

FEEDING FISH OILS TO DOMESTIC ANIMALS

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BACKGROUND

In recent years, the increasing use of animal fats as major sources of energy in the diets of farm animals has suggested that marine oils might also be used successfully in a similar way. Knowledge of the effects of fish oils in the rations of domestic animals is not nearly as extensive as is that concerning the use of other fishery products.

Two important questions rated priority in the fish-oil feeding investigations. First, the most effective level at which fish oils might be fed should be determined; and second, a comparison of different oils--both from different species of fish and from different processing methods--needed to be made. A program, supported by funds from the Saltonstall-Kennedy Act, was started in July 1955 at Oregon State College to supply information regarding these questions. Experimental work was carried out in the Department of Animal Husbandry, Oregon State College, Corvallis, Ore., and came under the general supervision of the Fishery Technological Laboratory of the U. S. Fish and Wildlife Service at Seattle, Wash.

METHODS AND FACILITIES

Facilities employed in this study included (1) swine from the Berkshire herd of the Oregon Agricultural Experiment Station and (2) individual feeding pens that enabled the keeping of accurate feed and performance records on each animal throughout the test period (figs. 1 and 2). Full-time staff members were responsible for the design of the experiments and the care of the animals. In addition to the facilities of the Department of Animal Husbandry, considerable assistance on this project was made available through the Food Technology Department, Oregon State College (particularly through its branch Seafoods Laboratory at Astoria, Ore.) and the School of Home Economics, Oregon State College.

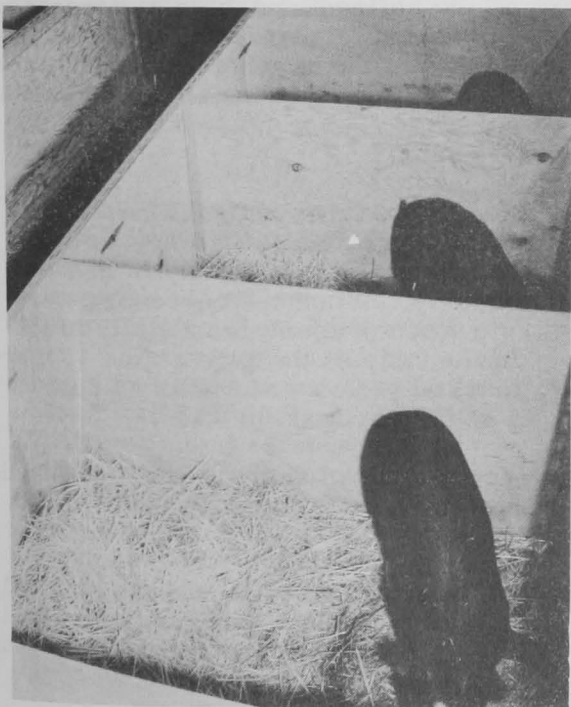


FIG. 1 - INDIVIDUAL FEEDING PENS IN THE SWINE NUTRITION UNIT AT OREGON STATE COLLEGE MAKE POSSIBLE THE KEEPING OF INDIVIDUAL FEEDING AND PERFORMANCE RECORDS.

Several criteria had to be considered in evaluating fish oils as additives to swine feeds. First, the rate of gain of the animals fed had to be checked to ensure that the oil-containing rations produced at least as rapid gains as did the nonoil-containing rations; second, the efficiency of conversion of the feed to pork had to be satisfactory; and third, the end product of the feeding (hog carcass) had to be acceptable from a market point of view.

Two feeding trials were set up involving 16 pigs each--four pigs were allotted to each ration treatment under consideration. The

duration of the trials was from shortly after weaning until the pigs reached about 190 pounds in weight; that is, the animals were carried through the normal growing-fattening period followed in farm practice.

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In the first trial, California sardine oil replaced 5-, 10-, and 15-percent of the grain portion of the diets. In addition, a nonoil-containing diet was fed as a check control. At the conclusion of the tests, all the animals were slaughtered at a commercial packing house, carcass measurements were made, and samples were obtained. A shoulder roast was cut out of each carcass and, after being cooked under standard controlled conditions, was subjected to taste testing by a panel.

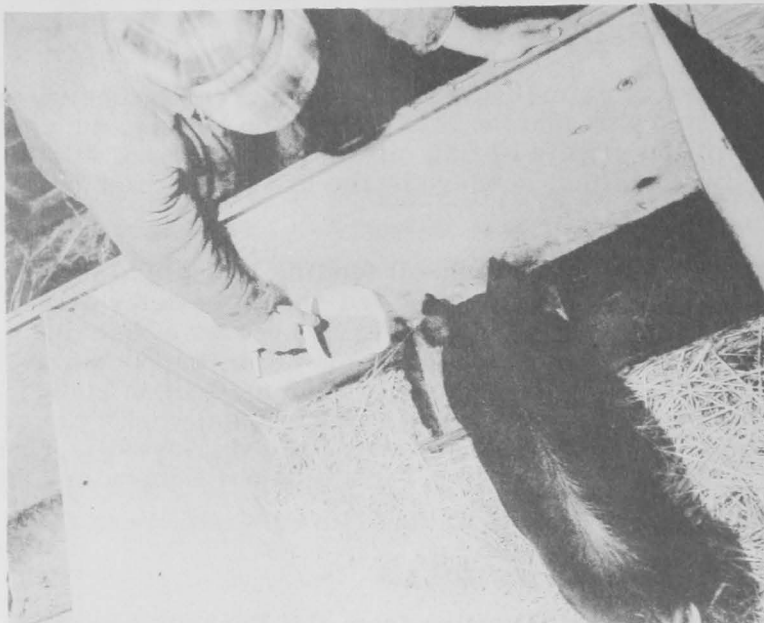


FIG. 2 - FEEDING FACILITIES IN INDIVIDUAL SWINE PENS KEEP FEED SEPARATE FOR EACH ANIMAL. COMMON WATER TROUGHS ARE PROVIDED.

After the results of the first trial were made known, a second was started using different oils fed at a constant level. In the second trial, the oils in each case made up 5 percent of the total diet. Again, a nonoil-containing diet was fed as a check. The oils used in this case were derived from menhaden. One sample was crude menhaden oil, one was alkali-refined-and-bleached menhaden oil, and the third was polymerized (kettle-bodied) oil. These rations were fed over the same length of time, and the results were evaluated in the same way as already described in the first experiment.

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PROGRESS MADE TO DATE

In the first trial, it was found that the pigs fed 5 or 10 percent California sardine oil grew at about the same rate and at about the same feed efficiency as did those that got the check ration. When oil replaced 15 percent of the grain in the diet, the pigs went off feed and failed to grow properly. When the carcasses were evaluated, it was found that a fishy odor and taste were present, especially in the fat, of all pigs fed all three levels of fish oil. In the case of the pigs on the 10-percent and 15-percent level of oil substitution, a marked yellow color was evident in the fat, which further detracted from the quality of the carcass.

It was concluded from this trial that a 5-percent level of fish-oil addition should be satisfactory in swine rations provided that something could be done to the oil to prevent the "fishiness" in the carcass.

In the second trial, it was found that pigs fed 5 percent of either crude or alkali-washed menhaden oils gained weight at a better rate than did the pigs on the control ration, while those fed the polymerized menhaden oil gained weight less quickly than did the controls.

The carcass quality of the pigs fed the polymerized oil, however, was vastly superior to that of the pigs fed either of the other types of oil and closely approximated that of the controls. From this trial, it was concluded that the type of oil fed is most important in determining the effectiveness of that oil in livestock rations. It seems possible that a fish oil polymerized under carefully controlled conditions might yield a product satisfactory from the nutritional (that is, growth-promoting) as well as the carcass-quality standpoint.

