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Epigenetics for heat tolerance

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SYMPOSIUM



POULTRY PRODUCTION UNDER HOT
AND HUMID CLIMATE CONDITIONS

LOME FROM 12TH TO 16TH JUNE 2017

PROGRAM
AND
SUMMARIES OF THE
COMMUNICATIONS

métis ont été distribués aux éleveurs en milieu rural pour servir aux croisements d'amélioration des performances de croissance de la poule locale.

Mots clés : poule locale, poulet de chair, croisement, métis, performance de croissance, Togo.

Abstract

The local hen is highly appreciated by the African populations. Its slow growth and low productivity reduce the profitability of its production, which causes the breeders to make anarchic crosses with exotic breeds. In order to improve the performance of this pool by providing improved broodstocks while maintaining our poultry genetic resources, breeding crossovers have been made to produce Métis that will be exploited in rural areas. The COBB strain chicks and local chicks were raised in the same conditions and were crossed. The metis obtained were raised in a henhouse with shelter and a range where they are in contact with soil, grass and sunlight. They were fed with local raw materials. Simple prophylaxis was adopted. Live weight and food consumption were measured and compared with those of local breeds. The results show that the mean live weight of the metis reached $2603.27 \pm 17.45\text{g}$ while that of the local breed was $1204.03 \pm 42.52\text{g}$ at six months of age. The total amount consumed was 8106g and 7441g respectively for metis and the local breed. The corresponding consumption index was 3.15 and 6.48 respectively. One hundred and twenty Métis were distributed to rural ranchers to serve as crossbreeds for improving the growth performance of the local hen.

Key words: local chicken, broiler chicken, crossing, metis, growth performance, Togo.

R9- EPIGENETICS FOR HEAT TOLERANCE

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Broiler chickens selected on performance traits are particularly sensitive to heat. This is likely due to an imbalance between their muscle mass and heat production on the one hand, and their ability to lose heat on the other hand. During chronic and moderate heat exposure, meat-type chickens cope with high ambient temperature by reducing feed intake and growth. Nevertheless, hot spells, predicted to become more recurrent with climate change, can increase morbidity and even be lethal. In order to alleviate heat stress in the long term, research has recently focused on early acclimation strategies based on epigenetic mechanisms.

Epigenetic alterations refer to mitotically stable but reversible changes in gene expression (without modifications in DNA nucleotide sequence) that could lead to phenotype modification, and possibly be transmitted to the progeny. These alterations include DNA methylation, histone modifications and noncoding RNAs. It is

nowadays known that early environmental exposure to high temperature is able to change gene expression in the long term through epigenome alterations. For instance, in *Drosophila melanogaster*, the exposure to a heat shock during embryogenesis leads to long-lasting epigenetic reprogramming through chromatin structure alterations.

Aimed at stimulating long-term thermotolerance, the thermal manipulations of embryos or chicks are methods based on the fine tuning of egg incubation or chick starting conditions. These methods take into account the level and duration of increases in temperature and relative humidity during critical periods of the bird development. The physiological basis of these methods is the induction of metabolic mechanisms and changes in gene expression that control body temperature in the long term, or a higher number of differentially expressed genes when animals are heat-challenged in later life. Recent results point to epigenetic modifications in chicken or quail brain and muscle tissues following early thermal treatments, in some cases associated with modifications in gene expression.

R10- EFFETS ANTHELMINTHIQUES DES GRAINES DE PAPAYE (*Carica papaya*) SUR LES PARASITES GASTRO-INTESTINAUX DES COQUELETS.

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RESUME

Les maladies parasitaires constituent un facteur limitant pour la production avicole. Le traitement de ces pathologies par des produits chimiques laisse des résidus dans les œufs et la viande. Des alternatives comme la valorisation des ressources végétales locales sont de plus en plus étudiées. La présente étude a été réalisée afin d'évaluer l'effet anthelminthique de l'incorporation des graines de papaye *Carica papaya* dans l'aliment sur les parasitoses gastro-intestinales des coquelets. Pour ce faire deux cent poussins mâles d'un jour « type ponte » de la souche Isa Brown ont été élevés sur litière pendant 30 jours. Un premier examen coproscopique réalisé à ce stade a révélé la présence des œufs d'helminthes (*Trichostrongylus* sp., *Heterakis* sp., *Ascaridia* sp. et *Syngamus* sp.). Les coquelets ont ensuite été répartis en cinq lots de 20 sujets chacun : les lots L_{0,5}, L_{1,0}, L_{2,0} ont reçu respectivement 0.5, 1 et de 2% de poudre de graines de papaye dans l'aliment ; L₀ (témoin) et L_{CP} (lot recevant 5g de citrate de pipérazine par litre d'eau pendant 1jour). La consommation alimentaire, l'évolution du poids vif, le gain moyen quotidien et l'indice de consommation ont été déterminés, ainsi que la charge parasitaire et le taux de réduction des OPG.

Les résultats ont montré une réduction significative de la charge parasitaire dans les lots ayant reçu les graines de papaye. Ces graines ont également amélioré la conversion alimentaire et l'évolution pondérale.

Les graines de papaye ont réduit la charge parasitaire et ont amélioré les performances zootechniques des coquelets.

Mots-clés : Poudres de graines de papaye, Helminthose, OPG et Coquelet