

## Efficacy of a piglet-specific commercial inactivated vaccine against Porcine circovirus type 2 in clinical field trials

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### Abstract

The efficacy of a piglet-specific inactivated Porcine circovirus type 2 (PCV2) vaccine was evaluated with clinical field trials, as recommended by the Republic of Korea's Animal, Plant & Fisheries Quarantine & Inspection Agency. Three farms were selected on the basis of their history of postweaning multisystemic wasting syndrome. On each farm 60, 1-week-old pigs were randomly allocated to 1 of 2 treatment groups: vaccination at 1 and 3 wk of age or no vaccination. The 2-dose schedule of vaccination with inactivated PCV2 vaccine improved the average daily weight gain from birth to 16 wk of age, the PCV2 load in the blood, and the frequency and severity of lymph node lesions. Inactivated PCV2 vaccine seems to be very effective in controlling PCV2 infection under field conditions.

### Résumé

L'efficacité d'un vaccin spécifique pour les porcelets à base de circovirus porcin de type 2 (PCV2) a été évalué dans des études cliniques, tel que recommandé par l'Agence d'inspection et de quarantaine des animaux, plantes et des pêcheries de la République de la Corée. Trois fermes ont été sélectionnées en fonction de leur historique relativement au syndrome de dépérissement multi-systémique en période post-sevrage. Sur chaque ferme, 60 porcelets de 1 semaine d'âge ont été répartis de manière aléatoire à un des 2 groupes de traitement : vaccination à 1 et 3 semaine d'âge, ou aucune vaccination. La cédule de vaccination à 2 doses avec le vaccin PCV2 inactivé a amélioré le gain quotidien moyen entre la naissance et l'âge de 16 semaines, la charge sanguine de PCV2, ainsi que la fréquence et la sévérité des lésions des nœuds lymphatiques. Le vaccin PCV2 inactivé semble être très efficace pour maîtriser les infections par PCV2 dans des conditions de terrain.

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Porcine circovirus-associated diseases (PCVADs), caused by Porcine circovirus type 2 (PCV2), have been recognized as the most economically important diseases in the global swine industry (1,2). Since PCV2 vaccines were introduced into the world market in 2006, vaccination strategies have been used to control and prevent PCV2 infection. PCV2 vaccination was administered to approximately 97.5% of all piglets farrowed in Korea in 2010 (3).

Several commercial PCV2 vaccines are available in the global market. Field reports on some products indicate that vaccination has been highly efficacious in reducing the incidence of PCVADs in the production system (4–9). Recently, a piglet-specific commercial inactivated PCV2 vaccine has been developed by the Korean Pharmaceutical Company. The objective of this study was to evaluate the efficacy of this new vaccine after administration to piglets at 1 and 3 weeks of age with the use of clinical field trials, in accordance with the registration guidelines of the Republic of Korea's Animal, Plant & Fisheries Quarantine & Inspection Agency (10).

The vaccine (CircoPrime; Komipharm International Company Ltd., Shiheung-shi, Kyongki-do, Republic of Korea) was prepared from an inactivated tissue homogenate and contained inactivated PCV2b ( $10^5$  fluorescent antibody infectious dose<sub>50</sub>/mL) and aluminum

hydroxide gel adjuvant (10% of volume). It was given as two 1.0-mL doses at 1 and 3 weeks of age.

The clinical field trial was conducted on 3 farms. Farms A, B, and C housed herds of 1100, 450, and 250 sows, respectively, that had consistently suffered losses due to PCV2 infection in several recent months. Farms A and B were 2-site production systems with separate nurseries and finishing units. Farm C was a 1-site production system. At all 3 farms the pigs were weaned into a nursery barn (which housed pigs from weaning until approximately 10 weeks of age) at an average age of 21 days, with approximately 2 farrowing house litters to a nursery pen. The pigs were moved to the finishing barns at approximately 10 weeks of age. All 3 farms tested seropositive for Porcine reproductive and respiratory syndrome virus (PRRSV), but the pigs were not vaccinated against PRRSV, and all 3 farms had been confirmed as positive for postweaning multisystemic wasting syndrome (PMWS) according to the diagnostic criteria of PMWS (1). No PCV2-associated reproductive problems had been reported, and the 3 farms had not previously used any commercial PCV2 vaccine.

On farm A the clinical signs of PCV2 infection first appeared at approximately 6 to 8 weeks of age, and the peak mortality rate (18%) occurred at approximately 9 to 11 weeks of age. On farm B,

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