Selected Pigeon Diseases

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1. Canker

Cause: a small, one-celled, microscopic parasite called *Trichomonas gallinae.* The same organism causes a disease called **frounce** in birds of prey. In pigeons, there are strains of this organism that range from very mild, relatively innocent types through to those that are very deadly.

Occurrence and Signs: Canker is probably most important in young birds, but it can also be a serious threat to old birds as well. The commonest form of the disease in youngsters is a yellowish lump in the mouth or throat area. It may also affect lower areas such as the crop or liver where it would not be visible to naked eye inspection. "Going light" is one of the first signs of illness if there is no visible change in the mouth or throat, although canker is not the only cause of "going light".

The disease may affect the liver severely, especially when one of the more deadly strains is involved. Here, "going light" may be the first sign of illness. Another important sign when the liver is severely involved is a puffiness in the abdomen, which can be detected by examination of the area between the keel and the vent bones. The mouth and the whites of the eyes may also have a yellow discoloration in this situation. It is common for involvement of the liver to occur in youngsters in the period soon after weaning when stresses are very high. At that time, depending on the strain of organism involved, one or more youngsters in a group of recently weaned birds may be affected. They go off feed, are listless and sit in a hunched posture with feathers ruffled. Droppings may have a yellow discoloration that is most commonly visible in the white portion.

Treatment: A commonly used drug in Canada is Emtryl. This product is purchased as a 40% water-soluble powder that is added to the drinking water at the rate of 1 level teaspoon per Imperial gallon (4.55 litres). Birds should be treated for a minimum of 5 days, and not longer than 7 days. Don't buy the feed-grade formulation of Emtryl.

One problem is that Emtryl can be poisonous. Commonly, birds are overdosed during hot weather or when they are raising youngsters, or both, because of their greater need for more water. In my experience, this tends to happen when fanciers leave Emtryl-treated water before the birds 24 hours a day in hot weather. One of the dramatic side effects is to see Emtryl-poisoned pigeons flopping upside down on the floor of the loft, with the remainder of the birds in the loft terrified by this aberrant behavior. Other, more subtle nervous signs of poisoning can be detected by the observant fancier. If these signs occur, simply remove the treated water and replace it with fresh, clean water, and affected birds will often recover in a day or so.

Fanciers may attempt to compensate during hot weather by cutting the dosage. However, such an approach (as well as putting Emtryl on the end of a toothpick and dropping it into the mouth of a bird -- avoid this procedure) opens the door widely to the development of resistance by the canker organism, and since there seem to be fewer and fewer effective anti-canker products on the market, it is important not to squander perhaps one of the few remaining arrows in our quiver, so to speak.

Luckily, there is a practical solution that should avoid both lower dosages and the possibility of resistance. The practical answer is one that was proposed by an Australian fancier. Having tried it many times, I am convinced that it works, and works well. Here is what the Aussie report recommended.

At the evening feeding, make up the correct dosage of Emtryl in the drinking water, that is, about 3/4 teaspoon of Emtryl per US gallon of water. (Fanciers in Canada should use **one level teaspoon of Emtryl per imperial gallon.**) The Aussie who proposed this method recommended that treated water be placed in the loft and left for a couple of hours or so, after which, this water is thrown out and replaced with fresh untreated water for the next 24 hours. At this time, on the next evening, water containing the same correct dosage is placed in the loft and left for two hours or so, then replaced with fresh water until the next evening. This process is repeated each evening for 5-7 days. This practical answer has two major advantages. Firstly, the birds receive the correct therapeutic dosage of Emtryl for the required number of days. Secondly, the problem with poisoning seems to be largely avoided.

I have often modified this procedure in my own loft by leaving the treated water in the loft over night, and haven't had any problem even with small youngsters in the nest. Note that the company recommends avoiding treatment if the adults are feeding small youngsters. Caution: if the weather is extremely hot and humid, as it can be in southern Ontario, I would suggest that, to be more certain of avoiding a poisoning situation, I would follow the Aussie recommendations and remove the treated water each evening after

two hours or so, and replace it with fresh clean water until the next evening. **Note that the dosage mentioned here is the one recommended for pigeons by the producer of Emtryl.** The information presented here simply follows company recommendations for the use of Emtryl to treat or prevent canker in pigeons.
Sometimes during the racing season, performances will fall off and birds are no longer at the top of the sheet, even though they continue to look good. One possibility is that during the stresses of racing, the immune system of the birds is weakened, and canker organisms have begun to multiply. If you examine the mouths of these birds, you may see marked reddening of the tissues and excess stringy, even dirty, mucus in the back of the throat. It is possible that canker organisms have begun to multiply into the many hundreds of thousands to cause irritation of the throat. To protect the throat from the irritation and to soothe the surface, glands in the area pour out a thick mat of protective mucus . When swabs of this mucus are examined under a microscope, the material is seen to be teeming with many tumbling, wriggling canker organisms.
For those who like to medicate against these canker organisms for one or two days at the beginning of the week, every 2-3 weeks during the racing season, it would seem advisable to use the correct dosage, that is, at the rate of 1 level teaspoon per gallon of water. Like others, I have some concerns about these short one or two-day treatments, because of the strong possibility of resistance developing in the organism as a result of the short treatment period. However, to treat for a full five days could throw the birds completely off form, so the short term treatment period may well be the lesser of two evils. The company producing Emtryl also recommends that you do not inhale the dust, and if you get any of the powder on your hands, wash it off immediately.

Ridzol is another product that can be used in pigeons in the treatment or prevention of canker. According to Dr Kevin Zollars, the correct dosage is 1 to 2 teaspoons per gallon for 5-7 days. Ridzol is reported to be far superior to any other drug in the US. It seems to be less toxic and more effective than other comparable drugs in the treatment or prevention of canker. However, it seems that at this time, it is approved for pigeons only in Europe. Spartrix and Flagyl are two other drugs that seem to be useful treatments.
It is likely a good idea to change drugs each time you feel birds need to be treated, say, Emtryl for one 5-7 day treatment period, and Ridzol, for the next one, etc., all at the correct dosage. This procedure may help to avoid the development of resistance to these drugs by the canker organism -- and all drugs have to be used at the correct dosage.

Resistance to Canker: one of the great problems faced by fanciers everywhere is resistance of the canker organism to a variety of treatments available to us. This problem has developed because fanciers routinely underdose their birds (witness the use of Emtryl on the end of a toothpick, or rubbing a canker lesion with a solution of Emtryl). The answer lies in treating with the correct dosage of drug for the required number of days.
Another important issue is the matter of the resistance of pigeons to the canker organism. To begin this subject, **it is a well-established fact that mild strains of the canker organism will protect birds against a deadly strain**, an important point that we can use to advantage in the loft. This fact was established about 50 years ago by Dr Robert Stabler who worked with the canker organism in Colorado. He worked with several strains of the organism, including a very deadly strain that he called his "Jones' barn strain", obtained from a wild youngster. He passed this organism by eye dropper to 119 successive, clean pigeons; so potent was this strain that 114 of the 119 birds infected with it, died of canker. Dr Stabler found that the transfer of even one organism of the Jones' barn strain to clean pigeons was capable of causing death. Obviously, the single organism multiplied rapidly to very large numbers (hundreds of thousands) in the mouth and crop of infected pigeons. Even so, mild strains of the organism were able to protect birds against this deadly strain. In general, if you haven't had a canker problem in old birds or their youngsters, especially for a few years, it is possible that there is sufficient resistance in your birds to protect them against more deadly strains. If it's not broken, don't fix it!

2. Paratyphoid Infection
In pigeons, this bacterial disease is caused most commonly by *Salmonella typhimurium* variety **copenhagen**, but other species of *S. typhimurium*

can also cause infection in pigeons. If there is any good news about variety **copenhagen**, it is that, firstly, it seems to be virtually confined to pigeons, although there have been occasional outbreaks of this type in chickens. Secondly, although *Salmonella* spp. very often readily cross from one species to another (witness the ongoing concerns about the spread of this infection from food-producing animals and birds -- notably chickens -- to humans), variety **copenhagen** very rarely infects humans. Thirdly, unless antibiotics have been underdosed in a loft consistently, **copenhagen** is often highly susceptible to a wide range of antibiotics.

One of the best if not the actual best is **Baytril**. The second best product is either Cephalexin or Amoxicillin. Treat for a minimum of 10 days with any of these products, and at the same time, it often helps to vaccinate during treatment. Avoid training for at least a week during these treatment periods, and **don't race your birds while they are infected. It is immoral and very unsportsmanlike to transmit his infection to your competitors.**

Paratyphoid disease is usually spread in the droppings of actively infected pigeons or in the droppings of birds that are silent carriers of the infection. It can also be spread through the egg as a result of infection of the ovary of the hen. Rats and mice are obvious culprits in the spread of some types of paratyphoid. According to Dr David Marx, it is a rare loft that doesn't have infected birds, a finding that may surprise many scrupulously clean fanciers who consider their lofts to be paratyphoid-free. It is a common finding that newly introduced, healthy looking birds may be a source of this infection -- which is why wild pigeons or strays from another loft should not be allowed into your loft. Naturally, it is always possible that your own race birds may have been exposed to one or more paratyphoid-infected birds during shipping, so racing is always a risk, not only for paratyphoid infections, but others as well -- *E. coli*, coccidiosis, paramyxovirus, etc..

Outbreaks are common during the breeding season, especially later on in the season after the parents have had to rear several rounds on their own. In this situation, they are severely stressed, and their resistance is down. At this time there has also been quite a drain on the immune system of the parents, because their bodies attempt to include protective substances (antibodies) in the yolk of the eggs and in crop milk. This process results in lowered antibodies in the parents, and they become very susceptible to infections such as paratyphoid.

According to Dr Marx, classical paratyphoid is common in breeding cocks which can become sick and die very quickly -- the bird is fine one day and dead the next. Hens can become sick in the same way, but this form is more common in cocks. In hens, paratyphoid is a more chronic disease in which the affected hens often have severe weight loss ("going light"), sticky droppings containing a lot of mucus, swollen wing joints and affected livers. Another clue to paratyphoid is eggs that turn black and appear rotten. Such eggs were once fertile, began to develop, and then the embryo died of the infection. (If eggs are infertile in the first place, they stay clear for the whole incubation period.) The organisms can contaminate the surface of the egg as it is laid, or it can be incorporated in the egg as it was being formed in an infected ovary (same with *E. coli* infections). Another key characteristic of paratyphoid infection is youngsters that begin to hatch but die in the shell. Diarrhea, dehydration and death in 7-10 day-old youngsters in the nest can occur. Often, only one of the two will get sick and die.

Sore joints in the legs and wings ("wing boil"), with or without swelling of these joints, can occur. Characteristically, the elbow joint is often affected, producing the "wing boil" just mentioned. Tilted heads and twisted necks as the result of infection of the brain can occur in paratyphoid infections, **but are more commonly associated with paramyxovirus infections.** Both paratyphoid and paramyxovirus infections can cause birds to pass a lot of fluids. In paratyphoid infections, the fluid is from a true diarrhea because it comes from the intestines and contains a lot of mucus, possibly some small gas bubbles, and even blood, and may have a detectable odor. In paramyxovirus infection, much of the so-called diarrhea is actually clear fluid coming from the kidneys which are often severely affected by the virus. There is a pool of fluid, in the centre of which is a small "snake" of normal droppings.

Whenever you are faced with an outbreak of paratyphoid infection in your birds, **the first thing to avoid is the use of lime or any other alkaline substance on floors or perches.** Reason: paratyphoid bacteria (and *E. coli)* like alkaline conditions which actually favor multiplication, something you want to avoid at all costs. Floor dressings such as sodium acid bisulfite create acidic conditions that these bacteria don't favor for reproduction. To prevent transmission through drinking water contaminated by droppings, you can add a teaspoon of Javex to a gallon of water to kill the bacteria.

Another approach is to make use of "friendly" bacteria. There are commercial products available for pigeons, as well as capsules of these bacteria for human use. One inexpensive source is plain yogurt.

This approach of using "friendly" bacteria is based on research conducted by a scientist named Esko Nurmi in 1973. Working in Finland, this man developed a procedure in which he fed litter and droppings from salmonella-free, clean, healthy flocks of chickens, to normal, day-old chicks. Afterward, he found that these chicks were resistant to a challenge dose of salmonella organisms given to them by mouth. The principle behind this process is that "good" bacteria in the droppings of clean flocks of birds colonized the intestines of these chicks and simply overwhelmed sites of invasion by salmonella organisms. The same principle applies when a broody chicken scratches in the soil and calls her chicks to pick in that area. The intestines of these chicks are colonized very quickly with masses of "good" bacteria picked up in the soil at this time. In other words, this defence network **competes with** and **excludes** disease-producing bacteria -- hence the expression **competitive exclusion**.

The means by which this protection against salmonella and other disease-producing bacterial organisms is accomplished are not completely understood. However, there are two known mechanisms that operate to protect birds against disease when the principle of competitive exclusion is applied. Firstly, the "good" bacteria in the normal droppings seem to form within the intestine, a physical barrier that may be 10-12 bacteria deep. These protective bacteria actually bind to specific sites on the inner surface of the intestine, and by this means, prevent contact by *Salmonella* sp. with the inner surface of the intestine, and so, prevent these disease-producers from breaching the wall of the intestine and entering the bloodstream.

The second process that occurs is an actual chemical alteration in the intestine. The "good" bacteria in clean droppings are anaerobic species (an = without; aerobic = oxygen), ie, they are able to live and reproduce in an environment in which levels of oxygen are low. In such a situation, the life processes of these bacteria are completed in an anaerobic state. In such an anaerobic environment, these organisms produce and excrete **lactic acid** as one of the by-products of their life processes. In turn, the lactic acid that is excreted by the bacteria into the surrounding environment of the intestine, creates a shift from a normally alkaline state to a more acidic condition in the intestine.

The importance of this fact needs to be re-iterated: many disease-producing bacteria like Salmonella sp. and *E. coli*, for example, like to live in a slightly alkaline environment -- such as the intestines -- where they can reproduce well. In an acidic environment, they are prevented from reproducing, and their numbers drop dramatically, in some cases by 97% or more. One of the many "good" bacteria present is the *Lactobacillus* sp. that we also find in yogurt and similar products used for human food.

Other "good" bacteria that are also present in yogurt include two species of lactic acid-producing *Streptococcus*, among others. The *Lactobacillus* sp. bacteria not only colonize the intestines, but they also attach to the wall of the crop, and are mixed with food that has just been eaten. As the food moves into the proventriculus and gizzard, and then into the intestine, the "good" *Lactobacillus* sp. bacteria move mechanically with it and multiply in the intestine. However, scientific information obtained from experiments using several pure cultures of *Lactobacillus* sp. in chickens showed that this organism alone was not capable of conferring on chickens, the desired resistance to *Salmonella* spp.. Additional methods had to be incorporated along with the use of *Lactobacillus* sp..

A few basic products incorporating these ideas of using "good" bacteria to combat *Salmonella* sp. infections have been examined in the poultry industry. One of these products is called "an unidentified culture". In this situation, intestinal contents from chickens known to be salmonella-free are incubated in a warm, anaerobic environment. The bacteria that are grown in this way are not specifically identified, but this culture is then fed to the birds. The second of these products is called "a defined culture", meaning that **specifically identified bacteria** from a culture of intestinal contents of normal chickens are included in a mix of bacteria that may contain up to 50 different species of bacteria.

There are also products called "probiotics" which are cultures of only a very few kinds of bacteria, ie, for example, the kinds that are found in yogurt. One such starter product for preparing yogurt at home contains a *Lactobacillus* sp., as well as two identified species of Streptococcus. One species of *Streptococcus*, that produced lactic acid, for example, was found to inhibit the growth of 75-85% of disease-producing strains of *E. coli*, but only 45% of livestock varieties of *Salmonella* spp..

In poultry, only the "unidentified culture" appears to be effective against salmonella organisms. "Defined cultures" and "probiotics" are more effective against disease-producing strains of *E. coli*, for example.

A fairly recent development is a mix of 29 bacterial types that is sprayed on newly hatched chicks. The birds pick at their down and of course, swallow the bacteria sprayed on them. These bacteria reproduce in the intestines and block the attachment of *Salmonella* spp.. It is possible that this spray could be helpful in pigeons as well.

In the poultry industry, these types of products have been used in at least three situations:
1. They are given to day-old chicks to allow the rapid colonization of the intestine with "good" bacteria which protect against infection by Salmonella sp..
2. In mature breeder chickens, these products are used if there has been an outbreak of salmonella infection. Birds are first treated with an appropriate antibiotic, after which they are given the "unidentified culture" to prevent re-infection.
3. At times of stress, these products are given to increase the numbers of "good" bacteria that, in turn, will increase the acidity of the intestines, and thereby decrease the risk of an outbreak of intestinal disease.
For pigeons, you can buy often expensive commercial products that are said to contain "friendly" bacteria said to be derived from pigeons.
These products are **alive**, ie, they contain live bacteria, and in order to be useful, the bacteria have to remain alive. So, exposure to sunlight or heat during periods of storage will adversely affect these cultures. **They must not be mixed in water that contains chlorine, iodine or other disinfectants, simply because these chemicals will kill the desirable bacteria in the culture. Similarly, they can't be used when there are antibiotics in the water, for the same reason.**
To further assist the "friendly" bacteria, you can add some whey (from a milk or cheese-producing company) to the drinking water. Whey contains the sugar lactose which these bacteria use a source of food, and from which they produce lactic acid to acidify the intestines.
On an equally practical level, some fanciers feed their birds, especially youngsters, right on the floor of the loft, so that they pick up cultures of normal "friendly" bacteria from their own environment. A similar approach would be to sprinkle fresh droppings from old birds that are known to be clean, on the floor of the young bird loft. There are obvious risks to these procedures, especially if the weather is damp and the floor tends to stay wet: in the dampness, worm eggs and coccidia are able to reach a stage of development that allows them to infect the youngsters. Disease-producing bacteria, including *E. coli* and paratyphoid organisms can begin to multiply in the billions and become a threat to the youngsters.

3. Respiratory Disease.
Respiratory diseases, including one-eyed colds in pigeons, are associated with various bacteria, Mycoplasma spp., Chlamydia spp., and viruses, including herpesvirus. Other important factor in the development of respiratory disease is poor ventilation, and by extension, crowding. Never mind the "overcrowding" we read so much about all the time. Do those who talk so constantly about overcrowding mean that if overcrowding is very bad, crowding is better or just a little less bad?? What nonsense! **Avoid crowding, and NEVER allow overcrowding!!** The stresses and social tensions associated with crowding, plus the reduced amount of oxygen available to birds in a poorly ventilated loft, can set up birds for any number of diseases and problems, including fly-aways. The old saying that **there should be a perch for every bird, but there should not be a bird for every perch**, is well worth heeding.
Respiratory signs can vary from a very slight "teary" appearance of the eyes to marked inflammation and fluid discharge from the eyes, accompanied by sneezing, head-shaking, dirty, greasy cere, the discharge of mucus from the nostrils ("snots")., and excess mucus in the throat. In these cases birds don't tolerate exercise very well, and may actually refuse to fly. Be aware that birds with excess stringy, even dirty mucus in the mouth and throat may not have respiratory disease at all, but instead may be affected by increasing numbers of canker organisms that irritate the tissues and result in an outpouring of protective mucus. In such cases, swabs of the mucus will likely reveal the presence of many canker organisms.
Viruses (eg., herpes) that may be involved in respiratory disease problems aren't affected by antibiotics, so the use of these products is to treat the chlamydia, mycoplasma and bacteria that may be contributing to the problem. A combination of a full dose of Terramycin plus a full dose of Tylan in drinking water is an excellent treatment for respiratory disease. A veterinary friend who is also an excellent fancier, finds that Aureomycin plus Tylan together seem to be an even better treatment. Doxycycline, another powerful drug in the same family as Terramycin and Aureomycin (the three of them are called **tetracyclines)**, is also highly effective -- if you can get it. When using any member of the tetracycline group, you should remove the grit and oyster shell, because the calcium in grit and oyster shell ties up these antibiotics and prevents the birds from making use of it.

4. Worms.

There are two major species of worms that cause problems in pigeons: roundworms (*Ascaridia* spp.) and threadworms or hairworms (Capillaria spp.). Roundworms live free in the intestines and threadworms bury their heads into the wall of the intestine.

i) Roundworms -- these worms are fairly large, and measure 1 1/2 to 2" or more in length. They are believed to compete with the pigeon for nutrients in the intestines, so in heavy infestations, roundworms can be another cause of "going light" because they absorb nutrients that the pigeon needs. In light infestations, these worms tend to gather in the upper part of the intestines, close to the proventriculus and gizzard. In heavy infestations they spread out along the entire intestinal tract and may even be found in the droppings. In large numbers roundworms can effectively block the intestines, and food has a very difficult time passing through.
Female roundworms lay many thousands of eggs regularly, so it doesn't take long for the loft to become heavily contaminated. Soon after they are passed in droppings, eggs aren't able to cause infection in pigeons, even if they are picked up from the floor and swallowed. The eggs need time -- about 2 weeks -- in damp, cool conditions for a young worm to develop. At this stage, if droppings containing eggs have contaminated feed or grit, or if birds are just picking on the floor and swallow eggs, the young worm hatches in the intestines, and over time, becomes an adult -- and the cycle repeats. If loft conditions are too dry, the thick wall of the eggs protects them from dehydration, and they remain dormant until conditions for development are more favorable. They can live in this way for years if necessary.
The only truly effective way to break the cycle after you have eliminated the adults from the intestines is to burn all floor surfaces with a torch. Hot lye (i small can of Gillett's lye to 5 gallons of very hot water) also works but there is always the risk of alkali burns to yourself or your birds when lye is used. If you use lye, all surfaces that it has touched have to be well flushed with clean water after the lye has had a chance to act.
Treatments include the old drug piperazine, but it is only 60-80% effective in killing worms in the intestines. According to Dr Marx, Tramisol, Ivomec and Telmintic are still 80-90% effective, even though worm resistance to Ivomec is developing.

ii) Threadworms (Hairworms) -- these worms are very small (up to 1/4 " long) and very thin, so seeing them in the intestines is very difficult, and requires special techniques. Because these worms bury their front ends right into the wall of the intestines, they cause tissue damage and irritation that can result in hemorrhage, diarrhea and loss of weight. Like roundworm eggs, those of the threadworm are not infective when they are passed in droppings, but need about a week in damp, cool conditions for the development of a young worm. Piperazine and Tramisol aren't effective against these worms. The best drugs continue to be Ivomec and Telmintic.

5. Coccidiosis
Coccidiosis is mainly an important infection of youngsters after weaning, likely because their immune system is not yet as fully developed as it will be later. Like worm eggs, the coccidial form (called an oöcyst) that is passed in droppings isn't yet at an infective stage, and requires, cool, damp conditions for development to the infective stage. Depending on the species of coccidia, microscopically, an oöcyst looks very much like a boiled egg cut in half or lengthwise. Under ideal conditions for the species of coccidia involved, the oöcyst undergoes what is called sporulation, to produce 4 or 8 banana-shaped structures called merozoites.
If a pigeon picks up a sporulated oöcyst and swallows it, within the intestines, these 4 or 8 structures break out and each one enters a cell where it divides to produce more merozoites, that in turn, break out of the cell and enter more cells. This process of repeatedly entering and breaking out of cells causes in the intestines, a great deal of damage and irritation that results in diarrhea. At some point, the process just described changes a bit, and the result now is the production of many oöcysts that break out of cells and pass out with the droppings, ready to start the whole cycle again.
In the past, the common treatment of coccidiosis was the use of sulfa drugs, notably Sulmet. One of our modern drugs, also a sulfa-based product is Vetisulid which is useful against coccidia and bacterial infections as well. One of the best modern drugs to use is Amprol (Amprolium). Another very effective drug is Baycox. After using Amprol (not **while** you are using it), give your birds a day or two of a multi-vitamin mix in the drinking water.

6. E. coli Infections

E. coli (short for *Escherichia coli*) is a very common bacterial organism in the intestines of humans, birds and animals and can be cultured from droppings almost all the time. For this reason, the isolation of this bacterium from a sample of droppings sent to a laboratory should not be surprising. If a culture of droppings reveals many *E. coli*, it is possible that these increased numbers may signify a problem. If the sample was fresh and held chilled until it reached the laboratory, high numbers of organisms are likely meaningful, especially if there was a related history of illness in the birds the sample came from. However, a high count may mean little if the sample wasn't refrigerated right after collection and wasn't sent chilled to the laboratory. Under conditions of little or no refrigeration, bacteria begin to multiply in the warmth, and can create a false picture of events happening in the birds. So don't read a lot into culture results that show high numbers of *E.coli*, unless you can eliminate warm shipping conditions, and can tie these high numbers to an illness that is compatible with *E. coli* infection.

If a post mortem examination and culture of a number of organs from sick birds reveals a high number of *E. coli* in these organs, these *E. coli* are likely to be significant in terms of the illness occurring in the birds. Also, if sick birds are vomiting, have mucoid diarrhea that has an odd odor, such findings are highly suggestive of a significant *E. coli* problem. *E. coli* can complicate other diseases by moving in as secondary invaders, a common finding in adenoviral and other infections, for example. Sometimes pathogenic strains can invade the bloodstream and, like the paratyphoid organism, can result in infections in joints, testes and ovary (which can produce dead-in-shell embryos -- black eggs), "going light", sudden death in youngsters or old birds, etc..

Some of the more useful treatments of *E. coli* infections include Baytril, amoxicillin, cephalexin, and trimethoprim/sulfa. Vetisulid seems to be much less useful than it used to be, likely because of overuse.

7. Paramyxovirus Infection

This infection is caused by paramyxovirus-1 (PMV-1), an agent that is very closely related to the virus that causes Newcastle disease in chickens -- both are PMV-1 agents. It seems to have begun in North Africa from which it spread to Mediterranean countries, Europe, the UK, and finally North America. We have lived with this disease for several years, and the likelihood is that it isn't going to go away any time soon. Last year in the CU yearbook, there was a good article on paramyxovirus in pigeons. Because of certain recent developments on this disease, I would like to update the subject with some new pieces of information that has come to light on this and one other disease.

Firstly, since January of last year, there have been outbreaks of PMV in lofts of racing pigeons in individual lofts in some cities in western Canada. These problems seem to have been dealt with pretty effectively and positively soon after the owners vaccinated all their birds with an oil-based product. These results have confirmed my belief that vaccination in the face of an outbreak of PMV is a very practical way of dealing with the problem.

The controversial parts of this situation are that, firstly, according to some producers of oil-based vaccines, only vaccines developed from the virus cultured from PMV-infected pigeons provide 100% immunity -- and there seems to be a lot of truth in this statement. Secondly, for professional, ethical reasons, practising veterinarians are often reluctant to recommend the use, in one species, of vaccines prepared specifically for use in another species. When there is such use, it is known as "off label" use of a product. In the case of PMV, the use in pigeons of an oil-based vaccine prepared specifically for injection into chickens for the control of Newcastle disease, when that vaccine hasn't been specifically tested in pigeons, is "off label" use of the product. For this reason, some veterinarians are recommending only the use of the appropriate vaccines developed from outbreaks of PMV disease in pigeons -- such as the vaccine developed by Maine Biologics in the USA, or the product known as Colombovac.

Why don't the big poultry vaccine companies that prepare these vaccines for use in domestic poultry, also have them licensed for use in pigeons? The reason is that it is time-consuming and expensive for producers of these vaccines to seek federal approval for their use in species such as pigeons, because of the relatively minor market that pigeons provide in this country. So these companies avoid the time-consuming research and expense of developing these products for pigeons, and concentrate their efforts on the more financially important domestic poultry industry.

A good but lesser example of this type of situation was the availability at one time, of small, convenient packets of Emtryl for pigeons. Several years ago, the company producing Emtryl sold it for use in pigeons in small packets (they called them "sachets") that contained the **correct dose of 3 grams (1 level teaspoon) to be used in one Imperial gallon (4.55 litres) of drinking water for 5-7 days.** Since the

market for this 3-gram packet of Emtryl was very limited, the company eventually discontinued production of these packets. (Too bad because in my experience, fanciers too often underdose their pigeons with Emtryl. If these packets continued to be available to us, it seems to me that lower-than-desirable doses might be largely avoided today. Final point: the dosage of Emtryl recommended in the veterinary formulary published in the yearbook a few years ago is far too low. Use the correct dosage given earlier in this paragraph.)

Back to PMV. When the western fanciers who experienced the outbreaks of PMV vaccinated their birds, I mentioned that most apparently used an oil-based vaccine, one called Newcastle K, since the formerly used Newcavac-T was no longer available. Several months later, I spoke personally to some of the fanciers involved in these outbreaks and learned that spread of the disease in their lofts came to a halt within a relatively short time after vaccination with this product, and they haven't had any more problem with PMV. Hence, my belief in vaccinating birds in the face of an outbreak. This belief is also based on the fact that PMV tends to spread relatively slowly through a flock of pigeons, a point that allows a fancier a window of opportunity to vaccinate, and save many birds in the loft.

For those who are adamantly opposed to vaccination or treatment of any kind, at the least consider this: at the minimum, protect your valuable stock birds (some of them irreplaceable) by vaccinating them each year. In this way, if your unvaccinated race team is virtually destroyed by the disease, you can produce another generation of racers from your routinely vaccinated stock birds. My recommendation would be to vaccinate all of your birds, old and young, before the race season each year.

Avoid the use of the live, water-based LaSota-type vaccines used in domestic poultry as protection against Newcastle disease. They are virtually useless in protecting pigeons against PMV infection and for this reason, they are a complete waste of time and money.

Now, another important development for us. Apparently in recent months in the USA, there has been an outbreak of Newcastle disease in chickens. **(Remember that the PMV agent in pigeons and the one causing Newcastle disease in chickens have a number of genetic similarities -- and both are PMV-1 agents.)** The importance of this outbreak is that the source of the virus seems to have been feral (wild) PMV-infected pigeons whose droppings contaminated feed prepared for these chickens. This outbreak has similarities to one that occurred several years ago in Britain during their first major epidemic of the disease. The scenario in Britain was the same: the droppings of PMV-infected wild pigeons seem to have contaminated feed to be used for domestic poultry. The virus was present in the pigeon droppings and after contaminating the feed, it was able to infect exposed, susceptible poultry.

Because the two agents are similar, in Canada when a Newcastle-type virus such as the PMV agent of pigeons is isolated from any species of bird, Agriculture Canada scientists inoculate this virus into susceptible chickens (or into developing chicken embryos). If these chickens develop a mild, hardly noticeable disease or no visible evidence of disease, the virus is considered to be a mild, or as they say, **lentogenic strain** of Newcastle disease. **This is the most common form of disease caused by the PMV agent of pigeons when it is inoculated into chickens.**

When the disease that occurs in the inoculated chickens is a little more severe, with increased signs of disease, the virus is considered to be a "medium strength" virus, and is designated as a **mesogenic strain** of Newcastle disease. Finally, if a very severe, deadly form of Newcastle disease develops in the inoculated chickens, in which many of these birds die, the virus is considered to be the "hottest" known strain, called a **velogenic strain** of Newcastle disease. **Velogenic Newcastle disease** is the most worrisome and feared form of Newcastle disease, and is one that causes a great deal of alarm in both the poultry industry and federal/provincial officials when it breaks out.

To date, most of the strains of PMV isolated from pigeons have been considered to be the **lentogenic** or the mildest strain of Newcastle disease, but some occasional isolates in Canada have been considered to be **mesogenic** forms of the disease. So far, to my knowledge, no PMV isolated from pigeons in Canada has produced severe, velogenic Newcastle disease when the virus is inoculated into chickens.

Having said the foregoing, however, I believe that it is important to recognize and acknowledge the fact that the poultry industry in North America is very powerful, and if this industry gets on a campaign to wage war on pigeons and pigeon racing because it believes that pigeons, including racing pigeons, are the cause of outbreaks of Newcastle disease in poultry, we could be in trouble. The poultry industry is not likely to let a few thousand pigeons or fanciers adversely affect or **appear** to adversely affect the goals of this mega-industry, without a vigorous reaction.

For this reason, it is highly important for the future of the sport that **individual fanciers accept their responsibility and vaccinate their birds annually against PMV.** Vaccination is both good public relations and good protection against this disease. To go a step further and for the protection of all of us, in my opinion, it should be CU and club policy that **all members must vaccinate their birds annually with an appropriate vaccine in order to compete in races.** If this is done and vaccination records are kept up to date, we can point with confidence to the fact that our birds were NOT the source of the infection if the disease breaks out in nearby poultry operations.
The Association of Pigeon Veterinarians in North America is preparing a formal letter to our national pigeon associations on both sides of the border to advise them of the current situation, and to make a strong recommendation about the need for annual vaccination of domestic pigeons.
This disease in chickens could result in serious problems for the sport because of the potential implications for the poultry industry, which is worth multi-billions of dollars. We have to protect the sport and the birds in our individual lofts, by getting on the vaccination bandwagon. Just as importantly, we also need to let the poultry industry know that vaccination programs for our birds have been well under way for these many years -- since the mid 1980s -- and that the practice continues to this day.
We also need to make a strong point that the most likely source of the virus for chickens is feral pigeons that sit on public and privately-owned buildings, including those housing feed companies. The virus has likely now infected a number of populations of feral pigeons all over North America. Many of these infected birds have probably died with severe nervous signs, whereas other in-contact birds have developed sufficient resistance to protect them, but not before they passed the virus to other susceptible pigeons around them, and so the process is continued -- a perfect mechanism for the virus to perpetuate itself indefinitely. A few birds die that many may live to spread the virus.

8. Avian influenza is another viral disease of poultry, and is one that can cause devastating losses in infected domestic chickens. It has caused interruption or cancellation of racing schedules in the USA, because of the fear by federal and state officials that racing and other pigeons could be a source of virus to major poultry operations. However, it seems that these fears are groundless.
Several scientific studies (including at least one in this decade) conducted over several years by respected scientists in the USA and Canada have shown that pigeons are not infected by this virus (not even by the North American strains that are most deadly to poultry), that they don't carry it, and that they don't transmit it to domestic poultry. On the other hand, wild waterfowl are intimately associated with a number of strains of the influenza virus, and are likely the major source of virus for the poultry industry.

9. Pigeon Pox
This is another viral disease that has posed some problems for fanciers over the years, especially in the summer time when flies and mosquitoes are abundant. The characteristics of the disease are wart-like growths on the side of the beak, nostrils, ceres around the eye and beak, feet and skin (dry pox). Occasionally, it will cause problems inside the mouth (wet pox) and may be confused with canker in this location.
The disease is readily preventable by proper vaccination, which should be done several weeks before training and racing begin. As the vaccine is alive, the idea is to pull a few feathers, usually from the area of the outer thigh, and with the use of the stiff brush provided, rub the brush that has been dipped in vaccine, into the exposed feather follicles. Avoid using the skin of the breast as a vaccination site to prevent any damage to the underlying muscles of flight. If there has been a "take", the early signs are swelling of the empty follicles at the vaccination site, followed in a few days by scabbing of the area. If scabbing doesn't occur, the birds haven't been vaccinated. It is a good idea to examine birds 7-10 days after vaccination to insure that there has been a "take". Vaccination in the face of an outbreak can be effective.
In North America in the past few years, there have been a number of reports from fanciers that in birds apparently vaccinated correctly, there has been no evidence of good immunity. The reasons can be varied. Some suggestions have included: **1)** the idea that in the pigeon pox virus, there has been a mutation to a more pathogenic strain, **2)** that there has been improper vaccination technique, **3)** that there has been improper handling of the vaccine during transport or after it is in use, **4)** that a number of outbreaks were related to use of a European vaccine (blue vaccine) that gave no indication of a "take", **5)** that some vaccines may have been ineffective, or only minimally effective in producing a "take". On this point, one producer of vaccines has assumed this to be the problem with their vaccine, and have

undertaken to examine all of their procedures on the production line to determine if there was a "weak link" in production. They too have wondered about a mutation in the wild virus to produce a strain that vaccines can't currently protect against.
There is no practical treatment of pox. The use of flowers of sulfur in the grit container is just not effective. The use of iodine on the pox lesions themselves could help to prevent spread of the virus to other birds, but these pox lesions will take just as long to resolve whether you use iodine or nothing.