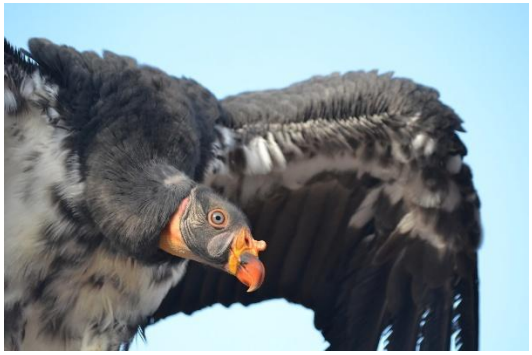
From Bird Flu Vaccine Trial Shows Promise for Saving California Condors

A team of US-based researchers recently tested the safety and efficacy of a licensed avian influenza vaccine in protecting California condors, a critically endangered bird species, against the highly pathogenic avian influenza virus.



Study

In the current study, researchers investigated the safety and efficacy profiles of a conditionally licensed influenza subtype H5N1 poultry vaccine, initially in black vultures and subsequently in California condors. They selected black vultures as a surrogate species for California condors to initially ascertain the vaccine's safety and efficacy in these abundant and easily available species. The vaccine used in the study was developed by Zoetis, Inc., which also donated the vaccine and provided expertise for the trial.

The researchers randomly assigned 28 black vultures into three groups. The first group received two doses (0.5 milliliters each) of the vaccine given at an interval of 21 days; the second group received a single vaccine dose (1.0 milliliters); and the third group remained unvaccinated.

For the California condor trial, a similar design was used, but with modifications to reduce risk and stress: condors were located at multiple facilities, vaccinations were staged to confirm safety before proceeding, and blood samples were collected less frequently (at 0, 21, and 42 days post-vaccination) to minimize handling of these endangered birds.

Results

The study found that both black vultures and California condors produced significantly higher levels of antibodies in response to the vaccine than unvaccinated birds. However, the short-term antibody response was stronger in black vultures than in California condors.

Specifically, 95% of vaccinated vultures and 80% of vaccinated condors showed a measurable antibody response within the published protective range.

Regarding vaccination regimen, the study found that birds receiving a single vaccine dose generated a weaker antibody response that dissipated more rapidly. This finding suggests that a prime-boost (two-dose) vaccination regimen would be more effective in protecting birds against infections caused by HPAI viruses.

However, the difference in antibody response between the two regimens was not statistically significant, although qualitative trends favored the two-dose approach.

The study was unable to evaluate long-term differences in waning immunity between the two vaccination regimens, as the antibody response was determined only 42 days after vaccination.

The study was unable to detect a significant impact of either sex or bone lead concentration on the antibody response, which may be due to the small sample size and uneven sex ratio of the sample group. The researchers believe that in the absence of these two limitations, they might have detected significant impacts of these two correlates of antibody response. Nevertheless, they noted that birds with the strongest antibody response were also those with the lowest bone lead level, regardless of vaccine regimen.

The authors caution that these findings are tentative and that a larger, more balanced sample might reveal the real effects of sex or lead exposure.

Regarding safety, the study found that none of the vaccinated birds (both vultures and California condors) exhibited significant adverse reactions. No changes in behavioral or physical activity were observed in birds following vaccination. The only minor adverse effect observed was the development of small, temporary nodules at the injection site in two vultures, which resolved without intervention.

Conclusion

The study highlights the importance of vaccinating threatened and endangered bird species against highly virulent and currently circulating HPAI viruses to protect them from deadly infections.

Overall, the findings suggest that licensed vaccines can be a realistic strategy to aid in conserving condors and potentially other species facing similar threats, especially those with small and highly threatened populations.

Vaccination may be particularly relevant when a population's resiliency has decreased to the extent that naturally occurring illness and death from disease could impair the species' long-term persistence.

The authors note that, despite species-specific differences in vaccine response, evidence from the literature suggests that even vaccination strategies covering less than 50% of an affected wildlife population can be effective at preventing extinction.

They also emphasize the need for ongoing monitoring of vaccine effectiveness in the field, as well as demographic modeling to optimize vaccination strategies for wild populations, taking into account factors such as timing, age class, and proportion vaccinated.

Given the economic benefits associated with poultry farming, researchers emphasize the need for close coordination with the US Department of Agriculture (USDA) and numerous other federal and state agencies to obtain authorization for implementing these vaccination trials.

Given the significant threat from HPAI viruses, the US Fish and Wildlife Service (USFWS) decided to initiate a California Condor Recovery Program vaccination program. By October 2024, 207 condors had received at least one vaccination.

The authors stress that this vaccination effort is unique within the United States and represents an unprecedented coordinated response to an emerging disease threat facing an endangered species.

Source:

https://www.news-medical.net/news/20250417/Vaccine-trial-shows-promise-for-saving-California-condors-from-bird-flu.aspx