

Coccidiosis – productivity

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Piglet coccidiosis is one of the most important protozoan disease of pigs. It is a cosmopolitan disease and is found wherever pigs are raised in confinement. It is caused by *Isospora suis*. The disease is normally clinically manifested in the animals which are 7-14 days old; however the disease could be seen in older animals as well.

Clinical manifestations include non haemorrhagic, yellowish to whitish diarrhoea, and piglets develop a rough hair coat and become dehydrated. Morbidity is usually high but mortalities are moderate.

Concurrent bacterial or viral infections may complicate the disease and lead to higher mortalities.

Epidemiology of coccidiosis

The disease is widely distributed in countries with intensive pig production. Piglet coccidiosis is an important disease worldwide. Torres (2004) reported the incidence of coccidiosis in Europe. In the survey 3478 faecal samples from 416 farms in 12 countries were examined: Austria (14 farms), Belgium (59), France (13), Germany (129), Greece (19), Hungary (54), Ireland (8), Italy (32), Netherlands (29), Poland (30), Portugal (14) and Spain (15). Some 25% of faecal samples were positive for *Isospora suis* (from 17-56% in different countries) and 69% of the investigated farms (41-100% in different countries).

The disease is also reported from Australia, Korea, Malaysia, Taiwan, People's Republic of China, Thailand and Philippines, Latin America and North America. Estrada et al (2004) reported that 64 out of 81 herds (79%) in Mexico were positive for *Isospora suis*.

Infectious oocysts are taken by the piglets from the environment, for example from the floor or separating wall of the pen. The intensity/level of contamination of the immediate environment plays an important role.

A few oocysts are able to produce clinical manifestation of the disease in young animals. The younger the animal the more severe the clinical manifestation of the disease. The sow does not seem to play a major role in the epidemiology and the dis-

ease transmission is horizontal. The clinical coccidiosis commonly occurs in piglets in their second and third week of life. The initial clinical sign is pasty diarrhoea, which turns fluid and lasts up to 5-6 days.

The faeces are white to yellow, creamy, but can also be brownish or greyish without the presence of blood. In the same litter it is common to find some animals with diarrhoea and some with normal faeces. The affected piglets have a rough hair coat. Morbidity is high, however, the mortality is low to moderate.

Pathophysiology

Since piglet coccidiosis is associated with diarrhoea and less often with the death of the affected animals, the pig farmers and veterinarians have often trivialised the problem.

Piglet coccidiosis not only causes diarrhoea but also causes massive damage to intestinal mucosa. It has been shown that large expanses of intestinal linings are destroyed by the disease. It also causes intestinal villi atrophy with villi becoming smaller and shorter, resulting in reduction in available surface area for nutrient absorption. Though the affected mucosa regenerates relatively rapidly, the villi are considerably shorter than normal even weeks after clinical signs have receded.

The disease affects the productivity and has severe economic impact.

- The treatment of resultant diarrhoea, which is non responsive to traditional antibiotic treatment, is an additional cost to the farmer.
- The uneven development of pigs is seen in affected farms and affects the uniformity in the litter.
- The affected animals have a reduced weaning weight.

Production parameters

Rypula and Porowski (2004) examined the effect of metaphylactic treatment with Baycox (toltrazuril) of piglets on two swine farms with confirmed history of *Isosporosis*. On one farm the weight gain in treated ani-

Impact on piglet health and economics

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animals between day four (day of toltrazuril treatment) and day 14 was 2.070kg and the untreated animals gained in the same period 1.477kg.

Growth during the second phase (day 14 to day of weaning) was 3.582kg for the treated and 2.732kg for the untreated group. The number of veterinary medical interventions for diarrhoea in the treated group was six and 13 for the untreated.

On other farms the weight gain in the second phase (day 14 to day of weaning) was 2.580kg for treated animals and 2.318kg for untreated animals. The number of interventions for diarrhoea was six in the treated animals group and 18 in the untreated group.

Blum et al (2005) treated piglet coccidiosis with toltrazuril 5% and studied the impact of treatment on the weight gain and feed consumption.

The trials were conducted in two farms, which had recurrent problems of piglet diarrhoea in age group 6-20 days. The diarrhoea was yellow to white colour with pasty consistency without the presence of blood. The diarrhoea did not respond to sulphonamides. At the weaning age, the animals did not show uniformity in weight.

On the farms animals were divided in two groups: treated and control. In the treatment group the animals were treated on the fourth day of life at the dose rate of 20mg/kg body weight (0.4ml/kg body weight Toltrazuril 5%) orally, while control group animals did not receive Toltrazuril 5%. The body weight was measured at regular intervals.

The difference in body weight gain was not only noticeable at weaning but became even more pronounced in subsequent stages.

The average daily weight gain in the control group was 818g, while in the treated group it was 860g at the end of production cycle.

The analysis of feed intake also showed considerable difference in feed required to increase per unit body weight. The analysis showed that to increase 1.0kg body weight the treated group required 2.75kg feed, whereas the control group needed 2.89kg feed.

The Toltrazuril treatment also reduced the occurrence of diarrhoea in the treated group. Viel (2005) reported that metaphyl-

actic treatment with Toltrazuril 5% favourably affects the production parameters. The animals were treated on day 3-5 of their age with 20mg/kg Toltrazuril 5% orally in the treatment group and the animals in the control group were not given the treatment. The piglets treated with Toltrazuril 5% did not show signs of diarrhoea, whereas 24% of litters in the untreated group showed clinical diarrhoea.

At weaning age, untreated animals had an average weight of 8.30kg and the Toltrazuril treated animals had an average weight of 9.15kg that means the treated animals gained more weight.

In treated groups, 93% of the animals were in the range of 7-10kg body weight, whereas in the control group only 86% of the animals were in this range. The weaning weights were less uneven after Toltrazuril treatment which makes the segregation of piglets after weaning easier.

Cost benefit studies

Mavromatis et al (2004) studied the efficacy and cost benefit of Toltrazuril treatment under field conditions in Greece. The animals treated with Toltrazuril gained more weight than the untreated ones.

The medication cost, particularly for diarrhoea treatment was significantly reduced. In one farm of 1500 sows the profit per weaned piglet was €0.53, while in the other farm with 500 sows the profit per weaned piglet was calculated to be €0.253.

Effect of treatment

Maes et al (2005) examined the effect of Toltrazuril treatment on the growth of piglets in herds without clinical isosporosis. The Toltrazuril treatment of Isospora positive herd without clinical symptom resulted in 11% better growth and treatment yielded 0.20 per piglet.

These studies show clearly that piglet coccidiosis impacts the economic parameters, however timely intervention with Toltrazuril 5% (metaphylactic treatment between day three and day five of piglet life) reduces the intensity of the adverse effects effectively. ■