Decreased production in broiler breeders due to tendon rupture by *Mycoplasma synoviae*

Fernando A. Moreira[a*], Juan A. Játiva[b], Luís Cardoso[a], Ana C. Coelho[a]

[a]*Department of Veterinary Sciences, School of Agrarian and Veterinary Sciences, University of Trás-os-Montes e Alto Douro (UTAD), Animal and Veterinary Science Center (CECAV), P.O. Box 1013, 5001-801 Vila Real, Portugal;*
[b]*Aviagen, S.A.U. C/ Quintana, s/n, 08416 Riells del Fai, Barcelona, España*
**fernando.moreira@lusiaves.pt*

INTRODUCTION

In chickens *Mycoplasma synoviae* most frequently occurs as a subclinical or inaparent infection of the upper respiratory tract (Vogl *et al.*, 2008). Nevertheless, this agent can also cause an infectious synovitis (Cobb, 2011). In both cases, infection with *M. synoviae* might result in a decrease of egg production, growth and hatchability rates, and in a downgrading of carcasses at slaughter due to airsacculitis and arthritis lesions (Kleven, 2003). In recent years, the occurrence of arthropathic and amyloidogenic strains of *M. synoviae*, as well as strains that induce eggshell apex abnormalities and egg production losses, has increased the economic impact of this pathogen (Catania *et al*., 2010).

CASE REPORT

In late February 2013, an outbreak of lameness occurred on a broiler breeder flock (30,000 birds divided by four houses) of a multi-age farm, with a total of two broiler breeder flocks (60,000 birds in total). The leg lesions began soon after transfer between 23 and 25 weeks of age, and persisted for the rest of the flock's life although with peaks of morbidity and mortality. The percentage of birds with this problem ranged between 5 and 10%. A standard breeder vaccination program was applied but the flock had not been vaccinated against *M. gallisepticum* or *M. synoviae*. In the rearing period, between 10 and 18 weeks of age, serologic tests to *M. gallisepticum* and *M. synoviae* were negative.

CLINICAL SIGNS

Postmortem examination of 30 animals at the farm revealed arthritis lesions affecting the hock joint in 40% of the examined birds (Figure 1) and the foot pads in 30% (Figure 2) , and 5% of the birds exhibit femoral osteomyelitis. The rest of the examined birds didn't reveal any articular or tendon lesion.

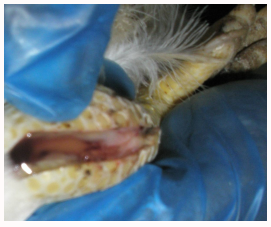

Fig. 1 and 2 – Incised swollen hock joint with granulation tissue and purulent exudates; Pathological findings in foot pad of broiler breeders;

ACKNOWLEDGEMENTS

FCT Fundação para a Ciência e a Tecnologia

DIAGNOSIS

After postmortem examination, samples of tendons, trachea and oviduct were collected for bacteriological culture and PCR analysis; 40 blood samples were randomly taken from the flock.

Mycoplasma synoviae was detected in tendons and trachea by PCR. The oviduct samples were PCR negative for all tests. PCR for Reovirus was negative in all samples. The alterations seen in tendons are consistent with a *M. synoviae* infection and confirmation was made based on serology and PCR. *Table 1* summarizes results and *Table 2* show the production rates below the standards.

Table 1 – Results of serology and PCR

Samples	Method	Flock (tendon rupture)
Blood	ELISA (MS)	+ (40/40)
Blood	RSA (MG)	- (0/40)
Blood	ELISA (IBV)	+ (40/40)
Blood	ELISA (Reo)	+ (40/40)
Trachea	PCR (MS)	+ (6/6)
Trachea	PCR (MG)	- (0/6)
Tendon	PCR (MS)	+ (6/6)
Tendon	PCR (Reo)	- (0/6)
Oviduct	PCR (MS)	- (0/6)

Table 2 – Decreased production rates in relation to the standards

Egg production	-9,02%
Hatchability	-3,94%
Chicks production	-15,3%
Total mortality	15,3%

CONCLUSIONS

Micoplasmas are important avian pathogens, which cause large economic losses in Portugal and worldwide (Kleven, 2008). Tendon rupture in this flock could be directly correlated with *M. synoviae* infection. Despite the good level of biosecurity and stringent control of contact routes in Portuguese breeder farms, *M. synoviae* infection was detected. We can hypothesize the presence of a *M. synoviae* strain with a tendon tropism.

The failure to eradicate *M. synoviae* in commercial poultry flocks is in part due to the ability of this organism to establish lifelong infections in their hosts and due to the physical design of the modern poultry premises (Marois *et al.*, 2005). It is necessary to determine new and more effective strategies to reduce losses due to *Mycoplasma* infections (Kleven, 2003).

In conclusion, infections with *M. synoviae* are present in broiler breeder flocks in Portugese poultry farms and more investigation should be put into practice to determine prevalence and strategies to reduce economic impact of this pathogen.

REFERENCES

Catania, S., *et al.* (2010) Treatment of eggshell abnormalities and reduced egg production caused by *Mycoplasma synoviae* infection. *Avian Disiases* 54:961-964. Cobb, S.P. (2011) The spread of pathogens through trade in poultry hatching eggs: overview and recent developments. *Revue Scientifique et Technique - Office International des Epizooties* 30:165-175. Kleven, S. H. (2003) *Mycoplasma synoviae* infection, in: *Diseases of Poultry 11th ed.* (Y. M. Saif, H. J. Barnes, A. M. Fadly, J. R. Glisson, L. R. McDougald, D. E. Swayne, eds), pp756-766, Iowa State Press, IA. Kleven, S. H. (2008) Control of avian mycoplasma infections in commercial poultry. *Avian Disiases* 52:367-374. Marois, C., *et al.* (2005) Experimental evidence of indirect transmission of *Mycoplasma synoviae*. *Veterinary Research* 36:759-769. Vogl, G., *et al.* (2008) *Mycoplasma gallisepticum* invades chicken erythrocytes during infection. *Infection and Immunity* 76:71-77.