



:: Control of fowl adenovirus (FAdV) with autogenous vaccines

Over the last years, the presence of fowl adenovirus (FAdV) associated diseases have been reported globally (Inclusion body hepatitis, IBH; Adenoviral gizzard erosions, AGE; Hepatitis-Hydropericardium Syndrome, HHS). It is now generally accepted that infections with FAdV are wide spread, yet in many cases without clinical symptoms.

FAdV are classified in 5 different genotypes (A-E), including 12 serotypes (Fig. 1). Due to different nomenclature in Europe and USA, the International Committee on Taxonomy of Viruses (ICTV) has proposed a standardization of terminologies that should be used. Allocation of clinical cases to serotypes is shown in Fig. 1. IBH is caused mainly by serotypes FAdV-2, -8a, -8b and -11, HHS is caused by FAdV-4, and members of the biologically different serotype FAdV-1 do induce AGE. Furthermore, infection with highly virulent FAdV are capable to cause immunosuppression.

In today's poultry industry FAdV is mostly seen in young chickens, especially broilers. In these cases, IBH and AGE are the predominant clinical picture. High biosecurity standards in the breeder stocks prevent the parental birds from natural FAdV infections, resulting in offspring not protected by maternal antibodies. In laying hens cases of FAdV infections have also been reported, mostly as HHS.



Fig. 1: FAdV serotypes as classified according to different nomenclatures

Species	Serotype according to			Disease
	ICTV	EU	US	
A	1	1	1	AGE, (IBH)
B	5	5	8	
C	4	4	4	HHS
	10	11	10	
D	2	2	2	IBH
	3	3	3	
	9	10	9	IBH
	11	12	12	
E	6	6	5	
	7	7	11	
	8a	8	6	IBH
	8b	9	7	IBH

Protection by vaccination:

There is no commercial vaccine against FAdV available in Europe. Therefore, autogenous vaccines are widely used in broiler breeders. The aim for vaccination is to avoid vertical transmission of the virus and to protect day-old chicks by maternal antibodies. Autogenous vaccines are produced by using farm specific FAdV strains after isolation and characterization. In many cases, more than one FAdV serotype can be detected, and thus, several strains of FAdV are included in the vaccine, offering the best chance for inducing protection (protection is very much serotype specific).

ELISA is a valuable tool to measure the effects of such vaccination. Interpretation of FAdV-ELISA results is sometimes difficult. Depending on the coated antigen, the ELISA detects FAdV antibodies of different groups with varying accuracy at the same time. Yet, protection is very much depending on the serotype, and consequently, positive titers do not necessarily correlate with protection. On the other hand, monitoring breeder flocks by ELISA can detect titers after vaccination, thus confirming the correct application of the vaccine and immune response.

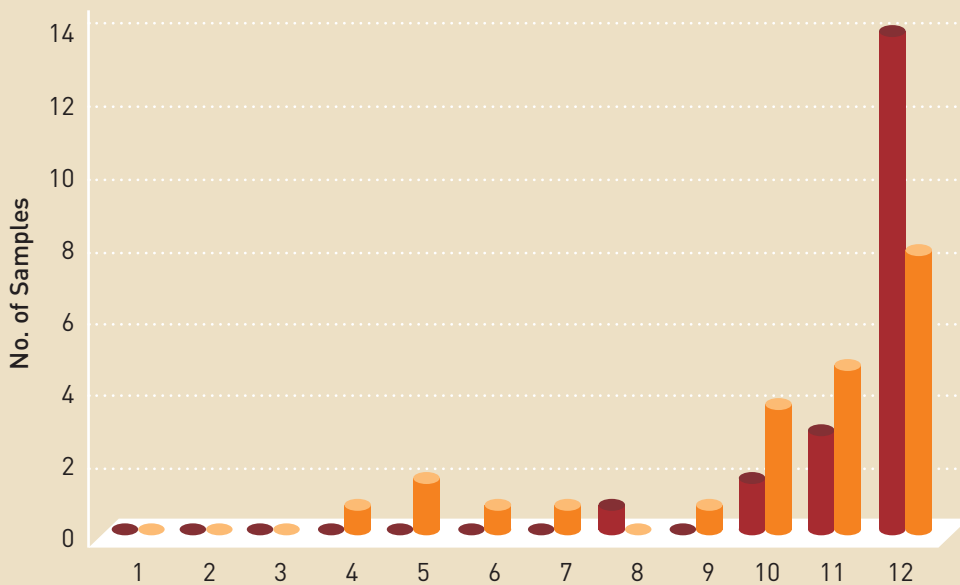


Clinical case

Breeders in two farms of one integration were vaccinated at 11 and 18 weeks with FAdV autogenous vaccine containing FAdV-1, FAdV-2, FAdV-8a, FAdV-8b and FAdV-11. The birds were confirmed to be FAdV free prior to vaccination by ELISA and virus isolation. Seroconversion of the flocks prior to lay was tested using a BioChek® FAdV ELISA.

It is recommended to vaccinate twice against FAdV, yet in this trial, serum samples were taken 4 resp. 6 weeks after first vaccination and before second vaccination. As expected, the flocks did seroconvert after first vaccination, resulting in high and uniform titers (AMn 15720 resp. 12990, CV 12,7 resp. 33,3).

Serology in two BB flocks 6 (F1) resp. 4 wk (F2) p.vacc.



Farm 1	S/P	Titer
AMn:	5,744	15720
GMn:	5,695	15563
SD:	0,671	1990
CV:	11,7	12,7
Min:	3,458	8989
Max:	6,367	17593

Farm 2	S/P	Titer
AMn:	4,805	12990
GMn:	4,467	11914
SD:	1,499	4327
CV:	31,2	33,3
Min:	1,492	3566
Max:	6,087	16743

Summary:

- Inactivated FAdV autogenous vaccines are used to interrupt vertical transmission of FAdV and to deliver maternal antibodies to progenies.
- Protection elicited is serotype specific.
- ELISA is a useful tool for detection of seroconversion after vaccination and thus for monitoring quality of vaccination.

Reference

Anna Schachner, Miguel Matos, Beatrice Graf and Michael Hess (2018)
 Fowl adenovirus-induced diseases and strategies for their control – a review on the current global situation, Avian Pathology, 47:2, 111-126,
 DOI: 10.1080/03079457.2017.1385724