Animal Models for Better Animal Health

Balancing Between Goal and Used Resources

In order to make animals healthy and keep them healthy, research sometimes needs to be carried out on these animals – to test whether a vaccine is sufficiently effective in practice or to determine whether sick animals recover after being given a new medicine. This kind of research for the benefit of animals is carried out using an animal model. The aim is always to improve the health of the farm animals that the tests are conducted on.

Royal GD has been working with animal models for many years and strives to continuously improve these, because an animal model has to meet many requirements and regulations. Erik Engelen, who is involved in developing animal models at GD, explains: "That makes sense, of course. You only carry out research on animals when there are no valid alternatives or when this is required by law. There are a lot of legal procedures that need to be followed and the animal model has to make a significant contribution to animal health."

In the Interest of Animals

This last point is definitely the case. For example, GD may conduct the statutory research required to guarantee that a vaccine or veterinary medicine actually complies with all the necessary quality requirements. The use of good and effective vaccines in the sector prevents animal diseases, and only veterinary medicines that meet strict standards can protect animals against pathogens or help them recover. So we work together to improve animal health, in the interests of animals, their owners and society at large. Information obtained through this kind of research can sometimes also be used to promote animal health in other ways, such as, to make a distinction between viruses that are harmful and less harmful, or to look at which diagnostic tool is the best to make an early correct diagnosis.

Specific Models

GD has an excellent international reputation when it comes to applied research, being the link between science and practical applications. "We have a lot of experience within the poultry sector in particular," says Erik. "But of course there are other species that suffer from particular health problems too. For example, respiratory problems in calves or post-weaning diarrhoea in piglets come to mind. During the weaning period, a pig's gastrointestinal tract undergoes huge changes. It has to go from processing easy-to-digest sow's milk to difficult-to-digest solid food. This can cause diarrhoea and health problems. If we can check the effectiveness of veterinary

medicines against these kinds of specific problems in an animal model and improve animal health, that's obviously brilliant."

The Three Rs

You might wonder whether testing medicines on animals is responsible. In some cases there are other options, according to Erik. "For example, cells, tissues, or lower animals whose level of consciousness is (as yet) less developed, such as larvae and eggs. These kinds of alternatives are used wherever possible but, in the final stages of the development of a medicine, for example, we often do need to look at whether it does in fact also work in the target species. The three Rs always need to be taken into account when using animal models: replacement, refinement and reduction. If possible, we replace animals with other media, we refine the animal models as much as possible and we reduce the number of animals to a minimum. This last point is possible because the conditions are so strictly controlled."

Final Goal

Refinement can be achieved through innovation. "Our laboratories, facilities and equipment are becoming more advanced all the time. At the moment we're working on biosensors. These deliver knowledge while allowing us to handle the animals less. That's another great new development within the use of animal models."

In the end, it all comes down to improving animal health. That's the final goal, and that goal has to be in balance with the resources used. If this is the case, you can achieve great results in the field of animal health with an animal model," concludes Erik van Engelen.

Knowledge and Expertise

GD has a lot of knowledge and expertise in the field of animal models, including specific expertise in the areas of animal health, data analysis and the laboratory. GD has a huge range of laboratory tests at its disposal, and is ISO-certified and able to carry out GLP work.

Erik van Engelen

After finishing his master degree in biology with focus on the immune system, Erik also succeeded in his studies for becoming a veterinarian. After some years working as a bovine practitioner, he became a lecturer at the veterinary faculty, teaching physiology. His PhD thesis focused on the calving process of cows, which can be described as an inflammatory process. About ten years ago, Erik started working at the Animal Health Service as an immunologist; however, after some years he changed to bacteriology for which he received the Dutch specialisation. Erik is involved in several studies on detection and characterisation of veterinary important pathogens. This also includes the production and improvement of autologous vaccines, a really promising topic at this moment.