protein diet to avoid the hens becoming fat. Injurious pecking is generally seen as the most important welfare issue in flocks where beak trimming is not applied.

"Welfare is a key priority for breeders and the industry," concluded Dr Burnside.

**Housing and Management of Layer Breeders in Rearing and Production**

The symposium 'Alternative Systems for Poultry – Health, Welfare and Productivity

"Floor eggs need to be collected regularly – several times a day, if necessary"

Housing and management of layer breeders need to be right, otherwise farmers are unable to take advantage of the genetic potential and high economic value of the hens, said Dr Hans-Heinrich Thiele of Lohmann Tierzucht in Cuxhaven, Germany.

He explained that a good start is secured by optimal brooding conditions, high feed quality and appropriate management in the early life of chicks.

The development of adequate eating capacity during the later rearing period and a fine-tuned light stimulation were factors that he identified as important for a good start in the production phase.

Dr Thiele stressed that the birds must be adjusted to the different housing systems for layer breeders; they need to be trained to be able to access easily the feed, water and nest boxes provided, and the correct vaccination schedule will prepare the birds for the different disease challenges they face in the production environment.

Once in production, nutrient requirements can be met by a phase feeding programme. Good hatching egg quality can be achieved by avoiding floor eggs and appropriate egg handling.

Dr Thiele offered a number of tips to prevent floor eggs, including ensuring easy access to all the nests without dark corners or draughts. Some lighting in the nests may help, he suggested, as does water provided near the boxes and barriers to prevent more dominant birds from excluding the others from that area. Excessive litter should be avoided on the floor. Also important, according to Dr Thiele, are to ensure birds are not disturbed while they are laying and to collect any floor eggs regularly – several times a day, if necessary.
Alternative Systems for Meat Chickens and Turkeys

Legislative and assurance scheme requirements for standard and alternative indoor and outdoor broiler and turkey production systems were described by Dr Tracey Jones of welfare campaigners, Compassion in World Farming, in a paper co-written with Dr Jutta Berg of the FLI in Celle, Germany.

She explained that health and welfare are protected to various extents by a series of input requirements, which cover stocking density, light, environmental control parameters, environmental enrichment, permitted mutilations and growth rate. Outcome measures, on the other hand, are usually related to physical well-being and tend to highlight flocks that performed poorly. Success depends on the effectiveness of the input and output measures, the reporting structure and remedial action taken.

Alternative systems represent a low market share of broiler and turkey production in the EU – approximately 10 and 30 per cent, respectively – and generally, production costs are higher, said Dr Jones.

Free-range and organic systems are perceived as having the potential to provide good living conditions and reduce environmental pollution, she continued, but concerns have been raised over bird health (Campylobacter infection), welfare (higher foot lesions and breast blisters and lack of outdoor ranging), product quality and consumers' willingness to pay.

Research shows that breed suitability is one of the most important factors determining welfare in alternative systems, particularly for broiler chickens. Dr Jones recommended that more robust and hardy breeds with lower growth rates should be used as these birds are better suited to a wide range of environments and perform well on less energy-dense diets.

The quality of the diet, particularly in relation to essential amino acids and protein balance and the free-range environment (particularly in relation to natural cover outdoors) are also highly important for both broilers and turkeys, she said.

The meat from slow growing broiler breeds is more suited to the whole bird market (as opposed to portioned or further processed) and generally contains less fat and more protein than from conventional breeds, according to Dr Jones. Consumers tend to be unable to differentiate chicken products from alternative system by odour and taste but can differentiate by appearance and texture.

"Alternative systems can deliver," concluded Dr Jones, adding that breed suitability and the quality of the outdoor area are important considerations. For the future, she highlighted the need to focus on balancing organic diets to reduce feather pecking and a need for clearer labeling so consumers can make informed decisions about their purchasing of poultry meat.