

REO Virus Infections in Broiler Breeders and Progeny - Prevention Strategies

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Avian Reoviruses

...are ubiquitous viruses in nature, and are commonly isolated from a variety of tissues in poultry affected by multiple disease conditions such as viral arthritis/tenosynovitis, stunting syndrome, respiratory disease, enteric disease, and malabsorption syndrome.

Economic Losses

Cause by Avian Reovirus:

1. Poor feed conversion
2. Poor flock uniformity
3. Reduced weight gains
4. Unthriftiness
5. Mortality
6. Severe Lameness

Historical Perspective

- The initial avian reovirus was isolated in 1954 by Fahey and Crawley from the respiratory tract of chickens.
- Olsen et al. Isolated a reovirus from chickens with naturally occurring synovitis in 1957 that were unrelated to MG or MS.
- During the late 70's and early 80's a nonspecific malabsorption syndrome due to avian reovirus was described.

Incidence and Distribution

- Reovirus infections are prevalent worldwide in chickens and turkeys.
- Viral arthritis/tenosynovitis is found primarily in meat-type chickens and turkeys.
- Reoviruses are commonly found in the digestive and respiratory tracts of clinically normal chickens and turkeys.

Transmission

Horizontal transmission

1. Intestinal tract (fecal contamination)
2. Respiratory tract
3. Age related resistance

Vertical Transmission

1. Egg transmission low (<2.0%)
2. Hens infected via oral, tracheal, and nasal inoculation were able to transmit reovirus to

Avian Reovirus (Vaccine Strains) Avian Reovirus (Live Vaccine)

Strain	Association	Live/Killed	Route of Administration	Efficacy
S1133	Tenosynovitis	Live and Killed	1. Subcutaneous (SQ)	Good
UMI 203	Tenosynovitis	Live	2. Wingweb	Good
2408	Malabsorption/Tenosynovitis	Killed	3. Water	Good
1733	Malabsorption/Tenosynovitis	Killed	4. <i>In Ovo</i>	Poor
CO8	Malabsorption Syndrome	Killed		
305	Malabsorption/FHN/BBD	Killed		
ss412	Malabsorption/proventriculitis	Killed		

Diagnosis

- Presumptive diagnosis may be made on the basis of signs and lesions.
- Virus isolation in chicken embryo liver cells or FA test on infected tendon sheaths.
- Histopathology of infected tendons.
- Serology - AGP, IFA, VN and ELISA test.

Avian Reovirus Serology (Broiler Breeder IDEXX ELISA System@ 1:500 dilution)

Age	Poor	Fair	Good
12 Wks	<1000	1200	>1600
16 Wks	<3500	4000	>5000
24 Wks	<4500	5000	>6500
38 Wks	<3000	3500	>4500
44 Wks	<2750	3000	>3500
58 Wks	<1000	2000	>2500

Clinical Signs/Gross Lesions

Viral arthritis/tenosynovitis

1. Lameness
2. Joint swelling
3. Thickened/ruptured tendons

Malabsorption syndrome

1. Runting/Stunting
2. Poor pigmentation
3. Abnormal feathering
4. Skeletal abnormalities
5. Increased mortality
6. Enlarged proventriculus

Pathogenicity

Reoviruses have been identified as the etiology of other disease conditions such as:

1. **Arthritis/tenosynovitis**
2. **Runting/stunting**
3. **Pericarditis/myocarditis/hydropericardium**
4. **Hepatitis**
5. **Bursal and thymus atrophy**

Prevention Strategies

1. **Good Husbandry Programs**
2. **Biosecurity Programs**
3. **Vaccination Programs**

Vaccination (Broiler Breeders)

Purpose:

1. **Prevent VA in the breeders**
2. **Prevent egg transmission to progeny**
3. **Produce maternal antibodies for the progeny**

Vaccination Strategies (Broiler Breeders)

Program	1st	1-2	SQ/Water	Program	1st	1	SQ/Water
1:	Live	Wks	SQ/Water/Wingweb	2:	Live	week	SQ/Water
	1st/2nd	3-8 W	SQ/Water/Wingweb		2nd	3-4	SQ/Wingweb/Water
	Live	8-16			Live	Wks	SQ/IM
	2nd/3rd	Wks			2nd/3rd	6-8	SQ/IM
	Live				Live	Wks	
					1st	10-14	
					Killed	Wks	
					2nd	14-20 Wks	
					Killed		

Current Challenges

- 1. Sporadic outbreaks on broiler farms throughout the Southeast US.**
- 2. Clinical signs include runting/stunting as early as 7-14 days of age, poor weight gains, poor feed conversions with significant feed passage.**
- 3. Broiler Breeder ELISA titers for reovirus > 15-20,000.**
- 4. Reovirus has been isolated by Dr. J.K. Rosenberger that may be different than the current vaccine types.**

Summary

- 1. Reoviruses are ubiquitous in nature.**
- 2. Healthy birds can harbor the reovirus without exhibiting clinical signs.**
- 3. Good husbandry and biosecurity practices will help reduce the spread of reovirus from flock to flock.**
- 4. A solid broiler breeder vaccination program is necessary to reduce losses due to reovirus in both broiler breeders as well as their progeny.**