

# Ileitis prevention by oral vaccination

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Mass vaccination of swine populations through their drinking water is a new concept to pork producers that is rapidly growing in acceptance.

Benefits of an oral application route of modified live vaccines include; route of infection that mimics natural onset of protective immunity, stress free handling for humans and animals, absence of pathogen transfer via multi used needles and labour savings by contemporary vaccination of large sized pig groups.

Enterisol Ileitis became available in 19 European countries in 2005 and since then more than 3,500 farms have started to vaccinate. Recommendations on handling and application, based on first user experiences with the lyophilised vaccine Enterisol Ileitis and efficacy in Europe are presented in this article.

## Diagnosis of ileitis

Incorrect diagnosis or not performing any diagnosis at all before vaccination can lead to false expectations. As not all diarrhoea is ileitis it is incorrect to rely on the clinical manifestation of the disease only.

### Application of Enterisol Ileitis by mobile proportioner.

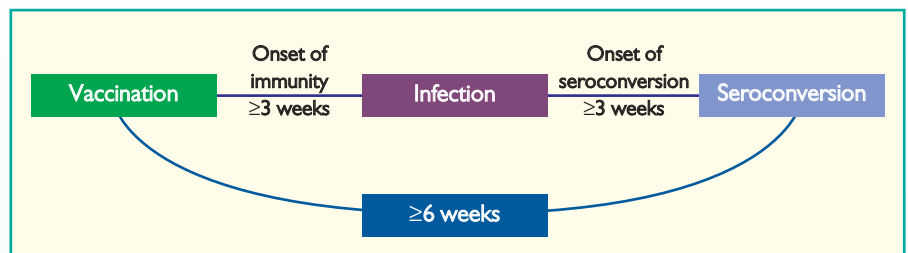


Fig. 1. The timing of application.

Most often misdiagnosed is *E. coli* diarrhoea at beginning of fattening, PCV-2 and *Brachyspira hyodysenteriae* infections where concurrently diagnosed with *Lawsonia intracellularis* at the middle of fattening.

Feed related diarrhoea remained clinically present in one farm although vaccination against ileitis showed a clear economical benefit throughout fattening.

Diagnosis of ileitis is based on the farm anamnesis and clinical symptoms, but foremost on laboratory investigations like ELISA serology and PCR. Confirmation of an infection with *Lawsonia intracellularis*, the cause of ileitis, is obtained by histopathology of ileum lesions in affected necropsied animals.

Although less than 1% of the farms perceived inefficiency of vaccination, 60% of these cases can be attributed to misdiagnosis or concurrent diseases.

## Timing of vaccination

In Europe the onset of infection has found to be as early as mid nursery (6-8 weeks) in Denmark, although most often at entry of fattening (10-13 weeks).

The timing of vaccination should be at least three weeks before field infection takes place to allow pigs to build up a protective immunity.

Pigs will show a seroconversion two to four weeks after field infection, which is detectable using the Enterisol Ileitis ELISA from Boehringer Ingelheim.

Profiling a herd by collecting eight blood samples at 15 weeks of age, six at 18 weeks of age and four at end of fattening gives an insight on the seroprevalence of ileitis.

This makes it possible to decide if vaccination is still possible at entry of fattening or

should take place shortly after weaning. Enterisol Ileitis induces a challengeable immunity three weeks after vaccination.

Therefore, the total time lag between vaccination and seroconversion should be at least six weeks.

## Handling and administration

Lyophilised vaccines contain live organisms and need to be stored at temperatures between +2 and +8°C to maintain viability. After reconstitution of the vaccine with the diluent, the amount of viable bacteria is guaranteed for up to six hours.

The recommended four hour time interval for the vaccine uptake allows all pigs of a group to drink the required amount of the vaccine. Shorter time intervals for the vaccine uptake can lead to an under supply of some pigs of the group.

Approximately 20% of a group of pigs will not be correctly vaccinated if the uptake of vaccine by this group of pigs takes place in less than two hours after the start of application. This is important as the immune response is dose dependent. Any preservation or uptake of the reconstituted vaccine beyond six hours will lead to a reduced efficacy.

An antibiotic-free window of at least three days before, at the day of vaccination and at least three days after the day of vaccination is needed to ensure that the live *Lawsonia intracellularis* in the vaccine will induce a suitable immunity for the duration of at least 17 weeks.

As this oral vaccine can be administered through the medicated water systems by a proportioner or by trough; leaks and

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residues of antibiotics or disinfectants should be avoided.

To ensure a uniform delivery and access of vaccine, the proportioner should be set at a correct rate of 3.0% with a proper volume of stock solution, which should be distributed over the prescribed time period of four to six hours.

Not measuring the water uptake by proportioner or trough a day before actual vaccination in a four hour time frame was one of the most common mistakes made.

Neither was the water system always charged before vaccination.

## Efficacy in Europe

Return of investment is the main driver in a production unit regarding the decision to

start a vaccination against a disease. This can be expressed by production traits like increased average daily weight gain, reduction of attrition, increased uniformity or reduction of clinical symptoms of the disease, all in relation to the costs of the vaccine and labour.

Enterisol Ileitis has shown in field studies in Belgium, Denmark, Germany, Greece and Switzerland to be very efficacious.

Results show that the benefit is not only seen at the end of fattening but in case of an early infection already present in the nursery (see Table 1).

The vaccinated animals have a higher weight at the end of the nursery and are more uniform when they enter the grower units.

This benefit extends itself in the grower units by showing a higher average daily weight gain and a significant reduction of



**The mobile proportioner.**

lightweight animals. The return of investment varies from 2.5:1 to 3.5:1.

## Conclusion

Feedback from field trials and field experiences confirm that oral vaccination against ileitis has proven to be an efficacious, labour reducing and stress free alternative to injectable vaccines or antibiotic treatments.

Overall, 99% of the first time users replied that it takes little time and practice to vaccinate correctly and their expectations were fully met. Nevertheless, attention is necessary to ensure correct application of Enterisol Ileitis.

Correct diagnosis, timing of vaccination, and the minimum seven day antibiotic-free window are the most important factors for the efficacy and economic benefit of Enterisol Ileitis.

Efficacy data show that the investment made for vaccination is easily returned and additional health benefits for the total herd will give the pigs the opportunity to exploit their full genetic potential. ■

**Table 1. Difference between vaccinated and non-vaccinated animals.**

Country/farm	ADWG (g)	Additional production traits
Belgium 1	+ 30	Uniformity improved by 4% less lightweights, end fattening weight increased by 3.0kg
Belgium 2	+ 59	Uniformity improved by 15% less lightweights, end fattening weight increased by 7.1kg
Denmark (nursery only)	+ 125	7.0kg increase in end nursery weight, reduction of diarrhoea to zero and strong reduction of PMWS problems
Germany 1	+ 74	Mortality 2% reduced, uniformity improved by 6% less lightweights at end of fattening
Germany 2	+ 59	Fattening period shortened by three days, 14% reduction in culled animals
Germany 3	+ 28	Feed conversion reduced by 0.18, antibiotic use reduced by 53%, Gross margin per animal €5.59 higher
Greece	+ 23	Diarrhoea incidence reduced by 75%, economic benefit €8.00 per animal
Switzerland	+ 51	Nursery: 33g ADWG increase, 2.1kg higher end weight Fattening: 18g ADWG increase, 4.5kg higher end weight