RES4LIVE
ENERGY SMART LIVESTOCK FARMING
TOWARDS ZERO FOSSIL FUEL CONSUMPTION

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AGRICULTURE & INNOVATION

Laying hens' thermal comfort and egg productivity

For homeothermic animals, thermoneutral zone is the range of ambient temperature in which normal metabolism provides enough heat to maintain an essentially constant body temperature. For laying hens this range is between 10°C-25°C and is a prerequisite for attaining maximum productivity in accordance with their genetic potential. Raising hens outside these limits, initiates physiological responses that may negatively affect both performance and egg quality.

Prolonged periods of heat stress are accompanied by reduced feed intake which in turns reduces growth rate of growing pullets and egg production and egg size of laying hens. Since birds cannot sweat, hens are panting at high temperatures in order to reduce their core temperature by evaporative cooling through mouth and the respiratory system. However, this physiological adaptation results in eggs with reduced eggshell strength and thickness and increased percentage of cracked or broken eggs.

On the other hand, when hens are cold stressed, their feed intake increases in order to produce more metabolic heat and compensate with the heat losses from their body. This increase has unfavorable effects on feed utilization for growth, in case of pullets, and for egg production in case of laying hens, leading to increased costs. Moreover, during prolonged periods of cold stress, especially during night hours, small chickens are piling on top of each other, and a high incidence of mortality is usually observed because of suffocation.

Also, the negative effects of extreme temperatures are often combined with inadequate relative humidity and air velocity values. Therefore, in the framework of RES4LIVE, we deem of major importance the use of equipment that can accurately adjust microclimate conditions - heat pumps and smart control systems - in a laying hens house in order to attain maximum productivity with respect to animal welfare and egg quality.

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