

The PMV Outbreak.

Every fancier would be aware of the PMV outbreak. 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 Aadenovirus. Paramyxovirus was not a consideration as this virus did not occur. 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 1 meter 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. 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 5 meters 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.

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 (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 Paramyxo viruses and the symptoms the birds show depends on this. Paramyxo viruses 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 viruses with a long incubation time cause milder disease and vice versa. The ability for infected birds to themselves shed the virus 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 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.

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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. 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.

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Against

- 1) The vaccines available 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 or 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.