Improving the health of farmed animals is a pressing issue for Europe. At the moment, European husbandry leads the world in efficiency and animal welfare, but livestock everywhere is prone to disease. Traditional therapies, such as antibiotics and anti-worm treatments, are becoming less effective as pathogens continue to develop resistance to them and there is increased pressure to cut down the use of drugs in order to reduce the risk of them entering the food chain. So, new control methods must be found to keep animals healthy and prevent diseases, many of which also infect humans, affecting food. Genomics offers new opportunities for controlling disease – for example, by breeding genetic resistance into animals, developing new vaccines, and for rapid diagnosis. A Network of Excellence concentrating on the genomics of animal-pathogen interactions is bringing together European research on livestock diseases, and will help ensure that Europe retains its status as a world leader in animal health for years to come.

Great potential

The genome holds a lot of promise for animal health. Identifying animal genes used in defence against disease makes it possible to screen for resistance, so animals with natural immunity can be identified and bred quickly. Knowing which genes in infectious agents are responsible for their ill effects enables the development of live vaccines in which the disease-causing genes can be disabled or removed while preserving the potency of the vaccine. Studying the behaviour of genes during disease leads to a better understanding of the interaction between a pathogen and the animal’s immunity, which may in turn assist in drug development. In diseases that are currently untreatable, such as paratuberculosis in cattle, these methods offer new hope. As a relatively new technology, the use of genomics in agriculture and aquaculture is still in its infancy.

Money well spent

Genomics is a high-cost science. Equipment is expensive and specialist knowledge and facilities are needed to deal with the information and resources being generated. The European Animal Disease Genomics Network comprises 13 research centres, each committed to a progressive pooling of resources and facilities and integrating of research strategies. The network is multidisciplinary and will relate findings from genomics to more traditional pathology and aspects of animal husbandry, such as housing. This integrated approach is also likely to enhance our understanding of human disease. The institutes will initiate joint research and training programmes on major diseases caused by bacteria, viruses and other parasites in pigs, cattle, chickens and farmed fish.

Hi-tech healthcare

To ensure the science reaches vets and farmers, research will be targeted on the needs of industry. A ‘club of interest’, made up of companies working in animal disease control, will advise the network directly, and regular workshops will communicate results back to the industry. By helping animal breeding companies to retain their competitive edge, the network will also help maintain Europe’s rural infrastructure. In line with the European Commission’s ‘farm-to-fork’ philosophy, the network will also consult consumers, through public hearings, and incorporate their opinions into research directions.

There will be many beneficiaries from this network. Research careers will be enhanced, animal health and breeding companies will make great advances, and animal health will be improved. But ultimately it is the consumer and society at large that will benefit from safer food produced from more sustainable farming systems.
LIST OF PARTNERS

- Institut National de le Recherche Agronomique (France)
- Wageningen University (The Netherlands)
- ID-Lelystad (The Netherlands)
- Institute for Animal Health, Compton (UK)
- Roslin Institute (UK)
- Danish Institute of Agricultural Sciences (Denmark)
- Liège University (Belgium)
- Ljubljana University (Slovenia)
- Cordoba University (Spain)
- Norwegian School of Veterinary Science (Norway)
- Research Institute for the Biology of Farm Animals (Germany)
- Parco Tecnologico Padano (Italy)
- European Forum of Farm Animal Breeders (The Netherlands)