypothetical transition to direct sales to retailers as a primary wholesaler was profitable. The net change in income for direct marketing to retailers was $391,169 for a co-operative farm (34% of the change in revenue) (Table 6). With a 50% discount on direct carrier services, a co-operative farm is expected to benefit from this business strategy with a net change in income of $703,427 (or 53% of the change in revenue). At full cost for direct-shipping expenses, the minimum farmgate price markup required to breakeven is 135% (i.e., a 58% gross margin on sale price).

Figure 2. Farm performance as a primary wholesaler.



Discussion

Three levels of freshwater ornamental aquaculture production were considered in this direct marketing feasibility study. Based on our scenarios described here, no farm would profit as a secondary wholesaler selling to an intermediary who distributes to Washington retailers.

Assuming a 33% markup on its farmgate price (i.e., 25% gross margin), a co-operative farm nearly breaks even with a change in income of -$3,956 (-1.7% of its change in revenue (Table 7). Independent small and large farms (Farms A and B), results indicate, were not profitable as secondary wholesalers. They experienced a negative change in income of 159% and 86%. As expected, large and co-operative farms (Farms B and C) benefit from economies of size associated with direct marketing expenditures, unlike small farms (Farm A). Figure 3 illustrates the differences between farmgate markups required to breakeven for each scenario.

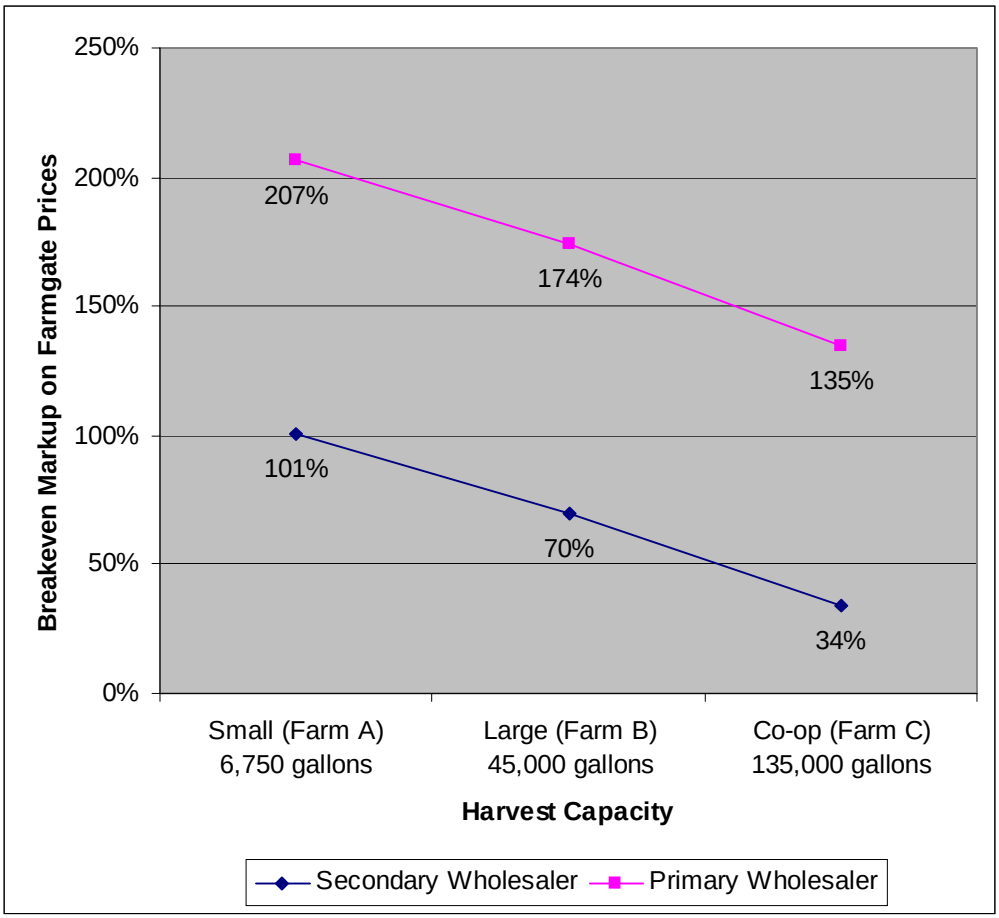
Only large and co-operative enterprises (Farms B and C) engaging in primary wholesaling activities benefited from this change in business strategy with a net change in income of 12% and 34% (Table 7). Farm A ships fish orders of approximately 60 pounds, a volume significantly lower than that of orders shipped by Farms B and C. Thus, Farm A experienced a negative impact on net income of -3.3% of the change in revenue. As illustrated in Figure 3, breakeven markups are much higher for small farms attempting to sell directly to retailers as primary wholesalers. Since small farms incur shipping charges higher than their large counterparts, a small enterprise may seek a specialization strategy in which they produce a limited variety of high-value fish. A small farm's low shipment volume to retailers (< 100 pounds) would result in a shipping cost of $56/box, versus a $45/box expense for large farms. Consequently, the ability for a small aquafarmer to find a market for and to successfully produce specialty fish is crucial to his or her success.

Although large and co-operative farms have a shipping expense rate lower than rates charged to small farms, large farms have to support a full-time marketing person and produce a wide variety of fish that includes low-revenue (or bread-and-butter) product lines to satisfy demand for a large catalog of fish (see assumptions in

Table 1). Still, large farms can spread out fixed marketing costs, marketing salary in particular, over revenues from the sale of a large volume of fish. It would be reasonable to assume that a primary wholesaler might exercise more marketing effort than a secondary wholesaler. Under such a scenario, the farmgate price markup required to breakeven would be higher than that stated in the primary wholesaler analyses.

As expected, the markup required to breakeven is higher for primary wholesaling than for secondary wholesaling. The relationship between the size of a farm enterprise and the markup required to breakeven under primary and secondary wholesaling strategies is partly a reflection of our assumption that the primary wholesaler's pricing strategy considers the direct-shipping costs faced by buyers. In comparison, our secondary wholesaler scenario assumes that cargo shipping costs are part of a buyer's cost of doing business. Thus, we presumed that direct-shipping costs affect the competitiveness of a primary wholesaler selling directly to retailers. We conducted our primary wholesaler analysis using this assumption in order to incorporate the effect of landed costs across different production levels. Additional cost savings experienced by a co-operative are influenced by our assumptions that a co-operative farm has higher quality control and greater leverage against buyer nonpayment than other farm operations. Better quality control results in lower mortality claims that do not exceed the overpack allowance.

Figure 3. Markup on farmgate prices required for a farm enterprise to breakeven under secondary and primary wholesaler conditions.



Growth of the ornamental fish industry may permit greater leverage than aquafarmers have previously experienced. Ornamental fish growers, for example, who ship their products directly to retailers, may be able to secure discounted shipping rates from carriers. As this study illustrates, an industry discount rate on shipping costs will undoubtedly improve the direct marketing outlook for farmers interested in primary wholesaling. Likewise, any coordinated industry efforts that can bring about industry discounts will allow primary wholesalers to price their products more competitively with mainland distributors and could potentially lead to an expanded retail customer base.

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Table 5. Partial budget analysis summary for a large farm (Farm B) shipping directly to retailers as a primary wholesaler.

Annual Performance Measures	No Discount	50% Discount	Breakeven
Wholesale Revenue*	602,810	653,069	544,906
Farmgate Revenue	227,066	227,066	227,066
Change in Revenue	375,743	426,002	317,840
Total Positive Impacts	375,743	426,002	317,840
Total Negative Impacts	330,567	285,932	317,840
Net Change in Income (NCI)	$45,176	$140,071	$0
NCI as a % of Change in Revenue	12.02%	32.88%	0.00%
Mainland Wholesaler Rate (% Markup on Hawaii Farmgate Price)	200%	200%	174%
Gross Margin on Sale Price	67%	67%	64%

**Wholesale revenue = gross sales, which includes shipping and box charges in the primary wholesale scenarios*

Table 6. Partial budget analysis summary for a farm co-operative (Farm C) shipping directly to retailers as a primary wholesaler.

Annual Performance Measures	No Discount	50% Discount	Breakeven
Wholesale Revenue*	1,863,247	2,022,280	1,406,780
Farmgate Revenue	703,732	703,732	703,732
Change in Revenue	1,159,515	1,318,548	703,049
Total Positive Impacts	1,159,515	1,318,548	703,049
Total Negative Impacts	768,346	615,122	703,049
Net Change in Income (NCI)	$391,169	$703,427	$0
NCI as a % of Change in Revenue	33.74%	53.35%	0.00%
Mainland Wholesaler Rate (% Markup on Hawaii Farmgate Price)	200%	200%	135%
Gross Margin on Sale Price	67%	67%	58%

**Wholesale revenue = gross sales, which includes shipping and box charges in the primary wholesale scenarios*

Table 7. Comparison of the effect of a change in business strategy from farmgate sales to secondary or primary wholesaling for different farm sizes.

Direct Marketing Strategy	Small Farm A	Large Farm B	Co-op Farm C
NCI as a % of change in revenue			
Secondary wholesaler, 33% farmgate markup	-159%	-86%	-1.7%
Primary wholesaler, 200% farmgate markup	-3.3%	12%	34%
Farmgate markup required to breakeven			
Secondary wholesaler	101%	70%	34%
Primary wholesaler	207%	174%	135%

Endnotes

[1] In this analysis, *markup* refers to the percentage calculated using the difference between sale price and farmgate price, divided by farmgate price: *markup = (sale price – farmgate price) / farmgate price.*

The *gross margin* refers to the percentage calculation based on the difference between the sale price and farmgate price, divided by the sale price: *gross margin = (sale price – farmgate price) / sale price.*

[2] A markup of 200% on farmgate prices was used for this study since Los Angeles wholesaler rates were not available. Based on anecdotal reports of 300% markups by some ornamentalists, our analysis using the 200% markup may be considered conservative.

[3] A product mix of eight varieties may be difficult for a small ornamental aquafarmer to maintain. Most retailers, however, will not deal with an aquafarmer producing too few products, e.g. less than a dozen fish. The product mix of eight species represents a compromise between these two issues: (1) the need to produce low-revenue products to support a large catalog of fish and (2) producing too few varieties of fish, a situation that requires an enterprise to find more buyers for its large volume of specific fish and, thus, increases per-order shipping costs. Consequently, small farm results may be viewed as a conservative estimate because a reduction in product lines or a requirement of improved fish variety would generate a greater loss of income than we report here.

References Cited

Brown, C., B. Cole, R. Bailey, and J. Brock. 1994. *Report on the Economics of Ornamental Fish Culture in Hawaii*. Honolulu: Pacific Business Center Program.

Bureau of Labor Statistics, U. S. Department of Labor. 2004. *Occupational Outlook Handbook*. 2004-05 Ed. http://www.bls.gov/oco/ocos176.htm (retrieved June 17, 2005).

Chapman, F. A., S. Fitz-Coy, E. Thunberg, and C.M. Adams. 1997. United States of America trade in ornamental fish. *Journal of the World Aquaculture Society 28*(1):1-10.

Kam, L. E., P. S. Leung, and C. S. Tamaru. 2005. *Directing Marketing Hawaii's Freshwater Ornamental Aquaculture Products* (Aquafarmer Information Sheet No. 151). Honolulu: Center for Tropical and Subtropical Aquaculture.

Microsoft Excel 2002. Redmond, Wash.: Microsoft.

Pacific Tropical Ornamental Fish Program and Hawaiian Marine Enterprises. 2002. *Direct Marketing of Hawaii's Tropical Fish and Plants*. Honolulu: University of Hawaii.

Rotan, B. L. 2002. *Analysis of Financial Statements: Local Farm Supply, Marketing, Co-ops, 2001* (RBS Research Report No. 197). Washington, D.C.: United States Department of Agriculture Rural Business Co-operative Service.

Tamaru, C. S., J. Corbin, and K. McGovern-Hopkins. 2003. Talk to the Experts about Marketing of Freshwater Ornamental Fishes. *Regional Notes* (CTSA) 14(1), 4-5.

Appendices

Part A: Cost Assumptions

Table 8. Rates for a standard double box.

Box Rates	Regular	Discount Rate
Styrofoam	$ 5.85	$ 5.00
Cardboard	$ 2.50	$ 2.50
Total	$ 8.35	$ 7.50

Table 9. Shipping options.

Industry Rate (50% discount)
$0.67
$1.09
$0.77
$26.14

Table 10. Shipping and handling costs for a 30-pound box shipped via airline cargo.

Shipping & Handling	Bag	Unit Price	Cost/Box
Outerbag	0.25	$0.75	$0.75
Bag (Inner)	1.00	0.50	2.00
Chemicals	1.00	0.05	0.20
Boxes w/Styrofoam	0.25	8.38	8.38
Labor (minutes)	5.00	0.13	2.67
Shipping (lb)	7.50	0.67	20.00
Total			$33.99

Table 11. Constraints used in our product optimization worksheet.

Parameter	Constraint
product lines	**minimum ≤ no. of products ≤ maximum**
harvestable capacity	**gallons harvested ≤ harvestable capacity** The harvestable capacity (in gallons) was assumed to be 25% of the total water capacity of the farm based on the 3- to 4-month production cycle.
supply	**specie production quantity ≥ minimum production quantity** The minimum production quantity for a selected product line (default of one case per month).
demand	**specie production quantity ≤ maximum production quantity** The maximum product quantity for a selected product line (default of one case per buyer-week).

Part B: Optimal Product Mix Worksheet

Our partial budget analysis was developed using Microsoft Excel 2002. This partial budget model, available upon request, is an electronic spreadsheet model that helps to determine a farm's optimal product mix and analyze the impact of a change in wholesaling strategies. Local industry members helped to update and augment product information that was based on an earlier catalog of ornamental fish (Brown, et al. 1994). Cost and sales data were generated from a product mix worksheet using Excel's Solver feature to establish the optimal product mix based on information supplied by local farmers and wholesalers. The worksheet can determine the product mix that will maximize net sales or direct profit based on farmgate price, water consumption, pack density, and overpack allowance. We chose to maximize net sales in this study because variable cost information specific to each product line was not readily available to calculate direct profit.

Product mix is constrained by the maximum and minimum number of species, harvest capacity, supply (minimum), and demand (maximum). A description of each of the constraints appears in Table 11. For harvest capacity and maximum and minimum number of product lines for each farm scenario, see Table 1.

This worksheet permits manual entry of minimum and maximum production levels in order to customize product demand to an aquafarmer's needs. Since reliable demand data for each product was not available, we used 1992 United States import data (Chapman, et al. 1997) to estimate product demand in the worksheet. The demand for all products was scaled relative to the U.S. import rates for guppies, the product with the highest import volume in 1992. For our analyses, we assumed that the demand for guppies was one box per weekly customer order. Demand for other products was approximated based on the relative percentage of other products imported. Resultant product proportions were considered reasonable, according to local ornamental industry specialists.

In this spreadsheet model, wholesale prices can be based on either a markup on farmgate price or prices competitive to Los Angeles wholesalers. For the product mixes in our secondary wholesaler analyses, we maximized wholesale revenue assuming a 33% markup on farmgate sale prices uniformly across all product lines. Since the primary wholesaler analyses assumed a 200% markup on farmgate prices and also uniformly across all product lines, the optimal product mixes are the same under the secondary and primary wholesaler conditions. Given actual wholesaler prices, competitive Hawaii prices can be calculated and would yield a product mix optimized according to wholesaler prices provided as well as to differences between Hawaii and Los Angeles shipping rates.

The ornamental product mixes assumed for each of our secondary wholesaler scenarios were based on their contribution to the farm's profit. Each product line's contribution to farm profitability is affected by the profit on the sale of each fish, stocking density, and pack density for each product. In general, a farm will want to produce highly valued fish that are in demand. High-value fish, however, often must be stocked and harvested at densities lower than fish of less value, utilizing more of a farm's production capacity. In addition, pack density is typically lower for highly valued fish than for less valuable fish, resulting in increased shipping costs per fish and the landed price of each product. Restricting demand for each product prevents an enterprise from overproducing highly valued fish that earn high profits after taking into consideration its landed price. All of these factors are incorporated in the optimization of a product mix.

Actual products assumed in each of our scenarios were based on farmgate and sale prices, stocking and packing densities, and estimated demand. They should not be considered a prescription for actual farms because farm specifics and actual demand may vary. Products with equivalent profiles (farmgate and sale prices, stocking and packing densities, and estimated demand) can be substituted.

Table 12. Ornamental product mix for the small farm scenario (Farm A).

Product	Landed Price†	Distributed Monthly
Angelfish, Asst (half-dollar)	$1.19	**165**
Angelfish, Asst (silver dollar)	$1.21	**165**
Cichlid, Jack Dempsey (large)	$1.15	**50**
Guppy, Fancy Pair	$0.49	**8,917**
Killifish, Asst 12+ varieties (male)	$1.78	**850**
Killifish, Asst 12+ varieties(pair)	$2.90	**850**
Sword, Asst 2.75"+ (xl)	$0.52	**300**
Sword, Neon/Sunset 2.75"+ (xl)	$0.52	**300**

Table 13. Ornamental product mix for the large farm scenario (Farm B).

Product	Landed Price†	Distributed Monthly
Angelfish, Asst (half-dollar)	$1.02	**331**
Angelfish, Asst (quarter)	$0.45	**331**
Angelfish, Asst (silver dollar)	$1.07	**331**
Barb, Longfin Rosey, pair	$0.63	**159**
Corydoras 1.75"-2+" (lrg)	$0.79	**124**
Guppy, Fancy Male (med.) 1.5	$0.32	**10,625**
Guppy, Fancy Pair	$0.45	**32,000**
Killifish, Asst 12+ varieties (male)	$1.75	**1,701**
Killifish, Asst 12+ varieties (pair)	$2.84	**1,701**
Mollies (med.) 2" Black/Blk Lyretail/Silver	$0.40	**2,884**
Mollies, Gold Dust (large)	$0.41	**961**
Mollies, Gold Dust (sm)	$0.40	**961**
Platies Marigold/Blue/MickeyMouse 1.75" (lrg)	$0.27	**1,116**
Platies Marigold/Blue/MickeyMouse 2+" (xl)	$0.41	**1,116**
Platies Red/RegWag/Painted 1.75" (lrg)	$0.27	**1,116**
Platies Red/RegWag/Painted 2+" (xl)	$0.41	**1,116**
Sword, Asst 2" (med)	$0.31	**646**
Sword, Asst 2.5"-2.75" (lrg)	$0.38	**646**
Sword, Asst 2.75"+ (xl)	$0.47	**646**
Sword, Green/RedVelvet/RedWag 2 (reg)	$0.33	**1,938**
Sword, Green/RedVelvet/RedWag 2.5" (large)	$0.40	**1,938**
Sword, Neon/Sunset 2" (med)	$0.31	**1,292**
Sword, Neon/Sunset 2.5"-2.75" (lrg)	$0.38	**1,292**
Sword, Neon/Sunset 2.75"+ (xl)	$0.47	**1,292**
Sword, Pineapple/Blue/RedWhBlue 2" (reg)	$0.33	**1,938**
Sword, Pineapple/Blue/RedWhBlue 2.5" (large)	$0.40	**1,938**

†Landed prices are based on airline cargo rates for the small or large farm secondary wholesaler scenarios.

Table 14. Ornamental product mix for the co-operative farm scenario (Farm C).

Product	Landed Price†	Distributed Monthly
Angelfish, Asst (half-dollar)	$1.02	**992**
Angelfish, Asst (quarter)	$0.45	**992**
Angelfish, Asst (silver dollar)	$1.07	**992**
Barb, Gold (large) 1.75+"	$0.41	**478**
Barb, Gold (med) 1.5"	$0.31	**478**
Barb, Gold (sm) 1"	$0.22	**478**
Barb, Longfin Rosey, Males	$0.45	**478**
Barb, Longfin Rosey, pair	$0.62	**478**
Barb, Rosey	$0.42	**478**
Barb, Rosey, Males	$0.42	**478**
Barb, Tiger (large)	$0.60	**478**
Cichlid, Jack Dempsey (large)	$0.87	**50**
Cichlid, Jack Dempsey (med.)	$0.47	**100**
Corydoras 1.25"-1.5" (med)	$0.53	**372**
Corydoras 1.75"-2+" (lrg)	$0.79	**372**
Guppy, Fancy Male (med.) 1.5	$0.32	**27,779**
Guppy, Fancy Pair	$0.45	**96,000**
Killifish Spec (male)	$2.78	**425**
Killifish Spec (pair)	$3.56	**425**
Killifish, Asst 12+ varieties (male)	$1.75	**5,103**
Killifish, Asst 12+ varieties (pair)	$2.83	**5,103**
Mollies (med.) 2" Black/Blk Lyretail/Silver	$0.39	**8,651**
Mollies, Gold Dust (large)	$0.41	**2,884**
Mollies, Gold Dust (sm)	$0.39	**2,884**
Platies Marigold/Blue/MickeyMouse 1.5" (med)	$0.22	**600**
Platies Marigold/Blue/MickeyMouse 1.75" (lrg)	$0.27	**3,349**
Platies Marigold/Blue/MickeyMouse 2+" (xl)	$0.41	**3,349**
Platies Red/RegWag/Painted 1.5" (med)	$0.22	**600**
Platies Red/RegWag/Painted 1.75" (lrg)	$0.27	**3,349**
Platies Red/RegWag/Painted 2+" (xl)	$0.41	**3,349**
Sword, Asst 2" (med)	$0.31	**1,938**
Sword, Asst 2.5"-2.75" (lrg)	$0.38	**1,938**
Sword, Asst 2.75"+ (xl)	$0.47	**1,938**
Sword, Green/RedVelvet/RedWag 2 (reg)	$0.33	**5,814**
Sword, Green/RedVelvet/RedWag 2.5" (large)	$0.40	**5,814**
Sword, Neon/Sunset 2" (med)	$0.31	**3,876**
Sword, Neon/Sunset 2.5"-2.75" (lrg)	$0.38	**3,876**
Sword, Neon/Sunset 2.75"+ (xl)	$0.47	**3,876**
Sword, Pineapple/Blue/RedWhBlue 2" (reg)	$0.33	**5,814**
Sword, Pineapple/Blue/RedWhBlue 2.5" (large)	$0.40	**5,814**

†Landed prices are based on airline cargo rates for the co-operative farm secondary wholesaler scenario.

Part C: Secondary Wholesaler Partial Budget Analysis

Table 15. Partial budget for a small secondary wholesaler (Farm A).

PARTIAL ANNUAL BUDGET ANALYSIS (Secondary Wholesaler)					
Net Sales	**$76,866**	**400%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$19,216	100.00%	Shipping	$17,128	89.13%
Shipping Fees Paid by Retailer	17,128	89.13%	Handling	1,370	7.13%
Box Charges Paid by Retailer	4,277	22.26%	Box Charge	4,277	22.26%
			Other Packaging Materials	1,516	7.89%
			Marketing Costs		
			Web Services Hosting	300	1.56%
			Web Services Updates/Maintenance	300	1.56%
			Postage	200	1.04%
			Direct Marketing Advertising	500	2.60%
			Electronic Payment Services	776	4.04%
			Agricultural Marketing Manager (Salary + Fringe)	27,338	142.26%
			Other Marketing Overhead	3,843	20.00%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	9,827	51.14%
			Fish Mortality Claims (% Wholesale Revenue)	3,843	20.00%
Total Positive Impacts	**$40,622**	**211.39%**	**Total Negative Impacts**	**$71,219**	**370.61%**
Net Change in Income (NCI)			**($30,597)**		
NCI as a % of Change in Revenue			**-159.22%**		

Table 16. Partial budget for a large secondary wholesaler (Farm B).

PARTIAL ANNUAL BUDGET ANALYSIS (Secondary Wholesaler)					
Net Sales	**$302,755**	**400%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$75,689	100.00%	Shipping	$48,185	63.66%
Shipping Fees Paid by Retailer	48,185	63.66%	Handling	6,674	8.82%
Box Charges Paid by Retailer	20,575	27.18%	Box Charge	20,575	27.18%
			Other Packaging Materials	7,384	9.76%
			Marketing Costs		
			Web Services Hosting	480	0.63%
			Web Services Updates/Maintenance	600	0.79%
			Postage	300	0.40%
			Direct Marketing Advertising	1,000	1.32%
			Electronic Payment Services	2,373	3.13%
			Agricultural Marketing Manager (Salary + Fringe)	54,675	72.24%
			Other Marketing Overhead	15,138	20.00%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	37,152	49.08%
			Fish Mortality Claims (% Wholesale Revenue)	15,138	20.00%
Total Positive Impacts	**$144,449**	**190.85%**	**Total Negative Impacts**	**$209,673**	**277.02%**
Net Change in Income (NCI)			**($65,224)**		
NCI as a % of Change in Revnue			**-86.17%**		

Table 17. Partial budget for a co-operative secondary wholesaler (Farm C).

PARTIAL ANNUAL BUDGET ANALYSIS (Secondary Wholesaler)					
Net Sales	**$938,309**	**400%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$234,577	100.00%	Shipping	$152,280	64.92%
Shipping Fees Paid by Retailer	152,280	64.92%	Handling	20,551	8.76%
Box Charges Paid by Retailer	61,254	26.11%	Box Charge	61,254	26.11%
			Other Packaging Materials	22,735	9.69%
			Marketing Costs		
			Web Services Hosting	1,080	0.46%
			Web Services Updates/Maintenance	900	0.38%
			Postage	500	0.21%
			Direct Marketing Advertising	1,500	0.64%
			Electronic Payment Services	8,627	3.68%
			Agricultural Marketing Manager (Salary + Fringe)	54,675	23.31%
			Other Marketing Overhead	46,915	20.00%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	57,592	24.55%
			Fish Mortality Claims (% Wholesale Revenue)	23,458	10.00%
Total Positive Impacts	**$448,111**	**191.03%**	**Total Negative Impacts**	**$452,068**	**192.72%**
	Net Change in Income (NCI)		**($3,956)**		
	NCI as a % of Change in Revenue		**-1.69%**		

Part D: Primary Wholesaler Partial Budget Analysis

Table 18. Partial budget for a small primary wholesaler (Farm A).

PARTIAL ANNUAL BUDGET ANALYSIS (Primary Wholesaler)					
Net Sales	**$151,264**	**162%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$93,615	100.00%	Shipping	$28,928	30.90%
Shipping Fees Inclusive			Handling	1,370	1.46%
Box Charges Inclusive			Box Charge	4,277	4.57%
			Other Packaging Materials	1,516	1.62%
			Marketing Costs		
			Web Services Hosting	300	0.32%
			Web Services Updates/Maintenance	300	0.32%
			Postage	200	0.21%
			Direct Marketing Advertising	500	0.53%
			Electronic Payment Services	1,733	1.85%
			Agricultural Marketing Manager (Salary + Fringe)	27,338	29.20%
			Other Marketing Overhead	7,563	8.08%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	15,126	16.16%
			Fish Mortality Claims (% Wholesale Revenue)	7,563	8.08%
Total Positive Impacts	**$93,615**	**100.00%**	**Total Negative Impacts**	**$96,714**	**103.31%**
	Net Change in Income (NCI)		**($3,100)**		
	NCI as a % of Change in Revenue		**-3.31%**		

Table 19. Partial budget for a small primary wholesaler (Farm A) shipping with a 50% industry discount.

PARTIAL ANNUAL BUDGET ANALYSIS (Primary Wholesaler)

Net Sales	**$164,361**	**154%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$106,712	100.00%	Shipping	$14,464	13.55%
Shipping Fees Inclusive			Handling	1,370	1.28%
Box Charges Inclusive			Box Charge	4,277	4.01%
			Other Packaging Materials	1,516	1.42%
			Marketing Costs		
			Web Services Hosting	300	0.28%
			Web Services Updates/Maintenance	300	0.28%
			Postage	200	0.19%
			Direct Marketing Advertising	500	0.47%
			Electronic Payment Services	1,992	1.87%
			Agricultural Marketing Manager (Salary + Fringe)	27,338	25.62%
			Other Marketing Overhead	8,218	7.70%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	16,436	15.40%
			Fish Mortality Claims (% Wholesale Revenue)	8,218	7.70%
Total Positive Impacts	**$106,712**	**100.00%**	**Total Negative Impacts**	**$85,129**	**79.77%**

Net Change in Income (NCI)	**$21,583**
NCI as a % of Change in Revenue	**20.23%**

Table 20. Partial budget for a large primary wholesaler (Farm B).

PARTIAL ANNUAL BUDGET ANALYSIS (Primary Wholesaler)

Net Sales	**$602,810**	**160%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$375,743	100.00%	Shipping	$111,365	29.64%
Shipping Fees Inclusive			Handling	6,674	1.78%
Box Charges Inclusive			Box Charge	20,575	5.48%
			Other Packaging Materials	7,384	1.97%
			Marketing Costs		
			Web Services Hosting	480	0.13%
			Web Services Updates/Maintenance	600	0.16%
			Postage	300	0.08%
			Direct Marketing Advertising	1,000	0.27%
			Electronic Payment Services	6,952	1.85%
			Agricultural Marketing Manager (Salary + Fringe)	54,675	14.55%
			Other Marketing Overhead	30,140	8.02%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	60,281	16.04%
			Fish Mortality Claims (% Wholesale Revenue)	30,140	8.02%
Total Positive Impacts	**$375,743**	**100.00%**	**Total Negative Impacts**	**$330,567**	**87.98%**

Net Change in Income (NCI)	**$45,176**
NCI as a % of Change in Revenue	**12.02%**

Table 21. Partial budget for a large primary wholesaler (Farm B) shipping with a 50% industry discount.

PARTIAL ANNUAL BUDGET ANALYSIS (Primary Wholesaler)					
Net Sales	**$653,069**	**153%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$426,002	100.00%	Shipping	$55,682	13.07%
Shipping Fees Inclusive			Handling	6,674	1.57%
Box Charges Inclusive			Box Charge	20,575	4.83%
			Other Packaging Materials	7,384	1.73%
			Marketing Costs		
			Web Services Hosting	480	0.11%
			Web Services Updates/Maintenance	600	0.14%
			Postage	300	0.07%
			Direct Marketing Advertising	1,000	0.23%
			Electronic Payment Services	7,947	1.87%
			Agricultural Marketing Manager (Salary + Fringe)	54,675	12.83%
			Other Marketing Overhead	32,653	7.67%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	65,307	15.33%
			Fish Mortality Claims (% Wholesale Revenue)	32,653	7.67%
Total Positive Impacts	**$426,002**	**100.00%**	**Total Negative Impacts**	**$285,932**	**67.12%**
	Net Change in Income (NCI)		**$140,071**		
	NCI as a % of Change in Revenue		**32.88%**		

Table 22. Partial budget for a co-operative primary wholesaler (Farm C).

PARTIAL ANNUAL BUDGET ANALYSIS (Primary Wholesaler)					
Net Sales	**$1,863,247**	**161%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$1,159,515	100.00%	Shipping	$351,948	30.35%
Shipping Fees Inclusive			Handling	20,551	1.77%
Box Charges Inclusive			Box Charge	61,254	5.28%
			Other Packaging Materials	22,735	1.96%
			Marketing Costs		
			Web Services Hosting	1,080	0.09%
			Web Services Updates/Maintenance	900	0.08%
			Postage	500	0.04%
			Direct Marketing Advertising	1,500	0.13%
			Electronic Payment Services	20,297	1.75%
			Agricultural Marketing Manager (Salary + Fringe)	54,675	4.72%
			Other Marketing Overhead	93,162	8.03%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	93,162	8.03%
			Fish Mortality Claims (% Wholesale Revenue)	46,581	4.02%
Total Positive Impacts	**$1,159,515**	**100.00%**	**Total Negative Impacts**	**$768,346**	**66.26%**
	Net Change in Income (NCI)		**$391,169**		
	NCI as a % of Change in Revenue		**33.74%**		

Table 23. Partial budget for a co-operative primary wholesaler (Farm C) shipping with a 50% industry discount.

PARTIAL ANNUAL BUDGET ANALYSIS (Primary Wholesaler)

Net Sales	**$2,022,280**	**153%**			
Additional Returns	**Change in Value**	**%**	**Additional Costs**	**Change in Value**	**%**
Revenue (change in)	$1,318,548	100.00%	Shipping	$175,974	13.35%
Shipping Fees Inclusive			Handling	20,551	1.56%
Box Charges Inclusive			Box Charge	61,254	4.65%
			Other Packaging Materials	22,735	1.72%
			Marketing Costs		
			Web Services Hosting	1,080	0.08%
			Web Services Updates/Maintenance	900	0.07%
			Postage	500	0.04%
			Direct Marketing Advertising	1,500	0.11%
			Electronic Payment Services	23,167	1.76%
			Agricultural Marketing Manager (Salary + Fringe)	54,675	4.15%
			Other Marketing Overhead	101,114	7.67%
			Reduced Returns		
Reduced Costs			Non Payment (% Gross Revenue)	101,114	7.67%
			Fish Mortality Claims (% Wholesale Revenue)	50,557	3.83%
Total Positive Impacts	**$1,318,548**	**100.00%**	**Total Negative Impacts**	**$615,122**	**46.65%**

Net Change in Income (NCI)	**$703,427**
NCI as a % of Change in Revenue	**53.35%**

For more information, please contact the
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