



IMMUNOLOGY & VACCINOLOGY

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DEVELOPMENT OF A MONOVALENT PIG VACCINE BASED ON A HUMAN PANDEMIC H1N1 (2009) STRAIN

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Introduction

Immediately after initial emergence in humans in 2009, pandemic H1N1 has now spread globally and represents a threat for global pig production by inducing economic losses worldwide. Based on a human virus isolate from 2009, IDT Biologika developed an inactivated full virus vaccine and gained market authorisation for Europe in 2017 under the name Respiorc® FLUpan H1N1. Primary aim for development was protection of the naïve swine population against pandemic Influenza virus. Pandemic influenza virus is considered as a zoonotic pathogen and hence development of the vaccine for use in pigs follows the One Health approach.

Material & Methods

In total, 77 influenza A seronegative pigs were vaccinated with Respiorc® FLUpan H1N1 at 53 to 56 days of life followed by a second vaccination 3 weeks later (injection dose= 1 ml, *i.m.*). Challenge strain was one of three different pandemic field virus isolates originating from different European countries with virus titres between 5.92 and 9.46 log₁₀ TCID₅₀. Challenge was performed 7 and 92 days after second vaccination according to European Pharmacopoeia.

Results

The vaccination with Respiorc® FLUpan H1N1 showed a significant decrease in viral lung load ($p=0.002$ to 0.056) and a significant reduction in viral shedding via nasal secret ($p < 0.0001$ to 0.0083). This translates up to 7943 fold reduction of viral lung load and up to 2986 fold reduction of viral shedding, respectively. Dyspnoea was relatively reduced by 44 to 99% in the mean cumulative score. All animals seroconverted on day 8 after 2nd vaccination.

Discussion

Vaccination with Respiorc® FLUpan H1N1 showed significant efficacy against three pandemic H1N1 field virus isolates from different European countries. Thus, Respiorc® FLUpan H1N1 is the appropriate tool to stimulate an active immunity in the European swine population against the widely present subtype pdmH1N1(2009).