

The Histopathology and Other Diagnostic Findings of Runting Stunting Syndrome in Broilers

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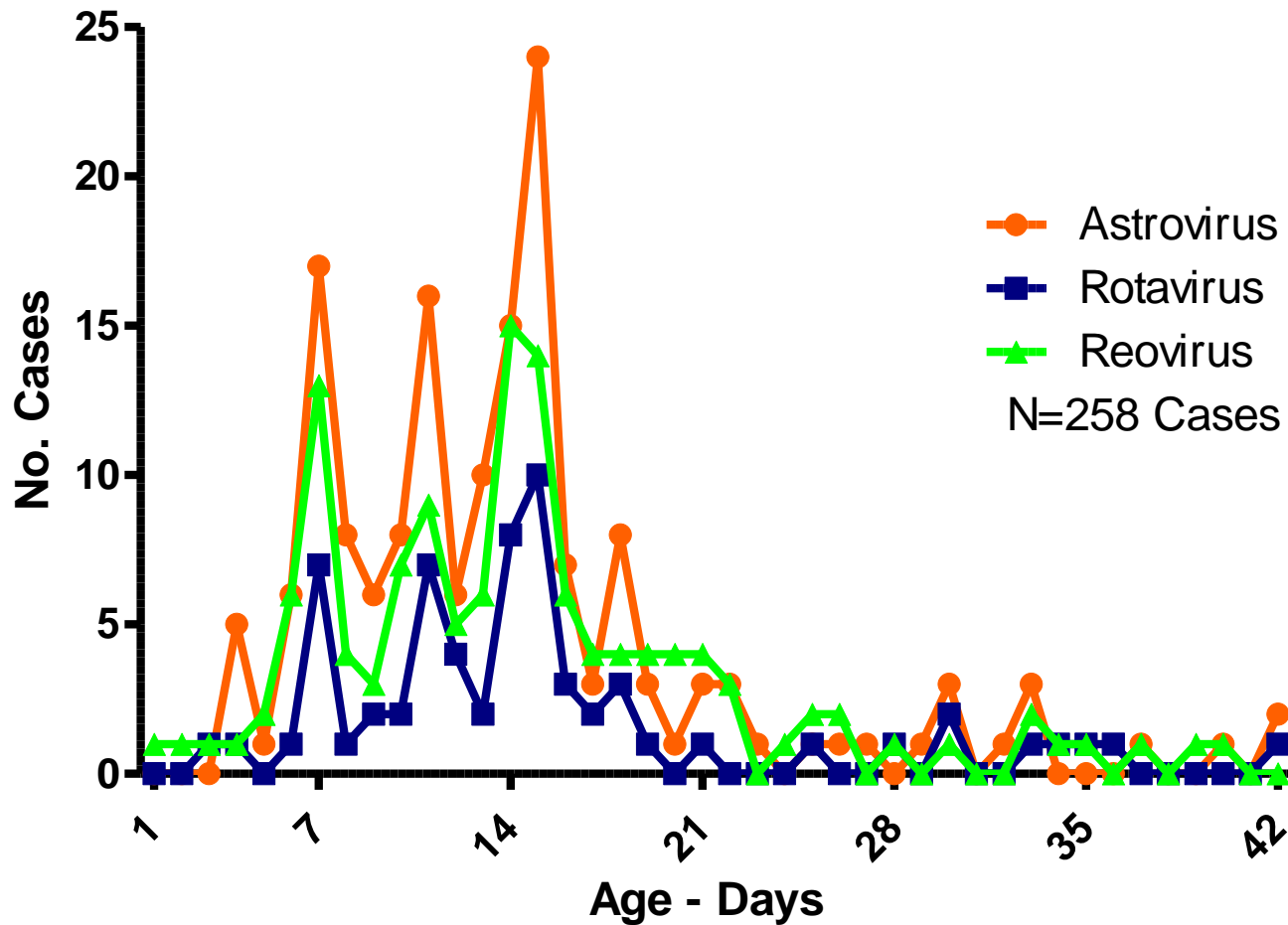
Objective

- Evaluate enteric virus positive cases from broilers submitted to Alabama State Diagnostic Laboratories:
 - Histologic lesions in virus positive cases
 - Gastrointestinal
 - Immune system
 - Concurrent diseases
 - Patterns to identify key lesions, etiology factors, and pathogenesis

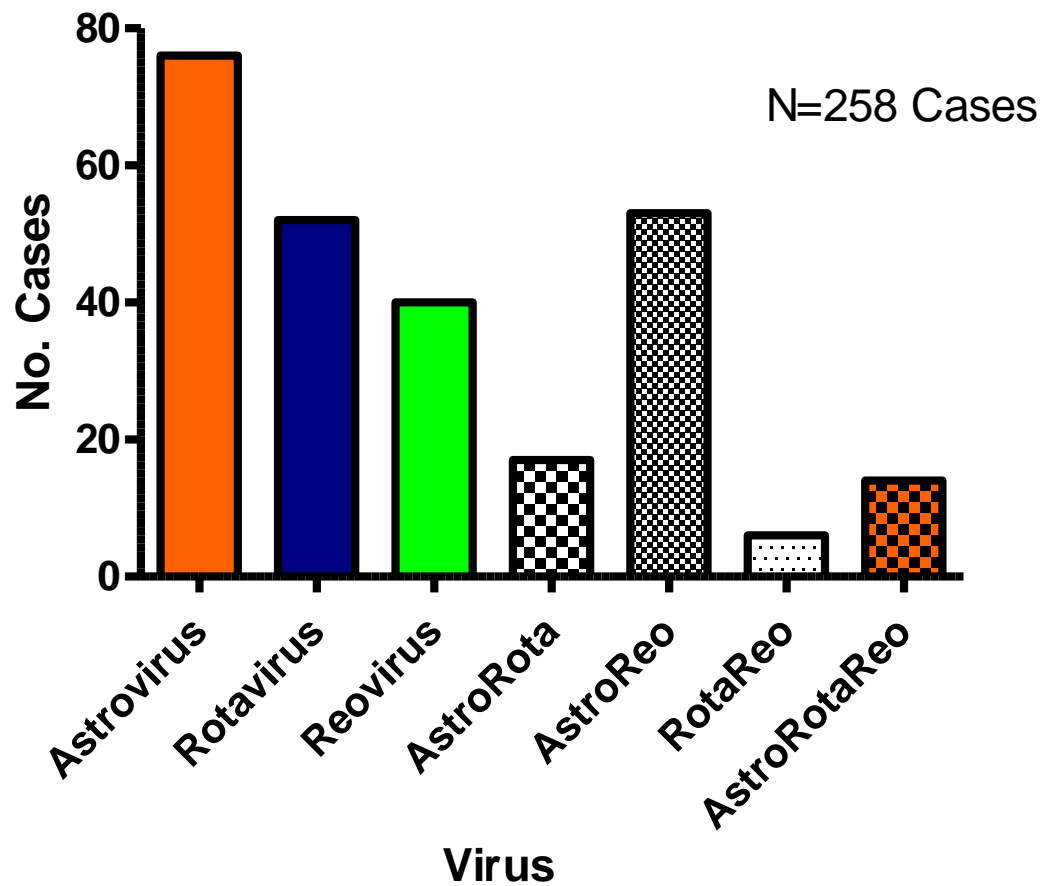
Study Criteria

- October 2007- June 2010 (33 months)
- Broiler chickens
 - Sentinels from broiler flocks
- Virus detection or isolation yielding one or more positive result
 - Enteritis cases
 - Respiratory cases (cecal tonsil)
- Histopathology was variable
 - Tissues submitted for histology were variable

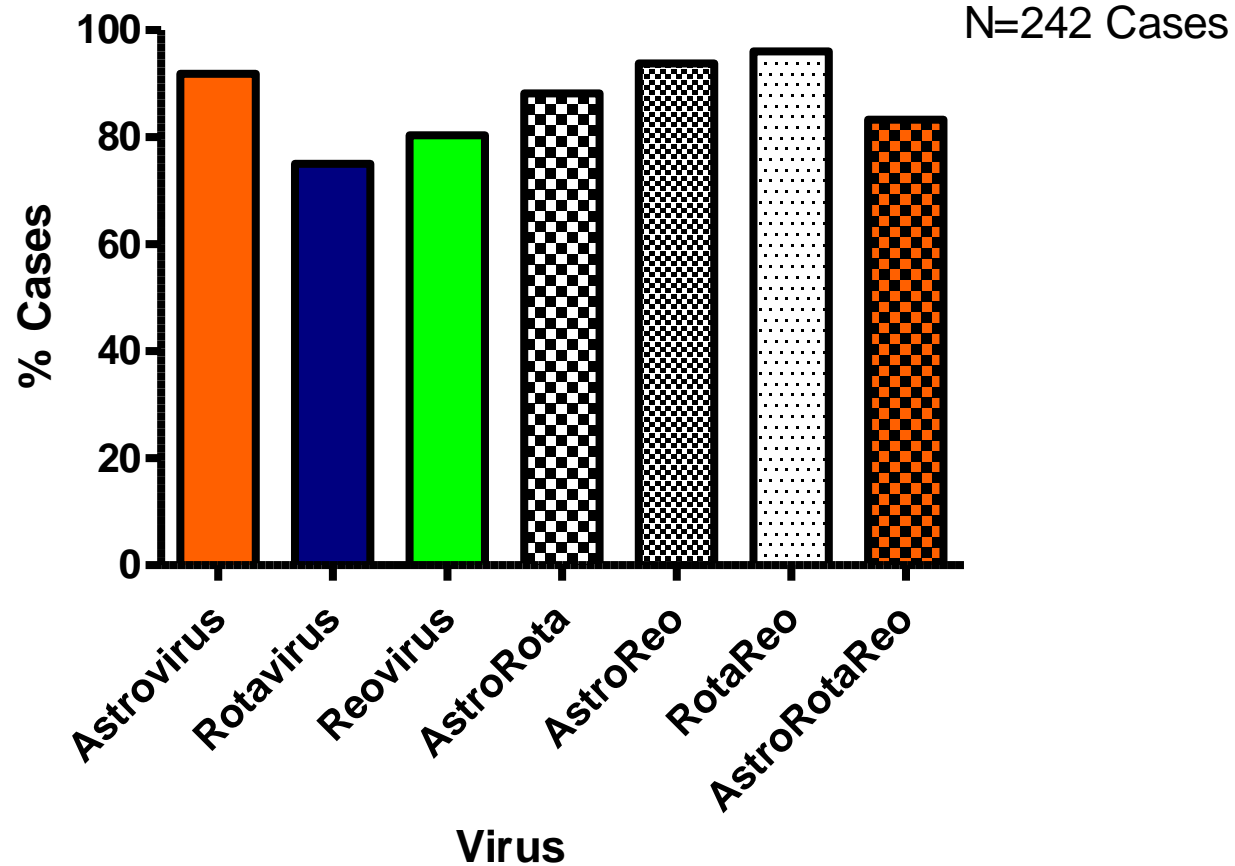
Broilers: Intestinal Virus Detection by Age



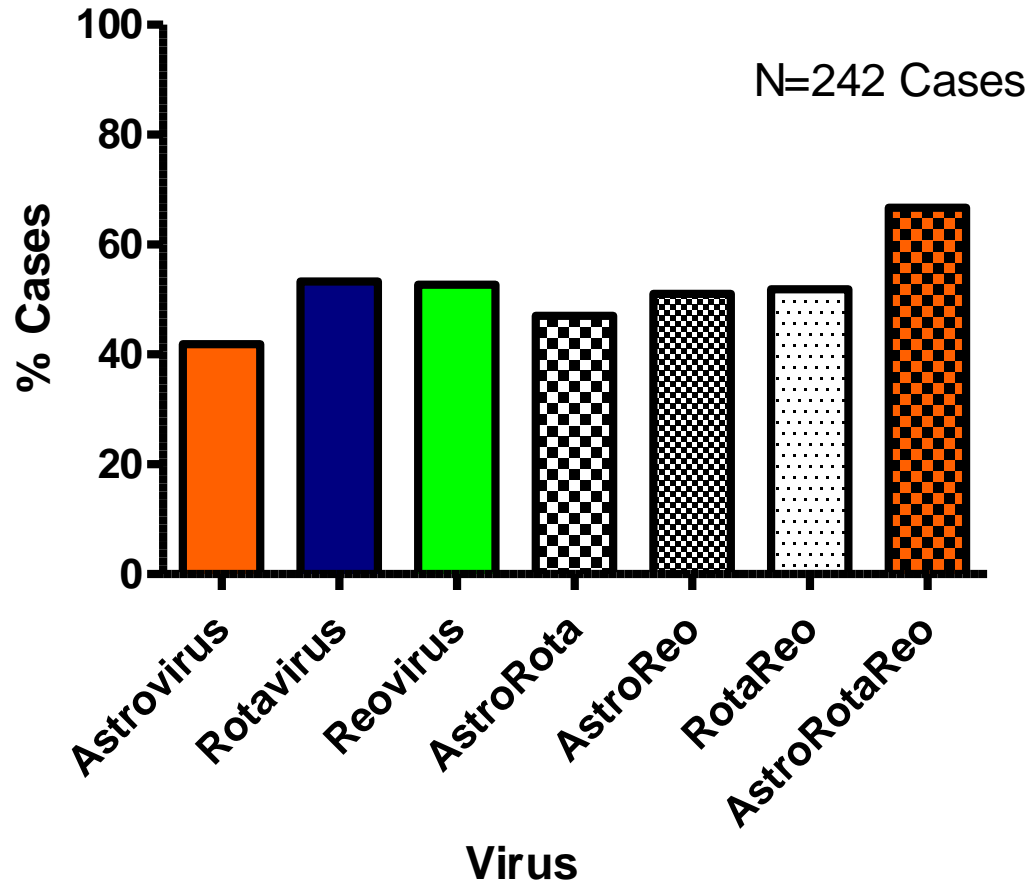
Broilers: Cases by Enteric Viruses Detected



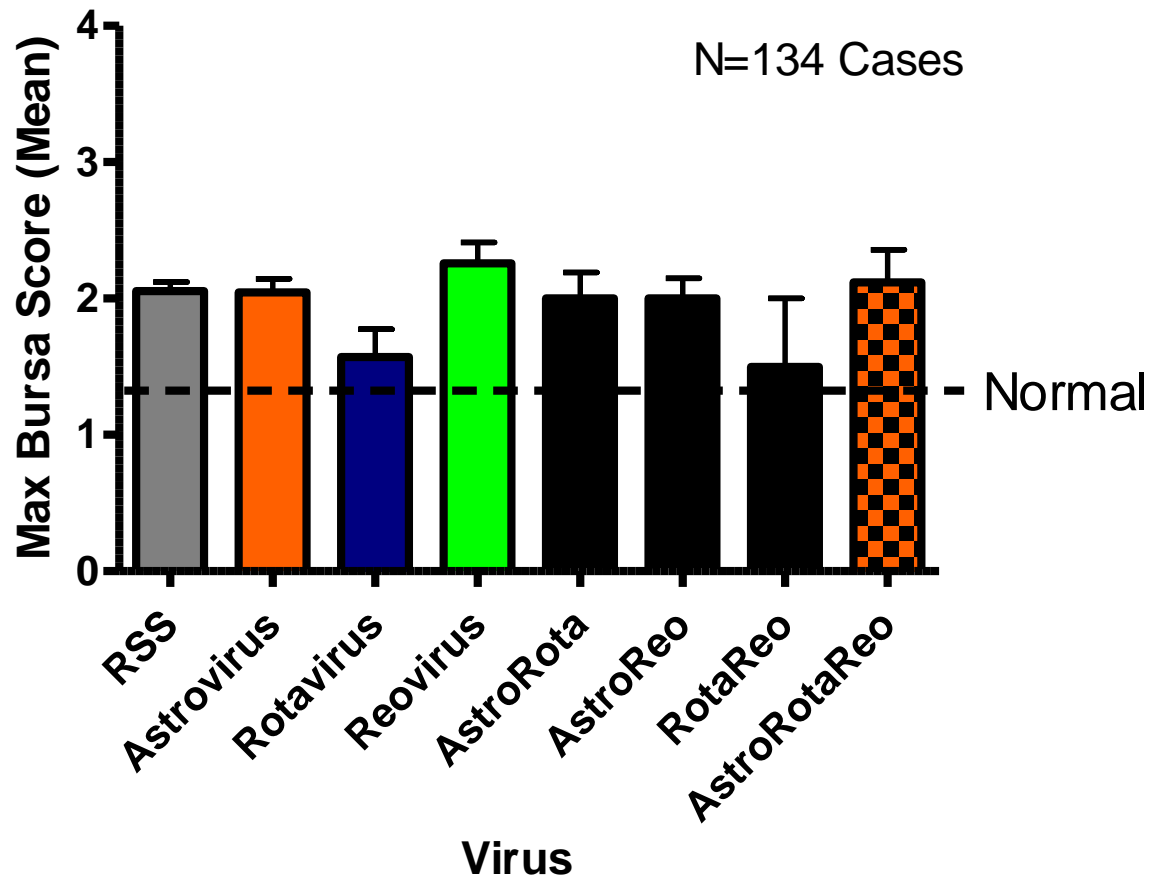
Broilers: Percentage of Virus-Positive Cases with Reduced Villus:Crypt



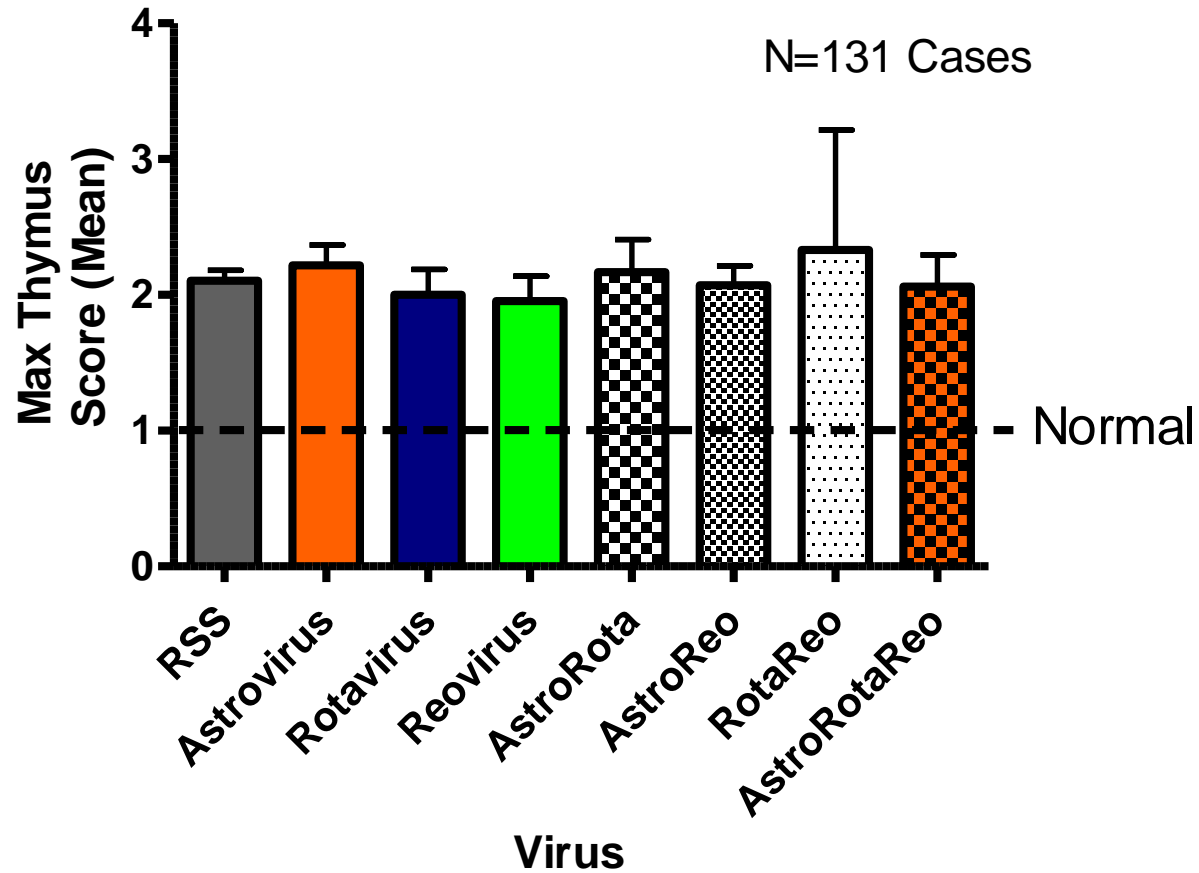
Broilers: Percentage of Virus-Positive Cases with Cystic Crypts



Virus Positive Broilers <20 days: Maximum Bursa Depletion Score



Virus Positive Broilers <20 days: Maximum Thymus Depletion Score



Concurrent Disease

- Skeletal
 - Rickets, TD, Osteomyelitis
- Respiratory
 - Tracheitis
 - Vaccine virus - IBV Mass, IBV Conn, Paramyxovirus)
 - Ammonia, Aspergillosis
- Coccidiosis
 - *E. maxima*, *E. acervulina*
- Sepsis
 - Septicemia, yolk sacculitis, cellulitis, gangrenous dermatitis
- Other
 - Necrotic enteritis, liver, proventriculus & gizzard lesions, bursal disease, CAV

Concurrent Diseases

Group	Respiratory	Coccidiosis	Sepsis	Other
Total 258	49 (19%)	23 (9%)	25 (10%)	7 (3%)
Astro only	13	4	7	-
Rota only	2	3	-	2
Reo only	12	7	8	1
Astro Rota	4	1	5	1
Astro Reo	10	6	3	2
Rota Reo	1	1	1	-
AstroRotReo	5	2	1	1

Skeletal Disease

Rickets, TD, Osteomyelitis

Group	Total	Ca/P	P	TD	OM	Normal
Bone Examined	43/258 17%	28	4	4	1	7/43
Astro only	15	9	2	1	-	4
Rota only	4	3	-	1	-	-
Reo only	7	4	-	1	-	2
Astro Rota	4	2	-	1	1	-
Astro Reo	6	5	1	-	-	-
Rota Reo	1	-	1	-	-	-
AstroRotReo	5	4	-	-	-	1

Conclusions

- Astrovirus, Rotavirus, and Reovirus detected in intestine from broilers submitted to diagnostic laboratories in Alabama
- Virus detected from 1 to 42 days of age
 - Peak 7 to 15 days of age
- Intestinal lesions are identified by histopathology
 - Reduction in villus:crypt ratio (75-92%)
 - Crypt hyperplasia
 - Villus atrophy
 - Cystic dilated crypts filled with mucus and cells (42-67%)

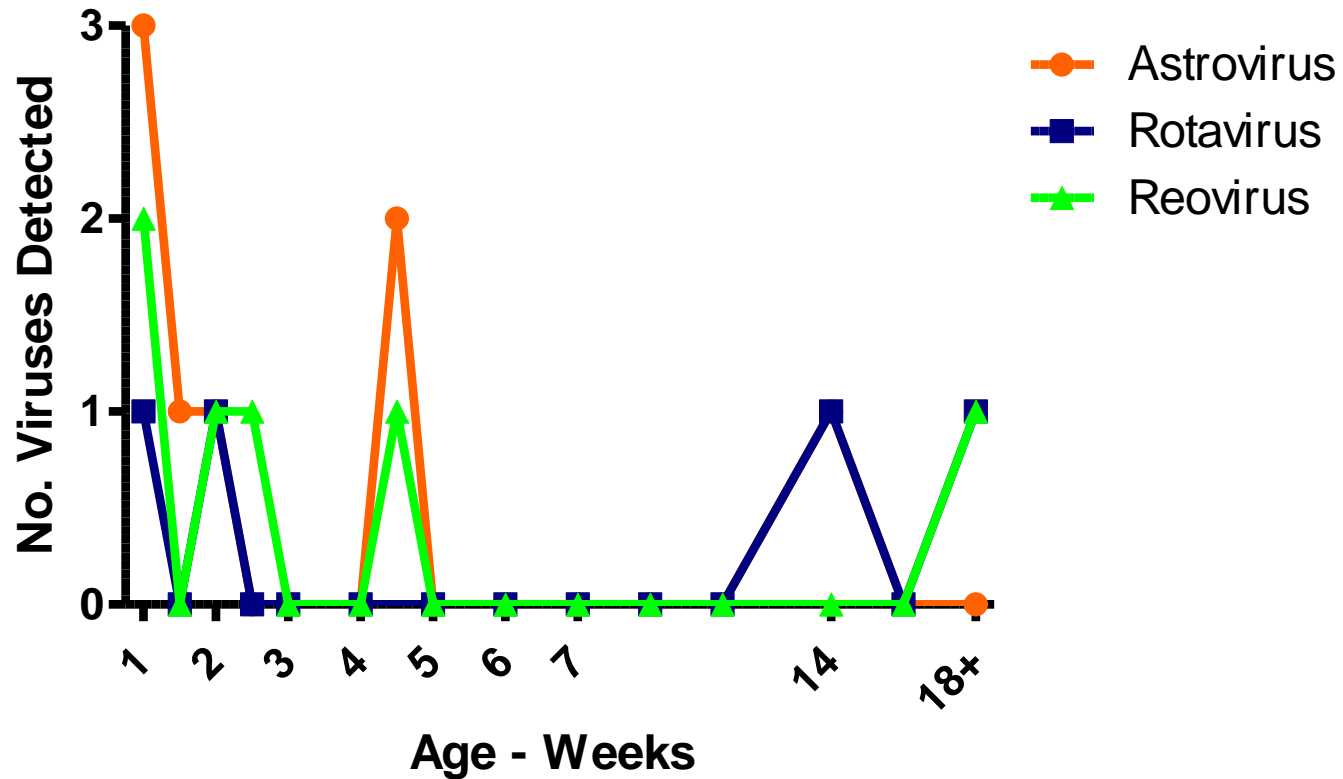
Conclusions

- Bursa and thymus have, on average, mild lymphocyte depletion
 - Lesions in individuals - normal to severe
- Rickets (17%)
 - Ca/D3, other
- Concurrent infectious diseases
 - Respiratory (19%) – E. coli and vaccine viruses
 - Coccidiosis (9%) – E. maxima, E. acervulina
 - Septicemia, other (13%)

Conclusions

- Intestinal and lymphoid lesions, and concurrent diseases occurred in cases with single and multiple enteric viruses detected, respectively.
 - No strong, obvious association with any one virus or virus combination
- Not included
 - Virus negative cases
 - Limited data on parvovirus

Broiler Breeders: Enteric Viruses Detected by Age



Results

	Cases	Astro (PCR)	Rota (PCR)	Reo (VI/PCR)	Adeno (VI)	Parvo
Broiler	266	175 66%	66 25%	150 56%	8 3%	ND
Br. Breeder	15	9	5	7	-	ND
Backyard	4	1	1	3	2	ND
Quail	3	1	1	1	-	ND