

The PMV Outbreak in Victoria

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Every fancier in Australia would be aware of the PMV outbreak in Victoria in late August and September. For me, the PMV outbreak began on Saturday evening the 27th of August when I returned a clients' out of hours phone call. It turned out to be a significant phone call. The pigeons I examined in a subsequent consultation the next morning turned out to be the first presented to a veterinarian with PMV in this country. The eventual confirmed diagnosis along with others the same over the next two weeks would result in a state border being closed, racing stopping in mid-season, and disunity within and between various pigeon racing organisations and substantially alter the pigeon landscape in Australia, possibly forever.

On that Saturday evening, I had gone to the clinic to routinely medicate the unwell birds hospitalised in the clinic. Four out-of-hours messages had been left on the clinic's phone recording during Saturday afternoon. While there I returned these calls. One sounded urgent. The pigeon fancier on the end of the line explained that every day some of his birds were dying. Rather than wait until Monday I arranged to meet him at the clinic on Sunday morning about 9am. The next morning he arrived with 4 birds. They were of mixed Middle Eastern breeds. Two appeared quite well, however 2 were definitely sick. These 2 were quiet, fluffed up, and one in particular was having trouble breathing. When picking this bird up it promptly died in my hand! The owner thought that the problem was due to the birds feed and said that he thought that the other birds would all die. The live birds were admitted to the clinic for preliminary testing while the dead one was left for autopsy and histopathology (microscopic examination of tissues). Routine microscopic examination of a crop aspirate revealed no abnormalities; however examination of the droppings showed large numbers of roundworm eggs and coccidia eggs. The birds were also on a low protein diet containing a high percentage of wheat and sorghum. I was also worried about the level of hygiene in the home loft as the basket the birds were presented in contained an accumulation of droppings. My thought was that all this, perhaps combined with a secondary infection was sufficient to cause the problems we were seeing. The live birds were wormed, treated for coccidia, and also started on a broad spectrum antibiotic. They were then placed in a heated cage and fed a protein rich grain mix. I expected all of these birds to recover. After all, two appeared clinically normal. Grossly at autopsy in the bird that had died the only obvious change was that the lungs looked very inflamed. During the autopsy all relevant tissue samples were collected in order to be sent to an avian pathologist for examination on Monday morning. I then headed home. Sunday evening I was back at the clinic to again medicate the hospitalised birds. The condition of the admitted pigeons was unaltered. On Monday morning however one had died. Throughout Tuesday, the two remaining birds became short of breath, developed a thirst and started producing profuse watery droppings. Both died Tuesday night. This, despite being hospitalised and treated for all the identified problems. I then started to think that we might be dealing with one of the more

severe pigeon viruses such as Circo virus, Herpes virus or Adeno virus. Paramyxovirus was not a consideration as this virus did not occur in Australia. Speaking to the birds' owner, he explained that 120 of his 130 birds at home were now dead. On Wednesday I rang the pathologist to make sure he had received the samples and requested that he get the results to us as quickly as possible. In the meantime the normal day to day running of the practice continued with bird owners coming and going. Normal disinfection practices were in place. One of the cases we saw however turned out to have quite significant ramifications for us later. This was a young grizzle hen belonging to J Shore. The bird had returned late on the Sunday (the same Sunday I saw the unwell birds) from the previous weekends race with an injured crop and was brought to the clinic to have this surgically repaired. But more on this later.

On Thursday morning, (1st September) a pigeon client arrived with some unwell Persian High Flyer pigeons. These are an unusual breed of fancy pigeon that originated in the Middle East. This fancier was experiencing high mortality in his birds. In fact, 29 of 50 had died in the previous few days and the birds he presented were showing similar symptoms to those I had seen on the previous Sunday. In these birds however microscopic examination of crop flushes and faecal smears revealed no abnormalities. As there were no dead birds available for further testing and these initial routine tests were normal it was decided to admit these birds, commence antibiotic treatment and only do further testing if the birds failed to improve. The next morning one was dead and the second had developed a severe thirst, delayed crop emptying leading to a large fluid-filled crop and profuse watery droppings. The bird that had died was autopsied. It had a large canker nodule in one of its liver lobes. Again, during autopsy, all tissue samples were collected and forwarded to an avian pathologist for examination.

On Friday morning (2nd September), the DPI rang the clinic to discuss a disease outbreak in pigeons in Shepparton, a country town approximately 200km north-west of Melbourne. They explained that in a loft of Persian High Flyers (the same uncommon breed); high mortality (greater than 90%) had been experienced with the birds showing symptoms of shortness of breath and wet droppings prior to death. The similarities were far greater than any coincidence to the two cases that we were investigating. The caller advised that the DPI had made a diagnosis of PMV1 in the Shepparton loft. Literally a shiver went down my spine. Cloacal swabs for Paramyxovirus DNA (PCR) testing were collected immediately from the live and dead birds belonging to these two owners. The DPI collected these swabs that afternoon and the results were available on Saturday afternoon. Both were positive for PMV1. In the meantime on the Friday afternoon, another fancier arrived again with Middle Eastern breed pigeons. He was also experiencing high mortality in his birds. These birds were also having trouble breathing and were producing profuse watery droppings. In addition they had lost their sense of balance and coordination and had a decreased awareness of their surroundings. Along with other tests, a cloacal swab for PMV DNA testing was also collected from these birds. Their cloacal swabs also confirmed a positive PMV1 result. The pigeon landscape in Australia had drastically changed. On the Thursday, PMV was an exotic disease and did not occur in Australia. Now, only 48 hours later, we seemed to have a mini outbreak with four known cases, three of which had been to our clinic.

With this diagnosis, it was immediately concerning that we had been seeing pigeon clients throughout the week. These birds had all been potentially exposed to PMV. It had been a normal week for us. Through each week we see many unwell birds. After all that's what people do – they take sick birds to the vet. It was impossible to know that one case seen at the start of the week would turn out to be PMV. After all this disease did not occur in Australia. Normal hygiene had been practiced but this virus is very infectious. With the diagnosis on Saturday, I decided that all fanciers who had been seen through the week should be contacted and advised to isolate the birds brought to the clinic from their other birds for at least several weeks. As the onset of ill health correlates reasonably well with virus shedding and therefore the ability to pass on the disease it was hoped that in the unfortunate event that a bird had become infected while at the clinic, even though this bird could die, the loft as a whole would be protected. As it turned out, one loft (only) did become infected. Given the large number of birds we see on a daily basis I think we were very lucky and if nothing else it shows that our hygiene practices are basically sound. This bird was the grizzle hen belonging to John Shore mentioned earlier. John is the Vice President of the VHA, he races in my club and is a personal friend. I mention his name with his permission.

The grizzle hen had been admitted to the clinic on Monday morning (29th August) and had been kept in a cage about 1m away from the cage holding the unwell birds admitted the day earlier on the Sunday (28th August). Her surgery was routine and she was discharged to John on the following Thursday (1st September) as a healthy bird. When the diagnosis of PMV came on the following Saturday (10th September) I contacted John (as I did all other fanciers who had been in) and advised the bird be separated. He placed her in an individual pen and reported that she still looked fine. We spoke on a daily basis for the next 7 days. Each day she was fine until 8 days later when on the following Friday (16th September) John noticed she had lost weight. I collected a cloacal swab for PMV testing. The DPI collected this on Saturday. The result was available Sunday morning – positive for PMV. This bird had obviously caught the disease while at the clinic. She was euthanized and her body was collected by the DPI on Sunday afternoon. A second PMV test done on her body was also positive. There was no doubt that she had the disease. On Monday morning the area of John's loft where she had been kept was sprayed with F10 (a virus disinfectant) and on Tuesday all of John's birds were vaccinated (with NDV4). At the time of writing, 4 weeks later, only one other bird has become unwell and this is recovering with supportive treatment at the clinic. As it takes 10-14 days to develop immunity after vaccination it is hoped that this outbreak is now under control.

As there were now no unwell pigeons in the clinic, a professional cleaner was called in to thoroughly clean the clinic and a normal week started on the following Monday morning (4th September). To be thorough and because the DPI was offering free cloacal swab testing for PMV in unwell pigeons, all sick pigeons that we saw had a swab collected and submitted for testing. As usual, people arrived with unwell birds. Along with the other cases, two fanciers in particular with unwell pigeons were seen on Monday afternoon.

One of these was a racing fancier who lived in Melbourne's south-east. He maintained a small loft of fancy pigeons about 5m from his racing loft and had introduced several birds to his loft

from a pet shop several days earlier. The birds he presented for examination were unbalanced with a decreased level of awareness. Because of the diagnosis of PMV that we had had over the weekend we were sensitised to the possibility of another case. This fancier had however treated his birds with DMZ ('Emtril') at a high dose during hot weather and while the birds were breeding (both of which would be expected to cause an increased water intake). DMZ has a narrow safety margin and in overdose could have caused just these symptoms. It was thought likely that this would be the cause however to be thorough a cloacal PMV swab was collected. The next day this returned a positive result and became our fourth confirmed case.

The second was a fancier from Melbourne's north-west. He brought to us a Persian High Flyer that was very thin. He had had several birds die at home, the last one several days earlier. Routine tests revealed no abnormalities. A cloacal PMV swab was also taken from this bird. The bird died that night and the next day its swab test result was also positive for PMV. Our fifth confirmed case.

Remember, up until this stage there had only been four positive cases in the state – the loft at Shepparton and the three other cases at our clinic. When we got these results on Tuesday (after getting over the initial shock) we realised that we were dealing with more than a few isolated cases but rather a mini outbreak. Once again, I had the difficult job of contacting all pigeon clients that had been seen on these days and advised them to isolate the birds. One found this difficult and elected to bring his birds to the clinic to be quarantined. This turned out to be a difficult case for us. The fancier had rung on Tuesday (6th September) several days after we had our first confirmed positive case and asked if it was safe to bring his birds in for testing. As the clinic had been professionally disinfected, we had not had any further confirmed cases since then and ongoing disinfection was in practice, I said yes. When I rang him and told him that 2 of the birds that had been seen the afternoon before he had come in had subsequently turned out to have PMV and that his birds could have been exposed he was not happy. This of course was quite reasonable. No one, including myself, would be happy in this situation. He brought the birds to the clinic and they were tested for PMV with cloacal swabs on admittal, and again 7 days later. These tests were all negative. The birds continued to be hospitalised and were again re-swabbed 10 days after admittal. All birds had remained well; however one now returned a positive result. This was a tense and concerning time. The birds were again swabbed 2 days later and fortunately all returned a negative result. The earlier positive result had been a laboratory error. The birds were held in the clinic for a further three days. As they were all still well and 17 days had elapsed since their possible exposure they were discharged. I must thank this fancier for his patience and understanding and if nothing else it was a lesson learned that when dealing with such an infectious disease one can never be too careful.

After this, the clinic policy changed. It was difficult for us to tell which sick pigeons we saw would subsequently turn out to have PMV. In the meantime these birds could expose non-infected birds. Until the full extent of the PMV outbreak was known, it was decided that only pigeon emergency cases would be seen and that any pigeons showing symptoms that could be associated with PMV be referred directly to the DPI for cloacal swab testing.

As news of the outbreak spread throughout the pigeon community and then the media the environment in the clinic changed from busy but organised to one of controlled chaos. The following week was very busy with some of us working 13 hour days from 7:30am until 8:30pm. For 2 days the phone rang literally every minute. All of our incoming lines were often engaged. We had calls from the media, members of the public, DPI representatives, disinfectant suppliers, lawyers worried about compensation if birds were culled, vaccine suppliers, other vets, interstate and Victorian government departments and of course many pigeon fanciers. There were radio, newspaper and television interviews, both for Australia and overseas. One American interviewer working for World News told me not to be nervous as the interview was going out to 100 million viewers. This did not help. All of this on top of the normal case load and day to day running of the clinic. Overall it was a very very busy time.

One thing that had become apparent fairly quickly on talking to fanciers who had the disease was that they had been to or purchased birds from a particular pet shop. This pet shop, located in Melbourne's North-West, provides a service to pigeon fanciers who have excess birds. Fanciers can take their spare birds to this pet shop which has extensive lofts. Here they can be housed and made available for sale to other fanciers. During the week, after Sunday 28th, a significant number of pigeons had started to die in the pet shop. The owner, thinking he had an outbreak of Circo virus on his hands, and thinking he was doing the right thing, contacted the owners of the birds and invited them to come and collect their birds. In hindsight this was unfortunate as subsequent tests by the DPI showed the problem not to be Circo virus but rather PMV1. In this way the virus was inadvertently spread.

So what is Paramyxovirus?

The answer might sound a bit complex, but it is actually quite simple and logical and makes things easier to understand. There is a family of viruses called Paramyxoviridae. Within this family, there are three genera (i.e sub-groups) – Morbillivirus (which includes human measles and dog distemper), Pneumovirus and Paramyxovirus (which includes human mumps and the viruses we are interested in, Avian Paramyxovirus). Within the Avian Paramyxovirus (PMV group) there are 9 different sub-groups, PMV1 through to PMV9 depending on their genetic makeup.

Paramyxovirus in pigeons is caused by a PMV1 virus as is the very severe disease in chickens called Newcastle disease (NDV).

Avian Paramyxoviruses vary in their ability to cause disease and also in the type of disease they cause. This means that some cause very severe disease while others cause only mild symptoms. The virus targets principally the bowel, the kidneys, the respiratory tract and the central nervous system. Different organ systems are affected and to different extents by different Paramyxoviruses and the symptoms the birds show depends on this. Paramyxoviruses also vary in the species of bird that they are able to infect. Each virus also has its own set of characteristics involving incubation time and time to recovery etc. Paramyxovirus's ability to cause disease is inversely proportional to the incubation time i.e. viruses with a long incubation

time cause milder disease and vice versa. The ability for infected birds to themselves shed the virus i.e. become infective to other birds' correlates well with the onset of symptoms.

Initially there was great concern that the 'new' PMV1 may be able to infect chickens or indeed native birds. The PMV1 currently identified in Australia however appears to only infect domestic pigeons. The exact symptoms it causes tend to vary from bird to bird and also loft to loft. The most common sign is associated with inflammation of the kidneys caused by the virus. Healthy kidneys concentrate urine and maintain a normal fluid balance in the body. Damaged kidneys lose this ability and so affected birds produce a lot of dilute urine leading to profuse watery droppings. In order to prevent dehydration, the birds need to drink a lot leading to increased water intake and a dilated fluid filled crop. Other symptoms include a breathlessness, associated with inflammation of the lungs and diarrhoea and weight loss associated with inflammation of the bowel. In some birds the virus can also inflame the brain and these birds develop a loss of balance, a decreased awareness of their surroundings and neck twisting (similar to birds with Paratyphoid).

This virus's incubation time appears to be between 2 and 10 days. This means that it takes 2 to 10 days for a pigeon to start to become sick after it is infected with the virus. This is consistent with the way PMV1 behaves in pigeons overseas. Based on overseas figures it is thought that recovered birds shed the virus for up to two months.

How did the virus get here?

Some birds, in particular water birds have a natural tolerance to many Paramyxoviruses. It is possible the virus has been naturally introduced by non-target species such as water birds migrating up the east coast of Australia. The virus survives well in both fresh and salt water. Water birds can carry the virus asymptotically with the virus passing from one bird to another until one of these birds comes into contact with a pigeon. Once the virus moves into a pigeon that pigeon then becomes unwell and can form the basis of an outbreak once it mixes with other pigeons. The virus could also have entered Australia inadvertently with pigeon equipment such as baskets contaminated with the virus. If these were then used in Australia the virus could infect Australian pigeons. One would hope that AQIS would prevent this happening. Alternatively, there is the possibility that the virus has entered illegally with infected avian material such as live birds or eggs. Smuggling birds into Australia has been a long term issue and if the virus has entered this way it highlights the importance of effective quarantine. One would hope that the appropriate authorities bring to account any involved individual if this has been the case.

Control measures

Several options are available to limit the spread of a disease once it has gained entry. These include:-

- 1) Identification and quarantine of infected properties
- 2) Education – educating pigeon fanciers about the virus and its potential means of spread so these can be avoided

- 3) Limitations on bird movement – the extent of these can vary from total bird loft confinement, to just loft flying or no tossing or racing
- 4) Vaccination
- 5) Depopulation of infected properties – Never really discussed as an option although some avian vets pushed very strongly for this.

The DPI very quickly and efficiently (in my opinion) looked after the first two on this list but made only suggestions about 3 and 4, preferring to leave final decisions here to pigeon keepers themselves. The DPI suggested that the use of PMV poultry vaccines could confer some immunity to pigeons but the exact extent of this immunity and the safety of the vaccines was unclear. They suggested fanciers discuss vaccine use with their veterinarian. The DPI also stated that the less bird contact the better and it would therefore be best that racing and shows etc be suspended. However, rather than be a 'big brother' with a legislative stick they offered this as guidance and left the final decision as to exactly what extent bird movement would be restricted and how vaccines would be used up to the actual people involved – the pigeon keepers. I thought this was a good approach. Vaccine use and bird movement very quickly became a very hot topic amongst pigeon fanciers. As the outbreak had occurred in the middle of the Victorian racing season some fanciers were keen to resume racing. They vaccinated their birds with a view to resume racing in 4 weeks. This outraged other fanciers who said that the best thing was to totally confine all birds. They were angered by the suggestion that birds should be loft flown let alone trained or raced. Some fanciers had extreme views, one mentioning to me that he would rather kill his birds than vaccinate them. Another finished off an email 'yours in our once great sport'. He explained that his father and he had raced pigeons and that his son was now showing an interest but he doubted if he would encourage his son to follow this interest. Some fanciers used as their only source of information gossip with other fanciers. While some fanciers who had no experience or training in disease control became overnight experts in vaccine use and viruses generally. Some of these were very keen to disseminate information through various platforms such as internet forums. Some fanciers were selfish, short sighted, critical of others and wanted to do just what suited them. Fanciers disagreed, federations disagreed, and a coordinated plan failed to evolve.

Often fanciers were polarised into pro-vaccination or pro-confinement camps. Many fanciers however adopted an in between approach seeing the advantages and disadvantages of both control options.

Vaccination

Against

- 1) The vaccines available in Australia were unregistered. Their safety and level of immunity formed after use was unclear.
- 2) Vaccinated birds could still become infected with the virus but show no symptoms. These birds could therefore be infectious for a period of time.
- 3) Diagnostic tests had difficulty in distinguishing birds that were vaccinated from birds that had the disease

For

- 1) Although the vaccines available were unregistered the advice from the experts was that they would probably be safe and probably confer at least some immunity
- 2) The vaccines were cheap and easy to use.
- 3) In the face of an outbreak, their use would help protect still healthy birds.
- 4) A good way of controlling disease generally is to vaccinate vulnerable birds. If there are no birds left to infect the disease is more likely to die out.

Confinement

For

- 1) Costs nothing and involves no effort
- 2) Will at least reduce the rate of spread even if it doesn't completely stop it

Against

- 1) The virus can asymptotically be carried by non-target species (such as water fowl) that can later infect pigeons when they are let out from their lofts
- 2) Feral pigeons – the virus could persist in feral flocks
- 3) Exposed/recovered birds can shed virus for up to 2 months therefore may need confinement lasting several months.
- 4) Long confinement causes problems with basic pigeon loft management eg the need to wean and home babies.
- 5) Policing. To be effective everyone would need to do it. Not all people that keep pigeons belong to clubs.

After several weeks the DPI upgraded their advice to totally ban all activities where pigeons from different lofts mix such as races, shows and sales. Loft flying was still permitted. Whether or not to vaccinate remains a topic of debate among fanciers.

Vaccines

Fanciers may remember that about 20 years ago a veterinary company called 'Vetafarm' released a paratyphoid (*Salmonella* sp.) vaccine in Australia. Something that would have been useful in protecting healthy birds that had been exposed to the disease during an outbreak or included in a health management program in vulnerable breeds like modenas and tumblers. After approximately 1 year the vaccine was withdrawn, the company's CEO Dr Tony Gestier wrote in an article published at this time that he was tired of wasting the company's time and resources on establishing the vaccine in Australia to its 'slow to change' fanciers.

Despite the same pigeon pox vaccine being available in Australia since 1956 (even though it has been sold by different companies) misinformation is still spread about this vaccine. With pigeon vaccine use in Australia having this history it almost seemed inevitable that the rather rapid availability and use of PMV vaccine would create some serious and perhaps heated discussion. On the day the DPI released its statement saying that the use of PMV vaccine available for chickens in Australia may be useful in protecting pigeons, my clinic decided to supply the

vaccine to fanciers who were at risk. Each fancier who was supplied with vaccine was also supplied with the following info sheet.

Use of PMV Vaccine in Pigeons

The vaccine you have been supplied with is registered for use in chickens in Australia and contains a mild strain of living Paramyxovirus (PMV) called V4 isolated originally in Australia.

Deliberately infecting pigeons with this mild strain may allow them to develop an immunity against more harmful PMV strains. The product is however not registered for use in Australia in pigeons and is being used off-label as an aid in protecting pigeons against PMV1 infection in the face of the current outbreak. It is not definitely known how safe this vaccine is in pigeons or how high the level of immunity is that the birds will form after it's use. However similar vaccines have been used in pigeons in the past and the general consensus is that this vaccine is unlikely to cause problems and can be expected to provide reasonable protection.

Following vaccination it is thought to take 10-14 days for immunity to develop. Some birds can be expected to show mild signs consistent with a PMV infection including lethargy, loss of appetite and wet droppings although the exact extent and severity of these symptoms is not known. If used during the breeding season the potential for symptoms is higher in nestlings. Although we do not expect severe side effects fanciers need to be aware that this is an off-label use and they therefore use this vaccine accepting the possibility of adverse reactions.

Instructions for use

- 1. The vaccine must be stored at less than -18°C (i.e. in deep freeze until use)*
- 2. Remove the top of the vaccine bottle*
- 3. Add 1-2ml of cool clean tap water to the dried vaccine pellet in the vaccine bottle*
- 4. With the supplied syringe transfer this freshly made suspension to the dropper bottle. Add a further 20ml of water to make the vaccine.*
- 5. Place one drop of vaccine into the throat of the pigeon*
- 6. Vaccine must be kept as cool as is practical and used within 2 hours of mixing*

Some fanciers were concerned that a 'chook' vaccine was being used. What perhaps was not realised was that the vaccines commonly used and registered in Europe to immunise pigeons against PMV are derived from a PMV La Sota strain of the virus which also originated in chickens. Fanciers were divided as to whether or not to vaccinate their birds. In Melbourne the VPU banned members from vaccinating! In the first 24 hours approximately 100 fanciers purchased vaccine from the Melbourne Bird Veterinary Clinic. To help address many of the issues and questions raised by fanciers, my clinic released a second info sheet the second day after the release of the vaccine. (See below)

PMV vaccination: Questions and Answers

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This clinic is recommending vaccination of pigeons against PMV in the face of the current outbreak. The main reasons for this, is that, based on overseas information the vaccine is unlikely to be harmful and is likely to confer some immunity. Also a good way of controlling a disease is to vaccinate all vulnerable birds. After all, if all birds are immune there are no birds to infect and the disease is more likely to die out. A good example of a viral disease that was eradicated through vaccination is human small pox. With no humans left to infect, the disease disappeared.

Commonly Asked Questions

- 1. Will it be necessary to vaccinate regularly in the future?*

Only if the current disease outbreak is not contained. Through failing to vaccinate, the Melbourne pigeon community could potentially lose one way of controlling the disease. Maintaining a large population of vulnerable birds gives plenty of opportunity for the virus to establish and persist. Vaccination reduces the incidence of disease, it does not increase it.

- 2. Will vaccinated birds become carriers?*

No. Following vaccination an immunity is formed and the vaccine strain of virus is cleared from the system. A similar situation occurs after pigeon pox vaccination.

- 3. Will my birds be harmed through being vaccinated?*

Unlikely. Similar vaccines have been used in pigeons overseas with minimal side effects. It is unlikely that our pigeons will react any differently. However, a transient reduction in fertility can be expected in some individual birds if birds are inoculated during the breeding season. In my opinion, a comparatively mild reaction compared to the risk of having stock birds die.

- 4. Will my birds be fully protected?*

We don't know. What is likely is that a variable level of immunity will form. Some birds will probably be fully protected while others may only develop a partial immunity. Any level of immunity formed will help to decrease the severity of the disease.

5. *What will happen to nestlings if I vaccinate their parents?*

It is likely that nestlings will be exposed to the vaccine virus by their parents. Adverse reactions to this vaccine virus are more likely to occur in pigeons under 4 weeks of age. By choice, we would not routinely vaccinate during the breeding season but in the face of the current outbreak it may be better to risk some side effects in some nestlings in order to protect the stock birds.

6. *What happens if I do not vaccinate?*

It is likely your birds will have an increased vulnerability to infection. In other lofts where the virus has gained entry, mortalities of up to 100% have occurred.

7. *Will the vaccine strain of virus become established in our pigeons?*

Unlikely. It is possible that the vaccine virus has entered our pigeon population in the past. The vaccine is widely used in chickens. Where chickens and pigeons mix there is the potential for transfer of the vaccine virus. The vaccine virus can also be transferred by people via clothing etc and other means. The virus has not previously established and if it has, has not caused harm. The vaccine virus does not have a harmful effect on wild birds.

8. *Will vaccinated pigeons infect non-vaccinated pigeons?*

Yes, for several weeks. Birds vaccinated with a live virus in a vaccine will shed that virus after a period of time and have the potential to infect other birds while they develop immunity. This is thought to occur for several weeks with this vaccine. A similar situation occurs following pigeon pox vaccination but birds vaccinated against pox are infectious for longer, up to six weeks.

9. *Should I vaccinate my birds?*

This is a decision for the fancier. It depends really on what risk he is prepared to accept. Fanciers should keep in mind that PMV is not a disease like pigeon pox. Pox is essentially a skin disease with very low mortality. If PMV gains entry, fanciers risk losing significant numbers of pigeons.

If fanciers have further questions, these can be directed to the staff of the Melbourne Bird Veterinary Clinic on 03 9764 9000.

There was also some controversy over exactly which vaccine should be used. Basically two types are available in Australia. One is a killed La Sota origin vaccine. This is more expensive and also more complicated and time consuming to use as each bird has to be individually

injected. The other vaccine is a live, non-disease causing strain of NDV (Newcastles Disease Virus) isolated from chickens in Australia called NDV4. The DPI recommended the killed La Sota vaccine. This was the obvious choice for them as a similar vaccine was already registered for use in pigeons in the UK and also some authorities thought it gave better immunity. After speaking to 3 of my veterinary colleagues who are literally experts in viral disease and vaccine use, we decided to supply the NDV4 vaccine. It is cheaper, is easier to use (a drop is placed either in the eye or throat of the bird) and also the experts felt that the immunity it gave formed quicker and was higher. A potential problem with vaccine use is that vaccinated birds can still become infected with the disease for a period of time but not show any clinical signs. They felt this was less likely to occur with the live NDV4 vaccine. To date this clinic has supplied about 150 vials of vaccine. I would estimate that about 2500 pigeons have been inoculated. A good number of these were breeding birds with chicks in the nest. To date, we have had no adverse reactions either in adults or nestlings reported to us. Similarly, in lofts that have been vaccinated, we have not had any clinical disease. One loft that is of particular interest here is that of John Shore mentioned earlier. It was the NDV4 vaccine that we used to help protect his birds after their possible exposure to PMV from the grizzle hen. As mentioned earlier, after 4 weeks only one other bird out of several hundred has become unwell and this is recovering with supportive treatment in the clinic. It is early days but it appears that the NDV4 has at least provided some immunity. This clinic is currently running vaccine trials with the support of the DPI. These trials will assess the efficacy of the available vaccines. A group of birds will have their immunity checked before and after inoculation. These results will be made available as soon as they are to hand and should give us a good indication of the level of immunity formed. This in turn will help us to decide if repeat booster vaccinations are required and if so at what time intervals in order to maintain a fully protected immunity. My understanding is that if these tests show that the available vaccines fail to provide sufficient protection and the disease is ongoing that recommendations can be made to the appropriate drug registration authorities to expedite the availability of proven overseas vaccines. These recommendations however will have to come from fairly high up in the appropriate government departments.

Current advice

In lofts that have had birds diagnosed with the disease our current advice is;

- 1) Separate unwell birds
- 2) Thoroughly clean the loft and spray with a virus -effective disinfectant such as F10 or Virkon
- 3) Test other birds in the loft and treat any other identified health problems
- 4) Immediately vaccinate all in-contact birds. Vaccination is certainly not a 'silver bullet' but it can be part of a coordinated attack. What I think is likely is that the vaccine in

Australia will give variable immunity. In some birds this will be high and totally protective. In other birds the immunity that develops may be partial. As any immunity is a good thing and we are not (to date) seeing adverse reactions to the vaccine it seems reasonable and worthwhile to use them.

- 5) Provide good ongoing care to all birds. Regular multivitamins and probiotics in the drinking water are natural tonics. Birds that do not eat or drink enough to maintain their strength should be hand fed. Some birds can be expected to die. In birds that survive, those with a kidney and bowel involvement (i.e thirsty with profuse watery droppings) can be expected to take several weeks to recover while those with a central nervous system involvement (i.e loss of balance and head twisting) can take several months to recover. These birds however are still worth treating. The carrier state does not exist with this virus and so as birds recover the virus is cleared from their system. Some recovered birds however may not be of value for racing. My advice is to try and save them all. Birds whose development has been compromised so that they can not be effectively raced can be culled later.
- 6) As recovered birds can continue to shed the virus for up to 8 weeks, no bird should leave the property until after this time. Also preferably several birds should be tested (a cloacal swab DNA test for the virus) and be shown to be negative before birds leave the property.

Outcome of exposure to the virus

The initial cases of PMV in pigeons in Australia involved fancy pigeons and in these lofts the mortality rates were very high, in some situations reaching 100%. As the virus spread further and became more established racing lofts became infected. The virus to date has behaved differently in racing lofts than in fancy lofts. Speaking to some of my friends who are avian vets overseas they described that the virus has a very high morbidity (i.e many pigeons are infected) but a very low mortality (i.e very few die). In their experience the two factors that affect the severity of the disease are;

- 1) How well the bird is at the time of exposure – birds on poor diets, with parasitic disease or already infected with another disease such as Chlamydia are much less able to cope with exposure to this viral disease. It may be that the excellent care, the fitness and the natural robustness of racing pigeons means that the virus causes less severe disease in them.
- 2) If the bird has any immunity – if the bird has had an earlier exposure and recovered or been vaccinated it may well have some immunity to the disease. Even if this immunity is not fully protective, even partial immunity may make the difference between a bird that is unwell for a few days then recovers and a bird that is overwhelmed by the virus and dies.

Other factors that have been shown to affect the outcome of exposure to this virus include the age of the bird at exposure, the method of entry of the virus into the bird and the initial dose of virus.

The future

Two exotic parrot diseases, IPD (Internal Papilloma Disease caused by a Herpes virus) and PDD (Proventricular Dilatation Disease caused by a Borna virus) that gained entry to Australia in the early 1990's are still with us. They are not common but are still regularly diagnosed, particularly in certain parts of the country. For example, PDD seems more common in the parrot aviaries of south eastern Queensland. The thought is that these two diseases are probably under diagnosed because many general practitioner vets that do not see many birds are unfamiliar with them and as their diagnoses can be involved and expensive many owners of birds do not wish to investigate their birds' poor health to this extent. These diseases are now considered endemic and are now on an avian vets list of potential diagnoses when dealing with unwell parrots while prior to 1990 they were not. On the other hand, we diagnosed in our clinic a PMV4 infection in a flock of canaries experiencing high mortality in Melbourne's western suburbs two years ago. To my knowledge, this disease has not spread or at least has not been diagnosed in other canary flocks.

Also, earlier outbreaks of PMV1 in poultry flocks in north eastern NSW and in north eastern Victoria were brought under control through a combined policy of quarantine and depopulation. The Australian commercial poultry flock however continues to be vaccinated against PMV1. In an outbreak of PMV1 in California in pigeons approximately 6 years ago an attempt was initially made to control this through the identification of infected properties, quarantine of these properties and restriction of bird movement generally. This failed to control the problem and fresh cases continued to be recorded at a variable rate for 18 months. It was only when infected properties were depopulated that the outbreak was controlled.

The fact that the virus can be carried asymptotically by some bird species (such as water fowl) that have a natural tolerance to the virus but can then spread the disease to pigeons, the high rate of contact of pigeons from different lofts, the presence of feral pigeons and the fact that recovered birds can continue to shed the virus for up to 8 weeks and therefore be infective (without showing any symptoms themselves) combined with the likelihood that some fanciers may be reluctant to seek veterinary advice if they think their birds have PMV will all make eradication of this virus a challenge. Without a crystal ball, the future is hard to predict. A PMV1 gained entry to Europe and the UK in 1977 after seed contaminated with the droppings of feral pigeons was imported from Egypt. In these countries the disease could not be eradicated and regular vaccination against PMV1 is now part of routine health management programs for pigeons in these countries. One would think that the same parameters would apply in Australia as these countries – we are a modern western democracy that cares for our pigeons in a similar fashion. With this being the case one could predict that the disease is here to stay and we will also need to now regularly vaccinate our birds. A well known American avian vet in a recent email to me stated 'as you know, since PMV is there, it is there to stay, it will become endemic but then be controlled through vaccination'. In the two weeks following the initial diagnosis on the 1st September, 26 infected properties were identified. In the next three weeks (15th September – 7th October) a further 15 properties were identified. At the time of writing (early October) this means that there are now over 40 properties where the disease has been

diagnosed. Several new properties continue to be confirmed as infected each week. However when dealing with animal issues the only thing that is certain is that nothing is certain and the disease may simply die out. One thing that is perhaps certain however is that it will take several years without any fresh cases before vets and fanciers start to breathe a bit easier. We will all just have to wait and see together.