



**EFFECT OF USING DIFFERENT DIETARY LEVELS OF  
ARGININE AMINO ACID ON THE PERFORMANCE AND  
IMMUNITY OF GROWING RABBITS**

**By**

**Ahmed Mohamed Ahmed Dahy**

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**Name of Candidate: Ahmed Mohamed Ahmed Dahy**

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**Supervisors: Prof. Dr./ Mahmoud Saad M. Abousekken**

**Prof. Dr./ Mohammed Ahmed El-Sherbiny**

**Dr./ Hosny Elsayed Ahmed Abo-Eid**

**Department: Sustainable Development of the Environment and Management of its Projects**

**Branch: Agriculture Science**

**Approval: / /**

### **Abstract**

The study was conducted to determine the effect of the use of different levels of arginine amino acid on growth performance, immunity, some biochemical parameters, digestibility, carcass traits and economic efficiency of growing WNZ rabbits. Forty growing White New Zealand (WNZ) rabbits of both sexes (males and females), aged 5 weeks with an average initial weight of  $739.75 \pm 87.55$  g. The animals were divided into 5 groups. Each group has 4 replicates. All animals were individually housed in galvanized wire cages and kept under the same managerial conditions. Formulated diets of 17% crude protein (CP) were used. The experimental groups were arranged as the following: group 1:(T<sub>1</sub>) (commercial or control diet) contain the requirements of arginine according to (NRC, 1977) (0.6g/ kg diet) - (basal diet) ; group 2:(T<sub>2</sub>) addition of arginine by 0.2g/kg diet to the basal diet (0.8g/kg diet ) ; group 3:(T<sub>3</sub>) addition of arginine by 0.4g/kg diet to the basal diet (1.0g/kg diet) ;group 4:(T<sub>4</sub>) addition of arginine by 0.6g/kg diet to the basal diet (1.2g/kg diet ) and group 5:(T<sub>5</sub>) addition of arginine by 0.8g/kg diet to the basal diet (1.4g/kg diet ). The criteria that measured and calculated were growth performance; immune response; caecum activity; digestibility; nitrogen balance (NB);blood parameters; carcass traits and economic efficiency.

The final body weight of rabbit fed T<sub>3</sub> was insignificantly higher (2500.0g) than the other groups T<sub>1</sub>, T<sub>2</sub>, T<sub>4</sub> and T<sub>5</sub> being (2280.0; 2487.50; 2446.88 and 2316.43g, respectively.). No significant differences observed in final body weight gain between control and experimental groups. T<sub>1</sub> group significantly ( $p < 0.05$ ) recorded the lowest total feed intake (5475g). No cleared effect for dietary arginine on Feed conversion ratio (FCR). The highest value of Mean of total performance index (PI) was insignificantly ( $p > 0.05$ ) recorded for T<sub>4</sub> and T<sub>3</sub> (55.72 and 54.04%) while, the worst value achieved by the control group (47.44%). No significant differences observed among organic matter (OM) and CP digestibility for T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> compared with control group (T<sub>1</sub>). The highest digestible CP value was significantly ( $P < 0.05$ ) recorded with T<sub>4</sub> group (15.2 g). Control group recorded the highest digestible crude fiber (CF) (5.53g) compared to other experimental groups. A significant increase in nitrogen intake (NI) was observed with group fed 0.8g/kg dietary arginine (T<sub>2</sub>) (3.28g) followed by T<sub>4</sub> (3.26g) while, group fed 1.4g/kg dietary arginine (T<sub>5</sub>) recorded the worst NI compared with control T<sub>1</sub> (3.24). Microbial activity as total *volatile fatty acids* (TVFA's) production in the caecum tended to be higher in caecum content of T<sub>3</sub> and T<sub>4</sub> compared with control and other experimental diets. Rabbits fed diets with supplementation of dietary arginine by 1.2g/kg diet (T<sub>4</sub>) were the best immunity compared with control and other experimental groups. T<sub>5</sub> group had significantly ( $p < 0.05$ ) the lowest abdominal fat% (0.89%) followed by T<sub>4</sub> (1.04%) while, the highest abdominal fat% was recorded with control group (T<sub>1</sub>) (2.17%); T<sub>3</sub> (2.03%) and T<sub>2</sub> (1.94%). **From economical point of view**, these findings indicated that rabbits groups supplemented dietary arginine by 1.2g/kg diet had a positive effects on economic parameters. Further research is required to establish the optimal dose and the best period for their supplementation.

**Keywords:** Arginine; growing rabbits; performance; immune response; economic efficiency.

## LIST OF ABBREVIATIONS

Abbreviation	Description
A/G	Blood albumin / Blood globulin
ADG	Average daily gain
Al	Blood albumin
BV	Biological value
BWG	Body weight gain
CF	Crud fiber
CP	Crude protein
CYC	Crushed yellow corn
D	Day
DM	Dry matter
DR %	Dressing percentage
EE	Ether extract
EEf	Economical efficiency
ESRI	Environmental Studies and Research Institute
FC	Feed cost
FCR	Feed conversion ratio
FI	Feed intake
FLBW	Final live body weight at the end of the experimental period
FN	Fecal nitrogen
GIT	Gastrointestinal tract length
GL	Blood globulin
Glu	blood glucose
GR	Growth rate
H	Hour
HB	Blood hemoglobin
HDL	High density lipoprotein
IW	Initial live body weight
L.E.	Egyptian pounds
LBW	Live body weight

<b>Abbreviation</b>	<b>Description</b>
LBWG	Live body weight gain
MG	Milligram
Mort%	Mortality rate
NB	Nitrogen balance
NFE	Nitrogen free extract
NI	Nitrogen intake
NR	Net revenue
NRC	National Research Council
OM	Organic matter
PI%	Performance index %
REF	Relative economic efficiency
RG	Relative growth
SE	Standard error
TAC	Total antioxidant capacity
TDN	Total digestible nutrients
TFCR	Total feed conversion ratio
TFI	Total feed intake
TG	Tri-glycerides
TL	Total lipids
TP	Total protein
TP	Blood serum total protein
TPI	Total performance index of experimental period
TRT	Treatment
TVFA	Total volatile fatty acids

**Abbreviation****Description**

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UN

Urinary nitrogen

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