

Combi-Tunnel ventilation – The all-weather system



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climate under climatic conditions of great fluctuations of temperature.

The objective of ventilation

Great demands are made on the climate system in the livestock house to ensure an exact adjustment of temperature, air humidity and air velocity in order to create optimum conditions. If the air humidity rises, the animals sense a higher temperature even though the temperature is actually unchanged. Likewise, a low humidity can make the animals feel a lower temperature even though it has not been lowered. The opposite applies as regards air velocity. If it is increased, the animals feel a lower temperature even though the temperature is unchanged. There is only one correct temperature – if it is not sustained an optimal productivity cannot be maintained.

When establishing a ventilation system, it is important to utilise the impact of temperature, air velocity and humidity to attain the most optimum climate in the livestock house. The Combi-Tunnel ventilation system utilises these factors in a positive way and thus the climate and the productivity of the animals is optimised.

Combi-Tunnel ventilation

Combi-Tunnel ventilation can be used in the subtropical/temperate regions of the world. The system has been designed for areas where there is a major difference in temperature with warm summers and cold/cool winters and/or great difference between the day and night temperatures.

At low outside temperatures, the system ventilates according to the side mode principle with air intake through wall inlets and air outlet through chimneys in the roof or wall fans. At high outside temperatures, the system ventilates according to the tunnel principle. The air is taken in through cooling pads and the air outlet is conducted through large gable fans at the opposite end of the

Animals of highly improved breeds combined with a high stocking density require a climate of precise adjustment. The Combi-Tunnel ventilation is developed by SKOV; it insures the animals the most optimum

house. A cool airflow is created lengthwise in the house. It is often possible to create a cooling effect of 10-25 °C. A Combi-Tunnel system is 100% flexible and can be adjusted to almost any kind of production, and by and large all livestock houses. The system provides a stable climate in the house all the year round.

Requirements for the livestock building

In order to be able to create an optimum climate through Combi-Tunnel ventilation, it is important that the livestock building is impermeable. If the livestock house is permeable, there will not be an optimum climate inside the house, which will result in poorer production results.

At minimum ventilation, when taking the air in through wall inlets, it is important that the fresh air is entering through the wall inlets and not through other leakages of the building. It is important that there is a wide air jet range so the air reaches the middle of the house and is mixed with the house air before reaching the zone occupied by the animals. If the building is permeable, in general, the air will enter in a diffuse way from these leakages and it is not controlled where it ends up. Greater leakages will create significant air jets inside the building; air jets that will give rise to an uneven stocking density.

Another important factor is the insulation of the building. Even though the production takes place in subtropical/tropical regions, there will be periods where the insulation of building and/or the possibility of heat supply will be decisive to maintain the optimum temperature. A well-insulated building provides the possibility of ventilating even more and this way it is possible to retain the best possible humidity level.

Automatic control and switch between modes

The climate controller is an important part of the Combi-Tunnel ventilation system. Only efficient control provides optimum ventilation. The control unit must ensure that all components in the ventilation system work together in order to have the optimum result.

The DOL 339 climate computer ensures that the animals have optimum conditions by making the ventilation dependent on the outdoor temperature and the age of the birds. DOL 339 handles a large number of functions, which make automation and control of the production



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possible. These functions are among others: Climate control in one or two zones, MultiStep® fan control, CO₂-control, alarm at too high or low negative pressure, displays of "chill effect" and efficient temperatures, humidity control with/without heating etc.

Installation of high-pressure cooling can delay and equalise the transition from side mode to tunnel mode. With high-pressure cooling, the air is provided with finely atomised water vapour. It cools the air in the house during the evaporation process. A high-pressure system can also be used for both humidification and dust binding. Between the batches, the high-pressure system can be used for soaking and disinfecting of the livestock house.

Combi-Tunnel in South Africa

The production of broilers in South Africa has increased considerably during the last few years. At the same time, SKOV A/S and Peninsula Poultry Appliances (Pty) Ltd have together succeeded in making Combi-Tunnel the prevailing ventilation system on the market.

Today, SKOV is the largest supplier of ventilation systems in the world and the SKOV ventilation systems are daily in operation in more than 15 000 poultry houses all over the world.

Conclusion

Much has been discussed in poultry circles about the pros and cons of open-sided versus controlled-environment houses. This is a whole subject on its own.

Some of the factors that we must take into account when making decisions are:

- 1) What does the 2007 broiler need to perform to its potential?
- 2) What stocking densities can different houses reliably be stocked at?
- 3) Most importantly, what amount of kilograms per square meter can be taken out of houses under South African conditions?
- 4) What houses can consistently produce chicken at the best cost per kilogram?
- 5) Lastly, forget about PEF when comparing houses. PEF is only a reflection of what is happening on your farm in similar houses. It is cost per kilogram and kilos per square meter that make your wallet fat.

