

Preventing neonatal diarrhea

HELPING THE OFFSPRING TO FACE THE CHALLENGE



The road to a healthier piglet starts with Porcilis® ColiClos

Prevent neonatal diarrhea, stop your farm losses



PIGLETS ARE BORN WITH **NO PROTECTION**



Passively acquired immunity

- Piglets don't acquire antibodies from the sow through the placenta, so they are naturally born in a very vulnerable state.
- **Piglets acquire protection by drinking colostrum,** which is secreted by sows during the first hours of life and transports antibodies into the piglets. The antibodies represent the sow's own circulating antibodies.
- During the first hours of life, the piglet's intestine has the ability to absorb colostrum antibodies before they are digested by enzymes, allowing for them to be carried to the blood soon after the first suck.⁶

During the first stages of passive immunity, Colostral Immunity develops

- Happens during the first 24 hours of sucking.
- Mainly made of Immunoglobulin M (IgM), Immunoglobulin G (IgG), and Immunoglobulin A (IgA) from colostrum.

• Lactogenic Immunity follows:

- Made of normal milk.
- Contains secretory IgA, which can be absorbed by the mucus. It doesn't get absorbed into the intestines and therefore can't provide protection against most intestinal infections.
- Lasts as long as there is milk^{.6,5}

PIGLETS MUST ACQUIRE SUFFICIENT PROTECTION BY **DRINKING COLOSTRUM**

Piglets are at risk of infection early on, thus passive immunization through colostrum is an optimal way to protect them. Since piglets can still be suckling, it precludes the ability to use water or feed antibiotics.¹



Adaptive Immunity depends on Colostral Immunity

- Takes place after 2-4 weeks of birth.³
- The piglet is able to produce its own antibodies





• If there is not enough antibodies absorbed during passive immunization, adaptive immunization will be less effective.

Vaccination can lead to a higher level of antibodies in colostrum and therefore to a stronger **Adaptive Immunity.**^{3,6}



- During gut colonization, *E. coli* strains and *Clostridium perfringens* can also enter the piglet's body, putting it at an early risk of infection.
- Antibodies from colostrum and milk are finite and can be overwhelmed by large doses of bacteria present in the environment.



PIGLETS NEED PROTECTION BECAUSE THEY ARE **SUSCEPTIBLE TO SEVERAL DISEASES**

NEONATAL DIARRHEA CAN BE ONE OF THE MOST COMMON AND IMPORTANT DISEASES.

- In well-run herds, piglet mortality from diarrhea should be less than $0.5\%.^6$
- In severe outbreaks, mortality can rise to over 7%.6
- If untreated, mortality can reach 100% in individual litters.⁶



E. coli - Scour

- Infections occur when *E. coli* attach to the villi of the small intestine.
- Infections are most common at less than 5 days of age.

Symptoms:

- Watery to salad cream consistency scour
- Vomiting
- Wet skin around rectum and tail
- Huddle together shivering



Clostridial Disease:

- Large gram-positive bearing bacteria present in the large intestine.
- There are several types, but type C is the most important as it can infect the small intestine before colostrum is taken in.
- Infections usually happen between the first 24 hours and the first 7 days.

Symptoms:

- Rotten smelling watery diarrhea (often with blood)
- Death
- Bubbles of gas in the small intestine



Porcilis® ColiClos PROTECTS PIGLETS BY VACCINATING SOWS

Safety study 1

- 24 sows
- Treatment groups (group size was 8):
 - Vaccine 1: **Porcilis® ColiClos**
 - Vaccine 2: Vaccine with a ginseng based adjuvant
 - Control (non-vaccinated)





Results:

- Slight rise in body temperature using vaccines.
- No abnormal clinical observations were made.
- No signs of local reactions were observed in injected areas.

Porcilis® ColiClos is able to deliver protection against two major infection diseases offering complete sow safety.

Porcilis® ColiClos PROTECTS PIGLETS BY VACCINATING SOWS

Higher antibody titer part 1:1 -

- 32 female finishing pigs
- Antibody titers were measured by ELISA
- Treatment groups (group size was 8):
 - Porcilis[®] ColiClos
 - Three groups of 8 sows, each vaccinated with a different commercially available vaccine



Results:

- Porcilis[®] ColiClos induced significantly higher titers than all three other vaccines against all virulence factors of *E. coli*.
- In respect to the clostridial component, Porcilis[®] ColiClos performed similarly to vaccine 1.





Higher antibody titer part 2:-

- 24 pregnant sows
- Treatment groups (group size was 8):
 - Porcilis[®] ColiClos
 - Vaccine 1
 - Control (non-vaccinated)



Results:

- Vaccination did not result in any acute systemic reactions.
- Porcilis[®] ColiClos had the highest (significantly) mean antibody titers against all five *E. coli* virulence factor.
- There was no significant difference in antibody titers against *C. perfringens* between Porcilis[®] ColiClos and Vaccine 2.

Antibodies induced by Porcilis® ColiClos inhibit the binding activity of *E. coli* fimbriae.

Antibodies induced by Porcilis[®] ColiClos neutralize the toxic activity of E. coli LT and C. perfringens β -toxin.

Protect your piglets against *E.coli* strains and *C. perfringens* with **Porcilis**[®] **ColiClos**



Agent	Peak	Range	Rank	Trend	Diarrhea	Necropsy	Histo	C/S	PCR	IHC	ELISA	Other
E. coli	3-7 d	2-28 d	1	Steady	Yellow to brown	Red jejunum	1	1				Virulence factors
Clostridium perfringens A	3-5 d	1-10 d	2	Increasing	Yellow-white	Red jejunum	1	1				Large CptA+B2 toxins
Rotavirus	3-7 d, 18-28 d	2-42 d	3	Increasing	Watery	Thin walls	1		1	1	1	
lsospora suis	7-10 d	4-28 d	4	Steady	Yellow pasty	Thick colon	1					Impression smear
Clostridium difficile	1-4 d	1-21 d	5	Increasing	Yellow pasty	Mecocolon, edema, colitis	1	1				Endotoxin A+/orB
TGE	All	2 d- adult	6	Declining	Watery	Thin walls	1		1	1		
Clostridium perfringens C	2-7 d	0-21 d	7	Declining	Yellow to bloody	Hemorrhagic necrosis of colon	1	1				
PRRS	All	2 d- adult	8	Increasing	Yellow to brown	Diarrhea	1		1			

DIAGNOSIS OF NEONATAL DIARRHEA⁸

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Vaccination scheme^{1,7}

Primary vaccination:



- Gilts are given a primary injection 6 to 8 weeks before the expected date of farrowing and a second injection 4 weeks later.
 Intramuscular injection of 1 dose (2 ml) of vaccine per animal.
- 4 weeks 1 weeks 1 st vaccination 2 nd vaccination Revaccination is carried out 2 to 4 weeks before the expected date of farrowing.
- Before use allow the vaccine to reach room temperature.
 Shake view use and st intervals during use
- Shake vigorously before use and at intervals during use.





Preventing neonatal diarrhea

For the passive immunisation of progeny by active immunisation of sows and gilts

to reduce mortality and clinical signs during the first days of life, caused by those *E. coli* strains, which express the adhesins F4ab (K88ab), F4ac (K88ac), F5 (K99) or F6 (987P) and caused by *C. perfringens* type C.

References:

- 1. Martens, M. et al. (2014). A comparison between Coli/Clostridium combination vaccines. Bacterology & Bacterial diseases.
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- Riising, H.J. (2005). Protection Against Neonatal Escherichia coli Diarrhoea in Pigs by Vaccination of Sows with a New Vaccine that Contains Purified Exnterotoxic E. coli Virulence Factors F4ac, F4ab, F5 and F6 Fimbrial Antigens and Heat-Labile E. coli Enterotoxin (LT) Toxoid. J. Vet. Med. B 52, 296-300.
- 4. Bel, S. et al. (2014). Comparative study of different E. coli-Clostridium vaccines by measuring antibody levels of E. coli virulence factors. IPVS.
- 5. *Clostridium* disease. The Pig Site.
- 6. *E. coli* disease. The Pig Site.
- 7. Porcilis® ColiClos Summary of Product Characteristics.
- 8. Mohr, M. Economic Impact of E. coli and Clostridia Disease in Piglets [Powerpoint slides].



