IMPROVING HEAT TOLERANCE OF BROILER CHICKS TO HEAT STRESS CONDITIONS

By

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B.Sc. Agric. Sc. (Poultry Production), Zagazig University, 2004

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ABSTRACT

Ahmed Gouda Abd-Allah Abd-Allah: Improving Heat Tolerance of Broiler Chicks to Heat Stress Conditions. Unpublished M.Sc. Thesis, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, 2010.

The beneficial effect of raising ambient temperature at early Age, some feeding programs and their combination in improving productivity of broiler chicks under summer season stress conditions was examined. A total of 200 one day old commercial broiler chicks were used in the present study. They were divided in two groups of 100 birds each. The first group was subjected to 38°C ±1° for 24h at d-5 post-hatching **(heat conditioning group, H.C)** while the second group was kept as a control **(non heat conditioning group**, **N.H.C)** .At d-7 birds were individually weighed, wing banded and then divided into four sub groups with approximately similar initial body weight . The sup groups were qualitative (70 %) feed restriction **(FR)** on d 7, 8 and 9 post-hatching, feed withdrawal **(FWD)** for 24h on d 9 and supplemental vitamin C **(Vit C)** group from 21 to 42 DOA and then the control group**.**

Chicks of all treatments were kept under similar managerial, hygienic and environmental conditions and vaccinated against common diseases.

Results indicate that average body weight, weight gain, feed intake and feed conversion ratio were significantly affected at 21 and 42 DOA. Respiration rate and body temperature were significantly reduced at 21 and 42 DOA. A varying magnitude in the relative weights of some internal organs, carcass, thigh, breast, and abdominal fat, heart, gizzard and LIVER were recorded. Thyroidal hormones (T_3,

T_4) and their ratio T_3/ T_4 showed considerable changes related to age of broiler chicks.

Moreover, plasma total protein, albumin, globulin and A/ G ratio were significantly changed by different treatments. Besides, blood hemoglobin concentration, haematocrit (%) and H / L ratio leukocytes were significantly affected by treatments. Also, total antibody against to Newcastle disease Virus **NDV** in response to treatments was significantly affected 20 days post Vaccination. Heat shock protein 70 **(HSP70),** was also changed by treatments

It is concluded from the present results that subjecting broiler chickens to early age heat conditioning at 5 DOA or using some feeding programs (FR, FWD and Vit C) during hot environmental temperatures could improve the productivity of broiler chicks under summer stress conditions.

Key words: Broiler chicks, heat conditioning, feed restriction, feed withdrawal, vitamin C, blood parameters, performance.

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LIST OF ABBREVIATIONS

AA	Ascorbic acid
A.F	abdominal fat
A/ G	Albumin to globulin
BC	blood capillaries
BV	blood vessels
BW	Body weight
BWG	Body weight gain
ºC	Dgree of centenary
Cd	Cadmium
CF	Crude Fiber
CS	Corticosterone
DOA	Day of age
EE	Economical Efficiency
FCR	Feed conversion ratio
Fig	Figure
FR	feed restriction
FWD	feed withdrawal
g	gram
GLM	General Linear Models
h	hours
Hb	Hemoglobin
HI	Homagglutination inhibition
H/ L	Heterophils to lymphocytes
HS	Heat Shock
HSC	Heat Shock constitutive
HSF	Heat Shock factor
HSP	Heat Shock proteins
hse	heat shock element

Ht	Hematocrit
IBD	Infectious bursal disease
KD	Kilo dalton
Kg	Kilo gram
ME	Metabolizable energy
mg	mille gram
min	minute
NDV	Newcastle disease Virus
Ng	nanogram
NHS	Non heat chock
NRC	National Research Council
ppm	part per million
RH	Relative humidity
RIA	Radio- immune- assay
RR	Respiration rate
SOD	Superoxide dismutase
SRBC´S	Sheep Red Blood Cells
T3	Triiodothyronine
T4	Thyroxine
Tb	Body temperature
VitC	vitamin C- supplied diet
Vit	Vitamin
Vs	Versus
Wk	Week
WOA	Week of age
WP	white pulp
%	Percent