

from the president...

LOHMANN NAMES WAYNE COLLINS DIRECTOR OF SALES



Wayne Collins has recently been named director of sales for North America for Lohmann Animal Health International (LAHI).

"Wayne is highly qualified and has tremendous depth and global experience in avian biological sales management," said Dave Zacek, LAHI president, in making the announcement. "We are very fortunate to have him in this position."

As LAHI's new NAFTA director of sales, Wayne Collins is actively taking steps to strengthen client relationships. To better meet client needs, he has restructured the company's sales efforts to increase market presence. "With the reorganization of territories, our sales force can focus on client needs

more effectively," Collins said. "The changes allow our sales managers to be more proactive and responsive."

In the position, Collins is in charge of all NAFTA area sales managers and technical service veterinarians. LAHI's six area sales managers under Collins' leadership are Travis Boatwright (Southwest), Dennis Kamstra (West), Jesse Rodriguez (Southeast), Shannon Kellner (Mid-Atlantic), Brent Swanson (Heartlands) and Kiko Carillo (Mexico, Canada & Puerto Rico). Collins manages accounts in the Northeast.

The technical service veterinarians on the team include one full-time veterinarian and four consulting veterinarians that are placed strategically throughout the United States. Full-time veterinarian Dr. Karen Burns also serves as manager of technical services. The consulting veterinarians are Dr. Ken Takeshita in California, Dr. Greg Cutler in California, Dr. Eric Lovell in Florida and Dr. David Shapiro in Tennessee.

Collins has been with LAHI for five years, most recently as area sales manager for the northeastern area. He has 18 years industry experience, including working as international sales manager for Kirkegaard & Perry Laboratories. He also worked with Dynatech Laboratories as an area manager, covering 30 states and Canada.

He has a BSA degree in poultry science from the University of Georgia. Collins also did graduate work and was a research assistant at the University of Maryland.

As NAFTA director of sales, Collins becomes a member of the LAHI management committee.

"Wayne has a solid understanding of the needs of our clients, the demands of the sales environment and the intricacies of the avian biological industry," said Zacek. "He will provide excellent leadership to our sales force."

avian insight

A LOHMANN ANIMAL HEALTH NEWS BRIEF

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Are We Controlling Infectious Bronchitis? Vaccination "Do's and Don't's"

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The following paper was modified from Dr. Gelb's presentation "Infectious Bronchitis Update-Current Thinking on Controlling IB. Is it Working or is it the Lull before the Next Storm?" at the North Atlantic Poultry Health and Management Conference, Portsmouth, New Hampshire, March 26-27, 2003.

Shh! Infectious bronchitis (IB) is quiet, at least for the most part in the USA. In many poultry growing areas, IB has been a "non-event" the last couple of years. The last major outbreak in broilers caused by the Georgia 98 strain devastated the Southeast in 1999-2000 (5). Delaware 072 (DE/072/92) strain vaccination in combination with management considerations reduced reoccurring IB induced respiratory disease due to the Georgia 98 and related strains. The last significant outbreak of the relatively rare renal form of IB occurred from 1997-2000 in Pennsylvania (7). In commercial layers, IB is still a concern, mainly due to variant strains of the virus that break through vaccinal immunity to cause egg production losses.

IB has been an ongoing problem in the industry for many years. So what, if anything, has changed and resulted in IB to be "controlled", especially in

broilers? I realize that I am at serious risk of implying that IB is "controlled"! Who knows what could lie ahead going into this fall and winter. Where might the next variant strain come from and what can we do about it? Before addressing these questions, it might be helpful to briefly review IB and its causative agent infectious bronchitis virus (IBV).

IBV VARIANTS; EVOLUTION AND PERSISTENCE

Certainly, a key reason IB is a concern for poultry producers is the virus' ability to change through mutation. One of the first indications of IBV's ability to change was the recognition of a "new" serotype, the Connecticut strain in the 1950's. Prior to that time only the Massachusetts serotype was known. Today many, many serotypes and/or genotypes have been reported virtually from all poultry producing countries. IBV, like all coronaviruses, is well suited to undergo mutation during its replication cycle (4). Replication of the virus' RNA genome is error-prone and mutations commonly result. A major target for mutation is the gene encoding the spike (S) envelope protein used by

the virus to attach and infect the host cell. Mutations in the S gene result in antigenic changes that can lead to the emergence of variant serotypes. The S gene is able to tolerate numerous mutations without compromising the virus' ability to replicate and cause disease. An end result of the virus' "flexibility" is that many strains of IBV are capable of existing in nature.

Once formed, new mutant strains, often referred to as variants, are soon subjected to immunological selection so that only the most antigenically novel variants survive in poultry populations. Many new variants probably do not become established in flocks. For example, a new variant that is not particularly antigenically novel, e.g. one similar to a vaccine strain used on the farm, will not become established in the flock because the vaccine-induced immunity will eliminate it. Conversely, newly mutated variants that are antigenically distinct from vaccine strains have greater potential to escape vaccine-induced immunity, become established in flocks, and cause disease. However, IBV sometimes defies logic. Even very unique variants with demonstrated pathogenicity to cause serious



In this issue of avian insight:

Are We Controlling Infectious Bronchitis? Vaccination "Do's and Don't's" p.1

From the president p.4

continued from page 1

disease outbreaks, have been known to “die out” within a few years. Factors enabling some variants to continue to be problematic in poultry while others do not are not understood.

An important outcome of IBV infection, viral persistence in the chicken, also favors viral change. Persistence is relevant because IBV is not rapidly cleared in chicken tissues and continues to multiply even after clinical signs following infection are resolved. Ongoing multiplication gives IBV a greater opportunity to undergo additional mutations. Both pathogenic field strains as well as vaccine strains are subject to persistent infections. Virus may be recovered from the intestinal cecal tonsil may for many weeks or even months (1). In respiratory tissues, IBV persists for up to 3 weeks, much longer than lentogenic strains of Newcastle disease virus (NDV).

TWO SOURCES OF IBV FIELD STRAINS; VARIANTS AND VACCINES

Highly novel variant serotypes, such as the Delaware 072 (2), evolve initially in commercial layers, very commonly on multiple age farm complexes. Complexes provide conditions favoring the emergence of new variants. Flocks of different ages, frequently numbering in excess of a million birds, are housed in close proximity. Periodic introduction of new pullets, and the continual re-infection and cycling of IBV in the layers, results in ongoing infections and mutations. Variants become established over time since the complexes are rarely, if ever, totally depopulated, cleaned and disinfected. As mentioned earlier, vaccine induced immunological mechanisms provide a selective pressure for the most antigenically novel variants. Variant serotypes represent biosecurity risks to neighboring poultry farms and may be spread via manure (fertilizer) application, exchange of contaminated egg packing materials, and movement of spent fowl to processing plants.

In recent years, modified live vaccines have become recognized as another important source of pathogenic IBV, especially in broilers. Live vaccines readily revert to virulence (3) because they contain heterogeneous subpopulations of the virus (6). Vaccines primarily consist of attenuated subpopulations but likely also contain a small residual pathogenic viral subpopulation. This makes live vaccines inherently unstable. The host in which the virus is growing will affect the expression of the different (virulent or attenuated) subpopulations. For example, repeated passage of embryonated egg-derived vaccine from one chicken to another, a process referred to as “back” passage, results in shifting of the viral subpopulations from the mainly attenuated subpopulations found in the vaccine to a predominant virulent subpopulation in the chicken (Fig. 1). Shifts in vaccine virus subpopulations occurring during back passage are often also

accompanied by slight antigenic and genomic (S1 gene) changes (6). Over time, and in the absence of farm clean out and disinfection, virus derived via back passage of a vaccine can become established as an IBV field challenge and cause significant disease losses. Indeed, laboratory studies have shown that vaccines may revert to partial or full virulence within only 3-6 back passages in chickens (3). Certain management practices are associated with enhancing vaccine back passage and these should be avoided (see below). Vaccine derived IBV should be considered as a source of infection in situations where there is a high incidence of isolation of field isolates of a vaccine serotype that has been used with little or no apparent reduction in disease incidence. For example, Arkansas vaccine was used in Delmarva in the early 1990s, yet most of the field isolates were of the Arkansas serotype and were also pathogenic (6).

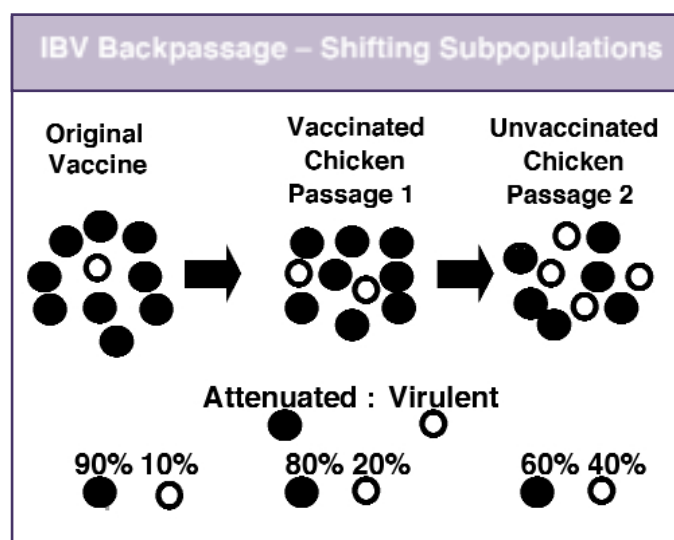


Fig. 1. Cartoon depicting a drop of IBV directly in a bottle of vaccine (original vaccine), in the trachea after vaccination (chicken passage 1), and in the trachea after transmission to a “missed” chick at the time of vaccination (chicken passage 2). Attenuated virus subpopulations (solid circles) shift to contain a higher percentage of virulent subpopulations (empty circles).

AVOIDING BACK PASSAGE OF VACCINES AND REVERSION TO VIRULENCE

Vaccination by drinking water or spray is a vaccine virus “numbers game”. The goal is to *immunize* the highest percentage of the poultry in a flock at the time the vaccine is applied. Achieving a high rate of immunization is difficult since the amount of the vaccine each chicken receives is not uniform. Some birds receive higher doses than others dose while some chicks may be missed entirely. Transmission of IB vaccine virus among birds in the flock after vaccination can be high if many birds are missed or receive a low dose. Transmission of vaccine virus to missed birds is not desir-

continued from page 2

able and may lead to a persistent rolling reaction, an indication of vaccine back passage.

Each chick must receive the *minimum protective dose (MPD)* of the vaccine to become immunized. The *MPD* will vary for different IBV vaccines. Any vaccine application practice that reduces the opportunity for a chick to receive the *MPD* will reduce its chance of becoming immunized and thus increase the opportunity for vaccine back passage.

Vaccination practices that enhance immunization and reduce back passage potential.

1. *Use the manufacturer’s recommended dosage for modified live vaccines.* Over-diluting or cutting IBV vaccines is *not* advisable because it reduces the amount of virus in the vaccine when sprayed and reduces the possibility of achieving the *MPD* required for immunization. A common outcome of cutting vaccines is a low percentage of the chicks in the flock become immunized and the vaccine virus is transmitted repeatedly to susceptible chicks that did not receive a *MPD* when the vaccine was sprayed.

2. *Apply IBV vaccines using sprayers that emit a consistent small to medium sized droplet.* Small droplets enable the vaccine spray to travel further (e.g. to the side walls) in the chicken house and remain airborne longer enabling the spray to come in contact with the respiratory mucous membranes (eye and nares), the targets for successful immunization. Large droplets travel only a few feet and fall to the floor rapidly and thus will not immunize the chick.

3. *Use IBV vaccine strain(s) on a year-round consistent basis.* Seasonal IBV vaccine usage was once common in the poultry industry. Booster programs in broilers were reserved only for the colder, winter months when respiratory disease was most severe. Similarly, some vaccine strains (e.g. Arkansas) were only used in colder months from October–April. Poultry producers elected not to use Arkansas strain vaccination from May–September in order to avoid the added stress of the post-vaccinal reaction associated with use of the strain. In retrospect, seasonal vaccine usage contributed to the reversion of the Arkansas vaccine to virulence through “back” passage during May to September when the vaccine was not being used. The result was the establishment of a virulent, vaccine derived Arkansas field challenge that was not easily controlled the next winter when Arkansas vaccination was resumed.

The use of the same strains of IBV vaccines year round helps to reduce vaccine “back” passage and reversion to virulence through the continual introduction of the vaccine in successive flocks.

FINAL THOUGHTS

IB modified live virus vaccines are indispensable tools required for poultry production. All live virus vaccines are associated with some degree of risk that requires consideration to minimize side effects. Unfortunately, IBV vaccines have inherent risks, but these can be greatly reduced by their appropriate application.

Will IB cause problems in the future? Of course, new variant serotypes will emerge from time to time and frankly, we probably don’t have much control over those circumstances. The virus’ capacity to change will always make it a threat.

We should however pay careful attention to reduce the opportunity for IBV vaccines to revert to virulence through poultry management and vaccination practices. Achieving a higher degree of immunity from proper vaccine application will also provide the best opportunity for protection against the new variant serotypes when they do emerge.

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continued on page 3