International Poultry Production

Poultryhealth BYTES

Your own reference source on poultry health

Poultry Focus Asia 2020

Number: 235

Colisepticaemia - II

Pathogenesis

E. coli is an ever present bacterium in the gut of poultry especially in the lower gut and the caeca. However, the strains of E. coli most commonly associated with colisepticaemia are also found in the pharynx at the back of the throat and upper trachea as a result of inhaling contaminated dust.

E. coli invades the chicken's body from the upper respiratory tract and this is facilitated by factors that impair the defence mechanisms that are found in this region. Such factors include ciliostatic viruses (for example, infectious bronchitis and avian pneumovirus) that impede the action of the microscopic hairs or cilia that line the trachea. A similar effect occurs with the action of ammonia gas on the cilia as well as a suppressing effect on the action of the macrophages – large cells that are part of the bird's defence system. These macrophages engulf and destroy foreign matter such as invading micro-organisms. E. coli invasion also occurs when the chicken's resistance is reduced by other stresses such as high dust levels, high temperatures and hypovitaminosis A.

After crossing the lining of the respiratory tract the E. coli spreads around the bird's body via the bloodstream and induces lesions in various internal organs. Except in the most acute cases these lesions are invariably associated with fibrin formation, thus we get fibrinous pericarditis, fibrinous perihepatitis and fibrinous pericarditis.

Clinical picture

Colisepticaemia can occur at virtually any age in broiler chickens and turkey growers, but in breeders the condition is more common pre-point of lay.

A typically affected broiler flock goes quiet and loses its appetite with birds then appearing dejected, listless and with ruffled feathers. Respiratory distress is a common occurrence. Morbidity is variable and mortality is usually less than 5% but can, on occasions, be significantly higher.

The clinical picture can be influenced by co-infecting agents. For example if infectious bronchitis virus or Mycoplasma gallisepticum is involved, the respiratory signs may be more pronounced. In the case of the latter, and also with avian pneumovirus in turkeys, swollen infra orbital sinuses are often seen.

Following a bout of colisepticaemia in a flock, uniformity of body size is lost. This is because some birds do not die but are left with the consequences (sequelae) of the disease process, such as a chronic restrictive fibrinous pericarditis which impedes cardiac function and thus growth. Such birds are often condemned or downgraded in the processing plant.

In some instances chronic lameness as a result of joint infection (arthritis) occurs.

Post mortem findings

Typically carcases are fevered and, as such, are dehydrated and discoloured due to the septicaemia. Internally the main organs of the body are enlarged and congested, so we see hepatomegaly (enlarged liver), splenomegaly (enlarged spleen) and congested lungs and kidneys.

Typically we see a white fibrinous lining on several organs and this is seen as a fibrinous pericarditis, a fibrinous perihepatitis, a fibrinous peritonitis and a fibrinous air sacculitis. which can be accompanied by a fibrinous pleurisy on the surface of the lungs.

A pure heavy growth of the causative E. coli bacterium can be isolated from the liver, spleen, lungs, heart blood and bone marrow. When taken from the heart blood this growth can be so pure and diffuse that an antibiogram can be performed on the primary culture. If this is spread over the agar plate time can be saved in obtaining the important information as to which antibiotics the causative E. coli is sensitive to.

Treatment and control

In many situations this condition will respond to antibiotic medication but the killing of broilers at younger and younger ages and the desire to minimise antibiotic usage in poultry production in many countries means that this is a less attractive proposition than it once was. In addition, some of the best treatments such as furazolidone, furaltadone and enrofloxacin are legally no longer available in many countries or their usage is tightly controlled.

When treating colisepticaemia time is of the essence so choice of antibiotic is often based on farm history and the antibiogram is used a couple of days later to confirm the choice that was made. The longer medication is delayed the greater the likelihood of downgrading and/or condemnations occurring in the processing plant. In this context it is desirable to train farm staff to spot the disease early on the farm so medication can be started as early as possible.

This means that the backbone to any control strategy has to be prevention. This centres on sourcing clean chicks from good sources and placing them in clean houses and then ensuring that the resulting flock is not stressed. This involves good environmental management, including ventilation. In the pre-turkey rhinotracheitis days, early detection of colisepticaemia in eight week or older turkeys, coupled to increasing the ventilation rate (which in some instances necessitated returning to heating the house), was a very effective way of 'treating' colisepticaemia.

Needless to say controlling the respiratory viral infections that can trigger an outbreak of colisepticaemia by vaccination forms an important part of this prevention strategy.

In some parts of the world E. coli vaccines have been used with success when the problem has been a recurring one.