



Heat stress intensifies the benefit of XTRACT 6930 on broiler performance.

INTRODUCTION AND OBJECTIVES

Heat stress is expressed as distress and discomfort by animals because the environment temperature is above the zone of comfort. In response to these conditions, farm animals must optimize heat dissipation (through increasing water consumption and panting) and limit digestive and metabolic processes. At the physiological level, blood flow is reoriented from the gut to the peripheral sites of the animal's body, while digestion, absorption, cell metabolism and immune function are reduced, and oxidative stress and lipid oxidation are increased.

The impairment of gut integrity and functionality combined with altered antioxidant capacity led to increased intestinal permeability, higher maintenance requirements and a drop performance in farm animals. In broilers, phytochemical compounds such as capsaicin, carvacrol and cinnamaldehyde have shown validated effect on digestion and oxidative status that resulted in positive effects on gut integrity and energy required for maintenance. Therefore, the objective of this trial was to evaluate the ability of XTRACT 6930 to limit performance reduction of

broilers submitted to heat stress conditions. These results show that XTRACT 6930 does not alter the physiological adaptation to heat stress of broilers. However, XTRACT 6930 improved body weight gain by 38.1% and reduced feed conversion ratio by 20.7% ($P \leq 0.1$). Based on previous research, these results may indicate the effects of XTRACT 6930 on digestion and oxidative status can support the gut function, nutrient utilization and feed efficiency leading to greater body weight gain during heat stress.

MATERIALS AND METHODS

Experimental Design

- Experimental facilities of Harper Adams University, United Kingdom, at Dr. Pirgozliev Laboratory.
- A total of 36 male Ross 308 broiler chickens were reared from hatch to 20 days of age in a common floor pen in thermo-neutral conditions and fed a standard starter feed void of coccidiostat, enzyme of similar additive.
- On day 21, broilers were randomly allocated according to body weight to 12 pens and 3 treatments (4 replications/treatment; 3 birds per replication).

Measurements

Feed intake, water intake, weight gain, feed conversion ratio (FCR).

Statistical analysis

Analysis of variance.



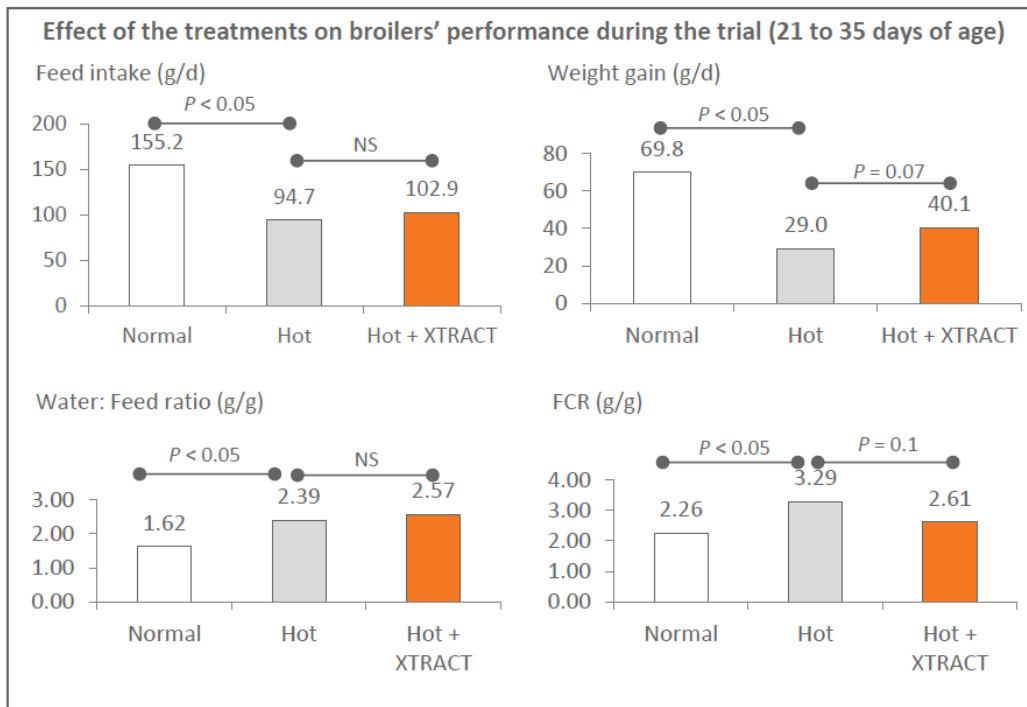
Results

The increase on environmental temperature from 21°C to 35°C reduced feed intake by 10.4% and weight gain by 58.5%, and increased water to feed and feed conversion ratios by respectively 47.5% and 45.6% ($P < 0.05$; see figure). These figures are fully in line with the effects of heat stress on broilers' performance reported in the literature and on farms that validate the experimental design applied.



Conclusion

In heat stressed broilers, XTRACT 6930 did not affect feed intake and water to feed ratio ($P > 0.3$). The reduction of intake is part of broilers' physiological adaptation to heat stress, as it limits excessive heat production generated by nutrients' metabolism. In parallel, water intake was not affected by heat stress, which resulted in an increased water:feed ratio in broilers submitted to this environmental challenge. This is in line with previous reports (Syafwan et al. 2012) that any increase in water intake would be limited by an important drop in feed consumption. These results show that XTRACT 6930 does not contradict this physiological adaptation to heat stress. However, XTRACT 6930 improved body weight gain by 38.1% and reduced feed conversion ratio by 20.7% ($P \leq 0.1$). These results may indicate the effects of XTRACT 6930 on digestion and oxidative status may be translated into support of the gut function, nutrient utilization and feed efficiency leading to greater body weight gain. In case of heat stress conditions, XTRACT 6930 may improve broilers' performance through enhanced feed efficiency and weight gain.



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