

# The ileitis vaccine

## Dispatch from France

>>>Presented at Space 2005, the only available vaccine against ileitis shows its first results for French producers.

With a mean cost of approximately 5€/pig and a prevalence rate in pig-raising greater than 70%, proliferative ileitis is a real problem in France. Cases of enteric bacterial infections caused by *Lawsonia intracellularis* are usually seen at the end of post-weaning and continue in the herd until fattening (Fig.1). A new milestone has been reached in the combat against ileitis, regardless of which form the disease takes - acute, clinical or subclinical, with the subclinical form being the most common. Whereas until last September the use of antibiotics was the only solution available for containing the microorganism and maintaining pig performance, an alternative is now available in France on veterinary prescription: vaccination. This represents an interesting development in view of the reduction in use of antibiotics. This vaccine is the first vaccine available against the gram-negative bacterium *Lawsonia intracellularis*, its oral method of administration is also innovative in the pig sector. Developed by the German laboratory Boehringer Ingelheim, the Enterisol® Ileitis vaccine is now

available in 19 European countries and more than 3,500 farms have started to vaccinate since its introduction in 2005. The return on investment is estimated to vary from 2:1 up to 5:1 (see Tables 2 and 3).

### A rigorous protocol but which remains accessible

The protocol of ileitis vaccination requires rigour to adhere to the conditions of administration that guarantee success, that is:

- » Validate the diagnosis of ileitis (see page 143);
- » Administer the vaccine in the middle of a 7-day antibiotic-free period (antibiotic-free 3 days before and 3 days after day D);
- » All materials used in administering this vaccine must be free of residues of disinfectants and antibiotics;
- » Measure the water intake the previous day (during a four-hour period) and neutralize the water with milk (3%) or thiosulfate (55 mg/l) if using chlorinated water for vaccination via trough/tank or proportioner;
- » Cut off water during vaccination;
- » 4 hours after administration, check intake and turn water on again.

According to the first users, these precautions are easily

implemented. The producers unanimously stated there was a reduction in the workload and ease of implementation after the veterinarian's demonstration. "The pig farmers had heard that implementing the vaccine would be complex but on-site follow-ups showed that once they had understood the methodology it was not complicated", reported Nadège Chesneau, veterinarian at CAM (Mayenne, France). This shows it is important for farmers to be advised by their veterinarians. "It is very important to prevent failures due to poor utilization", stresses Sylvie Héliez, veterinarian from Cabinet Vétérinaire Flandre, L'Ille-et-Vilaine, France.

### An increase in growth which needs to be driven carefully

The results of the Technical and Economic Management<sup>1</sup> (TEM) of the first vaccinated batches are consistent: the tendency is towards an improved growth rate of pigs (+ 20 to 40 g/day). Unexpected associated effect: the slaughter grade is often decreased (reduction in LMC and change from P3 to

P4, see results on page 142). "The farmers are taken by surprise by the weight gains. Adjusting management practices (departures, etc.) to adapt to this new potential

### BENEFITS

- First vaccine against *Lawsonia intracellularis*
- Oral administration
- Single dose



**Frank Bouchet**, veterinarian from the Agrial cooperative tended to the first vaccinated pigs in France.

caused by the vaccine should resolve this phenomenon", reassures Éric Gérard, veterinarian at Coopagri Bretagne. The first French user of the vaccine, Hervé Desmares, pig farmer in the department of Ille-et-Vilaine was no exception to the rule (see page 142). His farm started immunization in June 2005 as part of the French laboratory trials. His veterinarian from the Agrial cooperative, Franck Bouchet, explains: "The farm had been affected by ileitis for at least six years. Back then we tested by serology. The symptoms were typical:

<sup>1</sup> Standardized criteria have been calculated for fixed growing periods and used in the French Technical Economic Management database from 1999.

*heterogeneity, grey  
diarrhoea and some cases of  
mortality at the*

end of finishing shortly before slaughter. We added supplementation in the grower phase plus antibiotic treatment for three weeks at the beginning of the finishing phase in association with acidification, but the problems persisted in a sporadic fashion. When we suggested trying the vaccine he was immediately convinced despite some legitimate apprehension about the protocol. I find administration by removable trough the most comfortable and the pigs drink the solution readily". A year later, the results of technical and economic management have been satisfactory for both of them. Antibiotic treatment was stopped right at the outset and acidification stopped more progressively. The pigs are vaccinated at 39 days of age to allow for 5 to 6 more days in the nursery at the beginning of post-weaning (no sign of ileitis). Results: more homogeneous groups of pigs with no more diarrhea or mortalities at the end of the finishing period. "The pigs grow more quickly and I no longer need to worry, in particular with regard to biosecurity between batches", confirms Hervé Desmares (see page 142). In terms of cost, the veterinarian estimates that on this farm the vaccine did not exceed the costs of the antibiotic treatment (without taking performance into account). "And the pig farmer is less stressed, we can tell because he phones us less frequently", he adds.

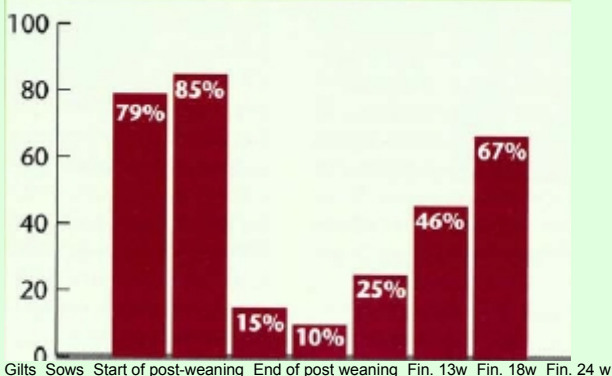
In their sector, the veterinarians from the Agril cooperative have already carried out vaccination at approximately 20 pig production units. Each time it is the same: together with the farmer they take scope of the situation and make an initial assessment with testing for ileitis by serology. Then several criteria enter into the equation: the farm's practices, existing antibiotic treatment and associated costs, response observed, the philosophy of the farmer... "It really is a case-by-case decision, antibiotic treatment can work well too if it is well implemented", he reiterates. "If the costs are equal, the decision will tend towards vaccination if possible: - both for reliability and security. Under one condition: that we really are dealing with *Lawsonia* as the culprit", Nadège Chesneau clarifies. Each to their own choice. As a reminder, the vaccine will uniquely target *Lawsonia intracellularis*, the antibiotics will affect several microorganisms but must be administered at the correct point in time: "If the antibiotic treatment is administered too late, it will not stop the damage, if it is administered too early it could result in naive pigs that are susceptible to developing acute ileitis later", Steven McOrist, specialist in *Lawsonia intracellularis*, points out.

**Emilie Hamelin**

**Vaccination or antibiotics: a case-by-case choice**

## 1. Seroconversion between the end of post-weaning and the 13th week of age

At 13 weeks of age one out of four pigs is positive for *Lawsonia intracellularis* and two out of three before slaughter according to a prevalence study conducted by Boehringer Ingelheim on 342 pig farms in the European Union in 2004. The pigs therefore seem to become infected at the end of post-weaning or at the beginning of finishing.



## 2. Synthesis of studies in the USA:

**+ \$4.33/pig (± €3.40)**

159 units, 120444 pigs	Not vaccinated	Vaccinated	Difference
DWG, g/d	795	844	+49 g/d
FCR	3.02	2.94	-0.08

Synthesis of five studies consisting of four recent studies and one older study. Comparison of vaccination to antibiotic supplement

Source: Boehringer Ingelheim laboratory

## 3. European trial in a pig farm affected by subclinical ileitis: + €4.47 margin per pig

(between €3.1 and €5.9 per pig)

Unit of 6000 farrow-to-finish sows vaccinated at 7 weeks	Not vaccinated	Vaccinated	Difference
No. of pigs <sup>1</sup>	278	555	
DWG, g/d	674	709	+35g/d
Feed intake, kg/d	1.85	1.93	
FCR	2.74	2.71	-0.03
Mortality	4.68	4.30	-0.38%

<sup>1</sup> Antibiotic growth promoting feed additives used during the first 18 days of post-weaning. No antibiotics over the remaining period.

Source: Hardge et al, 2004

### Characteristics

Name: Enterisol® Ileitis

Veterinary prescription vaccine

Laboratory: Boehringer Ingelheim

Live attenuated bacteria

Strain: *Lawsonia intracellularis*

Target: post weaners 3 weeks of age or older (no age limit)

Oral administration: in circular troughs, by proportioner or medicator

Cost of dose: ± €1.30

>>>Hervé Desmares, 90 farrow-to-finish sows,  
Chauvigné, L'Ille-et-Vilaine, France

**Less than 30 minutes for 120 piglets**



ileitis vaccine, I have fewer fall-behinds and losses, and the batch leaders finish more quickly. Like many other people, initially I was apprehensive about the method of administration for the vaccine via Maxi-Tolva hopper pans. I stayed to watch the pigs the first time. Now that I am reassured, I just let them get on with it. No need to inject or to

before. I don't use milk because I use non-chlorinated water from flasks. I vaccinate at the beginning of the afternoon and when I return at the end of the afternoon, they have drunk everything.

>>> Michel Cloteaux, Agrial technician

## Review the diet strategy



farmer as the situation significantly improves and is associated with less stress from

period, I think they could gain in LMC again.

Vaccination since June 2005 at 39 days of age	TEM before vaccination 01/05/05-31/10/05, 9 batches	TEM after vaccination <sup>1</sup> 01/11/05-30/04/06, 9 batches
No. of pigs	964	960
LW at slaughter, kg	114.5	114.9
DWG 8-115 kg/d	686	722
Duration W-S, d	155	148
% losses + seized W-S	4.2	2.9
Age 115 kg, d	183	176
LMC, %	60.4	59.9
% in the range	86	86.9
Added value, c€/kg	15	14.1
	1st trimester 2005	1st trimester 2006
% P1 + P2	22.0	2.4
% P3	7	10.5
% P4	1.8	1.5

<sup>1</sup> Results TEM with a non vaccinated batch

>>> **Dominique Pilon**  
**120 farrow-to-finish sows,**  
**Torcé-Viviers-en-Charnie, Mayenne, France**

**I delayed slaughtering the pigs**

The problems started in 2004: I experienced devastating episodes of ileitis - the effects were very stressful and without any possibility of detection even though the pigs had been seen by a veterinarian the previous day. Ileitis would break out very late, shortly before slaughter and often following stress (late ID marking, variations in temperature, removal of littermates for slaughter, etc.) I therefore treated selectively with tylosin but this was costly because the animals were heavy and, in addition, I always

experienced some problems. It was not ideal. Since June 2005, I have been vaccinating the pigs via proportioner three weeks after they enter into the post-weaning phase to allow the possibility of administering colistin after weaning if necessary. I am completely satisfied despite the increase in P3 and P4. This was entirely my fault: the pigs were growing too quickly and I delayed slaughter! To sum up: I've stopped treating them, it is less costly and I am less stressed.

>>> **Nadège Chesneau, veterinarian for CAM**

**Correct diagnosis and rigour**

In this production unit, despite a good general level of sanitation, hemorrhagic ileitis was identified several times by post mortem. The serological screening conducted in 2005 by the laboratory revealed a late seroconversion at the end of the finishing period. The losses amounted to as much as three pigs per batch, each weighing more than 80 kg, and with an associated antibiotic treatment cost ranging between €1 and €2.7 per pig depending on the batch (tylosin in drinking water for 8-10

d). Vaccination was therefore justified and fully corresponded to the producer's philosophy of keeping antibiotic treatments to a minimum. All the producer's feed is therefore without antibiotic feed additives. Oral administration was also an advantage as this reduced his workload. He is very rigorous, finds the protocol easy to follow and applies it scrupulously. With the correct diagnosis and rigour, the results follow: no more episodes of acute ileitis and better homogeneity in the batches.

Vaccination since June 2005 3 weeks after weaning	Before vaccination 29/07/05-18/11/05, 5 batches	After vaccination 18/11/05-23/03/06, 6 batches
No. of pigs	413	470
DWG, W-S	729	759
LW, warm, kg	91.8	95.4
% losses + seized W-S	4.54	3.25
LMC, %	62.49	62.22
Added value, c€/kg	14.2	13.0
% range	77	65
P1 + P2	2.67	1.27
P3	9.93	18.51
P4	6.30	10.64

>>> Jean-Louis Brault,  
129 farrow-to-finish sows,  
Saint-Senier-de-Beuvron (Manche, France)

## Back to a diet without antibiotic supplementation



With ileitis, I've repeatedly had to use antibiotics in the feed - from the starter diet to the finishing diet. This was mid-2004. I started vaccinating against ileitis in June 2005, and am now back to a diet without antibiotic supplementation. The pigs are more uniform in size, no longer have diarrhoea and are heavier at slaughter. The loss rate has decreased to 5-6% compared to more than 8% with ileitis. This will be noticeable in the next

technical-economic management assessment. I bought Maxi-Tolva hopper pans which I also use for the weaners. It has now become a routine: every three weeks, the day after weaning, I vaccinate 160 piglets. It is not complicated: the veterinarian assists the first time then you just need to stay calm and concentrate - it's over in 20 minutes. The piglets soon start drinking. Milk is a good appetizing factor: I even add it if I am using mineral water. I go back to stimulate them during the vaccination so that they drink well. The vaccine corresponds better to my philosophy. It is expensive, so when I take it out of the fridge I am very careful not to break it!

>>> Sylvie Héliez,  
veterinarian from Cabinet Vétérinaire Flandre

## Outstanding results

In this pig production on partially slatted floor, the pigs seroconverted as soon as finishing started. Grey diarrhea, lack of uniformity, and losses disrupted production. In 2005, despite consequent antibiotic treatment, the prevalence of Lawsonia was above 50% at the end of finishing. The antibiotic costs amounted to more than €5 per pig. In combination with the diagnosis of ileitis, this justified using the vaccine. Together with the laboratory we assisted the producer implement the procedure. This step is crucial to the success of the sensitive vaccination which requires rigour during administration.

The response was outstanding in this pig production unit, with the results of the first batch showing an estimate of nearly €9 increase per pig compared to the previous strategy - including the price of the vaccine. And this continues, all is going well. The pigs are vaccinated very early which leaves them sufficient time for the immunity to develop (three weeks), on a diet without antibiotic supplementation which is ideal. Today about twenty of my producers vaccinate and there are no problems whatsoever: is the diagnosis is correct, the vaccine responds.

Vaccination since June 2005, the day after weaning (29 d of age)

TEM before vaccination Oct. 2005-Feb. 2006, 7 batches

First batch vaccinated (weaned on 06/10/05)

DWG 8-115, g/d

671

695

Age at 115 kg/d

187

183

LW sale, kg

110,3

114.4

LMC, %

60.5

60.2

% losses and seized

8.2

4.3

Source: Sylvie Héliez, veterinarian from Cabinet Vétérinaire Flandre

>>> Eric Gérard,  
veterinarian at Coopagri Bretagne

## A vaccine against Lawsonia, not against lack of uniformity!



The first results of our recently conducted field trials on ileitis are interesting. Vaccinated pigs have a higher daily weight gain. We have even observed a vaccinated batch of pigs in a production unit contract PRRS and finish heavier despite growth delay in the middle of the finishing period! However, the pig producers were not expecting the grading at the slaughterhouse: the pigs arrived heavier (pigs were shifted to P4 and P5) and their LMC was penalized. Therefore, it is necessary to modify one's practices to adapt to the vaccine, and not the contrary (move pigs earlier...). The vaccination provides its real benefits only if Lawsonia really is the discriminating factor for the problems of lack of uniformity and growth, etc. If, however, these problems are due to bad practices (e.g. overcrowding) or are caused by other microorganisms, the vaccine will

not solve anything. It is a vaccine against Lawsonia intracellularis - not against lack of uniformity! Prior diagnosis is fundamental. In production sites where there are other limiting factors, it is necessary to be cautious to the extent of reviewing one's practices. If the diagnosis of ileitis is confirmed on the basis of serology, the protocols already implemented at the pig producers are analysed before vaccination is offered: treatments, associated costs, possibility of vaccinating or not. Of course if the costs of antibiotic supplements per 100 kg of carcass as shown by our Optivéto software program and the losses caused by the disease (e.g. delayed growth, higher feed conversion ratio) are significantly higher than the price of the vaccine, I suggest vaccinating if the producer agrees, or else readjusting the treatment. It is necessary to be cautious to avoid mistakes as you need time before you can measure the results. The effect of the vaccine is not always visible at first: this is proven by the producers who were surprised at the weight gain although they see their pigs every day!

Synthesis of tests conducted by 1/2 batch over 4 distinct production units	Current control batches	Vaccinated batches
No. of pigs, total	401	364
DWG life, g/d	615	636
Hot carcass weight, kg	90.76	92.32
Age at slaughter, d	186	182
M2, mm	59.19	59.74
G2, mm	15.46	16.09
LMC, %	61.27	60.83
Added value, €/pig	13.77	13.04

Source: Coopagri study, June 2006

### Ileitis, not to be confused with

- » Swine dysentery or hemorrhagic enteritis  
Causative agent: *Brachyspira hyodysenteriae*
- » Porcine colonic spirochaetosis  
Causative agent: *Brachyspira pilosicoli*

### Main factors linked to infection

- Biosecurity measures are not respected (principle of "moving animals forwards", etc.)
- Changing rooms during post-weaning
- Exit from post-weaning before 70 d of age
- Overcrowding in post-weaning
- Absence of dietary transition at the beginning of finishing
- Insufficient empty building time between batches ( $\leq 2$  d)

(Source: JRP 2006)

