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# Adaptation potential of naturally ventilated barns to high temperature extremes: The OptiBarn project

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Climate change interferes with various aspects of the socio-economic system. One important aspect is its influence on animal husbandry, especially dairy faming. Dairy cows are usually kept in naturally ventilated barns (NVBs) which are particular vulnerable to extreme events due to their low adaptation capabilities. An effective adaptation to high outdoor temperatures for example, is only possible under certain wind and humidity conditions. High temperature extremes are expected to increase in number and strength under climate change. To assess the impact of this change on NVBs and dairy cows also the changes in wind and humidity needs to be considered. Hence we need to consider the multivariate structure of future temperature extremes.

The OptiBarn project aims to develop sustainable adaptation strategies for dairy housings under climate change for Europe, by considering the multivariate structure of high temperature extremes. In a first step we identify various multivariate high temperature extremes for three core regions in Europe. With respect to dairy cows in NVBs we will focus on the wind and humidity field during high temperature events. In a second step we will use the CORDEX-EUR-11 ensemble to evaluate the capability of the RCMs to model such events and assess their future change potential. By transferring the outdoor conditions to indoor climate and animal wellbeing the results of this assessment can be used to develop technical, architectural and animal specific adaptation strategies for high temperature extremes.