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Potential for Open-Air Fish Markets Outlets for Tilapia in Honduras

Omar Fúnez, Ivano Neira, and Carole Engle
Aquaculture/Fisheries Center
University of Arkansas at Pine Bluff
Pine Bluff, Arkansas, USA

Abstract

Honduran tilapia farmers face several problems regarding product size and export-quota requirements. One major obstacle is the significant production of undersized fish not suitable for the export market. Domestic markets would provide stability by offering additional market alternatives, thereby reducing risks associated with having only one target market. The goal of this project is to assess the domestic market as an alternative tilapia outlet. While the overall study includes analyses of open-air fish market, supermarket, and restaurant market outlets, this document will focus on open-air fish markets.
A random sample of all open-air fish market vendors in the major urban areas and census of the fish market vendors in the small towns in the country resulted in 66 completed fish market questionnaires. The survey showed that tilapia is a well-known product in Honduran open-air markets. Overall, 70% of open-air market vendors sold tilapia, and over half of the open-air market vendors not currently selling tilapia responded that they were very likely to sell tilapia the next year. Approximately 25% of tilapia sold was from Lake Nicaragua. However, lack of demand, high wholesale prices, and off-flavor were mentioned as primary reasons for not selling or not continuing to sell the product. Results indicated relatively stable tilapia sales in recent years; however, inconsistency in supply was a major obstacle for further market growth. The survey results appeared to indicate potential to increase tilapia sales if a consistent supply can be maintained. Nevertheless, careful attention needs to be paid to the costs of production of farm-raised fish versus wholesale prices of wild-caught tilapia. Wholesale prices of tilapia ranged from US\$0.20 to \$0.61 lb^{-1} and averaged \$0.51 lb^{-1}. It is unlikely that many tilapia farms would be able to produce and transport tilapia to open-air markets at these wholesale prices. Open-air markets do not appear to represent a profitable market outlet for farm-raised tilapia.

Introduction

Tilapia culture began in Honduras in the late 1970s (Teichert-Coddington and Green, 1997). In the early years, tilapia production was primarily characterized by small-scale, family operations with the objective of supplementing high-quality protein, and tilapia ponds were managed either extensively or semi-extensively as a supplemental agricultural activity. However, in the last decade tilapia production in Honduras has grown rapidly because of expansion of the market for fresh tilapia fillets in the United States and fiscal reforms that made Honduras more attractive to foreign investors (Humphrey, 1997). Additionally, uncertain prices and disease problems that struck shrimp farmers in the 1990s encouraged many to raise tilapia (Engle, 1997a).

Export-oriented production of tilapia targeting the US market began in 1990 and has developed rapidly (Teichert-Coddington and Green, 1997). In 1997 fifteen tilapia farms with a total water surface area of 185 ha produced tilapia on a commercial scale for export and for domestic markets. These farms produced tilapia exclusively and are owned by individuals, local investors, and international investors (Green and Engle, 2000). Tilapia exports from Honduras increased 56% (792 Mt) in 1999 compared with 1998 levels (Green and Engle, 2000). Nevertheless, exporting tilapia fillets to the US is a risky practice due to the lack of adequate infrastructure needed to export the product and the small number of brokers handling tilapia. Most successful export

Figure 1. Principal urban centers and small towns in Honduras.

companies in Central America have developed their own marketing companies in the US.

Honduran tilapia farmers currently face several problems regarding product size and export-quota requirements. One major obstacle is the production of undersized fish not acceptable for the export market. Domestic markets would provide stability by offering additional market alternatives, hence reducing risks associated with one target market. Volume requirements would likely be lower and it might be possible to sell smaller sizes of fish, thereby taking advantage of selling to different market segments. Development of a domestic market would also provide broader economic benefits such as new sources of employment and additional sources of high-quality protein for Hondurans.

Limited work has been done on markets for finfish in Central America. The few studies that have been carried out focused on the catch from commercial fisheries in Costa Rica (Scheid and Sutinen, 1979) and in Panama (Matton, 1981). Head et al. (1994) developed market guidelines for saltwater-cultured Florida red tilapia in Puerto Rico. Several studies conducted in the US have examined the potential to develop markets for tilapia (Crawford et al., 1978; Galbreath and Barnes, 1981; Nelson et al., 1983). More recently, Swanson (1995) described US market requirements for tilapia. Engle (1997b) interviewed intermediate seafood buyers in the US to determine the potential to increase sales of fresh and frozen tilapia fillets in the country. However, no systematic market information is available to provide guidance to identify potential market channels, most promising markets, and efficient marketing strategies in Central America.

Description of Surveys

A comprehensive study was designed to characterize existing open-air market channels for tilapia in Honduras and to seek strategies to further develop open-air market outlets in the country for farm-raised tilapia. The survey instrument was designed to obtain descriptive information. Questions were included on tilapia and other types of fish and seafood sold, most frequent prices of fish products sold, market channels, and seafood suppliers. Awareness and availability of tilapia were addressed through questions related to the owner's familiarity with tilapia as well as questions related to the supply of tilapia.

Direct personal interviews were conducted in Honduras in 1999 based on a random sample of fish markets in Tegucigalpa and San Pedro Sula, which are the two main urban populations countrywide, and selected small rural towns. Small rural towns were selected along the primary route from north to south through the country to collect data along a possible gradient of preferences between the Pacific and the Atlantic coasts. Honduras is one of the few countries in Central America with good access between the two coasts where this might be possible. Additional towns that were large enough to be included on maps and located to the east and west of the Tegucigalpa–San Pedro Sula highway were included. All of the following towns were included in the study: Catacamas, Juticalpa, Santa María del Real, and Campamento in the Olancho Department; Siguatepeque, Comayagua, Lago de Yojoa in the Comayagua Department; Puerto Cortéz in the Cortéz Department; and Santa Barbara y Choluteca in the department of the same name (Figure 1).

Only the vendors with a market stand within the market were interviewed. Itinerant vendors selling fish outside the market area were excluded from the survey.

Characteristics of clientele and of fish markets were necessary to interpret responses to the survey. Questions were asked about the size of stands and characteristics of the owners and businesses.

The response rate was very high. This is likely due to the novelty of market surveys in Honduras. People were surprised to be asked to participate but were extremely cooperative. The response rate was 100% for the fish market survey, and 66 completed questionnaires were obtained.

The 40 potential questions on the survey were directed towards the vendors or owners of the fish market stands. Interviews lasted approximately seven minutes.

The data collected were analyzed in Survey Pro® software. Cross-tabulations were developed to compare responses by region (Central-South and North). Additional cross-tabulations were developed to compare responses by supermarkets that sold, never sold, or used to sell tilapia; reasons why supermarkets never sold tilapia; likelihood of beginning to sell tilapia; years the stand had been selling tilapia; current sales of tilapia in the survey year compared to one and two years ago; and type and origin of tilapia suppliers.

Characteristics of Honduran Open-Air Fish Markets

Overall 32% of the open-air fish market vendors interviewed were located in Tegucigalpa. Another 25% were located in San Pedro Sula and 21% in Comayaguela. The remaining 22% were located in the towns of Puerto Cortéz, Choluteca, Santa Barbara, Catacamas, Juticalpa, La Paz, Siguatepeque, and Comayagua (Table 1). Overall, 65% were in the Central-South region and 35% were in the North region. Of the total number of respondents, 42% were located in small towns and the remaining 58% in urban areas.

Open-air fish market vendors originally came from a variety of locations (Table 2). Equal percentages came the two main urban areas of Tegucigalpa and San Pedro Sula, but many also came from the towns of San Lorenzo, Choluteca, Olancho, Langue, Nacaome, La Paz, Travesia, and Santa Barbara.

The average age of fish market vendors was 38 years (Table 3). There appeared to be little difference

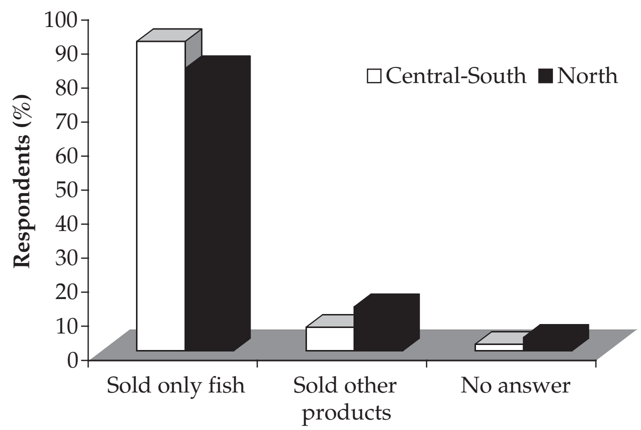

Figure 2. Percentage of open-air fish market vendors that reported selling products other than fish, by region. Open-air fish market survey, Honduras, 1999.

Table 1. Location of open-air fish market vendors interviewed in Honduras. Open-air fish market survey, Honduras, 1999.
[a] Catacamas, Juticalpa, La Paz, Siguatepeque, Comayagua.

Stand Location	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
Tegucigalpa	21	49	0	0	21	32
San Pedro Sula	0	0	17	74	17	25
Comayaguela	14	32	0	0	14	21
Puerto Cortéz	0	0	6	26	6	9
Choluteca	3	7	0	0	3	5
Santa Barbara	2	5	0	0	2	3
Other [a]	3	7	0	0	3	5
Total	43	100	23	100	66	100

Table 2. City of origin of owners of open-air fish market stands, by region. Open-air fish market survey, Honduras, 1999.
[a] Nacaome, La Paz, Travesia, and Santa Barbara.

City of Origin	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
San Pedro Sula	1	2	8	35	9	14
Tegucigalpa	7	16	2	9	9	14
San Lorenzo	6	14	0	0	6	9
Choluteca	4	9	1	4	5	8
Olancho	3	7	1	4	4	6
Langue	3	7	0	0	3	4
Other [a]	19	44	11	48	30	45
Total	43	100	23	100	66	100

Table 3. Age of owners of open-air fish market stands, by region. Open-air fish market survey, Honduras, 1999.

Range of Ages (yr)	Region of Country									
	Central-South				*North*				*Total*	
	Female		Male		Female		Male			
	N	%	N	%	N	%	N	%	N	%
20–25	4	15	3	19	2	25	0	0	9	14
26–30	6	22	3	19	0	0	3	20	12	18
31–35	7	26	1	6	0	0	3	20	11	17
36–40	0	0	4	25	4	50	2	13	10	15
41–45	3	11	0	0	0	0	2	13	5	8
46–50	3	11	2	13	1	13	3	20	9	14
51–55	3	11	2	13	0	0	1	7	6	9
56–60	1	4	1	6	1	13	1	7	4	6
Total	27	100	16	100	8	100	15	100	66	100
Weighted Average	36		37		38		40		38	

Table 4. Years of education of open-air fish market vendors, by gender and by region. Open-air fish market survey, Honduras, 1999.

Years of Education	Region of Country									
	Central-South				*North*				*Total*	
	Female		Male		Female		Male			
	N	%	N	%	N	%	N	%	N	%
< 5	14	52	10	63	5	62	5	33	34	51
6–10	7	26	2	12	3	38	5	33	17	26
11–15	4	14	1	6	0	0	4	27	9	14
16–20	1	4	3	19	0	0	1	7	5	8
No Answer	1	4	0	0	0	0	0	0	1	1
Total	27	100	16	100	8	100	15	100	66	100
Weighted Average	6		7		5		8		6	

Table 5. Distance (km) from the open-air fish market vendors' house to location of their fish market stand, by region. Open-air fish market survey, Honduras, 1999.

Distance (km)	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
< 5	31	72	12	52	43	65
6–10	7	17	4	17	11	17
11–50	1	2	5	22	6	9
> 50	3	7	2	9	5	8
No Answer	1	2	0	0	1	1
Total	43	100	23	100	66	100

Table 6. Size of open-air fish market stands, by region. Open-air fish market survey, Honduras, 1999.

Size (m^2)	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
1–5	14	33	13	56	27	41
6–10	18	42	2	9	20	30
11–20	7	16	2	9	9	14
21–40	1	2	2	9	3	5
41–80	2	5	4	17	6	9
No Answer	1	2	0	0	1	1
Total	43	100	23	100	66	100
Weighted Average	10		17		13	

Table 7. Frequently-mentioned clientele groups of open-air fish markets, by region. Open-air fish market survey, Honduras, 1999.

Clientele Group	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
Middle-Income Mestizo	42	98	20	87	62	94
Low-Income Mestizo	30	70	16	70	46	70
High-Income Mestizo	8	19	4	17	12	18
International	5	12	1	4	6	9
Middle-Income Black	1	2	2	9	3	5
Low-Income Black	1	2	0	0	1	2
High-Income Black	0	0	1	4	1	2

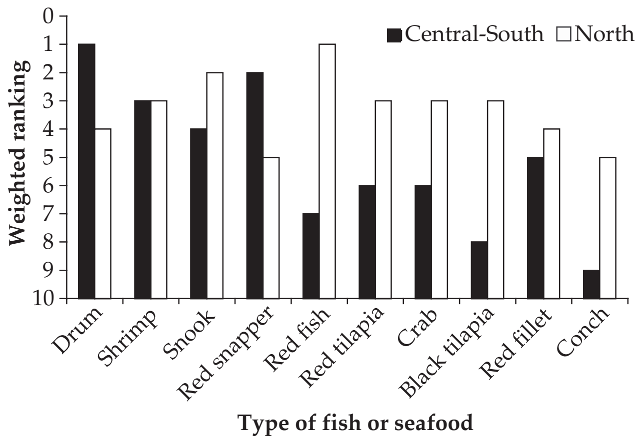

Figure 3. Weighted ranking of top fish and seafood products in terms of sales, by region. Open-air fish market survey, Honduras, 1999, (1 is the top ranking.)

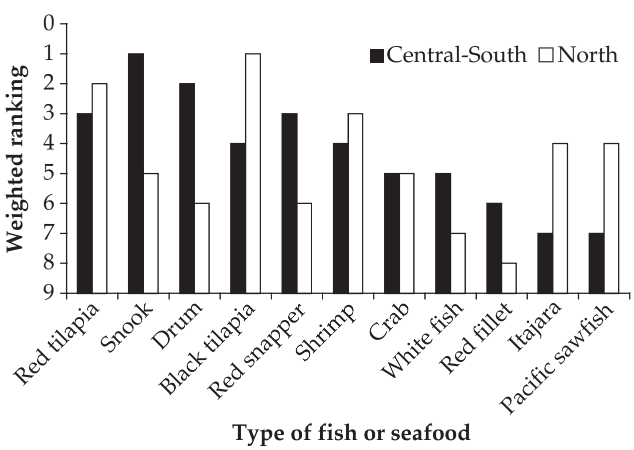

Figure 4. Weighted ranking of fish and seafood items with fastest sales growth, by region. Open-air fish market survey, Honduras, 1999. (1 is the top ranking.)

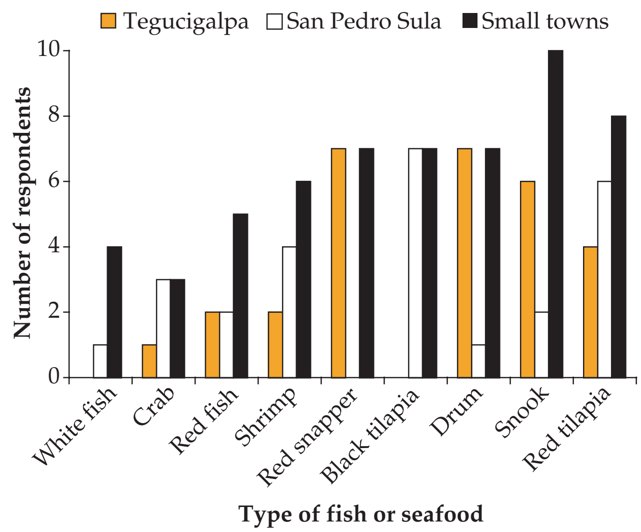

Figure 5. Fish and seafood items with fastest sales growth, by store location. Open-air fish market survey, Honduras, 1999.

in age between male and female vendors or between regions. Ages ranged from 20 to 60 years.

The average number of years of education completed by open-air fish market vendors was six (Table 4). There was little difference according to gender or region. Half of respondents had less than five years of education.

The majority of fish vendors traveled less than 5 km from their home to the fish market (Table 5). Another 17% traveled 6 to 10 km, but 17% traveled more than 10 km.

The area of most fish market stands was small (1 to 5 m^2) (Table 6). Nearly a third (30%) had slightly larger stands with an area of 6 to 10 m^2. Another 14% had stands of 11 to 20 m^2, and 14% had large stands with an area greater than 20 m^2.

Table 8. Rent (US$) per week paid by open-air fish market vendors, by region. Open-air fish market survey, Honduras, 1999.

Rent Paid (US$ wk^{-1})	Region of Country					
	Central-South		North		Total	
	N	%	N	%	N	%
0.66–1.33	10	23	8	34	18	27
1.40–3.30	12	28	3	13	15	23
3.40–6.67	10	23	2	9	12	18
6.73–33.33	2	5	6	26	8	12
> 33.00	0	0	2	9	2	3
No Answer	9	21	2	9	11	17
Total	43	100	23	100	66	100
Weighted Average	3.92		10.35		5.55	

Table 9. Number of trips per week to purchase fish and seafood products, by region. Open-air fish market survey, Honduras, 1999.

Category (trips wk^{-1})	Region of Country					
	Central-South		North		Total	
	N	%	N	%	N	%
One	6	38	1	20	7	33
Two	8	50	1	20	9	43
> Four	1	6	2	40	3	14
No Answer	1	6	1	20	2	10
Total	16	100	5	100	21	100

Table 10. Cost (US$) per trip to purchase fish and seafood products, by region. Open-air fish market survey, Honduras, 1999.

Transportation Cost (US$ per trip)	Region of Country					
	Central-South		North		Total	
	N	%	N	%	N	%
1.33–33.00	5	31	2	40	7	33
33.01–67.00	2	13	1	20	3	14
67.01–200.00	5	31	0	0	5	24
201.00–500.00	1	6	0	0	1	5
No Answer	3	19	2	40	5	24
Total	16	100	5	100	21	100
Weighted Average	75.00		17.00		61.00	

The majority of customers of open-air fish market vendors were middle- and low-income mestizos (Table 7). Only 18% of respondents indi-

Table 11. Amount (US$) of ice expenditure per day for open-air fish market vendors, by region. Open-air fish market survey, Honduras, 1999.

Ice Expenditures (US$ d^{-1})	Region of Country					
	Central-South		North		Total	
	N	%	N	%	N	%
0.66–1.33	7	16	2	9	9	14
1.40–5.30	12	28	9	39	21	32
5.40–13.30	2	5	3	13	5	8
13.40–40.00	4	9	0	0	4	6
No Answer	18	42	9	39	27	41
Total	43	100	23	100	66	100
Weighted Average	4.05		2.62		3.53	

cated that high-income mestizos purchased fish from them. Another 9% mentioned international customers, and 9% mentioned black costumers. Regionally, there appeared to be more international customers in the Central-South region and a higher percentage of black customers in the North region.

Open-air fish market vendors specialized in selling fish and seafood. The majority (88%) of open-air fish market vendors interviewed in both the Central-South and North region indicated that they sold only fish in their stands (Figure 2).

Drum was the top fish and seafood product sold in open-air fish markets in the Central-South region. This was followed by red snapper, shrimp, snook, and "red" fillets (Figure 3). In the North, "red" fish was the top fish product, followed by snook, shrimp, red tilapia, crab, and black tilapia.

In terms of fastest sales growth, snook was the fastest in the Central-South region, followed by drum, red tilapia, and red snapper (Figure 4). In the North region, black tilapia was indicated to have the fastest sales growth, followed by red tilapia, shrimp, itajara, and Pacific sawfish.

In small towns snook had the fastest sales growth, followed by red tilapia (Figure 5). Tilapia was not listed as high in terms of fastest sales growth in Tegucigalpa as it was in the Central-South region as a whole.

Weekly rent paid by vendors for stands in open-air fish markets averaged US$5.55 (original amounts were converted from Honduran lempiras to US dollars at the prevailing rate of Lps. 15 = US$1). Half of the respondents paid from $0.66 to $3.30 a week to

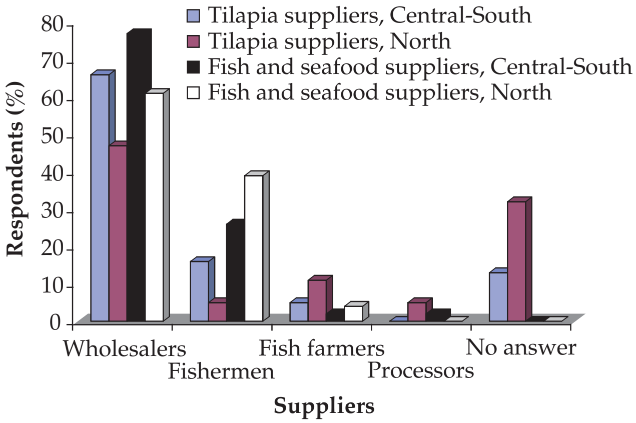

Figure 6. Comparison between tilapia and other fish and seafood suppliers, by region. Open-air fish market survey, Honduras, 1999.

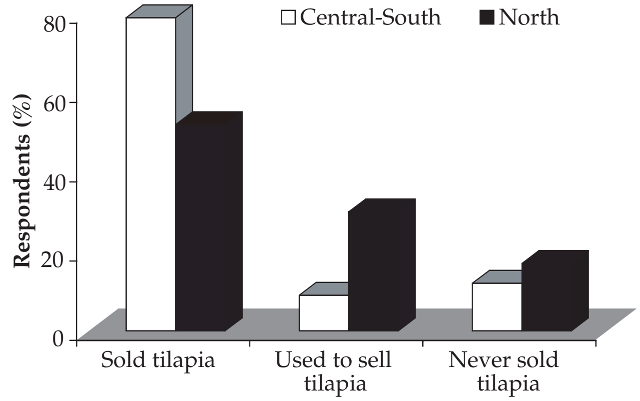

Figure 7. Percentage of open-air fish markets that sold, never sold, or used to sell tilapia, by region. Open-air fish market survey, Honduras, 1999.

Table 12. Number and percentage of fish and seafood suppliers, by region. Open-air fish market survey, Honduras, 1999.

Number of Suppliers	**Region of Country**					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
1–4	13	32	8	36	21	33
5–8	20	49	8	36	28	44
9–2	5	12	3	14	8	13
> 12	3	7	3	14	6	10
Total	41	100	22	100	63	100

rent their stands (Table 8).

More fish market vendors made two trips per week to purchase fish and seafood products (Table 9). However, one-third made only one trip per week and another 14% made more than four trips per week. Vendors in the North tended to take more trips per week than vendors in the Central-South region.

The cost per trip to purchase seafood varied widely, but a higher percentage (33%) of respondents had a cost of from $1.33 to $33 per trip (Table 10). Five percent of vendors had costs in the range of $201 to $500 per trip.

Expenditures on ice varied widely, from $0.66 to $40 per day for fish market vendors (Table 11). Nearly one-third of respondents spent from $1.40 to $5.30 per day on ice. On average, ice expenditures were $3.53 per day.

The greatest number of fish market vendors purchased fish from five to eight different suppliers (Table 12). Another 13% purchased from nine to twelve different suppliers.

A higher percentage of fish vendors in the Central-South region purchased from fish farms (7%) than did fish vendors in the North (0%). Most fish and seafood was purchased from wholesalers (Figure 6). A relatively higher percentage of vendors in the North region purchased fish and seafood from fishermen.

Tilapia Sales

Overall, 70% of the respondents sold tilapia, 17% used to sell, and 14% never sold tilapia (Figure 7). A much higher percent of respondents in the Central-South region sold tilapia (79%) as compared to only 52% of respondents in the North region. The North region had a higher percentage (30%) of vendors who used to sell than the Central-South (9%).

Tilapia sales appeared to have been relatively stable. Equal percentages of respondents indicated that they were selling more and less tilapia compared to two years previously, and 20% of respondents indicated that sales had remained constant from 1999 to 2000 (Table 13).

The greatest number of fish market vendors had been selling tilapia for only four to six years (Table 14). The second most frequent length of time selling tilapia was one to three years. Only 9% of fish market vendors had been selling tilapia for more than 11 years.

Fish market vendors who sold tilapia had more years of education on average than those who never

Table 13. Current sales volumes of tilapia compared to one year and two years ago, by region. Open-air fish market survey, Honduras, 1999.

Current Sales Volumes	**One Year Ago**						**Two Years Ago**					
	Central-South		*North*		*Total*		*Central-South*		*North*		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
More Tilapia	11	33	5	42	16	36	13	39	4	33	17	38
Less Tilapia	12	36	2	17	14	31	12	36	4	33	16	36
Same	8	24	5	42	13	29	5	15	4	33	9	20
No Answer	2	6	0	0	2	4	3	9	0	0	3	7
Total	33	100	12	100	45	100	33	100	12	100	45	100

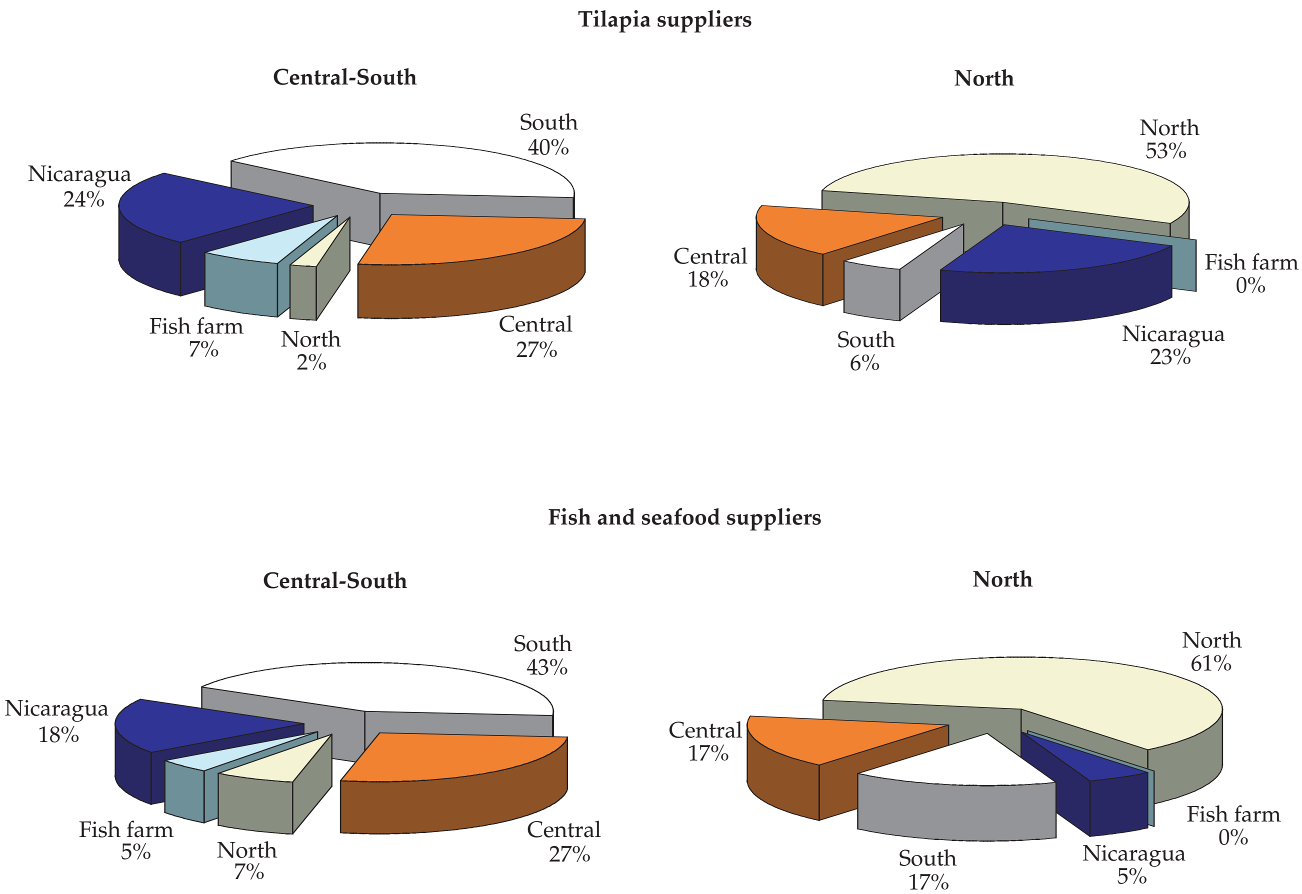

Figure 8. Origin of tilapia and seafood suppliers, by region. Open-air fish market survey, Honduras, 1999.

sold and these who used to sell tilapia (Table 15). This was true for both female and male vendors.

Approximately 24% of tilapia supplies were purchased from Nicaragua (Figure 8). This was equally true for both the North and Central-South regions. Most tilapia supplies were purchased in the same region as the vendors. Only 2 to 6% of tilapia supplies were purchased from the other region in the country.

Newer stands (less than ten years old) had higher percentages of vendors who sold tilapia (Table 16). This was particularly true in the Central-South region. The greatest number of fish market vendors had only one to four suppliers of tilapia

Table 14. Number of years that open-air fish market vendors had been selling tilapia. Open-air fish market survey, Honduras, 1999.

Years Selling Tilapia	Region of Country					
	Central-South		North		*Total*	
	N	%	N	%	N	%
1–3	11	29	5	26	16	28
4–6	18	47	5	26	23	40
7–11	4	11	5	26	9	16
12–25	2	5	3	16	5	9
No Answer	3	8	1	5	4	7
Total	38	100	19	100	57	100
Weighted Average	5		7		6	

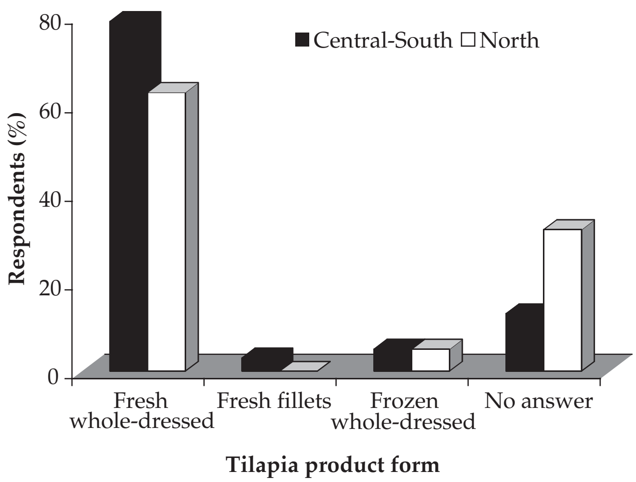

Figure 9. Tilapia product form preferences of open-air fish market vendors, by region. Open-air fish market survey, Honduras, 1999.

(Table 17). Another 30% had only five to eight suppliers.

The top selling product form of tilapia was fresh whole-dressed (74%) followed by either frozen whole-dressed or fresh fillets (4%) (Figure 9). The remainder of the respondents (21%) did not answer the question. Fresh whole-dressed tilapia was preferred by 79% and 63% of the open-air fish market vendors in the Central-South and North regions, respectively. In contrast, no open-air fish market vendors in the North sold fresh fillets, while two open-air fish market vendors in the Central-South did.

Almost 70% of the open-air fish market vendors in the North region sold from 50 to 100 lb d^{-1} of fresh whole-dressed tilapia, compared to 40% in the Central-South region (Figure 10). More than half of the open-air fish market vendors in the Central-South reported selling less than 30 lb d^{-1} of fresh whole-dressed tilapia.

The most frequently mentioned price (93% of respondents) for fresh whole-dressed tilapia were \$0.68 lb^{-1}, but prices as high as \$0.87 lb^{-1} were reported (Figure 11). There were some regional differences in the responses to this question. Most fish vendors in the Central-South region (65%) mentioned retail prices of fresh whole-dressed tilapia of \$0.33 to \$0.80 lb^{-1}.

Wholesale prices of fresh whole-dressed tilapia averaged \$0.51 per lb and ranged from \$0.20 to more than \$0.60 lb^{-1} (Figure 12). Fresh tilapia fillets and frozen whole-dressed tilapia wholesale prices averaged \$0.58 lb^{-1} and ranged from \$0.20 lb^{-1} to \$0.80 lb^{-1}.

Table 15. Open-air fish market vendors who reported that they sold, never sold, or used to sell tilapia, by years of education. Open-air fish market survey, Honduras, 1999.

Years of Education	Sold Tilapia				Never Sold Tilapia				Used to Sell Tilapia				Total	
	Female		*Male*		*Female*		*Male*		*Female*		*Male*			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
< 5	12	48	6	30	6	86	1	50	1	50	8	89	34	52
6–10	8	32	6	30	1	14	1	50	1	50	0	0	17	26
11–15	4	16	5	25	0	0	0	0	0	0	0	0	9	14
16–20	1	4	3	15	0	0	0	0	0	0	1	11	5	8
Total	25	100	20	100	7	100	2	100	2	100	9	100	65	100
Weighted Average	7		9		3		5		5		4		7	

Table 16. Open-air fish market vendors who sold, never sold, or used to sell tilapia, by years in business and by region. Open-air fish market survey, Honduras, 1999.

Years in Business	Region of Country																	
	Central-South								*North*								*Total*	
	Sold Tilapia		Never Sold Tilapia		Used to Sell Tilapia		Total		Sold Tilapia		Never Sold Tilapia		Used to Sell Tilapia		Total			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0–5	17	89	2	11	0	0	19	44	2	50	0	0	2	50	4	18	23	35
6–10	6	75	1	12	1	12	8	19	4	33	3	25	5	42	12	52	20	30
11–15	7	78	1	11	1	11	9	21	2	67	1	33	0	0	3	13	12	18
16–20	3	60	0	0	2	40	5	12	3	100	0	0	0	0	3	13	8	12
21–40	1	50	1	50	0	0	2	5	1	100	0	0	0	0	1	4	3	5
Weighted Average	6.13		11.20		14.12		8.72		12.20		9.13		6.43		9.91		9.14	

Table 17. Number and percentage of tilapia suppliers, by region. Open-air fish market survey, Honduras, 1999.

Number of Suppliers	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
1–4	14	37	10	53	24	42
5–8	15	40	2	11	17	30
> 8	4	11	1	5	5	9
No Answer	5	13	6	32	11	19
Total	38	100	19	100	57	100

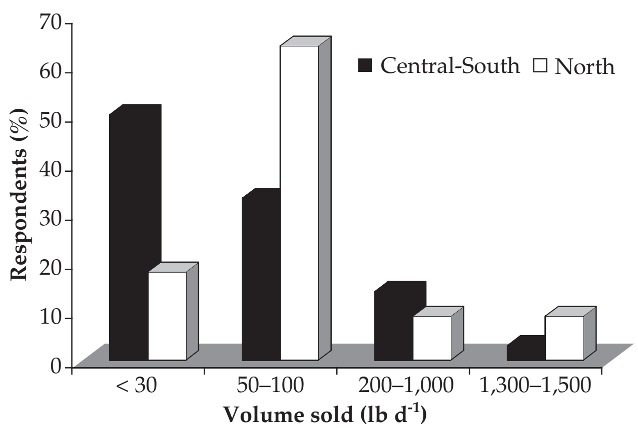

Figure 10. Volume sold (lb d^{-1}) of fresh whole-dressed tilapia in each region. Open-air fish market survey, Honduras, 1999.

Table 18. Specific problems reported with consistency of tilapia supplies, by region. Open-air fish market survey, Honduras, 1999.
[a] Multiple answers to this question resulted in totals over 100%.

Category	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
Seasonal Availability	16	64	6	86	22	69
Insufficient Quantity	11	44	5	71	16	50
Unreliable Quality	7	28	0	0	7	22
Availability of Product Form	5	20	1	14	6	19
Earthy Flavor	4	16	2	29	6	19
Other	2	8	2	29	4	13
No Answer	1	4	0	0	1	3
Number of Respondents [a]	25	184	7	229	32	195

Problems with Tilapia Supply

More than half (56%) of respondents indicated that they had problems with tilapia supply (Figure 13). Another 19% of respondents indicated that their supply of tilapia had been consistent. Sixty-six percent of respondents in the Central-South region reported inconsistent tilapia supplies, whereas only 37% of respondents in the North indicated inconsistent supplies.

Of those respondents who reported problems with tilapia supplies, the most frequently mentioned problem (69%) was seasonal availability (Table 18). Half of the vendors mentioned insufficient quantity. A smaller number mentioned unreliable quality, availability of product form, and earthy flavor.

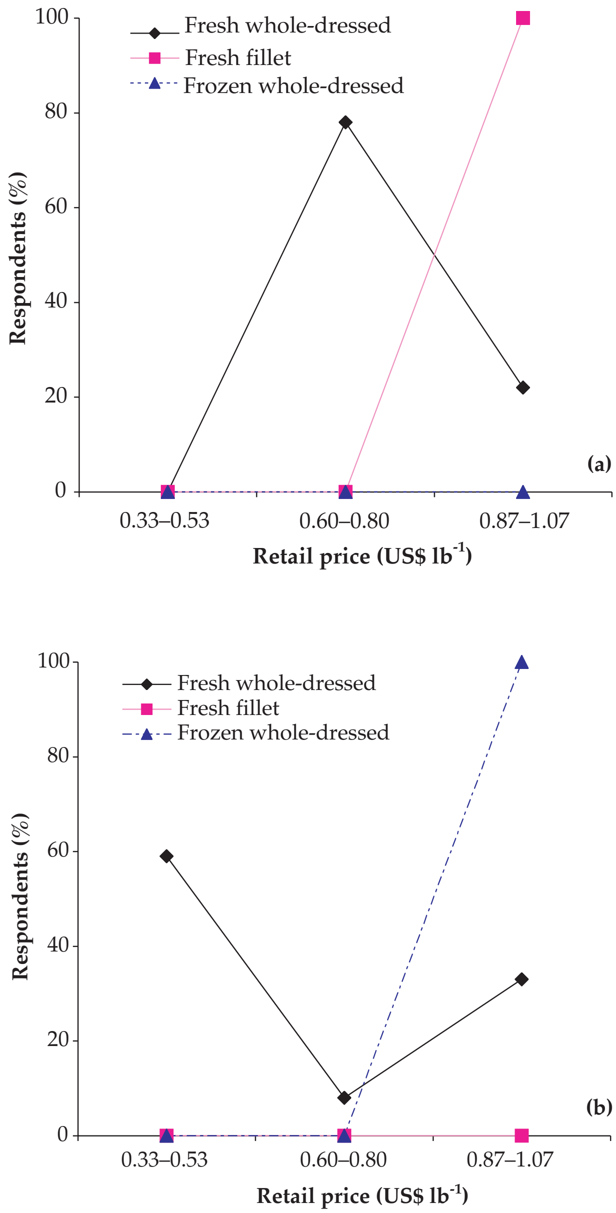

Figure 11. Retail price (US$ lb^{-1}) of tilapia by product form, by region [(a) Central-South, (b) North]. Open-air fish market survey, Honduras, 1999.

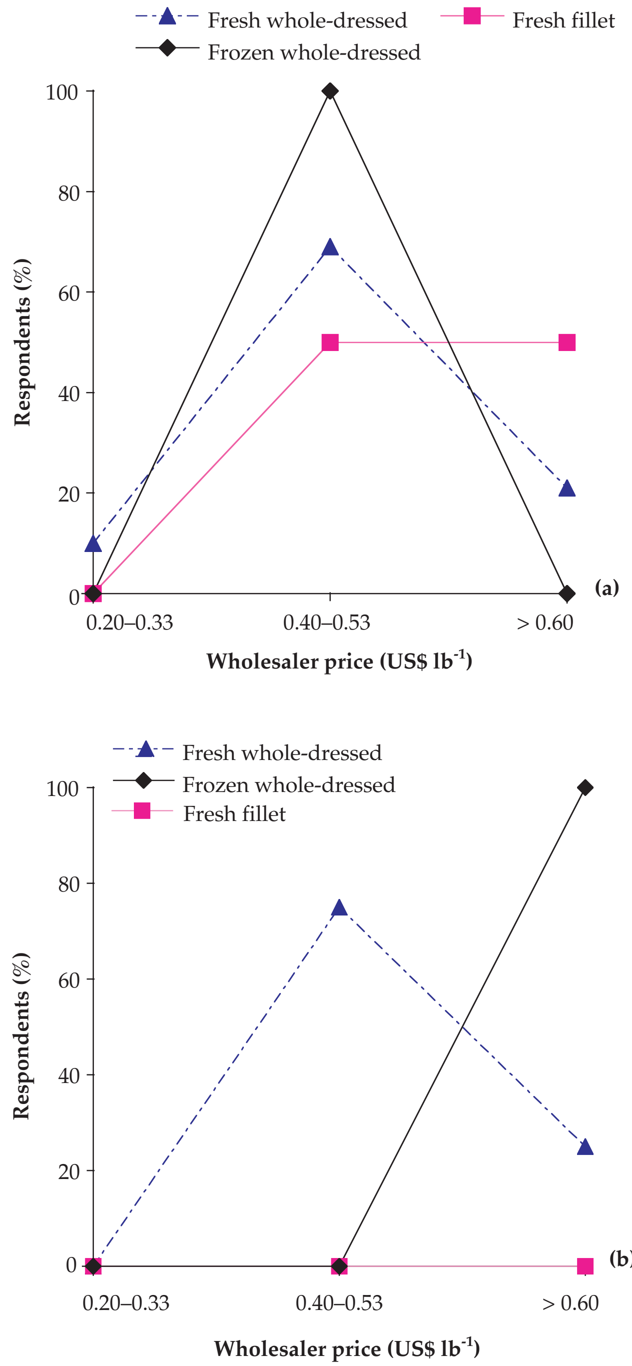

Figure 12. Wholesale prices (US$ lb^{-1}) of tilapia by product form, by region [(a) Central-South, (b) North]. Open-air fish market survey, Honduras, 1999.

Marketing Channels for Farm-Raised Tilapia as Compared to Marketing Channels for Wild-Caught Tilapia

Figure 14 presents the more important marketing channels used for wild-caught tilapia in Honduras. The majority of open-air fish market vendors interviewed who were selling wild-caught tilapia indicated that they purchased this product from wholesalers or intermediaries. Purchasing directly from fishermen was mentioned as the second most important marketing channel for wild-caught tilapia.

The majority of open-air fish market vendors interviewed mentioned that wholesalers or intermediaries were the most important marketing channels

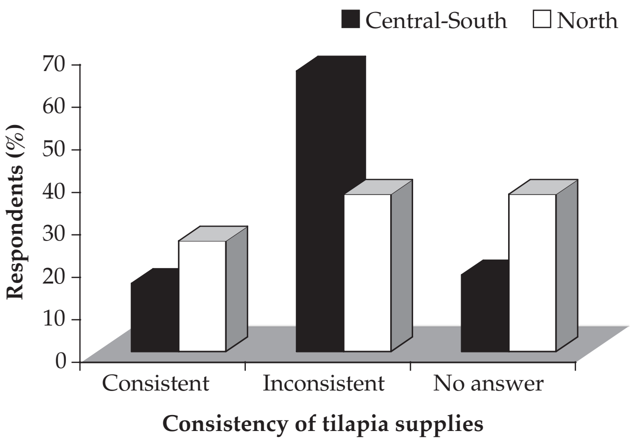

Figure 13. Consistency of tilapia supplies, by region. Open-air fish market survey, Honduras, 1999.

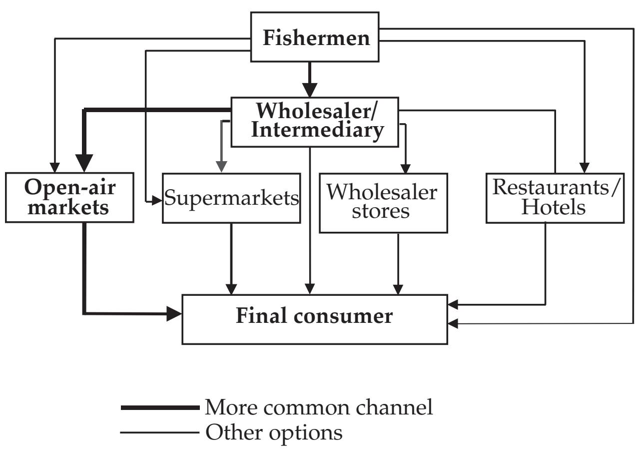

Figure 14. Marketing channels for wild-caught tilapia in Honduras. Open-air fish market survey, Honduras, 1999.

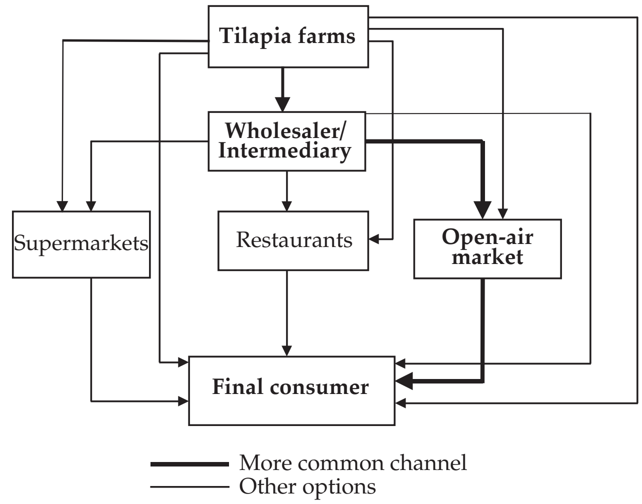

Figure 15. Marketing channels for farm-raised tilapia in Honduras. Open-air fish market survey, Honduras, 1999.

for farm-raised tilapia in both the Central-South and North regions (Figure 15). A few fish market vendors mentioned that tilapia farmers sold tilapia directly to their store.

Transportation

The majority of fish market vendors transported their own fish and seafood products (Figure 16). This was true in both regions (Central-South and North), but more respondents in the North (73%) indicated so compared to 63% in the Central-South region.

The most common type of truck used to transport tilapia products was a 2,000-lb truck (Figure 17). This was followed by a 2,200-lb truck. A few respondents used a 6,000-lb truck.

Table 19. Likelihood of open-air fish market vendors to begin selling tilapia the next year, by region. Open-air fish market survey, Honduras, 1999.

Likelihood of Selling Tilapia	Region of Country					
	Central-South		*North*		*Total*	
	N	%	N	%	N	%
Very Likely	6	67	4	36	10	50
Somewhat Likely	2	22	1	9	3	15
Very Unlikely	0	0	5	46	5	25
Somewhat Unlikely	0	0	0	0	0	0
No Answer	1	11	1	9	2	10
Total	9	100	11	100	20	100

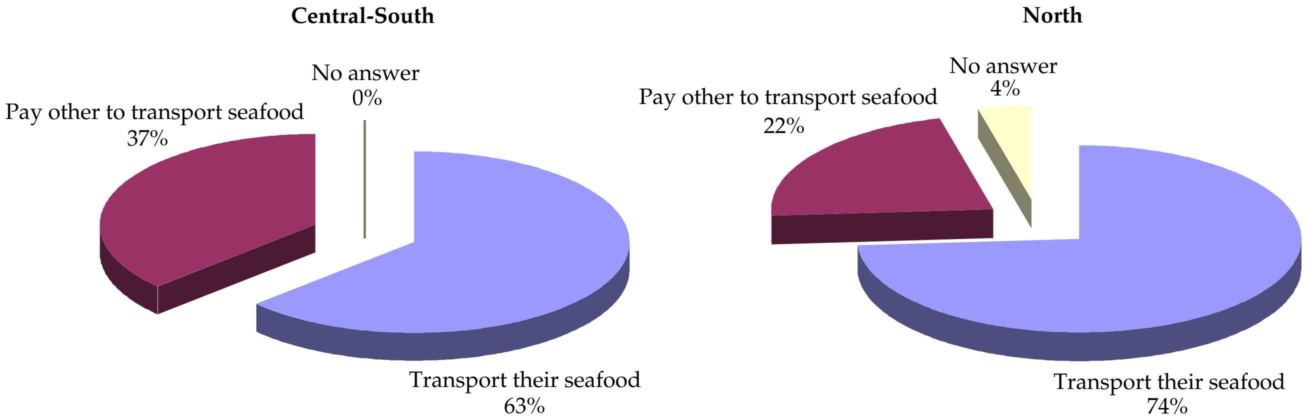

Figure 16. Percentages of open-air fish market managers who transported their own fish and seafood products, by region. Open-air fish market survey, Honduras, 1999.

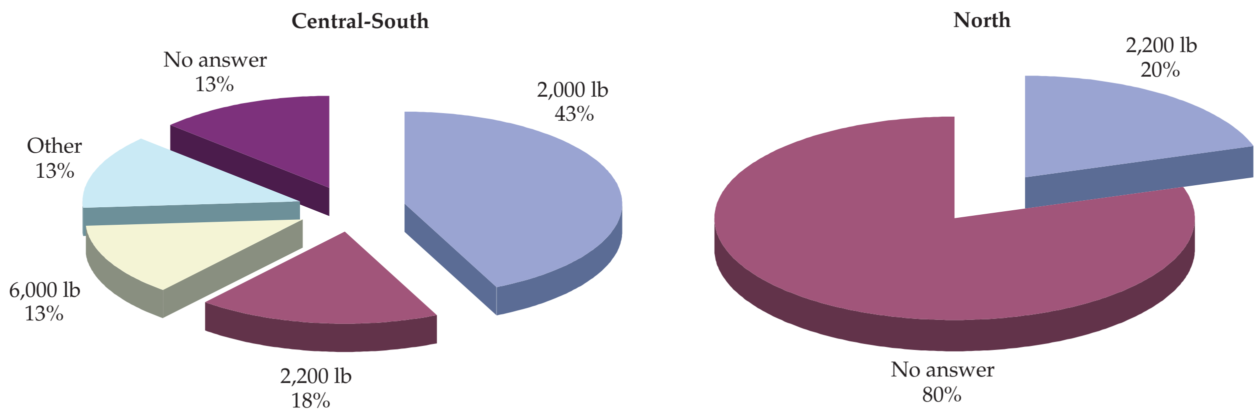

Figure 17. Capacity of trucks used to transport tilapia products, by region. Open-air fish market survey, Honduras, 1999.

Likelihood of Beginning to Sell Tilapia

Over half of respondents (65%) indicated that they were very or somewhat likely to begin selling tilapia the next year (Table 19). Only one-fourth said they were very unlikely, and the remaining 10% did not answer the question.

Conclusions

Direct personal interviews were conducted nationwide of open-air fish market vendors to obtain information about markets for Honduran farm-raised and wild-caught tilapia. The study documented market penetration in the open-air fish market outlet segment and quantified the differences in purchase and consumption patterns in two regions (Central-South and North).

The survey showed that tilapia is a well-known product in Honduran open-air markets. Overall, 70% of open-air markets sold tilapia, and over half of open-air market vendors not currently selling tilapia responded that they were very likely to sell tilapia the next year. Approximately 25% of the tilapia sold was from Lake Nicaragua. The most important product form was fresh whole-dressed tilapia. However, the lack of demand, high wholesale prices, and off-flavor were mentioned as primary reasons for not selling or not continuing to sell the product. Results indicated that tilapia sales have been relatively constant in recent years; however, inconsistency in supply was a major obstacle for further market growth.

The Central-South region had both a greater number of vendors currently selling tilapia and more vendors who indicated a likelihood of beginning to sell tilapia. The Central-South region also represented the larger fish market in the country.

Wholesalers or intermediaries were cited as the principal suppliers of tilapia and seafood for open-air fish markets nationwide. Only a few open-air fish market vendors reported purchasing tilapia directly from fish farmers or fishermen.

The survey results appeared to indicate a potential to increase tilapia sales if a consistent supply can be maintained. Nevertheless, careful attention needs to be paid to costs of production of farm-raised fish versus wholesale prices of wild-caught tilapia.

Wholesale prices of tilapia sold to fish market vendors averaged \$0.51 lb^{-1} but ranged from \$0.20 to \$0.60 lb^{-1}. Costs of production have been estimated at \$0.74 lb^{-1} (Engle, 1997a). It is unlikely that open-air fish markets will present a profitable market outlet for farm-raised tilapia in Honduras.

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Aquaculture CRSP
Oregon State University
418 Snell Hall
Corvallis OR 97331-1643 USA
<pdacrsp.orst.edu>

Program Director: Dr. Hillary S. Egna

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