

First heat exchanger for laying hens in Denmark

On 30 March, when the sun shone from a clear, blue sky, Jens Skovgaard Jensen invited us to visit and have a look at the new heat exchanger in one of his laying hen houses with approx. 33,000 free-range hens.

The Agro Supply heat exchanger was supplied by Rokkedahl Energi and the first one used in a laying-hen house in Denmark.

The heat exchanger



Jesper Toft Jensen, Rokkedahl Energi, and **Ruud van der Heijden**, Vencomatic talked about the heat exchanger and how it works in a laying hen house with much more equipment than a broiler house.



The heat exchanger extracts warm air from the hen house and uses it to heat the cold fresh air - even on the coldest winter days, the heat exchanger blew 16°C hot

air into the hen house.

The air is blown through a large pipe to the ridge of the roof and then the warm air is distributed along the length of the house by a number of ventilators. On warm days, the hen house ventilation takes over.

You would also be able to use the heat exchanger in a double-level hen house. If the heat exchanger is to be used in breeding houses, an extra 50kW heating element must be installed in the heat exchanger.

Infographic



The farm

Jens Skovgaard has two identical hen houses, one of which has an extension containing packing and installations rooms and staff amenities.

Each house has room for approx. 33,000 free-range hens. In the house with the heat exchanger, the hens were 29 weeks old and, in the one without a heat exchanger, they were 47 weeks. Albeit that the houses do not operate in parallel, they can be compared with certain reservations for age differences.

Preliminary results

Jens Skovgaard takes the view that the air is better and there are fewer examples of feather picking in the house with the heat exchanger, just like the bedding is dry and loose whereas the bedding in the other house without a heat exchanger is lumpy and crusty.

The heat exchanger means that the temperature in the house is stable day and night which also reduces stress levels the house. Jens Skovgaard said that there were significant differences in the ammonia levels in the two houses. Ammonia levels in the air may be up to 70 % lower and, even on a beautiful spring day, ammonia levels in the house with the heat exchanger were more than 20 % lower than in the house with no heat exchanger, 19 ppm compared to 25 ppm. CO₂ levels were also much lower at 1,600 ppm in the house with heat exchanger and 1,750 in the house without one.

In the house with the heat exchanger, the bedding was dry and loose which encourages dust bathing and reduces stress.

Based on preliminary figures, Jens Skovgaard also finds that feed consumption in the house with the heat exchanger is 20 g less per hen per day with no difference in the laying of eggs.

Based on the preliminary figures, the savings in feed consumption alone will mean a payback time of 2-3 years.



The two identical houses at Jens Skovgaard's farm



The 29-week-old hens and the bedding in the house with the heat exchanger



The 29-week-old hens in the house with the heat exchanger



The dry and loose bedding in the house with the heat exchanger



Hens dust-bathes in the house with the heat exchanger



The air from the heat exchanger is blown into the middle of the house and distributed through a series of ventilators





Jesper Toft Jensen of Rokkedahl Energi and Jens Skovgaard at the heat exchanger

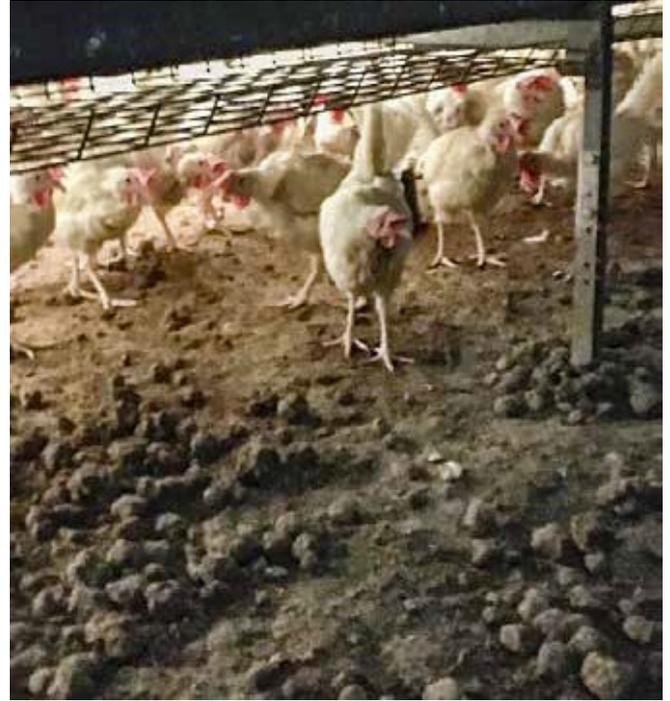


A selection of relevant climate data from the house without a heat exchanger - note the levels of CO₂ and NH₃



The heat exchanger from Agro Supply outside the hen house at Jens Skovgaard's farm

The bedding in the house with the 49-week-old hens and no heat exchanger was crusty and lumpy



Cracked eggs

On the same day, John Nielsen of Tekvice tested artificial eggs, used to identify the areas where eggs are subjected to such serious physical impacts that the shells cracks.



The artificial eggs were placed in different areas of the egg conveyor or in the nest and then all G-forces were registered all the way to and through the packing machine which aided a technician in fine-tuning the system to reduce the number of cracked eggs.

Final results

It will be exciting to follow the results of Jens Skovgaard's productions and see if the use of heat exchangers spreads throughout Danish egg production.

If the final results show that a heat exchanger reduces feed consumption and, thus, the climate impact and increases animal welfare due to reduced ammonia levels in the house as well as reduce feather picking and stress levels, this will be something every producer should consider.

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The eggs on the egg conveyor