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EPAnHaus project: assessment of the energy use for climate control into animal houses

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Environmental conditions of livestock housing can affect the quality and the costs of the animal production. Many environmental parameters (e.g. indoor air temperature, indoor relative humidity) must be set up and controlled to maintain animal welfare, to prevent the incidence of certain diseases, and to raise productive performance of the animals. This control is generally carried out by mechanical system that entails an energy consumption for heating, cooling and ventilation, that for some livestock housing (e.g. pig and broiler buildings) may be an important part of the total running costs of the structure. Those energy consumptions and costs may be reduced by improving the thermos-physical features of the building envelope or increasing the efficiency of the used mechanical systems. To understand the effectiveness of each action regarding the envelope and/or the mechanical system, it is necessary to assess the performance of the different livestock houses.

While several investigations have been carried out for the assessment, certification and improvement of the energy performance of human-related buildings (e.g. residential and retail), in the livestock sector there was not a similar attention. For this reason, the EPAnHaus (Energy Performance of Livestock Houses) project aims at defining an energy certification scheme that considers all the energy uses related to the control of indoor environment: heating, ventilation (both for cooling and Indoor Air Quality) and cooling. This project was developed through three different steps. First, an inventory of the energy use for climate control of the animal houses across Europe was made for determining benchmark values. Then, a calculation method derived from ISO Standards on building energy performance was customized for being applied to the animal production buildings to assess the energy use for climate control. It was applied into different calculation tools (some developed in cooperation with industry). Their outputs were used for defining the energy certification scheme. Finally, measurement campaigns were carried out in some livestock houses for testing and refining the models referring to the different housing types.

The use of the certificate will make available the possibility to know the actual amount of energy consumed for the climate control and information about retrofitting actions (e.g. simple payback period and energy savings).

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