

# Management and alternative crops as a means to reduce parasite infections in organic pig production systems

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## Background

Intestinal parasites is a potential problem of considerable importance for the production of out-door pigs. This is particularly true for the organic production systems that tries to minimize or completely avoid the use antiparasitic drugs. There is therefore an overall need for alternative methods of parasite control as parasite infections may have an negative effect on feed conversion and growth of pigs. Previous experiments have shown that it is possible to reduce infection levels by manipulating feed composition and it has been suggested that some plants may have antiparasitic effects. Ideally it would be possible for farmers to grow antiparasitic bioactive crops that could be used as roughage or other feed supplements.

However, bioactive plants are probably not enough to control parasite infections. Future control strategies should be based on a good knowledge of parasite infection epidemiology and consist of not only selective feeding but also pasture management. Parasites such as the round worm and whip worm are transmitted between pigs as eggs that may survive in the soil for a minimum of 5 and 11 years, respectively. Pasture rotation may therefore only have a limited effect if contaminated pastures are not kept free of pigs long enough. It is therefore also of interest to examine if ploughing can reduce the availability of parasite eggs to pigs. In later years it has been shown that neonatal exposure to the round worm may increase the susceptibility to infections with the parasite. This means that pigs that are moderately infected at an early age does not become immune to this parasite to the same degree as pigs that are first exposed later in life. Overall, production losses is therefore expected to be larger in out-door herds where the piglets are born on contaminated pastures compared to an in-door intensive herd where parasite faeces containing eggs can be efficiently removed.

## Objective

The project can be divided into 4 parts with the following aims:

1. To obtain knowledge on natural parasite infections in pigs that are born and raised on infected pastures.
2. To investigate the survival of free-living parasite stages on contaminated pastures in relation to ploughing.
3. To test extracts of bioactive plants for potential antiparasitic effects using a "Larval Development Assay (LDA)" (this has been taken out of the Ph.D., see below).
4. To examine if bioactive plants can be used to reduce parasite infections in fatteners.

## Status September 2004

### Part 3

The last samples were examined in early 2004 and the results show that the paddocks were still heavily contaminated with *Ascaris* in late 2003. *Trichuris* were also still present though at lower levels, reflecting the initially lower contamination with this parasite. and ploughing seems to more effective Overall, ploughing reduced the transmission level of *Trichuris* considerably more than *Ascaris* throughout the trial. The reason may be that *Trichuris* eggs have a higher optimal temperature for embryonation than *Ascaris* and therefore do not develop well when ploughed deeper in the soil.

Time has also been spent on analysing and compiling the results that will form the basis of the 4 papers included in the thesis. It is planned to submit the thesis in December or January 2005.

### **Plans 2005**

To defend the thesis.

### **Publications**

Mejer, Helena and Roepstorff, Allan (2003). Non-medical control of parasitic worms in pigs. Online at <<http://www.darcof.dk/enews/jun03/parasit.html>> Newsletter from Danish Research centre for Organic Farming (DARCOFenews) · June 2003 · No. 2.

Mejer, Helena and Roepstorff, Allan (2003). Ikke-medicinsk kontrol af indvoldsorm i grise. Online at <http://www.foejo.dk/enyt2/enyt/aug03/orm.html>. Nyhedsbrev fra Forskningscenter for Økologisk Jordbrug (FØJO enyt) · August 2003 · nr. 4

Mejer, H. 2004. Pløjning virker mod nogen indvoldsorm (2004). Online at <http://orgprints.org/00003228/>. Økologisk jordbrug 315, 10.

### **The thesis will include the following papers that are currently being finalised:**

Mejer, H. & Roepstorff, A. *Ascaris suum* infections in pigs born and raised on contaminated paddocks. To be submitted October 2004.

Mejer, H. & Roepstorff, A. *Oesophagostomum dentatum* and *Trichuris suis* infections in pigs born and raised on contaminated paddocks. To be submitted October 2004.

Mejer, H. & Roepstorff, A. The survival and development of porcine helminths in relation to ploughing. To be submitted December 2004.

Mejer, H., Roepstorff, A., Thamsborg, S . M., Hansen, L. L. & Bach Knudsen, K. E. The effect of bioactive plants on *Oesophagostomum dentatum* and *Ascaris suum* infections in pigs. In preparation.