Pig Tale

ALASKA's Agricultural Experiment S improvement of production, processi management. All photos with this art

Pigs and Fish. It would seem the two couldn't be further apart. However, opposites attract and necessity is the mother of invention and therein may lie the reason Alaska has found pigs and fish make a good team.

In all parts of the state economy, Alaska has a traditional problem with the boom-bust syndrome. From the Gold Rush to the pipeline, a series of highs and lows have plagued the economic structure with little moderation between. A general decline since pipeline construction has placed stabilization of the economy foremost among concerns for state officials. Steadying the fishing industry is a road already paved—with intensive aquaculture projects, legislative structures like limited licensing, and a host of management plans. The success of these attempts is partially measured by their ability to deal with new problems to the industry.

Using Fishery Wastes

One of those new problems is what to do with fish processing wastes. Across the country, processors are looking at the same problem, since pending Environmental Protection Agency regulations will stop the dumping of wastes back into the ocean and mandate cleaning of effluent waters. The classic solution to this problem is fishmeal; if wastes can be made into a saleable product, they cease to be waste. Alaskan processors decided some time ago that there was a future in the fishmeal business, and three plants currently operate in the state at Kodiak, Petersburg, and Seward.

One problem Alaska has with encouraging industry of any kind is a lack of necessary infrastructure to support it. The groundwork for fishmeal processing has been laid, however, with those plants in operation. The problem now is getting a big enough market to support them. Not only is the home market for fishmeal small, but Alaska fishmeal sold in a lower 48 has to go at a price that includes high transportation costs. Finfish meal enjoys a fairly large steady market as a high quality protein supplement, especially in livestock feed. Shellfish meal has a poorer quality protein content and finds its biggest market as a fertilizer. The shellfish meal market is much smaller than that of finfish meal and so is the price. Consequently, Alaska processors produce shellfish meal at a loss.

Will Pigs Eat Meal?

It's now that pigs begin to look promising. Since the 1940's, shellfish meal has been considered indigestable and unpalatable. Researchers said the protein content of shellfish meal could not be used, even by livestock. But Fred Husby of the University of Alaska Agricultural Experiment Station takes exception to that commonly held truism.

Husby says those conclusions were drawn from investigations on small numbers of East coast blue and Tanner crab. The chemical composition of Alaskan king and Tanner crab is different from East Coast crabs and should, by its nature, be more digestable. Husby's Sea Grant experiments have centered around raising pigs from 40 pounds to market weight on a diet using shellfish meal as a substitute for part of more expensive protein supplements.

Potential for shellfish meal production in the state is tremendous, given the tonnage of shellfish caught annually. Alaska currently places about one-fifth to one-tenth of its total waste into fishmeal, yet it produces over one-half of the total U.S. shellfish meal output. What is needed desperately is an expansion of the shellfish meal market. Husby's project not only shows a way of getting that increase, but it fits in neatly with state concerns for encouraging stable, renewable industries. It also provides an in-state market, avoiding high shipping costs that make some Alaska products unable to compete in the continental U.S.

There are only two small commercial

tation carries out studies concerning conservation and development of new land, g and transportation of food and wood products, and development of resources icles by Sabra McCracken, University of Alaska.

T. Frady
Alaska Sea Grant Progr.

pig farms in the state today. Husby says that is partially because of a lack of supporting slaughter houses and processors, so that each operation must raise, slaughter and process its own pork for sale. But the biggest block to a large livestock industry in Alaska is a lack of feed production in the state. Farmers have to import cereal grains and protein supplements, paying not only for the feed, but high shipping costs. Farmers currently pay about $400 per ton for soybean oil meal, used as a protein supplement. King crab meal sells at about $140 per ton from Alaskan producers. If it proves to be an effective substitute, a substantial feed savings can be realized.

Alaska Grown Feed?

One way of solving the feed grain problem may rest in another state project aimed at encouraging renewable industries. About 70 miles southeast of Fairbanks at Delta Junction, the state is sponsoring a 60,000 acre agricultural project raising cereal grains, notably barley. Current marketing plans for the grain call for sales to Japanese and Korean investors. If, however, those plans alter, the grain can be sold in-state to livestock operations. Husby estimates that if the total output of those 60,000 acres were put into pork production, the resulting animals would just meet Alaska's current pork demand.

In his initial experiments, Husby found that pigs had no problem eating shellfish meal. Pigs fed a corn diet had up to 25 percent of the soybean oil meal supplement replaced with shellfish meal, with no adverse effects. The change represented a savings of 3 percent or $3.30 per pig marketed. If they are fed a diet of barley, 50 percent of the soybean oil meal can be replaced at a savings of $2.90 per pig marketed (1979 figures).

Some Drawbacks

There are some drawbacks to the use of shellfish meal. Since the protein is not of the highest quality, Husby does not suggest using the meal as a complete replacement for more expensive protein supplements. He says the shellfish meal is most efficiently used at lower consumption rates. (This is also because pigs tend to waste feed at a high rate.) Pigs have shown no aversion to a diet with some fish meal in it, and indeed a substantial savings in feed costs can be realized, even at lower levels of consumption.

Because of his success in feeding shellfish meal to pigs, Husby has turned his attention to other types of livestock. Preliminary experiments with dairy cattle have been successful. Alaska has one large commercial dairy and a good potential for additional growth with reduced feed costs. Husby says the cattle experiments have yielded good success in spite of one uncooperative cow who wouldn't eat. Levels of intake for most cows were high, and Husby expects successful application of shellfish meal to dairying.

Taste Prejudice

Another problem with putting fishmeal of any kind into livestock feed is a market prejudice about taste. Consumers seem to feel that fish-fed livestock will taste like fish. To alleviate these fears, Husby has kept a careful sampling of his pork for testing by professional tasters. So far, Husby say no one eating the pork has complained of unusual odors or tastes.

One other aspect of the fishmeal problem also under investigation by Sea Grant is the storage of wastes. There are a multitude of small fishing communities in the state that will be put in a real bind by the new EPA regulations on fish waste. These communities are too small to support their own fish meal plants and

FARMERS AND SCIENTISTS alike have held that shellfish meal is unpalatable, but these hogs show little aversion to feed containing a shellfish meal supplement. The animals are placed in control groups. Each group gets a certain percentage of crabmeal in its feed, the percentage varying with the group and reaching a high of 20 percent for some groups.

too far from established plants to get their wastes there cheaply. In order to save enough wastes to make a trip to the processors profitable, they may have to fish for a month or more.

Marine Advisory specialists Curt Kerns and Per Heggelund have been working with an ensilaging process to help with storing wastes. Through manipulation of pH, they have found wastes can be stored for several months with no odor or spoilage. When a community has collected enough to make the cost of shipping per unit low enough, the wastes can be sent away to a fishmeal plant.

Somewhat of a "chicken-and-egg" syndrome is developing among fish processors and the various state sponsored attempts to stabilize the economy. Although Husby got involved with shellfish meal feeds because the fish processors were looking for new markets, it is equally true that livestock farmers are trying almost as hard to find ways to cut feed costs. Both problems have a possible solution in shellfish meal, but it is difficult to say which came first. An over all guideline of stabilizing Alaska's notoriously fluctuating economy provides a public dimension to the project, helping Alaskans overcome a heavy dependence on short-term revenues like the oil pipeline.

Sailing Lake Champlain

This summer students and alumni of the University of Vermont will be able to learn about **life on a sailing ship** through first-hand experience. Professor Kempton E. Webb, Chairman of the Geography Department of Columbia University, will be guiding the interested through a week-long experience in the **history and geography of Lake Champlain** on board the first windjammer to sail the waters of this lake in fifty years.

Those who enroll will study, live, and sail aboard the Schooner *Richard Robbins*, which is powered only by sail, where food is cooked on a wood stove, and ice cools the food. Participants will explore the lake, learn about sailing craft and navigation, the early explorers and settlers, military campaigns and naval battles and the present threats posed to the lake by development and pollution.

For further information, write Summer Session, University of Vermont, Burlington, VT 05405; or Box 195 Vergennes, VT 05491; phone 802-759-2411.

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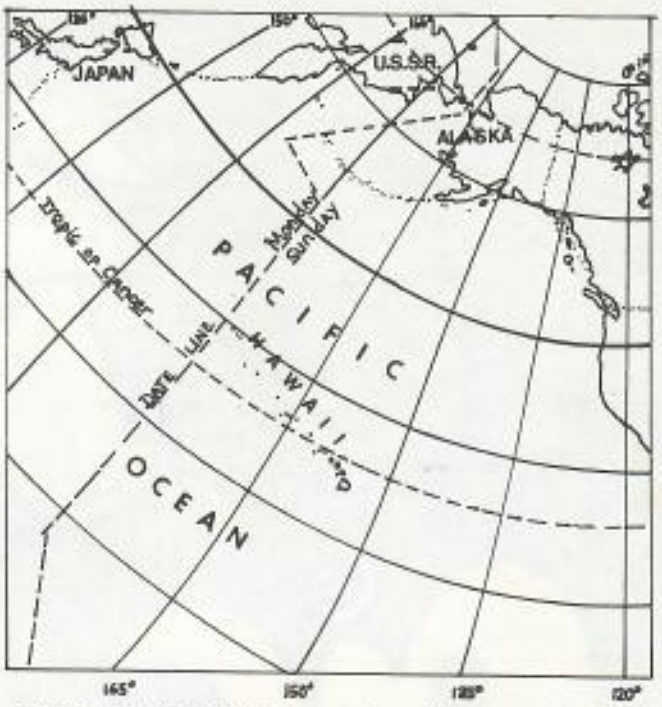

OBLIQUE MERCATOR projection of the western United States and the north-eastern Pacific Ocean, drawn by Barbara Hall from one published by the National Geographic Society, Washington, D.C. (1968).

About three-fourths of the 1600-mile Hawaiian archipelago (see map) was designated a National Wildlife Refuge in 1909 by Theodore Roosevelt, pretty much isolating the coral reef and volcanic islands comprising the **Northwestern Hawaiian Islands** (or NWHI).

Recently, however, pressures on the marine resources of the principal inhabited islands of the archipelago and the implementation of the Fisheries

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