



DANDER

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President's Report

Planning and preparation for our next scientific session on 30-31 October are well advanced and we extend our thanks to Kim Critchley and Margaret Sexton for their wonderful efforts in organising the meeting. The program looks extremely interesting with a focus on public health issues. Registrations are now open and I would encourage your attendance.

Kevin Whithear and his 6th Asia Pacific Conference (AP6) Scientific Program Committee have been continuing the arrangements required for our scientific contribution to the World Poultry Congress. AP6 will provide the main poultry disease stream of AP6 and has as its theme "From Pasteur to Genomics: Past, Present and Future Control of Poultry Disease". Dr John Glisson, the Director of the Poultry Diagnostic and Research and Center at the University of Georgia will address this theme in a Plenary Address. Laureate Professor Peter Doherty will be another Plenary speaker and his topic will be Avian Influenza. Two further sessions at AP6 will be devoted to control and prevention of HPAI with Les Sims and Tom Grimes as keynote speakers with contributions from other Australian and overseas experts. Other scientific sessions will be based around the most economically important diseases of poultry and will include major control success stories as well as challenges for sustainable control and how researchers are addressing those challenges. An excellent group of overseas and local speakers is being organised to help make this a top rate conference not to be missed by AVPA members. More details will be available in coming weeks and will be published in the next edition of DANDER.

Progress in establishing the new AVPA entity continues. The draft constitution is being checked by a solicitor and being brought into line with legal requirements to smooth the way through with ASIC registration. The Business Meeting in Adelaide will represent the inaugural meeting of the new Limited Company. Finalisation of the name of the registered entity rests with ASIC approval but we should be in a business state by the meeting. This has taken considerable effort and time to achieve and my thanks go to the other committee members for their tireless and valuable efforts – Ben Wells, Peter Claxton and Peter Gray.

A draft agenda for the inaugural meeting of AVPA Limited is included in Dander and may have been circulated to you by the secretary. I would appreciate any further business items to be submitted prior to the meeting or we can raise any matters from the floor.

I would ask that all members give serious consideration to taking on one or more of the executive positions in the AVPA and in the Poultry SIG. A number of currently serving office bearers have indicated that they would like to step down for the coming year, so this is your chance to step into the foundation executive of our dynamic and passionate organisation. Below is an official call for nominations for these roles and I would appreciate your thoughts and willingness to participate. Now that we will be an independent entity, all members are eligible for executive roles, not just AVA members nor just vets – we can all contribute at any level. Only the Poultry SIG requires AVA membership as a prerequisite

Peter Groves

CALL FOR NOMINATIONS

A call is made to the membership for nominations for all office bearing positions for the AVPA Limited: President, President Elect, Secretary, Assistant Secretary, Treasurer, Scientific Meeting Coordinator, Editor of Dander, WVPA Bureau Member, Web Page Coordinator. Incumbent office bearers are welcome to stand in continuation

A call is made to the membership for nominations for all office bearing positions for the Poultry SIG Executive: President and Secretary/Treasurer. Members must be members of AVA to stand for Poultry SIG positions.

Please forward all nominations to the President (Zootechny@bigpond.com) or the Secretary (benwells@bigpond.net.au).

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Welfare	John Barnett	<john.barnett@nre.vic.gov.au>

The Australian Veterinary Poultry Alliance is a Special Interest Group of the Australian Veterinary Association. Membership of the AVPA is available to individuals and groups working in, or interested in, any veterinary aspect of poultry.

Dander will be published quarterly (March, June, September and December). Contributions are welcome. Electronic copy is requested. Deadline for copy is by the end of the second week of the month of publication. Please send information on abstracts of interesting papers, summaries of reports, case histories, social news etc. to Kevin Whithear, School of Veterinary Science, The University of Melbourne, 250 Princes Highway, Werribee 3030, Victoria <kevingwt@unimelb.edu.au> fax 03 9731 2366.

Summary of Important Upcoming Scientific Meetings

- October 2007** **AVPA Scientific Meeting Adelaide.** Comfort Inn Haven Marina, Glenelg North SA. October 30-31. Contact Dr Kim Critchley. Email: kimcritchley@hotmail.com.
- April 2008** **57th Western Poultry Diseases Conference & XXXIII Convencion Annual ANECA.** Sheraton Buganvillas, Peurto Vallarta, Jalisco, Mexico. April 9-12. Contact Dr Rocio Crespo. Email: rcrespo@ucdavis.edu. Web: conferences.ucdavis.edu/wpcdc
- June-July 2008** **23rd World's Poultry Conference and Sixth Asia Pacific Poultry Health Conference.** Brisbane Conference and Exhibition Centre. June 29 - July 4. AVPA Contact Dr Kevin Whithear; Email: kevingw@unimelb.edu.au. Web: www.wpc2008.com
- August 2008** **8th International Marek's Disease Symposium,** Townsville, Queensland. August 17-21. Contact: Dr. G. Burgess, School of Veterinary & Biomedical Sciences, James Cook University, Townsville, Queensland 4811. Phone: 07 4781 5472; Fax: 07 4781 6833; Email: graham.burgess@jcu.edu.au

MEMBERSHIP MATTERS

Membership List

Thanks to all members who have renewed their AVPA subscriptions for 2007. As at 20 September AVPA has 79 Ordinary Financial Members, one Student Member, 6 Life Members and 4 Sustaining Members. Total membership 90.

New Members: AVPA welcomes the following new members: **Cornelius Matereke** from Niugini Tablebirds

Current members are asked to encourage potential new members to join the AVPA. There is always strength in numbers!

2007 Financial Members: George Arzey, Edla Arzey, Caroline Ash, Phillip Ashby, Trevor Bagust, John Barnett, Leone Basher, Carol Bates, Peter Beers, Susan Bibby, Doug Black, Pat Blackall, Wayne Bradshaw, David Buckley, Graham Burgess, Brian Burke, Neil Christensen, Peter Claxton, Kim Critchley, Mike Cundy, Peter Curtin, Colm Culligan, Joanne Devlin, Kent Dietemeyer, Elizabeth Evans, Gordon Firth, Peter Gray, Tom Grimes, Peter Groves, David Hampson, Bob Hughes, Fakhrol Islam, Clive Jackson, Rod Jenner, Noel Johnston, Bob Johnston, Brian Jones, Wayne Jorgensen, Branco Karaconji, Vivien Kite, Azadeh Laghai, Mark Lindsey, Margaret MacKenzie, Michael McDermott, Paul McQueen, Con Malliadis, David Marks, Cornelius Matereke, Krystyna Minkiewicz, Linden Moffatt, Chris Morrow, Iain Mortimer, Kerry Mulqueen, Amir H. Noormohammadi, Frank Pace, Barry Philps, Ravi Ravindran, Rod Reece, Bruce Remington, Grant Richards, Julie Roberts, Simon Robinson, Ambrosio Rubite, Brett Ruth, Peter Scott, Margaret Sexton, Shamon Shamon, Wafi Shinwari, Jo Sillince, Peter Spradbrow, Jillian Templeton, Andrew Turner, Greg Underwood, Aileen Vanderfeen, Julie Wagner, Steve Walkden-Brown, John Walters, Ben Wells, Pam Whiteley, Bill Williams, Sarah Wiley.

Student Member: Alireza Mahmoudian.

Life Members: Balkar Bains, Leon Barlow, Roger Chubb, Paul Gilchrist, Harvey Langford, Kevin Whithear.

Please see the AVPA website for information on sustaining members and links to websites

AVPA Sustaining Members 2007

Sustaining members contribute funds that help defray costs of services to members of the AVPA. We thank all sustaining members for their active interest and support.



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Importation and Exotic Diseases Subcommittee

Draft Policy Review – Importation of Preserved Duck Eggs from Taiwan

AVPA Comments

The Australian Veterinary Poultry Alliance (AVPA) appreciates the opportunity to comment on the Draft Policy Review Importation of Preserved duck eggs from Taiwan.

The AVPA generally supports the concept delineating the risk between disease agents with evidence of vertical transmission and disease agents that may be present only on the shell of the egg. However, microbial forms such as NDV and m sycoplasma with no means of locomotion were proved to be capable of penetration through the intact shell egg (Williams et al Avian Diseases Vol 12, 1968, Arzey G, 1989, Mechanisms of spread of ND, Tech Bulletin Number 42, NSW Agriculture and Fisheries ISBN 0 7305 66412).

Therefore, while the concept is helpful, it is important to consider that many organisms even with no inherent motility, can be capable of penetration of the egg and establishing internal presence or infection regardless of the ability for vertical transmission.

The AVPA is of the opinion that while the difference in structure between duck egg inner shell membrane and chicken egg membrane may not be significant, a transparent risk assessment should elaborate on the differences and the possible risks associated with the differences. Extrapolations from one species to another should be approached with caution and even if the differences are insignificant, it is important for a risk assessment to explore the risk.

The AVPA supports the list of diseases that require further mitigation in both categories; salted/heat treated and alkalisised eggs.

However, the AVPA does not support the exclusion of the diseases listed below from the list of diseases of quarantine concern as per table 6 'Hazard Refinement'.

Chlamydomphila psittaci. The agent meets the international guidelines for the agent to either not be present or be associated with a notifiable status. In Australia, Avian Chlamydiosis is notifiable in most States and therefore meets the criteria. The AVPA submission to the Chicken meat IRA questioned the exclusion of Chlamydomphila from the list because "it is apparently present in Australia" The strains of Chlamydomphila present in ducks in overseas countries have been reported not to be similar to serovars from other birds (Saif 11th Ed of Dis of Poultry pages 863- 879).

While Chlamydiosis has been detected in Australian domestic ducks, no studies have been done to demonstrate that the strain is different or identical to the overseas strains detected in ducks.

The RAP response to one of the stakeholders in 2001 was that multi-resistant strains have been found in DUCKS and since the IRA is considering importation of uncooked chicken meat this is not considered to be relevant. This should be relevant for this IRA which deals with importation of products from ducks.

Antibiotic resistant *Campylobacter jejuni*. The Chicken Meat IRA stated that quinolone-resistant strains of *C jejuni* have been isolated from a small number of locally acquired cases (Sharma et al 2003).

However in the paper by Unicomb et al in Emerging Infec. Dis Vol 9 number 11 Nov 2003 – "No resistance to Fluoroquinolones was found (Nalidixic acid is not a Fluoroquinolone) in isolates known to be locally acquired". Therefore, the occurrence of Fluoroquinolone resistant isolates in Australia is questioned by the AVPA and aspects in Table 6 Hazard refinement concluding that Antibiotic resistant *Campylobacter jejuni* are present in Australia and therefore should not be on the list of diseases of Q concern is questioned by the AVPA.

Avian Reovirus. Indeed some strains are but other strains are not endemic. Reovirus infection in ducks has been described

Duck Reovirus has been reported to be different from chicken Reovirus The nucleotide and amino acid sequence identities in the amplified σA -encoding gene were 74.2–78.4% and 86.9–92.0%, respectively, between duck/goose and chicken species (Archives of Virology Vol 151, vol 8 August 2006). This work reported findings in mainland China and is likely to be relevant to Taiwan.

Other Reoviruses have been described in various duck species like Muscovy ducks (Arzey G, Diseases of Ducks, Post Graduate Foundation Proc 92 Poultry Health May 1986)

Although the Chicken Meat IRAP excluded Reovirus, it stated "Australian strains appear to be of low virulence in comparison to North America and European strains" (Chicken Meat IRA page 304). However, on page 308 the IRA states that "There is difficulty in determining that exotic strains are more virulent than Australian strains making it difficult to accurately target risk management. Therefore the IRA concludes that no further RA is necessary (IRA page 308).

This IRA added another facet to the debate by stating in table 6 "that some strains of Reovirus are endemic in Australian poultry".

It appears that combining the comments in the Duck eggs IRA and the chicken meat IRA would suggest that Australian Reovirus strains appear to be of lower virulence than overseas strains and some Reovirus strains are not present in Australia.

Therefore, on the balance of evidence, the justification to remove Reovirus from the list of disease of quarantine concern is questioned by the AVPA. It also demonstrates the risk of extrapolation from one species to another.

Non-notifiable Avian Influenza virus. The same principles guiding the outcome of release assessment and consequence assessment for NAI should apply also to non NAI.

All AI viruses in Australia are notifiable and therefore meet the international guidelines under the heading; not present in the importing country or is of notifiable status.

Among the subtypes reported to establish stable lineage in domestic poultry in other countries are: H9N2, H9N3, H6N1, H6N2, H3N2, H3N6, H4 (Liu et al Avian Dis 2003, Vol 47, Sun Yingjie 4th Int Symp on Av Influenza 1997).

The AVPA questions the conclusion on page 56 that overall, it is assessed that the likelihood of backyard and wild birds would be exposed to an infectious dose of LPNAI virus are low.

Unless the infective dose is known and stated for each of these categories and allowances are made for different infective doses in different species of birds, it is not sustainable scientifically to accept this conclusion.

Newcastle disease. The AVPA questions the conclusion in page 67 that overall, it is assessed that the likelihood of backyard and wild birds would be exposed to an infectious dose of Newcastle disease virus is low.

Unless the infective dose is known and stated for each of these categories and allowances are made for different infective dose in different species of birds, it is not sustainable scientifically to accept this conclusion.

Salmonella. The AVPA questions the conclusion on page 73 that overall, it is assessed that the likelihood of backyard and wild birds would be exposed to an infectious dose of *Salmonella* Pullorum or *S* Gallinarum is low. Unless the infective dose is known and stated for each of these categories and allowances are made for different infective doses in different species of birds, it is not sustainable scientifically to accept this conclusion and the negligible risk estimation.

The AVPA also believes that the cost associated with outbreak scenarios should include the overall cost associated with eradication of *S* Pullorum from commercial flocks in Australia in the past and the current cost of monitoring.

Based on effective control and eradication the impact of *S* Pullorum should be consistent with the impact of *S* enteritidis (moderate for SE and Low for Pullorum?).

DEV. The AVPA questions the conclusion on page 86 that overall, it is assessed that the likelihood of backyard and wild birds would be exposed to an infectious dose of duck viral enteritis virus is extremely low.

Unless the infective dose is known and stated for each of these categories and allowances are made for different infective doses in different species of birds, it is not sustainable scientifically to accept this conclusion and the negligible risk estimation.

It is also difficult to understand how the impact from DEV, a disease that can affect only ducks is LOW and the impact from *Salmonella* pullorum and *S* Gallinarum that can affect a variety of avian species is also classified as LOW.

The impact of a disease may be diluted if it is estimated on the entire Industry rather than a small fraction of the Industry. The duck industry is significantly smaller than the chicken industry and the impact of a disease outbreak may affect a higher percentage of duck producers than for example ND in chickens. It is not clear to what degree this potential has been assessed.

Japanese encephalitis virus. No occurrence has been reported in poultry in Australia and the reported serological evidence in sentinel pigs in Cape York should not be accepted or used in any manner to extrapolate / insinuate the status of this disease in Australia in commercial poultry.

Table 6 does not state the effects of pH or salting /heat inactivation and while the AVPA agrees that it is unlikely to be present inside the egg contents it is not entirely clear that the organism may not be present on the egg shell.

Outbreaks of West Nile virus involving ducks have been reported from Israel and Romania.

Arboviruses have been isolated from fertile eggs of quails.

A full risk assessment would benefit the IRA rather than exclusion based on a summary table that is not entirely accurate.

Eastern Equine Encephalitis (EEE). This disease agent is not listed in this IRAP. EEE was described in ducks as early as 1912 and sporadic outbreaks have been reported. The host range of EEE includes many mammals as well as at least 30 wild bird species as well as ducks, quails, chicken (note that EEE was also omitted from the Chicken meat IRA), turkey, pheasants and guineafowl (Avian Dis 1960, Vol 4 page 247). The isolation of the virus from fertile eggs of quails was reported and the possibility of transfer in duck fertile eggs was not investigated.

There is also evidence that direct transmission through ingestion of infective material may play a role. The AVPA is of the opinion that not enough weight is given to this route of infection in the assessment of the pathways of exposure.

General. The AVPA is questioning the avian health status portrayed by the Taiwanese regarding Salmonella sp. as apparently found in survey of retail markets in 2003 and 2004.

It is difficult to believe Salmonella, a ubiquitous organism found in the environment and with extremely high prevalence in commercial poultry flocks across the world has not been detected in processed ducks in Taiwan? This is particularly of concern since the standards of the veterinary services in Taiwan are deemed satisfactory by the Australian authorities.

The AVPA does not support the rationale outlined on page 25 of the Draft Risk Assessment that “if the adverse effects of a pathogenic agent entering, establishing and spreading, had already been determined by another related risk analysis (the chicken meat IRA), and were evaluated to be very low or negligible, no further risk assessment was necessary. The statement presumes that the determination of the risk in the draft Chicken Meat Risk Assessment was accepted by all stakeholders. The AVPA has not seen a final document on the Chicken Meat IRA and therefore believes it is not appropriate to use the outcomes of a draft document under review to provide final determination of the risk for a new IRA such as the current Duck Eggs Importation.

**George Arzey
Covenor**

Report - 15th World Veterinary Poultry Congress, Beijing September 12-15 2007

Well, after 2 years of build-up since Istanbul – the 15th Congress of the WVPC in Beijing proved to be a great event in all the important areas that a Congress needs to be good in to be successful: scientifically, socially and touristically.

Plus a liberal dose of spontaneous celebration and being made welcome by the locals. And the 14 AVPA delegates (plus 3.3 accompanying partners and/or progeny) were treated to the lot over the week or so that we were in Beijing as part of the more than 1000 delegates including some 400 international visitors, representing some 65(!) countries.

Warmest thanks and congratulations are due to our Chinese colleagues in avian health, and particularly to Md. Dr Chen Xiaoling, the (seemingly indefatigable!) Scientific Secretary of WVPC-15. She had dealt superbly with the organization of the Scientific Sessions and preparation of the Scientific Proceedings, including coordination of the editing of Abstracts for 237 oral presentations of papers. The scientific sessions for the oral papers were run in 4 parallel streams in smaller theatres. There were also some 250 poster presentations on show, all in one location, being prominently featured for viewing as part of the coffee breaks with cakes, between the scientific sessions. A rich scientific diet indeed, while in addition we were also being fed like kings throughout the whole Congress (!)

The 14 keynote Papers, each of 30-45 min duration, were Plenary Sessions able to be attended by all of the delegates to this Congress. Without exception, these were authoritative, being delivered by eminent speakers, and were designed to confront and interrogate the most important issue areas globally in avian health today e.g Management for poultry health in a changing world; Poultry products and public health; Composting to combat viral survival on production sites. These were well complemented by specialist overviews on certain topics which continue in importance for avian health e.g Immunosuppressive disease; The path to a better vaccine for Mareks?; Avian oncogenic viruses – their control & diagnosis and Current and future ways of detecting enteric and other viruses of poultry.

And then that great and continuing challenge to avian and potentially to human health, The changing face of avian influenza ecology and control. In fact avian influenza proved to be one of the richest lodes of publications of new work within the scientific sessions - 2 Keynote papers, which were then supported by 32 of the oral papers and 38 poster presentations. Another Keynote presentation with broad implications for avian health professionals, was given by Prof C. Hofacre from the University of Georgia USA on Education & training for avian veterinarians: Past, present & future. UGA's important decision to become directly involved in online delivery of education globally, in equal partnership with the University of Melbourne, was also announced at this World Congress

Something quite special happened between 0830-1000 on Thursday Sept 13.

First our Amir Noormohammadi delivered the Houghton lecture for this Congress on the topic Who is smarter mycoplasma, or the host?

He was followed by Pat Blackall's keynote Lecture, Bacterial respiratory diseases.

As well as having a clear mastery of their subjects, each of these scientists demonstrated great skills in both their presentations and communications.

Both established a quite excellent rapport with their audiences, and as a direct result, applause was particularly long and loud for each, with even cheering and some stamping (Beijing Opera?!). So with these two important Keynote lectures - each of 45 minutes - these two presenters have really "done Australia proud" on the world stage of Avian Health. Amir and Pat - you can both take a bow please!

Each of these 14 Keynote papers were printed in full in English, and are readily available now in Australia should AVPA members like to follow any of them up. Some of the potential contacts whom you could access a copy of the Proceedings would include Rod Jenner/Pat Blackall (Qld), Clive Jackson/ Ben Wells /Lyn Tan (NSW) and Amir/ myself/David Tinworth/Chris Morrow in Victoria.



Presentation of the Bart Rispens Award for the best paper in Avian Pathology 2005-06,

On a stage in the Congress Banquet Hall (which seemed to be about the size of the MCG!).

Dr David Swayne receiving the BRA Medal and cash award, with congratulations from the President of the WVPA, Professor H. Hafez.

From L-R behind them, Dr Hanchan Yang (Congress Organizing Comm), Prof Jiao Zhou (Chairman, Congress Org Comm), Trevor Bagust (Vice-President WVPA) and Dr Ursula Heffels-Redmann (Secretary-Treasurer, WVPA).

The Interpreter is at the far right.

In conclusion, WVPC-Beijing proved to be a GREAT and SUCCESSFUL Congress.

And, all across that city, they are really getting ready for hosting the Olympics. While the Welcome ceremony that we were treated to for this WVPC was terrific, our guessing is that the Official Opening of the Olympics 2008 is going to be just absolutely unforgettable as a spectacle!

TREVOR BAGUST
WVPA Bureau Member for the AVPA

Post Script: *Where and when are the next WVPA Congresses going to be held?*

WVPC-16, 19-23 September, 2009. Marrakesh, Morocco.

Planning by the WVPA Executive and the local organizers has started already. We'll keep you posted as this Congress is developed over the next two years.

WVPC-17, 2013. Cancun, a big resort centre in the Bay of Mexico.

Yes- these Congresses will be going back to being held on a cycle of four-years apart.

Industry Health Issues

Report on NSW Poultry Health and Welfare Liaison Group Meeting 27 July 2007

Joint Infections in Breeders

Tenosynovitis/hock and more knee infections in larger birds. *Staphylococcus aureus* isolated from joints and birds bacteraemic. Seems to be related to stress, injury joint/tendon associated with vaccination and catching and feed lines. ? *S. aureus* comes from the hatchery and the problem then appears when birds are stressed. There are lots of culls due to this problem.

Not seen in flocks where skip-a-day is introduced at about 3 weeks when the birds are 300g. The birds are calm during feeding time. If skip-a-day is introduced at an older age there tends to be more mayhem at feeding time and more injuries produced by the feeder lines and the scramble.

Aspergillosis

Aspergillosis cases in broilers mentioned. Improved ventilation in the hatchery improved the problem, however, *Aspergillus fumigatus* is causing a niggling problem again from one hatchery.

A. flavus is causing some mortality in breeders to 6 weeks. Lesions are severe nodules that look like Marek's disease tumours.

One feedmill sending mouldy feed for about a month which was traced back to a holding silo and from there seems to have seeded many farms with *A. fumigatus* and *A. flavus* producing 1cm nodules throughout the birds at 25d. Clinfarm treatment of trucks, silos and farms to reduce or remove the problem.

Chlamydiosis

One confirmed case of chlamydiosis in 13 wk pullets in Sydney and a strong suspicion in an 11 wk flock 400km away. This is the same picture as 2005 although in slightly older birds. Clinically there are no systemic lesions, just a dry conjunctivitis in a small number of birds with one shed more affected than the other. Confirmed by immunofluorescence at EMAI in 1 shed and Susan Bibby found faint positives in the other shed. Both flocks are the same strain of bird but it is not known whether they came from the same hatchery. Flocks now on doxycycline.

EDS 76

Has been diagnosed in 4 layer flocks, 3 in Sydney, 1 in the country. All unvaccinated against EDS. No known epidemiological link between the 2 flocks. Comments on possible links were proffered e.g. end-of-lay pickup crews, lack of disinfection between batches even with all-in all-out sheds, increased contact between producers and egg fillers.

Vaccination recommended for all layers..

ILT vaccination

Vaccination of adult layers (HiSex) on slatted floors with SA2 had no detrimental effect on egg production. B vitamins were given in the water at the same time.

Clubbed Down

Problem with about 1% of birds with clubbed down and 0.2-0.4% with wire down. Possible causes discussed included vitamin deficiency (not riboflavin), mineral deficiencies Mo and Zn (which shouldn't be unless Cu is high), hot spots in the hatchery, low O₂ in hatchers. Has also been a problem in PNG.

Other alternatives? – feedback would be appreciated!

Clubbed down is the end stage of a non specific injury.

Good Broiler Performance

Generally good broiler performance was seen. Not much ascites and none when reared with lower light intensity.

Roundworms

When Levamisole treatment at 28mg/kg not having the desired effect on roundworms, treatment was changed to mebendazole.

Conjunctivitis and Death in Layers

Mystery disease in birds reared on the ground for 4-6wk then to multilayer cages and after 3 wk the birds get conjunctivitis which progresses to sinusitis and death over the next 4 weeks. Last 2-3 weeks of rearing the birds are alright and also alright in production (This is a case related to an overseas consultancy).

Unknown cause - ?irritation, ? chlamydiosis but doesn't spread. If histopath suggestive of chlamydiosis samples will be sent to Amir for culture.

Latest verdict pronounced after the PHLG meeting - According to Dr R Reece it is a bizarre form of fowl pox based on following histopathology:

Transverse section of nasal area and upper beak. Severe massive epithelio-proliferative sinusitis. Large intra-cytoplasmic eosinophilic inclusion bodies abundant. Dense underlying inflammatory cell response. Numerous foci lymphoid cells in oesophageal mucosa with papillary like projections off the surface.

It is nice to reduce the number of cases of unsolved ailments and mystery diseases.

High Salt in Water

Most layer flocks have high health status. There are some problems with water, especially in Queensland. Water with 8,000 ppm salt is causing scours and slowing the birds down.

SPAFAS Surplus Eggs

No health problems but have surplus eggs. Now have 15,000eggs/month and by October this will be 50-60,000/month. Biosecurity has been increased and looking for a second site to decrease the risk.

George Arzey

Edla Arzey

Houghton Lecture 2007

Who is Smarter – Mycoplasmas or the Host?

Amir H. Noormohammadi

School of Veterinary Science, the University of Melbourne, Werribee, Victoria, Australia 3030

Introduction

Mycoplasmas are the smallest self-replicating organisms known but, despite their relatively small genome and proteome, they can persist in highly evolved eukaryotic hosts and induce a chronic infection. The interaction between mycoplasmas and their hosts is reflected most clearly in their membrane proteins, some of which are responsible for adherence to host cells and are major targets of the host's immune response. In the avian pathogens *Mycoplasma gallisepticum* (MG) and *M. synoviae* (MS) an abundantly expressed variable lipoprotein haemagglutinin (VlhA) is believed to play a major role in pathogenesis of the disease by mediating adherence and immune evasion.

Mechanisms of mycoplasma pathogenesis

Pathogenic mechanisms of mycoplasmas are partly attributed to 1) competing with their host cells for metabolic substrates such as lipid precursors, purines and pyrimidines, 2) their ability to attach to host cells (adhesion), 3) their ability to invade the host cells, 4) variation of their phenotype (phase/antigenic-variation), presumably to evade the host immune response (immune evasion), and 5) their cytopathic effects (Simecka *et al.*, 1992). Recently biofilm formation by some mycoplasmas has been documented and is suggested to play a role in their pathogenesis and persistence in the host and/or environment (McAuliffe *et al.*, 2006).

Adherence of mycoplasmas to host cells has been considered as an initial step for infection and a prerequisite for the pathogenicity of mycoplasmas. Interference with adherence will thus prevent colonisation and infection, and could be a basis for prevention of the disease (Kahane *et al.*, 1982; Razin, 1993). Direct or indirect damage to host tissues due to mycoplasma infection is believed to follow the adherence of mycoplasma to target cells. Ciliostasis appears to be the first sequela of cytopathic effects in respiratory epithelial cells. Some mycoplasma species exhibit the potential to invade deeper areas (i.e., the lamina propria) of tracheal tissues (Simecka *et al.*, 1992). The capacity of MG to cross the mucosal barrier has been demonstrated and suggested to play a major role in its systemic spreading (Much *et al.*, 2002). The persistence of mycoplasmas in the host is thought to be mediated through the phenomenon of antigenic variation.

Antigenic variation

Antigenic variation of surface proteins is not unique to mycoplasmas and is a survival strategy for many bacterial pathogens, including, *Haemophilus* (Roche & Moxon, 1995), *Neisseria* (Senior *et al.*, 1989), *Streptococcus* (Madoff *et al.*, 1996) and *Chlamydia* (Brunham & Peeling, 1994) species. Such pathogens may evade host defences, thus prolonging the course of the disease or ensuring repeated infections (Mackowiak, 1984) or invade different types of host cells (Kupsch *et al.*, 1993; Nassif *et al.*, 1993; Weel *et al.*, 1991). A range of mycoplasmas, including MG (Bencina *et al.*, 1994; Panangala *et al.*, 1992) and MS (Noormohammadi *et al.*, 1997) have been reported to exhibit high frequency variation in the expression of their surface antigens.

Most of the research on antigenic variation of MG and MS has been focused on the major variable lipoprotein haemagglutinin (VlhA) and their respected gene families (*vlhA*). In MG, the *vlhA* gene family consists of up to 70 genes depending on the strain examined (Baseggio *et al.*, 1996; Papazisi *et al.*, 2003). Expression of the members of the *vlhA* gene family of MG oscillates both in vitro and in vivo (Glew *et al.*, 1998; Glew *et al.*, 2000; Markham *et al.*, 1998) and remarkably this variation could be influenced by the presence of VlhA-specific antibodies (Glew *et al.*, 1998; Markham *et al.*, 1998). In MS, the VlhA is expressed as a single protein but cleaved into two separate proteins, MSPA and MSPB (Noormohammadi *et al.*, 1997). MSPA and MSPB show a high degree of amino acid variability between strains (Noormohammadi *et al.*, 1997) or even clonal isolates from a single strain (Noormohammadi *et al.*, 2000). It has been shown that loss of expression of both proteins results in the inability of MS to haemadsorb (Noormohammadi *et al.*, 1997) and that the haemagglutinating clones of MS induce synovitis more frequently than do non-haemagglutinating clones (Narat *et al.*, 1998). As in MG, the VlhA of MS (MSPB and MSPA) is also encoded by a repertoire of genes.

Molecular mechanisms of antigenic variation

Whilst the phenomenon of phase variation seems to be a general feature among mycoplasmas, the variably expressed proteins have been distinct, and the mechanisms used for control of variation, where investigated in most parts differ. The phase-variable surface antigens of mycoplasmas, including VlhA of MG and MS, are encoded by multigene families (Behrens *et al.*, 1994; Markham *et al.*, 1993; Noormohammadi *et al.*, 1998; Wise, 1993). The MS *vlhA* gene family has high sequence similarity with a number of the MG *vlhA* gene family, even though phylogenetic studies indicate that these two species are distantly related (Noormohammadi *et al.*, 1998). While this suggests that the *vlhA* gene family may have been transferred horizontally between these two species through sharing a common host, the mechanisms controlling expression of the gene families are different. The members of the MG *vlhA* family are arranged predominantly as tandem repeats in the genome with most characterised members having an uninterrupted open reading frame (ORF) and each gene preceded by a single promoter. The control of MG *vlhA* gene variation is mediated

by variation in the length of a GAA trinucleotide repeat motif 50 nucleotides upstream of the promoter (Baseggio *et al.*, 1996; Glew *et al.*, 1995; Glew *et al.*, 1998; Markham *et al.*, 1994). The MS *vlhA* gene family also consists of 70 or more members, however there is only a single complete functional *vlhA* gene at any given time. In fact, there is only one genomic copy of the promoter region and the conserved 5' coding sequence of the *vlhA* gene in the MS genome, the remainder of the coding sequence occurs as multiple copies (at least up to 70) in tandem repeats in the genome (Allen *et al.*, 2005; Jeffery *et al.*, 2006; Vasconcelos *et al.*, 2005). These incomplete "pseudogenes" lack the putative promoter region and the single-copy 5' end of *vlhA* and extend over one of four distinct overlapping regions. Examination of sequential clones of MS has established that unidirectional recombination occurs between the pseudogenes and the expressed *vlhA*, with duplication of pseudogene sequence and loss of the corresponding region in the previously expressed gene (Noormohammadi *et al.*, 2000). Hence, the control of VlhA antigenic variation in MS is achieved by multiple gene conversion events, probably by site-specific recombination, using a repertoire of coding sequences to generate a chimeric expressed gene. Subsequent gene conversion drawing on the shorter pseudogenes may introduce further variability into this new variant that may contain sequences derived from several overlapping pseudogenes. Thus, although the haemagglutinin gene families of MG and MS appear to may have arisen by horizontal gene transfer, alternative control mechanisms have been adopted to achieve a similar aim: "high-frequency antigenic variability".

Implications of antigenic variation

Generation of diversity of membrane exposed elements is potentially a vital adaptive mechanism for the mycoplasmas enabling them to survive in an immunocompetent environment. This ability is commonly referred to as "immune evasion". Diversity of the membrane exposed elements could also serve as a strategy for invasion of different host tissues, hence altering the "tissue tropism" of the bacterium (Dybvig & Voelker, 1996). These vital capacities enable mycoplasmas to persist in the host and cause a prolonged and "chronic" disease.

Chronicity of the disease

In MS, a duplicated pseudogene sequence may recombine at one of three specific 5' sites (base pairs 406, 1068 or 1326) and at one of two specific 3' sites (base pair 1836 or the 3' end) in the expressed *vlhA* gene. The potential of such a system for generating diversity is considerable, as it would allow for the rapid, independent shuffling of four different regions of the pseudogenes (base pairs 408-1068, 1068-1326, 1326-1836, 1836-3' end). Using only 6 pseudogenes fully characterised in a previous study (Noormohammadi *et al.*, 2000), it was predicted that 120 variant *vlhA* genes could be generated. With at least 70 *vlhA* pseudogenes identified in MS genome (Vasconcelos *et al.*, 2005), the full repertoire of pseudogenes is exponentially greater. This degree of diversity may not be sufficient for effective immune evasion and survival in a highly evolved immune system such as that of mammals. However, birds are known to have a relatively less complex immunoglobulin machinery with limited capacity to generate diversity in the variable region of the immunoglobulin molecules. Somatic diversification of B lymphocytes in birds is limited mainly due to the absence of multiple V and J gene segments coding for the variable region of the heavy and light immunoglobulin chains. In fact the maximum number of immunoglobulins that birds can potentially produce is approximately 10^6 . This is in contrast to mammalian immune system that can potentially produce 10^9 different immunoglobulin molecules (Glick, 2000). Thus the strategy used by MS to generate VlhA diversity may well outsmart the mechanism used by the host immune system to generate immunoglobulin diversity.

Examination of multiple strains of MS has suggested that MSPA is the more antigenically variable of the two proteins encoded by MS *vlhA*. Indeed, most of the potential for generating variation is in the part of the gene that encodes the haemagglutinin, MSPA (amino acid 344 to the carboxyl terminal), rather than in the amino-terminal lipoprotein portion, MSPB. This agrees with previous studies, which have suggested that the haemagglutinin exhibits greater antigenic variation between strains, and that infected birds are slower to develop an antibody response to MSPA (Narat *et al.*, 1998; Noormohammadi *et al.*, 1997). However so far, only MSPA is found to play a major role by mediating adherence to host cells, in pathogenesis of MS infection. In fact, MS clones with haemagglutinating activity are more likely to cause disease than non-haemagglutinating clones (Narat *et al.*, 1998). Thus, while MSPB is the membrane exposed protein that induces a strong immune response, it is MSPA that enables the MS cells to attach to the host cell and induce disease. It is tempting to speculate that MSPB perhaps provides a mean for the MS to "distract" the immune system while MSPA has been evolved to induce a pathogenic activity.

Diagnostic tests

Given the potential antigenic diversity among subpopulations derived from a single mycoplasma cell, the need for standardisation of mycoplasma strains and diagnostic antisera is now even more critical, and underscores the importance of careful interpretation of experimental results. In addition, it has been found that variation in the major membrane antigens of the avian mycoplasmas can influence the haemagglutinin inhibition (HI) titer of the antigen produced from a single clone (Milosevic Berlic *et al.*, 2000). Characterisation of the immunodominant mycoplasma antigens and identification of their gene(s) have made it possible to produce and use recombinant antigens for specific and sensitive detection of antibodies induced during the course of mycoplasma infections. The use of recombinant antigen circumvents the potential problem of variable antigen expression in mycoplasma cultures, ensuring the consistency of the antigens prepared. It is essential that only conserved immunodominant proteins or conserved domains of the variable proteins be targeted for production of a diagnostic antigen. An example of such conserved domains is the highly conserved amino terminal domain of MSPB which is invariably expressed in all MS strains tested (Noormohammadi *et al.*, 1997). This domain has been targeted for recombinant antigen production and successfully used for detection of autologous and heterologous MS strain antibodies despite MSPB showing a high degree of variability in regions downstream of this domain in different MS clones and strains.

Vaccine development

It is well known that inactivated MG and MS vaccines show poor efficacy against a virulent strain even though they induce a very strong systemic antibody response (Whithear, 1996). One can speculate that this may be due to the fact that inactivated vaccines represent a single or, at best, a limited number of surface antigens and consequently live vaccines induce significant protection due to their capacity to express a large number of antigenic variants in response to the (selection) pressure imposed by the host immune response.

Thus, despite their limited number of genes and lack of cell wall, avian mycoplasmas have developed adaptive mechanisms to evade a highly evolved immune system and even take advantage of the strategy used by the host immune system against them to survive and induce a prolonged infection. These mechanisms have evolved independently in each mycoplasma species and have implications for development of diagnostic tests and vaccines for avian mycoplasmosis.

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An Overview of Responses to Two Index Cases of Low Pathogenic Avian Influenza Breaks in Commercial Poultry and Subsequent Surveillance Activity.

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Abstract: Avian influenza (AI) is of significant economic concern to the poultry industry in the United States. Because of public concern related to the pandemic potential of AI viruses and due to the potential for significant morbidity in commercial poultry, the H5 and H7 subtypes receive special attention. Pathotype designation of low or high is based on 1) gene sequencing results from virus isolates or virus fragments in clinical samples, or 2) the clinical response of chickens inoculated with virus isolates. Export markets are particularly sensitive to these subtypes and quickly impose trade restrictions when they are identified in commercial poultry. Disruption of trade necessitates a vigorous and urgent response and has been recognized as such by the United States Department of Agriculture resulting in remediation costs being included in an indemnity program. The rapidity of the response to an index case (i.e., quarantine, surveillance, epidemiological investigation, flock disposition, etc.) can determine the duration and extent of spread of the virus to other premises. This report reviews the responses, from an operations perspective, during the 2004 Delmarva and 2007 Shenandoah Valley incidences.

History:

Delmarva 2004. The poultry industry is made up primarily of four broiler companies in the middle and southern portions of the Delmarva Peninsula, some pullet farms and a few layers in the northern portions with a scattering of independent farms, growing for the New York live markets, and numerous backyard flocks mingled across the entire peninsula. The four broiler companies, in conjunction with the trade association Delmarva Poultry Industry, Inc., had previously developed a procedure manual for emergency poultry disease outbreaks which included specific company and vendor responses under three potential scenarios: Part I Minimal Program where No Known EPD Exists or is Distinctly Remote, Part II Preventive Program if EPD Break(s) Occurs in a Nearby

Area Posing a Threat to Delmarva or Part III Plan of Action if an EPD is Suspected on Delmarva. In addition, memoranda of understanding (MOU) were prepared between the poultry companies and state offices for specific services and monetary considerations. The four companies committed to provide monetary compensation for the initial response and were met by commitments from two states to provide additional funds enabling a decision process absent financial negotiations.

Avian Influenza was diagnosed on an independent grower's two-house farm by the local laboratory and the Emergency Poultry Disease Task Force (EPDTF) members were notified. This flock was depopulated via CO₂ gas within 48 hours of the local laboratory results using supplies purchased and delivered per existing MOUs. Laboratory samples were submitted to the National Veterinary Services Laboratory (NVSL) in Ames, Iowa for confirmatory and pathotype testing indicating a low path H7N2. Each commercial company selected individuals to participate on the depopulation team, limiting the total from any one company that would be exposed to the infected premises. The Secretary of Agriculture, at the request of the State Veterinarian, ordered State Police security of the site during the depopulation procedures to ensure biosecurity and facilitate traffic flow. Birds were composted on-site under the direction of the University of Delaware Cooperative Extension Service.

Enhanced surveillance was conducted throughout the Delmarva region coordinated by an industry selected allied health veterinarian and supported by state, federal and integrator employees. Global Positioning Satellite (GPS) coordinates were available for commercial farms but the data had not received rigorous verification and could not be used for route planning using existing Global Information Services (GIS) mapping. Two- and six-mile surveillance zones were established using traditional

mapping equipment and routes were developed from visual assessment. Multiple two-person teams were assigned to the two- and six-mile zones and were made up of federal and state veterinary service employees. Integrator employees were responsible for collecting samples from farms outside the surveillance zones during the initial testing and were joined by government employees following completion of each round of testing within the six-mile zone.

Each integrator identified a single person to communicate surveillance and pre-slaughter needs and all collection requests were channeled through the response coordinator for team assignments. Tracheal swabs were collected and submitted initially to one of two laboratories based on geographic proximity but work was later consolidated to a single laboratory for efficiency. In addition, overload samples were submitted to NVSL. The USDA-APHIS Area Veterinarian in Charge (AVIC) provided support in securing supplies from the National Veterinary Stock Pile, ensuring adequate reagent availability, facilitating NVSL submissions and providing GIS expert advice. All public communication was directed through the trade association office and key individuals from industry met daily with the AI response coordinator for situation reports and scheduling adjustments.

Shenandoah Valley 2007: The poultry industry is made up of three broiler and two turkey operations, a turkey breeder and a broiler breeder. In addition, layers for human vaccine production, numerous backyard and small layer flocks are present. Slaughter facilities are primarily located in VA, however, the complexes place birds in VA and WV and pre-slaughter testing is done in VA. The commercial companies, in conjunction with the trade association Virginia Poultry Federation, Inc., have developed guidelines for AI breaks in VA, "Prevention and Rapid Response for Avian Influenza (H5 and H7) in Virginia" and a separate document is in place in WV, "West Virginia Avian Influenza Prevention and Response Protocol." These plans give specific and detailed instructions for communication, response and surveillance following identification of an AI suspect. Each company is responsible for updating the GPS coordinates for their farms and the data is robustly verified.

Routine pre-slaughter serology of a commercial turkey tom flock indicated exposure to the avian influenza virus in six finisher barns. Notification was made to the company veterinarian and tracheal swab samples were collected for PCR analysis resulting in evidence of an H5 AI exposure. Serology samples submitted to NVSL confirmed exposure to an H5 subtype. Notification to industry and governmental representatives was made and the state veterinarian ordered depopulation. A public statement was released indicating that the isolate appeared to be of low pathogenicity and that all of the birds on the farm would be depopulated and composted on-site.

Prior interaction with an emergency services contractor had occurred involving federal and state agencies, the poultry federation and all commercial poultry operations in the area. The contractor indicated an interest in developing expertise in AI response management and suggested existing expertise in depopulation, biosecurity, cleaning and disinfection and having some familiarity with composting but suggested additional consultation

Appraisal of the birds was completed on the second day post NVSL confirmation of the seropositive flock an

permission to proceed was delivered after business hours on the same day. A contractual agreement was made between the USDA and the emergency services on-site contact, for all services from depopulation to final cleaning and disinfection. Fire-fighting foam, recently approved for mass depopulation, was selected as the method of choice for depopulation and a Kifco® unit was provided by a commercial broiler company. Individual indemnity agreements were completed for the integrator and the grower by the AVIC and finalized on the third day post NVSL identification/confirmation. Local emergency services provided road closure signs to facilitate traffic flow during depopulation and composting. The first house of turkeys was depopulated on the fourth day and all houses were depopulated by the seventh day post NVSL confirmation. Carbon material for composting was sourced from two county landfills and delivered to the site over the seven-day period. Water for use in foaming was obtained initially from a dry well stream source and later from a city source. All birds were in compost on the ninth day post identification. Surveillance of backyard flocks in a six-mile zone was conducted by state and federal employees while commercial flocks and high risk contact premises were sampled by individual company personnel.

Discussion:

The following comments are given from the perspective of operations activity. However, it is important to note that this perspective may be influenced by the fact that the author changed jobs between the two outbreaks. In the Delmarva '04 outbreak he served as an interested but non-vested party, while in the Shenandoah '07 outbreak he served as a substantially vested responsible party. Any bias infused is unavoidable but will indicate the difficulty in maintaining objectivity during the stress of dealing with a depopulation process.

During the Delmarva outbreak, decisions were made efficiently during the morning meetings and the pressure of needing continual financial assessment was absent. The unique uniformity of bird types in Delmarva provided a similar prioritization basis among the integrators and the economic implications had a balanced impact. The decision to depopulate and indemnify the independent grower was determined to be of utmost importance to the integrated poultry industry. The original concept of the indemnity monies put forth by the companies and augmented by the states did not include independent growers but the needs of the industry as a whole made it prudent to include them and thus facilitate a rapid response. Ultimately two additional farms were identified with AI and were depopulated but the quick response was likely beneficial in stopping the spread of the virus. Coordinating the response through a single non-vested source proved insightful on the part of the EPDTF as daily activities could be scheduled without the weight of liability or preference. The AVIC functioned in the role of facilitator and provided guidance in communicating daily operations with concerned governmental organizations. The AVIC secured supplies from the National Veterinary Stockpile and held them at a central site under the control of the quartermaster. Daily inventories enabled the teams to always have adequate supplies and minimized waste.

The strong role of the two state's Department of Agriculture, with the secretaries of Agriculture often involved in the daily morning meetings, facilitated a cohesive response and created avenues of cooperation among various unrelated departments such as forestry,

state police, environmental services and animal agriculture. Cross-state cooperation in laboratory testing and personnel use created a fluid exchange of results, optimized manpower use and substantially reduced redundancies. Failure to validate the GPS coordinates proved costly in time spent detailing surveillance routing and required substantial time investment to rectify. Use of a courier service to deliver samples to NVSL at times proved frustrating and time sensitive testing should be done locally whenever possible.

The response in the Shenandoah Valley highlighted some unique nuances and challenges of dealing with a mixed poultry population and activation of the USDA indemnity plan. The accuracy of GPS data and access to GIS mapping promoted rapid data dissemination to all parties involved. The availability of farm concentration and bird population maps allowed each company to assign resources and plan surveillance activities in very quick order and aided in visualizing the potential threat to neighboring farms. Recruitment of an outside contractor allowed personnel from the owning integrator to be utilized in highly productive surveillance capacity limiting the number of company personnel entering the index facility. However, the contracting company was not trained in handling live birds and required the services of trained integrator personnel to complete the depopulation process.

Resources could not be pooled for surveillance activities between poultry types necessitating some redundant travel and loss of efficiency. Financial negotiations and equipment malfunction delayed the depopulation response and lack of readily available carbon resources further hampered the ability to proceed. Early release of public information indicating a specific response reduced available options and created limits when essential resources were not readily available. A simplified budget structure would have benefited the decision flow as conflicting priorities among the various parties resulted in a stop-go-stop operational mode and frustrated on-site activities. Solutions promulgated at the farm were often countermanded then later reinitiated creating a sense of discontinuity. The AVIC was placed in a fiduciary role in contract negotiations and could not exercise flexibility in a support role as was possible in the Delmarva experience

Highlights and opportunities:

Delmarva 2004.

1. Pre-incident MOUs with monetary commitment substantially facilitated rapid depopulation in the absence of financial negotiations, insured activation of vendor action plans and promoted a strong cooperative effort.
2. Minimal detail in public statements protected multiple response actions.
3. Surveillance activities coordinated through a single point enhanced information flow.
4. Using a non-vested operations coordinator avoided conflict of interest in the decision making process.
5. Lack of quality control for GPS data hampered utilization of GIS.
6. Samples lost in transit to NVSL created logistic hurdles.

Shenandoah Valley 2007

1. Budgetary AI response plan provided specific protocol for surveillance
2. Outside contractor minimized company personnel on-site
3. High quality GPS data facilitated mapping operations
4. Delay in valuation and contract negotiations slowed depopulation
5. negotiations interrupted work flow
6. Public statements negated some options.

Suggestions based on these experiences:

1. Use of an outside contractor for depopulation, disposal, cleaning and disinfection is a valuable asset for integrator human resource allocation
2. Carefully worded public statements are valuable in maintaining the widest options
3. High quality GPS data can greatly facilitate response planning
4. A simplified budgeting system would expedite the process
 - a. A value for poultry based on bird type, age and current dock prices that requires only verification of head count
 - b. Depopulation expenses should include the option of controlled marketing vs mass euthanasia
 - c. A value for depopulation based on square footage
 - d. A value for disposal based on protein weight, may be adjusted for composting, land fill, burial or in the case of controlled marketing added expense for live haul risk reduction
 - e. A value for cleaning and disinfection based on square footage.

This article was first published in the September 2007 AAAP Newsletter. It is reproduced in full in *DANDER* with kind permission from AAAP and the author for the benefit of AVPA members. Thanks to Tom Grimes for bringing the article to the attention of the Editor.

Experiences and Rewards in Pursuit of a Career in the Poultry Industry

Part 3

Balkar S Bains

Pharmaceutical Industry

In the late seventies I was employed by Roche Products P/L (Roche) in the Vitamins and Fine Chemicals Division (VFC) as a technical manager in the Feed Department. Roche was well known to nutritionists for their range of vitamin products but had no products for poultry health and thus little or no contact with poultry veterinarians. The VFC infrastructure was essentially focused to supply and support the range of vitamin products required by the food, pharmaceutical and feed industries. In the feed department the focus was, in order of priority, to poultry, swine, companion animals and others. My period of employment in VFC spanned over 20 year with various responsibilities at national and international levels. It was a new learning experience which I shared with colleagues in the poultry industry, both nationally and internationally, through personal liaisons and publications.

Lasalocid Sodium

My immediate responsibility was to conduct all necessary trials to determine the efficacy of lasalocid sodium (Avatec) as an anticoccidial in poultry for the control of local *Eimeria* isolates. After having acquired local *Eimeria* isolates, battery trials were set up to determine the purity of each isolate by using individual chicken oral inoculation. For challenge trials, a dosage was established by orally inoculating individual chickens with each *Eimeria* isolate.

A total of five local *Eimeria* isolates including *E. acervulina*, *E. necatrix*, *E. tenella*, *E. maxima* and *E. brunetti* were included in a single individual oral dose of all trial chickens. A floor pen trial was conducted by using broiler chickens with four dose levels of Avatec included in the feed. This was followed by commercial trials under field conditions using only one dose level of Avatec in feed throughout the broiler growing period. The data generated from the trials was submitted for approval of Avatec as an anticoccidial for inclusion in broiler feed. The data from the floor pen trial was also published in a scientific journal. Further Avatec efficacy trials were conducted which led to approval for its use in feed to control coccidiosis in both pullets and turkeys. Australia was the first country to register Avatec in pullets and turkeys and the Australian efficacy data was used for registration approval in other countries.

Avatec was introduced to the broiler industry in 1980 in Australia and immediately thereafter to the broiler industry in New Zealand. During 1982, I launched Avatec in both Japan and Korea and a couple of years later in Thailand, Malaysia and Taiwan. This was absolutely a unique experience for me and repeat visits to these countries during the eighties enhanced my understanding of the poultry industry in the region.

Towards the end of eighties I was encouraged by Roche senior management Switzerland to accept the position in USA to manage Lasalocid product in its entirety for the international markets. Due to the personal commitments I was unable to accept this offer.

Vitamins in Nutrition

During 1981, I was promoted to the position of a Director of VFC which broadened the scope of my interaction with the pharmaceutical and food industries. The learning commenced with my exposure to the abundance of scientific literature on vitamins in human nutrition that was often made available to the regulatory authorities as well as health professionals. It was interesting for me to learn that in human nutrition, the health workers recognised vitamin deficiency in four progressive stages. In comparison, veterinarians recognise vitamin deficiencies on lesions observed on necropsy which is a fourth stage. The role and application of vitamins in human nutrition has been studied to determine the effects of life style changes such as smoking, alcohol beverage intake, high energy food (junk food) intake, lack of exercise and environment pollution etc. The educational campaign for health professionals in the pharmaceutical and food industries was a major and ongoing exercise supported by engaging consultants experienced in this field. The information used for educational purposes was based on recent studies and population based surveys and statistics that included children, elderly, and various socio-economic groups etc. There were no such parallel studies, surveys and statistics of that scale available for the intensive animal production industry.

I began to think of the parallel that exists with modern broiler production by noting high energy feed intake (junk feed), high population density, no exercise, ammonia concentration, potential exposure to pathogens and immunosuppression etc. It was my considered opinion that there is a real need to understand the role of vitamins in nutrition of modern broiler production under intensive conditions. I made a concerted effort, beyond my normal duty and function as a director of VFC, to review the role of vitamins in modern poultry production and provide this information to poultry industry nutritionists and veterinarians. The information was published in two books in an easily readable format and provided cost free to the poultry industry by courtesy of VFC. The first book was a joint publication with Professor J. T. Brake entitled '*Physiological and Metabolic Functions of Ascorbic Acid in Commercial Chickens*'. The second book was an individual effort and entitled '*A Guide to the Application of Vitamins in Commercial Poultry Feed*'. In addition, World Poultry published a special vitamin issue for international distribution to its subscribers. The recipients of these books have often rewarded me with their compliments.

Far East Asia

From the beginning of nineties my role as Technical Director VFC (Feed) broadened to include services to the Far East Asia region. In this capacity, I retained my activities to the poultry industry of the region while the other four members of the team were given responsibilities to the other animal species. I also engaged Prof. J. T. Brake as a consultant for his contributions on breeder and hatchery management. My extensive travels into the Far East was an education itself,

in understanding the local cultures, and in finding ways and means to establish credibility with the local companies. These activities included, in selected cases, visits to poultry farms of large integrator companies. However, most of the time was spent attending roundtable meetings and workshops or providing seminars on topics nominated by the inviting company. The knowledge of vitamin application and the concept of vitamins in nutrition for the modern breeds of poultry were inadequate to say the least. A great deal of time was dedicated for the education and understanding of the application of specific vitamins under modern intensive conditions of poultry production. The information was often provided in the local language for better understanding.

Poultry Research Foundation

It was a unique privilege for me to be elected as a President of the Poultry Research Foundation (PRF) in the University of Sydney from the early eighties and I served in this capacity for 18 years. My current contact with the PRF is in the capacity of an Honorary Governor of the Foundation. It was an interesting challenge to work with the academic institution on the one hand and the poultry industry professionals on the other. There were continuing activities to liaise with industry members to foster their support and identify their needs for research in poultry nutrition. During my travels to the Far East Asia region, I continued to promote the PRF and its symposia to the local poultry industry professionals and encourage their participation. The notable achievements during this period worth mentioning here include:

Sid Wilkins Award. At the time I was elected President, Sid Wilkins, who was a great supporter of the PRF, had served the PRF in the capacity of Vice President for many years. He was well known to the poultry industry for his dedication and commitment. For the recognition of his work, I initiated a campaign and succeeded to raise enough money from the industry to establish an award to be known as Sid Wilkins Award to be given as a prize to an approved candidate.

Building New Poultry Houses. In the early nineties it was apparent that the poultry housing facilities at Camden were rapidly falling behind the current building standards used in the poultry industry. It was also considered that the research data generated may not be considered favourably when applied to modern poultry house conditions. A major effort was successfully undertaken to raise funds from the poultry industry and the University of Sydney to build new poultry houses of comparable standard to those being used in the poultry industry.

Joint Poultry Science Symposia. In the early eighties it was considered a step forward to have the World Poultry Science Association (WPSA) branch in NSW combine with the PRF to present a joint annual symposium. The objectives of combining the two groups were to provide a better outcome for both the poultry industry and the PRF. After considerable discussion both groups agreed with the terms and conditions and have successfully held joint symposia every year.



Balkar spreading the message!

Donations to the Veterinary School

During mid-eighties, then retired Deputy Prime Minister D. Anthony and the then Dean of the Sydney Veterinary School arranged a meeting with the Roche Managing Director and myself. The objective of the meeting was to ask for financial support from the company to build new facilities at the Sydney campus. Apart from the vitamins, Roche had no product to offer to the veterinary profession. It was thus rather a surprise that the fund raising organising committee saw it fit to contact Roche first to kick start their campaign, although the association of Roche with the PRF and through that contact, with the Dean of the Faculty, were probably factors. To support the cause and to drive a positive momentum in the fund raising campaign, a commitment to provide \$100,000 was given and contributed from the VFC budget.

Publications

In my opinion for information to be effectively understood and used it must be available in a written form in a language best understood by the recipients. Therefore it became a common practice to translate relevant information in local languages and publish in local magazines whenever possible. I chose to write articles on vitamins and vitamin related issues and application in the most popular international poultry magazines. During this period I wrote 57 articles and many were again published in the local language and in local poultry magazines. In total, I have published more than 90 articles and three books and a vitamin supplement.

In conclusion, this has been a great experience for my personal and professional development and my thanks go to many colleagues with whom I have the pleasure to work with and share their experiences. For the readers I hope this has given you some insight into the activities that went on when everything was new and everyone was learning.

This is the third and final episode of Balkar Bains' *Experiences and Rewards in Pursuit of a Career in the Poultry Industry*. Many thanks to Balkar for his personal reminiscences that provided us with valuable insights into the development of the poultry industry in Australia. Anyone interested in obtaining a full list of the publications referred to in the article should contact Balkar directly.

New Web Site Makes Poultry a Priority

Poultry industry professionals and the general public can now use a unique web site to share just about anything to do with commercial poultry production.

The site, Poultryhub.org, offers a collaborative resource centre where people can contribute their knowledge and expertise about poultry, manage poultry-related events that don't have dedicated web sites in the budget, post blogs or news releases, check poultry-related job postings or access research and training opportunities.

PoultryHub uses MediaWiki software, similar to popular sites like Wikipedia, to give users the choice of interacting with the site and editing the content.

The Australian-focussed site is the result of a Poultry CRC initiative addressing the need for an easily accessible 'information centre' outlining both the scope of universally available poultry-related information as well as education and training relevant to a career in the poultry industry.

Visitors to the site can register for free and immediately begin editing content on just about any page of the site.

Editing can include creating a new article on a particular poultry-related topic, fine-tuning an existing article or updating your own professional profile.

Additional tools and features are being progressively added to the site, including customised poultry-specific search engines, an open newsletter and file transfer facilities.

The Poultry CRC was established under the Australian Government's Cooperative Research Centres (CRC) Program in 2003.

One of the CRC's objectives is to improve the skills of Australia's poultry industry personnel and this web site provides a hub for Australia's 40,000 strong community of workers and researchers to share their resources and knowledge of poultry and poultry production.

The Armidale-based Poultry CRC's CEO, Professor Mingan Choct, said that the Australian poultry industry is benefiting from the power of community-driven software like MediaWiki to draw together a widely spread group of people with a common interest such as poultry.

"Once the poultry community realises what a tremendous resource it now has at its fingertips," said Professor Choct, "I'm sure those who haven't already heard about PoultryHub will want to get involved."

"Finally, people can visit a 'one-stop-shop' that lets them search for poultry-related information or chip in with their own bit of knowledge or expertise."

Visit www.poultryhub.org to find out more.

Contact: Chris Day
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chrisday@poultrycrc.com.au

Adelaide AVPA Conference Draft Programme

Day 1 - 30th Oct

Food Safety and the Australian Poultry Industry

Jane Raupach: Recent SA experiences of poultry related food poisoning

Diane Davos: Salmonella typing and their species relationships

Mark Woolley: Campylobacter typing and their species relationships

Break

FSANZ (Duncan Craig): The Poultry processing and egg legislation

Anthony Fisk: The Egg Industry Perspective

Liam Morrisroe: The Chicken Meat Perspective

Break

Dave Marks: The NZ Campylobacter scene

Martine Boulianne: Food safety - the Canadian perspective

Nalini Chinivasagam: Food Borne Pathogens and Poultry Litter

Break

Ben Daughtry: Risk Profile of the Australian Egg Industry: Physical, Chemical and Microbiological hazards

Duncan Craig: Risk Assessment

Jane Owens: Phage control for campylobacter

Chris Morrow: Vaccination in Salmonella control

AVPA Meeting

Pre dinner soiree and sponsors' exhibits

Dinner

Day 2 - 31st Oct

DAFF: AI, figures from last year's surveillance

AECL: Where are we up to with the cage legislation?

Valeria Torok: DNA profiling of chicken gut bacteria

Naomi Kirkpatrick: Transfer of diagnostic tests

Penelope Steer: Classification of FAV serotypes using HRM analysis of their hexon gene

Speaker to be announced: Climate change and the poultry industry

Balkar Bains: Incidence and Control of Enteritis in the Meat Chicken

Peter Groves: The Paracox trials

Peter Scott: Report on Pasteurella vaccine

Australian disease incidence and WTO/world view

P Scott, R Rahaley, Viv Kite

(Compartmentalisation, SE status, pullorum status, AI and ND?)

Report on the Beijing WVPA congress

Conference Accommodation:

Conference accommodation can be booked at :

Comfort Inn Haven Marina
6-10 Adelphi Tce
Glenelg North SA 5043

The Haven Marina overlooks the Patawalonga and is a short walk from the Glenelg foreshore and beach. It is also only a 5 min walk to the Glenelg/City Tram and Jetty Rd shopping precinct. The airport is approximately 10 km or a 10 min taxi ride.

For those who may wish to stay on, the Glenelg area is a major beach and tourist destination as well as being only a half hour drive from the Southern Vales wine area with ready access to the Adelaide CBD via a 15-20 minute tram ride.

Haven Marina
Phone 08 83505199
Facs 08 83505299
Email reservations@haveninn.com.au
Standard Rates \$135, Corp Room \$140+, Deluxe rooms \$140-160

Other accommodation in the area

Buffalo Motor Inn,
766 Anzac Highway Ph 08 8294 6244,
approx 500 metres from the venue, rates \$100-120 a night

The Taft Motel and Apartments,
18 Moseley St Ph 08 8376 1233,
approx 1 km from venue, motel units from \$105, 1 & 2 bedroom apartments from \$135.

For those wanting real upmarket,

Oaks Plaza Pier, 16 Holdfast Promenade, Toll Free 1300 551 111 approx 500 metres from venue, overlooks beach. Rates from \$170.

Stamford Grand Moseley Sq Toll Free 1300 301 391 approx 1 km from venue but easy walk across park and beach front. Rates from \$180.

avpa



The Australian Veterinary Poultry Alliance

Australasian Veterinary Poultry A... Limited

Inaugural General Meeting

30th October 2007.

**Comfort Inn Haven Marina Waterfront Room
6-10 Adelphi Tce
Glenelg North SA 5043**

AGENDA

1. Welcome to the Company
2. Attendance & Apologies
3. Adoption of The Constitution
4. Membership of AVPA Limited
5. The Poultry SIG of the AVA
6. Treasurer's Report
7. Institution of Standing Committees
 - a. Animal Welfare
 - b. Importation
 - c. Therapeutics
8. Election of Office Bearers:
 - President
 - President Elect
 - Secretary
 - Assistant Secretary
 - Treasurer
 - Scientific Meeting Coordinator
 - Editor of Dander
 - WVPA Bureau Member
 - Web Page Coordinator

 - Poultry SIG Executive
 - President
 - Secretary/Treasurer
9. General Business
 - AP6 and WPC
 - Future meetings
 - Other Business