Strategic de-worming to boost performance

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Worms constitute a continuous threat in the pig industry. Unfortunately, the impact of a parasitic infestation is often underestimated. Therefore, it is of the utmost importance to enhance the awareness of the negative impact of worm infestations on the economic performance of pig farms.

The economic impact depends on a variety of factors, resulting in a loss between €0.8 and 4.8 per slaughtered pig.

Knowledge of how the worms live, reproduce and when is the best time to fight them is, therefore, essential. Implementing an appropriate de-worming strategy will considerably reduce the damage and loss.

The parasites

Ascaris suum, the large roundworm, is, economically, the most important worm in modern pig husbandry.

Furthermore, due to the change from individual crates to group housing systems for sows, Oesophagostomum dentatum and Trichuris suis are gaining importance.

Most other pig worm types have lost their importance because of the flow management and improved hygiene in modern production systems.

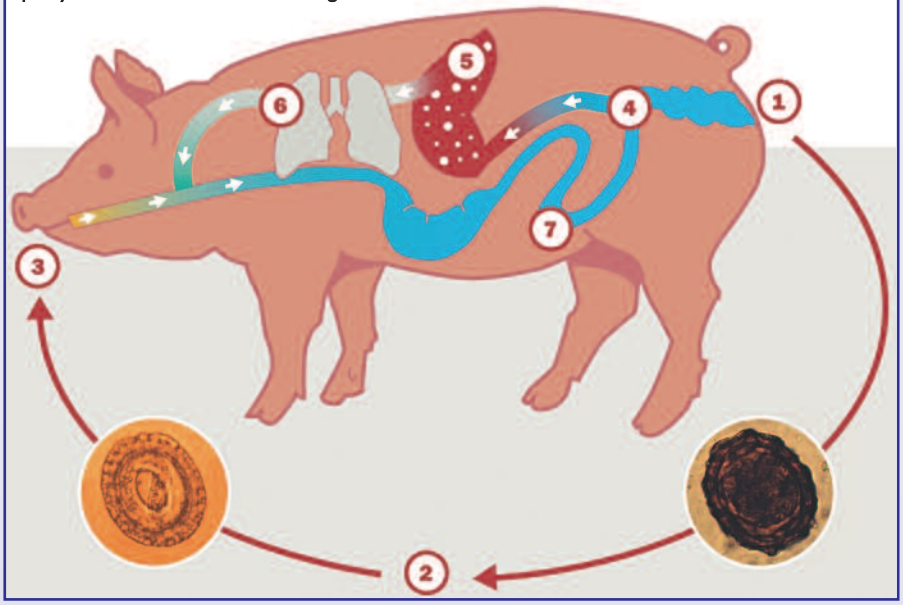
Strategic de-worming focuses on the large roundworm, because it is the most widely spread worm with the highest economic impact in grower and finisher pigs.

The cycle of the large roundworm is very specific (Fig. 1). Once the eggs are shed in the environment, they are very resistant and can survive for years. It takes a few weeks before these eggs become a threat to the pig. Within the egg, a larval stage will develop.

Once ingested, the larva leaves the egg and uses the blood vessels of the digestive system to migrate to the liver, where it causes the well known white spots.

Fig. 1. Life cycle of Ascaris suum.

1. Excretion of eggs with faeces. 2. In the faeces, embryonated eggs pass from non-infective, non-embryonated to infective, embryonated and become very resistant. 3. Swallowing of eggs. 4. L3 travels the digestive mucosa and moves to the liver via the circulation of the veins. 5. The liver. L3 migrates to the periphery of the liver causing white spot lesions. 6. The lungs. L3 changes into L4 in the alveolus. L4 goes through the bronchi and the trachea and is swallowed at the level of the pharynx. 7. Small intestine. L4 changes into L5.



Ascaris suum or large roundworm.

These spots disappear after one month, due to the high regeneration capacity of the liver. From the liver, the larva migrates to the lungs, where it assents via the alveoli and bronchi to the trachea or windpipe. They are coughed up, and swallowed down. Once again in the digestive system, they remain in the small intestine, where they become adult.

There can be up to 80 adult worms in the gut. These adults will start producing eggs at a rate of 200,000-900,000 eggs per day in just over one month!

This is why a low infection pressure can quickly lead to a new massive infestation. The whole cycle takes five to six weeks and this is called the pre-patent period.

Measuring the infection

The diagnosis of worm infections is not an easy task.

The egg counts (or EPG) are hard to interpret. Negative egg counts do not necessarily mean that there is no worm problem. It is perfectly possible to have a massive migration of larvae without the presence of adult worms. On the other hand, finding eggs does not give you an accurate insight into the degree of infection.

The presence of adult worms in the gut at post mortem section clearly indicates there is a problem, but this is not a convenient method.

White liver spot counts in the slaughterhouse give a clear indication of recent migration of larvae, since these spots heal and vanish within 30-35 days.

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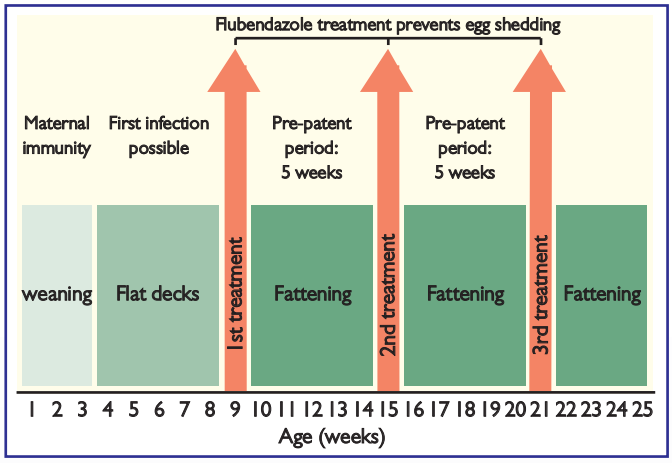

Fig. 2. Strategic de-worming treatment schedule for growing and finishing pigs.

Fig. 3. Effect of strategic de-worming with flubendazole on the number of condemned livers.

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Regular liver score assessments in the slaughterhouse give a good insight into the evolution and success of the de-worming programme on the farm.

The economic damage

It is difficult to determine the economic losses due to parasites that are not lethal. There are a lot of interactions between the worm, the host, the presence of other diseases, the production system and many more. High correlations have been found between farms with chronic respiratory disease complex and even outbreaks of PMWS and the presence of migrating Ascaris larvae.

Worm infections independently cause a great deal of damage. The migration of roundworm larvae through the pig's vital organs, such as the liver and lungs, causes a range of negative effects. Secondly, adult worms feed in the intestines, thus, depriving the pig of nutrients. Consequently, the economic damage is a combination of inferior growth, increased feed conversion, the consequences of intestinal damage, lower lean meat percentage, condemned livers, increased medication cost due to increased health problems and higher mortality.

All this can add up to €4.8 per slaughtered pig.

In some countries, decommissioned livers due to white spots are penalised by the slaughterhouse. It often triggers the farmer to do something about the problem, while the penalty represents only 3-13% of the total financial damage. Inferior growth and increased feed conversion are far more important and represent up to two thirds of the damage. To asses the economic damage on your farm, Janssen Animal Health developed a calculation module, taking into account your production parameters.

Strategic de-worming

Eradication of roundworm in commercial herds is unlikely. In order to contain the problem, halfway measures will not solve your problem.

The strategic de-worming programme is built on the specific knowledge of the lifecycle of the large roundworm, the contact with the host and the spectrum of the wormer.

Essentially, the strategy is based on the removal of the eggs in the environment and the prevention of new contaminations by killing all stages of the parasite within the host.

As a very low infection pressure is sufficient to revive the infestation, even after a long time, it is important to implement the strategic de-worming on a continuous basis. Correct timing of the treatments is key for success. To deal with the egg load in the environment, you need to apply an adequate sanitation programme.

White liver spots and lung lesions due to recent larval migration.

As the worm eggs are very resistant in the environment, mechanical removal helps you to decrease the infection pressure. As for all infectious diseases, working strictly all in, all out is a must.

Thorough removal of all organic material is necessary, even more so than for viruses and bacteria. Are the sows washed before entering the farrowing crate? What precautions are being taken to prevent passive transport from one pen to another (boots and shovels)?

To deal with the 'internal' contamination, you need a strict de-worming strategy. The objective is to kill new adults before they can produce eggs and to neutralise all larval stages and eggs present in the body. The programme includes both a de-worming schedule for sows and for growing and finishing pigs.

For sows, the optimal schedule is a treatment every quarter. The number and interval of treatments are of equal importance. Knowing that the pre-patent period for roundworm is five to six weeks for growers and finishers, the interval between treatments should not be longer than six weeks (treatment period included). For a 110kg slaughter pig, this means three treatments during growing and finishing (Fig. 2).

Good choice essential

Finally, your choice of wormer will be decisive for the success of the programme. The wormer needs to be active against the adults, the (migrating) larvae and the eggs. Only benzimidazoles have all these properties.

Of all benzimidazoles, flubendazole has the highest affinity to the parasite and the highest ovicidal effect. It has the highest concentration in the gut. Unlike fenbendazole, flubendazole does not alter the biotransformation enzymes in pigs. These enzymes are known to transform drugs, possibly compromising their activity.

Flubendazole is administered orally, via premixes for feed or via a special drinking water formulation. As always, carefully choose quality products and strictly follow the directions on the leaflet and ask the advice of your veterinarian. Once the strategic de-worming programme has been set up, it can take up to 15 months before the situation is completely under control (Fig. 3).

Again, the explanation lies in the time needed to deplete the environment of infectious eggs and the ease in which a small egg load can lead to a new infection.

The large roundworm is here to stay, but with a good de-worming strategy, the negative effects can be effectively controlled. ■

For more information on the economic calculation module,- contactjanah@janbe.jnj.com