Turkey parvovirus ‘widespread’ in US flocks

Researchers believe this newly discovered virus could play a major role in the development of enteric disease in turkeys.

Turkey parvovirus (TuPV), a recently discovered pathogen, is not only widespread in US commercial flocks, it appears to be an important cause of gut disease, says Dr. Laszlo Zsak, a researcher with the United States Department of Agriculture, Agricultural Research Service.

Further evidence that TuPV causes enteric disease now comes from more recent studies in which the researchers orally challenged 2-day-old specific-pathogen-free (SPF) turkeys with the virus.

“It’s important to note that these turkeys had no maternal antibodies to TuPV, nor did they have any detectable astrovirus, reovirus or rotavirus. We had a clean experimental environment and SPF birds to study the effect of parvovirus infection alone,” Zsak told Turkey Health.

“After challenge, birds developed characteristic signs of enteric disease such as diarrhea, and starting about 14 days after challenge, approximately 75% displayed significant growth retardation. Turkeys with stunted growth averaged 15% behind that of uninfected control birds and they never achieved normal weight, says Zsak, who reported the findings at the Western Poultry Disease Conference earlier this year.

Parvovirus shedding was also observed in cloacal swabs 4 days after challenge and lasted until 32 days post-challenge. In addition, 80% of the turkeys infected with TuPV developed viremia that peaked at 14 days after challenge. At the end of the 35-day study, TuPV was still detectable in the intestine, spleen and bursa of Fabricius.
Markers identified for turkey condemnation

French investigators have identified markers they say indicate an increased risk for condemnation of turkeys at the slaughterhouse.

In their study, 117 male standard turkey broiler flocks were randomly selected from 13 slaughterhouses in western France. The flocks were monitored from arrival until the results of post-mortem sanitary inspection, and information was gathered about their background, including rearing conditions and health history.

The within-flock, weighted average condemnation proportion was 1.8%; the main reasons for condemnation, accounting for 76% of condemned carcasses, were emaciation, arthritis-polyarthritis and congestion, the investigators, of the French Agency for Food Safety, say in the May 1, 2010, online issue of Preventive Veterinary Medicine.

Three variables were significantly associated with an increased condemnation risk: observed locomotor disorders on the farm, high cumulative mortality 2 weeks before slaughter and clinical signs observed by veterinary services during the ante-mortem inspection at the slaughterhouse.

Like other parvovirus infections, turkey parvoviruses are present in birds as young as 4 days of age, confirming the possibility that the virus may spread vertically — from parent to progeny. However, “considering the rapid growth characteristics of parvoviruses and their efficient spread via the fecal-oral route, horizontal transmission of the virus from infected birds to naïve individuals may also play an important role in the spread of virus within flocks,” Zsak says.

Asked if TuPV might be a more important cause of enteritis in turkeys than other pathogens, the researcher says there is no real scientific evidence that one pathogen would be more important in the etiology of turkey enteric diseases than any other factor.

“What however, our results suggest that infection with parvovirus, which can happen at a very early age, may result in a rapid and robust virus replication in the gut, which is followed by diarrhea and stunting of the birds.” In these cases, there is an increased chance for other, sometimes opportunistic, pathogens to further contribute to the clinical and pathological course of the disease.

“While TuPV infection may not cause the most severe [enteric] disease by itself, we believe that early infection with this virus can induce a series of major, primary events in the gut, which, in conjunction with other factors, will turn eventually into a complex enteric syndrome,” he says.

CONTROL OPTIONS

The key to control of TuPV, Zsak says, may be immunizing parents to provide offspring with maternal immunity sufficient enough to protect against TuPV during the first few weeks of life. This approach has been used successfully to control Derzsy’s disease in geese, which is caused by a parvovirus, he notes.

Because technology to propagate and attenuate live turkey parvoviruses in cell culture is lacking at this time, the most realistic approach for now may be using an inactivated vaccine to immunize breeders, then boosting them with a subunit vaccine to provide a high level of maternal antibodies for prevention of parvovirus infection or to at least eliminate the primary clinical signs. It is very likely that a high level of maternal antibodies in turkeys would successfully protect against parvovirus-induced enteric disease, the veterinarian predicts, noting that he and his team are working to develop an in-house ELISA that could detect TuPV-specific antibodies in layer flocks and maternal antibodies in young poults.

“Since enteric disease in turkeys is a very significant health problem, these novel research findings should be taken into consideration when we try to improve the health status of commercial US turkey flocks,” Zsak says, noting that he is confident that researchers, working collaboratively with the turkey industry, will ultimately find an efficient strategy for controlling TuPV.
A non-chlorine cleansing solution for washing eviscerated poultry carcasses effectively removed bacteria that cause human foodborne disease and might also enable US turkey and chicken producers to resume exports to Europe and Russia, according to news sources.

In a series of studies, researchers from USDA’s Agricultural Research Service washed broiler carcasses with different concentrations of lauric acid and potassium hydroxide. Lauric acid at 2% and potassium hydroxide at 1% generally removed more bacteria from broiler carcasses.

Bacterial contamination was not significantly affected by the amount of pressure used to wash carcasses, but it was significantly reduced when the amount of time carcasses were spray-washed was increased from 5 to 15 to 30 seconds.

The European Union’s and Russia’s ban on chlorine-rinsed poultry carcasses has frustrated US producers, who are required to use chlorine as a sanitizer to prevent cross-contamination of pathogens such as salmonella, Invention and Technology News says.

However, “With the development of an alternative to chlorine for processing chicken and turkey, the USDA may have found a way for US processors to once again supply Europeans and Russians with American-raised poultry for the dinner table,” the publication reports.

Proper brooding management after vaccination with Coccivac-T is just as important as proper application of the vaccine, says Dr. Charlie Broussard, US poultry technical service director, Intervet/Schering-Plough Animal Health.

Coccivac-T can effectively prevent coccidiosis in turkeys, but the poult must get off to a good start to achieve optimal success with the vaccine, he says. Toward that end, “the goal is uniform feed and water consumption, minimal litter consumption and minimal disease challenge.”

Start by making sure that air and floor temperatures in the poultry house encourage good poult activity at placement, and don’t hinder feed and water consumption, Broussard recommends. Provide an appropriate number of easily accessible supplemental feeders — feed lids — and drinkers during the initial stages of brooding. “If poult’s drink well, they’ll eat more and vice versa.”

He advises against reducing or discontinuing supplemental feed until poult’s are at least 7 days of age; both supplemental feed and water should be continued until poult’s have acclimated to the standard house feeding and watering equipment.

When supplemental feed is removed, it should be done gradually to discourage litter eating. After vaccination at 1 day of age with Coccivac-T, the poult excrete then ingest coccidia from the vaccine, reinfecting themselves. It’s this cycling of oocysts that enables poult’s to develop immunity against coccidiosis, the veterinarian explains.

If poult’s eat large amounts of litter, however, they can consume too many coccidial oocysts as well as harmful bacteria such as clostridial organisms. “The result could be an excessive vaccination reaction or enteritis, respectively, and flock uniformity and performance will be less than optimal,” Broussard explains.

Proper litter moisture is another important aspect of brooding management. Some moisture is needed to stimulate the coccidial life cycle, but too much may result in heavy coccidial cycling and bacterial overgrowth. “Again, you can risk too much vaccine reaction or enteritis, even if poult’s don’t eat excessive amounts of litter,” he says.

Don’t be alarmed, Broussard says, if poult’s vaccinated with Coccivac-T exhibit transient wet droppings at about 21 to 28 days of age. This may signal the final life cycle of coccidial cycling after vaccination. “Just make sure that the type of litter you use and its depth accommodate the expected moisture, and adjust the ration formulation and ventilation in the house to reduce the amount of moisture that’s excreted.”
Minimizing poult stress from 6 to 8 weeks of age is ‘critical’

**Dr. John Radu** / senior technical service manager, Intervet/Schering-Plough Animal Health

Turkey poults experience less stress from 6 to 8 weeks of age than they do the first 2 weeks of life, but minimizing the stress that occurs is critical for achieving optimal performance. The two stresses to avoid are overcrowding and improper ventilation.

**Overcrowding**

The cause of overcrowding is simple: Either the house is too small, or there are too many birds.

Turkey growth soars at about 5 weeks of age, a fact to consider when moving poults. If the plan is to transfer them at 6 weeks of age and the move time is delayed until 8 weeks, overcrowding will occur.

The effects of overcrowding can be severe. Ventilation is harder to control, so dust, ammonia and airborne bacteria increase. Litter management is difficult due to poor ventilation and because manure output increases rapidly with poult growth. Overcrowding is also hard on equipment and growers.

Overcrowding can be prevented by careful planning. Measure your houses and order poults based on the available square footage. If there’s any risk that moving will be delayed, place fewer birds.

When overcrowding occurs despite planning, add feeders and waterers and carefully supervise ventilation. It’s better to over-ventilate, even if you use more gas. Sometimes you can get away with 5% overcrowding, but when overcrowding reaches 10%, you may be in for serious trouble.

**Improper ventilation**

Improper ventilation can be caused by either over-ventilating or under-ventilating. Over-ventilating is fairly uncommon but can occur during dry weather or due to inexperience or poor supervision of the staff.

Under-ventilation can be caused by over-enthusiastic energy conservation, incorrect fan or fan motor size and poor ventilation equipment maintenance, as well as inadequate staff experience or supervision.

Improper ventilation results in wet litter, increased ammonia levels or increased dust and airborne bacteria levels, which can lead to leg problems and respiratory disease. Remember that the major causes of respiratory disease are ammonia, dust, low humidity, disease and overheating, probably in that order.

Most people can barely smell ammonia at 10 ppm in the air; 20 ppm causes respiratory damage in turkeys and reduced feed efficiency, while 50 ppm causes nasal and eye irritation and will usually lead to disease — most often *Escherichia coli* infections.

Low humidity can also cause some respiratory irritation and may encourage formation and spread of *Aspergillus* spores. Overheating will cause poults to breathe through their mouths, which means they aren’t using the efficient dust and bacteria filters in their nostrils and that more dust and bacteria get into tracheas and air sacs.

Improper ventilation can be prevented by using additional fans and heating equipment, despite energy costs; by adding misters or foggers for dust control, if needed; and by avoidance of overcrowding. In some cases, managers just have to decide whether to add ventilation equipment, reduce bird numbers or accept respiratory disease losses, including fowl cholera vaccination reactions.

**Editor’s note:** To read Dr. Radu’s article on reducing stress in turkey poults during the first 2 weeks of life, see issue 10 of Turkey Health at www.turkeyhealth.com.

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