Asiatic Newcastle Disease

outbreak checked to eliminate potential source of loss to poultry industry in California and nation

W. J. Mathey, D. E. Stover and J. R. Beach

The lifting of quarantines on June 15, 1950, from five California premises on which game birds are raised confirmed the elimination of a potential source of great loss for the poultry industry of the state and the nation.

The quarantines were imposed on the five premises because each one had received birds which had been exposed to Asiatic Newcastle disease on the establishment of a Contra Costa County bird fancier.

Asiatic Newcastle disease is a very virulent and lethal form of that relatively nonfatal disease familiar to the poultrymen of California under the names of pneumoencephalitis—PE—or Newcastle disease.

Asiatic Newcastle is characterized by very severe hemorrhagic lesions in the digestive tract and elsewhere in the body of the bird and by a mortality approaching 100%. It resembles an important disease of poultry, fowl plague or fowl pest, which is not found in this country at present but which was imported in the past and was eradicated at great expense. Acute fowl cholera is a condition which also had to be eliminated in the process of making a diagnosis.

The disease was introduced with a shipment of exotic birds consigned to the Contra Costa County bird fancier which left Hong Kong, China, on March 16, 1950. The shipment consisted of: *1*, three Chinese pheasants—Tragopans; *2*, three Elliot pheasants; *3*, 50 quail; *4*, four ducks; and *5*, 10 partridges. On arrival at San Francisco on March 18 all partridges were dead. The entire shipment, including the dead, was taken to the Contra Costa County premises. Three days later one pheasant died and three days after that another bird died. About 10 days after arrival of the shipment deaths began to occur in a flock of 40 bantams which had the run of the fancier's premises. Twenty of these birds died within a week. The remaining birds were brought to the Department of Veterinary Science at the University of California, where all but one eventually succumbed. Bantams which lived for a few days after becoming sick were positive to hemagglutination inhibition—HI—test for Newcastle disease.

Birds from the shipment were sold to another fancier in Contra Costa County and to a fancier in Sonoma County, who in turn sold some birds to two other Sonoma County fanciers, one of whom had a flock of 700 chickens. The carcass of one bird was given to an Alameda County man who wanted the skin for stuffing. At the same time, birds on the premises when the Chinese shipment arrived, were sold to a Napa County fancier, and shipments were made to fanciers in five other states.

On April 1, the fancier began to be alarmed by his losses and brought a dead pheasant and bantam to the Department of Veterinary Science at the University of California at Berkeley.

Asiatic Disease Suspected

When the birds were examined suspicion of Asiatic Newcastle disease or fowl pest was aroused by the lesions seen in dead birds. The Bureau of Livestock Disease Control, Division of Animal Industry, State Department of Agriculture was immediately notified. The Bureau assigned a veterinarian to work on the outbreak with the University veterinarians. The Bureau of Animal Industry of the United States Department of Agriculture was notified by the California officials. More birds were obtained and bacteriological, serological, and other appropriate diagnostic procedures were carried out.

The Department of Veterinary Science at the University of California had on hand the materials and facilities necessary for quickly establishing a diagnosis without the infection spreading to chickens being used in poultry disease experiments or to the flocks of the Poultry Husbandry Division located less than a quarter mile distant from the Veterinary Science laboratories. These include adequate isolation quarters for diseased chickens, sera from chickens immune to fowl plague and the European or Asiatic type of Newcastle disease, normal chickens and pigeons, chicken embryos, and chickens immune to pneumoencephalitis—the United States type of Newcastle disease.

Chickens immune to pneumoencephalitis are also immune to the highly fatal European or Asiatic Newcastle disease. It was by the establishment of this fact a few years ago that pneumoencephalitis was shown to be immunologically related to Newcastle disease.

Acute fowl cholera and other acute bacterial infections were eliminated by the negative results of bacteriological examinations of the dead birds. By employment of the procedures by which virus diseases are detected and identified a diagnosis of Asiatic Newcastle disease was reached.

Basis of Diagnosis

The findings upon which the diagnosis was based are: *1*, positive results of HI tests for pneumoencephalitis; *2*, positive results of serum-neutralization tests with Newcastle disease immune serum and virus isolated from the dead birds in embryo; *3*, negative results of similar serum-neutralization tests made with fowl plague immune serum; and *4*, the fact that pneumoencephalitis immune chickens were not infected by inoculation with blood and tissues from the dead birds while the same material produced fatal infection in both normal chickens and pigeons.

Veterinarians of the State Department of Agriculture placed the two Contra Costa County premises under quarantine on April 4. The following day the premises in Sonoma County were placed under quarantine. No evidence was found of the disease having been carried from the original premises to those to which the imported birds were sent. Nevertheless the officials of the Divisions of Animal Industry, State Department of Agriculture and Federal Bureau of Animal Industry decided that the potential danger of the disease to the poultry industry of California and the United States was serious enough to warrant slaughter of exposed birds on all premises as the most certain means of eradication.

Appraisals of value of the birds were made by Federal and State veterinarians assisted by bird fanciers. Half of the compensation based on these appraisals was to be paid out of Federal funds with the rest to be paid from California funds.

In a little over a week after the birds were first brought to the University for diagnosis, the Federal and state veterinarians had wiped out all birds on those ranches which had received birds from the infected shipment. The premises were cleaned, disinfected and left without any stock of birds for 30 days. In the meantime, a stock of normal chickens was ob-

Continued on page 15

Growth Results of Chicks Fed a Diet Containing 44% Cottonseed Meal Plus Amino Acid Supplements.

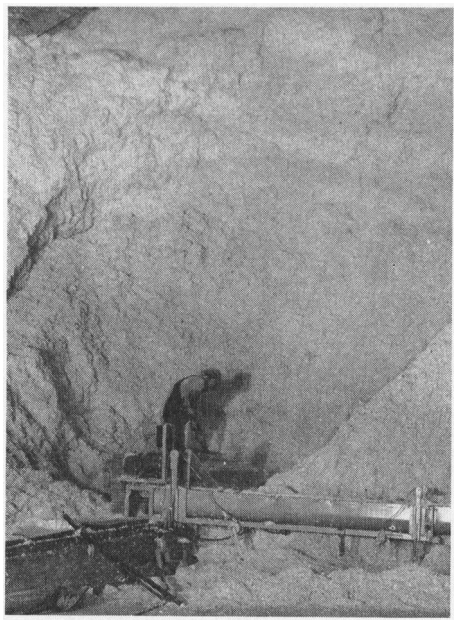
Diet	Level of supplemental L-lysine monohydrochloride, %	Average gains in grams with these DL-methionine supplements, (%)		
		0	0.05	0.10
Cottonseed meal mash	0	157	152	150
	0.05	164	160	151
	0.10	163	132	148
	0.20	159	148	155
Chick starter mash ...	0	162		
Connecticut broiler mash ...	0	176		

When high levels of cottonseed meal were fed, more riboflavin was needed in the diets than was expected, based upon published analyses of cottonseed meal for this vitamin. Until more definite information is available on this point, it is suggested that cottonseed meal not be depended upon to contain more than two milligrams of riboflavin per pound.

Because animal products supply vitamin B_{12} and probably some unidentified vitamins, it is recommended that 3% of fish meal be kept in the diet. A source of additional vitamin B_{12} may well be added to the diet.

Conclusion

Expeller-type cottonseed meal can be used extensively for chick-starting, broiler-fryer, and growing rations for chicks to provide the principal source of protein. Such rations should not be fed to laying hens, however, because of their adverse effect upon interior egg quality, particularly after storage. Under practical conditions, diets containing cottonseed meal probably need no amino acid supplements.



Cottonseed storage awaiting treatment in expeller.

C. R. Grau is Assistant Professor of Poultry Husbandry, University of California College of Agriculture, Berkeley.

The above progress report is based on Research Project No. 6670E.

FROST

Continued from page 12

signed blowers drawing air through oil-fired furnaces were installed several years ago near Whittier and it was found in general, that drawing cold air, the jet carried about 500 feet as would be expected from conventional wind machines. With heated air, however, the carry was only about 300 feet because the buoyancy lifted the air blast out of the orchard.

Portable wind machines blowing under the trees with small open-flame burners are probably not so subject to the buoyancy fault as overhead, furnace-heated jets, but their effective reach down the tree rows is more limited. Only one test was possible this season. A 37-horsepower rig was tried having two fans blowing at right angles to both sides of the line of travel. The air conditions were unfavorable for the test, there being only a 4.4° F inversion, a light fog, and the considerable air drift of two mph, above tree tops.

A square route was followed in the citrus orchard enclosing 2.9 acres, repeating every six minutes. Running with one burner only, which delivered about 1,000,000 Btu per hour toward the inside, the combined response in the three acres was approximately 1° F. This indicates that forced delivery is advantageous because this response is at least three times what should be expected from small distributed heaters delivering the same amount of heat, and very little temperature gain could be expected from the blower in such poor inversion. Further tests are essential before substantial conclusions can be drawn.

The early freeze of December 13, 1949 caused a lot of frost damage, which in some cases clearly revealed the limitations of wind machine protection.

The illustration shown on page 12 was taken from a bluff on the east of an orchard in East Highlands. Areas protected by wind machines appear dark, but damaged spots show the light brown color of the frozen leaves. In this picture three of the five wind machines can be seen surrounded by undamaged circles up to a distance of about 400 feet. A small orchard to the northeast in a cold spot—to the right outside the picture—was completely damaged not being equipped with any kind of frost protection. A small frost spot is seen close to the nearest wind machine where the air is relatively quiet.

A significant frost area is to be noted extending from the northeast corner of the whole area—righthand side—in a wedge between the near machine and the two farther wind machines—in the west orchard. Here the frost border approaches within 200 feet of the wind machine. The main reason for this damage is probably that the cold canyon air drift received an extra low-level chilling in the meadow and the unprotected orchard to the northeast. Then the extra stability of this cold strata would be more difficult to penetrate by the wind machine jets, and stagnant air is virtually self-chilling. However, other reasons such as growth susceptibility might be the explanation for a considerable part of the frosted area.

F. A. Brooks is Agricultural Engineer, University of California College of Agriculture, Davis.

D. G. Rhoades is Research Assistant in Agricultural Engineering, University of California College of Agriculture, Davis.

H. B. Schultz is Assistant Specialist in Agricultural Engineering, University of California College of Agriculture, Davis.

The survey of citrus growers, in June 1950, which resulted in the decision to install additional wind machines was conducted by Dr. L. D. Batchelor, Director of the Citrus Experiment Station, R. H. Gray, Superintendent of Cultivations, Citrus Experiment Station, with Dr. F. A. Brooks.

The above progress report is based on Research Project No. 400U.

NEWCASTLE

Continued from page 7

tained from the Poultry Husbandry Division at Berkeley. These were kept in isolation for 30 days and representative samples tested at intervals for pneumoencephalitis antihemagglutinins. At the end of the 30 days these chickens were taken to the ranches and distributed in the various bird pens. These birds were inspected at three- to five-day intervals during the following 30 days. Any sick or dead birds were examined at the University to determine the presence or absence of Newcastle disease. At the end of the 30-day interval, the quarantines on the various farms were lifted, and the owners were told that it was considered safe for them to restock their aviaries.

J. R. Beach is Professor of Veterinary Science, University of California College of Agriculture, Berkeley.

D. E. Stover is Livestock Disease Control Specialist, Division of Animal Industry, California Department of Agriculture.

W. J. Mathey is Junior Specialist, Department of Veterinary Science, University of California College of Agriculture, Berkeley.