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Control of health and welfare problems in organic sow herds

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Organic pig production differs from the conventional production as regards e.g. feeding, access to outdoor areas, weaning age and use of preventive medication, and therefore it is likely that the occurrence of health and welfare problems may be different in organic herds compared to conventional production systems. Improved management in the individual herd may reduce problems and in order to ensure a high level of animal health and product safety it is necessary to be able to monitor and assess any risk factors present in the herd. This is relevant, especially for organic producers as the organic guidelines encourage control of disease and welfare problems by means of prophylactic measures.

The current DARCOF II project (MANORPIG) aims to develop strategies for control of selected health and welfare problems as well as zoonoses in the organic sow herd. This management tool will be constructed as a HACCP (**H**azard **A**nalysis and **C**ritical **C**ontrol **P**oint) programme, which is a tool originally developed for quality assurance and food safety in the food industry.

In the HACCP system intervention is directed towards the risk factors rather than focusing on the problem (see Figure 1). Identification and quantification of risk factors and description of critical control points (CCP's) are important elements in the HACCP system. CCP's are indicators of the presence of a risk factor. The CCP's must be measurable on-farm and they form the core of the monitoring system.

Figure 1. Elements of a HACCP system

1. Identification and quantification of risk factors for the problem
2. Identification of critical control points (CCP) for

the risk factors
3. Establish alarm values for the individual CCP's
4. Description of monitoring systems for CCP's applicable in the individual herd
5. Preparation of action plans in case of exceeded alarm values
6. Preparation of an efficient and user-friendly documentation system for the HACCP programme

An expert panel of 10 Danish and Swedish veterinarians and production advisers with experience in organic pig production has assisted in the selection of problems and the identification of important risk factors. The experts either have completed a series of 5 questionnaires in February – May 2003 or have participated in an advisory workshop in the MANORPIG project in April 2003.

The experts have estimated the occurrence of health and welfare problems in organic herds. Insufficient access to water and wallowing facilities, especially as regards the sows was perceived as a common problem. Apart from that, poor body condition and reproduction problems are frequently observed in the sows, and stone chewing in pregnant sows. The experts did not indicate large problems with lameness or hoof disorders in organic sow herds, but at the advisory workshop it was suggested that leg disorders and other clinical diseases might be under-estimated in outdoor herds due to difficulties diagnosing the problems in extensive production systems. According to the experts, suckling piglets commonly experience welfare problems caused by crushing or trauma inflicted by the dam, and other welfare problems can arise due to insufficient care and disease treatment, disturbances and trauma from predators, and unsuccessful nursing. Weaned pigs might suffer from diarrhoea as a common health problem and further poor quality feed stuffs might constitute a problem.

We selected body condition, reproductive problems and leg disorders as important welfare problems for organic sows based on the expert opinion, while the most common welfare problems for suckling and weaned pigs have been identified as crushing/trauma and diarrhoea, respectively. Relevant risk factors in a HACCP system should be important for the occurrence of the problem and furthermore the factor should be sensitive to changes in operational management routines on-farm. Thus, important risk factors related to management and animals have been investigated as regards possible control points while risk factors related to the production system (e.g. design of huts) have been left out.

Risk factors for poor body condition in sows were

identified as mainly feeding related. Competitive feeding systems or restricted access to feed are important risk factors according to the expert panel. Possible CCP's measurable on-farm might be: Feeding space per sow, feeding related aggression between sows, group composition, feeding system and actual amount of feed provided. Poor feed quality might be a further factor. CCP's for this could be: energy, protein and vitamin/mineral content in feed, control of feed mixing equipment and percentage returns-to-oestrus.

Poor mating management regarding oestrus and pregnancy testing, synchronisation of oestrus in sow batches and poor body condition were regarded as important risk factors for reproductive problems in the herd. Possible CCP's might be available through the productivity records in the herd: non-productive days, farrowing rate, lactation days, variations in number of sows per batch and variation in farrowing dates and mating dates within sow batches. Other risk factors were defined as infections or improper vaccination strategies. Possible CCP's mentioned by the expert panel were: Control of vaccination records, control of vaccine, occurrence of arthritis or mortality in piglets, variations in litter size and abortions or returns-to-oestrus.

Important risk factors for leg problems in sows were considered to be genetic factors affecting leg strength, diseases in legs and hooves, ground condition in outdoor areas and management in the mating area (increased social activity resulting in trauma). Possible CCP's for leg strength might be assessment of leg conformation in replacement gilts and control of sow breeds employed. CCP's for diseases in legs and hooves might be regular hoof examination focusing on lesions, lameness, disease treatments, reports from the abattoir, and regular control of hoof length. CCP's for outdoor ground condition might be an assessment of the outdoor area and strategy for moving feeding area, and finally possible CCP's for the mating area might be aggression between sows at mixing, skin lesions, area per sow, group size, and flooring.

Risk factors for crushing of piglets were suggested by the expert panel relating to a) The farrowing hut: design, dimensions and climatic conditions; b) Bedding material: type, amount and quality; c) Environment: disturbance caused by predators or other animals and d) Sow condition: Litter size, milk production, body condition, leg disorders and other diseases. Possible CCP's regarding the bedding material might focus on the type and amount as well as quality of the straw bedding. CCP's regarding environmental disturbances might be: straw bedding messed up, the sows being nervous at inspections, insufficient fencing, location of hut in the pen, timing of

introduction of the sow to the farrowing pen, several sows per farrowing pen. Finally, possible CCP's as regards sow condition might be litter size, thriving of the piglets, crushed piglets in former litters, body condition score, leg conformation, hoof health, disease treatment, lameness and control of mineral content in the feed.

The risk factors suggested for diarrhoea in weaned pigs were related to feed quality and hygiene of outdoor area, indoor pens and wallowing holes. Possible CCP's for feed quality might be control of feed mixture, especially protein and amino acids and control of mixing equipment. CCP's for the hygienic risk factors might be assessment of outdoor area, control of cleanliness of empty pens between batches of pigs, condition of resting area, moving strategy for wallowing holes, use of wallowing holes and cleanliness of the pigs.

The selection of relevant CCP's for the welfare problems must rely on an evaluation of risk factors present in the individual herd, and the importance of the various risk factors preferably should be quantified. The selected welfare problems: poor body condition, reproductive disorders and leg problems in sows, crushing of piglets and diarrhoea in weaned pigs are all multi factorial in nature, and a complete eradication of the problems are not likely to happen by controlling some of the risk factors by for instance a HACCP programme. However, a reduction in the incidence of problems should be achievable.

The HACCP system is currently being adjusted to fit as a management tool in organic sow herds. The suggested control points will be evaluated for applicability in a surveillance tool including the identification of alarm values and action plans. Subsequently, the prototype HACCP programme will be evaluated as regards practicability, time consumption and potential as a management tool through a questionnaire study targeting the organic pig producers.

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