

Ready-To-Sell

Developing Value-Added Seafood Products

How do you make more money out of the same product? You know – get a bigger bang for the buck?

As commodity producers, local seafood businesses like yours may seem to be at a disadvantage with foreign competitors because of their lower labor costs. But two current market trends are in your favor:

- The growing demand for seafood in this country, particularly locally produced products.
- Demand for convenient, ready-to-eat meals because people are leading very busy lives, often with little time to cook at home.

Following either trend can help you expand your market and add value to your existing products:

- When you identify your product with a locale, you are appealing to a consumer's attraction for a region's coastal heritage or their preference to buy locally harvested foods.
- When you create a product that is less perishable and requires little in-home preparation, you are satisfying a retailer's need for an extended shelf life and a consumer's need for convenience.

By formulating a seafood appetizer or entree that is nutritious, flavorful and easy to prepare, you are giving that raw seafood enhanced or new qualities – thereby adding value to your product.

But manufacturing a new seafood product is not as simple as preparing a home meal. Processors must discern how to receive, portion, weigh, blend and cook mass



Image Credit: Scott Taylor

ingredients using different kinds of processing equipment. Hazard analyses must be conducted to determine where monitoring and control measures should be applied during processing and storage to ensure that products will be safe for consumers to eat. Creating new products is also time intensive, taking up to a year or more to develop.

So how can you, the seafood processor, create wholesome **value-added seafood products** that satisfy specific consumer needs? There are two main answers we'll go over in this Blueprint:

1. Knowing who to talk to, and
2. Understanding the product development process.

WHO TO TALK TO: A Food Technologist

The state of North Carolina can help you develop value-added foods through three resources: the Department of Food, Bioprocessing and Nutrition Sciences (**FBNS**); the N.C. Department of Agriculture and Consumer Services (**NCDA&CS**); and the N.C. Department of Environment and Natural Resources (**NCDENR**).

It's easier to talk to a single person who can help you navigate all the information and expertise within FBNS, NCDA&CS and NCDENR. You need a food technologist.

Working with a food technologist who is skilled in product development is critical to your success. The technologist can help you access resources

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within FBNS, NCDA&CS and NCDENR; manage the product development process; and provide marketing guidance.

North Carolina Sea Grant can direct you to an experienced food technologist. Sea Grant, in partnership with FBNS, NCDA&CS and NCDENR, has assisted seafood businesses in commercializing many kinds of new products.

WHO TO TALK TO: A Marketing Specialist

When you commit to developing a new seafood product, you must first decide if it will be sold in the wholesale trade, the retail sector or both. If your product represents your first experience in retail, you should consider **branding** to provide your product a commercial identity that will appeal to your target customer.

Remember that one of the hot trends today is the **local food movement**. With local branding, customers feel a sense of connection with their favorite coastal region, or relate to a sense of honor for the fishermen – inspiring them to pay more for local products.

To better inform the public when local seafood is seasonally available and where it is sold, Sea Grant led a community effort to launch **Carteret Catch** in 2006 to highlight the seafood harvested by fishermen in the central coast of the state. This program influenced community partners to launch **Brunswick Catch, Ocracoke Fresh** and **Outer Banks Catch** in later years, giving each region a unique brand for customers to recognize.

Marketing specialists at Sea Grant and NCDA&CS can help you with the branding process and with creating sales brochures to market your product. You can learn more about branding and developing sales information in the North Carolina Sea Grant publication “Branding Seafood: Developing a Marketing Plan to Sell Value-Added Seafood Products” (UNC-SG-BP-06-01).

HOW TO DEVELOP IT: Lessons from the Pamlico Packing Company, Grantsboro, N.C.

To showcase the steps involved in product development, let’s look at a case study of the Pamlico Packing Company in Grantsboro, N.C., which applied for and received funding through the N.C. Fishery Resource Grant (**FRG**) Program (Project O2-ST-04). FRG, which is funded by the N.C. General Assembly, has provided research grants to businesses to develop innovative seafood products.

Pamlico Packing developed a line of refrigerated, **ready-to-eat (RTE)** seafood spreads and salads for the retail market. Let’s see how their recipe concepts were transformed into finished products.

THE CHALLENGE

Though popular in stores, the keeping quality of perishable, RTE seafood spreads or salads may only

average 7 to 10 days, depending on the type of ingredients and on their bacterial load, as well as on processing, product storage and distribution conditions.

This tight time frame can place processors like you at an economic disadvantage. The time window in which a product is purchased by consumers can be very short, due to variables beyond a processor’s control. **Improper product rotation** can result in old inventory getting shoved further back in the shelf. **Poor shelf visibility** at the store means customers won’t buy what they can’t easily find, and more inventory gets backed up.

And who bears the costs for this unsold inventory? Chances are it will be you.

But, simply extending the shelf life from 10 up to 30 days creates a more stable product to market to retailers. If it keeps longer, it can stay on the shelf longer. More units have the potential to be purchased.

Now, let’s develop this value-added RTE product.

STEP 1: Refine Product Concepts

In 2004, one of Pamlico Packing’s owners was interested in retailing a line of seafood salads, dips and spreads his wife had developed for her catering business.

But which of her recipes could be converted into commercially successful products? The first step was to determine the recipes that had the strongest sales potential, and to learn which items would require more refinement to enhance their consumer appeal.

Sea Grant contacted the FBNS’s Sensory Service Center, which assembled a **consumer panel**. The panel evaluated 12 prototypes having clams, crab, crawfish, shrimp, or tuna as primary ingredients.

To gauge each product’s appeal, about 50 consumers were recruited to rate each item on numeric scales that measured preference and purchase intent.

Two shrimp and two tuna salads received the highest acceptability scores, indicating they had the strongest commercial potential among the 12 prototypes tested. Let’s follow the progress of these four products.

STEP 2: Convert Recipes for Production

The ingredients in each recipe were weighed to convert U.S. measurements, such as tablespoons, cups, ounces and pounds, into metric units (grams). Then, Sea Grant calculated the percentage by weight for each ingredient within the recipe.

By converting ingredient amounts into percentages, a recipe was transformed into a **formulation**. Ingredient prices and operational fixed costs (such as overhead) were then entered into a **computer spreadsheet**, which is available from Sea Grant. Using the spreadsheet, Pamlico Packing could now adjust the percent amount of any

ingredient in any formulation and calculate new estimates for a product's total manufacturing cost.

This information can then be balanced against a desired retail cost and sensory characteristics (texture, flavor, color and appearance) to create an item that is both appealing and profitable to manufacture. This is called **least-cost formulating**.

STEP 3: Identify Industrial Suppliers of Functional Food Ingredients

To control bacterial growth during refrigerated storage and extend shelf life, Sea Grant staff recommended a commercially available blend of sodium lactate and sodium diacetate. Sea Grant also suggested to Pamlico Packing other ingredients to maintain the optimal flavor, texture and appearance of each product.

Sea Grant provided the contact information of suppliers who sold these ingredients – saving Pamlico Packing considerable effort in having to source vendors on their own. Sea Grant also gave instructions for the use of each suggested ingredient, which included:

- Flavor enhancers to maintain product taste
- A gum powder to control moisture loss from the shrimp and vegetable ingredients
- A natural antioxidant to retard rancidity in the tuna salads
- Potassium sorbate to suppress yeast and mold growth.

STEP 4: Enhance Production Efficiencies

With the formulations refined, it's now time to fine-tune production methods. Several tests may be needed to verify whether your production equipment operates as expected, and whether your manufacturing process produces the highest possible yields of saleable product.

Pamlico Packing developed a manufacturing schedule to determine the order of ingredients to be added during the blending step, as well as specific mixing times between ingredients to ensure a homogenous product composition. Fill tests were conducted to ensure their packaging equipment was delivering the correct amount of finished product to each retail container.

Sea Grant and the **FBNS Seafood Laboratory** specialists identified equipment suppliers for Pamlico Packing to obtain industrial blenders, stainless steel tables, scales and packaging equipment. FBNS can refer you to food industry resources for processing equipment and ingredients for your manufacturing needs.

STEP 5: Conduct Shelf Life Evaluations

Next, samples of each product must be subjected to **bacterial** and **sensory testing**. This will validate our

expectations for shelf life and consumer appeal, or whether more adjustments to the formulations are needed.

Bacterial tests tell us how many days it takes for spoilage microorganisms to grow and make a food unfit to eat. And while a food might not spoil, it can lose its desired taste or develop objectionable flavors over time. So, a sensory test is also needed.

Pamlico Packing produced two versions of each salad: one with preservatives, and one without. The salad samples were sent to the Seafood Laboratory in Morehead City. At weekly intervals, both versions of each salad were subjected to bacterial and sensory evaluations.

In bacterial tests, FBNS determined the date at which **borderline spoilage** is reached. This is measured in "colony forming units per gram (**CFU/g**)" – basically the average concentration of bacterial colonies in one gram or 0.035 ounces of food. The commonly accepted limit is 500,000 CFU/g. Here, the bacterial tests demonstrated that the preservative system was adequately controlling the growth of spoilage organisms.

Then comes the sensory test. Individuals were recruited to serve as sensory panelists to rate the flavor, texture, color and appearance of each product on a scale of 1 (Terrible) to 7 (Excellent). The scores proved that the ingredients mentioned earlier were successfully maintaining the desired sensory characteristics of each product.

STEP 6: Develop Safety Specifications and Nutritional Information Labels

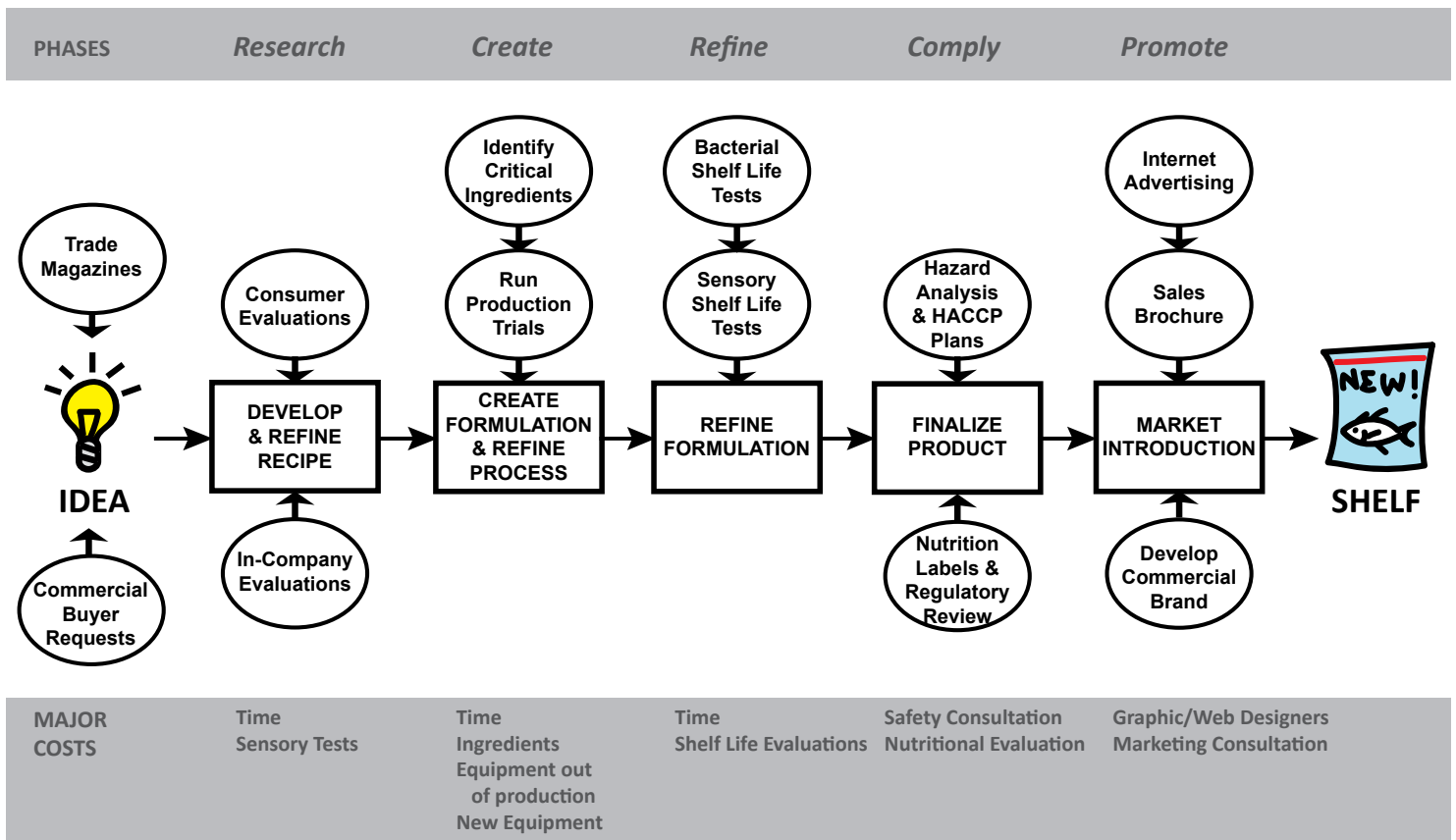
You've perfected the formulations and production process for your new RTE products. Next step: comply with federal safety and nutrition labeling requirements.

At the beginning of the project, Sea Grant contacted NCDA&CS and NCDENR to arrange a consultation with the owners to design a factory processing area that met guidelines for producing safe food. Once the facility and equipment were in place, the Seafood Laboratory conducted a process validation on the heat-processing equipment for cooking tuna steaks, to ensure it was sufficient to destroy disease-causing bacteria as recommended in the U.S. Food & Drug Administration's "Fish & Fisheries Products Hazards & Controls" guide.

The shrimp were received fully cooked and did not need any further heat processing. However, Pamlico Packing requested a letter of guarantee from the shrimp producers promising that safe handling procedures were observed at their plants.

Sea Grant also helped Pamlico Packing conduct a hazard analysis on its product line, developing safety monitoring plans for items that were subject to the federal **Hazard Analysis and Critical Control Point (HACCP)** regulation. These plans were reviewed with

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NCDA&CS and NCDENR inspectors before the company began production and distribution.

FBNS and NCDA&CS helped Pamlico Packing develop and review nutritional profiles for its new products. FBNS generated nutritional information for each product using a computer program. The information was then reviewed by NCDA&CS. Once approved, Sea Grant sent the data to Pamlico Packing so it could print product labels.

STEP 7: Market Introduction

Before inviting an entrepreneur to present a product, retail and wholesale buyers prefer to review **sales brochures** to determine if a product is a good fit with their existing line of value-added items or meets critical consumer needs.

Once the salads were ready to be marketed, Sea Grant assisted Pamlico Packing in designing sales brochures that gave brief descriptions of each product – brand name, type of packaging, shipping-case dimensions and pricing – that all buyers require for an initial evaluation.

You should also consider using the Internet to draw attention to your new product. A **website** profiling your

product acts like an online sales brochure, except you can add colorful photos, videos, customer comments and other promotional features without the cost of printing. Websites not only attract wholesale buyers, but they also can generate word-of-mouth advertising from consumers.

Learn more about creating a website for your business in the North Carolina Sea Grant publication “Using the Internet to Enhance Direct Market Sales of Seafood” (UNC-SG-10-02).

THE RESULT

Pamlico Packing’s new salads entered limited test markets with good results. The buyers at two grocery chains were pleased with the quality of the products and the quick turnover, indicating the items had high consumer appeal.

Developing a value-added seafood product requires sufficient time and resources to enhance your success. You just need to plan well and consult with a helpful food technologist and marketing specialist for a good return on your investment.