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Direct Heating in Broiler Houses

On 12 July, The Official Journal of European Union published "COUNCIL DIRECTIVE 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of broilers".

The Directive lists a series of general requirements regarding water supply, feeding, litter, monitoring etc. The general requirements apply to stocking densities of up to max. 33 kg/m². Currently, the typical stocking density - e.g. in Denmark - has a scope of about 40 kg/m².

Provided a series of conditions are met, further to the general ones, it will also in the future be possible to obtain permission for establishing stocking densities of 39 or 42 kg/m². It is to be expected that a large number of producers in the EU will be interested in obtaining permission for increased stocking densities.

The below special requirements must be met as regards ventilation in houses where the producer wants an increased stocking density (the list is not exhaustive):

"The owner or the keeper shall ensure that each house of holding is equipped with ventilation and, if necessary, heating and cooling systems designed, constructed and operated in such a way that:

a) the concentration of ammonia (NH₃) does not exceed 20 ppm and the concentration of carbon dioxide (CO₂) does not exceed 3 000 ppm measured at the level of the broilers' heads;

b) the inside temperature, when the outside temperature measured in the shade exceeds 30° C, does not exceed this outside temperature by more than 3° C;

c) the average relative humidity measured inside the house during 48 hours does not exceed 70% when the outside temperature is below 10° C.





Today, direct heating through e.g. gas blowers inside the livestock house is often used due to the relatively low initial costs. And this is done despite the fact that it results in a number of evident operating and climate technical drawbacks. The combustion process brings in both water vapour and CO₂, among other things, directly to the livestock house and thus the ventilation requirement and with that the heat consumption is increased.

SKOV has used StaldVent to carry out calculations, which show that the use of direct heating in broiler houses within the EU in future will involve very high heating costs because of the CO₂ requirement.

The calculations have shown that if the requirement for max. 3 000 ppm CO₂ is to be respected in future, it should be expected that heating consumption will increase by approx. 50% when direct heating is used e.g. by means of gas, instead of indirect heating in poultry houses. The calculations were made on the basis of an outdoor climate corresponding to

Danish conditions, and the additional consumption corresponds to approx. 150,000 kWh per year for only one broiler house of 2 000 m². A broiler grower - in Denmark - typically pays approx. 0.5 DKK/kWh, which means a significant extra annual amount per house.

The fact that heating consumption in houses with direct heating in the simulations is approx. 50% higher is especially because of the CO₂ requirement, which has been taken into consideration in the calculations. Should we in reality experience that houses with direct heating do not have such a marked additional heating consumption, this would probably be because the content of the CO₂ level exceeds 3 000 ppm significantly. However, in light of the new EU Directive, this will no longer be possible in future, should you wish to produce more than 33 k/m².

The Directive stipulates that the member states shall bring into force the laws, regulations and administrative provisions necessary to comply with the Directive by 30 June 2010 at the latest.

