

Innovation Project

Food and Agriculture Cluster



Moorgut Kartzfehn: Development of a Climate-Adapted Ventilation and Feeding Concept for Turkey Farming

The farm Moorgut Kartzfehn in Bösel/Kartzfehn is the largest independent turkey-raising operation in Europe, and at the same time has Germany's largest research site for turkeys. Since turkeys, like all birds, cannot sweat, the predicted long and hot summer days are a risk, especially for the final stage of turkey-farming. In order to avoid heat stress for the animals, various ventilation and feeding concepts have been developed in the context of **nordwest2050**.



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The Need for Climate Adaptation

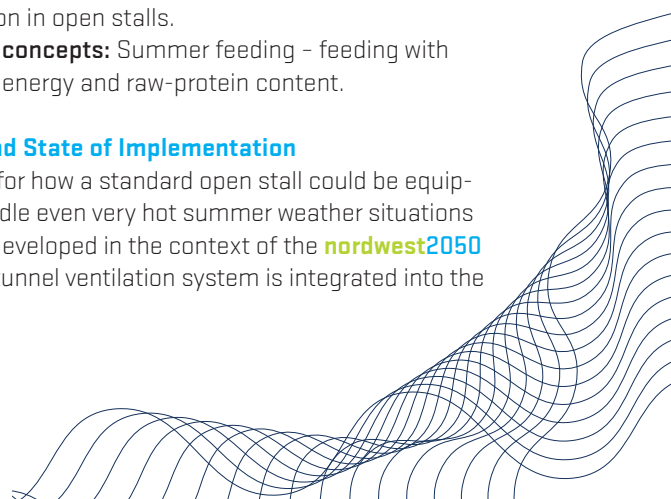
nordwest2050's vulnerability analysis for the pork and poultry industries have shown that due to the climate-related temperature rise, an increase in cooling requirements will result, since the well-being and productivity capacity of the animals is dependent on the temperature. Weight increase in fattening poultry, as well as stall sanitation and the resulting risk of epidemics, can be negatively affected by increased temperatures. This will result in increased costs, and at the same time a growing lack of available land for raising feed.

Implemented Measures

- **Ventilation concepts:** Summer ventilation - tunnel ventilation in open stalls.
- **Feeding concepts:** Summer feeding - feeding with reduced energy and raw-protein content.

Method and State of Implementation

A method for how a standard open stall could be equipped to handle even very hot summer weather situations has been developed in the context of the **nordwest2050** project. A tunnel ventilation system is integrated into the



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existing building structure. In this way, the stall building has an innovative large-scale ventilation system which can pass the air out of the stall by way of the gable in summer, and thus increase the speed of air movement directly at the body of the animal. This has a cooling effect.

Moreover, in various test series, the feeding of the turkeys has been adapted to the increasing impact of heat by the development of a special summer feed. For this purpose, various recipes with various energy and protein contents have been conceived, and the health and output of the male turkeys in the stall supervised in detail.

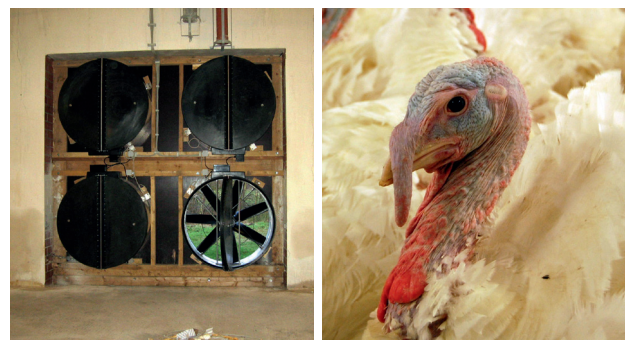
Male turkeys are generally fed according to a standard program during the 21-week fattening period. In the practical partner project, the energy and raw-protein contents were reduced during the heat period in order to relieve the animals. When the ambient temperature dropped, the energy and raw-protein contents were again raised. In comparison, a second group was fed with the standard program. The weight of the test animals remained lower than that of the standard group, as intended. However, it was possible to achieve the same final weight for the test animals as for the standard animals, once the feed was again readjusted. This permitted relief for the turkeys, with no far-reaching economic disadvantages.

Results and Transferability

By means of the test series with special summer ventilation and feeding, it was possible even during extreme heat waves to reduce the stress on the turkeys.

In the test processes, it was shown that the tunnel ventilation, when correctly maintained, reduced the mortality rate of the turkeys. However, if the air speed was increased too much, a draft was created at the animals bodies, which made the turkeys susceptible to respiratory diseases. Comparative data-surveying cooperation with the turkey-farm associations showed that with correct application of the spray cooling facilities, the mortality rates during heat waves could be significantly reduced.

While restructuring measures were necessary for the summer cooling operations (e.g. tunnel ventilation or spray cooling), summer feeding concepts can be applied



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directly to the animals being fattened. It should be taken into account that the feeding with lower-energy summer feed can result in lower final weights. This disadvantage can be compensated at the end of the feeding process by lower mortality rates during heat waves and by lower feeding costs.

nordwest2050 is one of a total of seven projects funded by the Federal Ministry of Education and Research (BMBF) in the context of the KLIMZUG Program (Klimawandel in Regionen zukunftsfähig gestalten - Creating Climate Change-Ready Regions). In 2012 **nordwest2050** was awarded as an official project of the United Nations' World Decade on Education for Sustainable Development. The goal of the adaptation research is to develop strategies and measures by means of which regions and industries can be better prepared for life and business under the conditions of climate change. This is on the one hand designed to strengthen future competitiveness, and on the other to promote the development and use of new technologies and procedures for adaptation to climate change.

