Avian Adenovirus Committee Report

Efforts to properly classify avian adenovirus isolates recovered throughout the world continued during the past year. Dr. Barrett Cowen, a member of this committee is coordinating these studies.

The committee has attempted to keep abreast with the current findings pertaining to adenovirus 127 (AAV127) infection all around the world. In order to do so, close contacts were maintained with individual researchers dealing with this problem in the U.S. and abroad and with USDA - APHIS.

Interesting reports were made on this subject during the ANECA - WPDC meeting held in Acapulco, April 23 - 26, 1980. Dr. Bill Baxendale of the United Kingdom and Dr. Brian McFerran of Northern Ireland stated that extensive vaccination with inactive AAV127 has brought losses due to Egg Drop Syndrome (EDS) under control. Dr. McFerran also reported procedures that are being successfully used to eradicate EDS from primary breeding stocks. An abstract of his presentation is attached. Dr. Rosales of Mexico presented evidence that the AAV127 infection is now present in the commercial chickens in Mexico and is causing clinical signs of EDS. An abstract of his paper is also attached. This committee has informed APHIS of its concern of the Mexican findings.

In August - September issue of "Foreign Animal Disease Report (APHIS)" a summary of AAV127 survey in the USA was published. This report is also enclosed for your information.

Barrett S. Cowen
Charles H. Domermuth
Stan H. Kleven
John K. Rosenberger
Donald G. Simmons
Vance J. Yates
Syed A. Naqi, Chairman

FURTHER INVESTIGATIONS ON THE EGG DROP SYNDROME

M.S. McNulty and J.B. McFerran, Veterinary Research Laboratories
Stormont, Belfast, BT4 3SD, N. Ireland

This condition, first described in 1976, is characterised either by a sudden increase in the production of thin shelled, soft shelled or shell-less eggs or by a failure to achieve predicted production levels. In either case the birds remain apparently healthy.

The etiological agent is a duck adenovirus. This virus only spreads from infected ducks to fowl if they are in very close contact. The spread appears to be due to contact with faeces and aerosol spread is minimal.

In Northern Ireland the disease was eradicated from an infected basic breeding organisation. Eradication was based on the following premises:

a) Birds infected through the embryo quite often failed to develop detectable antibody.

b) These infected birds would show EDS around peak production. Following EDS antibody was detectable.

c) Birds over 40 weeks of age, even if infected, were unlikely to excrete virus.

d) The viruses infecting fowl in 1976-1977 at least had poor lateral spreading ability.

Therefore using these findings, chicks were hatched from flocks over 40 weeks of age. They were segregated from infected birds in the hatchery and were reared in semi isolation. These flocks were tested by HI at regular intervals. If a large number of reactors were found, these were removed. After 40 weeks, if the flock passed a 100% HI test, eggs for breeding were then collected.

RECENT RESEARCH ON EGG DROP SYNDROME '76 (EDS '76)

WILLIAM BAXENDALE
INTERVET LABORATORIES LTD.
THE ELMS
HOUGHTON, HUNTINGDON
CAMBRIDGE PE 17 2 BQ, INGLATERRA

S U M M A R Y

EDS '76 has become widespread in the fowl population and it is a cause of considerable economic loss. Eradication of the disease may be possible from the breeding and elite stock as vertical transmission is an important means of the spread of the virus. Screening individual birds for antibodies and removing them before lay may eliminate carriers. Where resources are limited, vaccination with an inactivated vaccine that induces high antibody

levels may be attempted. The results reported here would indicate that it is likely that both vertical and horizontal infection are reduced.

Of interest is the recent observation (Baxendale, unpublished) that vaccination of chicks previously experimentally infected as 1 day old embryos and which had developed only low HI antibody, titres resulted in a considerable boost in antibody titre. If such birds were potential carriers, an antibody boost may reduce the chance of these birds excreting virus.

DETECTION OF ANTIBODIES AGAINST EDS - VIRUS (BC - 14 STRAIN) IN DOMESTIC HENS IN MEXICO

G. Rosales, M.V.Z., A Antillon, M.V.Z., M.S., Ph.D. and C. Morales, M.V.Z.

Departamento de Produccion Animal: Aves
Facultad de Medicina Veterinaria y Zootecnia
Universidad Nacional Autonoma de Mexico
Mexico 20, D.F.

One thousand one hundred blood samples were obtained from 67 chicken flocks throughout Mexico. Four hundred and six samples were positive to Adenovirus antibodies using the agar gel precipitin (AGP) test.

Hemagglutination inhibition (HI) tests were performed on the 406 AGP-positive samples: 318 were negative, 36 had titers of less than 1/40, and 52 were considered positive (titers of 1/40 or higher).

Most of the positive samples came from commercial medium-size layers and heavy breeders.

FOREIGN ANIMAL
DISEASE REPORT

ADENOVIRUS 127 - SURVEY

Early in 1978, officials of Ireland notified the U.S. Department of Agriculture (USDA) that researchers at Belfast have isolated an adenovirus (adeno 127) associated with drops in egg production in laying flocks of chickens. The disease occurred in flocks hatched from eggs imported from continental Europe. Since 1973, the United States has permitted under certain conditions the importation of hatching eggs from countries not known to be free of viscerotropic velogenic Newcastle disease to enhance bloodlines.

In 1978, a program to survey and test U. S. flocks containing birds hatched from imported eggs was established. The same year, the import requirements of the United States were adjusted to require testing of the parent flock. Twenty-five percent of the birds in the flock over 30 weeks of age must be tested/and found free of adenovirus (adeno 127) antibodies before the eggs are allowed entry into the United States. At about the same time, a program was established to survey and test U. S. flocks hatched from imported eggs. On May 4, 1978, during the survey, a breeding flock hatched from imported eggs was serologically sampled. Two of the 220 sera had hemagglutination inhibition (HI) antibodies to adenovirus 127. The birds from the houses with positive titers were resampled on June 15, 1978. Again, some of the birds had some antibodies to adenovirus 127. Twenty-six birds were sent to Plum Island Animal Disease Center (PIADC). Four birds were bled, necropsied, and tissues submitted to the National Veterinary Services Laboratories (NVSL). No antibody or virus was detected from sera and tissue submitted to NVSL. PIADC reported to Veterinary Services on August 18 that a virus had been isolated from one of the birds having an antibody titer of 1:8. As a result, the following occurred:

1. The flock owner and the State officials were notified of the virus isolation.
2. Subsequently, PIADC reported that a virus similar to adenovirus 127 was isolated and reisolated from two different birds.
3. All birds from the flock in question were slaughtered. Samples were collected at the processing plant and sent to National Veterinary Services Laboratories (120 sera, 120 sets of tracheal and cloacal swabs, and 55 sets of tissue). No antibody or virus was detected. Flock records were reviewed. No evidence of production problems was identified.
4. Progeny of the breeding flock in question has been sampled, with 82 sera from 4,000 progeny showing no evidence of adenovirus 127 HI antibodies when screened at 1:10.
5. The two commercial egg flocks which had reported egg production problems were investigated and resampled. No evidence of adenovirus 127 was noted.
6. Sera from migratory waterfowl were collected.
7. A virus isolated from ducks in Missouri was sent to PIADC for further characterization. Chickens have been inoculated to produce antisera to the duck isolate. The duck isolate has been evaluated by inoculating it into layers at the Southeastern Poultry Research Laboratory in Athens, Georgia. The layers were not affected and egg production and quality remained normal.

8. National Veterinary Services Laboratories are producing inactivated adenovirus 127 antigen and reference serum and will provide them to diagnostic laboratories on request.
9. Some large commercial duck flocks were found to have antibody to adenovirus 127.
10. The sera from migratory waterfowl have a very low frequency of antibody to adenovirus 127.
11. Two additional isolations of a virus similar to adenovirus 127 have been made from commercial duck flocks from California and New York.

Summary

A survey was carried out on flocks in the United States hatched from imported eggs. A low level of antibody was determined in a breeding flock during this survey. Positive-titered birds were sent to PIADC and NVSL. A virus similar to adenovirus 127 was isolated and reisolated from two different birds at PIADC. There is no agreement among scientists as to the significance of low HI titers in chickens and flocks in the United States, since most of the infected flocks in Europe were associated with much higher titers.

Since no clinical signs were noted in the flock, no virus or antibody was detected in the rest of the flock or in progeny of the flock, and no drop in egg production was noted; the virus isolate is considered avirulent and not a significant risk to the U.S. poultry industry.