

Histomoniasis

- Histomoniasis, also known as Blackhead Disease, is an important poultry disease that affects turkeys, chickens, peafowl, game birds, and ratites
- The disease is caused by numerous sub-strains of *Histomonas meleagridis*, which are often localized to a specific farm or area
- *H. meleagridis* is sensitive to oxygen and temperatures lower than the body temperature of birds, rendering the bacteria non-infectious after a few hours spent outside of a host
- *Heterakis gallinarum*, a nematode parasite, can serve as an intermediate host for *H. meleagridis*
 - ❖ *H. gallinarum* eggs may be consumed by an intermediate invertebrate host, such as earthworms or flies
 - ❖ *H. gallinarum* eggs are able to survive in the environment for multiple years
 - ❖ A single egg can cause an outbreak in a poultry flock
- This complex lifecycle makes the parasite a challenge to control once it gets into a poultry facility

Histomoniasis in Turkeys

- Turkeys are highly susceptible to the disease and can be devastating to any flock that is infected
 - ❖ Once a flock has been infected, mortality can reach 70 to 100%, with losses of up to 10% per day
- *H. meleagridis* produces characteristic lesions in the caeca and necrotic foci in the liver of infected turkeys
- Chickens, guinea fowl, chukar partridges, and pheasants are ideal hosts for the cecal worm *H. gallinarum* and thereby act as a reservoir for infection (Lund and Chute, 1970); turkey housing in close proximity to operations containing other poultry species can lead to cross-transmission
- A turkey health survey of professionals representing the majority of the U.S. turkey production industry reported a minimum of 50 outbreaks of histomoniasis each year since 2009

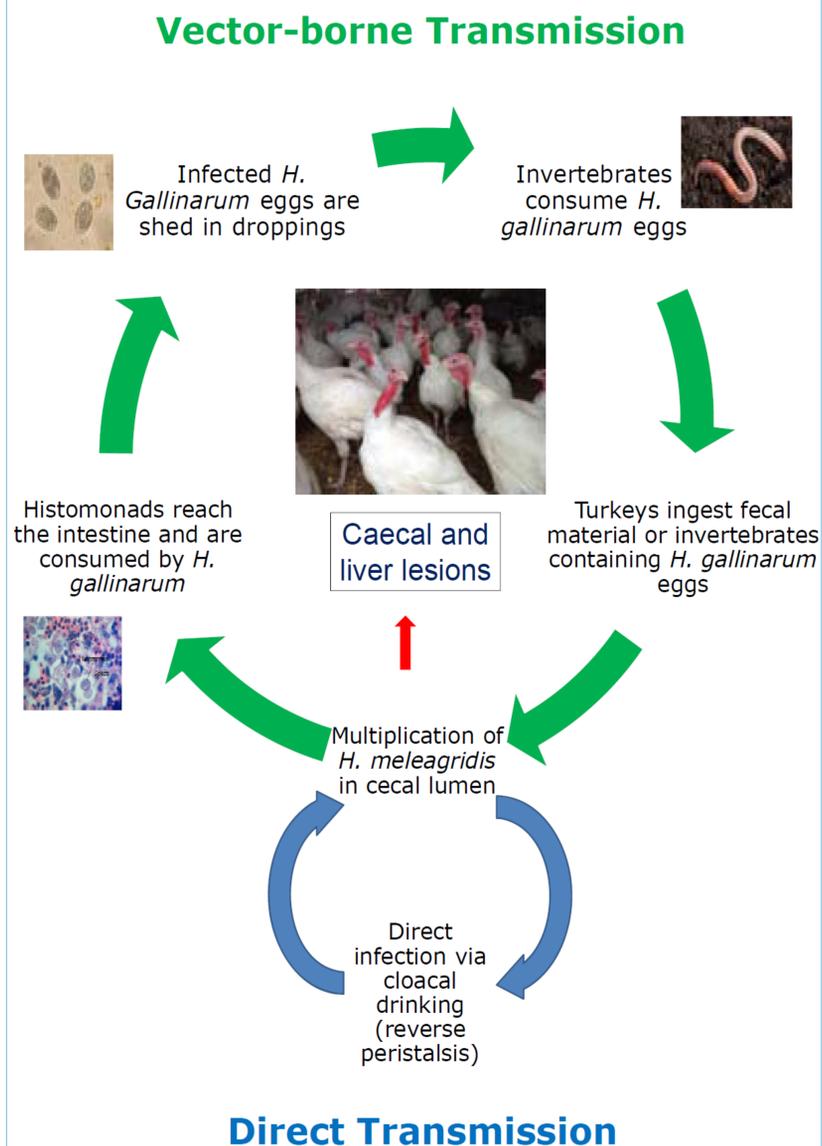
Table 1. Histomoniasis outbreaks reported in the United States (Source: Clark and Bailey, 2015).

Year	2009	2010	2011	2012	2013	2014	2015
No. of outbreaks	67	108	89	80	52	61	55

Histomoniasis in Chickens

- The disease frequently does not cause symptomatic lesions in chickens, leading to a reduced severity in comparison with its presence in turkeys
- When *H. meleagridis* becomes infectious in a chicken flock, mortality can range from 10 to 20%, with high morbidity
- Despite the decreased severity in chickens, the presence of histomoniasis has been shown to lead to a reduction in egg production (Bleyen *et al.*, 2010)
- *H. gallinarum* eggs from infected chicken flocks are considered a major source for transmission of the disease to turkey flocks
- Recent reports have shown an increase in the number of histomoniasis cases in chickens, especially in breeders and free range flocks (Dolka *et al.*, 2015 and Hess *et al.*, 2015)

Transmission in Turkeys



U.S. Turkey Industry Facts

- In 2015, 233 million turkeys were raised in the U.S, resulting in approximately 5.7 billion dollars in revenue
- Although the turkey industry is concentrated in the Eastern portion of the country, 42.6% of the total U.S. turkey production occurs in Minnesota, Arkansas, and North Carolina (USDA, 2015)
- The average turkey flock size is ~20,000 birds
- No information available regarding the number of turkeys in the United States that require therapeutic interventions against histomoniasis on an annual basis

Please direct any questions or comments on this subject matter to Dr. Prajwal Regmi, prajwal.regmi@fda.hhs.gov; 240-402-0577

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Current Concerns

- Therapeutic options for the prevention, treatment, or control of histomoniasis are limited
- Mechanical transmission is of concern due to the close proximity between many turkey and broiler breeder operations
 - ❖ *H. gallinarum* eggs may be consumed by an intermediate invertebrate host
- Knowledge gaps exist with regard to the understanding of the disease, limiting development of prevention or control options
- As the severity of the disease in turkeys is associated with factors such as bird age, virulence of the strain, breed or strain of the animal, less severe cases of histomoniasis may not be reported and the economic loss from the disease is not accurately captured

CVM's Call to Action

- CVM encourages drug companies, the poultry industry, and academia to work together to:
 - ❖ Investigate the disease further, including determining the mechanism of action so that potential points of intervention can be identified
 - ❖ Invest in research of effective products (drugs, vaccines, etc.) for the prevention, treatment, or control of *H. gallinarum* in chickens and *H. meleagridis* in chickens, turkeys, and game birds
 - ❖ Assess the possibility of targeting genetic strains of poultry that are resistant to *H. meleagridis*
 - ❖ Determine management practices that can aid in the successful prevention and control of histomoniasis
 - ❖ Identify the appropriate host age range for targeting prevention of the disease in turkeys
 - ❖ Collect information about histomoniasis outbreaks throughout the country on an annual basis to aid in determining the true economic loss associated with the disease
- CVM is willing to engage in discussions with stakeholders about a pathway toward approval of safe and effective products

References

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- USDA. 2016. Poultry Production and Value 2015 Summary. <http://usda.mannlib.cornell.edu/usda/current/PoulProdVa/PoulProdVa-04-28-2016.pdf> (Accessed July 27, 2016).