



Current Advances

February 14, 2013

Providing Unique Technology for Animal Health

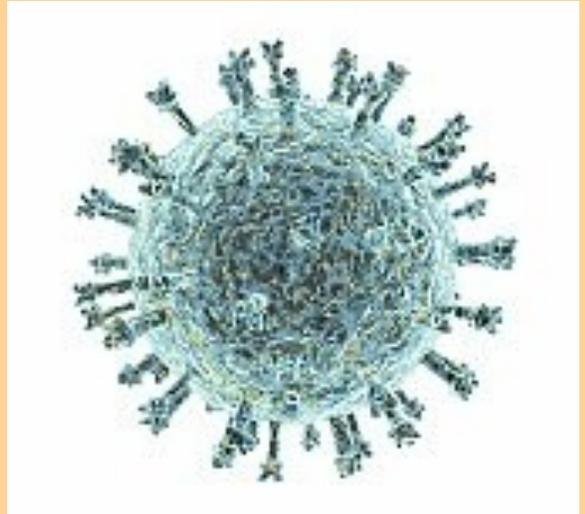
Swine Influenza Virus Diagnostic Testing and Autogenous Vaccine Manufacturing

In 2012 Gallant Custom Laboratories introduced custom Swine Influenza Virus (SIV) vaccines to the Canadian swine industry under license by the CFIA. Gallant has the capability to detect, sub-type, isolate and culture SIV strains and manufacture vaccines upon request by veterinarians.

In 2013 Gallant will continue to support our Canadian veterinarians by offering free SIV diagnostics to build on the success experienced in 2012. Gallant will process, without a cost to the client, up to 5 individual or pooled samples per diagnostic case submission.

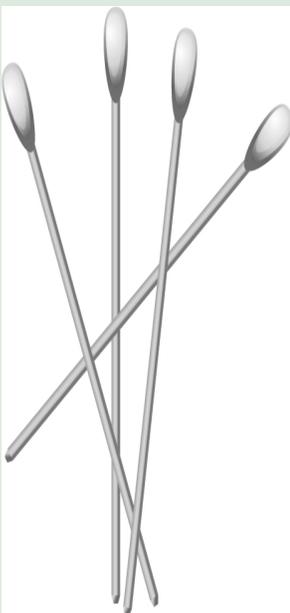
Veterinarians may choose to pool samples prior to submission to increase the number of animals screened or submit extra samples at an additional cost. Any SIV strain(s) recovered will be isolated and stored.

Gallant has achieved repeated success with detecting and culturing SIV from 5 or fewer field samples submitted from infected swine. However, detection and isolation success is highly dependent on effective in-field sampling practices and sample quality. Therefore, **Gallant recommends that SIV diagnostic samples always be shipped cold with next day delivery** to maintain viability of the virus and to increase the odds of recovering isolates for future vaccine production.



Sample Collection and Diagnostic Submission

Animals selected for sampling should be in the acute phase of the disease, febrile with serous nasal discharge and coughing. Ideally, veterinarians should take samples at the earliest signs of SIV infection for the best chance of detecting and recovering infective virus for use in an autogenous vaccine. Both lung tissue and/or nasal swabs may be submitted for SIV diagnostic testing and although infective virus can be successfully recover from both sample types, **Gallant has experienced more consistent success with detecting and isolating SIV from nasal swabs. Consequently, nasal swabs are recommended.**



Lung tissue should be sampled fresh from infected tissue; pneumonic areas are clearly demarcated, collapsed and purplish red. Tissue samples should be placed in leak proof plastic bags or plastic screw capped containers and shipped cold or frozen for next day delivery.

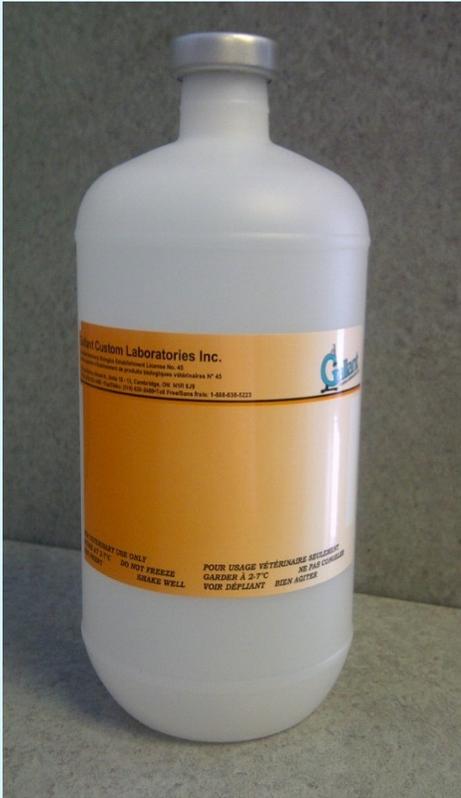
A Dacron or synthetic nasal swab(s) (no wooden swabs) should be saturated with nasal mucosal secretions/surface epithelium from both nostrils and placed in a viral transport medium vial to stabilize the virus and shipped cold for next day delivery.

If required, contact Gallant for a supply of viral transport media vials.



Sample Testing and Reporting

All diagnostic samples submitted to Gallant will be tested by real-time PCR to confirm positive or negative SIV status for preliminary reporting. All SIV positive samples will be inoculated onto tissue culture cells to assess virus infectivity and growth. Infective viral strains showing cytopathic effect (cpe) in tissue culture will be isolated, sub-typed and stored for future vaccine production and a final report will be issued to the attending veterinarian.



Use of Autogenous SIV Vaccines

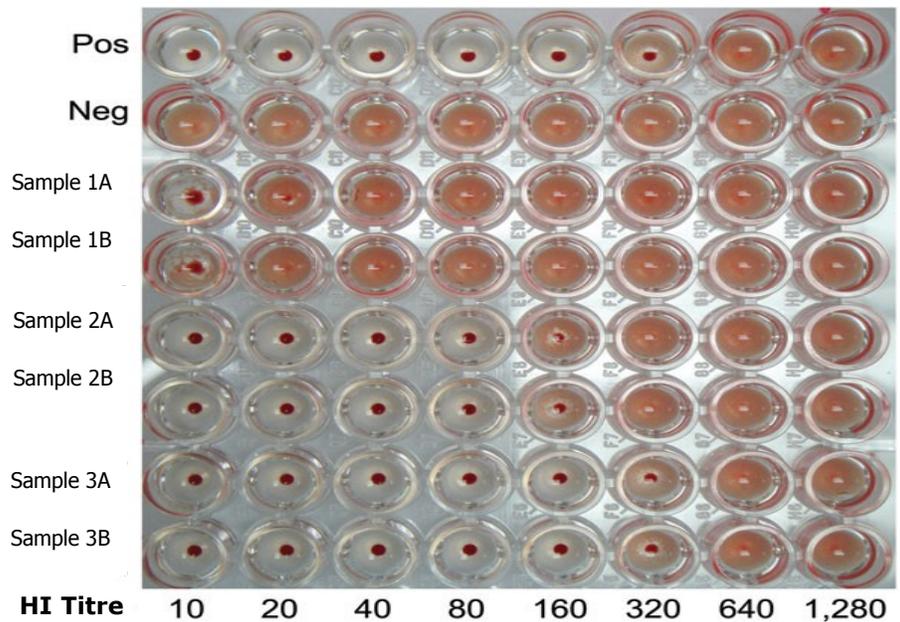
Genetic variation of swine influenza virus over time is a known cause of change in surface antigens responsible for triggering infection and immune response in animals. This continual antigenic drift is the primary reason why viral vaccines may lose effectiveness, over time, unless the vaccine strains are updated by periodic diagnostic sampling of the herd, to limit the negative impact of genetic drift. In general, the benefits of SIV vaccines are well documented and have shown influenza vaccines can be used to decrease susceptibility to influenza infection and decrease influenza transmission¹ in a herd and that strain-specific antibodies are more effective than cross-reactive antibodies in conferring protection against flu infection².

In a 2011 research study by Romagosa *et al.*, improved protection provided by a homologous inactivated autogenous SIV vaccine was reported compared to a commercial vaccine that offered only partial protection in vaccinated animals. In addition, 2 weeks after vaccination Hemagglutination Inhibition (HI) testing was performed and pigs in the homologous autogenous vaccinated group had higher antibody titres against the SIV challenge strain than pigs in the group vaccinated with the heterologous commercial vaccine.

Although potency and efficacy of autogenous vaccines are not established, autogenous SIV vaccines prepared from homologous SIV strain(s) currently circulating in a particular herd may be used to prevent or control the current disease problem.

Additional Follow-up Testing

A good performance measure of immunity and protection from SIV vaccines is seroconversion and this can be successfully measured by Hemagglutination Inhibition (HI) testing. Gallant offers homologous strain HI testing for serum samples submitted by veterinarians from animals vaccinated with an autogenous SIV vaccine manufactured by Gallant. The SIV strain(s) used in the HI assay is the same strain(s) included in the vaccine, thereby, offering the most accurate measure of immunological response to the vaccine. Testing both pre-vaccination and post final vaccination serum samples allows a direct comparison of antibody titres and confirms seroconversion induced by the autogenous vaccine.



To further discuss the benefits of using an autogenous SIV vaccine, to receive free SIV diagnostic services, to request viral transport media vials or to place a vaccine order please contact Gallant Custom laboratories at:

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 519-620-2488

References:

- Romagosa et al. *Veterinary Research* 2011, **42**:120.
- Haaheim and Schild. *Acta Pathol Microbiol Scand B* 1980, **88**:335-340.