

SEROLOGICAL INVESTIGATIONS ON THE AVIAN INFLUENZA

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ABSTRACT – Serological investigations were carried out during 2006 – 2008 on 4,176 blood samples, taken from different fowl species (hen, turkey hen, goose, duck, guinea fowl and pigeon), in areas where the avian influenza was signalled. At the beginning, examination was carried out through the ELISA immunoenzyme test and then, through the *hemagglutination-inhibition reaction* (HIR). Of the tested 4,176 samples, 485 samples have reacted positively, which represented 11.61%, while 3691 have reacted negatively, representing 88.39%. Positive serological reactions were recorded only in the samples taken in 2006, when of 848 tested samples, 485 have reacted positively, which represented 57.11%, while 363 (42.89%) had negative reactions. Samples taken and tested in 2007 and 2008 had a negative reaction. The most positive reactions were obtained at samples taken from hen, where of 2182 tested samples, 371 (17%) had positive reactions, followed by samples taken from turkey hen (10.51%), guinea fowl (5.78%), duck (3.11%) and goose (2.74%).

Key words: avian influenza, serologic examination, virus

REZUMAT - Cercetări serologice privind gripa aviară. Investigațiile serologice s-au efectuat în perioada 2006 – 2008, pe un număr de 4176 probe de sânge, recoltate de la diferite specii de păsări (găină, curcă, rață, găscă, bibilică, porumbel), din zone în care a fost semnalată infecția gripală. Examinarea s-a realizat, inițial, prin testul imunoenzimatic ELISA, ulterior, prin reacția de inhibare a hemaglutinării (IHA). Din totalul de 4176 probe examinate, 485 probe au reacționat pozitiv, ceea ce reprezintă 11,61%, iar 3691 au reacționat negativ, reprezentând 88,39%. Reacții serologice pozitive s-au înregistrat numai la probele recoltate în anul 2006, când, din cele 848 probe examinate, un număr de 485 au reacționat pozitiv, ceea ce reprezintă 57,11%, iar 363 (42,89%) au dat reacții negative. Probele recoltate și examinate în anii 2007 și 2008 au reacționat în totalitate negativ. Cele mai multe reacții pozitive s-au obținut la probele recoltate de la găină, unde, din cele 2182 probe examinate, 371 (17%) au dat reacții pozitive, urmate, în ordine descrescătoare, de cele prelevate de la curcă (10,51%), bibilică 5,78%), rață 3,11% și găscă 2,74%).

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Cuvinte cheie: gripa aviară, examen serologic, virus

INTRODUCTION

Avian influenza is an infectious and very contagious disease, characterized by severe troubles and high mortality rate. In Europe, it came to actuality at the beginning of 2003 (Daneş, 2005; Moga Mânzat, 2005; Perianu, 2005).

In the last years, the contagious extension of avian influenza has caused losses in the entire world estimated at over 63 million birds, of which 50 millions cumulated the Italian and Dutch contagious extension of avian influenza (Daneş, 2005).

The etiological agent belongs to *Orthomyxoviridae* Family, *Influenzavirus* genus, type A. Highly pathogenic strains belong to H₅ and H₇ subtypes (Arsene *et al.*, 2006; Carp-Cărare M. and Carp-Cărare C., 2001; Gugiu, 2003). Infections with highly pathogenic virus, but reduced as incidence, should not be mistaken with those determined by lowly pathogenic virus (Daneş, 2005).

All the bird species, domestic and savage, sweet and sea water, are susceptible to the infection with type A influenza viruses. Adult hens are more sensitive than chickens and the disease has a great septicaemia character, with super acute and acute evolutions. After an incubation of 3-5 days, the signs appear suddenly with explosive character (Moga Mânzat, 2005; Perianu, 2005).

Taking into account the presence in some areas of avian influenza diseases, the goal of this scientific paper was to investigate serologically the presence of avian influenza in fowls.

MATERIALS AND METHODS

Serological investigations were carried out during 2006-2008 on 4,176 blood samples, taken from different fowl species (hen, turkey hen, goose, duck, guinea fowl and pigeon), in areas where avian influenza was signalled (*Table 1*).

Samples were tested initially through the ELISA immune-enzyme test and, then, through the *hemagglutination-inhibition reaction* (HIR).

Table 1 – Samples tested during 2006-2008

Year	Tested samples	
	Number	%
2006	848	20.30
2007	2085	49.93
2008	1243	29.77
Total	4176	100.00

SEROLOGICAL INVESTIGATIONS ON THE AVIAN INFLUENZA

Table 2 – Results of the serological examination carried out during 2006 – 2008

Tested species	Year																			
	2006						2007						2008							
	No. tested samples		Positive samples		Negative samples		No. tested samples		Positive samples		Negative samples		Positive	Negative						
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Hen	2182	454	81.72	83	18.28	1.105	0	-	1105	100	623	0	-	623	100	371	17,00	1811	83,00	
Turkey hen	685	134	53.73	62	46.27	337	0	-	337	100	214	0	-	214	100	72	10,51	713	89,49	
Duck	611	112	16.96	93	83.04	302	0	-	302	100	197	0	-	197	100	19	3,11	592	96,89	
Goose	511	93	14	15.05	79	84.95	237	0	-	237	100	181	0	-	181	100	14	2,74	497	97,26
Guinea hen	156	45	9	20.00	36	80.00	89	0	-	89	100	22	0	-	22	100	9	5,78	147	94,22
Pigeon	31	10	0	0.00	10	100.00	15	0	-	15	100	6	0	-	6	100	0	0,00	31	100,00
Total	4176	484	57.11	363	42.89	2085	0	-	2085	100	1243	0	-	1243	100	485	11,61	3.691	88,39	

RESULTS AND DISCUSSION

Of the total 4176 serologically tested samples, during 2006 – 2008, 485 samples have reacted positively, which represented 11.61%, while 3691 have reacted negatively, representing 88.39% (Table 2 and Figure 1).

The presence of positive serological reactions differed

according to testing year and sample origin. Thus, positive serological reactions were recorded only at samples taken in 2006, when of 848 tested samples, 485 have reacted positively, which represented 57.11%, while 363 (42.89%) had negative reactions. We must mention that at the samples taken and tested in 2007 and 2008, no positive reaction was recorded.

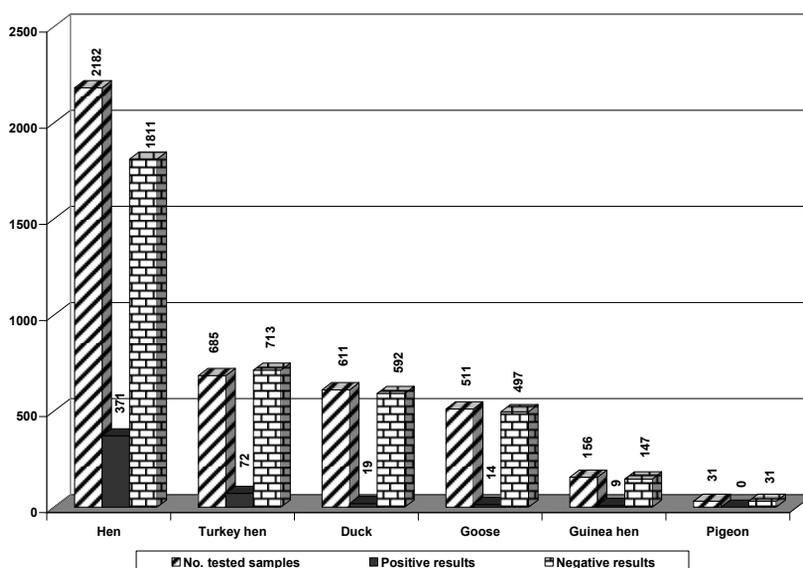


Figure 1 – Results of the serological examination carried out during 2006-2008

The lack of positive reactions may be explained by the fact that samples were taken from areas and stocks where virus was not present and no disease was recorded.

Analysing the obtained results based on the origin of tested samples, we found that they differed according to fowl species (Figure 2). Thus, the

greatest positive reactions were obtained at samples taken from hen; of 2182 tested, 371 (17.00%) had positive reactions, followed by samples taken from turkey hen (10.51%), guinea hen (5.78%), duck (3.11%) and goose (2.74%)

SEROLOGICAL INVESTIGATIONS ON THE AVIAN INFLUENZA

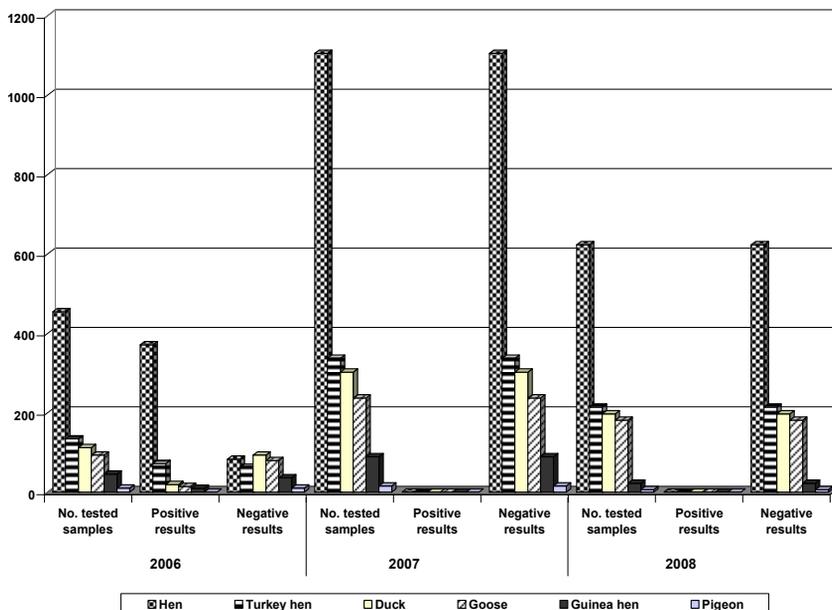


Figure 2 – Results of the serological examination according to species

We must mention that all the 31 (100%) blood samples taken from pigeon in different areas have reacted negatively. The lack of positive reactions in pigeon might be explained by the fact that they were not receptive to the virus of avian influenza and could not be infected. The analysis of the obtained results showed that in Palmipedes (ducks and geese), the lowest positive serological reactions were obtained, 3.11% in ducks, respectively, 2.74 in geese. Generally, Palmipedes do not have clinical disease forms, but have a special epidemiological importance, because they are the main virus spreading species, contacting savage birds the most frequently.

CONCLUSIONS

Of the 4,176 tested samples, 485 have reacted positively, which represents 11.61%, while 3,691 have reacted negatively (88.39%).

The presence of positive serological reactions differs according to the year when they were taken and to the origin of serums.

Positive serological reactions were recorded only at samples taken and tested in 2006, where of 848 samples, 485 have reacted positively, which represents 57.11%, while 363 (42.89%) had negative reactions.

The most positive reactions were obtained at samples taken from hen, where of 2,182, 371 have reacted positively, which represents 17%.

The least positive reactions were found in goose, where of 516 tested samples, only 33 have reacted positively, which represents 2.74%.

Of 31 samples taken from pigeon, no positive serological reaction was recorded.

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