Herman Van den Weghe,Vechta

Trends in breeding pig and piglet production techniques

The present development in sow and piglet production is characterised mainly by three trends which should support one another. These must be regarded as of equal importance and capable of being methodologically achieved at the same time:

- *Increasing the physiological and economical breeding performance per sow and year and, through this, achieving further reductions in production costs*
- *More welfare-based livestock production*
- *More environmentally-friendly plans for the production process (increasing material and energy efficiencies, decreasing emissions).*

Quite independently of respective business organisation forms, piglet production as a specialised enterprise is at the moment characterised by a very rapid development towards substantially larger herds of between 300 to around 1,200 sows per production unit. Other aspects include organisation/technological measures for prophylactic herd hygiene and limiting of epidemic/hygienic risks, as well as the compelling necessity for delivering large groups of piglets consistent in quality and age (120 to 200 head). In total, such concepts should lead to a further reduction in fixed costs, through digression of investment costs, to increases in production performance per sow and year and to raising the profit from the piglets.

The individual solutional strategies all lead to a substantial reduction of the animal transport between individual herds and at the same time to an aria division of the individual production stages (basic breeding, gilt breeding, serving centre, pregnancy testing centre and piglet rearing unit) with each on a separate site.

Fig. 1: A large group of piglets with interval feeding via round-trough automatic (Photos: W. Achilles)

Farrowing pens

From the production-technological point of view, the procedural techniques in the farrowing section regarding labour productivity, animal hygiene, flooring design, ventilation and minimising of piglet losses have reached a high standard. However, along with this development towards space-saving solutions has also come an emphasised restraint of the sow and the cessation of straw supply which is disadvantageous from both the behavioural-biological and physiological point of view.

For some time now, new types of farrowing pens have been developed and investigated both in Germany and abroad. These work without any continual restraint of the sow and cater better for the natural behaviour of the mother animal around farrowing time when compared with the conventional (and apparently internationally strongly standardised) quasi fully slatted farrowing pens with diagonal placement and farrowing creates. New types of pens should, at the same time, neither lead to reproduction performance drops nor substantially higher labour requirements, or extra costs. The structural design necessary within the so-called movement pen for efficient protection of sow production have, up until now, not been fully clarified in detail. However, one can start of with the premise that a permanent detention of the sow during the whole nursing period will in the medium term, be neither necessary nor legally permitted.

Trial results up until now have shown that total piglet losses as well as the labour requirements in strawless movement pens do not need to be higher than in standard pens with continual restraint of the sow. Within movement pen systems the percentage proportion of the individual causes of piglet losses are more interconnected in comparison with those in the standard pen and the management of animal handling is more difficult.

Prof. Dr. Ir. Herman Van den Weghe is director of the Institute of Procedural Technology at the Weser-Ems Study Centre for Livestock Production Economics of the Georg-August-University Göttingen, Driverstraße 22, 49377 Vechta. He compiled the following review for the DLG.

Keywords

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Group housing of pregnant sows

The individual housing of sows has already been limited in terms of length of time as well as in production-technological terms under the Pig Housing Order within the animal protection law in the last decade. In the future this is to be replaced altogether to a great extent through group housing systems. With new buildings in particular, but also on farms which have to undertake re-equipment of housing by 2005, questions are being raised as to the system solution most suitable for the future. Systems used up until now for group housing in large groups (e.g. individual electronic transponder-activated feeding) or for small groups (e.g. trickle feeding, feeding crates in group pens) have in each case a few specific disadvantages mostly involved with the approach to feeding and feed presentation.

Almost without exception pregnant sows have been individually fed with feed low in crude fibre. In the past, labour rationalisation meant this was done in a very limited period of time. Independently of the form of housing (in a limited sense) this tended to lead often to nutritional-physiological and behavioural-biological deficits which were followed by reductions in condition and could cause health problems, especially in the subsequent farrowing and lactation phases (e..g. MMA, intestinal blockages).

A further practical development of housing and feeding technology is based on technically relatively simple replete feeding from wet mash automatic feeders using feed strongly reduced in energy content (~8.5 to 9 MJ ME/kg) wherein the crude fibre component has a high swelling potential. Through this, a limitation of energy intake is achieved by inducing a sufficiently replete feeling with the animals.The sows spend a substantially larger proportion of their time in feed intake and can feed almost without a time limitation and without the need for expensive individual feeding places.

The design of the associated housing system is relatively simple and economical. In the main it comprises a two-compartment pen for large groups and around 12 to 15 sows per wet mash feed automatic. The two-compartment pens with separate lying and dunging areas can feature strawless as well as straw-bedded lying areas in insulated housing or in association with insulated boxes in naturally ventilated buildings. Through this, housing and feeding technology should not only better meet animal welfare requirements but also be more economical in the construction than is the case presently with high-technology housing systems.

Reducing in-house dust and ammonia content

To the important air-hygiene problems in modern housing belong, along with the ammonia concentration in the interior air, the suspended dust which as a rule is carrier of health-impairing substances (allergens, bacteria, fungus spores and endotoxins). Towards reducing concentration of the so-called bioaerosols and towards limiting the content of the material in the air, a series of new conditioning techniques are offered (e.g. ionising, UV-rays, fogging with rapeseed oil/water solution) the action of which at the moment is not sufficiently reliable.

The drastic reduction of dust concentration especially in the interior air of piglet production and feeding pig housing will attract increased attention from now on because of the currently discussed EU introduction of threshold values for breathable dust content in the air as well as endotoxin content in the dust. Necessary measures for the reduction of ammonia emissions from livestock housing according to international guidelines for the limiting of soil and water acidification will lead to substantial modifications in the housing, manure withdrawal and ventilation techniques with the housing for piglet production being no exception here.

Fig 2: Feed centre including acidification facility at a modern weaner production unit

Piglet rearing in large groups

The housing of early-weaned piglets in large groups with 25 to 40 animals per group is becoming increasingly accepted and moves in the right direction to meet the nutritional-physiological requirements of younger animals with the separating of rations into many portions, the sinking of investment costs for pen equipment and feeding technology as well as the creation of homologous groups of piglets for further feeding, as far as possible without mixing of different piglet rearing groups.

Large groups make it possible for the animals, even without constructional or climatic partitioning, to create different function areas for resting, feeding and dunging. The feeding system can be equipped with, e.g., wet mash pipe feeding with round trough, lateral trough with individual feeding places or liquid feeding with sensor in a short trough. One thing in common with the different feeding systems is time-controlled rationing of feed. Around 10 to 12 mealtimes are optimal according to current knowledge. Through the feed supply divided into many mealtimes, over-eating by the young animals, and the resultant diarrhoea diseases, can be avoided.

For the acidification of feed in the stomach-intestinal tract of younger piglets, the amount of feed and its pH plays an important role. For this reason the manufacturers of liquid feeding plants in particular have increasingly presented more technical possibilities for the precise acidification of piglet rearing feed. Decisive here are the technical possibilities for exact dosing and controlling pH in feed preparation. Here, a series of organic acids are applied in various combinations. With the fall in use of many so-called antibiotic growth promoters, prophylactic measures in feed hygiene and animal nutrition are gaining substantially in importance.

Naturally ventilated housing for piglet production

Investment costs of DM 450 or more per piglet rearing place for conventional piglet rearing housing with forced ventilation in closed and insulated buildings are increasingly encouraging consideration of changing to piglet production in much more economical naturally-ventilated housing with microclimate boxes. On the other hand, although they are technically possible, naturally-ventilated housing for sows is seldom built. Especially in winter it is advantageous for AI and oestrous control to have the service centre in enclosed and heated buildings. Thus natural ventilation for the dry sow accommodation only is less attractive for many farms.