

# The **LODE STAR**

Charting the course of fisheries development today.

Alaska Fisheries

Development Foundation, Inc.

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## News to Use

Summer is coming to the end of her song in Alaska, and she's rushing the beat. She started out slow and easy, singing up the fireweed, singing out the herring and the halibut, singing up the birds of summer. By August it's more march-like, accompanied by the slow timpany of rain, the inevitable coda: Fall.

It's usually said that Spring is for beginnings, but those of us in Alaska know everything begins in the Fall. It's now, before the snow flies, that the trees and grass and animals practice up for what they'll do next Spring: disburse their seeds, bank leaves against their roots, memorize their colors, get extra groceries. Everything in nature is done in preparation for something else.

Likewise, AFDF will begin a new fiscal year this fall, and in December will begin its second decade of fisheries development in Alaska. In Washington D.C., three of AFDF's projects have received final approval for 1989-90 funding. They are:

1) Alaska Groundfish Quality Enhancement - including studies of quality factors, bone and parasite studies and further surimi quality studies; 2) Multispecies By-Product Utilization - including hydrolyzed fish oils and an AFDF-sponsored international fish by-product workshop; and 3) Flatfish Utilization - consisting of processing improvements and experiments to improve yield enhancement.

Several proposed tasks did not make it through the review process. They included further equipment improvements at KRI (see page 5), small-boat fishing for sole in Bristol Bay, studies of the arrowtooth flounder market, and an investigation of surimi made from arrowtooth.

We can learn a lot from the trees out our windows, which aren't just preparing for the cold season ahead, but also for the Spring that follows, and the return of summer.

For information about the Foundation's upcoming projects, contact Mel Mosen at AFDF.



## Alaska salmon chili goes to the fair

Giant cabbages and tundra bovines weren't the only novelties at the Alaska State Fair this year. The Alaska Chili Challenge, a chili-making competition sponsored by the fair and other local businesses, also featured Alaska salmon chili using minced salmon from North Pacific Processors in Cordova.

The Alaska Chili Challenge was held September 3, and featured 20 of Alaska's best chili makers, who competed for the chance to enter the World Champion Chili Cook-off October 30 in Rosamond, California.

Alongside the chili competitors, the AFDF staff served about 500 samples of Alaska Salmon Chili, a new product developed by Chef Eric Benson in cooperation with Oregon State University. Alaska Salmon Chili was one entry in AFDF's New Product Development Contest sponsored last year to assist development of new food products using Alaskan salmon, pollock and surimi. Because of the National Chili Organization's definition of chili (which doesn't seem to mention salmon at all), and because the winning formulation becomes public domain, the Alaska Salmon Chili was not an official entry in the chili challenge.

Alaska Salmon Chili uses minced pink salmon in place of ground beef; AFDF served chili with and with-

out beans at the fair. It is flavored with Chef Benson's own formulation, which some say tends to favor those whose taste buds were killed during adolescence.

"I think it's excellent, really," said Roy Sigurdson of Bell Buoy Crab Co. of Seaside, Oregon, whose company has acquired the license to produce the salmon chili. "It has an appeal that goes beyond regular chili. For one thing, it doesn't have red meat, doesn't have any cholesterol, and naturally, it has Omega-3 fish oil in it. And yet its flavor and consistency is much the same, if not better, than the chili you find now marketed."

Bell Buoy, a mail-order canned seafood firm specializing in dungeness crab, will look to Alaska and the Columbia River to fulfill its raw material needs for the salmon chili. Because the formulation uses lower-grade pink salmon mince, Sigurdson hopes that the product will not only be inexpensive to produce, it will also upgrade the value of salmon mince "...in time."

Bell Buoy now is working with the National Canners Association lab to determine optimum cooking time and temperatures. Then the company will develop labels for approval through the Food & Drug Administration (FDA), and hopes to introduce spicy and mild versions of the product to market early next spring.

"But by then we will have brought the product before  
*Continued next page...*

## Salmon chip isn't in the bag

Where besides chili will salmon lovers find their favorite fare in foods of the future? Arctic Seas Development Group has created a salmon snack chip that is similar to the potato chip but is made with minced chum salmon rather than spuds. Arctic Seas has been working with Lynda Nestelle of Taste 1 to improve the texture and the formulation of the product.

"We do have a nice salmon chip that's fried like potato chips," Nestelle said from her laboratory/home on Oregon's Sandy River. "Now I'm working on a formulation that can be baked in the oven so the final product will have less fat. But the product has a nice crunch to it and a good bite."

Snack chips made with fish have found certain popularity in the Oriental market on both U.S. coasts, Nestelle said, but she is somewhat skeptical about their catching on among mainstream consumers.

"One of the reasons I want to test the baked version of the chip is that it sort of puffs up the product. It changes the shape to more closely resemble some of the puffed snacks on the market today, and I'm hoping that will move it away from the potato chip market," Nestelle said. "Market tests done in the past show that people have a hard time accepting a potato chip that's different from what they're accustomed to."

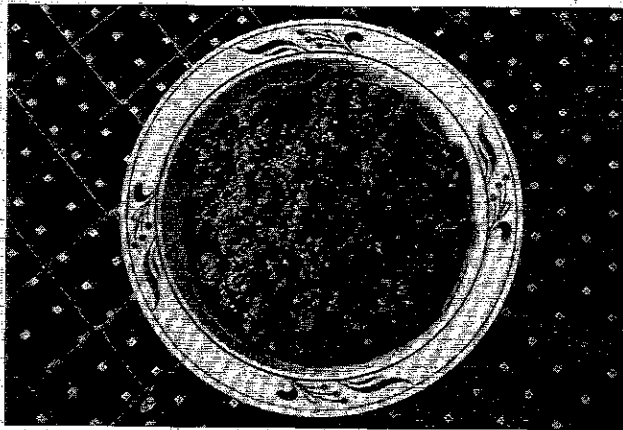
However, she said, the average consumer has developed a taste for fish in the past few years, and the Oriental market has grown significantly also. "There may be a market out there for salmon chips—even fried ones," she said.

The salmon snack was part of AFDF's New Product Development Contest to help create new foods from Alaska pink or chum salmon. The project included formulation and all aspects of product development up to commercial stages. Arctic Seas Development Group will conduct a regional market study for the product this fall.

The salmon chip used dried mince from chum salmon production at North Pacific Processors in Cordova, Alaska.

For more information about the salmon snack chip contact Lynn Gabriel at Arctic Seas Development Group, P.O. Box 201513, Anchorage, Alaska 99520; (907) 277-4716.

## Alaska salmon chili: first AFDF-sponsored product goes commercial



Alaska salmon chili was popular at the Alaska state fair

the public in various forms, and we may have sold it to institutions before then," Sigurdson said. "It's a great foodservice item, especially in mild form. It doesn't have meat, it doesn't have to include beans, and it's nutritious and inexpensive. I think it would be good in hospitals."

The product probably will hit the supermarkets last, Sigurdson said, because the packaging and labeling process for the commercial product will take longest.

"We have high hopes for salmon chili, but of course there are no guarantees," he said. "I know there's a market out here for products that don't contain red meat, and with health conscious America nowadays, and with a little promotion, I think it will work."

If it does, it won't be the first successful product Chef Benson has developed. Benson is a food technologist who has developed many new product formulations for companies along the West Coast. He has been working with new seafood products for several years. Benson, in cooperation with OSU, also developed a seafood bisque using pollock in a lobster base, a chowder using pollock in a clam base, and a Klondike Potato that combines potatoes and surimi in a finger-food that beats Tater Tots hands down.

Several of the products developed at OSU will be developed for commercial markets if producers can be found. However, the Alaska Salmon Chili is the first of the products from AFDF's New Product Development Contest to enter into commercial production.

For more information about Alaska Salmon Chili, call Loretta Lure at AFDF, Chef Eric Benson at (503) 738-7576; or contact Bellboy Crab Co., P.O. Box 46, Seaside Oregon 97138; (503) 738-6354.

## MEMBERS ONLY:

### News from the offices and plants of AFDF members

#### Evergreen Food Ingredients

##### Nutritionally equivalent analogs

Evergreen Food Ingredients of Olympia, Wash. now offers enrichment blends for use in surimi-based seafood analogs to bring the products up to nutritional equivalency of the real thing. The blends are based on the requirements outlined in a study performed by the National Food Processors Association and National Fisheries Institute Surimi Committee.

Because most seafood analogs are not nutritionally equal to the foods they imitate, the Food & Drug Administration requires they be labeled "imitation." By adding the enrichment blend to the surimi-based analog, a producer could produce a product nutritionally equal to real shellfish and therefore bypass the FDA's "imitation" ruling.

The enrichment blends include all the vitamins and minerals necessary to meet nutritional equivalency requirements. No protein is added, however, following studies that demonstrate the amino acid profile of surimi is of sufficient quality that protein does not need to be added to analogs.

For information contact Paul Taylor, Evergreen Food Ingredients and Equipment 1131 Black Lake Blvd., Suite 7, Olympia, WA 98502; (206) 754-1718.

#### McFarland Foods, Inc.

##### Chicken salad topping for sale

Rae McFarland, creator of the surimi-based Chicken Salad Topping that was introduced at Fish Expo last year, is now seeking to enter a joint venture with U.S. analog producers to make the product commercially. The product is made with surimi much as flaked imitation crab meat is made, and is flavored with chicken broth. McFarland said the product has brought a lot of interest, but his company doesn't have the facilities to produce it. Anyone interested in seeing the product can get samples from MCFarland Foods or taste samples at the AFDF booth at the Western States Meat Association expo in San Francisco in November.

McFarland also has a 30-60 lb. continuous microwave line for sale that is very useful for lab tests and product experimentations. "This is a small, 16-foot continuous cooker that's perfect for an existing lab," McFarland said. "All you need to run it is water and electricity. It lets you run tests in a lab to see the effects of formulation changes without running big machines and wasting product."

McFarland now is using the machine to create new products such as edible "fish leather," fashioned after fruit leather and using combinations of chicken, turkey and fish. But McFarland said his main thrust is "getting someone to work with me on the salad toppings. I want to develop bacon-flavored, pepperoni, pizza, corned beef, pastrami, saami-flavored product...I just don't have enough facilities to do it all. My building is bulging at the doors."

For more information contact McFarland at McFarland Foods, 84 High Country Road, Herriman, UT 84065; (801) 254-7377.

#### Specialty Foods:

##### Variety of processing ingredients

Specialty Foods now is offering some unique products to seafood processors to improve their product quality and expand processing capabilities. Specialty Foods offers a fish glaze to producers of frozen seafood that is reportedly superior to other glazes because its special formulation, which includes sodium erythorbate and a special combination of film-forming ingredients to make it more crack resistant than the usual water-based glazes or corn syrup solids. The glaze is used to coat the fish or fish product before freezing to inhibit oxidation and dehydration of the product during storage and shipping. Specialty Foods offers the glaze in white, free-flowing dry mix that readily dissolves in water.

Specialty Foods also offers a line of minced fish and seafood binders and matrices for seafood processors to improve texture and binding of fat and moisture in minced and chopped products. The company says that products made from these binders and matrices have no tendency to weep after freeze/thaw. Specialty Foods can custom tailor these products for processors' special requirements.

Specialty Foods is the company that makes pre-blended, pre-weighed cryoprotectant blends for surimi. The pre-blend saves space aboard surimi trawlers and saves shore plants and at-sea plants alike in time and productivity otherwise spent in weighing exact measurements of cryoprotectants.

For more information, contact Peter Fox at Specialty Foods, 1081 Essex Ave., Richmond, CA 94801; (415) 236-7400. Northwest distributor is Evergreen Food Ingredients (above).

## Listeria hysteria?

### Seafood processors should worry!

*"Food producers and processors are sharing in the "export boom." Categories doing the best: Oils and fats, +177%; fish products, +47%; animal oils and fats, +37%; fruit preserves, +26%; meat products, +17%; milk and cream products, +12%."*

*—The Food Industry  
Newsletter*

#### Henningsen Foods:

##### Dehydrated crab analogs

Henningsen Foods, Inc. has developed dehydrated crab analogs made with surimi. Henningsen now offers four variations: crab analogs with and without snow crab, using standard or all-natural colors and flavors. The products are formulated to retain top-quality flavor and color. Typical analysis is 6% moisture, 2% fat and 40% protein. The flaked products are usable in dry mixes, pasta dishes, instant soup mixes and side dishes. Henningsen reports that the first 10,000-lb. order was recently placed by a large East Coast company.

For information, contact Henningsen Foods, 14334 Industrial Road, Omaha, NE 68144; (402) 330-2500.

#### Teepak:

##### Sizer and stuffer for surimi producers

A new stuffing machine now used by some Japanese surimi makers could help the Alaskan seafood industry modernize, expand and grow a little closer to the U.S. meat industry. The T-Sizer is the highest capacity casing stuffer now on the market, according to Teepak. The stuffing machine for chunk or emulsion-style meat products can be used to package surimi for freezing, or for forming logs of minced fish meat for the foodservice market. It packs incoming meat into sausage casings for compact storage, quick freezing and easy transportation. It works with casings from 8" to 76" long, which could be used in place of pans to store raw surimi.

The T-Sizer is equipped with sensing devices to decrease product loss in casing tails. The machine measures just under 11' X 35" and can be controlled on either side of the machine. It costs \$50,000.

For more information contact Teepak, 1211 West 22nd Street, Oak Brook, Illinois 60521; (312) 571-6200.

A new word has washed ashore of the minds of West Coast seafood processors that is about as welcome as the needles washing up on the beaches of New York: *Listeria*. This food-borne pathogen, which can infect everyone but is most deadly for newborns, pregnant women and others with weakened immune systems, has appeared in "ready-to-eat" seafoods. It has already appeared in red meats, poultry and dairy products. You'll remember that 47 people died during a *Listeria* outbreak in Jalisco cheese in California in 1985. Last year the U.S. destroyed \$72 million worth of contaminated dairy products.

The same nefarious *Listeria* pathogen now is a concern among seafood processors. *Listeria Monocytogenes* was found to be present in cooked seafood products from several Oregon plants. No product has been recalled, but one lot of frozen Dungeness crab meat has been seized by the FDA. Indeed, *L. Monocytogenes* is widely found throughout nature: in soil, water and in the feces of humans, animals and birds. According to the Center of Disease Control, 4% of the U.S. population are carriers of the pathogen.

*Listeria* survives well at room temperature, and even at refrigerated temperatures. It has been isolated from frozen ice cream held for a year. However, experts seem to agree that heating to pasteurization temperatures does kill the organism in most cases. But even here, processors must be cautious: the organism was found in shrimp boiled for three minutes if the bacteria presence was extremely high before cooking.

The Washington, Oregon and Alaska Sea Grant programs have all dedicated much time and effort to help educate seafood processors about how to prevent the occurrence of *Listeria* in our seafood products. Irradiation may be one solution to the *Listeria* problem. It's been found that ionizing energy kills the microorganism. The state of Alaska now is investigating the feasibility of irradiation of seafoods and other foods in Alaska, but its use may be banned in the state if legislation introduced in the legislature this year should pass. More information is available from all Sea Grant programs, and from the Center for Disease Control.

- Editor

#### By Dr. Jong Lee

*Listeria*, named after famed English surgeon and bacteriologist Joseph Lister, is long known to cause abortions and encephalitis in sheep and cattle. Food-borne listeriosis caused by *L. Monocytogenes* started to appear in the 1980s but the problem, no doubt, had been with us for a long time. Who knows how many stomach flu episodes we have suffered were in reality a mild form of listeriosis!

To susceptible individuals, the symptoms of listeriosis are far more serious than stomach flu. In immunocompromised hosts—pregnant women, the very old and the very young, organ recipients and AIDS victims—the microorganism invades the macrophage and multiplies into large numbers. These are transported throughout the body via the bloodstream and to the fetus across the placental membrane. When deposited in the central nervous system it manifests itself into meningitis or encephalitis. When a pregnant woman is infected, abortion, stillbirth or neonatal sepsis may follow.

Foods that could carry listeria are soft cheese, contaminated milk, ice cream and coleslaw. No seafood or seafood product has been implicated, but *L. Monocytogenes* have been found both in raw and cooked seafoods.

*Listeria* is a hardy microorganism and persists for a long time in soil and plant materials. *Listeria* can survive in saturated brine, can withstand desiccation and can tolerate acidic or alkaline conditions. Its ability to multiply at low temperatures would allow this microorganism to grow in the refrigerator.

The regulatory agencies presently impose "zero-tolerance" for *L. Monocytogenes* in ready-to-eat seafoods. This includes crab, shrimp, surimi-based seafood analogs, smoked fish and raw molluscan shellfish. Cooked crabs have been recalled in Oregon as a result of regulatory action.

*Listeria* contamination of seafood occurs through cross-contamination of the cooked with the raw. An unclean processing surface, dirty floor, old brine and sea birds are the potential sources of this microorganism. Aerosol generated by the raw fish and steam condensate falling from the ceiling was shown to contaminate cooked crab meat.

Proper cleaning and sanitizing as well as the elimination of cross-contamination through proper separation of processing functions are the keys to the elimination of the *Listeria* problem. Such practices should be standard operating procedures for food processing plants.

Because of its hardiness, *Listeria* can be pulled out of seafoods after long frozen storage. So far the *Listeria* contamination of Alaskan seafood appears to occur during reprocessing in the Lower 48. However, "so far" is the key phrase here.

#### Tips to tackle Listeria bugs

John B. Peters of the Washington Sea Grant Marine Advisory Service has provided some tips for seafood processors who don't want to see *Listeria* on their product list:

1) Clean your plant, floor and equipment often and thoroughly with warm water (140° F) to clean fats, oils and product residues—but use low pressure and avoid splashing. Then apply FDA-approved detergents and scrub with appropriate brooms and brushes. Rinse with hot (180° F) water. Follow with approved sanitizers. Leave area as dry as possible.

2) Consider all floors contaminated. Eliminate the possibility of floor water contaminating the product. Make sure your floor has adequate drains and catchments, and use squeegees to eliminate standing floor water.

3) Reduce cross-contamination by separating raw product areas completely from cooked product areas. Don't allow anyone to enter any area where unprotected product is exposed without sanitizing hands, gloves and outerwear.

4) Keep product moving quickly, smoothly and in one direction, so no raw product can contaminate cooked product.

5) Use plastic or stainless steel containers; wood totes and boxes can't be adequately sanitized.

6) Use exhaust fans and hoods to reduce steam; eliminate all possibilities of condensate falling onto the product. Consider filtering the air coming into the plant.



FOUNDATION

projects

## Ergonomics:

# Designing a plant for productivity and safety

*"In Alaska, three out of ten workers suffer a serious job-related injury each year, amounting to 40,000 hours of total lost time."*

A design idea that got its start in the pubs and watering holes of Europe and the New World now is helping processing plants of all kinds improve productivity and decrease worker injury.

It's called ergonomics, the study of the work environment and how it affects the people who work in it. Ergonomic studies investigate motion, efficiency and equipment positioning, and how machinery, furniture and the work environment can be made more friendly to the human body. It got its start when tavern owners learned that, if you give patrons a bootrail to rest one foot on, they can stand at the bar longer before firing out and going home. The theory as applied in industry is that when people are more comfortable and less strained, productivity rises and worker injuries decrease.

Production industries are quickly



*Repetitive movements can cause fatigue.*

learning that poorly-designed equipment can cause cumulative damage to employees, resulting in lower productivity and higher medical costs for employers, not to mention fatigue, discomfort, and injuries to employees.

In June AFDF funded a pilot ergonomic study of the Baader 175 flatfish processing line operating at Eagle Fisheries Inc. in Kodiak. The study was conducted by Mark Catlin, an industrial hygienist with the Alaska Health Project, a private, non-profit organization that provides information and assistance to Alaskans on the prevention of work-related injuries and illnesses.

The pilot study was conducted to document portions of the processing line that represent potential problems and that may be improved by the application of basic ergonomic principles, and to recommend changes to the line. A two-day, on-

site analysis was conducted in July at Eagle.

Many of the general recommendations of this pilot study should be applicable to other fish processing operations. The project identified some problems common to all seafood processing plants, and some that Eagle Fisheries had already begun to alleviate on the flatfish processing line. A full report of the results will be available from AFDF in September.

"In Alaska, three out of ten workers suffer a serious job-related injury each year, amounting to 40,000 hours of total lost time," Catlin said. "Along the West Coast, interest is growing in job redesign in the fish processing industry."

The primary ergonomic problems associated with seafood processing plants are repetitive, twisting, hand motions, work levels set at the wrong height, or operations that require employees either to bend or twist with a heavy load, or to stand still for long periods of time.

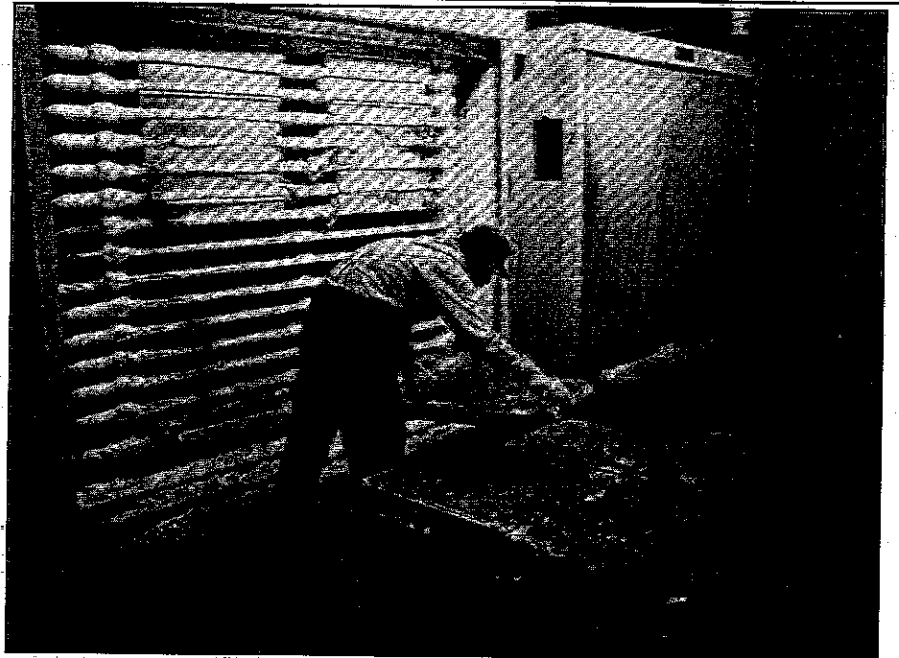
"One of the most common problems is with the work position," Catlin said. "When people have to stand in the same position all day, especially if that position is an unnatural one that doesn't allow ease of movement, it puts undue strain on various areas of the body. For example, if you have a candling table where four or five people are working, the table is probably not the right height for everybody."

Catlin said it's recommended that a work table allow workers to stand with elbows bent at a 90-degree angle, with the hands near or just above waist level. Injuries can result when a table is too high and workers must stand with their elbows out, shoulders high and wrists bent. Because fish plant workers aren't all the same height, Catlin said it is best to adjust table height to the tallest person and give shorter people a sturdy platform to stand on.

"A static work position is very hard on an employee," Catlin said. "You want to do all you can to make the workplace more accessible to the worker."

### Give employees a real lift—redesign

Lifting has long been identified as a major injury-inducer in the workplace. According to a booklet published by the United Auto Workers (UAW), lifting a 25-lb. box from



*It takes 700 lbs. of back muscle force to lift 25 lbs.*

the floor requires 700 lbs. of back muscle force. And putting the box down can be worse than picking it up. In addition to reminding employees to lift with the legs, the UAW strongly recommends redesigning the workplace. "Too much emphasis in the past has been placed on lifting techniques and not enough on changing the workplace," the UAW booklet reads. "A program to teach workers the proper lifting techniques should not substitute for workplace redesign to reduce the amount of lifting needed."

Catlin said that in fish plants, problems caused by lifting can be exacerbated.

"Lifting even light weights the wrong way causes injury," he said. "But in a processing plant, the problem can be worse because the material being lifted often has a wet surface, and the floor usually is wet and sometimes is covered in fish slime. At the beginning of a shift, you can catch yourself when you start to slip. But if you've been working for longer than eight hours in a day, you're more likely to suffer an injury because you're not as quick on your feet."

### Twisting the night away

Arm and wrist injuries like tendonitis and carpal tunnel are caused by repetitive twisting motions in the forearm and wrist, which puts undue strain on the tendons and muscles. The tendons, ligaments and bones in the wrist are particularly delicate and are often abused when using heavy tools in an awkward position, or when exerting force with a bent wrist. Wrist injuries are usually cumulative rather than immediate, and usually can be cleared up if the problem is solved before permanent damage occurs.

Catlin said he didn't see any indication of arm and wrist strain at the Eagle flatfish line, though it may be present on filleting lines of other processing plants.

"The hand filleters weren't operating regularly at Eagle when I was there," Catlin said. "But generally, flatfish are more delicate than a lot of other fish, so they don't require the same amount of force to fillet properly. Also, Eagle's filleters keep their knives sharp. I didn't notice as many problems there as at other plants."

One solution for potential problems on the filleting line is to redesign the knife handle to better suit the hand position. Any repetitive motion that requires twisting or bending the wrist should be eliminated from the workplace.

### Don't shoulder the burden

Repetitive shoulder and elbow movements, particularly those done above the head, can be damaging if done too often for too long. If a worker frequently must make an extreme motion—pushing something over head or leaning over to pick up or see something—the cumulative effect might be injurious.

The UAW recommends every worker get in the habit of noticing when he or she is working with a bent spine—a sure sign of strain.



*Arms at a good level*

## KRI BACK ON LINE: *Higher quality, better markets*

*Kodiak fish processors dump 30.6 million pounds of fish waste into the sea every year. That's an average of 38 metric tons of fish waste per day, though the volume varies from season to season. Waste is heaviest during pollock roe season, and surimi processing. Processors dump their waste for two reasons: KRI, the only fish by-products producer in town, can only handle 70% of the waste generated in Kodiak on a given day. And some processors say that, even with KRI right down the street, it's cheaper to barge their waste out to sea than to pay to have it processed into meal and oil.*

*This and several previous stories in The Lodestar, chart the progress KRI has made toward its two-fold goal of increasing the quantity of fish waste it can handle, and also of improving the quality of the final product—which would make KRI more profitable and, thereby, make it slightly more profitable for Kodiak's fish processors to direct their waste toward KRI instead of a mile or so offshore. For more information about AFDF's involvement with KRI, call Peter Moore at the foundation. —Editor*

### Solutions can be simple

For plants that do have ergonomic problems, solutions are available, Catlin said. Productivity and work quality can be improved and discomfort and injuries reduced without much expense, especially if ergonomic principles are applied when first designing a processing line. Adapting an existing production line to better fit human needs can be simple and inexpensive as well. Simple redesign of tools, handles and positioning reduces stress associated with movements. Changing chairs or standing position can reduce fatigue, and injuries can be prevented by positioning tables, storage bins, conveyors and access to freezers in such a way as not to cause repetitive strains on workers.

"The goal of ergonomics is to make the job fit the person," Catlin said. "Some major studies at beef and poultry processing plants indicated that hand, arm and wrist injuries could be reduced simply by knife redesign, proper glove fit and better worker training." Some auto manufacturing plants have flipped their cars up on their sides for engine assembly so the workers can stand up straight.

The study of ergonomics began in the 1980s, when many American industries began major efforts to reduce workplace injuries and improve productivity through the use of ergonomic principles. Today, ergonomic studies have given rise to many new products and gadgets designed to help the aging U.S. population through arthritis, injury and weaknesses due to age or illness. For example, tableware has been redesigned with curved knives and forks for use by people with arthritis for whom the twisting action of cutting meat with a steak knife can be painful. Zipper grabs, velcro fastenings and even the pull handles on car doors are a few products of ergonomic thinking.

Ergonomic design, product flow patterns and worker environment studies may become as much a part of future industrial development as walls, equipment and conduits. If seafood processing plants are to follow the example of other industries in efficiency, quality and environment, ergonomics is sure to play a part in its development.

*For more information contact the Alaska Health Project, 417 West 8th Avenue, Anchorage, Alaska 99501 (907) 276-2864.*

Kodiak Reduction, Inc. (KRI) this summer made one giant step toward worldwide marketability of by-products from Kodiak's fish waste. The installation of a new indirect-heat dryer and a larger boiler seems to have made the difference for KRI between marginal and marketable fish meal.

KRI replaced its antiquated direct-flame dryer for one that doesn't burn the materials and produces a more consistent product. The new equipment also allows KRI to add more solubles back into the dryer and thus increase its protein recoveries by nearly 5%.

"It's a little too soon to tell how everything's going, but we're definitely producing a higher quality product," said Randy Mullen of KRI. "The protein is a few percentage points higher. We also have a lot better control over the process, and a lot nicer product."

Mullen said a few weeks after the plant started up again that recovery levels had increased from an average of 13% to 16%, and protein levels in salmon meal increased from 60.5% last year to 65.8%. A larger-scale mincer that will allow KRI to significantly increase its production capacity has not yet arrived; it is expected to be installed this fall.

Since July 15 KRI has achieved consistent production levels of 150 tons per day of product that was "far superior in quality to anything produced with the previous drier," according to plant manager Dan James. The goal at KRI is to achieve 200-225 tons per day capacity, which would mean the plant could handle most of Kodiak's fish waste even during the heaviest seasons.

Jack Miller, whose company, James Farrell & Co., has marketed KRI's product both before and after the equipment upgrade, said, "Installation of the new equipment (at KRI) allows the fish meal produced to measure up to the high standards required for use in aquaculture."

Miller said that, though fish meal is used in all kinds of feeds

including poultry and swine, only some fish meals are best for eel and shrimp feeds in the world's aquaculture industry. Meal for feed must have high protein, excellent digestibility, and certain handling characteristics that are peculiar to low-fat, low-ash, finely-ground white fish meal.

"Demand for this kind of fish meal has increased rapidly in the last several years," Miller said. "For instance, large increases in the Taiwan production of eel and shrimp have made this a primary market for the increased production of white fish meal in Alaska from shore plants and factory ships."

Increasing demand and the decreased production of anchovy meal in South America has jacked up prices for white fish meal worldwide in the last six months. In addition, the drought in the Midwestern U.S. has increased prices for vegetable proteins—at least in the short term. However, a drought in South America and in Taiwan also wiped out much of the aquaculture activity there, drying up ponds and killing the fish that would eat Alaska's fish meal.

"Users of white fish meal in Taiwan have had losses of 70-90% of their shrimp in mid-July due to drying ponds and increased salt content from scorching heat," Miller said. "Then in mid-August, torrential rains struck, with loss of life and heavy property damage from flooding. Again, aquaculture facilities were hit hard. This will reduce fish meal use for some time, and no doubt slow down the rate of increase in pricing."

But, Miller said, the fish meal market is still attractive for quality fish meal. "And it is one that KRI can now compete in successfully," he added.

*For more information about KRI, or for samples of its product, contact plant manager Dan James at (907) 486-3171. To contact James Farrell & Co., write 705 Second Avenue, Seattle, WA 98104; (206) 623-1993.*



## North Pacific offers free salmon head oil samples

North Pacific Processors of Cordova, Alaska is offering free 4- to 5-gallon samples of high-quality, hydrolyzed pink salmon head oil. The plant will also offer silver salmon oil later in the season.

North Pacific is investigating the marketability of salmon oil as part of AFDF's effort to reap more profits from the Alaska salmon resource. When an evaporator is added to the hydrolyzer, North Pacific will also be distributing fish paste samples for fish feed.

AFDF and North Pacific will be issuing a request for proposals for companies interested in conducting market and regulatory research for salmon oil. The RFP will include researching potential markets, regulatory obstacles, and distribution channels. For more information about the project or the RFP, contact Loretta Lure at AFDF, or plant manager John Hewitt at North Pacific Processors, (907) 424-7111.

## Highliners pledge to keep ocean clean

The Highliners Association has devised a way to remind North Pacific fishermen of their responsibility to keep the ocean clean of garbage and debris: engrave it on a plaque. The association is selling \$25 brass-on-walnut plaques to hang in the galleys and wheelhouses of fishing vessels. Each plaque will be engraved with name of the vessel and the "Fishermen's Pledge for a Clean Ocean." The plaques were designed by Natural Resources Consultants and composed by fishermen. The pledge reads:

I recognize that a clean, productive ocean is necessary for the livelihood of fishermen throughout the world.

I realize that pollution and marine debris, particularly plastics, threaten marine life and my safety at sea.

Therefore, I pledge to:  
Return all discarded fishing gear and other plastics to port and dispose of them properly;

Make every effort to prevent accidental loss of fishing gear;

Make an effort to safely collect others' lost fishing gear and debris I find at sea and return them to port for proper disposal;

Follow the marine debris regulations required by the international treaty, MARPOL Annex V; and

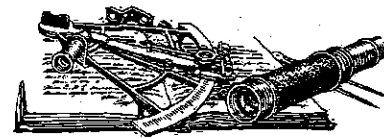
Encourage all my fellow fishermen to follow my good example.

Through these actions I will preserve a clean ocean today and for fishermen of the future.

The plaque was one result of the Pacific Rim Fishermen's Conference on Marine Debris held in Hawaii last October. MARPOL Annex V, an international treaty on ocean pollution that prohibits deliberate disposal of plastics at sea, will take effect Dec. 31, 1988.

For more information or to order a plaque, contact The Highliners Association 4055 21st Avenue West, Seattle, WA 98199. If ordering a plaque, please include the name of the vessel to be engraved on the top.

# director's log



## Alaska should build FITC a home

By Mel Monsen  
AFDF Executive Director

The seafood industry and AFDF have benefited in many ways from an entity that some of us are unaware of: the University of Alaska's Fishery Industrial Technology Center (FITC).

The Center, its staff, and associated personnel (particularly the NMFS Utilization lab in Kodiak) have greatly enhanced several of our projects. Even operating without its own building, FITC has been able to aid development of the surimi industry with microbiological, functionality and preservation studies; to development of fish by-product utilization through analysis of waste flows; and to use its engineering expertise to assist in expanding processing options.

The Alaska legislature established the FITC within the university system in 1981. According to the legislation, the center was to create employment opportunities in the fishing industry and provide other benefits to the state by:

- 1) providing training opportunities in harvesting and processing of Alaska's fishery resources;
- 2) providing information and technical help toward adapting current technologies to the state's fisheries;
- 3) providing R&D work to help adapt existing technologies to enhance the profitability of the industry;
- 4) providing R&D activities to create new technologies to enhance the effectiveness of the industry; and
- 5) encouraging joint projects between industry and government that will enhance productivity of the industry.

Since this legislation was passed, FITC has attempted to implement that legislative directive. This has been difficult because FITC has no facility, and because no one knew who was responsible for backing its development, so raising funds has been arduous at best.

Among the obvious benefactors were the seafood industry, the university system, the community of Kodiak and, in a broader sense, the state of Alaska. Because of this wide range of potential backers, no one took charge to ensure the funds were designated to construct what may turn out to be the most important step toward obtaining the full economic potential of our fisheries resources—a facility for the center to call home.

The lack of a building has led to a cooperative effort with the NMFS/Utilization lab in Kodiak, where

federal space is used for FITC's laboratories. With this makeshift arrangement the center has been working diligently, if not always successfully, to be a catalyst for industry advancement.

The industry already has accrued substantial benefits. FITC, NMFS and private companies cooperated in helping develop and implement new process concepts for surimi manufacture. Two examples are in-line washing and centrifugal de-watering systems, which increase the yield and quality of surimi. FITC also has been instrumental in gathering microbiological data in the surimi process, which is necessary for improving product quality and safety.

The Center examined the shelf life of frozen pink salmon fillets, a study which has helped others to develop alternative product forms from our most abundant salmon. And FITC also has studied the behavior patterns of fish as they encounter the trawl net. This is part of a longer-term effort to help develop trawls and trawling techniques which can be selectively targeted for chosen species.

Many other worthwhile efforts have been completed that have direct and immediate applications. They include vessel fish chilling techniques, fish flesh biochemistry and its relationship to handling requirements, and processing efficiency. Among the exciting future plans are studies in bar code tracking of processor product flow and automated parasite detection.

These innovative efforts benefit nearly everyone, from the small boat fishermen looking for a place to sell fish, to a floating or shore-based processor looking for a way to increase efficiency, to the secondary processors looking for consistent functional properties, to the seafood marketer looking for better product, and to the consumer who wants the best seafood available at an affordable price. At this critical time in the Alaska seafood industry, when production volumes are growing so significantly, the need for a completely functional center without the limitations of borrowed lab facilities is becoming desperate.

With state revenues decreasing, the days of easy access to construction funds are past. It has become especially important to make a concerted effort to emphasize the importance of the FITC to the seafood industry and the seafood industry's importance to the state. If we don't, we may not have a Fishery Industrial Technology Center to call upon for crucial assistance in the future.

## What's happening with the pollock in Shelikof?

If you want to find an Alaskan pollock processor around the week of September 25, you might try the North Pacific Fisheries Management Council meetings in Anchorage. There the council will be considering the decline in the Shelikof Straits pollock resource. The 1988 Shelikof acoustical survey for pollock revealed that the biomass in that area had decreased below the 700,000 m.t. threshold—to 330,000 m.t. Managers now are considering whether a Shelikof area shutdown would be in order.

"One scenario certainly would be a zero quota for Shelikof," said the council's Gulf of Alaska expert, Steve Davis. "But this year, only about 10% of the landed pollock in Kodiak came from Shelikof. Most of it came from elsewhere in the Gulf."

Davis doesn't recommend panic, but he said there

are some indicators that the Shelikof stocks could be in trouble. "We've seen strong recruitment of young pollock in the past," he said, "but this year there don't seem to be any three-year-olds. Where are those fish? That's a question that should be answered. And the of the four and five year olds, who normally are 100% sexually mature, only about 5% were sexually mature. These things definitely bear looking at."

Davis said pollock have been caught outside their normal breeding grounds—like right off the dock in Homer and Seward this year. "So things are changing. But we won't see the council make any decisions until December."

The Shelikof fishery has always been overshadowed by the Bering Sea pollock fishery, which in 1988 was set at 1.5 million metric tons.

The editor's turn



## Off the Cuff

By Krysl Holmes

**T**his summer I witnessed a phenomenon more rare than humpbacks in Cook Inlet, more unlikely than fish talking: I saw about 200 grocery store managers rise out of their chairs, raise their right hands and say, all together, "I promise to get excited about seafood!"

This happened at the Food Marketing Institute's Seafood Merchandising conference in Seattle in August, and sure, it happened after two and a half days of lectures, workshops and tours designed to get folks excited about seafood. But it was still impressive to see so many people, in such a big room, saying such a thing and speaking so loud.

I left that well-choreographed excitability after that, and stepped out into the bright spontaneity of big city Seattle. That sunny afternoon, National Marine Fisheries Service was sponsoring its annual fish feed in Gas Works Park. Free fish for everyone (salmon and pollock, prepared on outdoor grills), NMFS's way of telling the people of Seattle that fish are good folk. There were hundreds of people there, some of them playing near the water, some dancing to the steel band, most of them chattering, all of them eating—eating fish. I was told that folks in Seattle look forward to the event every year; families come, groups come, babysitters bring their charges, vacation Bible school classes break for the fish feed (no doubt marking the theological, if not economic, importance of fish)—in short, the fish fry is an Event worth getting excited about.

Of course you can tell I'm about to advocate an Alaska

Fish Fry (since it was *our* fish they were hawking in Seattle!) But this is about something else, too. Most people in our country know they should be eating more seafood. Most people in Seattle, and in Alaska, even know a little bit about the seafood they ought to be eating: where it comes from, what its name is. It's also true that most of those people aren't really excited about seafood. But they're ready to be.

Consumers are ready to be excited about seafood, and they could use the help of those 200 retailers who raised the roof at the Seattle Sheraton. But those retailers could use some help, too, and it should come from seafood producers, brokers, cookbook publishers, equipment designers, ice suppliers, and of course from fisheries development people.

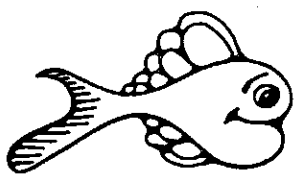
Seafood has taken the back seat at the grocery counter, been listed with "other meats", and been left out of economic studies long enough. It's no longer productive to just remind ourselves how important seafood is. (Though some of us could still use it: Alaska Business Monthly's latest economic analysis of Alaskan industries didn't even *mention* fisheries) It's time to start spilling out a little sweat, to jack up that soap box a little higher. Those retailers promised to get excited about seafood; it will be a job for all of us to make sure we can keep them there.

"Autumn comes to the sea with a fresh blaze of phosphorescence, when every wave crest is aflame. Here and there the whole surface may glow with sheets of cold fire, while below schools of fish pour through the water like molten metal..."

Man, in his vanity, subconsciously attributes a human origin to any light not of moon or stars or sun. Yet here are lights that flash and fade away, lights that come and go for reasons meaningless to man, lights that have been doing this very thing over the eons of time in which there were no men to stir in the vague disquiet."

—Rachel Carson

Letters  
to the  
Editor:



## Let's use surimi process on muscle meats

Dear Editor:

During the last 75 years the U.S. Department of Agriculture (USDA) has followed the original 1906 definition of meat. I believe that, in light of new technologies that have arisen, that definition should be modified.

The 1906 definition of meat as written in the USDA Official Meat Inspection Manual excludes surimi. The condensed definition describes the traditional view of meat: beef, sheep, swine or goat's muscle. Meat with or without overlaying fat and tissue normally contains attached bone.

Since 1906, many changes have taken place in the marketplace. For example, consumers do not depend so much on red meat. Poultry now has its own regulations, and seafood inspection is pending. These changes have altered the market for red meat. In addition, many cheaper proteins are now produced with new technologies. With these changes, more consumers are turning away from red meat as their primary source muscle protein. We need to change the meat regulations to permit the food industry to manufacture products from a variety of protein sources.

The recently developed technology of producing washed, defatted and dewatered muscle proteins using the surimi process have expanded. Many new products now are made from muscle surimi—in other words, other muscle meats are being put through the surimi process of deboning, defatting and washing, and these muscle surimis can be used to make many different products. I am speaking of surimi as a *process*, not as a product that is necessarily made from fish.

These muscle surimis are called muscle fiber bundles, and appear increasingly in the industry. The use of this non-traditional protein technology with poultry and red meat protein promises many new opportunities.

To produce a muscle surimi, the meat material must be washed with fresh water, just as in making pollock surimi. Washing the meat results in muscle that is lower in fat and higher in protein. The excess natural juices, fats, vitamins and minerals in the product should also be recovered for later use. As in pollock surimi, the

processed muscle exhibits exceptional processing capabilities. Muscle meats processed in this way could demonstrate a tremendous potential in today's U.S. food market. Nevertheless, the surimi process in the U.S. is not allowed for meat foods with a standard—that is, in making sausage, chunk-style meats, or any other approved products that have a standard of identity. Many other nationalities enjoy healthful products of this kind using red meat, poultry and marine protein blends. However, without USDA approval, it is not legal to commercially produce such products in the U.S.

Changing the definition of meat to include surimi technology would not only enhance current processing technologies, it would also expand the consumer's choices of foods. If USDA were to apply to surimi the same meat inspection procedures that now are used to identify meat qualities, the food industry could better educate the consumer about products made by this process, and could also guarantee a high-quality product. I believe it is time for the regulatory agencies to move ahead with appropriate legislation for the use of surimi technology in the red meat industry.

In the last 12 years, I have made production quantities of research-quality surimi. I have gathered volumes of findings that support the approval for surimi technology. It presents to the industry a viable, economical means of producing natural muscle shapes. Surimi technology, when applied to muscle meats, produces an excellent value-added, low-fat food protein.

Right now in other countries, nutritious surimi made from various wholesome materials is feeding people regardless of regulations here in the U.S. If we in this country were to take advantage of these innovations, we could not only expand the future of the meat industry, we could help accommodate the world's food demands as well.

—A. Rae McFarland  
McFarland Foods



*News*

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**Notes from New Zealand Surimi Technology Workshop** will be available soon from Department of Scientific and Industrial Research (DSIR). The three-day conference covered the science of surimi production, quality determination (U.S. and Japanese methods), determining properties of surimi, secondary processing, and least-cost linear programming in surimi product formulations. The workshop included tours of Skeggs' hoki surimi plant. Copies of the extensive notes—in 3 volumes—will be about US \$200, and will be available from DSIR, P.O. Box 5114, Port Nelson, New Zealand.

**Global Groundfish Market Report** compiles information from the first stage of worldwide research on the interdependency of world groundfish markets. The Global Groundfish Market Research Group, producers of this report, are members of the International Institute of Fisheries Economics & Trade (IIFET) who cooperatively produced all the information in this two-stage report. For information or

copies of Report #1 contact Lewis Queirolo, Regional Economist, NMFS, P.O. Box 21668, Juneau, AK 99802 or Dick Johnston, IIFET, Dept. of Agricultural & Resource Economics, Oregon State University, Corvallis, OR 97331-3601.

**Seafood Shelf Life as a Function of Temperature**, by John P. Doyle of the University of Alaska Marine Advisory program, will be available soon. Doyle's report focuses on increasing shelf life of fresh seafood to cater to the growing demand for high-quality fresh seafood; that is, producing seafood that not only has never been frozen, but is also truly fresh. This brief paper should be of interest to processors, marketers and retailers alike. Write to the Marine Advisory Program at 2221 E. Northern Lights Blvd., Suite 220, Anchorage, Alaska 99508.

**Changing Demographics: Impacts on your Workforce and Consumer Markets** is a study of U.S. consumer demographics and how the "aging baby boom" phe-

nomenon will affect meat producers. Findings are of interest to seafood producers as well: for example, Baby boomers aren't noted for brand loyalty, but they do develop STORE loyalty. Ethnic and regional markets are growing, creating opportunities for new products. And the economic classes are getting farther apart, creating more distinct upscale and downscale markets. Edited by Thomas G. Exter, American Demographics Inc. Write to: American Meat Institute, P.O. Box 3556, Washington, DC 20007.

**Health Effects of Fish and Fish Oils**, a conference sponsored by the Janeway Child Health Centre in Newfoundland, Canada, was followed up by both proceedings and abstracts. Abstracts are available now for \$15. Write your check to Nutrition Research, Janeway Child Health Centre, St. John's, Newfoundland, Canada A1A 1R8. Proceedings should be available in November.

## Herring waste and peat moss make fertilizer

A Nova Scotia company wants to produce fertilizer using herring waste mixed with peat moss. The Canadian government has sponsored a pilot project to help the nation's growing fish waste disposal problem, but Agriculture Canada says the project may run into environmental problems because of the high oil content of herring. (Source: NMFS)

## Taiwan increases fish catch

Taiwan harvested 1,095,000 metric tons of fish in 1986, a 6% increase over 1985. The value of Taiwan's fisheries increased 18% in the same year, to almost \$2 billion. Taiwan exported 265,000 tons of seafood in '86, valued at \$1.2 billion—an increase of 19% in quantity and 43% in value over 1985 exports. (Source: NMFS)

## Thailand importing pink salmon

Thai markets are importing frozen, whole round pink salmon, 2 to 5 lbs. each. Sources say they will import about 15,000 metric tons per year, valued at \$1,800 - \$2,000 per ton. Pink salmon suppliers interested in this market should contact Krys Holmes at AFDF for more information.

## Bandit fishermen, black market traders

Congress has started railing against Taiwanese and Japanese squid gillnetters who in June and July were illegally fishing salmon in the North Pacific. Several of the vessels had covered their hull markings to avoid identification. One Japanese vessel, the Hoshi Maru No. 28, allegedly tried to ram a Coast Guard cutter patrolling the area. Once aboard that vessel, Coast Guard officials discovered salmon, steelhead and a live fur seal aboard—all of them violations of international agreements.

Just as these reports were being confirmed, the Mainichi Shimbun, a major Japanese newspaper, exposed a huge black market network that has

been poaching Alaskan cod, pollock and flounder and selling them on the Japanese market for 30% to 50% less than product legally imported from the U.S. It was reported that one shipment alone contained at least 700 tons of illegally-caught fish worth \$1.5 million. The Alaska Factory Trawlers Association says Japan's black market in poached Alaskan fish has significantly cut into the legitimate market for Alaskan seafood.

President Reagan has been asked to ban Japanese seafood imports, and several Congress members are asking for retaliation against both Japan and Taiwan under the Pelly Amendment.

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Charting the course of fisheries development today

Alaska Fisheries Development Foundation, Inc.

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*"I am for integrity, if only because life is very short and truth is hard to come by." -Kermit Eby*

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