# GENETIC VARIATIONS IN ASCITES OF COMMERCIAL BROILER CHICKEN STRAINS

By

**AMER MAKRAM ALI SAWY**

B.Sc. Agric. Sc. (Poultry Production), Cairo University (Fayoum Branch), 2005

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**Department of Poultry Production**
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## Approval Sheet

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## ABSTRACT

**Amer Makram Ali: Genetic Variations in Ascites of Commercial Broiler Chicken Strains. Unpublished M.Sc. Thesis, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, 2010.**

This experiment was carried out at poultry breeding farm, Poultry Production Department, Faculty of Agriculture, Ain shams University. The objective of this study is to investigate the hematological and morphological changes associated with Ascites syndrome in broiler chicks. Broiler chicks from four strains (Arbor Acres, Avian, Cobb and Hubbard) were reared under the same environmental, managerial and hygienic conditions from 1 to 42 day of age. The chicks received a commercial diets (starter, grower and finisher) *ad libitum*. At 39 days of age, 10 chicks from each strain were randomly chosen for LPS injection. Body weight, ascites mortality, arterial pressure index (API=right ventricular/total ventricular weight ratio), hematocrit values and proportional lung weight (lung weight/body weight*100) were determined. The present result showed that the hematocrit level was significantly reduced at 48 hr post LPS injection. Also, LPS-induced hypocholestrolmia at 48 hr post LPS injection in all strains. The arterial pressure index of injected-group had significantly higher than that of control-group. Lung and liver sizes as a percentage of body weight in injected-group becomes higher than in control-group. With respect to strain effect, The Cobb broiler chicks had significantly higher hematocrit level, plasma total protein, globulin and cholesterol concentrations compared to other strains.



**Key Words;**

broiler chicks, Lipopolysaccharide, hematological traits, arterial pressure index , Pulmonary Hypertension , Right Ventricular

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## LIST OF ABBREVIATION

| ABBREVIATION | Mean |
|---|---|
| A/G | Albumin to Globulin |
| AA | Arbor Acres |
| AV | Avian |
| BW | Body Weight |
| CMI | Cell-mediated immunity |
| COB | Cobb |
| F.C | Feed consumption |
| F.C.R | Feed consumption rate |
| F.C. /∆wt | Feed conversion ratio |
| ∆WT | Weight gain |
| GLM | General Linear Model |
| GR | Growth Rate |
| H | Heterophils |
| H/L | Heterophils/ Lymphocytes ratio |
| HCT | Hematocrit |
| HB | Hubbard |
| LV | Left Ventricular |
| LV% | Left ventricular as a percentage of body weight |
| LV/TV | Left Ventricular/ Total Ventricular |
| LPS | Lipopolysaccharide |
| L | Lymphocytes |
| MER | Mercaptoethanol-Resisstant |
| PAP | Pulmonary Arterial Pressure |
| PAH | Pulmonary Arterial Hypertension |
| PCV/Hematocrit | Packed Cell Volume |
| PHA-P | Phytohemagglutinin-P |
| PHS | Pulmonary Hypertension Syndrome |
| RBC's | Red Blood Cells count |

| | |
|---|---|
| RV | Right Ventricular |
| RV% | Right ventricular as a percentage of body weight |
| RV/TV | Right Ventricle to the total ventricular weight |
| RVF | Right Ventricular Failure |
| RVH | Right Ventricular Hypertrophy |
| SRBC | Sheep red blood cells |
| SAS | Statistical analyses |
| SDS | Sudden Death Syndrome |
| TV | Total Ventricular |
| TV% | Total ventricular as a percentage of body weight |
| WBC's | White Blood Cells |

# INTRODUCTION

In poultry breeding, traits like growth rate and feed efficiency are of great interest because they have a major economic effect. Therefore, breeding programs aim to select birds with a higher growth rate and/or a higher feed efficiency. However, it is suggested that the improvement in growth rate or feed efficiency associated with same undesirable correlated responses such as increased incidence of defects in heart and lung functions and reduce adaptability to environmental conditions. This is concider with the resource allocation theory which states that when a population is genetically driven towards higher production, and thus allocates a higher proportion of resources to these traits, fewer resources remain to respond adequately to other demands, such as coping with unexpected stress factors. The selection of production traits in broilers has been accompanied by negative consequences on different aspects of the birds' physiology. These negative consequences are mainly due to the tremendous increase in body mass without parallel improvements in the internal organs, vascular system, and skeleton to support such a rapidly growing and large body mass. The negative characteristics, such as fatness, ascites, leg deformity, and reproduction problems, have a large impact on animal welfare and on the economics of poultry production. Ascites in broilers is an accumulation of liquid in the abdominal cavity resulting in mortality and condemnations. Originally detected several decades ago at high altitudes, this condition is now also found at low altitudes, where broilers are hypoxic during periods of rapid growth. Post-mortem examination of ascetic birds reveals straw-colored fluid in the abdominal cavities, enlarged hearts, pulmonary congestion, and abnormal livers and spleens.