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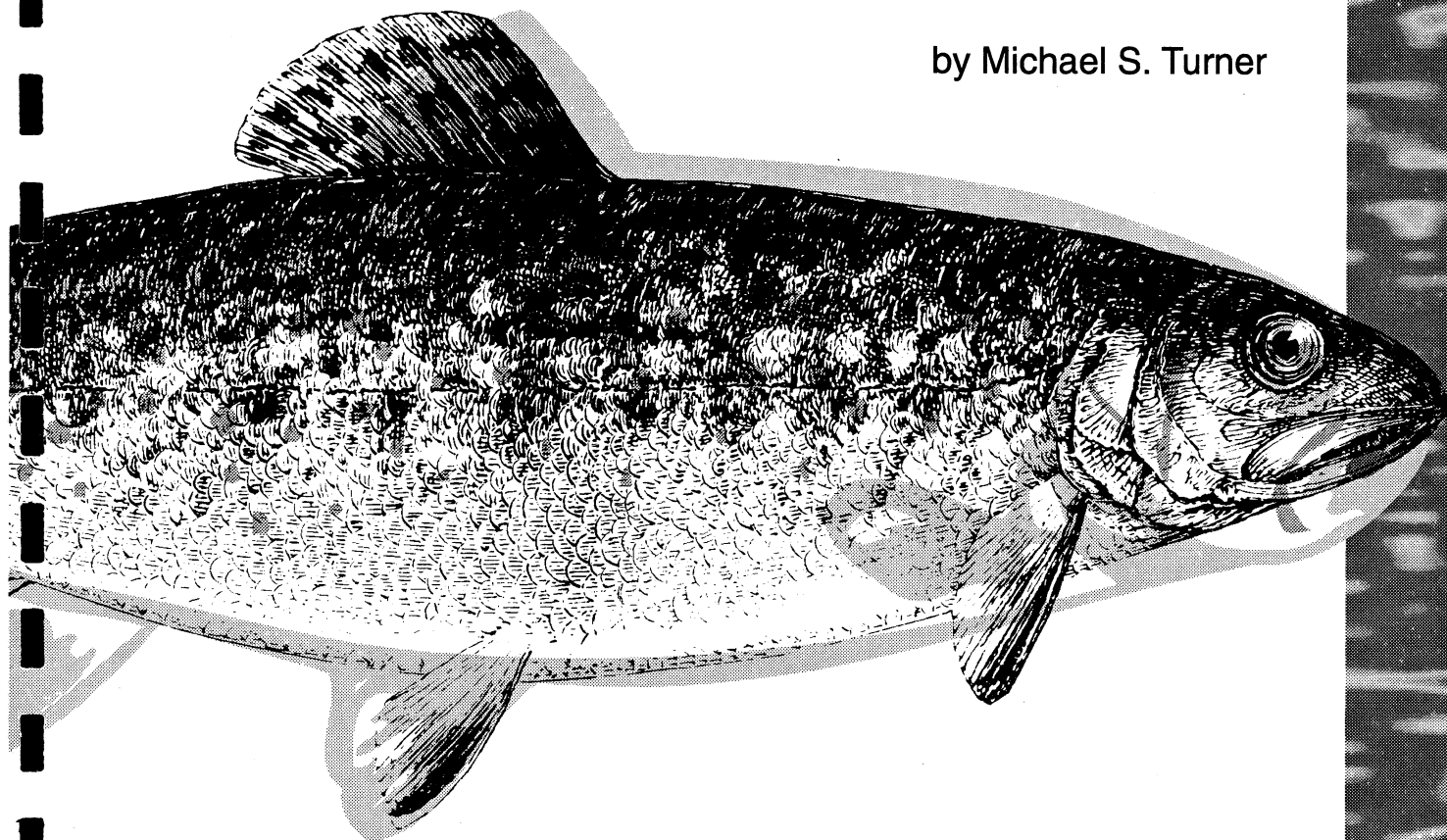
nebraska

Marketing

Study

Fish Farmers

by Michael S. Turner



The Agricultural Research Division
University of Nebraska-Lincoln
Institute of Agriculture and Natural Resources



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Nebraska Fish Farmers

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Executive Summary

Per capita consumption of fish/seafood in the U.S. has increased by nearly 30 percent since 1970. Even more remarkable is the expanded consumption rate in the presence of more than a 400 percent increase in the prices during the same time period; more than twice the rate of increase in prices of red meats. The affluence of the U.S. consumer has also led to greater convenience in fish and seafood products available through the food marketing channel. In spite of the positive market trends, fish and seafood products account for only 8 percent of total meat consumption compared to 59 percent for red meats and 33 percent for chicken and turkey.

The U.S. food marketing channel is a highly developed and structured system reflecting an affluent consumer market and a mature economy. Food processors, wholesale grocery warehouses and retail food chains comprise the primary channel for food distribution. The hotel-restaurant-institutional market is similarly served by the same food processors and food service distributors.

In both cases the processor acquires and retains a presence in wholesale warehouses and retail shelf space to assure access for his/her products to consumer markets. In this channel the producer and/or processor assumes responsibility for advertising, promotion, and education of consumers and vendors employees regarding their product offerings. The structured nature of the market channel poses significant challenges for entrepreneurial ventures which lack marketing experience and may be limited in size and scope of operation.

The use of food brokers and pursuing niche opportunities are the two most relevant alternatives for entrepreneurs needing to enter the food marketing channel. Brokers do not take title to the product but instead provide the services needed to represent products to wholesalers, food retailers, employees and consumers. A very specific and perhaps limited niche market may allow the entrepreneurial producer to accomplish the same market functions to compete in the market channel for food products.

Based on the limited scale of fish production in Nebraska, marketing opportunities will be largely limited to local opportunities. This adds further complications. Fish does not represent a significant portion of consumers' diets in the Western Cornbelt. As a result, little or no attention is given to promotion and advertising of fish and/or seafood to consumers. Most food retailers and restaurants handle fish as an afterthought, placing little emphasis or promotion of these products. From a marketing perspective, fish producers will have greater success by focusing their marketing efforts on grocery store chains in larger cities. Marketing fish in a frozen form is almost essential. The exception would be restaurants or grocers who specialize in fresh seafood. It is also important to recognize that Nebraska grocery retailers and restaurants who handle fish rely on seafood wholesalers, grocery wholesalers, seafood specialty retailers and food service distributors for fish and seafood products as well as other items they sell.

Of the three fish species studied, yellow perch was the least significant to Nebraska retail

grocers and restaurants. Both trout and salmon were more popular. Attitudes toward purchase of Nebraska raised salmon and trout were positive. However, current purchases of fish directly from producers was very limited among businesses who responded to the survey.

The size of purchases by grocers and restaurants on a weekly or monthly basis did not appear to exceed the capabilities of Nebraska fish farmers to supply.

The feasibility of a producer-owned fish processing facility scaled to current levels of Nebraska production seems feasible. Estimated cost per pound of fish processed ranged from \$.33 to \$.43 compared to wholesale cost of product to grocers of \$2.99 to \$4.00 per pound for trout and \$2.75 to \$5.99 per pound for salmon. Investment cost divided among a group of 10 to 12 investors would appear to be a manageable commitment even for small scale or part-time operators. The added significant benefit of a producer-owned processing facility would be the potential for an organized marketing effort on behalf of the producers.

Finally, consideration of a "finishing" facility for fish operated in conjunction with the processing facility is recommended. A "finishing" facility would serve the needs of producers who are attempting to capitalize on available water resources for fish production, but do not represent a full-time employment opportunity. Fish could be grown to marketable size (finished), selectively harvested, processed and marketed as a service to producers who are not equipped to accomplish those steps in the production and marketing process.

A variety of business forms could be used for a fish "finishing" operation and/or producer-owned processing facility including: general corporation, cooperative corporation or a limited liability company.

Finally, the importance of promoting increased consumption of fish by Nebraskans can not be over emphasized. Local markets are the most feasible option for Nebraska fish farmers. Fish represents a small portion of grocery and restaurant sales. As a result, development of the market will require promotion with all firms in the market channel plus consumers. It will require more than an "eat more fish" campaign. Cooking instructions, menu suggestions, introductory offers, etc. will be necessary. The magnitude of the task and benefits to be achieved is bigger than an individual producer. It can best be addressed as a producer-owned marketing initiative.

Nebraska Fish Farmers Marketing Study

Introduction

In 1994 the Nebraska Department of Agriculture conducted a mail survey of aquiculture producers within the state. Results of that survey indicated that the 10 largest operations accounted for 94% of fish for human food sales, 96% of food fish fingerling sales, and 94% of stocker sales.¹ This report, which builds on the earlier study was financed with a grant from the Nebraska Department of Economic Development, and focuses on the market for Nebraska-reared fish as human food. The study was conducted on behalf of the Nebraska Fish Farmers.

This report is divided into four major sections plus an executive summary. Section one is a descriptive analysis of the domestic market for fish and seafood in the United States. Section two describes marketing practices of Nebraska restaurants and grocers with particular emphasis on fish and aquiculture products. Section three presents a feasibility analysis for a fish processing plant scaled to the level of production described in the 1994 Nebraska survey referred to above. Section four is a recommended structure for a producer organization to process and market Nebraska produced fish for human consumption.

SECTION I

THE DOMESTIC RETAIL AND FOODSERVICE MARKET FOR FISH AND SEAFOOD IN THE UNITED STATES²

Many customers, retail and foodservice operators, and consumers view fish/seafood as a commodity driven by supply and demand (commodity pricing). Viewing fish/seafood as a commodity **does not** adequately address the consumers' wants and needs. Today's consumer is looking for convenience, variety, consistent quality, consistent supply, nutrition and low price. As a result, more retail grocery stores are offering a wider range of uncooked and cooked prepared entrees and complete meals.

Fish/seafood product availability and product safety continue to be significant concerns shared by customers and consumers. Factual information concerning product availability and safety is needed. To increase fish/seafood per capita consumption, promotion of fish/seafood as a wholesome, safe and high quality, alternative source of protein is needed.

Most Midwest consumers have limited knowledge of fish and seafood. They do not know how to prepare it nor do they understand the differences between species. Unlike the beef and pork industries, the fish/seafood industry lacks national promotional efforts to educate

¹ Nebraska Aquiculture; 1995 Industry Status, Nebraska Department of Agriculture, Agricultural Promotion and Development Division, Lincoln, Nebraska.

² Prepared by Dave McLaren, Food Strategy Office, University of Nebraska-Lincoln. Source: Annual Seafood Operations Review, Supermarket Business, November 1993, 1994, 1995 and 1996.

consumers on seafood preparation, storage, and nutritional benefits. As a result, species specific campaigns are being attempted. These species specific efforts do not address substitutability of species nor the differences between species, leading to additional consumer confusion concerning fish/seafood. Individual fish/seafood processors and suppliers are beginning to work with retail operators on fish/seafood promotion, education, and training. These individual efforts are costly compared to an industry wide effort such as *Pork--The Other White Meat*.

A fish/seafood processor/supplier must be able to provide consistent supply, consistent quality, safe and competitively priced products that have the taste, palatability, and eye appeal consumers desire. If any of these factors are not being met, then a fish/seafood processor/supplier will not be successful.

Product Availability and Quality. To gain entry into either the retail or foodservice market for fish/seafood a processor/supplier must first guarantee a consistent supply and consistent quality. Defining consistent supply and quality includes species specific amounts and processing capabilities such as: pre-cut/whole, ready-to-cook, uncooked prepared entrees, cooked entrees, portion control/individually packaged, etc. Lack of detailed information relative to consistent supply capabilities and quality assurances will discourage retail and foodservice operators from purchasing fish/seafood.

Food Safety. Consumers are very concerned about the safety of fish/seafood. This must be addressed by processors/suppliers. Programs such as HACCP must be developed and implemented. These programs help insure product safety and product quality assurance.

Education and Training. A fish/seafood processor/supplier must provide training to retail and foodservice operators on preparation (recipe cards), storage, nutritional benefits, multiple usage and substitutability between the different species. This same information must be passed on to the consumer. Consumer education is most effective at the local store level with in-store promotions, cooking demonstrations and sampling.

Pricing. A fish/seafood processor/supplier should work with the local stores on value-added and per serving/portion pricing. Local stores and consumers need simple and standardized ingredient guides for preparing value-added products. Local stores are also looking for complete meal solutions. Providing stores and restaurants with value-added components such as packaged, ready-to-use stuffing which they combine with fish, garnish and package as ready-to-bake entrees.

Promotion and Marketing. A fish/seafood processor/supplier must work with local stores and restaurants on promoting and marketing their products to consumers. Promotion and marketing efforts should be viewed as a "shared" responsibility. Effective promotional activities could include: newspaper and radio advertising allowances, in-store demonstrations and sampling, sponsoring fish/seafood cooking classes, and providing recipe cards for simple and standardized preparation of value-added products.

The following is a description of the marketing channel for fish and seafood products.

Retail Grocery Distribution Channels

In the retail grocery market, the distributors purchase (take ownership), warehouse, and notify grocery chains and independents of product availability and any supplier promotions that

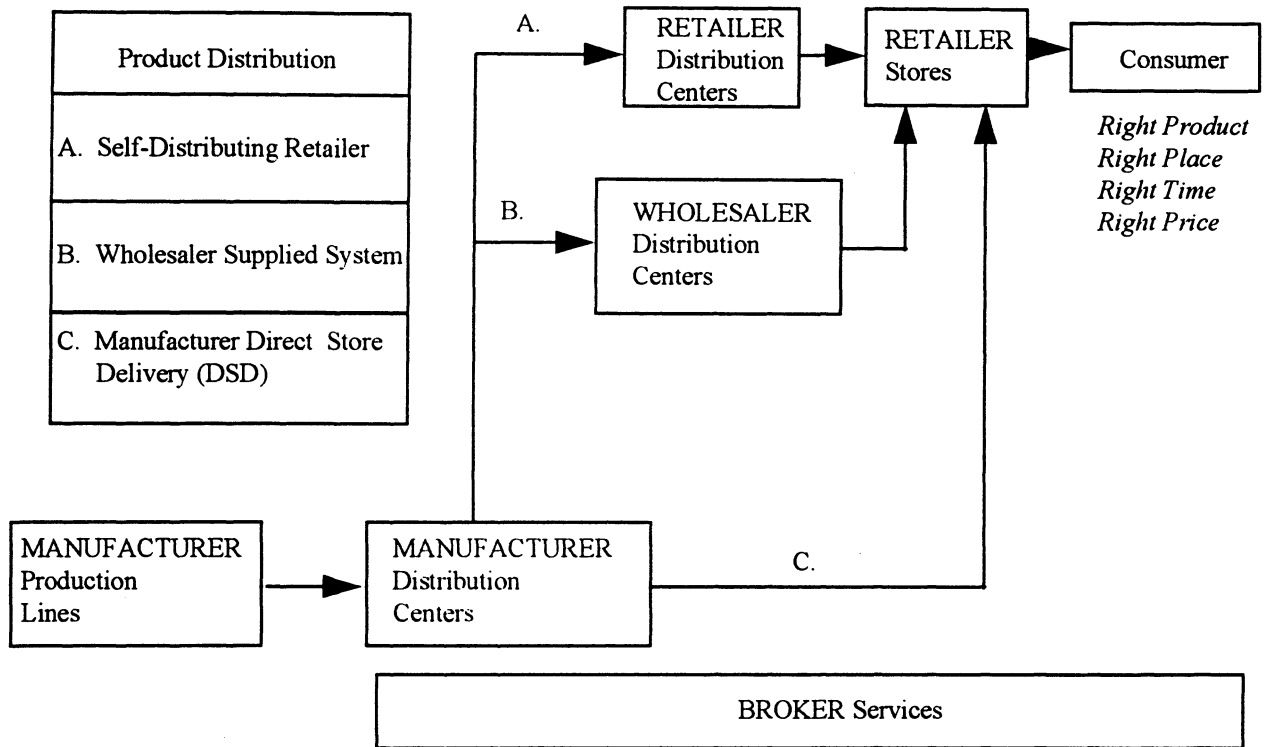
will be passed on to them. The distributor will then wholesale, ship/distribute the supplier's products to stores, as orders are received. The distributors do not employ sales representatives. The fish/seafood supplier is totally responsible for marketing and promoting their products to the grocery chains and independents. The major question that distributor category buyers ask fish/seafood suppliers is, "What is it about your product and marketing/promotional plan that will generate sufficient interest at the retail level for us to carry your product?" If the answer comes across as just another "me-too" fish/seafood processor and product, they will not carry (warehouse) the product.

Retail distribution of fish/seafood, which is the movement of product from fish/seafood processor to individual retail stores, can take one of three primary channels:

1. Self-Distribution. With self-distribution, the fish/seafood processor ships product from their warehouse to the retailer's warehouse/distribution center. In many cases, the fish/seafood processor must first get an account (slot) with the warehouse/distribution center. To get this account/slot the fish/seafood supplier may be required to pay up-front slotting fees. HyVee has their own warehouse/distribution center, PDI, in West Des Moines. With self-distribution to PDI/HyVee, the fish/seafood processor would ship directly to PDI warehouse/distribution center and PDI would then ship to individual stores as orders are received. The warehouse/distribution center does not employ sales or marketing personnel. The fish/seafood processor is completely responsible for generating orders from the individual stores and working with store/department managers on in-store promotions and demonstrations. The fish/seafood processor will receive a bill-back for all product that is not sold.
2. Wholesale Supplied System. In Nebraska, examples of Wholesale Supplied System would include Fleming/Bakers, Nash Finch/Hinky Dinky, and Affiliated/Affiliated Stores. In the Wholesale Supplied System, the fish/seafood processor must first get an account (slot) with the wholesale/distributor. In many cases, to get this account/slot the fish/seafood supplier will be required to pay up-front slotting fees. The wholesale/distributor does not employ sales or marketing personnel. The fish/seafood processor is completely responsible for generating sales and working with the individual stores on in-store promotions and demonstrations. The wholesale/distributor will then buy from the fish/seafood processor based upon orders received. The fish/seafood processor will receive a bill-back for all warehoused product that is not sold.
3. Direct-Store-Delivery (DSD). With DSD, the fish/seafood processor would ship directly to the individual stores as orders are received by the processor. The fish/seafood processor is completely responsible for generating orders, shipping, and in-store promotions and demonstrations. In many cases, the fish/seafood processor will be required to guarantee sales of all product supplied.

Figure 1-1.

The Grocery Industry's Three Primary Product Distribution Channels



Source: *Food Retailing Review*, Food Institute, pg. 277, 1995.

Broker Services. A broker is an independent company providing local and regional sales representation to manufacturers of food products. A broker calls on multiple classes of trade (Accounts) such as distributor buyers, chain store buyers and individual store managers in a defined *territory* designated for coverage by the broker. Brokers represent several manufacturers' products within each defined territory with no conflict of interest. Many brokers employ *Retail Persons* (also called *Retail Merchandisers* or *Retail Salesperson*) who call on retailers to service a product or group of products, render sales assistance, arrange displays, set up in-store demonstrations, etc. Other brokers employ *Combination Salespersons* who have both wholesale and retail sales responsibilities.

Brokers should have the ability and resources to monitor consumer preferences, understand local market conditions, and maintain long-standing relationships with buyers. In addition, brokers should have the latest in consumer demographic data available, data needed for new product launches, general competitive activity data or data specific to a particular product, consumer or circumstance.

How Brokers Serve You. In general, the broker becomes your selling arm responsible for making sure that your product(s) are distributed and placed where they should be. The broker represents you and your product(s) to the buyers for each retail grocery distributor in their territory and makes sure that distribution runs smoothly (to the retail stores). If going direct to the retail stores (DSD), the role of the broker is to represent you and your product(s) to the buyers for each retail chain or independent in the territory and make sure that distribution runs smoothly to the individual stores and that in-store promotions/demonstrations are carried out.

Prospecting and Product Introduction. Your broker should work with you in the development of your advertising and promotional plan. Your broker will also have the "Product Presentation/Introduction Forms" for the warehouses and retail chains in their market territory. Your broker will schedule and make product presentations to the warehouse/distributor buyers and retail chain buyers. Typically, a broker will need a two to three month lead time for getting a new product into distribution.

Territory Coverage and Sales Coverage. Your broker should present you with a plan or program for calling on wholesale and retail accounts in their market territory. In addition, your broker should make regular progress reports to you on sales calls made according to the pre-set plan.

Micro-Marketing. Your broker should have in-depth knowledge of the local markets and the customer demographic/profile for grocery chains, independents and individual stores. You and your broker should direct your marketing efforts toward a specific group of potential customers/stores rather than the general population as a whole. Your marketing/promotional efforts in Lincoln may be different than your efforts in Grand Island or North Platte, for example.

Distribution. Your broker should regularly contact retailers to ensure that your products are in distribution and placed properly on the retail shelf. Your broker should also ensure that your products are ordered correctly, shipments are received and priced correctly, and unsaleable items are credited and disposed of properly.

Pricing in the Stores. Your broker should check the pricing of your products in the stores on a regular basis. If you have given *Off-Invoice Allowances* to be passed on to the retail stores for

“Specials”, have the individual stores actually lowered the price to reflect the allowance? The broker should also keep you informed of your competitors’ prices and specials. Will you respond with a *Temporary Allowance* to match your competition? Your broker should help make this decision.

Merchandising. Your broker should work with the retail chains, independents and distributors on developing and implementing special efforts and techniques by which your products are presented to shoppers in the stores for maximum sales.

Promotions and Allowances. Your broker should work with you in developing and conducting in-store promotions and demonstrations. The broker is most helpful when it comes to services requiring their experience and knowledge of promotions. For example, you will have a short time period to prepare and set up promotions using case-off incentives (off-invoice allowances for specials). It is the broker's job to make sure your timing is coordinated with these promotions. Your broker can assist you with: marketing plan development and implementation, coupon programs, radio spots, in-store displays and product demonstrations.

What Does a Broker Charge? Brokers receive a commission on all products sold in their designated territory. Broker commissions of 5 percent are quite common. Additional fees and charges will depend on what functions you want the broker to perform.

How to Evaluate A Broker.³ Broker evaluations should include:

- Local market knowledge
- Knowledge of the buyer’s company
- Retail level support capabilities
- General credibility in the marketplace
- Value-added services
- Knowledge of the buyers’ needs and the customers’ goals and objectives
- Execution of programs
- Product knowledge
- Sales presentation skills
- Depth of resources
- Management capability

Commercial Foodservice Market

The foodservice industry is extremely fragmented. Each segment fills different consumer needs. The segments within the industry vary by types of products offered, types of services rendered and profit objectives. In general, foodservice can be partitioned into two sectors: the commercial sector and the non-commercial sector.

The commercial sector encompasses the entire restaurant industry. This sector is also called the "free choice" or "noncaptive" market. The non-commercial market sector, also called the institutional market, encompasses a wide range of facilities including school lunch programs,

³ *How Brokers Serve You*, National Food Brokers Association.

airlines and trains, prisons and rehabilitation centers, military, hospitals and convalescent homes. In this sector, the consumer has no freedom of choice in the menu or only a very limited selection. Consumers are captive; they cannot go elsewhere to eat. Commercial foodservice owners/operators are profit motivated while non-commercial foodservice operators usually operate on a budget and/or specific dietary requirements.

Gaining entry into the foodservice industry can be difficult and time consuming due to the diversity of facilities, equipment in these facilities and labor skills. Food preparation and storage facilities of restaurants are very diversely equipped. Many operate at one cooking temperature for all items served. Storage and preparation areas may also be very limited. To be successful in this market, a meat processor/supplier's products must be able to withstand temperature stress while maintaining high quality during preparation and in quantities that require minimal storage and preparation space.

Labor in foodservice establishments is largely unskilled, frequently unreliable, and demonstrates a high rate of absenteeism and turnover. Training of these employees can be discouraging and fruitless. Therefore, preparation of fish products must be kept simple, require minimal amount of labor, and produce little, if any, waste. According to the *National Restaurant Association's Quickservice Operators Survey and Tableservice Operator Survey*, September 1995, limited service and fullservice operators cited labor -- the availability and quality of new employees, and the training and retaining of current employees -- among the most significant challenges they will have to face in 1996. A fish/seafood processor/supplier must provide products with simple and foolproof preparation requirements and work with foodservice establishments in training of employees.

Price, consistent quality, consistent supply, portion control, taste, palatability, eye appeal and food safety are very important factors in the foodservice market. Price is regulated by what the trade will bear and what consumers will pay. On average, the cost of a meal should not exceed 35% of the menu price. Price is also related to portion control. A restaurant does not want a patron observing others and thinking, "Their portions are bigger than mine!" Consistent supply and portion control, therefore, become very important elements of price. Quality must be consistent with the price the consumer is willing to pay at each and every sitting. Taste, palatability and eye appeal are also very important factors for generating repeat sales. In addition, food safety is becoming increasingly more important in foodservice. A fish/seafood processor/supplier must be able to provide consistent supply, consistent quality, portion control, safe and competitively priced products that have the taste, palatability, and eye appeal consumers desire. If any of these factors are not being met, then a fish/seafood processor/supplier will not be successful in the foodservice market.

Today's consumer is concerned about price/quality relationships, taste/palatability, service, and nutrition. A product that can serve a multitude of uses in a foodservice establishment, such as satisfying the consumer with a variety of tasty products and the customer by reducing the variety and amounts of inventory, everybody wins. Nutrition, price, taste, palatability and convenience (elements satisfying to both customers and consumers) influence acceptance of products in foodservice markets.

A fish/seafood processor/supplier will need to provide foodservice buyers and end-users with clear and explicit instructions for:

- ☐ Storage of the product and unused portions of the product
- ☐ Preparation of the product itself and preparation of any of its recipe variations (multiple menu applications of products or ingredients are very important)
- ☐ The safe display of the product
- ☐ Serving and presentation of the product

Why is it so difficult to break into foodservice? There are four problems that a fish/seafood processor/supplier will face in foodservice:

1. The sheer number of diverse establishments. In 1995, there were over 700,000 commercial foodservice establishments in the United States.
2. Using a foodservice distributor effectively. You must push your fish/seafood products ahead of someone else's. Unless a meat processor/supplier can offer the right incentives, differentiate their products from the competitors' and offer tips on how to sell the products, the processor/supplier will be just another "me too" face in the crowd.
3. Knowing what fish/seafood products to offer a prospective customer. Foodservice chains and operators are always looking for upcoming trends on which they can capitalize. A processor/supplier must show prospective customers multiple recipes and applications for a product that will appeal to a cross-section of consumers. Variety is the key.
4. Distribution. No product is going to compete if it cannot be supported. With such a large number of operators, and the chains so spread out, it is challenging to make sure a product arrives on time and in acceptable condition.

Quality is related to the satisfaction of needs. Both customers and consumers are judges of quality. Quality fish/seafood products must first meet the needs of the kitchen staff. The attributes of quality that meet the needs of the kitchen staff include convenience, minimal labor requirements, short preparation time, consistent quality, individual packaging or controlled portions, and multiple uses for the product. When these attributes are satisfied, the product is ready for the ultimate judge of quality--the consumer. Will the consumer be a repeat buyer of the product? Will the consumer purchase but discard the product or a portion of the product? Consumer reaction to the product can be found by use of questionnaires.

Foodservice Distribution Channels and Methods

Distribution of food products and information in the foodservice market typically flows from fish/seafood processor through foodservice brokers who call upon and work with fish wholesalers and foodservice distributors. Once the fish/seafood processor has an account (slot) with the distributor's warehouse(s), then the distributor sales representatives (DSRs) call on foodservice operators. The role of the DSRs is to make operator calls, serve as foodservice operator consultants and work with a food fish/seafood processor's sales representation (brokers) in selling food products that are warehoused by the distributor. In 1995 the top five consulting

services DSRs offered foodservice operators were: new product information, menu planning and costing, inventory control, menu merchandising assistance and employee training.⁴

In terms of merchandising tools preferred by DSRs, the top seven tools are: product samples, trade shows, special pricing, catalogs/brochures, recipe cards, promotional displays and direct mail. The type of incentive that DSRs prefer most is Spiffs (monetary incentives paid to salespersons).⁵

Foodservice Trends

Food Processing predicts the following 10 trends will increasingly shape the foodservice industry and its players:

1. Foodservice eclipses supermarkets. The foodservice sector will likely capture 100 percent of additional food spending through the year 2005. As a result, foodservice will account for 42 percent of consumer food spending by 2005 (Table 1-19).
2. Commercial foodservice predominates. Quick service restaurants' (QSRs) annual growth rates will decrease from 7 percent to 2.9 percent. Other formats, such as broader-menu fast-food chains (home meal replacement eateries such as Boston Market) and sit-down chains will experience increases in annual growth rates.
3. Convenience drives market. Driving commercial foodservice growth is convenience. The most convenient commercial foodservice segment is fast-food kiosks in a variety of retail and institutional settings. This segment is expected to top all categories with growth of 15.8 percent annually.
4. Home meal replacement (HMR). As consumers eat more meals prepared outside the home, they are starting to demand quality similar to what Mom used to make. The HMR segment has a projected annual growth rate of 13.5 percent. By 2005, HMR will capture 2 percent of total U.S. food expenditures (sales of \$8 billion).
5. Supermarkets and manufacturers fight back. Supermarkets' number-one competitor will be commercial foodservice. Their attempts to become more competitive will result in the growth of modified atmosphere packaging (case-ready), which will let them order higher quality prepared foods direct from manufacturers. Supermarkets will also offer home delivery of prepared meals and ingredients for home-cooked meals. Manufacturers will offer supermarkets new meal solution products. Manufacturers will also direct more resources looking for ways to promote "branded" for foodservice.
6. Ethnic eateries go mainstream. Sales of Asian foods grew 25 percent in 1995. Development of ethnic concepts (introducing ethnic menu choices) by mainstream foodservice operators will support the future growth of ethnic foods.

⁴ The Focus is on Consulting, *ID: The Voice of Foodservice Distribution*, July 1995, pp. 64-69.

⁵ The Focus is on Consulting, *ID: The Voice of Foodservice Distribution*, July 1995, pp. 64-69.

7. Variety. Commercial foodservice operators will increasingly offer a variety of ethnic and other choices on their menus. More restaurants will be offering multiple ethnic cuisine under one roof.
8. Health-consciousness grows. With more than one-third of consumers trying to eat healthier, foodservice operators are starting to make health a marketing focus.
9. Value, value, value. Consumers expect extras and "more-than-you-can-eat" portions for no extra cost. Since 1985, the average ticket at QSRs has fallen from \$3.30 to \$3.00, while the ticket at up-scale restaurants has dropped from \$12.00 to \$9.70. Consumers are pressuring operators to cut costs without sacrificing quality. This requires restaurants to operate more cost efficiently in areas other than food cost, giving chains a competitive advantage over independents. As a result, table-service chains will have an annual growth rate of 5.1 percent compared to 2.3 percent for independents.
10. Dinner and a show. Consumers are increasingly wanting entertainment for themselves and their kids along with their meals. Formats that offer some form of diversion are growing. Many entertainment-intensive eateries will be family focused, as the trend toward bringing kids along increases.

SECTION II

MARKETING PRACTICES

OF NEBRASKA RETAIL GROCERS AND RESTAURANTS

A mail survey of Nebraska Retail Grocers and Restaurants was initiated in 1997 by the University of Nebraska to study the potential for marketing Nebraska raised fish to local consumers through established food market channels. Mailing lists of Groceries and Restaurants were obtained from the Nebraska Retail Grocers Association and the Nebraska Restaurant Association respectively. A forty-five percent sample of grocers and restaurants was selected. The larger sample size was selected in anticipation of a low response rate given the limited emphasis fish represent in the diet of many Nebraskan's. A total of 287 questionnaires were mailed to grocers and 660 to restaurants. The questionnaires were returned by 112 grocers and 122 restaurants. This represented a response rate of 39 percent and 18 percent respectively.

The questionnaires were patterned after those used in a North Central Region study of yellow perch and walleye marketing in the Great Lakes States.⁶ A follow-up survey was then mailed to grocers and restaurants who indicated they had sold yellow perch, trout and/or salmon during 1996. A total of forty-one questionnaires were mailed to grocers and thirty-five to restaurants. Fifteen grocers and seventeen restaurants returned follow-up questionnaires.

Finally, questionnaires were mailed to seventeen food wholesalers in Nebraska. Five were returned for a thirty-five percent response rate.

In addition to the initial mailing of questionnaires, a follow-up post card plus a second questionnaire was mailed to each address in the samples. Thirty surveys were returned by the postal service as undeliverable.

While the response rate was as predicted or better, numerous respondents were selective in their answers to some questions. The decision was made to include all questionnaires in these results to better represent grocery and restaurant marketing practices for fish. As a result, there are inconsistencies in total number of respondents between individual questions. No inference or interpretation of non-responses is offered.

Fish Marketing by Retail Grocers - - By Independents vs. Chains

(See Appendix Tables 1-11)

Over three-fourths of the chain stores sold seafood other than frozen-prepackaged or branded products; but less than forty percent of the independents. Sixty percent of the independently owned stores handled only frozen-prepackaged-branded fish products.

Likewise over half of the chains provide full service at the sea food counter compared to only three percent of the independents. However, nearly two-thirds of the independents failed to respond to this question.

The contribution of seafood to total store sales was essentially identical for independent

⁶ Reipe, Joan. Department of Agricultural Economics, Purdue University, West Lafayette, Indiana.

and chain stores.

Sales of yellow perch in 1996 was eight percent for chain stores and one percent for independents. Lack of demand and lack of product availability were primary reasons given.

Over half of the chain stores handled trout in 1996 but less than seventeen percent of the independents. Again lack of demand and product availability were the reasons given.

Nearly seventy percent of the chain stores handled salmon in 1996 but only one-third of the independents. Lack of demand and expense were the only reasons given for not handling salmons and those reasons were given by eight percent or less of the respondents.

Store seafood/meat managers determined the choice of seafood supplier (62%) and what to purchase (69%). Those decisions were more equally divided between store managers and seafood/meat managers in independent retail stores.

Frozen fish and seafood followed by frozen/pre-packaged-branded products accounted for the large majority of purchases and sales in both independents and chains. Chain store purchases of fresh fish did account for seventeen percent compared to eight percent for independents.

Purchase of fish by independent grocers from primary suppliers were divided approximately equally between frozen and frozen-prepackaged-branded products. Purchases from secondary suppliers were fifty-six percent frozen, thirty-one percent frozen-prepackaged-branded, and nine percent fresh.

Primary suppliers provided fifty-eight percent of chain store purchases, twelve percent frozen-prepackaged-branded and seventeen percent fresh. The pattern of purchases from secondary suppliers was essentially the same.

Irrespective of the type of fish or seafood product or store ownership (independent vs. chain) four types of suppliers dominated; they included seafood wholesalers, grocery wholesalers, seafood specialty retailers, and food service distributors. Fish farmers were identified as a source for fresh and frozen lake fish and farm raised fish.

Strong interest was expressed by both independent (86%) and chain stores (77%) in purchases of fresh/frozen fish produced in Nebraska.

Fish Marketing by Retail Grocers - - By Size of City (See Appendix Tables 12-21)

A slightly different interpretation of Retail Grocer conduct is observable when comparing results based on size of city.

The largest population of grocers handling fish other than frozen-prepackaged-branded were in cities of 3,000 to 19,000 population. The smallest proportion handling fish other than frozen-prepackaged-branded were in cities of less than 3,000.

There were a larger proportion of stores with full service seafood/meat counters in Lincoln/Omaha and fewer in smaller cities.

Seafood provided a smaller fraction of total store sales in Lincoln/Omaha (1.3%) and approximately the same (4%) in other size cities.

Thirty percent of grocery stores in cities with population of 20,000 to 50,000 had sold yellow perch in 1996, much higher than in other size cities. Lack of demand and product availability were reasons given for not offering yellow perch.

Over half of the Lincoln/Omaha stores sold trout in 1996, thirty percent of stores in cities from 50,000 to 3,000 and twelve percent in cities of less than 3,000 population. Low demand and product availability were reasons given in cities smaller than Lincoln.

Approximately 50 percent of the stores in cities larger than 3,000 handled salmon in 1996. One third of the stores in the smallest towns sold salmon in 1996. Lack of demand and expense were reasons given for not handling salmon.

Stores' seafood/meat managers made the decision on what fish to buy in fifty percent or more of the stores in cities larger than 3,000. In cities of less than 3,000 store managers plus seafood/meat managers made the decision thirty-eight percent of the time. Likewise store managers and/or seafood/meat managers were dominant decision makers on source of supply.

Frozen and frozen-prepackaged-branded products accounted for the majority of purchases irrespective of size of city. Fresh fish were most important in Lincoln/Omaha stores and secondary suppliers were the more important sources.

Grocery wholesalers, seafood wholesalers, food service distributors, and seafood specialty retailers (Lincoln/Omaha) were the primary suppliers for grocers irrespective of size of city or seafood product. Fish farmers were used for lake and farm raised fish by grocers in cities of 20,000 to 50,000.

Eighty percent or more of the grocers in cities of 50,000 or less would consider purchasing Nebraska-raised fresh or frozen fish.

Fish Marketing by Restaurants - - No Table Service vs. Table Service Restaurants (See Appendix Tables 22-32)

Restaurant responses are reported by restaurant type (**table service** and **no table service**) and by size of city. **No-table-service** restaurants include primarily taverns and some fast food establishments. One half of the **no table service** restaurants reported sales of less than \$100,000 annually. **No table service** restaurants with annual sales of \$100,000 - \$250,000 and \$250,00 - \$500,000 each accounted for ten percent of the responses. Approximately one-fourth of **table service** restaurants were in each of the annual sales categories.

Fifty percent of the **no table service** restaurants and seventy-six percent of the **table service** restaurants included fish or seafood on their menu. However, fish/seafood as a percent of total food sales was low, twelve percent (**no table service**) and thirteen percent (**table service**), as compared to beef which was fifty percent or more.

None of the **no table service** restaurants and fourteen percent of the **table service** restaurants sold trout in 1996. Low/no demand was the primary reason given for not serving trout; twenty percent **no table service** and forty-seven percent **table service** restaurants.

Ten percent of the **no table service** restaurants and thirty-six percent of the **table service** restaurants served salmon in 1996. Again low/lack of demand were the primary reasons given for not serving salmon; twenty percent **no table service** and twenty-six percent **table service** restaurants.

None of the **no table service** restaurants and twenty percent of the **table service** restaurants served yellow perch in 1996. Low/lack of demand were the primary reasons given for not serving yellow perch; (twenty percent **no table service** and fifty-four percent **table**

service restaurants). Other reasons given for not serving trout, salmon and yellow perch included too expensive, not available, and inconsistent quality in order of importance.

Restaurant managers were the primary decision makers regarding choice of species and sources of supply; species forty percent **no table service** and sixty-two percent **table service**; sources of supply thirty percent **no table service**, and fifty-nine percent **table service**. The chef made those decisions approximately ten percent of the time on **table service** restaurants. Central buyers made species decisions in ten percent of the **no table service** restaurants and choice of supplier in twenty percent of **no table service** restaurants.

Frozen seafood was the dominant form of purchase for restaurants; seventy-three percent **no table service** and ninety-one percent **table service**. Primary suppliers provided nearly all frozen fish while secondary suppliers were the source of some fresh fish; twenty-five percent fresh fish **no table service** and twelve percent fresh fish **table service** restaurants.

No table service restaurants relied exclusively upon food service distributors for all types of seafood purchases. Food service distributors were also the dominant supplier of **table service** restaurants, with the exception of fresh farm raised fish. From forty-three percent to eighty-eight percent of other fish were purchased by **table service** restaurants from food service distributors. Ten percent of fresh farm raised fish were purchased by **table service** restaurants from seafood wholesalers. Purchases from fish farmers amounted to six percent of **table service** restaurants purchases of frozen farm raised fish.

Fish Marketing by Restaurants - - By Size of City (See Appendix Tables 33-43)

Fish marketing patterns of restaurants by size of city is based on the following population parameters, Lincoln/Omaha, cities of 20,000 to 50,000 population, 3,000 to 19,000 population and population of less than 3,000.

Over two-thirds of Lincoln/Omaha restaurants had annual gross sales in the \$100,000 to \$250,000 range, with twenty-three percent in the \$250,000 to \$500,000 range. There were more smaller restaurants in cities of 50,000 and less with roughly twenty-nine percent in the less than \$100,000 gross sales. Approximately two-thirds of the restaurants in cities of 19,000 population or less had sales of \$100,000 to \$250,000.

From seventy-one percent to ninety-one percent of the restaurants reported having seafood on the menu. The highest proportion (91%) was in cities of less than 3,000 population.

The highest proportion of total food sales involving fish/seafood (16%) occurred in Lincoln/Omaha restaurants. Among meat products, beef was consistently the largest contributor to food sales. Over forty percent of restaurants in cities of 20,000 to 50,000 population reported selling trout in 1996. From eleven percent to five percent of restaurants in other population categories reported selling trout. No/low demand was the major reason given for no trout sales in 1996 followed by too expensive and lack of availability.

Fifty-nine percent of the restaurants in cities of 20,000 to 50,000 population sold salmon in 1996. One third to twenty-six percent of the restaurants in larger and smaller size categories sold salmon in that year. No/low demand was the primary reason given for no salmon sales in 1996, followed by too expensive.

Only five to six percent of Lincoln/Omaha restaurants and restaurants in cities of 20,000 to 50,000 population reported sales of perch in 1996. No/low demand, too expensive and not available were reasons given for no sales in order of importance.

Choice of species and choice of supplier were decisions made primarily by the restaurant manager in cities of all sizes followed by the restaurant chef or seafood/meat buyer. Frozen fish was the dominant form of purchases by restaurants irrespective of city size. Purchase of fresh fish was more common by restaurants (34%) in cities of 20,000 to 50,000 population.

Frozen fish was the dominant form of product supplied by the primary supplier to restaurants in all cities. Secondary suppliers provided fresh fish to eighteen percent of the restaurants in cities of 20,000 to 50,000 population.

Seafood wholesalers, grocery wholesalers, and food service distributors were the major suppliers by type of product and size of city. Processors, supermarkets, and fish farmers were also sources of supply for restaurants in smaller cities.

From fifty-six percent to eighty-two percent of the restaurants in various size cities indicated willingness to purchase Nebraska produced fresh/frozen fish.

Fish Marketing by Retail Grocers Who Sold Trout or Salmon in 1996 (See Appendix Tables 44-78)

A follow-up questionnaire was mailed to retail grocers who indicated they had sold either trout, salmon and/or yellow perch in 1996. The following is the results of the follow-up survey.

Retail grocers who sold trout -- a total of fifteen useable follow-up questionnaires were returned by retail grocers. Fifty-three percent reported selling trout in 1996. January through March were the months of highest consumer demand for trout. With the highest supply of trout available in January, February, June, July, and October. The highest prices for trout occurred in January to March and in June.

Year-round sales of trout were reported by twenty-seven percent of the respondents with occasional or lenten sales by thirteen percent each. Twenty percent of the food stores sold trout either daily or once a month. Fresh dressed (20%) and fresh fillet, skin on (13%) were the two most preferred trout product forms with frozen fillet, skinless the two most preferred second choices. Most frequently purchased forms of trout were also fresh fillet, skin on and fresh dressed (13% each). The second choice of product form purchased was consistent with the first product form preference; frozen fillet, skin on and frozen fillet skinless (13% each).

Size, prices, and quantity of trout deliveries, most frequently received varied from five to eighteen ounces, \$2.99 to \$3.85 per pound and weekly or monthly intervals. Second most frequent deliveries involved ten to twelve ounce size, \$3.85 to \$4.00 per pound, and ten to fifteen pound deliveries either weekly or monthly.

Grocery wholesalers and seafood wholesalers supplied both the highest and second highest volumes of preferred forms of trout to respondents. Likewise, seafood wholesalers and grocery wholesalers were the suppliers of the highest and second highest volumes of the second most preferred forms of trout.

Average summer purchases of trout were nineteen pounds/week and twenty-eight pounds/month.

One third of the respondents purchase trout regularly and forty-seven percent expressed an interest in purchasing Nebraska raised trout. On the average, grocery retailers anticipated purchasing 17.5 pounds weekly or thirty-one pounds monthly of Nebraska raised trout.

If the trout forms which respondents preferred were not available twenty percent would temporarily drop trout as an item while thirteen percent would switch to a different species. If the preferred trout forms were too expensive grocery retailers would employ the same strategies of temporarily dropping trout as an item (27%) or switch to a different species (13%). Switching from fresh to frozen trout products was mentioned by thirteen percent of the respondents.

Retail grocers who sold salmon - - fifty-three percent of the stores reported selling salmon in 1996, with February and March being the months of strongest demand (Appendix Table 2-63). Highest supplies of salmon were available in February, March, June, July, and August. Highest wholesale prices were paid in January through March and May. Year round sales of salmon were reported by forty percent of the stores, with 53 percent making sales on a daily basis.

Fresh dressed salmon was the most preferred form with preferences for other forms being equally divided among alternatives. The next most preferred forms were fresh fillets, skin on, followed by fresh dressed. Fresh dressed salmon was the form most often actually purchased in 1996, with fresh fillets, skin on (20%) and frozen dressed plus fresh fillets, skinless (13% each) being the second most frequent forms actually purchased.

Most frequent size, price, and quantity of deliveries received in 1996 were eight to twelve pounds, \$2.75 to \$3.99 per pound, eight to thirty-six pounds delivered weekly or at three to four week intervals. The second most frequent deliveries were four to eight pounds, \$4.00 to \$5.99 per pound, seven to twenty pound quantities delivered either weekly or monthly.

Seafood wholesalers (27%) and grocery wholesalers (20%) were the highest volume suppliers. They were also the second highest volume suppliers. Seafood wholesalers and grocery wholesalers were also the second most preferred product form supplier for highest and second highest volume of product.

Average volume of salmon purchased during summer months of 1996 was 32.6 pounds per week and fifty pounds per month. Thirty-three percent of the respondents purchased salmon regularly, while fifty-three percent indicated an interest in purchasing Nebraska raised salmon. Estimated average volume of purchases was forty-seven pounds per week or 120 pounds per month.

If the preferred salmon is not available twenty percent would drop salmon or switch to a different size and thirteen percent would switch from fresh to frozen.

If the preferred salmon were too expensive twenty percent would drop salmon, while thirteen percent would either switch from fresh to frozen, switch to a different size or switch to different salmon product.

None of the respondents handled yellow perch.

Fish Marketing by Restaurants who Sold Salmon in 1996 (See Appendix Tables 79-94)

There were thirteen restaurants who handled salmon in 1996 and completed the follow-up

questionnaire. The following is the results from this survey.

Forty-six percent of the respondents handled salmon. January, March and April were the months of highest demand with March and April being months of highest supply (Appendix Table 2-80 and 2-81). Highest prices were reported in March and April.

Salmon was handled year round in thirty-one percent of the restaurants and served daily in thirty-eight percent of the restaurants.

Frozen fillets with skin on was the preferred product (23%) where price and supply were not a problem. Fresh dressed, frozen fillets and frozen other were each mentioned by eight percent of the respondents. Frozen fillets, skinless were the next most preferred form (23%). When supply and demand conditions are a problem, the most frequent forms of product actually purchased were the same. Frozen fillet, skinless was also the second most frequent form purchased. The size, price and qualities of deliveries were eight ounce, \$2.35 to \$3.75 per pound and one to ten pounds per month to ten pounds every six months.

Food service distributors were the highest volume suppliers followed by grocery wholesalers and fish farmers. Commercial fishermen and food service distributors were second highest volume suppliers.

Supplies of the second most preferred product forms by volume include grocery wholesalers and fish farmers (highest volume) and commercial fishermen (second highest volume).

Average purchases during the summer of 1996 were fifteen pounds per week or thirty-one pounds per month. Only eight percent purchased farm raised fish regularly. Anticipated future summer purchases are fifteen pounds per week or fifty-six pounds per month.

If the preferred salmon is not available thirty-one percent would drop salmon from the menu and eight percent each would switch to a different size or switch species. If the preferred salmon is too expensive thirty-eight percent would drop salmon from the menu and eight percent would switch to a different size.

Fish/Seafood Purchases and Sales by Nebraska Food Wholesalers (See Appendix Tables 95-101)

Questionnaires were mailed to seventeen Nebraska food wholesalers and five usable questionnaires were returned. The following are the results of this survey.

Eighty percent reported selling only frozen seafood; while twenty percent sold both frozen and other seafood products, (Appendix Table 2-95). Fish and seafood products accounted for 3.6 percent of total food sales compared to seven percent (chicken) and six percent (beef).

Frozen products accounted for 97.5 percent of fish/seafood handled by wholesalers with the remainder (2.5%) being previously frozen products.

In eighty percent of the cases the wholesaler described their primary role as a food service distributor. Grocery wholesaler described the remaining twenty percent. Supermarkets, restaurants, and other food services were descriptions of secondary roles.

The wholesale suppliers relied on a lengthy list of suppliers for both fish and seafood products ranging from processors and brokers which were used by eighty percent of the firms to grocery wholesalers used by twenty percent of the respondents. Fish farmers were a source of

supply for forty percent of the food wholesalers.

Restaurants (80%) were the most important customer of food warehouses with supermarkets and other food service, each served by forty percent of the wholesalers.

Processors and brokers were primary suppliers and restaurants were the major customer of food warehouses. In no case were fish farmers identified as a supplier.

Pollock and shrimp were identified by all wholesalers as best selling seafood species. Cod (60%), crab (40%) and channel catfish (40%) were also important best selling species.

Summary and Conclusions

The purpose for surveying Nebraska food retailers, restaurants, and food wholesalers was to learn more about the potential for marketing Nebraska farm raised fish through established outlets within the state, with special emphasis on three fish species; trout, salmon, and yellow perch. Results of the survey indicate that food retailers, restaurants, and wholesalers are actively handling trout and salmon. However, yellow perch receives only limited attention. Lack of consumer demand is the major limiting consideration. Frozen fish is the most popular form of product, perhaps indicative of the lower volumes of product sold or served. Store/restaurant managers or seafood/meat department managers are the individuals to approach concerning marketing decisions.

Grocery wholesalers, seafood wholesalers, and food service distributors are the major suppliers food retailers and restaurants typically depend on for fish and seafood products. Fish farmers are a source of fresh/frozen fish for a small number of food retailers and restaurants.

Food retailers and restaurants expressed positive interest in purchasing Nebraska raised fish. The suggested quantities needed per week or per month were of manageable proportions for Nebraska fish producers. A consistent supply throughout the year is the more important issue.

Seasonality in demand, availability and price of trout and salmon was apparently highest during the lenten period. January to March was identified as the high demand and high price period.

Food wholesalers almost exclusively handle frozen fish products. Processors and brokers were the wholesalers' dominant suppliers. Selective or niche market opportunities may exist for some producers who have the ability to process and deliver fresh fish products. Food retailers with full service seafood counters (chains) or larger restaurants would be most likely possibilities. This is the exception, not the rule, in how fish are marketed in the food channel in Nebraska. As in the national market, established grocery and seafood wholesalers plus food service distributors handle the needs of most food retailers and restaurants. This implies the producer and/or processor needs to be actively engaged in promoting and representing their product as it moves through the food marketing channel to the consumer's plate or shopping cart.

SECTION III

FEASIBILITY FOR NEBRASKA FISH PROCESSING

Aquiculture production in Nebraska is an entrepreneurial activity, involving a limited number of relatively small producers. As noted earlier the 10 largest producers account for over 90 percent of production. In total the largest 12 producers who responded to a 1994 survey produced less than 350,000 pounds of fish for human consumption in that year (Table 3-1). As a result, the volume of product to be processed by an individual producer is limited. In addition cost estimates from previous studies in other states are based on much larger volumes. For example, a Mississippi study evaluated four plant sizes ranging from 3.9 million pounds to 19.5 million pounds annually at an estimated per pound cost of \$.4691 per pound to \$.3245 per pound for the largest plant.

Producer Owned Processing -- To evaluate the potential for a Nebraska producer owned fish processing facility, a processing plant scaled to the combined production of Nebraska's 12 largest producers of fish for human consumption was undertaken. This in turn imposed limitations on technology employed in the processing operation. The description which follows is a labor intensive operation with minor reliance upon mechanization.

The building containing an office, processing, packaging and freezer space is housed in a 24 x 40 steel building (see Figure 1-3). The building side walls are insulated with 3½" batt insulation (R-19) and the ceiling with R-38 blown-in insulation. . Walls and ceilings are covered with water repellent glass bead wall covering. The floor is 4" concrete with a 4" curb. Estimated price for the building is \$50,000. Itemized electrical and plumbing requirements, including cost for installation were estimated to be \$12,796 and \$4,589 respectively (Tables 3-2 and 3-3). Heating and cooling is provided by combination electric wall mounted heating/air conditioning units located in each area of the building; office, processing, and packaging.

Equipment cost, other than a grinder for offal were provided by the University of Nebraska Food Strategy office (see Table 3-4). Equipment costs include a 12' x 12' walk-in freezer. All fish products will be shipped as frozen products. A cost estimate for an offal grinder (\$2,697) was provided by American Delphi Inc. (Table 3-5).

Total cost for the proposed facility is estimated to be \$128,700 including a three acre building site (Table 3-6). Availability of municipal sewage treatment was assumed.

Annual estimated operating costs are presented in Table 3-7. The cost of a full-time manager was included at \$35,000 per year. The estimation of labor cost is provided in Table 3-7. One full-time employee is possible. All other employees would be part-time based on volumes estimated in Table 3-1. Labor requirements are based on an 8-hour day, 5 days per week at \$6. per hour. Depreciation expense was calculated on a 10-year straight line basis for nonland investment cost. Interest expense was calculated based on an annualized rate of 7.75% for one-half of the original investment cost or \$64,350. The resulting first year interest expense would be \$4,987. The average annual interest expense over the life of a long-term loan would be \$2,494. Fish producers, as owners of the processing facility, would provide the investment capital for the remaining 50% of the original investment cost of \$64,350. Operating capital equal to two months of operating expense (\$22,270) would be borrowed at 7.5% interest to finance operating expenses; interest cost would be \$1,670 per year. Property taxes were calculated based upon

100% of original cost at \$1.60 per \$100 of valuation. All other operating expenses were based upon experience of locally owned agribusiness firms operating in rural Nebraska.

The results of operating the processing plant to accommodate the combined volume of 12 fish producers (311,264 pounds of annual production) is a cost of \$.4293 per pound. Increased utilization of the facility would reduce cost per pound. If the plant were operated throughout the year at 2,428 pounds per day (estimated volume for the month of April) cost per pound would be reduced to \$.3316. This level of production is an unlikely goal. Seasonality of fish production in Nebraska should be anticipated.

These results compare favorably with similar studies conducted in other states for different species of fish and larger plants.⁷

The scope and funding of this project did not allow for the development of architectural design or equipment specifications. The results are based upon the author's efforts to estimate approximate feasibility utilizing supplier prices in the Lincoln, Nebraska area, plus input from the UNL Food Strategy Office.

Alternative Processing Strategies — If Nebraska fish farmers elect not to invest in a fish processing facility, there are two alternative strategies to consider: 1) utilize a custom processor located in Nebraska, or 2) market their production to a major North American lake fish processor.

Custom processing — Custom meat processing plants traditionally known as locker plants, exist in many rural communities throughout Nebraska. In some cases, these businesses have been willing to custom process fish. However, as explained in Section I, production and processing are preliminary steps in a successful food marketing program. Representing a processed product to retail grocers and the food service industry directly or through a food wholesale distribution center is the necessary final step. As a result, custom processing of Nebraska fish for a group of producers, who in turn utilize the service of a food broker or hire a full-time marketing employee, is recommended. This would likely involve processing agreements with one or more custom processors at strategic locations throughout the states. A provision of these agreements would be a volume commitment by individual producers to supply a specific quantity of fish to the processor on an annual or quarterly basis.

Producer commitments are the justification processors will need to invest in equipment and training of personnel to process fish. Producer commitment also permits a processor to commit plant space for this alternative. Likewise, a producer commitment is a necessary condition for retaining the services of a food broker and/or employment of a sales representative. The cost of processing would be a negotiated amount. It may be greater or less than the cost of owning a processing plant. Custom processing avoids the fish farmers investment cost obligation

⁷Goff, Dutrow and Williams, *Establishing a Trout Marketing Cooperative*, Agricultural Cooperative Service, USDA, Washington D.C., Farmer Co-op Research Report No. 12, 1982. Fuller, Marty and James Dillard. *Cost-Size Relationships in the Processing of Farm-Raised Catfish in the Delta of Mississippi*, Department of Agricultural Economics, Mississippi State University, December 1984.

of plant ownership. However a custom processing agreement is of limited duration while plant ownership provides access to services on a more permanent basis. But it is easier to exit a custom processing agreement than ownership in a processing plant.

These alternatives allow Nebraska fish producers to market their products locally. While residents of Nebraska and the Western Cornbelt are not large consumers of fish, fish farmers are not in direct competition with the commercial fisheries industry for this localized market.

Marketing to a Lake Fish Processor — Four to six major lake fish processors operate in the Great Lakes region of North America. It is a well established industry which has operated for many years spanning the international boundary between the United States and Canada. These are companies which specialize in cold water species in contrast to catfish farming operations in the Southern United States or Salt Water companies which operate on the coasts.

The fresh water fish companies have relied initially upon wild catch from the Great lakes and their tributaries. Today, with increasing restrictions on commercial fishing, the fresh water wild catch has dropped significantly. As a result, fish companies are relying increasingly upon domestic production plus imports from Northern Europe. Fish from Canadian provinces are being shipped up to 1,500 miles for processing. Nebraska and other Northern Plains states have become potential suppliers to processors in the Great Lakes states.

Under this scenario, fish become a commodity for the producer. The processor provides transportation from the point of production to a processing facility (Nebraska fish farm to Great Lakes processing plant). The producer is paid the Great Lakes price minus transportation costs. Seasonal fluctuation in the Great Lakes fresh market price for fish should be anticipated. With the beginning of the spring fishing season, supplies in the Great Lakes region increase and prices decline based on the wild catch. Fish farmers would need to time their sales prior to the spring season when prices are higher. Timing of sales and distance from processing facilities are critical considerations for the fish farmer. This alternative gives Nebraska fish farmers access to the major fresh fish consumer market in the United States. The fish companies are also positioned to handle all marketing considerations from the farm to the consumer's plate. But as producers, Nebraskans must compete in the commercial fresh fish industry.

Net price received in Nebraska adjusted for seasonal price variability and transportation cost is the primary decision criteria for this alternative. It will be in the producer's interest to have holding facilities for graded fish to be picked up by the fish companies truck. In this case harvesting and grading become the responsibility of the producer. The practicality of this alternative improves with the number of Nebraska producers who are willing participants. Size, quality, quantity, species, and timing of sales can most effectively be addressed as a group commitment. This represents a commodity market where producers are in a price takers role.

Table 3.1 Nebraska 1994 Food Fish Survey Results, 12 Producers
311,264 Pounds — Total Annual Production

Month	Marketing by Month (%)	Estimated Marketing by Month (Pounds)	Average Processing per Day (Pounds)	Combined* Volume of Seven Producers (Pounds)
Jan.	3.2	9,960	498	317
Feb.	3.8	11,828	591	376
Mar.	10.7	33,305	1,665	1,059
Apr.	15.6	48,557	2,428	1,577
May	9.5	29,570	1,478	940
June	11.6	36,106	1,850	1,148
July	10.7	33,305	1,665	1,059
Aug.	10.7	33,305	1,665	1,059
Sept.	5.4	17,244	862	584
Oct.	6.5	20,232	1,012	644
Nov.	5.9	18,365	918	584
Dec.	6.4	19,920	996	634
Total	100.0	311,264		

*Seven of 12 producers indicated interest in participation.

Source: Nebraska Aquiculture, 1995 Industry Status, Nebraska Department of Agriculture, Lincoln, Nebraska.

Figure 3-1. Floor Plan for Proposed Processing Plant

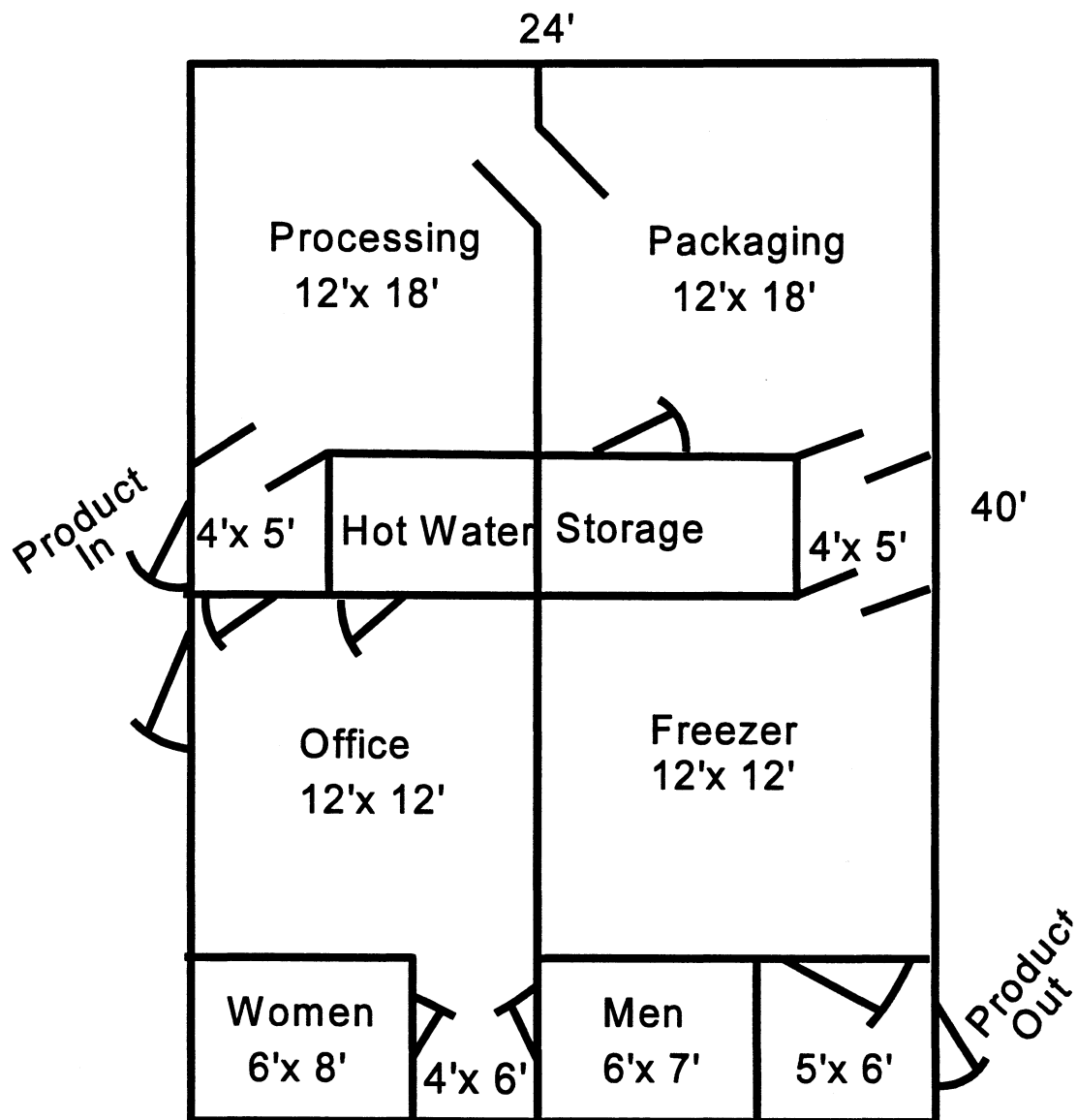


Figure 3-2. Cost Estimate and Building Specifications

- ☐ 24' x 10' x 40' building
- ☐ 1' overhangs, ventaridge peak
- ☐ Gutters
- ☐ 2" x 4" stud walls with 3½" batt insulation - R19
- ☐ Ceiling - R38 blown-in insulation
- ☐ Water repellent beaded glass board on walls and ceilings
- ☐ 3 windows in office area
- ☐ 13 walk doors
- ☐ 4" concrete floor with 4" curb

Total Cost \$50,000

Source: Morton Buildings, Inc. I-80 Waverly Interchange, Waverly, Nebraska

Table 3-2. Electrical

	Price	No.	Total Cost
Heater/Air Conditioner*			
Office	\$1,085.00	1	\$1,085.00
Plant	1,085.00	2	2,170.00
Grinder	2,697.00	2	2,697.00
200 amp panel	100.00	1	100.00
Circuit breakers			
220 amp	10.00	3	30.00
110 amp	4.00	9	36.00
Switches			
Conventional -20 amp	.60	12	7.20
Ground fault - 20 amp	13.00		
Switch Plates	.40	12	4.80
Receptacle Plates	.40	17	6.80
Electrical Boxes			
Ceiling	2.00	20	40.00
Switches/	1.40	29	40.60
Receptacles - 110 amp			
Conventional - 20 amp	3.00	11	33.00
Ground fault - 20 amp	13.00	9	117.00
Conventional - 220 amp	15.00	3	45.00
Wiring			
12-2/Ground \$239/1000'		1	60.00
12-3/Ground \$309/1000'		1	80.00
Lights/Fan	70.00	2	140.00
Office/Plant - 4-48" Fluorescent	150.00	10	1,500.00
Lights (Protected	25.00	8	200.00
Wire Nuts	.08	50	4.00
Itemized materials			\$8,396.40
Miscellaneous			800
Labor			3,600
Total Electrical			\$12,796.40

*Amana 3.5 kw heating and 9,000 BTU cooling.

Source: Lincoln, Nebraska retail suppliers.

Table 3.3. Plumbing

	Price	No.	Total Cost
Commode	138.00	2	276.00
Lavatory & Faucets	155.00	2	310.00
Rinse Tub	60.00	2	120.00
Pipe-Copper			
1/2"	4.00	8	32.00
3/4"	6.00	8	48.00
Elbows-1/2"	.18	4	.72
Elbows-3/4"	.38	16	6.08
T's-1/2"	.35	4	1.40
T's-3/4"	.80	4	3.20
Faucets			
Rinse Tubs	100.00	2	200.00
Traps			
Lavatory	15.00	2	30.00
Rinse Tubs	15.00	2	30.00
Floor Drains	18.00	3	54.00
Soil Pipe 6" pvc	30.00	28	840.00
T's	10.00	2	20.00
.45°	5.00	1	5.00
Ball Valves			
1/2"	5.00		
	6.00	4	24.00
Supply Valves	5.00	4	20.00
Supply Lines (Lavatory & Commodes)	6.00	6	36.00
Pipe Bibs 3/4"	4.00	4	16.00
Toilet Seat	20.00	2	40.00
Pipe			
Galvanized 3/4"	\$25/20'	5	125.00
Elbow 3/4"	1.35	1	1.35
Commode Base	12.00	2	24.00
Commode Seal Ring	2.00	2	4.00
Hot Water Heater - 50 gal.	170.00	1	170.00
Towel Dispenser	75.00	4	300.00
Soap dispenser	50.00	4	200.00
Total Itemized Cost			\$2,936.75
Miscellaneous			350.00
Labor			3,600.00
Total Cost			\$6,886.75

Source: Lincoln, Nebraska retail suppliers.

Table 3-4.

<u>Equipment Required</u>	<u>Price Range</u>
Stainless Steel Receiving Bin With running water (Filtered) 7X3 1/2	\$ 400.00 --- 600.00
Stainless Steel table (4X8) Rolled edge with wheels so it can be used in the Packaging process Must have drainage capabilities If this becomes a bottle-neck, 2 can be purchased.	\$ 660.00 --- 845.00
Stainless Steel Double Sink Drainage to USDA Spec's	\$ 325.00 --- 380.00
Knives and Sharpener Quote is for 8 max employees, must have storage place for knives assuming that is part of infrastructure.	\$ 275.00 --- 350.00
Offal Container USDA Approved Plastic	\$ 109.00 --- 140.00
USDA approved Ban Saw With AMA approved blade	\$ 2,950.00 --- 3,400.00
Scale Price could vary given production levels	\$ 480.00 --- 640.00
Vacuum Sealer Packager Production level will dictate size packager, for this purpose a multivac single seal is quoted. Quote does not include packaging material.	\$ 3,280.00 --- 4,320.00
Freezer This might be part of the infrastructure. The Price stated is a stand alone walk-in unit. This is for Equipment only and not installation. *This does include setup	\$ 9,100.00 --- 10,890.00
Cleaning Materials Initial purchase only	\$ 250.00 --- 350.00
TOTAL	<u>\$ 17,829 --- 21,915</u>

Source: Mr. Jim Keeler, Food Strategy Office, University of Nebraska-Lincoln.

Table 3-5. **AMERICAN DELPHI INC.**

"Trimwaste Disposal Systems"

7110 Fenwick Lane, Box 307, Westminster, CA 92684
(714) 894-0515 • (800) 854-6464 • FAX: (714) 897-5596

TO.

MR. MIKE TURNER
UNIVERSITY OF NEBRASKA
LINCOLN, NEBRASKA
PH:402-472-1710
FX:402-472-3460

QUOTE NO. 8-146-97 PAGE 1 OF 1
QUOTED BY Betty Gwen Veryar
DATE OF QUOTE 8-27-97
REFERENCE Dept. of Agricultural Economics

QUOTATION

TERMS NET 15 DAYS ON APPROVED CREDIT

FREIGHT FOB WESTMINSTER CA

ITEM	QTY	DESCRIPTION	WEIGHT	UNIT	TOTAL PRICE
1	1	<p><u>FISH TRIMWASTE STATION</u> MODEL #300-FVP-4 Foot 16 gauge stainless steel, 304 #4 grade finish, NSF certified OAL: 48"L x 36"W x 37"H (1) Encore #K53-1000-BR pre-rinse, hot/cold water (1) Water flow inlet (1) Poly cutting board Stainless steel legs with adjustable bullet feet and cross bracing (1) Model #3006-3P, 3 phase 208-230 Volt, A.D.I. disposer, U.L. listed, second water after flush, solenoid valve, syphon breaker, dejamming wrench and leg braces Model #620-SN Control Panel, NEMA approved spring loaded, forward/off/reverse push buttons and overload protection</p> <p>3 YEAR DISPOSER WARRANTY</p> <p>Unit is pre-plumbed, pre-wired, pre-assembled and pre-tested</p> <p>NET PRICE.....\$2,697.00</p>			
*PRICES ABOVE PROTECTED FOR 45 DAYS					

NOTE. ANY SPECIAL LOCAL HEALTH, PLUMBING OR ELECTRICAL REQUIREMENTS MUST BE BROUGHT TO OUR ATTENTION. TOTAL P.01

Table 3-6. Fish Processing Facility Investment Costs

Item	Cost
Building - 24' x 40' with 10' ceiling, fully insulated concrete floor, glass bead paneled walls and ceilings, 4" concrete curb	\$50,000
Plumbing	6,900
Furniture	5,000
Electrical	12,800
Well & Pump	5,000
Land - 3 Acres @ \$3,000	9,000
Drive & Parking	3,000
Equipment	20,000
Walk-in Freezer (12' - used)	8,000
Total Cost Including Land	\$119,700
Less: Land Cost	9,000
Total Cost Without Land Included	\$110,700

Source: Tables 3-2 to 3-5.

Table 3-7. Operating Cost

Item	Cost
Personnel:	
Manager	\$35,000
Employees (\$6.00/hour)	36,297
Employee Benefits	6,170
Total Personnel	\$77,467
Utilities*	12,400
Taxes - Property	2,059
Insurance*	9,300
Depreciation	11,970
Supplies Office *	2,000
Plant Supplies*	2,000
Auditing & Professional Fees*	1,500
Bank Service Charges*	300
Data Processing	3,000
Interest:	
Term 7.75%	2,494**
Seasonal 7.50%	1,670***
License & Fees*	1,500
Miscellaneous*	2,500
Travel & Meetings	1,500
Repairs & Maintenance*	2,000
TOTAL	\$133,660

*Based on 30% of expenses incurred by agribusiness firms with payroll expense of \$250,000 per year.

**Average cost over 10-year payback (first year \$4,987).

***Two months of operating expenses, \$21,788.

Table 3-8. Labor Cost Estimates for Fish Processing and Packaging

	Average Pounds Processed Per Day	Average Employees Per Day	Personnel* Cost
Jan	498	1.2	\$1,152
Feb	591	1.4	1,344
Mar	1,661	4.0	3,840
Apr	2,428	6.0*	5,760
May	1,478	3.6	3,465
June	1,850	4.4	4,224
July	1,665	4.0	3,840
Aug	1,665	4.0	3,840
Sep	862	2.2	2,112
Oct	1,012	2.4	2,304
Nov	918	2.2	2,112
Dec	996	2.4	2,304
			\$36,294

Eight-hour work day, five days per week @ \$6 per hour.

*Based on experience of a similar sized Nebraska fish processing operation.

SECTION IV

STRUCTURE FOR A PRODUCER ORGANIZATION TO PROCESS AND MARKET NEBRASKA PRODUCED FISH FOR HUMAN CONSUMPTION

The need for and purpose of a Nebraska fish processing and marketing organization is addressed in section one of this report. The need is multifaceted: it includes the consumer driven nature of today's food system which requires consistent supply, consistent quality, safe and competitive priced products that are palatable and have eye appeal. The need is also a reflection of the marketing channel for food which requires processors to purchase slots in warehouse/distribution centers and assuming responsibility for marketing their product to grocers and/or food service firms, or use the services of food brokers for these marketing functions.

Details of pricing, consumer demographics, packaging, value added (differentiation), advertising, cooking instructions, employee training, etc. are all part of the marketing responsibility of the processor or his/her broker. For the Nebraska fish industry, these ultimately became the responsibility of the producer.

The feasibility of processing was addressed in section three of this report. With a processing facility scaled to the volume of fish produced for food, Nebraska producers could be competitive with fish products from other regions of the country. Equity capital requirements of approximately \$65,000 divided among 10 to 12 producers would appear to be a manageable commitment even for a small scale or part-time operator. But the need for a group initiative does not end with the processing activity. The challenge of addressing marketing activities noted above and in section one of this report also argues for a collective response by fish producers.

Producing for the market - A successful marketing plan first requires a production system which can produce a product acceptable to the consumer; this means a consistent quantity and quality. Fish production in Nebraska is not a full-time employment enterprise for most producers. In most cases production of fish contributes supplemental income, is a part-time activity or a hobby for the producer. Availability of water resources, including natural Sandhills lakes, sand pits, natural springs, or pumped water and the potential for economic gain is the reason Nebraskans are producing fish. The degree to which an individual pursues fish production is limited by the constraints the producer faces. Capital investment requirements, labor resources, management, marketing, production expertise and time are challenges for the part-time producer. Fish production must also compete with other more lucrative employment opportunities available to producers. The result is a limited number of small producers who are attempting to capitalize on a water resource by producing fish and are challenged to provide a consistent quantity or a consistent quality of product for human consumption.

In some cases production activities of part-time Nebraska fish producers would best be described as "raising" in contrast to "finishing" fish. To address this problem, production specialization is recommended. Small and/or part-time producers would concentrate on utilizing various water resources in "raising" fish for human consumption. Fish "raising" would be less labor intensive than "finishing" fish. Fish produced by independent operators who "raise" fish vary in size and quality with considerable seasonal variability in production. In many cases, the product they produce fails to satisfy requirements in the marketplace, i.e., consistency in quantity and quality. To accommodate needs of the market, fish could be transferred for "raising" to a

“finishing” location. Operation of a fish “finishing” facility could include a number of options.

- ☐ Ownership of fish could be retained by the “raiser.” This would require tagging of individual fish if they were to be co-mingled in the “finishing” ponds. Alternatively, the “finisher” could purchase the fish from the “raiser” at the time they were delivered to the finishing location.
- ☐ Individual “finishing” ponds could be committed to use by a specific “raiser” or alternatively fish for more than one “raiser” could be co-mingled with those of other “raisers.” Both cost efficiency and disease control should be considered.
- ☐ The “finishing” operation could be owned and operated by one or more investors with a schedule of charges for the use of the facility by other “raisers.” Charges would include a fee for feed plus an additional fee based on number or pounds of fish and number of days on feed. A profit objective would exist in this scenario.
- ☐ The finishing operation could be owned by an association of users (raisers) rather than one or more investors. In this case an individual “raiser” would be obliged to pay for services in proportion to the number of fish he/she placed in the finishing ponds.
- ☐ An association could be operated on a profit or a non-profit basis at the option of the organizers. If the decision were to operate on a for-profit basis, distribution of earnings could be based on ownership investment or based on use by individual owner-patrons.
- ☐ If an association of “raisers” were organized for the purpose of operating a fish “finishing” facility, responsibility for capitalizing this operation would reside with members of the organization. Roughly 50% of the total capital investment cost would reside with the members of the organization.
- ☐ If use of the “finishing” facility were shared equally among all members, then an equal investment by each would be appropriate. If, on the other hand, some members expected to make greater use than others, their investment should be in proportion to the use they make.

In the latter case, commitments on use can be tied to the initial investment to finance the “finishing” facility. This would assure an individual member a pre-established amount of space for his/her use.

The establishment of a fish “finishing” facility to be operated in conjunction with a fish processing plant appears to be a necessary step for a successful Nebraska fish farming industry. The size and number of fish farmers in Nebraska in 1998 diminishes the probability that an investor-owned fish “finishing” and/or processing operation will be established. The quantity produced by any individual producer would not justify the investment nor lead to a feasible operating cost level. In the absence of commitments from other producers the risk of such a venture would be too high.

The alternative of a grower association with a shared commitment for financing and use of the facilities appears to be necessary, given present levels of production among fish farmers in the state. The following is a proposed structure for a producer organization:

Purpose of the Organization:

- ☐ The purpose of the organization is to address consumer needs by providing a consistent quantity and quality of fish for human consumption and enable producers

to realize a competitive return in fish production.

Objectives: The producer organization will--

- ☐ Own and operate a fish production facility for the purpose of finishing member-owned fish to desirable market weight and quality.
- ☐ Own and operate a plant to process members production including fish which are supplied by the association's "finishing" operation.
- ☐ Provide technical assistance and supervise the production process of member producers and the association's finishing operation to achieve consistency and quality in the fish produced for processing and marketing.
- ☐ Coordinate and facilitate marketing of the finished product from the processing plant through warehouse/distributors to grocers, restaurants, and consumers.

Organizational Provisions:

- Investment Requirements
 - ☐ One-half the cost of a fish processing facility will be provided by member producers through the purchase of capital stock or membership shares (approximately \$65,000) with the balance to be borrowed.
 - ☐ One-half the cost of a fish "finishing" facility will be provided by member producers through the purchase of capital stock or partnership shares (no estimate of cost was made) with the balance to be borrowed.
 - ☐ Capital stock shares or partnership certificates will be considered marketable securities which can be purchased or sold among and between individuals who are engaged in fish production and who could legitimately participate in the use of these assets.
(Capital investments in the processing and finishing facilities are mutually exclusive activities)
- Commitments to Patronize
 - ☐ Capital stock or membership shares in the fish processing facility will include commitments to deliver a specified quantity and quality of fish for processing to the plant on an annual basis. Purchase of multiple shares can assure producers capacity to match their needs.
 - ☐ Capital stock or partnership shares in the fish "finishing" facility will include commitments to deliver a specified quantity and quality of fish to the facility on an annual basis. Purchase of multiple share can assure producers capacity to match their needs.
- Distribution of Income
 - ☐ As a producer owned organization the processing facility would operate on a non-profit basis. Identity of fish entering the plant for processing would be established along with their weight. A processing and marketing fee, based on weight, would then be charged members for services provided. Fees for processing and marketing would include operating expenses for the plant including depreciation, debt service and marketing expenses. Proceeds from the sale of processed fish and

fish products would be paid to the producer on a per pound basis, adjusted for associated shrink in processing. The producer would retain title to his/her product through the processing and marketing channel. The association would guarantee payment to members for sales of product and collection of payment from grocers and food service establishments.

- ☐ As a producer-owned organization the "finishing" facility would operate on a non-profit basis. Fish entering the facility for finishing would either be tagged with a member's identification number or segregated in a specific pond or tank. The member would be billed on a periodic basis (monthly) for feed and associated costs, plus a daily charge based on pound of fish delivered to the facility. The producer-member would retain ownership of his/her product through the finishing stage. Fees charged to members would be adjusted based on experience of the organization to recover operating costs.

Owner Control

Given the limited number of fish producers in the state, a board of directors including all members might be considered. However, the geographic dispersion of the potential members would also pose a problem for regular meetings of the total membership. The election of board officers with responsibilities for on-going operations would be a logical compromise in this situation.

■ Form of Business Structure

- ☐ A variety of organizational forms are possible. They include ordinary corporations (both profit and non-profit options), cooperative corporations (both stock and non-stock), limited liability companies (LLC), and partnerships.
- ☐ Statutory requirements of annual meetings, minutes, officers, and certain taxation provisions argue against ordinary corporations and a cooperative form of business. An LLC has the advantage of single taxation (like a partnership) without statutory requirements of meetings and minutes required of corporations and cooperatives. LLCs provide limited liability protection for individual owners.

While a non-profit basis for operation is recommended for this start-up business, a profit-based operation with internal funding possibilities would have considerable potential for an established business. For that reason, consideration should be given to organizing on a for-profit basis while operating as a non-profit business during the early years of the business's existence.

■ Facility location and logistics

- ☐ Geographic location of the processing and "finishing" facilities can most logically be addressed once the members of the association have been determined. At that point, a location which minimizes transportation cost for members to deliver fish for finishing and/or processing can be selected.

For reasons of efficiency, including minimizing handling and transportation costs, the finishing and processing facilities would ideally be located on the same site. In that case, water resources to support the finishing operation would also be a critical consideration. Finally, a location adjacent to desirable highway access for shipment of

finished products should be considered. No cost for refrigerated delivery equipment was included in the processing plant feasibility (Section 3). Either common carrier or company owned equipment would be required.

■ Personnel

- One of the most important decisions the owners of the processing facility will make is the selection of a manager. The owners will need to delegate responsibility for day-to-day operations to this individual, including the hiring, training, supervision, compensation and dismissal of employees. Care should be taken in developing a job description to assist in the identification, selection and hiring of a competent manager. Special attention should be given to primary responsibilities of the position, including operation of a food processing facility with associated regulatory and food safety requirements. In addition, responsibilities would include management and operation of a fish production facility with attention to disease control, water temperature, oxygenation, etc. the manager would also have responsibilities for marketing finished products. The latter is critically important to the success of the venture and could represent a full-time commitment. As a result, a food broker(s) might logically be employed during the start-up phase of the business. Depending upon the level of sale activity, the organization might at some future date, employ a person full-time to market the organization's product.

Finally, as mentioned above, the manager will need good personnel skills to work effectively with employees, owners and customers. Other attributes, including finance, accounting, mechanical skills, etc. are obviously important. Most of these can be learned or employees can be hired to address specialized tasks. In any case, the right person must be found to assure success of such a venture.

Appendix

Appendix A. Marketing Practices of Nebraska Retail Grocers and Restaurants

Food Retail by Independent/Chain (112 responses)

Table 1. Does your store sell seafood other than frozen, pre-packaged, branded such as Gorton's or Mrs. Paul's?

	Independent	Chain
Yes	38%	77%
No	60%	23%
No Response	2%	0%

Table 2. Type of Seafood Service Provided to Customers by Your Store:

Service	Independent	Chain
Full	3%	54%
Self	35%	23%
No Response	62%	23%

Table 3. What Percent of Your Store's Food Sales Are:

	Independent	Chain
Seafood	3.7%	3.3%
Beef	21.8%	28.1%
Pork	11.7%	14.5%
Chicken	9.0%	15.3%

Table 4. Did your Store Sell Yellow Perch in 1996?

	Independent	Chain
Yes	1%	8%
No	42%	69%
No Response	56%	23%

If no, indicate the reason:

	Independent	Chain
No/Low Demand	24%	23%
Too Expensive	1%	0%
Not Available	16%	46%
Supply	0%	0%
Quality	0%	0%
Other	3%	0%
No Response	55%	31%

Table 5. Did your Store Sell Trout in 1996?

	Independent	Chain
Yes	17%	54%
No	24%	23%
No Response	58%	23%

If no, Indicate the reason:

	Independent	Chain
No/Low Demand	23%	15%
Too Expensive	1%	0%
Not Available	3%	8%
Supply Inconsistent	0%	0%
Quality Inconsistent	0%	0%
Other	0%	0%
No Response	73%	77%

Table 6. Did your Store sell Salmon in 1996?

	Independent	Chain
Yes	34%	69%
No	8%	8%
No Response	58%	23%

If no, Indicate the reason:

	Independent	Chain
No/Low Demand	3%	8%
Too Expensive	4%	0%
Not Available	0%	0%
Supply	0%	0%
Quality	0%	0%
Other	0%	0%
No Response	92%	92%

Table 7. Who makes the decision for this store on which fish/seafood to sell and from which suppliers to purchase?

	Independent	Chain
Store Manager	17%	8%
Store Seafood/Meat Manager	24%	69%
Central Buyer	0%	0%
Central Buyer Provides List of Alternatives	1%	0%
Other	0%	0%
No Response	58%	23%
Choices of Supplier	Independent	Chain
Store Manager	20%	8%
Store Seafood/Meat Manager	16%	62%
Central Buyer	2%	0%
Central Buyer provides list of alternatives	2%	8%
Other	1%	0%
No Response	59%	23%

Table 8. Percent of Store's Fish and Seafood Purchases and Sales that are Live, Fresh and Frozen.

	Independent		Chain	
	Purch	Sales	Purch	Sales
Live	0%	0%	1.1%	1.0%
Fresh	8%	9.3%	17.2%	12.4%
Frozen	58.6%	56.1%	58.5%	59.3%
Previously Frozen	.3%	1.2%	10.8%	10.0%
Frozen/ Pre-Packaged/ Branded	27.8%	31.4%	12.0%	17.1%
No Response/ Rounding Error	5.3%	2.0%	.4%	.2%

Table 9. Percent of Total Fish Purchased by Type from Primary and Secondary Supplier at Your Store.

	Independent		Chain	
	Prim.	Sec.	Prim.	Sec.
Live	.1%	0%	1.1%	1.0%
Fresh	2.1%	9.25%	17.2%	12.4%
Frozen	49.6%	56.1%	58.5%	59.3%
Previously Frozen	1.2%	1.2%	10.8%	10.0%
Frozen/ Pre-Packaged/ Branded	48.5%	31.4%	12.0%	17.1%
No Response/ Rounding Error		2.0%	.4%	.2%

Table 10. What suppliers does your store typically use when buying the following items?

Supplier Type	Independent	Chain
Fresh Shrimp		
Seafood Wholesaler	1%	8%
Grocery Wholesaler	12%	23%
Seafood Spec. Retailer	1%	23%
Food Service Dist.		
Frozen Shrimp		
Grocery Wholesaler	28%	8%
Food Service Dist.	1%	38%
Fresh Ocean Fish		
Seafood Wholesaler	3%	8%
Grocery Wholesaler	10%	31%
Food Service Dist.	1%	8%
Seafood Spec. Retailer	1%	
Frozen Ocean Fish		
Seafood Wholesaler	1%	8%
Grocery Wholesaler	47%	46%
Food Service Dist.	2%	15%
Seafood Spec. Retailer	1%	
Fresh Lakefish		
Seafood Wholesaler	4%	8%
Grocery Wholesaler	9%	23%
Food Service Dist.	1%	8%
Seafood Spec. Retailer	1%	
Fish Farmers		
Frozen Lakefish		
Seafood Wholesaler	1%	8%
Grocery Wholesaler		46%
Food Service Dist.		8%
Fish Farmers		8%
Fresh Farm Raised Fish		
Seafood Wholesaler		8%
Grocery Wholesaler		23%
Food Service Dist.		8%

Fish Farmers	8%
Frozen Farm Raised Fish	
Seafood Wholesaler	8%
Grocery Wholesaler	38%
Food Service Dist.	15%
Fish Farmers	8%

Table 11. Would your store consider purchasing fresh/frozen fish produced in Nebraska?

	Independent	Chain
Yes	86%	77%
No	7%	23%
No Response	8%	0%

Fish Marketing Retail Grocers by Size of City
(112 responses)

Table 12. Does your store sell seafood other than frozen, prepackaged, branded, such as Gorton's or Mrs. Paul's?

Cities				
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	54%	50%	63%	35%
No	46%	50%	37%	64%

Table 13. Type of seafood services provided to customers by your store.

Cities				
Service	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Full	23%	10%	13%	6%
Self	31%	40%	44%	30%
No Response	46%	50%	43%	64%

Table 14. What percent of your store's food sales are:

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Seafood	1.3%	4%	4.3%	4%
Beef	9.1%	29.6%	32.3%	28.1%
Pork	3.5%	16.4%	16.3%	11.8%
Chicken	4.1%	15.0%	14.8%	7.8%

Table 15. Did your store sell Yellow Perch in 1996?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	8%	30%	0%	0%
No	46%	20%	56%	39%
No Response	46%	50%	44%	61%

If no, indicate the reason:

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
No/Low Demand	31%	10%	13%	27%
Too Expensive	0%	0%	0%	2%
Not Available	31%	30%	44%	11%
Supply Inconsistent	0%	0%	0%	0%
Quality Inconsistent	0%	0%	0%	0%
Other	0%	0%	6%	3%
No Response	38%	60%	37%	58%

Table 16. Did your store sell trout in 1996?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	54%	30%	31%	12%
No	0%	20%	31%	27%
No Response	46%	50%	38%	61%

If no, indicate the reason:

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
No/Low Demand	0%	20%	25%	26%
Too Expensive	0%	0%	0%	2%
Not Available	0%	0%	13%	3%
Supply Inconsistent	0%	0%	0%	0%
Quality Inconsistent	0%	0%	0%	0%
Other	0%	0%	0%	0%
No Response	100%	80%	62%	69%

Table 17. Did your store sell salmon in 1996?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	46%	50%	50%	32%
No	3%	0%	13%	8%
No Response	46%	50%	37%	60%

If no, indicate the reason:

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
No/Low Demand	0%	0%	6%	5%
Too Expensive	8%	0%	6%	3%
Not Available	0%	0%	0%	0%
Supply Inconsistent	0%	0%	0%	0%
Quality Inconsistent	0%	0%	0%	0%
Other	0%	0%	6%	3%
No Response	92%	100%	88%	92%

Table 18. Who makes the decision for this store on which fish/seafood to sell and from which supplier to purchase?

Choice of Species:	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Store Manager	8%	0%	13%	21%
Store Seafood/Meat Manager	54%	50%	50%	17%
Central Buyer	0%	0%	0%	0%
Central Buyer provides list of alternatives	0%	0%	0%	2%
Other	0%	0%	0%	0%
No Response	38%	50%	38%	61%
Choice of Supplier:				
Store Manager	8%	0%	25%	21%

Store Seafood/Meat Manager	38%	50%	38%	12%
Central Buyer	0%	0%	0%	3%
Central Buyer provides list of alternatives	15%	0%	0%	2%
Other	0%	0%	0%	2%
No Response	38%	50%	38%	61%

Table 19. Percent of Total Fish Purchased by Type from Primary and Secondary Supplier at Your Store.

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Primary Supplier:				
Live	.8%	0%	.4%	0%
Fresh	15.3%	1.2%	5.0%	.9%
Frozen	36.3%	56.4%	60.4%	48.5%
Previously Frozen	2.1%	.7%	1.7%	1.4%
Frozen/Pre-Packaged/Branded	46.3%	41.7%	32.5%	47.1%
No Response/Rounding Error	0%	0%	0%	0%

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Secondary Supplier:				
Live	0%	0%	0%	0%
Fresh	30%	0%	33.3%	0%
Frozen	19.4%	0%	65.8%	60%
Previously Frozen	4.0%	0%	.8%	0%
Frozen/ Pre- Packaged/ Branded	33.0%	0%	0%	40%
No Response/ Rounding Error	13.6%	0%	0%	0%

Table 20. What suppliers does your store typically use when buying the following items?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Fresh Shrimp				
Seafood Wholesaler	1%	0%	0%	3%
Grocery Wholesaler	1%	6%	28%	20%
Food Service Dist.	1%	6%	6%	0%
Seafood Spec. Retailer	1%	0%	0%	0%
Frozen Shrimp				

Seafood Wholesaler	0%	0%	6%	91%
Grocery Wholesaler	1%	24%	39%	3%
Food Service Dist.	1%	6%	6%	0%
Seafood Spec. Retailer	0%	0%	0%	0%

Fresh Ocean Fish

Seafood Wholesaler	3%	0%	0%	0%
Grocery Wholesaler	1%	6%	22%	20%
Food Service Dist.	1%	6%	0%	0%
Seafood Spec. Retailer	1%	0%	0%	0%

Frozen Ocean Fish

Seafood Wholesaler	1%	0%	6%	0%
Grocery Wholesaler	8%	29%	44%	89%
Food Service Dist.	2%	6%	0%	3%
Seafood Spec. Retailer	0%	0%	0%	3%

Fresh Lakefish

Seafood Wholesaler	3%	0%	6%	3%
Grocery Wholesaler	1%	6%	22%	17%
Food Service Dist.	1%	0%	0%	0%
Seafood Spec. Retailer	1%	0%	0%	0%

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Fish Farm	0%	6%	0%	0%
Frozen Lakefish				
Seafood Wholesaler	1%	0%	6%	0%
Grocery Wholesaler	3%	29%	22%	62%
Food Service Dist.	1%	0%	0%	0%
Seafood Spec. Retailer	0%	0%	0%	0%
Fish Farm	0%	6%	0%	0%
Fresh Farm-Raised Fish				
Seafood Wholesaler	2%	0%	6%	3%
Grocery Wholesaler	1%	6%	22%	14%
Food Service Dist.	1%	0%	0%	0%
Seafood Spec. Retailer	1%	0%	0%	0%
Fish Farm	0%	6%	0%	0%
Frozen Farm-Raised Fish				
Seafood Wholesaler	1%	0%	6%	3%
Grocery Wholesaler	5%	24%	33%	71%
Food Service Dist.	1%	0%	6%	0%
Seafood Spec. Retailer	0%	6%	0%	0%
Fish Farm				

Table 21. Would your store consider purchasing fresh/frozen fish produced in Nebraska?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	0%	80%	100%	83%
No	0%	10%	0%	9%
No Response	0%	10%	0%	8%

**Fish Marketing by Restaurants — No Table Service and Table Service
(122 responses)**

Table 22. Annual gross sales by restaurant type.

Sales Category	No Table Service	Table Service
Less than \$100,000	50%	27%
100,001 to 250,000	10%	25%
251,000 to 500,000	10%	23%
500,001 to 1 million	0%	10%
Over 1 million	0%	6%
No Response	30%	9%

Table 23. Does your restaurant menu include fish or seafood as an entree?

	No Table Service	Table Service
Yes	50%	76%
No, but I plan to add	0%	6%
No	20%	11%
No Response	30%	7%

Table 24. Percent of restaurant total food sales.

Product	No Table Service	Table Service
Fish/Seafood	12%	13%
Pork	9%	7%
Beef	50%	54%
Chicken	10%	19%

Table 25. Did your restaurant sell trout in 1996?

	No Table Service	Table Service
Yes	0%	14%
No	60%	67%
No Response	40%	19%

If no, indicate the reasons:

	No Table Service	Table Service
No/Low Demand	20%	47%
Too Expensive	10%	8%
Not Available	0%	3%
Supply Inconsistent	0%	0%
Quality Inconsistent	0%	1%
Other	40%	15%
No Response	50%	26%

Table 26. Did your restaurant sell salmon in 1996?

	No Table Service	Table Service
Yes	10%	36%
No	60%	44%
No Response	30%	20%

If no, indicate the reasons:

	No Table Service	Table Service
No/Low Demand	20%	26%
Too Expensive	10%	8%
Not Available	0%	2%
Supply Inconsistent	0%	2%
Quality Inconsistent	0%	1%
Other	30%	13%
No Response	40%	48%

Table 27. Did your restaurant sell yellow perch in 1996?

	No Table Service	Table Service
Yes	0%	20%
No	70%	79%
No Response	30%	19%

If no, indicate the reasons:

	No Table Service	Table Service
No/Low Demand	20%	54%
Too Expensive	10%	3%
Not Available	0%	14%
Supply Inconsistent	10%	3%
Quality Inconsistent	0%	2%
Other	30%	14%
No Response	30%	10%

Table 28. Who makes the decision for this restaurant on which fish/seafood to sell and from which supplier to purchase?

Choice of Species:	No Table Service	Table Service
Manager	40%	62%
Seafood/Meat Manager	0%	2%
Chef	0%	11%
Central Buyer	10%	
Central Buyer provides list of alternatives	0%	0%
No Response	50%	25%
Choice of Supplier:	No Table Service	Table Service
Manager	30%	59%
Seafood/Meat Manager	0%	3%
Chef	0%	10%
Central Buyer	20%	1%
Central Buyer provides list of alternatives	0%	0%
No Response	50%	27%

Table 29. Percent of restaurant seafood purchases by type.

Type	No Table Service	Table Service
Fresh	10%	8%
Frozen	73%	91%
Previously Frozen	17%	1%

Table 30. Percent of total fish purchased by type from primary and secondary supplier at this restaurant.

Primary Supplier:	No Table Service	Table Service
Fresh	0%	8%
Frozen	100%	91%
Previously Frozen	0%	1%

Secondary Supplier:	No Table Service	Table Service
Fresh	25%	12%
Frozen	75%	85%
Previously Frozen	0%	3%

Table 31. What suppliers does your restaurant typically use when buying the following items?

Supplier Type:	No Table Service	Table Service
Fresh Shrimp		
Food Service Dist.	100%	45%
Seafood Wholesalers	0%	7%
Supermarkets	0%	3%
Frozen Shrimp		
Food Service Dist.	100%	66%
Seafood Wholesalers	0%	5%
Fresh Ocean Fish		
Food Service Dist.	100%	43%
Seafood Wholesalers	0%	6%
Supermarket	0%	4%

Frozen Ocean Fish		
Food Service Dist.	100%	72%
Seafood Wholesalers	0%	3%
Supermarket	0%	10%
Fresh Lake Fish		
Food Service Dist.	100%	88%
Fish Farmer	0%	2%
Frozen Lake Fish		
Food Service Dist.	100%	52%
Seafood Wholesaler	0%	3%
Grocery Wholesaler	0%	3%
Other	0%	4%
Fresh Farm Raised Fish		
Grocery Wholesaler	100%	0%
Seafood Wholesaler		10%
Frozen Farm Raised Fish		
Food Service Dist.	100%	62%
Fish Farmer	0%	6%
Supermarket	0%	4%

Table 3-32. Would your restaurant consider purchasing fresh/frozen fish produced in Nebraska?

	No Table Service	Table Service
Yes	50%	73%
No	10%	14%
No Response	40%	13%

Fish Marketing Restaurants — By Size of City
(122 responses)

Table 3-33. Annual gross restaurant sales by size of city.

Gross Sales	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Less than \$100,000	0%	29%	28%	29%
100,001 to 250,000	68%	29%	67%	63%
251,000 to 500,000	23%	35%	6%	9%
500,001 to 1 million	9%	6%	0%	0%
Over 1 million	0%	0%	0%	0%

Table 34. Does your restaurant menu include fish or seafood as an entree?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	71%	76%	78%	91%
No, but I plan to add	10%	6%	6%	6%
No	14%	18%	17%	3%
No Response	5%	0%	0%	0%

Table 35. Percent of total restaurant food sales.

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Fish/ Seafood	16%	10%	7%	8%
Pork	6%	5%	6%	7%
Beef	32%	19%	38%	54%
Chicken	14%	18%	16%	14%

Table 36. Did your restaurant sell trout in 1996?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	5%	41%	11%	6%
No	71%	41%	67%	89%
No Response	24%	18%	22%	5%

If no, indicate the reason:

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
No/Low Demand	38%	29%	44%	63%
Too Expensive	10%	6%	6%	11%
Not Available	0%	0%	6%	3%
Supply Inconsistent	0%	0%	0%	0%
Quality Inconsistent	0%	0%	0%	0%
Other	19%	12%	11%	23%
No Response	33%	53%	33%	0%

Table 37. Did your restaurant sell salmon in 1996?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	33%	59%	33%	26%
No	43%	24%	44%	60%
No Response	24%	17%	23%	14%

If no, indicate the reason:

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
No/Low Demand	14%	12%	28%	43%
Too Expensive	10%	0%	11%	9%
Not Available	0%	0%	0%	6%
Supply Inconsistent	0%	0%	0%	6%
Quality Inconsistent	0%	0%	0%	3%
Other	14%	12%	11%	20%
No Response	62%	76%	50%	13%

Table 38. Did your restaurant sell yellow perch in 1996?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	5%	6%	0%	0%
No	68%	76%	78%	94%
No Response	27%	18%	22%	6%

If no, indicate the reason:

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
No/Low Demand	43%	53%	50%	56%
Too Expensive	5%	18%	0%	7%
Not Available	5%	0%	17%	10%
Supply Inconsistent	0%	0%	0%	7%
Quality Inconsistent	0%	0%	0%	0%
Other	19%	12%	17%	15%
No Response	28%	17%	16%	0%

Table 39. Who makes the decision for this restaurant on which fish/seafood to sell and from which supplier to purchase?

Choice of Species:	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Manager	52%	59%	72%	69%
Seafood/Meat Buyer	0%	0%	0%	6%
Chef	23%	12%	6%	3%
Central Buyer	0%	0%	0%	0%
Central Buyer provides list of alternatives	0%	0%	0%	2%
No Response	25%	29%	22%	22%
Choice of Supplier:				
Manager	43%	59%	67%	69%
Seafood/Meat Buyer	0%	0%	6%	6%
Chef	19%	12%	6%	3%

Central Buyer	10%	0%	0%	0%
Central Buyer provides list of alternatives	5%	0%	0%	0%
No Response	23%	29%	21%	22%

Table 40. Percent of restaurant seafood purchases by type.

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Fresh	2%	34%	13%	9%
Frozen	67%	66%	85%	91%
Prev. Frozen	31%	0%	2%	0%

Table 41. Percent of total fish purchased by type from primary and secondary supplier at this restaurant.

Primary Supplier:	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Fresh	30%	1%	6%	1%
Frozen	61%	98%	58%	89%
Prev. Frozen	0%	1%	8%	0%

Secondary Supplier	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Fresh	9%	18%	0%	6%
Frozen	29%	0%	50%	19%
Prev. Frozen	0%	0%	0%	0%

Table 42. What suppliers does your restaurant typically use when buying the following items?

Items	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Fresh Shrimp				
Seafood Wholesaler	14%	12%	0%	0%
Food Service Dist.	5%	12%	11%	6%
Supermarket	0%	0%	0%	3%
Frozen Shrimp				
Seafood Wholesaler	24%	0%	0%	0%
Grocery Wholesaler	5%	6%	0%	9%
Food Service Dist.	33%	59%	44%	0%
Other	0%	0%	0%	60%
Supermarket	0%	0%	0%	3%
Fresh Ocean Fish				
Seafood Wholesaler	20%	12%	0%	0%
Food Service Dist.	5%	0%	0%	0%
Grocery Wholesaler	5%	25%	6%	0%
Supermarket	0%	6%	0%	3%
Frozen Ocean Fish				
Seafood Wholesaler	14%	0%	0%	0%
Food Service Dist.	24%	47%	33%	29%
Grocery Wholesaler	0%	6%	0%	9%
Supermarket	0%	0%	0%	3%

Fresh Lake Fish				
Seafood Wholesaler	10%	7%	0%	3%
Grocery Wholesaler	10%	0%	0%	0%
Food Service Dist.	5%	17%		
Supermarket	0%	0%	0%	3%
Other	10%	0%	0%	0%
Processor	0%	6%	0%	0%
Frozen Lakefish				
Seafood Wholesaler	5%	0%	0%	3%
Grocery Wholesaler	5%	6%	0%	0%
Food Service Dist.	14%	24%	6%	20%
Other	5%	0%	0%	0%
Processor	0%	0%	6%	0%
Fresh Farm-Raised Fish				
Seafood Wholesaler	10%	12%	0%	0%
Grocery Wholesaler	10%	0%	0%	0%
Food Service Dist.	5%	12%	0%	3%
Fish Farmers	0%	6%	0%	0%
Processors	0%	0%	6%	0%
Supermarkets	0%	0%	0%	3%
Frozen Farm-Raised Fish				
Seafood Wholesaler	5%	0%	0%	0%
Grocery Wholesaler	5%	0%	0%	0%
Food Service Dist.	20%	47%	13%	29%

Items	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Supermarkets	5%	0%	0%	0%
Fish Farm	0%	6%	0%	6%
Seafood Specialty Ret.	0%	0%	6%	0%

Table 43. Would your restaurant consider purchasing fresh/frozen fish produced in Nebraska?

	Cities			
	Lincoln/ Omaha	20,000 to 50,000	3,000 to 19,999	Less than 3,000
Yes	76%	82%	560%	80%
No	10%	18%	28%	6%
No Response	14%	0%	16%	14%

Nebraska Food Retailers Who Purchased and Sold Trout and Salmon
(15 responses)

Table 44. Did your store sell trout in 1996?

	Percent
Yes	53%
No	47%

Table 45. Rank of highest four months in consumer demand for trout at your store:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan	2		1	1
Feb	1	3	1	
Mar	2	1	1	
April		1	1	1
May				1
June		1		1
July	1			
Aug			1	
Sept			1	1
Oct	1			
Nov		1		
Dec			1	

Table 46. Rank of highest four months in supply of trout at your store:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan	1		1	1
Feb	1	1		
Mar		1	1	
April				1
May				
June	1			2
July	1	1		
Aug		1	1	
Sept			1	1
Oct	1			
Nov		1		
Dec			1	

Table 47. Rank of highest four months for wholesale prices paid for trout at your store:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan	3			
Feb		3	1	
Mar			3	
April		1	1	2
May				2
June	1			
July		1		
Aug			1	
Sept				1
Oct				1
Nov			1	
Dec		1		

Table 48. Frequency with which your store typically sells trout.

	Percent
Occasionally	13%
Only During Lent	13%
Summer Months Only	0%
Year-Round	27%
Other	0%
No Response	46%

Table 49. How often does your foodstore sell trout?

	Percent
Daily	20%
Once a Week	0%
Once a Month	20%
Other	13%
No Response	47%

Table 50. Which two trout product forms does your store prefer to purchase when price and supply are not problems?

Most Preferred	Percent
Frozen Dressed	7%
Fresh Fillet, Skinless	7%
Fresh Fillet, Skin On	13%
Fresh Dressed	20%
Frozen Fillet, Skinless	7%
No Response	47%
Next Most Preferred	
Frozen Fillet, Skin On	13%
Fresh Fillet, Skinless	13%
Fresh, Whole Round	7%
Fresh Dressed	7%
Frozen, Whole Round	7%
No Response	53%

Table 51. Because of supply and demand conditions in 1996, which trout products did your store purchase most frequently?

Most Preferred	Percent
Frozen Dressed	7%
Fresh Fillet, Skinless	7%
Fresh Fillet, Skin On	13%
Fresh Dressed	13%
Frozen, Whole Round	7%
No Response	53%
Next Most Preferred	
Frozen Fillet, Skin On	13%
Fresh Fillet, Skinless	13%
Fresh, Whole Round	7%
Fresh Dressed	7%
Frozen Fillet, Skinless	7%
No Response	53%

Table 52. Most frequent size, price and quantity of trout deliveries to your store in 1996.

Deliveries Received				
Size	5 Lb.	10 oz.	10 oz.	18 oz.
Ave. Price/lb.	\$3.85	\$3.50	\$3.85	\$2.99
Delivery Schedule	5 lb/ month	20 lb/ month	15 lb/ month	15 lb/ month

Table 53. Second most frequent size, price and quantity of trout deliveries to your store in 1996.

Deliveries Received			
Size	10 oz.	12 oz.	12 oz.
Ave. Price/Lb.	\$4.00	\$3.85	\$4.99
Delivery Schedule	10 lb/ month	15 lb/month	10 lb/ month

Table 54. What types of firms supply your restaurant with trout? (Preferred Product Form)

Highest Volume	Percent
Grocery Wholesaler	27%
Food Service Distributor	7%
Seafood Wholesaler	20%
No Response	47%
Second Highest Volume	
Seafood Wholesaler	20%
Grocery Wholesaler	7%
No Response	73%

Table 55. How much trout did your store purchase during an average week or month in the summer of 1996?

	Average Summer Purchases	Range
Pounds/Week	19	15-20
Pounds/Month	28	10-60

Table 56. What type of firms supply your store with trout? (Second Most Preferred Product Form)

Highest Volume	Percent
Seafood Wholesaler	20%
Grocery Wholesaler	20%
No Response	60%
Second Highest	
Grocery Wholesaler	13%
Seafood Wholesaler	20%
No Response	67%

Table 57. Does your store purchase farm-raised trout?

Purchases	
Yes, Infrequently	7%
Yes, Regularly	33%
No, and Not Interested	7%
Not Sure	7%
No Response	47%

Table 58. Would your store be interested in purchasing Nebraska-raised trout?

Interest	
Yes	47%
No	0%
No Response	53%

Table 59. How much trout might your store purchase weekly or monthly?

	Pounds	Range
Pounds/Week	17.5	5-40
Pounds/Month	31.0	15-50

Table 60. If the trout form your store prefers to purchase is not available, which strategy do you choose?

	Alternative Strategy
Switch from fresh to frozen	7%
Switch to different size	0%
Switch to different salmon product	7%
Switch Suppliers temporarily	7%
Drop salmon temporarily	20%
Switch species	13%
Other	0%
No Response	47%

Table 61. If your preferred trout product is too high priced, which strategy does your store choose?

	Alternative Strategy
Switch from fresh to frozen	13%
Switch to different size	7%
Switch to different salmon product	7%
Switch Suppliers temporarily	7%
Drop salmon temporarily	27%
Switch species	20%
Other	0%
No Response	20%

Table 62. Does your store sell salmon?

	Percent
Yes	53%
No	47%

Table 63. Rank of highest four months in consumer demand for salmon at your store:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan		1		
Feb	2	2	2	
Mar	4	2		1
Apr		1	2	
May				3
June			2	
July				2
Aug		1		
Sept				
Oct			1	
Nov	1			1
Dec				

Table 64. Rank the highest four months in supply of salmon at your store:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan				
Feb	1		1	
Mar	2	1		1
April		1	1	
May			1	1
June	1	1	2	
July	1	1		2
Aug	1	1		1
Sept		1		
Oct			1	
Nov				1
Dec				

Table 65. Rank the highest four months for wholesale prices paid for salmon at your store:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan	2			
Feb		2		
Mar	2		1	
April			1	1
May	1			1
June		1		
July			1	
Aug				1
Sept				
Oct		1		
Nov			1	
Dec				1

Table 66. Frequency with which your store typically sells salmon.

	Percent
Occasionally	7%
Only During Lent	7%
Summer Months Only	0%
Year-Round	40%
Other	0%
No Response	47%

Table 67. How often does your store sell salmon?

	Percent
Daily	53%
Once a Week	0%
Once a Month	0%
Other	0%
No Response	47%

Table 68. Which two salmon product forms does your store prefer to purchase when price and supply are not problems?

Most Preferred	Percent
Frozen Dressed	7%
Fresh Dressed	20%
Fresh Whole/Round	7%
Fresh Fillet, Skin On	7%
Frozen Fillet, Skinless	7%
Fresh Fillet, Skinless	7%
No Response	46%
Next Most Preferred	
Fresh Fillet, Skinless	27%
Fresh Dressed	13%
Frozen Dressed	7%
No Response	53%

Table 69. Because of supply and demand conditions in 1996, which salmon products does your store purchase most frequently?

Most Preferred	Percent
Fresh Dressed	27%
Fresh Whole/Round	7%
Fresh Fillet, Skin On	7%
Fresh Other	7%
No Response	53%
Next Most Preferred	
Frozen Dressed	13%
Fresh Fillet, Skin On	20%
Fresh Dressed	7%
Fresh Fillet, Skinless	13%
No Response	53%

Table 70. Most frequent size, price and quantity of salmon deliveries to your store in 1996.

Deliveries Received					
Size	8 lb.	10 lb.	10 lb.	12 lb.	10 lb.
Ave. Price/lb.	\$3.05	\$2.75	\$3.75	\$3.99	\$3.99
Delivery Schedule	8 lb/ 3-4 weeks	20 lb/ 3-4 weeks	12 lb/ week	36 lb/ week	
Second Most Frequent					
Size	4 lb.	8 lb.	8 lb.		
Ave. Price/lb.		\$4.00	\$4.95	\$5.99	\$4.99
Delivery Schedule		15 lb/ month	7 lb/ week	20 lb/ week	

Table 71. What types of firms supply your store with salmon? (Preferred Product Form)

Highest Volume	Percent
Grocery Wholesaler	20%
Food Service Distributor	7%
Seafood Wholesaler	27%
No Response	47%
Second Highest Volume	
Food Service Distributors	7%
Grocery Wholesaler	20%
Seafood Wholesaler	13%
No Response	60%

Table 72. What types of firms supply your store with salmon? (Second Most Preferred Product Form)

Highest Volume	Percent
Grocery Wholesaler	20%
Seafood Wholesaler	27%
No Response	53%
Second Highest Volume	
Food Service Distributors	7%
Grocery Wholesaler	20%
Seafood Wholesaler	13%
No Response	60%

Table 73. How much salmon did your store purchase during an average week or month in the summer of 1996?

	Average Summer Purchases	Range
Pounds/Week	32.6	18-56
Pounds/Month	50	20-90

Table 74. Does your store purchase farm-raised salmon?

Purchases	
Yes, Infrequently	0%
Yes, Regularly	33%
No, and Not Interested	7%
Not Sure	13%
No Response	47%

Table 75. Would your store be interested in purchasing Nebraska-raised salmon?

Interest	
Yes	53%
No	0%
No Response	47%

Table 76. How much salmon might your store purchase weekly or monthly?

	Pounds	Range
Pounds/Week	47	20-80
Pounds/Month	120	40-200

Table 77. If the salmon form your store prefers to purchase is not available, which strategy does your store choose?

Alternative Strategy	Percent
Switch from fresh to frozen	13%
Switch to different size	20%
Switch to different salmon	7%
Switch Suppliers temporarily	7%
Drop salmon temporarily	20%
Switch species	0%
Other	0%
No Response	33%

Table 78. If your preferred salmon product is too high priced which strategy does your store choose?

	Alternative Strategy
Switch from fresh to frozen	13%
Switch to different size	13%
Switch to different salmon product	13%
Switch Suppliers temporarily	7%
Drop salmon temporarily	20%
Switch species	7%
Other	7%
No Response	20%

Nebraska Restaurants Who Purchased and Served Salmon

(17 responses)

Table 79. Does your restaurant sell salmon?

	Percent
Yes	46%
No	54%

Table 80. Rank of highest four months in consumer demand for salmon at your restaurant:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan	1			
Feb				1
Mar	2	2	1	
April		2	1	
May			1	
June				1
July			1	
Aug			1	1
Sept				
Oct				
Nov				
Dec				1

No Response: 62%

Table 81. Rank the highest four months in supply of salmon at your restaurant:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan				1
Feb				
Mar	2			
April		2		
May				
June				
July				
Aug				
Sept				
Oct				
Nov			1	
Dec			1	1

No Response: 85%

Table 82. Rank the highest four months for wholesale prices paid for salmon at your restaurant:

	Rank			
	1 st	2 nd	3 rd	4 th
Jan				1
Feb				
Mar	2			
April		3		
May				
June				
July				
Aug				
Sept				
Oct				
Nov				1
Dec			1	

No Response: 85%

Table 83. Frequency with which restaurants typically sell salmon.

	Percent
Occasionally	15%
Only During Lent	0%
Summer Months Only	0%
Year-Round	31%
Other	0%
No Response	54%

Table 84. How often does your restaurant sell salmon?

	Percent
Daily	38%
Once a Week	8%
Once a Month	0%
Other	0%
No Response	54%

Table 85. Which two salmon product forms does your restaurant prefer to purchase when price and supply are not problems?

Most Preferred	Percent
Frozen Fillet, Skin on	23
Frozen Other	8%
Fresh Dressed	8%
Frozen Fillet, Skinless	8%
No Response	54%
Next Most Preferred	
Frozen Fillet, Skinless	23%
No Response	76%

Table 86. Because of supply and demand conditions in 1996, which salmon products does your restaurant purchase most frequently?

Most Preferred	Percent
Frozen Fillet, Skin On	23%
Frozen, Other	8%
Fresh Dressed	8%
Frozen Fillet, Skinless	8%
No Response	54%
Second Most Preferred	
Frozen Fillet, Skinless	15%
No Response	85%

Table 87. Indicate the size, price and quantity of deliveries to your restaurant in 1996.

Deliveries Received					
Size	8 oz.	8 oz.	8 oz.	8 oz.	
Ave. Price/lb.	\$3.60	\$2.35	\$3.75	\$3.50	\$3.70
Delivery Schedule	10 lbs/ month	10 lbs/ 6 mths.	1 lb/ week		

Table 88. What types of firms supply your restaurant with salmon? (Preferred Product Form)

Highest Volume	Percent
Food Service Distributor	31%
Grocery Wholesaler	8%
Fish Farmer	8%
No Response	54%
Second Highest Volume	
Commercial Fisherman	8%
Food Service Distributors	8%
No Response	85%

Table 89. What types of firms supply your restaurant with salmon? (Second Most Preferred Product Form)

Highest Volume	Percent
Grocery Wholesaler	8%
Seafood Wholesaler	8%
No Response	84%
Second Highest	
Commercial Fisherman	8%
No Response	92%

Table 90. How much salmon did your restaurant purchase during an average week or month in the summer of 1996?

	Average Summer Purchases	Range
Pounds/Week	15	10-25
Pounds/Month	31	100

Table 91. Does your restaurant purchase farm-raised salmon?

	Purchases
Yes, Infrequently	0%
Yes, Regularly	8%
No, and Not Interested	15%
Not Sure	23%
No Response	54%

Table 92. How much salmon does your restaurant expect to purchase weekly or monthly during the summer?

	Average	Range
Pounds/Week	15	10-25
Pounds/Month	56	1200

Table 93. If the salmon your restaurant prefers to purchase is not available, which strategy do you choose?

	Alternative Strategy
Switch from fresh to frozen	0%
Switch to different size	8%
Switch to different salmon	0%
Switch Suppliers temporarily	0%
Drop salmon from menu	31%
Switch species	8%
Other	0%
No Response	54%

Table 94. If the salmon your restaurant prefers is too expensive, which strategy do you choose?

Alternative Strategy	Percent
Switch from fresh to frozen	0%
Switch to different size	8%
Switch to different salmon	0%
Switch Suppliers temporarily	0%
Drop salmon from menu	38%
Switch species	0%
Other	0%
No Response	54%

Fish/Seafood Purchases and Sales by Nebraska Food Wholesalers
(5 responses)

Table 95. Does your company sell fish/seafood other than frozen, pre-packaged and branded such as Gorton's or Mrs. Paul's?

	Percent
Yes, both	20%
Yes, I sell only fresh seafood	0%
yes, I sell only frozen seafood	80%
No, I only sell frozen pre-packaged, branded items	0%
No, I do not sell fish/seafood	0%

Table 96. What percent of your company's food sales are:

Product	Percent
Fish/Seafood	3.6%
Beef	6.0%
Pork	5.0%
Chicken	7.0%

Table 97. What percent of your company's fish/seafood sales and purchases are:

Form	Percent
Live	0%
Fresh	0%
Frozen	97.5%
Previously Frozen	2.5%
Frozen/Prepackaged	0%

Table 98. Your company's primary and secondary role in the fish/seafood marketing channel:

Primary Role	Percent
Food Service Distributors	80%
Grocery Wholesaler	20%
Secondary Role	
Other Food Service	20%
Supermarket	20%
Restaurants	20%
No Response	40%

Table 99. What types of firms typically supply your company with fish and seafood products?

Type	Percent
Processors	80%
Brokers	80%
Fish Farmers	40%
Grocery Wholesalers	20%
Importers/Exporters	60%
Seafood Wholesalers	60%
Other Food Service	40%

Table 100. What types of firms are your company's customers for fish and seafood products?

Type	Percent
Supermarkets	40%
Restaurants	80%
Other Food Service	40%
Final Consumers	20%

Table 101. What types of firms are your customer's primary suppliers and customers by product type?

Product Type	Supplier	Percent
Frozen Shrimp	Processor	20%
	Seafood Wholesaler	20%
	Importer/Exporter	20%
	Broker	20%
Frozen Ocean Fish	Processor	40%
	Seafood Wholesaler	20%
	Broker	20%
Frozen Lake Fish	Processor	60%
	Broker	20%
Frozen Farm Raised Fish	Processors	60%
	Broker	20%
Product Type	Customer	Percent
Frozen Shrimp	Restaurants	80%
	Brokers	20%
Frozen Ocean Fish	Restaurants	80%
	Brokers	20%
Frozen Lake Fish	Restaurants	80%
Frozen Farm Raised Fish	Restaurants	80%
	Processors	20%

Table 102. What are your company's best selling fish and seafood species?

Species	Percent
Crab	40%
Pollock	100%
Shrimp	100%
Channel Catfish, Lake	40%
Cod	60%
Salmon	20%
Halibut	20%
Other	20%

Water Supply, Plant Drainage, and Sewage Disposal System

Water Supply

Potable Water Supply

1. The water supply must be ample and potable. A certificate showing that the water is potable must be obtained from the appropriate health authorities prior to granting inspection.

Water from public water supply systems is usually acceptable. If the water is supplied from private wells, they should be certified as potable and protected from pollution. This certification should be made by the appropriate health authorities or by other government agencies acceptable to the Administrator.

If chlorinators are required to assure a continuous potable supply, they should be automatic and equipped with devices that inform the plant management and inspector when they have ceased to function. Poultry plants must have specified, in terms of gallons-per-minute, the water available for the processing needs of the plant.

Water must be distributed throughout the plant under adequate pressure and in quantities sufficient for all operating needs. Both hot and cold water must be provided. Hot water must come from a central heating plant of sufficient capacity or from other facilities capable of furnishing an ample supply. Hand-operated mixing valves for mixing steam and water are not acceptable for producing hot water used for such purposes as sanitizing equipment or areas contaminated by diseased material. If automatic mixing valves are utilized, a thermometer must be located at a point after mixing has occurred.

Nonpotable Water Supply

2. Nonpotable water lines shall not be cross-connected with the potable water supply. Nonpotable and potable lines must be physically separated to assure against accidental contamination. There can be some method of quickly connecting the two, if necessary for fire protection, but it should be located outside the plant.

Vacuum Breakers

3. Vacuum breakers of an acceptable type should be provided on all steam lines and water lines connected to various pieces of equipment.

Plant Waste Disposal

4. An efficient method of disposing of plant wastes is essential. If a private septic tank or sewage disposal system is used, it must be efficiently designed

and operated so as to not produce objectionable conditions. The system must be acceptable to those authorities having jurisdiction.

Disposal of Paunch Contents, Hog Hair, Feathers, Blood, and Similar Waste Material

5. Waste material such as paunch contents, hog hair, feathers, blood, and pen manure must be disposed of without creating objectionable conditions, and the drawings or specifications should indicate how this will be accomplished.

Acceptance of Plant Waste System

6. The sewage disposal facilities must be acceptable to those having jurisdiction over such matters (local or State pollution control agencies or the U.S. Environmental Protection Agency). A letter from such authorities indicating that the proposed sewage system is satisfactory to them must be submitted to the area supervisor before inspection can be inaugurated at the plant.

Catch Basins for Grease Recovery

7. Catch basins for recovering grease should not be located in or near edible products departments or areas where edible products are shipped or received. When a catch basin is within a building, it should be adequately gasketed and sealed and located in a ventilated room. To permit easy cleaning, such basins should have inclined bottoms and a removable cover. They should be constructed so that they can be completely emptied of their contents for cleaning. Hot water hose connections should be provided at convenient locations near the basins for cleanup purposes. The area surrounding an outside catch basin should be paved with impervious material, such as concrete, and provided with proper drainage. Suitable facilities, such as a blow tank, should be provided for the transfer of grease to the point of disposal after it is skimmed from the basins.

Plant Drainage

8. All parts of floors where wet operations are conducted should be well drained. As a general rule, one drainage inlet should be provided for each 400 square feet (37 square meters) of floor area. A slope of about $\frac{1}{4}$ inch per foot (6.35 cm per 3.05 m) to drainage inlets is usually required. In areas such as beef sales coolers and other departments where a limited amount of water is used, the slope may be about $\frac{1}{8}$ inch per foot (3.18 cm per 3.05 m).

It is important that the floors slope uniformly to drains with no low spots where liquids could collect.

Floor drains are not required in freezer rooms or dry storage areas. When floor drains are installed in rooms where the water seal in traps is likely to evaporate unless replenished, they shall be sealed with removable plugs.

Special Drainage Requirements

9. In certain departments, special floor drainage is required. For example, floor drainage valleys are essential under the dressing rails for hogs, calves, and sheep. Such valleys in the floor should be about 24 inches (61 cm) wide, and should slope at least 1/8 inch per foot (3.18 cm per 3.05 m) to floor drains within the valleys. In on-the-rail cattle slaughtering departments, floor valleys under the dressing rails are required unless the floor drainage is carefully localized, with drainage inlets placed advantageously beneath the dressing rail.

In poultry picking rooms and poultry eviscerating rooms, for example, drains must have adequate capacity and slope (counter to the product flow) to accommodate the operational and cleanup demands without overflow or backup of effluent. All drains should have effluent flow in the reverse direction from edible product flow.

Traps and Vents on Drainage Lines

10. Besides blood drains, each floor drain must be equipped with a deep-seal trap approved by the appropriate plumbing code. Drainage lines must be properly vented to the outside air and be equipped with effective rodent screens.

Trunk Lines

11. Where several drainage lines discharge into one trunk line, this line must be proportionately larger so as to efficiently handle the drainage into it.

Sanitary Drainage Lines

12. Soil lines from toilet bowls and urinals should not be connected with other drainage lines within the plant and may not discharge into a grease catch basin. Such lines should be located so that if leakage develops, it will not affect product or equipment.

Size and Construction of Drainage Lines

13. Drains for cattle paunch contents should be at least 8 inches (20.32 cm) in diameter to avoid clogging. Drains for hog, sheep, and calf stomach contents should be at least 6 inches (15.24 cm) in diameter. Such drains should not be connected to the regular plant drainage lines or to toilet lines. All other lines must have an inside diameter of at least 4 inches (10.16 cm). Drainage lines within the plant must be constructed of cast iron, galvanized metal, or other acceptable material.

Plant Construction

Energy Conservation

1. Energy conservation measures should be considered in the design and construction of the plant. When utilizing conservation measures, it is necessary to submit descriptive details for evaluation.

Minimum Requirements

2. The design concepts listed in this handbook represent minimum requirements. Variations are acceptable, provided substitutions equal or exceed these standards.

Materials

3. Building materials should be impervious, easily cleanable, and resistant to wear and corrosion. Wall and ceiling surfaces should be white or light colored for light reflection and sanitation. Whenever practical, materials that do not require painting should be used. Materials that are absorbent and difficult to keep clean are generally unacceptable. Examples of such unacceptable materials are wood, plaster board, and porous acoustical-type panels or tiles.

Floors

4. Floors should be constructed of durable water-resistant materials. Commonly used acceptable material are concrete, ceramic floor tile, floor brick, and synthetic material approved by FSIS. As a safety precaution, excessively smooth floors must be avoided. Good results are obtained by using brick or concrete floors with abrasive particles embedded in the surface. Concrete floors should have a wood float (rough) finish. Concrete or mortar floors that incorporate an approved latex or synthetic resin base have better than ordinary resistance to meat fats and acids.

Coves

5. Coves with radii sufficient to promote sanitation should be installed at the juncture of floors and walls in all rooms.

Interior Walls

6. Interior walls should be smooth, flat, and constructed of impervious materials such as glazed brick, glazed tile, smooth-surfaced portland cement plaster, plastic, or other USDA-accepted nontoxic, nonabsorbent material applied to a suitable base. Walls should be provided with suitable sanitary type bumpers or curbs to protect them from damage by handtrucks, carcass shanks, and the like.

Ceilings

7. Ceilings should be of sufficient height—10 feet (3.05 m) or more is desirable in workrooms. So far as structural conditions permit, ceilings should be

smooth and flat. Ceilings should be constructed of portland cement plaster, large-size cement asbestos boards with joints sealed with a USDA-accepted impervious material. If the ceiling has exposed joists, the joists should be at least 36 inches (91.44 cm) on center and designed so that there are no excessive ledges or crevices which would be difficult to keep clean.

Window Ledges

8. Window ledges should be sloped about 45° to promote sanitation. To avoid damage to window glass from impact of handtrucks and similar equipment, the window sills should be at least 3 feet (0.91 m) above the floor.

Doorways and Doors

9. Doorways through which product is transferred on rails or in handtrucks should be wide enough so that there is no contact between the doorways and the product. In most cases 4.5-foot-wide (1.37 m) doorways are necessary.

Doors in such doorways must be constructed of either rust-resistant metal or other USDA-approved material. If made of wood, they should be clad on both sides with rust-resistant metal having tightly soldered or welded seams. Door jambs should be clad with rust-resistant metal securely affixed so as to provide no crevices for dirt or vermin. The juncture at the walls should be effectively sealed with a USDA-approved flexible sealing compound. For safety reasons, double-acting doors should have a reinforced glass or transparent plastic panel at eye level.

Plastic Strip Doors

10. Available information indicates that plastic strip doors or curtains require extensive and continuous cleaning to be maintained in an acceptable sanitary manner. Associated with cleaning difficulty is the tendency to crack, scratch, and break. Therefore, this type of door is not acceptable for openings in new construction or as a replacement for doors in existing facilities through which exposed product or personnel handling exposed product will be moving. However, the use of plastic strip doors through which packaged product will be moving is acceptable.

Screens and Insect Control

11. All windows, doorways, and other openings that would admit insects should be equipped with effective insect and rodent control devices (screens, fans, seals, etc.).

Plant Lighting, Ventilation, Refrigeration, and Equipment

Rodent Proofing

12. Effective means should be provided to exclude rats and other rodents.

Interior Woodwork

13. Dressed lumber may be used for exposed interior woodwork. Any exposed interior wood surfaces should be painted with a USDA-accepted coating or plastic base paint, or treated with hot linseed oil, or a clear wood sealer.

Stairs

14. Stairs in edible product-handling departments should be of impervious construction with solid treads and closed risers and should have side curbs of similar material, 6 inches (15.24 cm) high measured at the front edge of the treads.

Lighting

1. Well-distributed and good-quality artificial lighting is required at all places where natural light is unavailable or insufficient. The overall intensity of artificial illumination in workrooms should be no less than 30 foot-candles. At all locations where inspections are made or where special illumination is required to enable employees to properly prepare products to meet the requirements of inspection, the illumination should be not less than 50 foot-candles.

2. Specific requirements for certain locations in meat plants include:

(a) General Ante-mortem Inspection. Ten foot-candles in the pens, alleys, or areas where ante-mortem inspection is performed. Readings are taken 3 feet (0.91m) above the floor.

(b) Suspect Pen. Twenty foot-candles over the entire suspect pen including restraint facilities if separate. Readings are taken 3 feet (0.91m) above the floor.

(c) Headwashing Cabinet (Beef). Fifty foot-candles at the level of the head hook.

(d) Beef Cervical (Head Rack). All areas of head illuminated to 50 foot-candles down to the symphysis of the mandible.

(e) Beef Cervical (Head Chain). Fifty foot-candles at the lowest inspection point on the hanging heads.

(f) Swine Cervical. Fifty foot-candles at the level of the mandibular lymph nodes of the lowest hanging heads.

(g) Beef Viscera (Truck). Fifty foot-candles with meter resting at bottom of the pan of lower portion of truck.

(h) Viscera (Moving Top Tables). Fifty foot-candles with meter resting in pan or on table top. (All species.)

(i) Rail Inspection. Fifty foot-candles at levels of the shoulders. (All species.)

(j) Final Inspection. Fifty foot-candles at shoulder level, viscera pan, and head rack. (All species.)

(k) Carcass Coolers. Ten foot-candles at level of front shank of carcasses in cooler.

(l) Offal Coolers. Twenty foot-candles general illumination at lowest level of open product storage. Fifty foot-candles at packing point and reinspection area.

3. Specific requirements for poultry plants include:

(a) Traditional Inspection. All rooms in which poultry is killed, eviscerated, or otherwise processed shall have at least 30 foot-candles on all work surfaces, except at the inspection stations where at least 50 foot-candles of light is required.

(b) Modified Traditional Inspection. A minimum of 150 foot-candles of shadow-free light shall be available

at the inspection surfaces of the bird to facilitate inspection.

Protection Devices

4. Light fixtures in rooms where exposed meat or poultry is handled should have a protective shield of suitable nonshattering material to preclude contamination of product with broken glass.

Ventilation

5. Adequate means for ventilation should be provided in work rooms and welfare rooms. This may be accomplished with ventilating-type windows, skylights, or both, or by mechanical means such as air conditioning or a fan and duct system. In locations subject to dust and objectionable odors, such as those adjoining livestock pens, runways, and inedible departments, windows should be of the fixed-type.

Refrigeration

6. Sufficient refrigerated space should be provided to handle carcasses and product properly. A maximum temperature of 50°F. (10°C.) should be maintained in such areas.

15-18°

The type of refrigeration should be indicated in the drawings. If wall coils are installed, a drip gutter of concrete or other impervious material properly connected with the drainage system should be placed within curbed and separately drained areas unless located adjacent to floor drains.

Equipment

7. Equipment intended for use in plants operating under Federal inspection must be reviewed, evaluated, and accepted by the Equipment Standards and Review Branch, Meat and Poultry Inspection Technical Services, Food Safety and Inspection Service, U.S. Department of Agriculture, Washington, D.C. 20250.

Spacing from Floor and Walls

8. All permanently mounted equipment should be installed far enough above the floor to provide access for cleaning and inspection or should be completely sealed (watertight) to the floor. Likewise, such equipment should be installed at a minimum of 12 inches (30.48 cm) (greater distances for large equipment items) from walls, support structures, and other stationary fixtures or should be completely sealed (watertight) to walls, etc.

9. Wall-mounted cabinets and electrical connections (such as switch boxes, electrical control panels, conduits, and cables) should be installed at least 1 inch from equipment or walls, or should be completely sealed to the equipment or walls.

Control of Waste Water

10. Water-wasting equipment, such as soaking and cooking vats, sausage stuffing tables, can sterilizers, and casing preparation equipment, should be installed so that waste water from each unit is delivered through an interrupted connection into the drainage system without first flowing over the floor. Valves on drainage lines serving such equipment should be easily cleanable and mounted flush with the bottom of the equipment. Soaking and cooking vats should be equipped with overflow pipes at least 2 inches (5.08 cm) in diameter. Overflow pipes should be equipped with cleanout tees.

Vent Stacks from Hoods

11. Vent stacks from covered cooking vats or hood over cook tanks should be arranged or constructed to preclude drainage of condensate into the vats.

Height of Work Tables

12. Working surfaces of tables and other equipment should be at a height of not more than 34 inches (86.36 cm) above the floor where employees stand to conduct operations. If tables and equipment have higher working surfaces, suitable metal foot platforms should be provided for employees to stand on.

Water on Work Tables

13. All tables or other equipment having water on the working surfaces should have turned-up edges. The height of the turned-up edge depends on the volume of water used and the operations conducted. In no instance, should the turn-up be less than 1 inch

Hand-Washing Facilities, Sterilizers, Drinking Fountains, and Connections for Cleanup Hoses

Lavatories

1. Each processing room or area should have conveniently located handwashing facilities (lavatories) with a bowl large enough to prevent splashing. Lavatories should be supplied with hot and cold running water delivered through a combination mixing faucet with outlet about 12 inches (30.48 cm) above the rim of the bowl to facilitate washing arms as well as hands; liquid soap; an adequate supply of sanitary towels in suitable dispensers; and a suitable receptacle for used towels. Lavatories in workrooms and welfare rooms should not be hand operated. One lavatory should be provided for every two sausage-stuffing tables, and they should be convenient to the stuffer operators. Lavatories should be directly connected to the drainage system. On eviscerating lines in poultry plants, a continuous flow or other acceptable handwashing facility must be provided at each inspection station. The supply of water shall be of adequate quantity and at proper temperature.

Sterilizers in Meat Plants

2. Sterilizers should be constructed of rust-resistant metal, and of sufficient size for complete immersion of knives, cleavers, saws, and other implements in 180°F. (83°C.) water. They should adjoin the lavatories in slaughtering departments and elsewhere as required. Each sterilizing receptacle should be provided with a water line, a steam line or other means of heating, an overflow, and a means for completely emptying the receptacle.

Drinking Fountains

3. Sanitary drinking fountains should be provided in large workrooms and in dressing rooms. If desired, they may be located at lavatories and arranged so that the overflow discharges into the bowls of the lavatories. If so located, they should be placed sufficiently high above the bowls to avoid water and soap splashing on them when the lavatories are used.

Hose Connections

4. Adequate and conveniently located hose connections for cleanup purposes should be provided throughout the plant. The use of long hoses should be avoided. Suitable racks or reels for storing the hose when not in use should be provided.

Location of Facilities

5. The location of lavatories, lavatory-sterilizers, drinking fountains, and other similar features must be shown on the drawings.

Facilities for Processing Edible Product

Size of Department

1. Meat and poultry preparation and processing departments should be of sufficient size to permit the installation of all necessary equipment with ample space for plant operations and truckways.

Flow of Operations

2. For efficiency, the processing departments should be arranged to allow a proper flow of product without undue congestion or backtracking, from the time raw materials and supplies are received until the finished product is shipped from the plant. Areas in which raw products are handled should be separate from areas used for handling ready-to-eat product. Ready-to-eat product and raw product cannot be exposed in the same room at the same time.

Perishable Product Departments

3. Facilities for holding perishable product under refrigeration should be provided. To insure proper care of product and to prevent growth of molds and bacteria, operations such as beef boning and trimming, deboning or otherwise processing of raw poultry, bacon slicing, pork cutting, prepackaging meats, and sausage chopping and mixing should be conducted in departments having a temperature not higher than 50°F. (10°C.) Such operations should be located in rooms separate from carcass or product holding coolers to avoid contamination of product by cleanup water and condensation during the cleanup period.

Freezers

4. Freezers should have adequate space and capacity to properly freeze and store product. Product should be stored well above the freezer floor and in such a manner so as to preclude congestion or other conditions which may lead to contamination or adulteration.

Incubation Room for Canned Product

5. A room for incubating samples of fully processed canned meat or poultry should be provided in a suitable location in all plants conducting regular canning operations. The room should have adequate size and equipment for holding the necessary samples. A 7-day recording thermometer should be mounted on the outside wall of the room. The sensing elements for the thermostat and the recording thermometer should be below the bottom shelf. The shelves should be made of expanded metal or heavy gauge (No. 9) wire mesh and be removable for cleaning. The floor in the room should be pitched to a floor drain equipped with a removable metal screw-plug. The door of the room should be equipped for sealing by USDA.

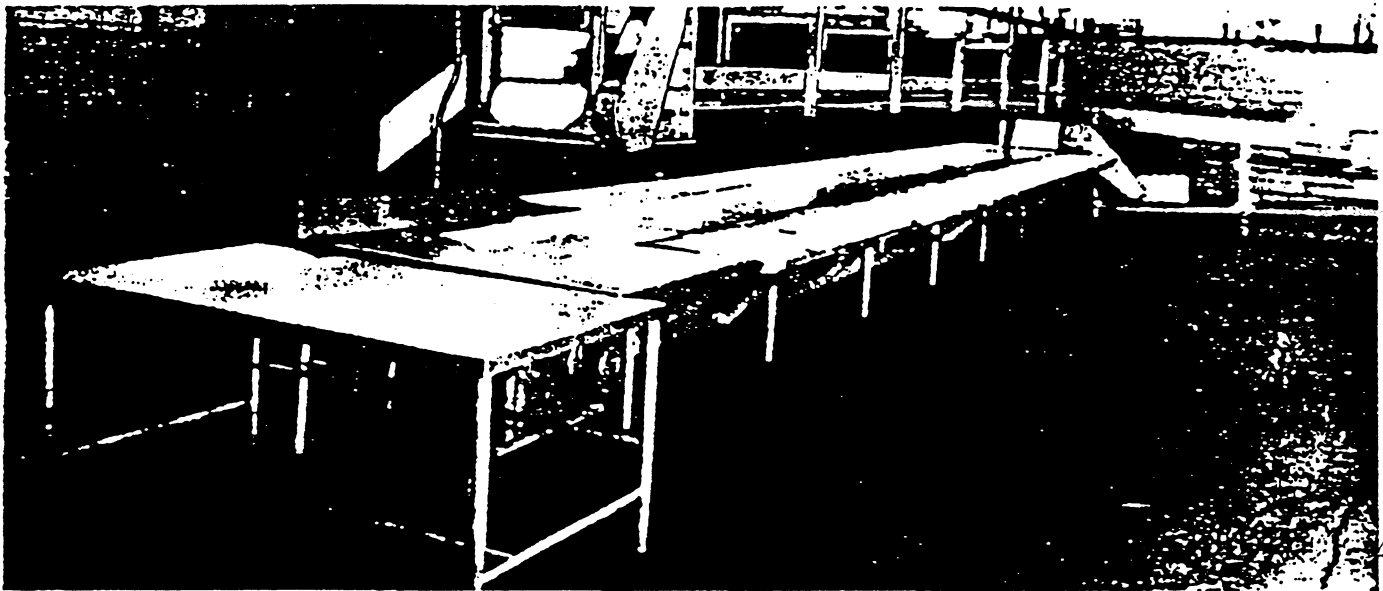


Figure 2—Boning department.

Dry Storage Space for Supplies

6. Suitable and adequate space for holding supplies such as boxes, paper, and cans should be provided in a convenient location in each plant. Establishments that slice bacon, slice and prepackage luncheon meat, bread and batter chicken, and prepare turkey loaves, sandwich steaks, and the like, generally use a large volume of packaging and labeling material. Adequate dry storage space should be provided for holding such supplies in a location convenient and preferably adjacent to the department where used. Supplies should be stored on racks about 12 inches (30.48 cm) above the floor.

Truckways within the Plant

7. Truckways should be unobstructed passageways having a minimum width of 5 feet (1.52 m) without overhead storage rails. When truckways are in coolers having overhead rails, a horizontal distance of 7 feet (2.13 m) should be provided between an adjacent wall and the vertical of the nearest rail and between boning tables and the vertical of the nearest rail. Truckways should be clearly designated on the drawings.

Vehicular Areas for Trucks and Railroad Track Gutters

8. Concrete-paved or other acceptable hard surface areas, properly drained and extending at least 20 feet (6.10 m) from buildings, loading docks, poultry han-

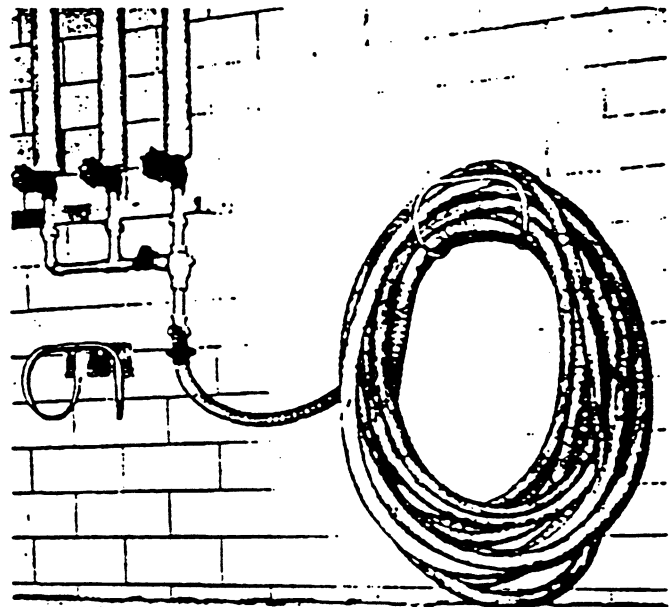


Figure 3—Cleanup hose and storage rack.

ding docks, or livestock chutes and platforms, should be provided at places where vehicles are loaded or unloaded.

9. Railroad track gutters with suitable drainage should be provided where refrigerated railcars are loaded and unloaded. The top of the gutter should be below the bottom of the railroad ties unless the entire track area is paved. This feature should be clearly illustrated on the drawings by a typical cross section of the gutter and adjacent railroad ties and rails.

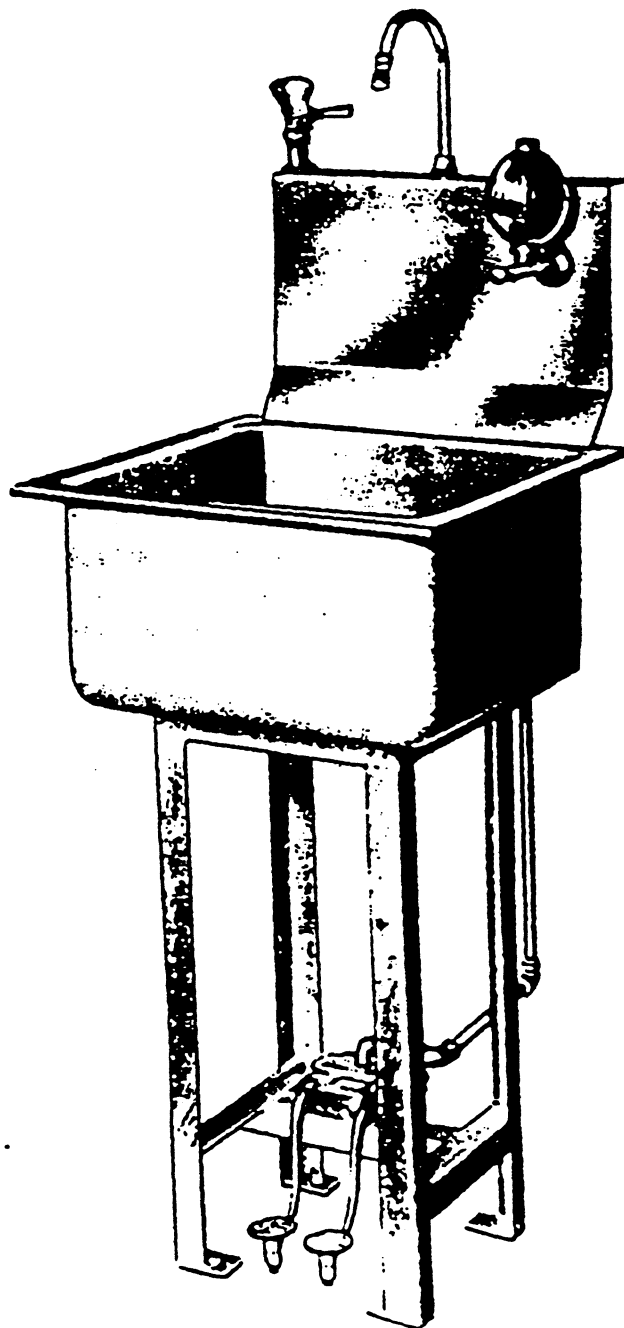


Figure 4—Handwashing basin.

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