

Production Performance Potential of PHYTOCEE® in Poultry : Impact on the Meat Quality

OBJECTIVE

To evaluate the effect of PHYTOCEE® on the production performance parameters on the Meat Quality & Serum Metabolomics in Ross 308 Broiler Chickens.

MATERIALS AND METHODS

The trial was conducted in the Ross 308 broiler chickens, which were randomly assigned for 4 groups viz. A (CONTROL) – Basal Diet (BD), B (PHYTOCEE® 1) - BD + 0.3 kg/ton, C (PHYTOCEE® 2) - BD + 1 kg/ton, D (PHYTOCEE® 3) - BD + 2 kg/ton with phases of Starter (0-10 d) to Grower (11-30 d) & Finisher (31-end). Effect of PHYTOCEE® on Production Performance Parameters as Body Weight, g. Daily Weight Gain, g. Feed Intake, g. Feed Conversion Ratio. Mortality, %. Carcass Characteristics. Meat Quality Parameters. Foot Pad Dermatitis. Serum Metabolomics were assessed. Duration of the experimentation for 42 days & the number of birds housed were 1,800 1-day-old male Ross 308 (9 replicates/group of 50 birds each).

RESULTS

Effect of PHYTOCEE® on production performance parameters on the Meat Quality & Serum Metabolomics in Ross 308 Broiler Chickens

Meat Quality - Introduction:

► Any stressors (ante-mortem stress, heat stress at the end of the growth or pre-slaughter phase and methods of stunning in the slaughterhouse) before and during slaughter will impair the meat quality.

The meat abnormalities caused by stress are:-

► pale, soft, exudative (PSE) is associated with stress during a short time, just before slaughter

► dark, firm, dry (DFD) is closely linked to long-term stress before slaughter

Meat Quality Traits	G1-Control	G2-PHY_L (0.3kg/ton)	G3-PHY_M (1kg/ton)	G4-PHY_H (2kg/ton)	SE	p-value
n	12	12	12	12	-	-
Fillet weight (g)	210.2	221.2	195.5	215	4.32	0.187
pH	5.67	5.71	5.64	5.78	0.03	0.194
Lightness (L*)	57.9 ^a	55.5 ^{ab}	55.9 ^{ab}	55.0 ^b	0.36	0.026
Redness (a*)	2.03 ^a	1.68 ^{ab}	2.04 ^a	1.49 ^b	0.09	0.05
Yellowness (b*)	3.92	2.95	3.63	3.46	0.16	0.164
Drip loss (%)	1.8	1.53	1.63	1.38	0.07	0.172
Cooking loss (%)	17.2 ^a	17.4 ^a	16.0 ^{ab}	14.8 ^b	0.34	0.013
TBARS (mg MDA/kg of meat)	3.89	4.25	3.9	3.85	0.07	0.11
Carbonyl (nmol/mg of protein)	2.6	2.29	2.06	1.96	0.1	0.127

1. pH, lightness, redness, yellowness, drip loss, cooking loss and carbonyl level were improved in Phytocee supplemented group as compared to control group

2. Broiler breast (*Pectoralis major*): Normal (pH 5.8 to 6.2) & PSE-like (pH 5.4 to 5.7)

3. Broiler breast (*Pectoralis major*): Normal (*L** 45 to 55) & PSE-like (*L** 55 to 65)

Beta-alanine Functional Annotation:

▪ The higher serum level of beta-alanine (H&M) could be associated with an increased synthesis of muscle carnosine, which play a crucial role in alleviating the oxidative-degenerative conditions frequently observed in the breast muscle of fast-growing broiler chickens.

Trans-4 hydroxy-L-proline Functional Annotation:

▪ Trans-4-Hydroxy-L-proline, also known as 4-Hydroxyproline, is a major component of the protein collagen and plays key roles in collagen stability.

▪ The higher levels of Trans-4-Hydroxy-L-proline in the serum of Phyt-H birds might be associated with enhanced adaptative mechanism for defense and survival.

Formate Functional Annotation:

Formate is an intermediate metabolite in one-carbon (1C) metabolism.

* Interestingly, a study reported a defective respiration and one-carbon metabolism contribute to impaired naïve T cell activation in aged mice. This evidence suggests that formate supplementation could rescue the decline of the adaptive immune system during aging.

* The higher levels of formate in the serum of Phyt-H birds can be associated with enhancement of adaptative immune system in birds.

CONCLUSIONS

Results from the present study confirms that all the groups were performed similar in terms of productive performance, carcass traits, and foot pad dermatitis. However, meat quality parameters viz. meat lightness, redness and yellowness were significantly improved in PHYTOCEE® at high dose (2 Kg/ton) supplemented group. Furthermore, cooking loss, drip loss & protein carbonyl levels were significantly reduced following supplementation of PHYTOCEE® at 2 Kg/ton. Hence PHYTOCEE® at 2 kg can be used improve the meat quality parameters of the processed meat.

OUTCOME

Overall, PHYTOCEE® could be used as a natural & effective supplement to improve the production performance parameters on the Meat Quality in Ross 308 Broiler Chickens.