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# New technical developments and trends in poultry production

*Egg and poultry production has to increasingly assert itself under the pressures of animal welfare demands, product hygiene needs, increasing energy and feed costs and environment protection requirements. Housing and management systems must cater for these demands while also remaining cost-efficient. Future units will therefore increasingly represent adequate structuring of the production environment, computer based management systems controlling a wide range of measurement and operational functions, energy-efficient equipment and housing and reduced-emission systems.*

Poultry production in the EU faces a time of upheaval. Comprehensive implementation of the EU Zoonoses Regulation represents a challenge to overcome. Simultaneously, new husbandry regulations such as the Laying Hen Regulation and the EU Directive for Determining Minimum Standards in Broiler Production have to be implemented. The demands on poultry producers increase from the management aspect as well as the economic one whereby the differing implementation of legal requirements within the separate EU member countries means the burden is not a uniform one.

The upcoming ban on conventional cages with their clearly proven hygienic advantages makes more difficult production of perfectly hygienic eggs. The enriched cage and the still more welfare-oriented small group production system indicate, however, advantages over on-floor systems. Hygiene management demands will therefore increase over-proportionally for free range and organic egg production.

The numerous influences on the production process means today's manager relies more than ever on high-performance control and operational systems and in this way there's a clear trend to computer-supported management for early warning of malfunctions. The development relieves the manager and leaves more time for direct animal care.

## Cleaning and disinfection

Implementation of the EU Zoonoses Regulation for layers from 2009, also planned for broilers in the following years, requires on most production units a hygiene management rethink. Alongside development of farm-specific hygiene concepts, suitable cleaning and disinfectant equipment has to be brought-in and there's now a range of such equipment on offer. The systems are characterised through precise control with integration in computer-controlled management allowing exact planning of operation times and optimum application from both labour and economic aspects thus avoiding errors and saving working time. Disinfectants and their active ingredients also now offer the possibi-

lity of new methods with future active ingredients needing to retain high efficacy while showing, where possible, no side-effects and being environmentally compatible.

## Ventilation equipment and unit management

In-house climate clearly affects hygiene, bird performance and not least staff health. On-floor laying systems produce especially high dust levels that can effect airways of both hens and poultry staff. Computer-control of ventilation equipment is now standard and climate control is increasingly precise through sensing of continually increasing contaminants (carbon dioxide, ammonia, dust) and climate factors (outdoor and interior temperature, air moisture content) whereby ventilation systems can be more efficiently operated. Fogging systems are now increasingly used for distribution of aerosols (mixes of air or oxygen, water and ethereal oils) in poultry housing for regulating humidity and binding contaminants. In the laying hen group housing systems (small groups and on-floor) manure drying in situ is also becoming normal nowadays with this system's proven positive effects on air quality.

Recording of different measurement and system data as well as controlling various system components requires high-performance management software. But in the past different BUS systems from respective manufacturers meant components were incompatible making adding components or making system alterations almost impossible. Now, increasing numbers of manufacturers are adopting the ISOagriNET standard enabling more flexible configuration with positive effects on investment costs.

Broiler production is traditionally almost exclusively on straw and wood shavings litter. But now new litter substrate is available that helps reduce contaminant emissions and also improves bird health. The new substrate is either mixed with the straw or replaces it with the most visual effect being reduction of foot pad lesions and hock burns. Such health improvements serve to meet increased welfare requirements so we can assume that

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## Keywords

Hygiene, air-conditioning technology, laying hen husbandry, feeding equipment

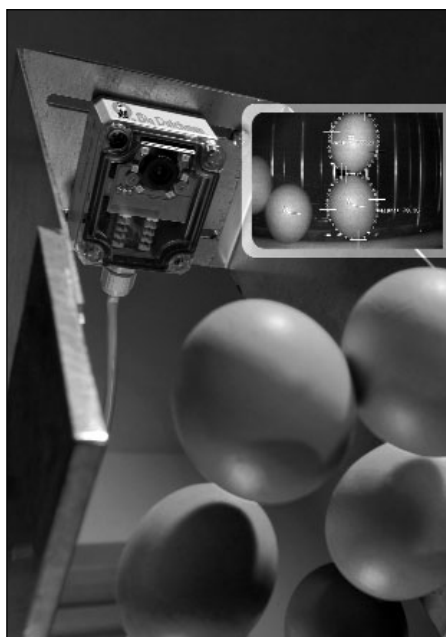
litter supplementation or alternative substrates will become more important. But it must be ensured that the resultant manure is also suitable for biogas production.

### Hatching equipment

Hatching is the basis for healthy stock with optimum performance capacity. Hatching equipment is exclusively computer-controlled nowadays with predetermined values for temperature and humidity precisely followed. However, even under optimum conditions no chicks develop in a proportion of the eggs and these eggs represent potential hygiene risks as well as wasting brooder capacity. Nowadays automatic separation systems are available that identify and separate the empty eggs, substantially reducing labour input in this respect. Similarly, automatic systems are available that help separate chick from eggshell at hatching, sort them out and move them onto transport equipment.

### Laying hen husbandry

Alternatives to conventional cage housing include on-floor systems with one or more levels, the enriched cage and, in Germany, the small group production systems or "Kleingruppenhaltung" as it called. These systems comprehensively apply requirements of animal welfare groups and politicians towards structuring of production environment. The small group production system differs from the enriched cage fundamentally in that larger groups have not only more space per hen but also perches at different heights. The business decision to change over to small group systems in Germany has been delayed, however, because of failing legal security, insufficient experience with the system in practice, and legally required egg labelling identical to that of cage systems. This means adjustments to accommodate such systems will be concentrated in the next months and through 2009. The technical fur-



*EggCAM from Big Dutchman counts, weighs and assesses quality of eggs (gold medal)*

Company photo

ther development of small group systems will be more intensively pursued especially following the publication of first results from the Federal Office for Agriculture and Food (BLE) cooperative project "Kleingruppenhaltung".

For management of layer flocks, the precise number of eggs produced, their weight range and quality, must be identified as soon as possible to allow timely identification of problems and introduction of possible solutions. Electronic egg counters are certainly already used whereas weighing systems on the collection lines tend to be the exception. Identifying dirty eggs, on the other hand, is only possible with substantial labour input. But there's no doubt video systems will be applied for this in the future thanks to the enormous development in computer and photo-analytical technology. Over some years now alterations in broiler carcasses on the slaughter line have been reliably identified by photo-analysis systems and the in-

formation applied in controlling the slaughter process. In future, similar applications will count eggs in layer systems, enable algorithmic calculation of their weights plus identification of dirty eggs or shell defects and automatic separation of unsuitable eggs.

The trend towards larger units in egg production means packing stages have to increase throughput too with considerable technical challenges involved in speeding up grading. Targets are gentle handling of eggs to avoid damage and at the same time reduced personnel costs with equipment easily cleaned and disinfected. Automatic systems that identify, grade, and then carefully transfer eggs to the correct conveyor belts according to class and weight before stamping them with the appropriate information are therefore on their way. Increased hygiene requirements mean that the equipment now involved has to be fully resistant to cleaning substances and high-pressure spaying. Grading performance reached under these requirements is already up to 180,000 eggs per hour.

### Feed equipment and feeding

An efficient feeding system must be capable of transporting feed rapidly to the troughs without demixing and also designed to avoid blockages. Troughs must aid cost reduction by avoiding any feed loss while enabling all hens to feed according to their needs and of course the equipment must be easy to clean and disinfect. To help meet these aims feeding equipment is being continually further improved in detail by manufacturers but without fundamental changes in functionality. Use of plastic feed troughs is now standard. The trend towards feeding more requirement-based rations demands flexible application of feed mixing with different nutrient components. And thanks to the latest flock management systems feed rationing can be automatically carried out according to performance and climate parameters thus offering economic savings too.