Epidemiological survey to identify eggshell apex abnormalities (EAA) syndrome in commercial layers in France

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Introduction

Mycoplasma spp. are a group of bacteria without cell wall. Endemic *M. synoviae* infection in commercial layer flocks and farms exists because transmission of mycoplasmas may be vertical, through the eggs, or horizontal either by direct contact between clinically affected or unaffected carriers and susceptible birds, or by indirect contact via people, wild animals and insects or contaminated equipment. Once contaminated birds can carry *M. synoviae* for the rest of their life. The diagnosis of *M. synoviae* infection is initially based on epidemiological information, clinical symptoms, analysis of macroscopic lesions, specific serology, isolation, and molecular tests. Among the different types of poultry production, Layers are one of the most affected since the infection in these birds can produce eggs with eggshell apex abnormalities (EAA).

Objetives: Evaluated prevalence and characteristics of EAA affected flocks.

Materials and methods

96 flocks sampled in 77 farms (≥59 weeks old) (May 2015-May 2016)

Region	Number of visited flocks	
	Furnished cages	Free range and organic
Bretagne and Basse-Normandie	45	24
Rhône-Alpes	8	10
Pays de la Loire	3	6

Results and Discussion

EAA Positive Cases: based only in EAA symptoms reported by the farmers.

- In Current flocks:

Seven flocks were positive at the moment of the visit, giving a 7.3% prevalence compared to Gautier-Bouchardon et *al.* (2012): 2% to 13% of EAA syndrome-positive flocks in France as a result of a survey among layer farm veterinarians.

Table 1: EAA symptoms in current visited flocks (96)

Region (visited flocks)	Positive flocks		Total positive
	Furnished Cages	Free range and organic	
Bretagne and Basse-Normandie (69)	4	0	4 (5.8%)
Rhone Alpes (18)	0	3	3 (16.6%)
Pays de la Loire (9)	0	0	0 (0%)
		Total:	7 (7.3%)

- In previous flock (last 5 years):

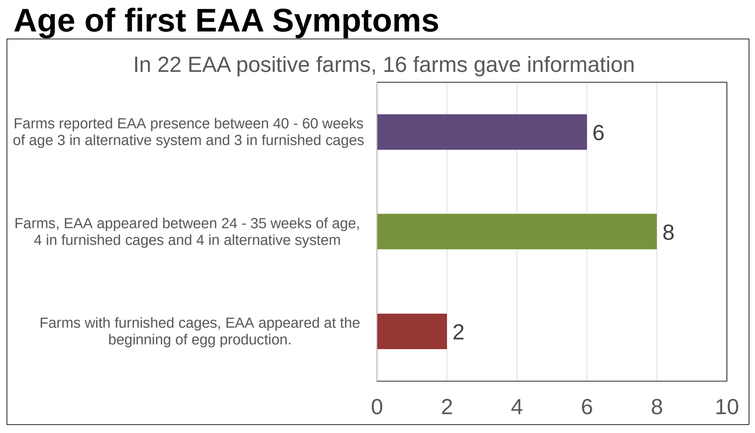
16 of 77 farmers questioned reported previous flocks showing EAA syndrome in their farm.

Table 2: Farms (77) with previous EAA positive visited flocks

Region (visited farms)	Visited farms		Total positive
	Furnished Cages	Free range and organic	
Bretagne and Basse-Normandie (52)	8	3	11 (21.2%)
Rhone Alpes (17)	4	1	5 (29%)
Pays de la Loire (8)	0	0	0 (0%)

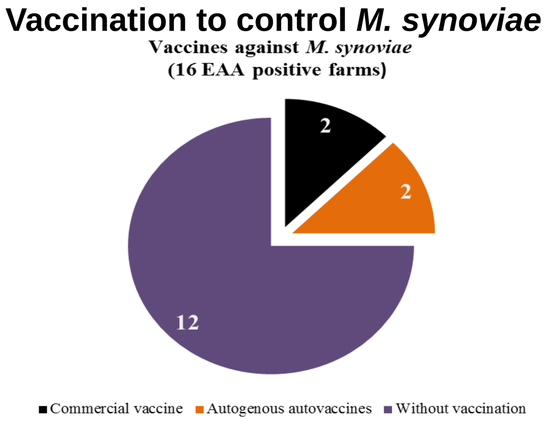
The low number of EEA cases identified in current sampled flocks, shows difference among different production systems and between the regions of France. These results were in accordance with various studies on EAA syndrome identification in many countries. The EAA syndrome presence variations are probably linked to the diversity of epidemiological, ecological and geographical conditions of the farms, bacterial transmission characteristics through different poultry production systems, types of farm management and biosafety measures, exposure to contaminant vectors, immune status and physiological conditions of birds (1, 2, 3, 5, 6).

Age of first EAA Symptoms



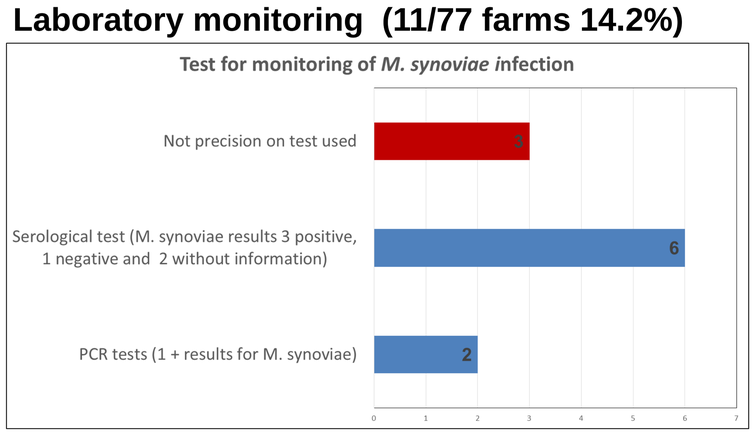
The frequent presence of EAA syndrome starting at 24 weeks of age may be explained by the physiological stress of the production peak, causing an immunosuppressive effect which can facilitate the *M. synoviae* increase and reflect the EAA occurrence (5).

Vaccination to control *M. synoviae*



The current positive flocks did not use *M. synoviae* vaccination. Feberwee et *al.* evaluated a commercial vaccine in a laboratory trial, applied to birds challenged with a strain of M. synoviae, and concluded that the vaccine could reduce the EAA symptoms but not eliminate *M. synoviae* presence (2).

Laboratory monitoring (11/77 farms 14.2%)



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Conclusion

The observed EAA frequency described in this survey reflects a negative trend of this problem in layer farms. The syndrome is detected in layer farms from the different regions sampled, in furnished cages and alternative production systems and different production ages. We underline the need for more frequent controls to evaluate the mycoplasma status of pullets or to identify positive flocks with or without symptoms, to help undertaking and controlling *M. synoviae* infections. This early diagnosis could help to decrease economic losses caused by the infection.

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