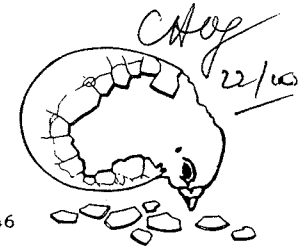

D A N D E R

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In this issue there is a Summary of Chicken Meat Research Development and EIRDC projects: the range of projects covered I think is exciting and is quite representative of the needs of industry. The article on preserving eggs continues, and an overview of Research into Poultry Disease in CSIRO and the Causes and Control of a Peracute form of Inclusion Body Hepatitis and info about the November APVA Scientific Program in Melbourne.
Thank you to all xeroxer-filers who sent in submissions also.

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VICTORIAN POULTRY ADVISORY COMMITTEE :
Below is a list of recently appointed members from 01 July 92 to 30th June 1995, as notified by Ian Baker, Minister for Food and Agriculture, Victoria:

Mr Donald J FOSTER
Mr Peter TJEPKEMA
Mr Kevin BRINKOTTER
Mr Anthony AINSWORTH
Mr Ralph BURD
Mr D Barrie PICKERSGILL
Dr Richard J COULTER
Mr Spencer B Field
Mr Gregory PARKINSON

HOW TO SOLVE YOUR EGG OVERSUPPLY PROBLEMS CONTINUED FROM LAST ISSUE:::

The Storage of Sterile Eggs: Dry Methods.

"Packed in dry bran; packed in a mixture of bran and sharps; packed in salt; and packed in sifted wood ashes. Then there comes the variation that some packagaes are made airtight by paper or linen being gummed or pasted over them; others are simply nailed or screwed down. Some add that the boxes or packages are to be turned completely over once every week; others do not require them to be moved. The follwoing dry methods seem to require each egg to be separately handled at least once, and sometimes twice or thrice, namely, coating or painting the egg with a) white of egg, b) gum, c) oil, d) bees wax rubbed on the egg or melted and the egg dipped into the solution; e) grease, f) butter, and then wrapping it in paper and packing away. In some cases, it is added, the eggs should be packed in sawdust, bran, or flour"

Next issue the storage of eggs using wet methods will be covered.
Reference: Poultry for Profit, (1904), by Tho H Young. ALSO USED FOR THE FOLLOWING....
$%$%$%$%$%$%$%$%$%$%$%$%$%$%$%$%$%
LISTED UNDER BIRD AND POULTRY FOOD PRICES:

TASTELESS P E P P E R
For giving colour to Young Canaries, 6d per packet.

#@#@#@#@#@#@#@#@#@#@#@#@#@#@#@#@#
Editorial question: Did anyone confirm with the canaries that the pepper is true to label ?

Paper presented at the 41st Western Poultry Disease Conference
Sacramento, March 1-3 1992.

CAUSE AND CONTROL OF A PERACUTE FORM OF INCLUSION BODY HEPATITIS

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AUSTRALIA 2570

SUMMARY

A disease identical pathologically to inclusion body hepatitis (IBH), but not associated with infectious bursal disease (IBD) virus or chicken anaemia agent (CAA), sporadically caused up to 40% mortality in 7-14 day-old, meat chicken flocks in Australia commencing in the early 1980's. Research and in-house company studies indicated that egg transmission of a fowl adenovirus (FAV) with a specific genetic makeup was the likely cause and that vaccination of breeding flocks with this FAV prevents this peracute form of IBH.

INTRODUCTION

IBH is described in scientific literature (5) as a disease of 3-7 week-old chickens with sudden mortality of up to 10% over a 5-day period in an affected flock, autopsy lesions including haemorrhages, enlarged mottled liver and atrophied bursa of Fabricius, intranuclear inclusion bodies in hepatocytes and the isolation of a Group 1 FAV of any 12 serotypes from the liver. Concurrent infection with immunosuppressing agents, such as IBD virus or CAA, has been considered to be a necessary part of the pathogenesis of IBH.

However in the early 1980's, a disease identical clinically and pathologically to IBH occurred sporadically in meat chicken flocks of various companies in all Australian states but mortalities up to 40% occurred at 7-21 days of age (1, 3, 4). FAV was isolated from the livers of chicks that died of this peracute form of IBH. Affected broiler flocks often appeared to be derived from the one breeder flock.

Studies were initiated in 1985 at Australian research institutes including the veterinary laboratories of the New South Wales and Victorian Governments and the CSIR0 Melbourne. Field investigations and epidemiological follow-up were undertaken by the technical staff of Ingham-Tegel poultry company.

AETIOLOGY

A Group 1 FAV of serotype 8 and a subtype of a Group E genome (2) is proposed as the cause of peracute IBH in Australia for the following reasons:-

1. All FAV isolated from 52 peracute IBH outbreaks from 1985-89 and subsequently characterised were classified as above. FAV from classical IBH outbreaks in older birds or from normal chickens were of a different genomic makeup, even though they were serotype 8 FAV (E. Arzey pers. com., 2).

2. Seroconversion in breeder flocks, as determined by virus neutralisation of a serotype 8 FAV, occurred concurrently with peracute IBH outbreaks in progeny flocks.

3. A disease similar to peracute IBH has been reproduced by exposing young chicks by natural routes of infection to FAV with these characteristics (1, 2). Sera from convalescent chicks were negative for antibodies against IBD virus, CAA and reticuloendotheliosis virus.

TRANSMISSION

It is proposed that young chicks become infected by either vertical transmission from their parents via embryonated eggs or by horizontal transmission from the chicks' environment whether that be hatchery, delivery truck or broiler farm.

Evidence for vertical transmission includes:-

1. FAV are known to be vertically transmitted (5).

2. Disease occurrence at 7-14 days suggests either vertical transmission or infection of chicks from their environment in the first few days of life. Since all Ingham-Tegel meat chicken flocks are placed on an "all out, all in" basis and entire sheds are depopulated and disinfected before placement, the likelihood of infection from the shed environment has been minimised.

3. Experience within the Ingham-Tegel company that the majority of sheds of progeny from a single meat breeder flock can be affected with peracute IBH for a 3-6 week period, irrespective of which geographical areas (including different states) they are placed. Progeny placed from other breeder flocks into the same geographical locations were often not affected.

4. Seroconversion of breeder flocks to serotype 8 FAV has been correlated with peracute IBH occurrence in progeny in a number of outbreaks in Ingham-Tegel chicken flocks.

Evidence for horizontal transmission includes:-

1. Chicks placed from parent flocks, other than the one apparently producing peracute IBH outbreaks at that time, occasionally are affected with peracute IBH.

2. Experimental transmission studies (1) indicate that young chicks in contact with infected chicks can die of peracute IBH.

INVOLVEMENT OF IBD VIRUS

IBD virus is not considered to be involved in peracute IBH because:-

1. IBD virus is not vertically transmitted and it is unlikely to infect up to 40% of chicks by 7-14 days of age in fully cleaned out and disinfected chicken sheds.

2. Maternal antibody levels to IBD virus in some affected broiler flocks would have been relatively high since parent flocks in some cases were vaccinated with both live and killed IBD virus vaccines and the peracute IBH outbreaks often occurred shortly after the onset of lay.

3. Serological testing of affected broiler flocks at slaughtering age revealed that some were negative to IBD virus antibody.

4. IBD virus antigen could not be detected by ELISA testing conducted by the CSIRO Melbourne in the atrophied bursa of Fabricius from some chicks that died of peracute IBH, and

5. Peracute IBH has been reproduced with FAV that have been plaque purified 3 times in chicken embryo kidney cell cultures produced frpm SPF eggs and the absence of IBD virus confirmed by serological testing of surviving chicks.

Involvement of CAA

CAA is not considered to be necessary for peracute IBH to occur because:-

1. Peracute IBH has been reproduced with FAV that have been plaque purified 3 times in chicken embryo kidney cell cultures produced from SPF eggs and the absence of CAA confirmed by serological testing of surviving chicks.

2. Clinical signs of runting and paleness, low blood packed cell volumes, autopsy lesions of pale bone marrow and thymic atrophy, and secondary infections with E. coli, salmonella and aspergillus are common features of CAA disease but not peracute IBH, and

3. Breeder flocks which produced numerous progeny flocks that were affected with peracute IBH were confirmed seropositive for CAA at 15-17 weeks of age by indirect fluorescent antibody testing undertaken in Germany. In some cases seroconversion was as a result of vaccination at 9-10 weeks of age with a living virus CAA vaccine now used routinely in breeder flocks of some Australian poultry companies. Seroconversion to CAA prior to lay is considered to prevent egg transmission of CAA and the development of CAA disease in young chicks (6).

VACCINATION

Field experience within the Ingham-Tegel company with peracute IBH outbreaks in the last 5 years indicates that outbreaks are usually associated with specific breeder flocks, that outbreaks abate within a 3-6 week period, that at the onset of outbreaks the breeder flock involved is negative for serum neutralising antibody to serotype 8 FAV and that outbreaks cease following seroconversion.

Similar epidemiology occurs with avian encephalomyelitis and CAA disease, both of which can be prevented by vaccinating breeder flocks in rearing with non-attenuated, live virus vaccines.

A serotype 8, hypervirulent, subtype Group E genomic FAV isolated in SPF chicken embryo liver cell cultures from the livers of 9-day-old meat chickens with peracute IBH was purified by limit-dilution technique, seedstocks produced in SPF cell cultures and an FAV vaccine using a titre of 10^4 $TCID_{50}$/dose produced (G. Firth pers. comm). Replacement breeders vaccinated per os or by drinking water administration in mid rearing were bled at 16 weeks of age and tested for serum neutralising antibodies against type 8 FAV to validate the vaccine titre and administration methods.

FAV vaccination of Ingham-Tegel breeder flocks has now been undertaken for 2 years commencing in areas where peracute outbreaks have been most prevalent in the past. Field studies indicate that the vaccine is safe, breeding flocks are serologically positive to type 8 FAV prior to onset of lay and peracute IBH outbreaks have not occurred in progeny of flocks immunised in this way.

References

1. Barr, D., and P. C. Scott. Proc. 2nd Pacific Poultry Health Conference. Post-Grad. Committee in Vet. Sci., Uni. of Sydney Proc 112:323-326. 1988.

2. Erny, K., D. Barr and K. Fahey. Avian Pathol. 20:597-606. 1991.

3. Reece, R, D. Barr, D. Grix, W. Forsyth, R. Condron and M. Hindmarsh. Aust. Vet. J. 63:201-202. 1986.

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5. McFerran, J. In: Diseases of poultry, 9th ed. B. W. Calnek, H. J. Barnes, C. W. Beard, W. M. Reid and H. W. Yoder, Jr., eds. Iowa State Univ. Press, Ames, pp 552-563. 1991.

6. Vielitz, E. and H. Landgraf. Avain Pathol. 17:113-120. 1988.

PROJECTS IN THE POULTRY HEALTH, PUBLIC HEALTH AND HUSBANDRY WELFARE AREAS

The following is a summary of a list supplied by Chicken Meat Research Development Council outlining projects underway.
Contact names and numbers can be obtained from Editor or V Kite.
Each item will be divided into Project title followed by Key words.

Health Status : Continuing Projects

Population studies on bacterial pathogens : E coli, H paragallimarum, Genetic diversity, Australia
Towards the development of an effective live attenuated vaccine against fowl cholera : disease, P multocida, molecular mechanisms, live attenuated vaccines.
Avian Colibacillosis in Australia: Improvement in understanding and control broiler respiratory disease, clonal types, source, spread, reproduce disease, strategy for practical control.
Development of rapid pathotyping tests for Newcastle disease virus : virulent strains, rapid detection, pathotyping, differentiation
IN VIVO assessment of a genetically engineered thymidine-kinase negative infectious laryngotracheitis virus as an efficaceous vaccine : IN VIVO, attenuated thymidine kinase negative, efficacious vaccine.
Diagnosis of Avian mycoplasma infections using PCR : PCR, routine diagnosis

Health Status : New Projects

Investigations into the control of big liver and spleen disease in poultry in Australia : sensitive test, infected birds, prevalence, pathogenesis, national, control programs
Control of coccidiosis in Australia : characterisation, lower virulence, compounds, inhibit specific metabolism
Production of definitive diagnostic assays for chicken anaemia agent : cost effective diagnostic assay, antigens, immune response
Investigations into broiler ascites syndrome : pathogenesis, epidemiology, risk factors, develop disease model.
Improvement of chicken disease resistance by cytokines : purify, sequence, clone, Avian Haemopoietic Growth Factor, resistence, newly hatched chickens, haeompoetic stimulating factors.
Infectious bronchitis viruses : role of variant strains in respiratory disease of chickens and developemnt of techniques for assessment of cross protection : requirement, alternative vaccines, variant IBV, antigens inducing protection, correlate
Evaluation of mass vaccination techniques using V4 and heat resistant V4 Newcastle disease virus vaccine strains on caged layers : efficacy, mass vaccination, techniques, V4, HRV4,
Relocation of positive pressure isolators: relocation, JCU

Public Health : Continuing projects

Discrimination of poultry/environmental isolates and development of rapid identification systems for Campylobacter and Listeria monocytogenes: nucleic hybridization technology, identify, C coli/jejuni , plate cultures, L monocytogenes, faecal amterial, processing, epidemiological, DNA fingerprinting.
Epidemiological studies of Salmonella using serotyping, phage typing and plasmid analysis and chromosomal fingerprinting : refine, compare, typing methods, plasmid analysis, role, small plasmids and phages, epidemiology compilation, IMVS
The characterisation of C jejuni isolates from chickens and comparison of colonisation and potential pathogenicity characteristics : compare, isolates, chickens, clinically ill patients, genetic characteristics, colonisation, mechanisms.
Epidemiological study of C jejuni in poultry flocks using biotyping and DNA analysis : sources, C jejuni, broiler flocks, lessen occurrence, seasonal, drinking water, limit, contamination

Public Health : New projects

Immunological control of Campylobacter in chickens : purify, flagellin protein, immunize chickens, adjuvants, gastro-intestinal tract, measure colonization, immunized broiler breeders.
Novel strategies for improved mucosal immunity in chickens: application to control of salmonellosis : vaccination formulations, mammals, mucosal protection, response.

Husbandry/Welfare : Continuing Projects

Air quality, high humidity and extreme temperature research - demonstration of automated poultry house controls : computer managed, low cost, control of air quality, low ambient, high ambient, results, Australian chicken meat industry.
Development of computer simulation models for the poultry industries : models, computer, prediction, produciton, meat chicken, laying hen

Husbandry/Welfare : Continuing Projects

Human factors and the productivity and welfare of commercial broiler chickens : attitude, stock person, behaviour, work ethic, productivity, broiler chickens, manipulation, human factors, improvement
Improving the summer growing environment for meat chickens : summer, naturally ventilated, equipment, deisgn, placement, management
Ideal drinking water temperature for broilers and layers : chilled, drinking water, meat chickens, optimum.
Application of computer model to poultry housing : growth performance, improve, feed efficiency, "Cost Being Wrong" model.

EGG INDUSTRY RESEARCH DEVELOPMENT CORPORATION

Continuing projects :

The significance of Listeria monocytogenes in eggs and egg products: L monocytogenes, incidence, eggs, egg products, survival, growth rapid, detection, foodborne human disease.
The significance of Salmonella, particularly Salmonella enteriditis to the Australian egg industry : SE , Australia, developing or underlying.

Application of molecular genetics of the major histocompatability complex to improvement of resistance to diseases : broiler, layer, genetic resistance, direct selection, major histocompatibility complex.

Welfare and productivity of laying hens in modified cages : welfare, laying hens, assessment, cage design, modifying, perches, solid side cages, high temperature, non-invasive assessment.

Prevention of beak regrowth and chronic pain following trimming: a physioloigcal, anatomical and behavioural approach : beak, capsaicin, trimming, decrease pain, prevent regrowth, behavioural responses, improve uniformity.

Oral Vaccination of Chickens : chickens, foodstuffs, vaccine, administration.

Characterisation of very virulent Marek's disease virus isolated in Australia : Western Blot analysis, very virulent Australian isolates.

NEW PROJECTS:

Relationship between bird body weight, productivity and shell quality in controlled environment housing - AND - Investigation of the relationship between vent trauma and prolapse in the laying hen : body weight range, point of lay pullets, controlled environment, prolapse, reduce mortality, selection indices, beak trimming, elimination.

Production and Welfare of laying hens in three bird cages at densities ranging between 450 and 600cm^2 per hen : three birds per cage, density range, production, egg quality, physiological stress, behaviour, strain, interactions.

Revise/rewrite Producers "Disease Handbook" : low cost, up-to-date, common language.

AWARDS and POST GRADUATE STUDENTSHIPS:

Jackie Pallister : To investigate the basis of virulence in a recently emerged group of fowl adenoviruses.

Sarah Jane Rickard : To determine the characteristics of Salmonella sofia that enable it to colonise and survive in the chicken: to determine if S sofia could potentially be a problem to the Australian chicken industry in the future.

Ross Bowles : A study of the genetic diversity of the poultry pathogens H paragallinarum and E coli.

Matthew Francis : The molecular analysis of virulence determinants of L monocytogenes.

Susan Sapats : To determine the nucleotide sequence of the major structural genes of the VicS Webster vaccine virus- AND- to analyse changes occurring at the molecular level in strains of IBV isolated over the last 10 years from vaccianted flocks at concetrated poultry complexes.

Carmela Ruffolo : To apply modern techniques of molecular microbiology and immunochemistry to clone protein antigens of P multocida, in order to investigate their role in immunity to pasteurellosis and assess their potential as prophylactic immunizing agents.

Sharon Cunningham : The pathogenesis of chicken anaemia agent, including its infectivity, molecular biology and the development of diagnostic assays for CAA.

OVERVIEW OF RESEARCH INTO POULTRY DISEASES IN CSIRO

Jagoda Ignjatovic
CSIRO Division of Animal Health
Parkville 3052, Victoria

The CSIRO Division of Animal Health carries out research into endemic and exotic diseases of farm livestock in temperate Australia aiming to (a) diagnose, control and eradicate endemic diseases of economic importance and (b) develop diagnostic methods to enhance Australia's capacity to combat exotic diseases.

To this end the charter of the Avian Disease Program at the Animal Health Research Laboratory (AHRL) in Parkville is to develop vaccines and diagnostic tests to control or eradicate the economically important endemic diseases of poultry and enhance vaccine efficacy using novel delivery systems or by manipulating host immune responses. The teams at the Australian Animal Health Laboratory (AAHL) in Geelong are developing methods to diagnose and control exotic diseases of poultry. The research interest has centered thus far on reticuloendotheliosis, lymphoid leukosis (LL), infectious laryngotracheitis (LT), infectious bursal disease (IBD), infectious bronchitis (IB), chicken anaemia (CA), inclusion body hepatitis, Newcastle disease (ND), avian influenza and coccidiosis. The majority of research projects receive continued support from the Chicken Meat and Egg Industry Research and Development Councils reflecting the relevance of CSIRO's research to the poultry industry. Arthur Webster Pty Ltd, the Australian Government's Industry, Research and Development Board and Biotechnology Australia Pty Ltd have also supported some of the research projects.

The research into poultry diseases was initiated in the Division by Dr Trevor Bagust in 1977 with the commissioning of the CSIRO Specified Pathogen-Free (SPF) Unit. The SPF Unit is still operational providing SPF eggs for research as well as supporting other SPF facilities in Australia and overseas. The expertise developed around the SPF Unit under Drs Bagust and Faragher is currently utilized in training staff from South East Asia. During the late 70's Dr Bagust worked on the mechanism of transmission of reticuloendotheliosis virus in chickens (2,3,4,18) and showed that feathering disorders, tumour formation and death in a large number of broiler and layer flocks in Australia during 1977/78 were due to contamination of poultry vaccines with reticuloendotheliosis virus.

From 1981 to 1986 Drs Ignjatovic and Bagust were involved in a program to eradicate the lymphoid leukosis virus from commercial breeding flocks in Australia. Infection with lymphoid leukosis virus (LLV) was shown to negatively affect a number of economically important traits of both layer and meat chickens. The number of eggs laid and chickens hatched, as well as body weight was reduced. Egg quality was also affected and onset of lay was delayed (21). The test to detect LLV was introduced (19) and a procedure to detect all infected hens was developed (20) which allowed all major poultry organizations to carry out a program of reduction of LLV in their breeding flocks. While the incidence of LLV infection in most commercial flocks has been reduced to a very low levels, it was shown that eradication of LLV is not feasible from commercial flocks.

Research into ILT was initiated in the early eighties and has continued to the present resulting in significant achievements in this area. Dr Bagust examined the establishment of latency by ILT virus (ILTV) (5) and further attenuated the ILT vaccine to obtain a mild but still immunogenic vaccine. Drs Fahey and York studied the mechanism of immunity to ILTV (9,10,13,28) and identified the antigens responsible for induction of protective immunity (26,29,30). This work

provided the basis for the development of recombinant subunit vaccines for ILT. Dr York also developed an ELISA test to detect ILTV which has significantly facilitated differential diagnosis of ILTV in outbreaks of the disease (27). The research on ILTV was broadened in 1989 by Drs Sheppard, Kongsuwan, Prideaux and Johnson. The project has three aims. The first aim is to develop a novel live virus vaccine from ILTV by deleting the thymidine kinase gene. It is hoped that this genetically attenuated vaccine will be able to reduce the establishment of latency in chickens. The other aim is to develop a recombinant subunit vaccine for ILT which can be used to boost high level immunity in chickens and which can facilitate in eradication of ILT from Australia. The third aim is to develop ILTV as a vector for delivery of protective antigens of other avian pathogens to chickens. Thus far, the thymidine kinase gene of ILTV has been identified and ILTV lacking this gene has been generated. The gene coding for the major protective antigen of ILTV has been identified, cloned and sequenced and is currently under evaluation for it's ability to confer protection using fowl pox virus as a delivery vector.

In 1981 Dr Fahey initiated research into IBD which lead to the world's first production of a genetically engineered subunit vaccine for a poultry disease. The structural antigens of IBD virus (IBDV) were characterized and the viral antigen inducing protective immunity identified (11,12). The gene coding for the protective antigen was cloned in collaboration with CSIRO's Division of Biotechnology (1) and the antigen produced in large amounts in collaboration with the CSIRO Division of Manufacturing Technology. The antigen obtained was highly effective as an inactivated vaccine for broiler breeders (14,15) and a commercial vaccine was developed for world wide use by Arthur Webster Pty Ltd. The ELISA tests for detection of IBDV and antibodies to IBDV were developed and have found a wide use in measuring the antibody levels in commercial flocks. The related project on IBDV is continuing currently at AAHL. Drs Boyle and Heine are working on the generation of a recombinant live vector delivered IBDV vaccine for administration to broilers.

Research on IB was initiated in CSIRO in 1986. Dr Ignjatovic and Ms Sapats aim to: (a) determine the role of variant strains of IBV in respiratory infections of broilers and layers; (b) develop a test to differentiate vaccine from field strains of IBV; (c) identify antigens that induce protective immunity and (d) identify changes that occur at the molecular level in variant strains of IBV. These studies have indicated that variant strains of IBV are frequently isolated following outbreaks of respiratory disease in broilers and occasionally from layers. A number of the variant strains differ antigenically and in pathogenicity from vaccine viruses and strains isolated previously in Australia (22). The genes coding for three structural antigens of Vic S vaccine virus have been cloned and their nucleotide sequence compared to the sequence of variant strain genes to determine the degree of changes. An ELISA test to detect IBV has been developed which enables rapid identification and differentiation of IBV strains.

With the realization that infection with the CA agent (CAA) might have significant impact on control of various diseases in chickens through its immunosuppressive effect, a project aimed at the isolation of endemic strains of CAA and developing tests for identification of antibodies to CAA was initiated in 1988. A local strain of CAA was isolated by Mr McCoy and Ms Pallister and the genome of CAA cloned. The CAA gene coding for the protein that induces antibodies in chickens will be cloned and expressed to obtain a large amount of antigen for the development of an ELISA to measure CAA antibodies in breeder flocks.

Research into avian adenoviruses (AAV) was initiated in 1989 upon the isolation of highly virulent strains of AAV from a number of outbreaks of inclusion body hepatitis in broilers in Australia. These strains of AAV were shown by Dr Erny and Ms Pallister to be highly pathogenic for SPF chickens (8) although they were serologically similar to other non-pathogenic AAV. Molecular fingerprinting was the only method that differentiated virulent from non-virulent strains of AAV (8), providing a convenient technique for differentiation of AAV. As AAV are ubiquitous in chickens Drs Sheppard, Erny and McCoy are working on

development of AAV as a vector for delivery of genes coding for protective antigens of other poultry pathogens. To that end a non-pathogenic strain of AAV that provides protection against infection with virulent strains is sought.

Coccidiosis, the major parasitic infection of broiler chickens is also studied. Research of Drs Prowse and Michalski aims to develop live attenuated and recombinant subunit vaccines to control coccidiosis to replace costly means of control by anticoccidiostats. Attenuated (precocious) strains of *Eimeria* are currently produced by serial passaged through SPF chickens. These precocious strains are infectious but are non-pathogenic providing protection against homologous pathogenic strains of *Eimeria*. In order to develop a non-infectious, cross-protective vaccine against all strains of *Eimeria* the project is aiming to identify the protective antigens of *Eimeria*. Also the mechanisms of protective immunity to Coccidiosis are being studied (23) with the aim of delivering protective antigens to chickens in the most appropriate fashion for stimulation of protective immunity.

As outlined previously ILTV and AAV are being developed as delivery vectors at AHRL (24). Drs Boyle, Coupar and Andrew at AAHL have been developing fowl pox virus as a delivery vector (6). It is hoped that these viral vectors will replace some of the conventional live vaccines of poultry, particularly those that are still pathogenic. The vector has the advantage of being capable of simultaneously delivering protective antigens for a number of pathogens. The fowl pox virus is envisaged as a delivery vector of antigens from pathogens such as NDV that require expression of antigens on the cell surface and stimulate cell mediated immunity. The ILTV vector might be more suitable for delivery of antigens from pathogens such as IBV that induce respiratory disease. The AAV vector on the other hand might be more suitable for delivery of antigens from organisms such as coccidia that require stimulation of gut immunity.

Improving immunological competence of chickens as an approach to the control of infectious disease is undertaken by the chicken cytokines project. Cytokines are molecules produced naturally by chickens which regulate the development of the immune system and immunological responses to antigens, enabling them to combat invading pathogens. The research carried out by Drs Lowenthal, Strom, York and Digby aims to identify the cytokines present in chickens, determine their role in disease resistance, clone genes coding for the immunologically important cytokines and deliver these genes to chickens using viral vectors to enhance immonological competence.

The aim of the project lead by Dr Westbury at AAHL is to develop a rapid diagnostic test for the detection of avian influenza virus in clinical specimens and for the detection of antibodies to the virus. The occurrence of two outbreaks of highly pathogenic avian influenza in Australia in 1976 and 1985 (16,25) have illustrated the need for such technology in Australia since a reservoir of avian influenza virus exists in wild birds and therefore there is the likelihood of an emergence of new virulent strains from such a reservoir. Drs Della-Porta and Gorman also at AAHL, are developing a method for rapid pathotyping of NDV isolates. Since avirulent NDV is endemic to Australia, rapid differentiation between pathotypes of NDV strains in outbreaks of disease is of utmost importance (7). The pathotyping test under development is based on the differences observed in the primary structure of an antigen located in the NDV (17). These differences will be exploited for development of a convenient and rapid pathotyping test. Monoclonal antibodies have also been produced that distinguish the avirulent group of NDV such as V4.

IMPORTANT NEWS ITEM:

At its last meeting the Scientific Program Sub-Committee resloved to request that all companies and persons contemplating inviting keynote speakers to visit should try and do so outside of the days on which the Conference is scheduled. This is to ensure that all conference attendees have maximum access to key note speakers. As some key note speakers will be in demand, EDLA ARZEY will be acting as booking clerk so we can ensure that no one misses out. Please direct all enquiries through EDLA ARZEY, Elizabeth MacArthur Agricultural Institute, Private Bag 8, Camden, NSW 2570: tel: 046-293-333, fax: 046-338-192.

XIth International Congress of WVPA, Sydney 16-19 Aug, 1993

PROVISIONAL PROGRAMME

Session Times	MONDAY 16 August	Session Times	TUESDAY 17 August	Session Times	WEDNESDAY 18 August	Session Times	THURSDAY 19 August
MORNING							
9.00	Opening – Recurrent & emerging diseases	8.30	Diseases of Village Poultry	8.30	Diseases of Cage & Aviary Birds	8.30	Education in Avian Medicine
		10.30	Diseases of Immune System	10.30	Metabolic Diseases	8.30	Poultry Production & Public Health
		10.30	3rd Asia/Pacific Poultry Health Conference	10.30	Diseases of Cage & Aviary Birds	10.30	Welfare & Poultry Production
12.30	LUNCH		LUNCH		LUNCH		LUNCH
AFTERNOON							
1.30	Environmental etc. Interactions in Disease	1.30	3rd Asia/Pacific Poultry Health Conference	1.30	Diseases of Cage & Aviary Birds		
3.30	Advances in Vaccines	1.30	Non-Specific Disease Resistance	1.30	Advances in Diagnostic Technology		
		3.00	Sessions End	4.00	Houghton Lecture		
		3.30	Taronga Park Zoo Excursion & Reception	5.00	WVPA Business Meeting		
EVENING							
5.30	Official Reception and Poster Viewing			7.30	WVPA Banquet		

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