

Paratyphoid — prevention is better than cure

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The causing bacteria

Salmonella the bacteria responsible for the disease known as Paratyphoid needs to be understood before we can understand the disease. There are many different species and strains of this gram negative bacteria. Some of these will cause only mild intestinal disease whilst others will be much more virulent and pathogenic however only Salmonella typhimurium var copenhagen and will be the cause of the dreaded Paratyphoid syndrome in pigeons.

Prevalence of the disease

Paratyphoid is a world wide disease amongst pigeons. In earlier years the disease was much less prevalent in

South Africa, but the continuous import of pigeons into our country has caused a significant increase in the disease prevalence. It is particularly common in Europe and the USA.

Understanding the disease

The highly pathogenic (severe disease causing) strains of Salmonella will cause full blown Paratyphoid. The bacteria will always enter the pigeon via the intestine. Initially it causes mild enteritis that may or may not progress to severe enteritis with some cases even showing blood in the stool. The Salmonella bacteria attaches onto the superficial cells of the intestine via specific areas in these cells. If the organism is prevented from attaching to these cells it will not gain access to the blood stream. Only when it attaches in vast numbers to the superficial cells will it cause enough damage to enter the blood stream and cause systemic disease. It is normally carried into the body via the white blood cells. Once Salmonella has entered the blood stream it is extremely well suited to gain entry to most organs in the body. It is only once it has entered the organs of the body that it causes typical Paratyphoid, Although Salmonella may affect any organ in the body it specifically targets the Liver, Spleen, Ovaries, Brain and the Joints.

It is this predilection for the Ovaries and Joints that makes it such a difficult organism to treat successfully. By entering the ovaries it ensures that the hen will become a life long carrier of the disease and even worse that she will pass this dreaded disease on to her babies via the egg. If it establishes itself in the joints it ensures that it is separated from the blood stream and that it can hide in the joint fluid and in the joint membranes.

Symptoms of the disease

Initial symptoms will always be mild to severe enteritis with green bile tinged sloppy stool. In some cases the pigeon's immune system may be strong enough or the bacterial strain may be weak enough to ensure that the bacteria do not gain entry into the body.

In most cases the bacteria will soon gain entry into the body and cause infection of the liver (hepatitis). The stool will remain loose and will become a dark green color signifying severe liver damage. Once this has happened, the pigeons become severely depressed and will stop eating. The affected pigeons will soon lose a lot of weight and may succumb from the hepatitis. In most cases the disease will spread from the liver to other organs. If it spreads to the brain the pigeons will show nervous symptoms that may be very difficult to distinguish from Paramyxovirus. Once the infection has established itself in the ovaries the hen will become a life long carrier and will pass the disease on to her babies via the egg. If the joints become infected pigeons will develop lameness in the leg or wing and it will establish itself in the joints. The bacteria will hide in the joint fluid or in the membrane of the joint. The fact that the normal antibiotics do not penetrate well into the joint or into the brain makes it very difficult to eradicate the bacteria from these organs. This gives rise to the true carriers of Paratyphoid,

Source of the infections

Salmonella infection is carried by rodents in their kidneys. When rats or mice urinate on pigeon food the food becomes contaminated with Salmonella and when pigeons eat the food they in turn become infected with the disease. Pigeons carrying the disease are another source of infection. These carrier pigeons often show no clinical signs of disease thereby making it very difficult to establish the source of infection. Contaminated drinking water and wild birds may be another source of infection.

Diagnosis of the disease

The clinical symptoms of Paratyphoid vary tremendously and may often be confused with other diseases. The diagnosis of Paratyphoid is made by growing the bacteria in the laboratory. A lab that is well versed in the diagnosis of these specific bacteria should be used as specific culture methods need to be used to identify the L- forms of these organisms. Pigeons that are clinically affected are easier to diagnose as the bacteria is not hiding in the affected organs yet. True Salmonella carriers will only excrete the bacteria in the stool from time to time. It is thus essential to do a post mortem or to do repeated fecal cultures to try and identify carriers. From the above it is clear that once the disease has established itself in a pigeon loft it is almost impossible to eradicate it completely.

Diagnosis

A new diagnostic kit for the fast diagnosis of Salmonella has been developed in the USA. This kit will make the diagnosis of Salmonella much easier and faster. Hopefully this test will be available at my practice this year.

The test can also be used to try and identify carriers of the disease after a Post Mortem has been performed.

(Pigeon fanciers are invited to discuss this test with me)

Prevention

Is Paratyphoid preventable? This is a question for which there is still no clear answer. If one can keep pigeons in isolation and prevent them from coming into contact with the bacteria one is assured of a Salmonella free flock. This is of course not possible in our sport.

The eradication of rats and mice from in and around the loft is paramount. As mentioned before these vermin are the greatest carriers of Salmonella. Grain should be stored in air tight bins to prevent rats urinating on the grain. No food should be left out in the feeders in the evening as rats will enter the loft and contaminate this food. Early mornings the pigeons will consume this contaminated food and become infected. It is extremely important to prevent the stock pigeons food from becoming infected as infected stock birds will breed infected babies. Be careful when bringing in new pigeons into the loft. Ideally pigeons should be tested and kept in quarantine before being allowed into the stock loft. In the past the efficacy of vaccination was an extremely contentious point. An excellent scientific study was done in 2000 where it was proven that at that stage vaccination did not protect pigeons from becoming infected after being vaccinated with the three Paratyphoid vaccines then available in Europe. All the pigeons that were vaccinated and challenged after vaccination developed symptoms and shed the organism. It is also well known that bacterial vaccines are not nearly as effective as viral vaccines. The duration of immunity is also much shorter and giving a booster vaccination two weeks after the first is mandatory. Recently two vaccines were available that seemed to give much better protection. The Salmonella vaccine manufactured by Columbovac is a good choice but is currently not being marketed in South Africa. Dr Van Sluis the well known Veterinarian from the Netherlands manufactures an excellent Salmonella vaccine. This vaccine is also not available commercially and when imported it is extremely expensive. It was clear to me that we needed an effective and affordable Paratyphoid vaccine made from a local South African strain of Salmonella typhimurium. After extensive research and development this vaccine has finally been made available to pigeon fanciers in South Africa. Paratyphoid-vacc was developed from Salmonella typhimurium bacteria that were isolated from a pigeon that died from the septiceamic form of Paratyphoid in South Africa. The vaccine is a dead vaccine and contains the maximum amount of dead bacterial colonies to ensure excellent immunity. The adjuvant is of the highest quality and is not oil based thereby ensuring less vaccination reactions and ease of injection. All the safety trials have been completed and because this is a dead vaccine it cannot cause disease, may be used along with antibiotics and will not affect post vaccination racing performance. The vaccine's efficacy was proven by challenging ten youngsters two weeks after their second vaccination with a massive dose of virulent live Salmonella typhimurium bacteria per mouth. Amazingly not one of the ten youngsters showed any signs of disease and are still all alive and well.

Over the last few years the concept of intestinal health by way of pre and pro-biotics has been advocated by many vets in the poultry and pig industry. When combined with systemic immune stimulants we have a powerful aid in the prevention of systemic Paratyphoid. The pro-biotics are the good bacteria that excrete an acid as they grow. If enough of these good bacteria are supplied to pigeons they tend to colonize the intestines in such a way that the bad bacteria such as Salmonella and E coli cannot adhere to the cells of the intestine and establish themselves in the gut. The lower acidity of the gut will also prevent the overgrowth of Candida. "The good guys stay behind and the bad guys are passed out." Lately it has become popular to also supply pre-biotics in an intestinal health product. These pre-biotics are specific sugars and fibers that the good bacteria need to live on and multiply. By supplying these pre-biotics we are ensuring that the good bacteria thrive and multiply in the intestine. The addition of well proven immune stimulants such as Beta-Glucan and other antioxidants to such an intestinal health product will improve the efficacy as it will stimulate the systemic immunity so that any bacteria that do gain entry to the blood stream is better neutralized by the immune system. Two excellent new intestinal health products have been launched lately. Intestum from Medpet and Avio-Entromune from Aviomed are both excellent products and should be used routinely in the health programs of pigeons. Intestum also contains Calcium, Magnesium and Methionine.

Avio-Entromune has the added advantage that it contains a special toxin binding clay. This is the same type of clay that the Macaws consume in the Amazon River area. It has the unique characteristic of binding toxins found in the water as well as Mycotoxins such as Aflatoxin found in mouldy grain. The inclusion of this clay prevents absorption of these toxins. When these toxins are absorbed they will cause liver damage and suppress the immunity, thereby increasing the chances of Paratyphoid developing. Also included in Avio-Entromune is the potent antioxidant derived from Grape skin extract and also garlic powder. Another new development is the availability of Avio-gel that is a specially developed product that may be used to adhere other powders to food. Avio-gel also contains dry Apple cider vinegar and Grape fruit seed extract that further helps to prevent Salmonella, E coli and Candida in establishing themselves in the intestine. Regular use of Avio-gel and Avio-Entromune will go a long way to aid in the prevention of Paratyphoid and other intestinal diseases.

Treatment

It is very important to realize that there is a marked difference in treating the intestinal non systemic form of Paratyphoid compared to the systemic form. When the bacteria has not yet entered the blood stream and is only in the intestine a short course of 5-7 days treatment with Furalfadone (Aviomed or Medpet 4 in I) may be used. Other antibiotics such as Amoxicillin or Neomycin may also be used.

Once the bacteria has however entered the blood stream and a systemic carrier status develops a very specific treatment regime has to be followed. At this stage it is unclear whether any treatment regime has the potential to clear the true carrier state that exists in some pigeons. It is especially the joint form and the ovarian form that is extremely difficult if not impossible to clear. The hens that carry the bacteria in their ovaries will transfer it via their eggs to their babies.

Research done in the eighties showed that treating pigeons at four times the recommended dose (2-3 ml per liter of drinking water) with Baytril for 10 days has the best chance of clearing carrier pigeons of the disease. It does however seem that this treatment regime may have a negative effect on the fertility of cocks.

Treatment with very high doses of Trimethoprim (Mediprim, Theraprim or Aviocox) for 10 days is also reported to clear some of the carrier states.

Resistance to all of the above antibiotics have developed and one is not always sure that any of the above will be effective. It seems that it is particularly the virulent forms of Paratyphoid that will kill pigeons that tend to be resistant to the normal antibiotics. In these cases it is essential to culture (grow) these bacteria and do an antibiogram to find out which antibiotic is best suited.

In cases where the disease in its acute systemic stage and where pigeons are dying the use of Chloramfenicol has been particularly rewarding, In these cases it is essential that an intestinal health product such as Avio Entromune and Avio-gel be combined with the antibiotic because Chloramfenicol will only suppress the bacteria and a healthy immune system is needed to eradicate the bacteria.

The use of Polypharmacy (combining of antibiotics) may currently be the best choice for the treatment of Paratyphoid. It is however very important that the correct combination of antibiotics at the correct dosage be prescribed by a pigeon veterinarian and that pigeon fanciers do not attempt to do this on their own. Typhoid-cure is a combination of three excellent antibiotics that act together to be highly effective against most strains of Salmonella. During a recent outbreak of Paratyphoid in a well known pigeon loft this product was extremely successful and even hens that were laying infected eggs were cured.

Summary

Understand the disease.

Realize that the joint forms of the carrier states are almost impossible to treat effectively.

Prevent infection by avoiding rodents on food and around the loft

Be careful of imported and other pigeons carrying the disease.

Quarantine all new pigeons in the breeding loft,

Understand the difficulty of diagnosing the disease.

Prevent the establishment of the disease by using Intestinal health products.

Vaccinate correctly with Paratyphoid-vacc

When treating with polypharmacy consult a pigeon Vet to prescribe the correct treatment.

Preventative program for Paratyphoid

Start 10 weeks before the racing or breeding season

Treat all pigeons for 10 days with Typhoid-cure in drinking water

Combine the above for the full 10 days with Avio-gel and Avio-Entromune over food

Vaccinate all pigeons the last day of treatment with Paratyphoid-vacc

Continue with the normal pre-racing or pre-breeding program

Vaccinate all pigeons again two weeks after the first vaccine with Paratyphoid-vacc

This vaccine may be combined with any other treatments even antibiotics

Leave at least one week gap between vaccination with Paratyphoid-vacc and any other vaccines such as Paramyxo or Pox vaccine

It is advised to vaccinate with Paramyxovirus vaccine 6 weeks before racing season

It is advised to vaccinate with Pox vaccine 5 weeks before the racing season

Vaccination schedule

Day 70 to Day 60 before season Typhoid-cure Avio-gel & Avio-Entromune

Day 60 before season vaccinate with Paratyphoid-vacc

Day 57 before season start with pre season program

Day 46 before season vaccinate again with Paratyphoid-vacc

Day 40 before season vaccinate with Nobivac paramyxo or other Paramyxo-vaccine

Day 35 before season vaccinate with pigeon pox vaccine