

The effects of different feed compositions on reducing the negative effects of heat stress in broilers on performance and meat quality

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Introduction

Heat stress can adversely affect broiler performance and meat quality. However, dietary composition could potentially mitigate those negative effects. Increasing dietary fat can stimulate nutrient absorption and provide extra metabolizable energy (ME).

On the other hand, proteins have a relatively high dietary heat increment. Consequently, a reduction could be beneficial during heat stress.

Therefore, we studied the effects of different feed compositions on broiler performance and meat quality during heat stress.

Material & methods

1920 male, Ross 308 broilers were divided in 8 treatments (8 replicates/treatment, 30 birds/replicate) according to a 4 x 2 factorial design – 4 dietary treatments and 2 climate conditions

Thermoneutral				Heat stress			
Control	LCP	LCPHCF	HCF	Control	LCP	LCPHCF	HCF

Heat stress (HS): 32°C ± 2°C and RH 55–65% for 6h daily, d29-43

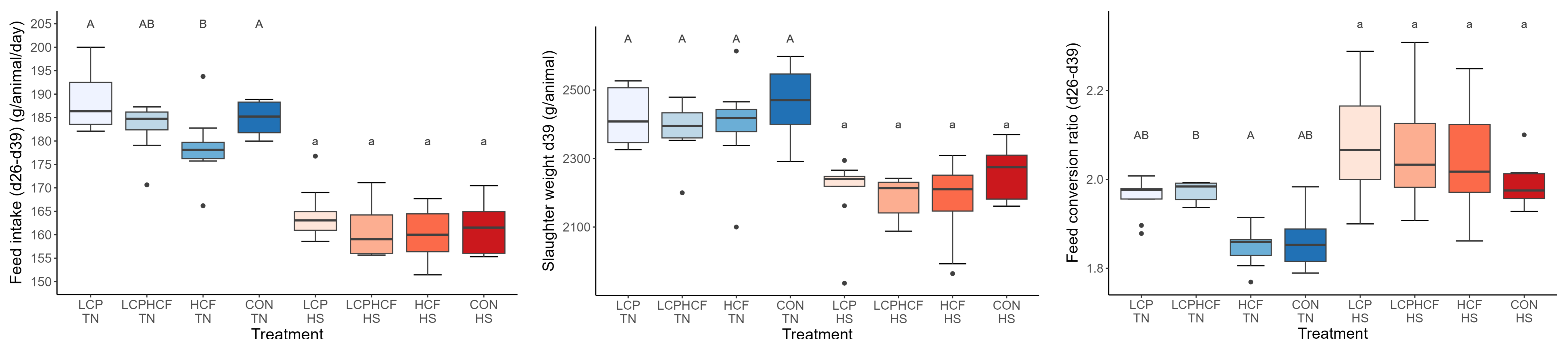
4 mash finisher diets (d26-39):

	ME (MJ/kg)	CP (%)	CF (%)
Control	12.2	18.2	8.0
LCP	12.2	17.3	7.8
LCPHCF	12.6	17.3	9.7
HCF	12.5	18.2	9.6

LCP = low crude protein (CP); LCPHCF = low crude protein and high crude fat (CF); HCF = high crude fat

Results

The dietary treatments did not improve broiler performance or meat quality (thawing- and cooking loss) during heat stress (HS). However, we observed significant negative effects on broiler performance due to HS. Additionally, some diets negatively affected performance during thermoneutral (TN) conditions in the finisher phase: the animals in the LCPHCF treatment were observed to have significantly less growth than the control (CON) group. Animals with a HCF diet had a significantly lower feed intake in the TN group. Furthermore, broilers in HS had significantly higher slaughter yield, upper thigh%, drumstick% and breast muscle%.



The figures illustrate the effect of the dietary treatments during thermoneutral (TN) or heat stress (HS) conditions on feed intake, slaughter weight and feed conversion ratio during the finisher phase. Values for a specific parameter sharing a letter are not significantly different ($p > 0.05$). Capital letters were used for the thermoneutral group and lower case letters for the heat stress group. Additionally, this indicates that both groups are significantly different from each other.

Conclusion

- Different feed compositions did not significantly improve broilers' performance during heat stress
- HS negatively affects broiler performance
- HS did not affect thawing and cooking loss, but increased slaughter- and parts yield
- Generally lower feed intake during heat stress could interfere with the effect of dietary treatments
- LCPHCF diet negatively affected growth in TN conditions
- The animals with a HCF diet had a significantly lower feed intake in TN conditions

