

TRANSMISSIBILITY OF INFECTIOUS BRONCHITIS VIRUS H120 VACCINE STRAIN AMONG BROILERS UNDER EXPERIMENTAL CONDITIONS

M.G.R. MATTHIJS,* A. BOUMA, F.C. VELKERS, J.H.H. VAN ECK, AND J.A. STEGEMAN

Department of Farm Animal Health, Faculty of Veterinary Medicine, Utrecht University, Marburglaan 2, 3584 CN Utrecht, the Netherlands

Study Results

The aim of this study was to quantify transmission of infectious bronchitis virus (IBV) H120 vaccine strain among broilers, and to assess whether birds that have been exposed to vaccine-strain shedding birds were protected against clinical signs after infection with a virulent strain of the same serotype. All contact-exposed birds, except one in one H120 group, became infected with either IBV H120 or IBV M41. Almost all birds contact-infected with IBV H120 or IBV M41 were subsequently protected against clinical signs after challenge with IBV M41 (Table 1).

Significance of Study Results

The study findings demonstrate that IBV H120 vaccine is able to spread extensively among broilers. This implies that this vaccine strain might be able to become endemically present in the poultry population. It also implies that even if not all birds have received vaccine during spray application, they will most likely be protected against clinical signs after a subsequent field virus infection due to the ability of the vaccine to spread in the flock.

Additional Information

IBV infection can cause respiratory signs in broilers, and in addition also predispose broilers for secondary bacterial infections such as *Escherichia coli* infection. The latter may result in colibacillosis (fibrinous polyserositis), a disease of major clinical and economic importance in broiler industry.

Vaccines against IBV are often applied to reduce economic losses due to an infection with field strains of IBV. In Europe, IBV H120

vaccine is one of the commonly used live infectious bronchitis (IB) vaccines in commercial poultry, and spray vaccination of broilers at 1 day or 15 days of age generally induces good clinical protection upon challenge with a virulent IBV strain of the same serotype. The vaccine itself is generally considered as safe for use in young chicks, although it has been demonstrated that it sometimes does induce mild signs of IB shortly after vaccination. In addition, other indications of side effects of the vaccine include increased the susceptibility for colibacillosis of four-week-old broilers to a similar extent as the virulent IBV M41. Colibacillosis in broilers is an airborne disease which mainly occurs in the second half of the production period, when the *E. coli* concentration in the air of broiler houses might be high. Thus, infection of broilers with IBV H120 vaccine from approximately 4 weeks of age is undesirable. Such infection might occur in vaccinated broiler flocks due to direct contact exposure of broilers not effectively hit by the vaccine or due to virus spread from vaccinated to unvaccinated flocks. Whether or not this phenomenon occurs in the field has to be determined, but it is clear that it can only occur if the vaccine strain is able to spread from vaccinated to unvaccinated birds or flocks. In addition to this, a transmissible vaccine may be able to persist in a population.

The probability of becoming infected with a live vaccine virus through contact with a vaccinated bird depends on the efficiency of its transmission, which can be expressed by the reproduction ratio R , the average number of contact infections caused by one vaccinated individual in a completely susceptible population. If $R < 1$, an individual may be infected by contact occasionally, but a major outbreak or epidemic will not occur; if $R > 1$, a large number of individuals may become infected through contact which can result in an epidemic.

*Corresponding author. E-mail: m.g.r.matthijs@uu.nl