

Lawsonia intracellularis infection in Switzerland

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Lawsonia intracellularis is an increasing problem in pig farms throughout the world. In Switzerland the number of cases due to *L. intracellularis* is also increasing.

Diarrhoea and wasting are the most frequently seen clinical signs of *L. intracellularis* infections on farms in Switzerland. The main group affected is pigs at nursery level, (6 to 12 weeks of age) but wasting is continuing in fattening.

There are no data about the occurrence of *L. intracellularis* and the serological response in pigs on herd level in Switzerland.

Material and methods

Altogether six pig farms in Switzerland with and without clinical signs of *L. intracellularis* were screened in 2004.

This was part of an Ileitis survey of European farms performed by Boehringer Ingelheim Animal Health. For the screening blood samples were taken from pigs of all age levels (Table 1).

A total of 50 samples was cross sectional at each farm. The blood samples were analysed by using a blocking ELISA for detection of antibodies against *L. intracellularis*.



Positive test results indicate an exposure of *L. intracellularis* to pigs two to three weeks before. All ELISA were done by one laboratory.

All participating farmers gave information about their farm:

- Production system and farm size.
- Production figures for the last six months.
- Current clinical signs.
- Antibiotic use.

- Housing, feeding, health management.
- Diagnosed diseases in the last 12 months.
- Current treatment and vaccination programme.

Results and discussion

For all six investigated farms serological positive results for *L. intracellularis* were found in one or more of the blood samples. The average seroprofile showed highest values (PI values = percent inhibition) in the ELISA in sows and in pigs during fattening at 13 weeks of age. The lowest PI values could be seen during suckling period, in three to four week old piglets (Fig. 1).

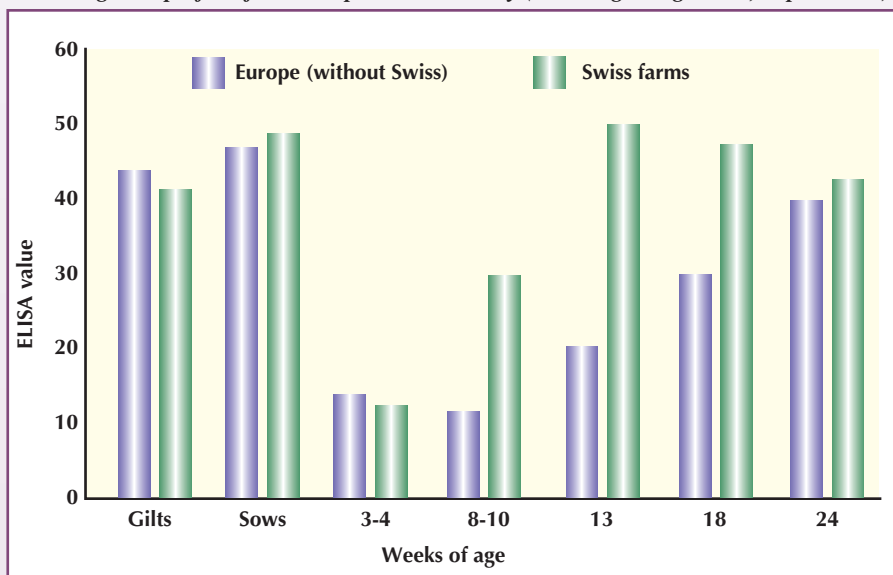
Fig. 1 maps the average seroprofile of six Swiss farms and of the average seroprofile of the European ileitis survey. On the y-axis ELISA antibodies levels can be seen. Results below 20 were classified as negative, between 20 and 30 as suspect and above 30 as positive.

In three farms there was a serological change in the group of 8-10 weeks of age. The other three farms showed conversion of serological values in pigs of 13 weeks of age (two farms) and 18 weeks of age (one farm).

The European ileitis survey showed that

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Fig. 1. Average seroprofile for antibodies against *L. intracellularis* of six Swiss farms and the average seroprofile of the European ileitis survey (Boehringer-Ingelheim, unpublished).



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Switzerland has the highest percentage of serologically positive pigs in the whole of Europe. In Switzerland 67% of all blood samples were positive. In addition, ELISA antibody levels in Switzerland were higher than the average ELISA antibody levels in Europe.

Higher PI values correspond to higher levels of *Lawsonia intracellularis* specific antibodies, thus the higher occurrence and antibody levels indicate that *L. intracellularis* plays an important role on herd level in Switzerland. There are probably several factors causing these exceptional results for Switzerland. It can be assumed that the increasing number of *L. intra-*

Number of blood samples per farm	Age level
5	Sows <=1 litter
5	Sows > 1 litter
5	Piglets at weaning (3rd/4th week of life)
10	Piglets ending nursery (8th/10th week of life)
10	Fattening pigs 13th week of life
10	Fattening pigs 18th week of life
5	Fattening pigs ending fattening (24th/26th week of life)
50	Total number of samples

Table 1. Number of blood samples per age group for the farm screening.

cellularis cases is related to the complete prohibition of antibiotic growth promoter since 1997.

In Switzerland, the most common antibiotic growth promoter was tylosin. In Denmark antibiotic growth promoter is also completely prohibited. Since the prohibition, an increase of clinical problems due to *L. intracellularis* in Denmark has been seen.

In Switzerland a national programme against *Actinobacillus pleuropneumonia* and *Mycoplasma hyopneumoniae* has been initiated. In the range of this programme there is a strict limitation for antibiotic use which has an effect on *A. pleuropneumonia* and *M. hyopneumoniae* such as tetracycline, tylosin or lincospectin.

These antibiotics are normally also used for therapy of *L. intracellularis*. So in Switzerland there are no commonly used antibiotics which have an effect on *L. intracellularis* and are legally approved.

Farm related features like management, hygiene and population density might also have an influence on the higher occurrence and antibody levels of *L. intracellularis*. Difference in time of seroconversion between the investigated herds indicate this.

When pigs are infected with *L. intracellularis*, this leads to seroconversion three to four weeks later. In three of the six farms infection happened at this stage. In two farms however, infection and seroconversion happened later.

Only these two farms used an all in/all out system to fill their nursery. In these farms seroconversion occurred three weeks after pigs were moved to continuous filled fattening units at 13 weeks of age.

These results support observations that complete all in/all out system and rigorous removal of faeces is more effective for controlling diseases caused by *L. intracellularis* than relying on slatted floors and sunken pits for faeces removal. In many farms in Switzerland all in/all out systems are not established.

This might lead to high quantities of pathogenic organisms in farm units like *L. intracellularis*, as was found in our survey. In general, pig husbandry in Switzerland has undergone a deep transformation in the last few years.

This led to increasing costs of building new pig houses. Many new houses were built; mainly fattening units because of lower building costs.

Another reason for the growing number of fattening units is that most Swiss farms are not specialised in pig husbandry; agriculture, cattle and pig housing are often combined. Pig breeding is much more time consuming than pig fattening and many farms are not able to invest this extra time.

Therefore, there are more and larger fattening units compared to breeding units. These larger fattening units need a lot of piglets. Often pigs cannot be delivered from only one or two origins. So pigs from three or more origins are mixed. This has, to our belief, a negative influence on the health status of concerning herds. The results of this serological survey, however, were coming from closed systems.

Several marketing programmes were established in Switzerland about 10 years ago, which lead to special requirements. Such requirements are, for example outdoor areas for fattening pigs or bigger farrowing boxes with suckling groups. These requirements lead to increased housing costs. To minimise building costs several big boxes are built for both nursery and fattening for more

than 30 pigs. Bigger groups in nursery or in fattening seems to have lead to increased problems with *L. intracellularis*. Our observation of increasing disease problems due to *L. intracellularis* corresponds to the results of the serological survey. In three of the six investigated herds seroconversion already occurred in the nursery.

In the three other groups seroconversion happened in the fattening units in pigs at 13 and 18 weeks of age. The three farms with herds with late seroconversion were working with small groups of 10-30 piglets per pen in the nursery and 50 pigs and more per pen in fattening. The three farms with seroconversion in the nursery, on the other hand, already started with big groups of 50 pigs and more in the nursery.

In our opinion, suckling in groups is a factor which makes piglets vulnerable to *L. intracellularis* infection. This is confirmed by the serological profiles of two of the six investigated farms.

Of all six farms these two farms showed the highest ELISA antibody levels in the group of pigs at 8-10 weeks of age. Only these two farms were working with suckling groups. One suckling group included four litters and their sows. A suckling group started two weeks after birth. At the end of the suck-

ling period all piglets of four weeks of age were moved to a nursery unit.

Development of a vaccine against *L. intracellularis*, such as Boehringer Ingelheim's Enterisol Ileitis, opens new ways for fighting the disease, especially in countries which are already confronted with limitations in the use of antibiotics like Switzerland and Denmark.

However, it should be kept in mind that the phasing out of the few remaining antibiotics as feed additives in the EC by January 2006 (EC regulation 1831, 2003) will surely have an impact on existing antimicrobial feeding schemes and the occurrence of enteric diseases in other European countries as well.

In conclusion, *L. intracellularis* is a major problem in Swiss pig keeping. Many housing factors have a negative impact on the *L. intracellularis* status of pig herds.

The main focus of farmers, veterinarians and marketing organisations in Switzerland should be on improvement of the concept of pig farming. Improving housing factors which have a negative effect can lead to a better health status of pig keeping in Switzerland. ■

References are available from the authors on request