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# **Value-Added Product Ideas for Northeast Aquaculture**

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# Introduction

The New England and Mid-Atlantic aquaculture industry faces stiff competition from production outside the region. Competition is most severe and, consequently, returns are lowest when fish and shellfish are sold as standard commodities. The region's aquaculturists should be looking for ways to differentiate their product so that they can obtain higher returns than commodity production provides.

Two recent examples point out the dangers of relying on a strictly commodity marketing strategy. In the case of farmed salmon, northern European and Chilean as well as U.S. and Canadian salmon producers engaged in a massive buildup in production capacity in the 1980s and targeted the U.S. as a major market. It was inevitable that American salmon prices would become depressed.

Atlantic hard clam aquaculturists also have had their share of problems with competition. Buyers have been able to squeeze profits out of small, independent clam producers who have seen themselves as merely price takers. The continuing chances of survival with this passive business strategy is highly questionable particularly with the startup of Atlantic LittleNeck Clam Farms (ALC) on James Island near Charleston, South Carolina. If ALC reaches its production target of 100 million clams by 1995-1996, it will account for one-fifth of all the hard clams sold in the U.S. (Stanley 1993). With ALC coming on line, a glutted market can be expected to depress prices and force non-competitive producers out of business.

Devising an effective differentiation strategy is concerned with adding value to the product. Value-added strategies seek to expand and diversify markets. This market development creates continuing needs for product improvements. Many people think only of highly processed products as adding value and shy away due to concerns about substantial initial investment. However, some types of product differentiation requires relatively little investment and can be accomplished by practically any aquaculture venture.

The purpose of this publication is to enhance strategic planning by aquaculturists in the New England and Mid-Atlantic region through competitive product positioning. The product and merchandizing ideas included were generated through review of seafood trade journals and personal interviews with seafood firms at the Boston Seafood Show, the New York Restaurant Show, and SeaFare in Miami. Reference to specific branded products and firms contained within this publication is offered by way of example. No endorsement or preference is intended by the author, the funding agencies, or cooperating institutions.

Positioning requires viewing a product through the eyes of consumers. Therefore, the discussion is organized according to leading consumer food trends as they apply to key species cultured in the region - hard clams, mussels, scallops, soft-shelled crabs, salmon, trout, tilapia, and hybrid striped bass.

# Value-Added Product Ideas

Stimulating higher demand for New England and Mid-Atlantic aquaculture products can be most effectively accomplished if efforts are consistent with leading American consumer food preferences for freshness, convenience, variety, and healthy diet (Sloan 1994a&b).

## Freshness & Safety

"Fresh" is the most desirable label claim on American foods (HealthFocus 1993). In response, supermarkets have shifted from a dry grocery to perishable mix of 60:40 to 50:50. Cultured seafood products are well-positioned to capitalize on this trend.

**Fresh is the most desirable label claim on American foods.**

Consumers also are concerned about seafood safety, particularly with respect to shellfish. In a recent survey, consumers ranked raw and cooked shellfish as the most likely to cause illness among 10 primary protein foods (Wessels et al. 1994). In particular, water pollution was identified as the primary cause of unsafe shellfish by 91% of consumer survey respondents (Wessels et al. 1994).

### **☛ Commitment to Quality**

Aquaculturists should look at all measures of maintaining freshness. Marks & Spencer, the U.K.'s top retail food chain, is able to charge 25% more for their Scottish farm-raised salmon because of their rigid product specifications and commitment to quality which have built consumer trust (Redmayne 1990).

Product quality ought to be a principal consideration in designing handling practices. Atlantic LittleNeck ClamFarm, which has indicated that its company's value-added is safety, goes the extra step to dehydrate its clams for 48 hours prior to marketing. Of course, growers should make sure that consumers are informed of the extra steps taken to ensure quality.

**Our value-added is safety.**

Analyzing harvest scheduling and distribution systems can also improve product quality by bringing to light ways to reduce time to market. Closely timing harvest to orders can be a strong competitive advantage. Irish Salmon Growers' claim that their product can be on New York City restaurant

**From Irish water to New York City restaurant tables within 10 hours.**

tables 10 hours out of the water (Griffin 1989).

#### **Labeling as "Cultured" or "Farm-Raised"**

Cultured product should be differentiated in the market place as "cultured" or "farm-raised" through product labeling. Using these terms capitalizes on positive consumer perceptions. A recent consumer survey found that nearly half of survey respondents considered farm-raised products safer than wild-harvested products and the same proportion agreed that farm-raised fish and shellfish are harvested in cleaner waters than wild-harvested species (Wessels et al. 1994).

Cultured clams are typically not marketed as cultured product, but rather are sold undifferentiated from wild-caught clams. Simply labeling the product as "cultured" or "farm-raised" could be an effective marketing strategy. According to a 1993 survey, 60% of clam wholesalers are willing to pay more for cultured clams (Henderson 1994).

An additional selling point of cultured mussels is that it produces a cleaner product. In contrast to wild-harvest in which mussels are scraped from a natural bed, off-bottom culture, in which mussels are grown suspended in the water, produces mussels with relatively little or no grit, pea crabs or pearls.

Likewise with farm-raised fish, the controlled conditions of fish farming appeals to consumer desires for safer food products. Fish farmers also should be aware, however, that some concerns have been voiced in the media about additives in fish feeds.

Icelandic, Chilean, Canadian, and Irish salmon farmers have merchandised their products as coming from the "purest" or "the best" waters rather than using the term farm-raised (Griffin 1989). The State of Maine has used the same approach in promoting seafood from its waters.

#### **Government Certified or Inspected**

The labeling of cultured molluscan products as coming from certified waters can be another value-added strategy. Three-fourths of consumers are not aware that these shellfish can be harvested legally only from government certified waters (Wessels et al. 1994). "From government certified waters" labeling could enhance consumer confidence in shellfish safety. Similarly, the use of "USDC inspected" in labeling

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**60% of clam wholesalers are willing to pay more for cultured clams.**

and advertising copy by processing facilities which operate under U.S. Department of Commerce inspection is likely to be positively received.

#### **☞ Product Dating**

Product dating of retail food products has become an accepted practice and valuable to consumers in making purchase decisions. A stamped harvest date on cultured fresh products would emphasize the producers commitment to freshness. Label copy on dated product could emphasize this commitment. Dating already is done for certification purposes on bulk bags of molluscan shellfish, but this information does not reach the consumer.

#### **☞ Packaging to Convey Freshness**

Packaging for value-added products should be carefully selected for eye-pleasing designs and color to convey the appearance of freshness. Film-sealed tray packs and vacuum packs protect product quality as well as allow customers to view the product.

#### **☞ Reduction or Elimination of Additives**

If a processed product is being formulated, the popular preference for no additives should be considered. For example, many smoked product processors have eliminated nitrates.

## **Convenience**

Consumers faced with increasing demands on their time are no longer willing or able to devote hours to planning, preparing, consuming and cleaning up after meals. Consumers prefer fresh food, tastily prepared, ready in 15 minutes or less (NPD Group 1994).

Seafood products fulfill consumers' desire for convenience in food preparation due to its relatively short cooking time. Aquaculture products can be further distinguished in the market by providing products that are simple and quick to prepare. Such measures could range from simple changes in packaging to processed ready-to-eat products. Improving the convenience of home preparation could also increase consumption frequency.

**Consumers prefer fresh food, tastily prepared, ready in 15 minutes or less**

The most convenient form for some cultured species may simply be the fresh state. For example, Atlantic hard clams are almost universally sold as fresh, live product and this feature of the industry is unlikely to change significantly because the American processed clam industry utilizes less expensive surf clams and ocean quahogs. Even in Italy where clams are a staple in the diet, more than 80% of clams are marketed fresh in the shell; only 20% are sold as frozen or processed meats packed in brine or sauce. However, even fresh, live product can be differentiated.

**Less than 20% of shellfish consumers eat mussels at home more than once per year.**

#### **☞ Preparation Aids**

One means of product differentiation which adds convenience for the consumer is the inclusion of preparation aids such as recipes on the package or on cards available at the point of purchase. Research indicates that providing such aids could increase at-home consumption of seafood. A consumer survey by Wessels et al. (1994) found that even though hard clams are widely accepted, only half of shellfish consumers purchase hard clams for preparation at home and fewer than 20% consume mussels at home more than once per year. Earlier surveys found that a lack of familiarity with preparation is a primary impediment to at-home seafood consumption (BH&G 1985 & Henderson 1990).

**Lack of familiarity with preparation is a primary impediment to at-home seafood consumption.**

Recipes need not be gourmet-oriented. The Norwegian Salmon Marketing Council has concentrated on basic cooking methods such as poaching, broiling, and grilling to encourage consumers to try their products (Marris 1990).

#### **☞ Steamer Bags for Shellfish**

A simple product idea for expanding retail and food service sales is the packaging of cultured hard clams and mussels in mesh steamer bags. The use of steamer bags enables consumers and chefs to prepare measured portions with minimal handling. Use of the bags also facilitates labeling of shellfish as "cultured," inclusion of harvest dating and provision of preparation aids.

**☞ Steamer Bags: aid to portion control and preparation convenience.**

*Idea Source: Royal Urn Bag*

#### **☞ Vacuum Packed IQF Shellfish**

Vacuum-packed, individual quick freezing of whole or half shell mussels and shucked meats and whole scallops provides another highly convenient form for both retail and food service. Because they are cleaned and grit-free, they are ready to prepare without any additional effort. There is no waste because they are stored in the freezer and kept frozen until needed. Freezing and storing of these products at 0°F

**☞ Cleaned, grit-free, cultivated IQF mussels or scallops vacuum pouches.**

*Idea Source: Blue Gold Mussel, New England Mussel Products, and Taylor Seafood.*

increases the shelflife of mussels to as much as 1 year.

### **☞ Smoked Products**

Among the most convenient of seafoods are ready-to-eat smoked products such as hot-smoked trout and mussels. These fully cooked items are perfect appetizers or can be added to salad or pasta dishes.

Vacuum-packed deboned smoked salmon fillets are elegant yet highly convenient, particularly when pre-sliced - perfect for entertaining. Other value-added products for easy preparation include smoked salmon or trout mousse, paté, and ravioli.

### **☞ Microwaveable Products**

The epitome of present day convenience is the microwave. Microwaveable seafood, such as a fish fillet in an overwrapped tray, provides a fast, easy-to-prepare meal. In contrast to meat, fish lends itself to microwaving because it does not require browning. Improvements in breeding formulation and packaging expand microwaveable options for cultured seafood products. Film-sealed trays are ideal for line expansion to more complete entrees such as salmon fillet on wild rice.

**☞ Hot-smoked trout or mussels.**

**☞ Vacuum packed, pre-sliced, cold-smoked salmon**

**☞ Smoked salmon or trout mouse and paté.**

*Idea Source:* Ducktrap River Fish Farm and Horton's

**Improvements in breeding formulation and packaging expand microwaveable options for cultured seafood products.**

## **Variety**

Seafood offers the variety of taste consumers are looking for. New England and Mid-Atlantic aquaculture products include well-established consumer favorites such as salmon, trout, striped bass, hard clams, and scallops. Other cultured products, such as mussels and soft-shelled crab, which have been limited historically to ethnic and regional markets, are gaining broader consumer acceptance.

Fish and shellfish are versatile and can be prepared in a myriad of ways including raw, broiled, baked, grilled, poached, and fried. Value-added processing of aquaculture products can add even greater variety of taste to consumer diets.



### ☛ **Ethnic Seasoning and Sauces**

The variety of ethnic cuisines on restaurant menus and supermarket shelves is expanding rapidly. More than 80% of restaurant menus now offer selections from more than one ethnic cuisine, up from 35% five years ago. Ethnic dishes account for 30% of all entrees served in restaurants (Find/SVP, 1994).

Retail sales of basil, oregano, thyme, bay leaves and sage have grown by 71% over the last five years indicating that Italian cuisine can be expected to remain an American favorite (Find/SVP, 1994). Italian sauces such as pesto can serve as a garnish and relish or be brushed on before grilling or baking.

Restaurateurs and other food service managers expect that the greatest growth will be in Mexican, Southwestern, Cajun and Caribbean cuisines (Find/SVP, 1994). As a result, hot condiments, such as hot pepper sauce and Mexican sauce, are expected to grow significantly in the next few years (Packaged Facts, 1993).

### ☛ **Marinated**

Marinades are an effective means of offering taste variety. A popular mussel marinade for both food service and deli sales is fresh mussel salad vinaigrette. Quick cooked mussel meats are marinated in assorted peppers, salt, pepper, sugar, garlic, other spices, oil and vinegar. One gallon plastic containers with polybag inner liners are a convenient pack. Refrigerated at 34°-40°F, the shelflife is as much as 45 days.

Marinated fish fillets fit with the increasing popularity of grilled foods. Grilling is quick and easy and leaves odors outside of the house. The American catfish industry has developed a variety of ethnic and regional marinades which could be readily adapted to cultured salmon and trout. Southwestern flavor include fajita, mesquite, barbecue, and lime & cilantro. Ethnic flavorings include Cajun, Italian, and a Japanese teriyaki.

Vacuuming packing affords another vehicle for providing seasoned easy-to-prepare products. A French-style mussels with white wine and herb butter sauce in a vacuum pouch provides Continental elegance as well as convenience. Many other seasoning mixes are possible using the same approach.

**The variety of ethnic cuisines on restaurant menus and supermarket shelves is expanding rapidly.**

**The greatest growth will be in Mexican, Southwestern, Cajun and Caribbean cuisines.**

### ☛ **Mussel salad vinaigrette**

*Idea Sources:* New England Mussel Products & Sweet Water Seafood Corporation

### ☛ **Marinated fillets:**

**Fajita, mesquite, BBQ, Italian garlic & butter, Cajun, lemon & pepper, and Italian marinara.**

*Idea Source:* Southern Pride Catfish, and Farm Fresh

☛ **French-style mussels with white wine and herb butter in a vacuum pouch.**

*Idea Source:* Blue Gold Mussels

### **☞ Smoked**

A wide variety of smoked products are possible. A number of Northeast aquaculturists already produce smoked salmon, trout, mussel and scallop products which have broad appeal. The use of woods such as hickory and mesquite provides distinct flavors and regional appeal. However, the competitive advantage of using distinctive woods to smoke can be short-lived. Mesquite-cooked, which once was exotic, has become common place (Johnson 1990).

**Mesquite-cooked, which once was exotic, has become common place**

Pre-smoking cures add another dimension to smoked products. Cures can be as simple as salt and sugar or more complex such as the inclusion of herbs and other flavorings. Popular spicing is peppered, dill, and Cajun.

The advent of electronically controlled smokers provided the means to assure consistent quality. However, smokers and complementary packaging systems are relatively capital intensive and their use has moved the smoked seafood industry segment out of the cottage-scale to big business. Competition from foreign as well as domestic processors is fierce.

Success within the smoked segment requires not only a commitment to quality and continued product innovation but creative merchandizing as well. For example, Morey's Smoked Fish of Minnesota used a creative campaign, "Six Ways to Eat Smoked Fish with Pigskin," to expand consumption among football enthusiasts (Perkins 1989).

### **☞ Appetizers and Soups**

Further market development is possible by expanding beyond entrees to appetizers and soups. By way of example of what is possible, the Swedish company, Hållo, is exporting mussel soup and Marina Danish Seafood has mussels in cocktail sauce.

### **☞ Roe on Scallops and Roe Only**

Although domestic scallops sold almost exclusively as roe-off product, roe-on and roe only cultured scallops may offer expanded product lines in selected markets.

### **☞ Other Processed Products**

A wide variety of value-added products which utilize species cultured in the Northeast are currently on the market. Salmon is particularly noteworthy. Marks & Spencer leads the U.K. in profit margins through innovations such as fresh boneless

salmon roasts and Scottish salmon paupiettes. The salmon roast is a deboned skin-on fillet rolled and encased in a string mesh wrap. The paupiettes are rolled salmon fillet strips with a variety of fillings, such as pesto, an herb blend, or tomato and garlic sauce, which are poached in dry white wine and butter (Redmayne 1990).

A glut of wild-caught salmon in Alaska has encouraged the development of more highly processed products such as burgers and sausage. However, the higher costs associated with culturing of salmon in the Northeast region are likely to make such products unprofitable. In addition, such extensive processing tends to overshadow the farm-raised identity of the product, and, therefore, is not a preferred option.

#### **Collateral Advertising**

Collateral advertising of cultured products with a variety of complementary products is an easy way to capitalize on the trend toward ethnic cuisines and to expand sales. Hard clams and mussels are commonly served with rice or pasta in restaurants. A variety of fresh pasta and packaged ethnic rice dishes, such as cajun rice and paella, are now widely available in supermarkets. In-store promotion of clams and mussels with the purchase of such products could effectively increase sales. Other retail tie-ins are fish fillets with bread crumbs and condiment sales.

**Marks & Spencer leads the U.K. in profit margins through innovations such as fresh boneless salmon roasts and Scottish salmon paupiettes.**

## Health and Nutrition

Another leading food trend is the focus on a healthy diet. In 1994, 94% of shoppers reported they had changed their eating habits in some way to achieve a healthier diet (FMI 1994). Sixty-percent sought specifically to reduce the risk of heart disease, obesity, hypertension, or cholesterol by altering their eating habits (FMI 1994).

### ☞ Nutritional Composition

The nutritional composition of the principal fish and shellfish cultured in the Northeast is provided in the side bar. Food & Drug Administration regulations now require the inclusion of nutritional information on processed food products. However, consumers of fresh seafood are likely to appreciate the inclusion of such information as well. It should be noted that the nutritional composition may vary with growing conditions and other factors. Computer software is now available which allows for analysis of nutritional content of recipes and may be useful in product development.

### ☞ High in Protein

Seafood is high in protein and has significant amounts of vitamins and minerals. A single serving of seafood nearly fulfills daily protein requirements. The average adult needs just 45 grams of protein per day. A 7 oz. portion of raw fish fillet (5 oz. cooked serving) provides approximately 40 grams of protein. In addition, seafood is an excellent source of complete protein. It provides all of the essential amino acids the body needs.

### ☞ Highly Digestible

Another feature of seafood protein is that it is highly digestible. Fish protein is more digestible than meat protein because it contains a higher ratio of muscle to connective tissue. As a result, cooked fish flakes under the fork and is easy to chew. This is of particular benefit to children and our aging population.

### ☞ Reduced Fat

"Fat-free" is the second most desirable label claim among American consumers exceeded only by "fresh" (HealthFocus, 1993). Increased consumption of aquaculture products contributes to reduced fat consumption. The USDA Dietary

## Nutritional Composition of Cultured Species (100 gram serving)

### ☞ Hard Clams

#### (*Mercenaria mercenaria*)

Protein:	9.2 gm
Carbohydrates	60.0 gm
Total Fat	1.0 gm
Omega-3	.24gm
Calories	2.8

### ☞ Atlantic Mussels

#### (*Mytilus edulis*)

Protein:	12.0 gm
Carbohydrates	4.5 gm
Total Fat	2.20gm
Omega-3	.43gm
Calories	89

### ☞ Bay Scallops

#### (*Argopecten irradians*)

Protein:	14.8 gm
Carbohydrates	2.9 gm
Total Fat	0.6 gm
Omega-3	.13gm
Calories	80

### ☞ Atlantic Salmon

#### (*Salmo salar*)

Protein:	18.4 gm
Total Fat	5.6 gm
Omega-3	1.4 gm
Calories	129

### ☞ Rainbow Trout

#### (*Salmo gairdneri*)

Protein:	18.4 gm
Total Fat	5.8 gm
Omega-3	1.1 gm
Calories	131

*continued next page*

Guidelines suggest limiting fat intake to 60-70 grams per day. Seafood is inherently low in fat; most contain less than 5% fat. Even so-called high fat fish, such as salmon, have less than 15% fat. In contrast, a T-bone steak has 37% fat and a pork loin chop has 21% fat. Even the leanest hamburger contains 10% fat.

#### ☞ **Alternative to Meat**

Aquaculture products are a logical healthy alternative to meat because of its high protein, low fat, low cholesterol characteristics. As a result of efforts to reduce dietary fat and cholesterol, Americans are choosing to eat less meat. By substituting seafood in the diet, meat consumption can be reduced.

#### ☞ **Heart Healthy Formulations**

Consumption of aquaculture products, as with seafood in general, fits into the health-conscious diets of today's American consumers. Seafood has long been recognized as a healthful food particularly since the mid-1980s when researchers reported that Omega-3, a fatty acid found in many seafoods, is highly beneficial to the heart.

To target health conscious consumers, the "HeartHealthy" guidelines of the American Heart Association should be kept in mind in developing value-added seafood products as well as promotional messages. Ralph & Kacoo's, a popular seafood restaurant chain in Louisiana and Texas, known for its spicy and delicious menu items, augmented its established menu with 14 new dishes with reduced oil, saturated fat, and sodium which comply with the HeartHealthy guidelines. The chain reduced entree portion size to 6 ounces from the usual 8, 10, and 12 ounces and served side dishes of steamed or flavored vegetables and rice or new potatoes. An entire meal amounts to 800 calories or less (Perkins, 1989,p.57).

#### ☞ **Hybrid Striped Bass** (*Morone x hybrid*)

Protein:	18. gm
Total Fat	2.3 gm
Omega-3	0.7 gm
Calories	97

#### ☞ **Tilapia** (*Tilapia sp.*)

Protein:	19.7 gm
Total Fat	2.6 gm
Omega-3	.16gm
Calories	105

Source: Nettleton 1985

#### **HeartHealthy Guidelines**

- 30% or less of total calories from fat,
- 10% or less of total calories as saturated fat,
- 150 mg of cholesterol or less,
- 1,000 mg of sodium or less.

Source: American Heart Assn.

# Conclusion

Aquaculture has been touted far and wide as a potentially lucrative business. Numerous small-scale entrepreneurs have entered the domestic industry in the past several decades, and large food companies are tracking the industry to see how they might become dominant players. The U.S. federal and state governments and governments in other countries have made invests to encourage growth in the industry as a means to rural development. As a result, predictions of significant increases in competition for existing aquaculturists is a safe bet!

This publication has brought together innovative ideas which can be applied to Northeast cultured species to counter competition. Applying these ideas does not guarantee higher prices or greater market share. However, the judicious application of these product development ideas and marketing options can increase the competitive advantage and likelihood of success of fish and shellfish farmers.

New product ideas can be generated by examining seafood, ethnic, and other types of cookbooks in your local library. Some of the most innovative ideas may come from recipes not in the fish and shellfish sections of the cookbooks. Consumers and restaurant trade magazines are other excellent sources as they make it a point to identify emerging trends. Trend-watchers also tend to pay particular attention to developments in the so-called "bellwether states" such as California and Florida which have been found to presage trends in many fields. Being at the forefront of an increasingly popular product idea is much better than coming in late with a me-too type of item.

An attribute of industry leaders is that they act quickly to capture opportunities. Moreover, it is not sufficient to adopt one improvement and call a company an innovator. Successful businesses in practically any industry have been shown to be continually on the lookout for ways to increase the value of their products. A portion of business resources - time as well as dollars - should be budgeted for trend watching, product innovation, and market development.

## COMPANIES CITED

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Horton's PO Box 430 Waterboro, Maine 04087	Tel: 207-247-6900	
New England Mussel Products PO Box 327 Warren, RI 02885	Tel: 401-245-6888	FAX: 401-247-2391
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