EFFECT OF BIOACTIVATEUR «ENZYVEBA ZOO c» ON ZOOTECHNICAL PERFORMANCE AND BIOCHEMICAL PARAMETERS OF BROILER CHICKEN IN ALGERIA

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Abstract. The purpose of this study is to evaluate the impact of the use of a bioactivator on zootechnical performance and biochemical parameters in broilers. A total of 2160 chicks divided into two experimental buildings with 18 replicates. One building treated the experimental batch (E) with the bioacivator at the litter level, and the other not the control batch (T). Our results show a significant decrease in the feed conversion (2.27 for lot E vs. 2.32 for lot T) ($P<0,0005$), as well as a significant reduction ($p<0.001\%$) in the amount of food ingested (5602.65 for lot E vs. 6096.29 for lot (T).The mortality rate has been reduced by about -12% ($p<0.005$).Lipid metabolism has been significantly influenced ($P<0.0005$). The use of ENZYVEBA ZOOC bioactivator has positive effects by improving certain zootechnical and biochemical parameters.

Keywords: **Chicken, Zootechnical performance, litter, Bioactivator, Algieria**

INTRODUCTION

Today, no one can ignore the seriousness and multiplicity of the problems encountered in intensive livestock farming. The failure to control the ambient parameters leads to excessive fermentation, the emission of bad odors and the formation of amoniacal vapor. Imbalances between saprophytic and pathogenic microbism lead to the degradation of zootechnical and sanitary performance. The use of biological treatment of liter on poultry houses is justified by the regular supply of a specific flora that makes it possible to guide microbial development and modify the degradation process of organic matter, (Bouzouaia and Aubert, 2015). Bacterial competition maintained by these inputs leads to a drastic reduction in pathogens by competitive exclusion in litter. The use of bacterial inoculum containing different strains of bacillus or other non-genetically modified microorganisms is capable of producing enzymes that are involved in the degradation process of organic matter (Bouzouaia and Aubert, 2015). ENZYVEBA ZOO C is a set of bacterial microorganisms and non-genetically modified fungi composed mainly of: Pseudemonas, Bacillus, and Streptomyces, capable of producing enzymes that contribute to the degradation of organic matter (Martinonnoti, 2002).

In this context, we have set ourselves the objective of studying in our local conditions the effect of the use of the bioactivator ENZYVEBA ZOOC on zootechnical and biochemical parameters in broilers during in breeding period.

MATERIALS AND METHODS

Animals and food. Two thousand one hundred and sixty (2160) day-old chicks of Arbor Acres strain (mixed sexes), from the same hatchery, are weighed and then divided into 2 experimental groups (n=1080) of homogeneous weight (35,74g ± 0.1g) each with 18 repetitions of 60 subjects (density of 11 hens/m^2) raised separately in two buildings with identical environmental parameters. The two Batches: Control (T) and Experimental (E), are

fed with a standard basic feed adapted to each breeding phase: a starter feed distributed from day 0 to day10 (Metabolizable Energy: 2800 kcal/kg; Crude Proteins: 21%), a growth feed from day 10 to day 42 (Metabolizable Energy: 2900 kcal/kg; Crude Protein: 19%), and a finishing feed from day42 to day49 (Metabolizable Energy: 2930 kcal/kg; Crude Protein: 17%). The litter was treated by the bioactivator 48 hours before the placement of the 3- 4 ml/m2 ,on the ground, and the internal surfaces, in the starter phase 2ml/ m2 ,on the growth /day, and in the finishing phase is 4 ml/m2.The chicks are vaccinated against Newcastle, Gumboro, and infectious Bronchitis. Water and food are distributed add libitum.

Parameters: Body weight, feed consumption ,conversion feed and mortality rate are determined at the end of each rearing phase (at day10, day42 and day49; collective measurements in each building; for the determination of biochemical parameters, blood samples were taken at 49 days of age from 18 chickens per experimental batch .The blood is centrifuged at 3000 rpm / 15 min. The sera are stored at -20_0 C until analysis to determine the following biochemical parameters: Glycemia, cholesterol, triglycerides, HDLc, LDLc ,total lipids and total proteins. All these assays are carried, and were determined by the auto analyzer using commercially available kits.

Statistical analysis. The results are described by the mean and standard deviations. The homogeneity of the variance between treatments was verified by the Bartlett test, which was not significant ($p>0.05$). The results are subjected to a one-factor analysis of variance to determine the impact of using an ENZYVEBA ZOO C bioactivator on the parameters considered. The differences between treatments are compared using a Student-Newman-Keuls test. The materiality level chosen is 5%. Analyses are conducted using the Statview program (Abacus Concepts, 1996, Inc., Berkeley, CA94704-1014, USA).

RESULTS

Growth Performance. The zootechnical growth (body weights, weight gains, consumption and feed conversion) measured during the test are presented in (Table 1). Our results show that the use of the bioactivator in the litter did not modify the live weight of the chickens: not significant variation between the 2 batches at day 0, day 42, and day 49. The average weights are almost identical in both groups T and E: 2635.11±93.4 5g, 2472.93±45g. Similarly, the differences in weight gains between E and T chickens are not statically different depending on the breeding period considered ($P>0$,05). In the starter phase, food consumption in both batches is comparable. On the other hand, it is lower in periods of growth (-5%, $P<0.01$), in the same way we observe a decrease of about -17% ($P<0.001$) in periods of finishing. The consumption recorded during the entire breeding period (day 0-day 49) is significantly reduced by the use of the bioactivator in batch E compared to batch T -8% ($p<0.001$). Concerning the feed conversion index, our results show that it is significantly improved at the end of breeding in batch E (Difference of about -2.20%) ($p<0.001$) (Table 1).

Mortality. The mortality rates recorded are significantly reduced by approximately -12% ($p<0.001$) at the lot E building treated with the ENZYVEBA ZOO C bioactivator (Table 2).

Biochemical parameters. The determination of Cholesterol, Triglycerides, Glycemia, HDLc, LDLc, Total protein and total lipids demonstrates that the use of the Enzyveba ZOOC bioactivator has significantly reduced the plasma content of lipid biochemical parameters compared to lot T, namely cholesterol, LDLc, and total lipids

respectively: 1.23vs 1.81 ;0.22vs0.39; 3.70 vs 5.65 (P<0.0001), but Glycemia and triglyceride and total protein levels remain comparable between the two batches (Table 3)

Table 1.

Effect of the use of the bioactivator ENZYVEBA ZOOC on body weight, weight gain, feed intake, and feed conversion of both batches (Mean; n=18)

	Control (Lot T)	Exprimental (Lot E)	Anova p=
Body weights (g)			
Day 0	35,74±	35,74±	0 ,19
Day 10	185,04±24,45	182,56±10,42	0,95
Day 42	1762,89±62,67	1648,83±85,45	0,02
Day 49	2635,11±93,45	2472,93±101,01	-
Weight gains (g)			
Starter(D0-D10)	148,57±23,9	146,16±10,10	0,93
Growth (D10-D42)	1578,21±47,18	1466,26±84,84	-
Finis (D42-D49)	877,22±72,36	824,11±59,87	0,09
Cumulative(D0-D49)	2604,11±35,09	2436,53±23,02	-
Feed intake (g)			
Starter(D0-D10)	333,00±3.05	321,60±18,75	0,01
Growth (D10-D42)	3596,59±153,76	3437,62±106,17	0,00
Finition (D42-D49)	2166,70±103,67	1843,44±111,97	0,00
Cumulative (D0-D49)	6096,29±236,51	5602,65±169,95	0,00
Feed conversion cumulative (g/g)	2.32±0,1	2.27±0,21	0,0001

Table 2.

Effect of the use of the bioactivator on the mortality rate of the Control Building Batch T and the Experimental Batch Building (E)(Means ; n=18)

	Lot T Control	**Lot E Experimental**	**ANOVA p=**
Mortality rate			
Starter(D0-D10)	1,67±0 ,25	1,48±0,23	0,76
Growth (D10-D42)	0,28±0,1	0,75±1,16	0,44
Finition (D42-D49)	1,01±1,43	0,40±0,74	0,32
Cumulative(D0-D 49)	2,95±2,37	2,63±2,12	0,0001

Table 3.

Effect of the use of the bioactivator on the biochemical parameters of the Batch T control building and the Experimental Batch building (E)(Average; n=18)

Biochimicals Parametrs (g/l)	Lot T Control	Lot E Experimental	ANOVA p=
Glycémia	2,10±0,42	2,05±0,36	0,70
Triglycerides	0,99±0,19	0,99±0,21	0,96
cholesterol	1,81±0,33	1,23 ±0,19	0,0001
HDLc	0,70±0,17	1,45±0,43	0,0001
LDLc	0,39±0,26	0,22±0,16	0,003
Total Lipides	5,65±1,21	3,70 ±0,40	0,0001
Total Protéines	50,65±9,51	44,00±4,46	0,02

DISCUSSION

This intended trial investigated the impact of the use of a bioactivator on zootechnical performance and biochemical parameters during a complete cycle of a broiler farm. Under our experimental conditions, the addition of the bioactivator ENZYVEBA ZOOC to the litter during a complete broiler chicken cycle did not alter the growth of the animals. On the other hand, the effect of the use of the same bioactivator on the final weight of the broiler chicken was reported by the work of HAMMOUDA (1999), which found an increase in body weight of about 40%. Similarly, the results of the study by Lounas (2008) demonstrated a 20% increase in weight gains in favour of the batch whose litter was treated by the bioactivator. In addition, the use of the ENZYVEBA ZOOC bioactivator has significantly reduced the amount of feed ingested during the entire breeding period with a significant improvement in the feed conversion. This effect is reflected in the increase in the efficiency of food processing, probably due to the exclusion of pathogens from the environment and the competitive effect on the intestinal flora. Our results showed a significant effect of the use of the bioactivator on the mortality rate in fact this reduction was observed by (Martinotti, 1999). In addition, we evaluate the impact of the use of the ENZYVEBA ZOOC bioactivator on the biochemical parameters: cholesterol, triglycerides, glycemia, HDLc, total protein LDLC, and total lipids. We would like to point out that no studies on the effect of the bioactivator on biochemical parameters have been carried out to our knowledge.

The lipid biochemical parameters indicate that the use of the bioactivator has resulted in a significant reduction compared to the control batch, this means that the chickens are not overloaded with fat, we obtain meat of better nutritional quality (Chorfi and Venne,2015)

CONCLUSION

In our local conditions, the use of the bioactivator ENZYVEBA ZOOC has made it possible to reduce mortality and improve the efficiency of food processing, this better digestive use of the feed is consistent on the one hand with the reduction of pathogens in the litter by competitive exclusion, and on the other hand with the orientation of the beneficial intestinal flora inducing this food efficiency, as well as the animal's well-being. The lipid parameters have been significantly modified in order to improve quality. The use of microbial additives in bedding seems to be an alternative for better management of environmental parameters, which has an impact on zootechnical performance and animal welfare.

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