International Poultry Production

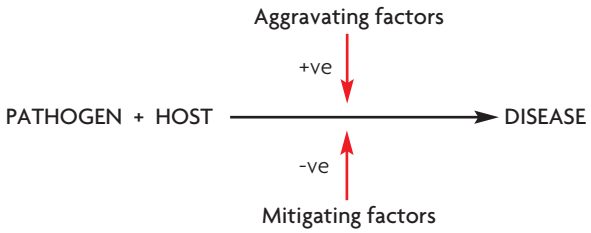
Poultryhealth BYTES

Your own reference source on poultry health

Number: 182

Interactions

Poultry health (and high productivity) is the end result of everything coming good at the same time or, to put it another way, disease is the end result of when things go wrong. By everything we mean more than just the pathogen and host. We mean pathogen + host + all those other factors that interact with these two to modify their outcome so that we do not have one specific outcome but rather an infinite multitude of outcomes, all of which are subtly different from one another. We can represent this in the following way:



Let us now consider this with a couple of examples.

Infectious bronchitis in chickens

If our chickens are just infected by the infectious bronchitis virus the clinical picture will be influenced by the strain of virus involved as this dictates the tissue tropism of the virus and its virulence, as well as host factors such as age of bird and level of vaccinal immunity. Then other factors come into play, such as stocking rate – increasing this is an aggravating factor and decreasing it is a mitigating factor. Other aggravating factors include under ventilation, high environmental temperatures, immunosuppression, various other stresses, increased ammonia concentration (it has been demonstrated that ammonia inhibits the movement of the tracheal cilia and thereby removes one of the respiratory tract's front line defence mechanisms). Another factor that aggravates infectious bronchitis is concurrent infection(s). These can be viral, such as Newcastle disease, mycoplasmal, such as Mycoplasma gallisepticum, or bacterial, for example, E. coli. These can be additive in nature, for example it has been shown that the impact on the disease picture of E. coli and ammonia is greater than that of ammonia or E. coli on their own.

Rickets in young turkeys

Rickets is a nutritional disease whose aetiology is a calcium deficiency, an imbalance between calcium and phosphorus in the diet or inadequate vitamin D_3 in the diet. Key bird factors are age, as rickets is a disease of young fast growing turkeys (2-5 weeks old), the provision of the wrong type of vitamin D_3 and the proportion of unavailable or phytate phosphorus in the diet. When it comes to aggravating factors anything that depresses feed intake is going to be important, as is anything that interferes with calcium (or phosphorus) uptake from the gut. A good example of this is clinical or subclinical coccidiosis, which damages the gut lining and reduces the area available for mineral uptake. If we are relying on an in-feed anticoccidial this is another way by which depressed feed intake can complicate the disease picture presented.