Maternally-derived antibodies (MDA) reduce piglets’ susceptibility to swine influenza A virus, but they favor the persistence of the virus in swine production units by extending the duration of spread within the population. Furthermore, a strong MDA interference with post-infectious immune responses was evidenced, raising questions about protection after passive immunity waning. To evaluate the dose-dependent effect of MDA during passive immunity decay, we studied the impact of residual MDA on virus excretion and immune responses in piglets infected at 5, 7 or 11 weeks of age. Subsequent protection towards a second homologous infection occurring 4 weeks after the priro-infection was also investigated.

**EXPERIMENTAL DESIGN**

MDA- and MDA+ piglets born to unvaccinated or vaccinated sows. Primo-infections at 5, 7 or 11 weeks of age > MDA+ piglets with different MDA levels.

**RESULTS**

### Clinical signs

<table>
<thead>
<tr>
<th>% of pigs showing clinical signs (hypothermia ± weight loss) after a primo-infection</th>
<th>5 weeks</th>
<th>7 weeks</th>
<th>11 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDA-</td>
<td>100%</td>
<td>29%</td>
<td>86%</td>
</tr>
<tr>
<td>MDA+</td>
<td>0%</td>
<td>36%</td>
<td>100%</td>
</tr>
</tbody>
</table>

> Impact of age on flu severity

> Impact of MDA level on flu severity

No clinical signs in MDA- and MDA+ animals after the second homologous infection

> Establishment of protection after the 1st infection

### Virus excretion after primo-infection

- Younger animals shed more virus than others
- Excretion peak delayed for 7w animals – lower AUC
- No impact of MDA on the shedding profiles whatever the age

No virus excretion after second infection

### Infectious potential of excreted virus

Individual virus titration at excretion peak

Pigs’ responses to H1N1 were impacted by the age at infection, *i.e.* the physiological development, whatever the immunological status.

MDA conferred clinical protection in a dose-dependent manner but did not prevent virus replication. Moreover, only high MDA levels slightly neutralized neo-formed virus particles.

Post-infectious humoral responses were more or less inhibited depending on the accessibility of the target antigen and the MDA levels. However, adaptive immunity was efficient enough to induce immune memory and confer protection against a second homologous infection, at least during 4 weeks after primo-infection.