Viernes, 30 de octubre, 12:00 h

Mycoplasmas in poultry sector: another point of view

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The pathogenic role of many avian Mycoplasma species is nowadays well recognized by the scientific community and by the technicians working in the poultry sector. The negative effects they are able to cause to the zootechnical production has brought to the need to apply routinely specific measures for the prevention and the confinement of infection. These regulations are mainly based on the development and conservation of Mycoplasma-*free* breeder groups and on the following of strict biosecurity programs, in which the meat sector is also involved.

The aim of the present study is to underline the strength of the relationship between mycoplasma's specific characters and their ability to determine great losses in all the categories of production. The objective is also the definition of some critical control points for the prevention of mycoplasma infection. The only way to reach this goal is to change the point of view from a single farm based one to a wider one, which includes also the environment.

In the last few years, new clinical signs related to mycoplasma infections appeared: the eggshell apex abnormalities in layers during a *Mycoplasma synoviae* (MS) infection (Catania., *et al* 2010), the *Mycoplasma iowae* (MI) syndrome in meat turkey groups (Catania *et al*., 2012), the identification of *Mycoplasma meleagridis* (MM) in a new host, the guinea fowl (Catania *et al*., 2014), and the atypical diffusion of a thermo-sensitive strain of *Mycoplasma gallisepticum* (MG) in a Densely Populated Poultry Area (DPPA) (Catania *et al*., 2012).

These kind of changes could be due to a variation or an adaptation of the microbial species to the environment or they could represent the result of a modification in host's characteristics or in farming technologies.

This *scenario* can be summarized as "things have changed", but it is fundamental to weight properly all the words of this short sentence.

First of all, while analyzing the change of a pathogen or an infectious disease it is critical to point out the reason why this modification has happened.

The application of Aristoteles doctrine could be helpful in reaching a complete understanding of events. Indeed, the observation of the disease's behavior is fundamental in the definition of the reasons that led to that specific change and in pointing out the differences get either through biologic modifications of the pathogen or through farming techniques.

It is even more important to learn from this changes and to understand them for the future, assuming a pro-active role in the pathogen's ecology (natural history), aimed at controlling the pathogen and at avoiding the presence of suitable conditions for a host jump or for a better fit of the microorganism to the farm's environment.

The assumption of this role could lower the risk of health consequences and economic negative repercussions on the production.

Moreover, among mycoplasmas distinctive traits, they are considered one of the organisms with the fastest evolution ability (Ciccarelli et al., 2006). An example could be helpful for a more complete understanding of their adaptation abilities.

The ability to adapt to new hosts concerns the avian pathogen *Mycoplasma gallisepticum* (MG). In 1994, a new clinical syndrome characterized by infraorbital sinusitis and death in the wild population of house finches (*Carpodacus mexicanus*) was found in North America. The causative agent isolated was MG.

This first finding just represented the starting point for many research groups to go in depth. Furthermore the possibility of a transmission from a well populated wild species could have represented a great risk for the avian industrial sector.

Bio-molecular studies demonstrated that the strain of MG isolated from the wild population of *Carpodacus mexicanus* was actually the adaptation result of an endemic strain of the poultry industry (Delaney et al., 2012; Hochachka et al., 2013). Its adjustment to the new population caused the loss of pathogenicity to its ancestral host.

The consequences coming from this adaptation depends not only to the pathogen itself, but also to the strength of control measures built up to contrast its spread.

The result of these dynamic forces working one against to the other could hesitate in the onset of economic losses in the poultry sector. This is the reason why it is unhelpful to change the pathogen, but it is possible to change the veterinary actions in the avian sector, undertaking a pro-active role direct to the definition of drivers and their modification.

The poultry industry system, the farming scenario and the presence of helpful conditions for the pathogen overcome are key factors, which should always be evaluated to avoid the establishment of new opportunities for our pathogens. A concrete example are multi-ages and multi-species kind of farms.

We have a big opportunity because a lot of tools are actually available but we have to better understand how we can use them more properly. In particular MG and MS genotyping techniques and Minimum Inhibitory Concentration test can give to the avian practitioners important data for a better management of Mycoplasma outbreaks.

The cooperation between every person involved in the avian sector could contribute in building a strong wall to front Mycoplasmas.

In conclusion, a pro-active role in the management of national and international avian population could represent a great tool to reach the control of many pathogens. This goal could be reached only *via* an integrated kind of approach where technicians, farmers, veterinarians and Institutions work together for this high and common objective.

A compart-based kind of national organization for the DPPA could represent the way to stop mycoplasma cycle and spread, with the aim of creating a more sustainable and profitable management and economic production.

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