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EryPoP - a Research Project on Erysipelas in Laying Hens

The three-year project 'Erysipelas–an emerging disease in animal friendly production systems for poultry and pigs' addresses the epidemiology, infection dynamics and immunity development in *E. rhusiopathiae*-infections in laying hens.

Figure 1. An increased risk for erysipelas outbreaks has been reported in production systems where the laying hens have access to the outdoor environment. Photo: SVA.

Background

Following the ban of conventional battery cages for laying hens in Europe and the change of housing systems, there has been a significant increase of erysipelas outbreaks (caused by infection with the bacterium *Erysipelothrix rhusiopathiae*) in several countries. Outbreaks are characterized by a sudden high mortality (up to 60%) and decreased egg production in affected laying hen flocks.

Erysipelothrix rhusiopathiae can be spread by a multitude of domestic and wild animal species, and may be present in the surrounding environment. Despite being a well-known disease, vital basic knowledge on erysipelas in laying hens is lacking. However, an increased risk for erysipelas outbreaks in flocks housed in systems where the hens have access to the outdoor environment has been reported, but flocks in indoor aviaries may also be affected.

The project

Within EryPoP, important aspects for prevention and control of erysipelas are addressed in the field and by experimental infections.

EryPoP has five main subtasks:

- to define transmission routes of *E. rhusiopathiae* by use of molecular epidemiology
- to identify risk factors for outbreaks
- to define the role of wild boars as potential reservoirs and sources of infection
- to establish an assay to detect antibodies to *E. rhusiopathiae* in chicken blood samples
- to study the pathogenesis and immune responses to *E. rhusiopathiae* infections in chickens.

EryPoP started in March 2016 and will run for three years. The project is funded via the Animal Health and Welfare ERA-Net (ANIHWA).

Activities

- *Erysipelothrix rhusiopathiae*-isolates and metadata are collected from affected laying hen flocks. Data collection from healthy flocks is included for studies of risk factors. Within the project, samples and data are also collected from domestic pigs and wild boars.
- Collected isolates are analysed by Next-Generation-Sequencing technologies and bioinformatics.
- For studies of the epidemiology and risk factors, flock data will be analysed together with data from the molecular analysis and from wild boars.
- Using available sequences and those provided within the project, *E. rhusiopathiae* antigens are being identified and used for a novel ELISA test to detect chicken *E. rhusiopathiae* antibodies.
- A model for experimental infections in chickens is being established and studies of the pathogenesis and immune responses are ongoing.