Ann. For. Res. 66(1): 2946-2952, 2023
ISSN: 18448135, 20652445

ANNALS OF FOREST RESEARCH
www.e-afr.org

EVALUATION OF COMMERCIAL FEED WITH FEED ADDITIVES, USED IN BROILER DIETS.

Patricio Manuel Paredes Orozco
Mgs. Docente Escuela Superior Politécnica de Chimborazo ESPOCH Sede Morona Santiago
Email: patricio.paredes@espoch.edu.ec
ORCID: https://orcid.org/0000-0002-9532-9866

Luis Rojas Oviedo
Mgs. Docente Escuela Superior Politécnica de Chimborazo ESPOCH Sede Morona Santiago
Email: luis.rojaso@espoch.edu.ec
ORCID: https://orcid.org/0000-0002-6424-1642

Luis Condo Plaza
PhD. Docente Escuela Superior Politécnica de Chimborazo ESPOCH Sede Morona Santiago
Email: luis.condop@espoch.edu.ec
ORCID: https://orcid.org/0000-0001-9625-9620

Fabián Delgado
Mgs. Docente Escuela Superior Politécnica de Chimborazo ESPOCH Sede Morona Santiago
Email: fdelgado@espoch.edu.ec
ORCID: https://orcid.org/0009-0004-9972-5075

Abstract

National poultry production is located in regions with a c limatic regime characterized by very unstable environmental temperatures and high relative humidity during most of the year. The effects of heat are particularly important because they cause a decrease in feed consumption and generate mortality in chickens. fattening that can reach 20% of the population in the last week of life, when most of the investment has already been made.

In addition, the poultry sector represents one of the most dynamic and important items in livestock activity, it is practiced by different social and economic levels, it constitutes an important source of work and meat production at low cost, compared to red meat. Ecuadorian livestock production, like many underdeveloped countries, is not self-sufficient to supply the production of food of animal origin for human consumption, which has made it necessary to constantly import basic raw materials for the production of animal feed. essentially grain corn, sorghum and soybean paste; The importation of these elements has a direct impact on the production costs of the product, an adequate feed balance will be nutritionally complete when it minimizes deficiencies, produces good quality carcasses, improves immunological competence and reduces stress. To achieve this purpose, alternatives have been sought for feed formulations, looking for raw materials of plant origin that lower production costs.

The study was carried out in Macas, Morona Santiago, at 1020 masl, the evaluation of three commercial feeds and two food additives in the rearing of broiler chickens was investigated. A Completely Random Design (DCA) was used. With a 3 x 3 factorial arrangement, the treatments resulted from the interaction of the factors under study (9 treatments), with 16 observations (Ross line chickens) per treatment, which were located in rectangular compartments with an area of 1.6 m 2 constituting a total of 192 chickens, in a total area of 2265m 2. The basic materials used were 192 chickens of the Broiler breed of the Ross commercial line, balanced feed (P, Av, Ag), feed additives (Avizyme 1500 and 3 Nitro 20), vaccines, brooder, feeders, drinkers, thermometer, scale.
As a result we obtained, with the best average is b1 (Pr) with 668.1g of weight increase/chicken; while, in the second range with the lowest response, b 3 (Av) is located with an average of 662.1 g of weight increase/bird. This is due to the fact that the feed (Pr) presented a high content of crude protein (21.7%), low in fiber (2.0%) and with 3426 kcal/kg of gross energy; while the balanced (Hz) presented the following values: crude protein (19.2%), high in fiber (6.5%) and with 3545 kcal/kg of gross energy, which determines the difference in growth and weight gain in the birds fed with the two balanced.
KEY WORDS: BROILER CHICKENS, POULTRY PRODUCTION, BALANCED, ANIMAL NUTRITION, FEED ADDITIVES, ANTIBIOTICS.

INTRODUCTION

Poultry farming in Ecuador is practiced at different social and economic levels because it constitutes an important source of work and provides it at low cost (Nacional, 1999).
According to (Rodríguez, 2013) the poultry industry is made up of a chain of links that begins in the cultivation and marketing of raw materials such as corn, sorghum and soybeans mainly; followed by the production of balanced feed, poultry breeding, processing, distribution, transport, marketing, added value and export; within each of these segments There are several human circles, such as wholesalers, marketing companies, intermediaries, importers, exporters, warehouses and around this there are several services, such as financial, input suppliers, technical and investigative advice, who, directly or indirectly depend on this activity. (Halasz A, Lasztity R. 1991).
The breeding of broiler chickens demands many economic resources, which forces the search for management and technologies that allow the maximum use of the balanced. In addition, it is important to test the new products offered by technological advancement such as additives.

feeds that, without being indispensable in the diet, could promote a better and more profitable development of chickens, (GARCÍA, DAMRON, & SLOAN, 2001)
Poultry feed additives often contain substances that are not directly related to meeting nutrient requirements (Duarte Vargas J., (2010).
In the poultry industry, feed additives have become extremely important. The decline in profit margins has stimulated the use of all measures to lower the cost of production. This is one of the

main reasons for the popularity of 3-Nitro in poultry feed. If broilers do not gain weight efficiently, losses
can be significant (Calzadilla F, Pérez M, Piad R. 2006). Feed conversion data in terms of meat production is more important than ever. This is another reason for the widespread use of 3-Nitro, (Alpharma, 2012).
Taking into consideration all these aspects, it has been considered convenient to carry out the present investigation, in order to obtain chickens with a higher weight and low mortality so that they are more profitable.

MATERIALS AND METHODS

To carry out this work were carried out 3Experiments with1 Treatments s used each in the stage of growth of broilers / broilers. The experimental unit was a day-old chicken of the Ross breed, (mixed flock). The 16 experimental units used per treatment were housed in an area of 1.60 m2, whose length was 1.67 m and the width of 0.96 m. The treatments were located in a shed with homogeneous characteristics inside; distributing the 12 treatments in the shed with a path in Medium treatments 0.60 m wide (total road area 3.45 m 2).
A Completely Random Design was used with a 3 x 3 factorial arrangement with 16 observations (chickens) per treatment.
All different treatments were weighed on days 7, 14, 21, 28, 35, 42 and
49.The results were expressed in grams.

Table 1. Treatments to be applied in the evaluation of three balanced and 2 additives in broiler / broiler breeding. (Macas, 2023)

TREATMENTS		INTERPRETATION
N.	INTERACTION	
1	b1a0	Balanced Pr (Growth Stage) + control without additive.
2	b1a1	Balanced Pr (Growth Stage) + 3 nitro 20
3	b1a2	Balanced Pr (Growth Stage) + Avizyme 1500
4	b2a0	Balanced Ag (Growth Stage) + control without additive
5	b2a1	Balanced Ag (Growth Stage) + 3 nitro 20
6	b2a2	Balanced Ag (Growth Stage) + Avizyme 1500
7	b3a0	Balanced Av (Growth Stage) + control without additive
8	b3a1	Balanced Av (Growth Stage) + 3 nitro 20
9	b3a2	Balanced Ag (Growth Stage) + Avizyme 1500

On the other hand, GARCIA and LEÓN, (2011), weight at 21 days of 627.1 g / chicken, value

obtained an average increase that does not exceed that presented in this research, whose average value is that in this research there was a lower 665.56 grams / chicken, this minimum waste of food during this stage ().

RESULTS

Table 2. Significance tests for weight gain, in the evaluation of 3 balanced and 2 feed additives in the rearing of broilers / broilers. (Macas, 2023)

FACTORS		Day 1 to 21	Day 22 to 49	total
Coding / Treatment	Meaning	Average in grams/ chickens		
Balanced (B)		1	1	1
b1	PRONACA	668,1	2169,5	2837,6
b2	AVIFORTE	667,4	2177,4	2844,8
b3	AGROMEL	662,1	2121,5	2783,6
Orthogonal Comparisons		2	2	2
b1b2 vs		667,75	2173,45	2841,2
b3		662,1	2121,5	2783,6
b1 vs		668,1	2169,5	2837,6
b2b3		664,75	2149,45	2814,2
b3 vs		662,1	2121,5	2783,6
b2		667,4	2177,4	2844,8
ADDITIVES			1	1
a0	Avizyme 1500	639,3	2061,8	2700,8
a1	3 nitro 20	646,5	2134,8	2781,3
a2	Witness without additive	648	2155,7	2803,7
Orthogonal comparisons			2	2
a1 a2 vs		647,25	2145,25	2792,5
a0		639,3	2061,8	2700,8
a2 vs		648	2155,7	2803,7
a1		646,5	2134,8	2781,3
INTERACTION bxa			3	3
t9 (b3a2)		679,3	2227,3	3906,6
t3 (b1a2)		671,9	2207,7	2879,6
t5 (b2a1)		667,8	2134,9	2802,6
t1(b1a0)		667,1	2125,3	2791
t2 (b1a1)		665,2	2175,5	2840,7

t8 (b3a1)		663,9	2165,6	2829,5
t6 (b2a2)		659,8	2162,2	2822
t7 (b3a0)		659	2139,3	2798,3
t4 (b2a0)		658,6	2067,6	2726,2

TUKEY at 5% for Balanced, in table 1 and 2 detects two ranges of significance. In the first range with the best average is b1 (Pr) with 668.1g of weight increase / chicken; while, in the second range with the lowest response is located at b3 (Av) with an average of 662.1 g of weight increase / bird. This is because the balanced (Pr) presented a high content of crude protein (21.7%), low in fiber (2.0%) and with 3426 kcal / kg of gross energy; while the balanced (Hz), presented the following values, crude protein (19.2%), high in fiber (6.5%) and with 3545 kcal / kg of gross energy, which determines the difference in growth and weight gain in birds fed with the two balanced (Medina, N. M.; Gonzalez, C. To.; Daza, S. L.; Restrepo, O.; Barahona, R, 2014). Keep in mind that a high fiber content can contribute to weight loss, since the digestive system of chicken is not adapted to support high levels of fiber (Andrade Yucailla V., Isuiza L., Ramírez A., Viamonte M.I., Sánchez J., Andrade Yucailla S., Toalombo P., and Vargas- Burgos J.C., 2017).
5% DMS for orthogonal comparison b3 vs b1b2, Table 2, detects two significance ranges. In the first range with better response is located b1b2 (Pr with 21.7% of PB, fiber 2.0%, Ag with 21.8% of PB, fiber 3.8%, Av. with 21.4% of PB, fiber 1.8%) with an average of 667.75g of weight increase / chicken and in second range with lower response is b3 (Av with 19.2 % PB, fiber 6.5%) with an average of 662.1 grams of weight gain/chicken. This response is due to the fact that the balanced (Av) presented a fiber content of 6.5%; which caused the animals to eliminate feces more frequently, and have a lower assimilation of food and therefore a smaller increase in weight.

For additives, Table 2, it is observed that the best response presented 2 (Avizyme 1500) with an average weight increase of 648.0 g / chicken; while the lowest response obtained a0 (Without Additive) with an average of 639.3 g of weight increase / chicken. The non-significance indicated that the application of additives at this stage is equally effective but does not present greater advantages over the control treatment. This small difference is possibly due to the fact that the additive (Avizyme 1500) contains enzymes such as xylase, protease and amylase, which improve the nutrient digestibility of feed (National Research Council (NRC) 1994; Cardenas E., (2006).
When evaluating the variable weight gain, growth stage, highly significant differences were detected for treatments, balanced, orthogonal comparison b1 vs b2 vs b3. The overall average was 627.1 g/chicken of weight gain and the coefficient of variation was 7.86%, which turns out to be excellent for this type of research (Santin E, Maiorka A, Macari M. 2001).
NITSAN et al. Cited by (Ortiz, 2004), they mention that the digestive and absorption capacity of the intestine during the first ten days to antibiotics, growth promoters is relatively low compared to that of chicken from 10 days of age, reflecting its low response in the flock in the initial stage.

This may be one of the main reasons for not having found statistical differences in weight gain with the application of additives, in the initial stage of this trial (Gonzabay De La O Alina Jamilex, 2021).

As mentioned (Pierson, 1998) the additive Avizyme 1500 has as its main

Function improve the digestibility of nutrients, allowing to reduce the cost of feed and increase the performance of birds, its components, mainly protease improves the solubility and digestibility of low quality protein sources, under conditions of heat stress have been shown to improve the development of monogastric animals and decrease their mortality (Gheisarl A, Kholeghipour B. 2006).

For the interaction B x A (Balanced x Additives), Table 20, it is observed that the best response obtained the interaction b3a 2 (Av + Avizyme 1500) with an average weight increase of 679.3 g / chicken that occurs efficiently according to the types of treatment, the quality of the diet (Fooks L, Gibson G. 2002).

REFERENCES.

Alpharma. (2012). Technical manual of chickens, turkeys, pigs; P. 1- 4.

Andrade Yucailla V., Isuiza L., Ramírez A., Viamonte M.I., Sánchez J., Andrade Yucailla S., Toalombo P., and Vargas- Burgos J.C., (2017). Phenotypic description of the backyard hen (Gallus domesticus) of the Kichwa Sarayaku people in the Ecuadorian Amazon. Actas Iberoamericanas en Conservación Animal 263-269

Calzadilla F, Pérez M, Piad R. 2006. Influence of a prebiotic based on yeast hydrolysate in the microbial ecology of birds. Advanced Scientific Journal. 9 (1): 1-7.

Cardenas E., (2006). Sanitary management, technical infrastructure and feeding in the breeding of Creole hens (Gallus Gallus) in the northern, southern and eastern communities of the Olmedo canton. Thesis. Faculty of Veterinary Sciences of the Technical University of Manabí.

Danisco. Animal Nutrition. St Louis. Missouri. US. 3 p.

Duarte Vargas J., (2010), Intensive production system. Florencia – Caquetá. Faculty of veterinary medicine and zootechnics. University of Tolima.

Fooks L, Gibson G. 2002. Probiotics as modulators of the gut flora. British J. Nutr. 88(1):S39-S49. http://dx.doi.org/10.1079/BJN2002628

GARCÍA, J., DAMRON, B., & SLOAN,
D. (2001). Nutrition for small flocks of chickens Obtained from Service of
Extension of Florida. Institute of Food and Sciences
Agricultural.

Gheisarl A, Kholeghipour B. 2006. Effect of dietary inclusion of live yeast (Saccharomyces cerevisiae) on growth performance, immune responses, and blood parameters of broiler chickens. XII European Poultry Conference, Verona, Italia, 6 p.

Gonzabay De La O Alina Jamilex (2021).

Halasz A, Lasztity R. 1991. Use of yeast biomass in food production, Boca Ratón (Flo, EUA): CRC Press.

Mac, M. s. (2023).

National Research Council (NRC). 1994. Nutrient requirements of poultry. 9th. rev. ed. Washington: National Academy Press, 155 p.

Medina, N. M.; Gonzalez, C. To.; Daza, S. L.; Restrepo, O.; Barahona, R. 2014. Productive performance of broilers supplemented with Saccharomyces cerevisiae biomass derived from the fermentation of banana residues. Journal of the Faculty of Veterinary Medicine and Zootechnics, vol. 61, no. 3, September-December, 2014, pp. 270-283. National University of Colombia Bogotá. Bogota, Colombia.

Manovacía NP, Moreno AM, Mayorga OL Barahona, R. 2008. Evaluation of nutrient content and biomass production in Colombian and commercial yeast strains. Rev. Fac. Nac. Agron. 61(2):4542-4553

Nacional, C. F. 1994. Nutrient requirements of poultry. 9th. rev. ed. Washington: National Academy Press, 155 p.

Ortiz, P. (2004). Use of natural alternatives to antibiotic promoters
growth in intestinal health and productive parameters of broiler chickens Obtained from
http://ucv.altavoz.net/prontus_uor dacad/site/artic/20061215/pags/20
061215104649.htm l

Perdomo MC, Vargas RE, Campos J. 2004. Nutritional value of brewer's yeast and its derivatives. Latin American Archives of Animal Production. 12(3):89-95.

Pierson, E. (1998). Avizyme 1500 as a tool to optimize productions.

Rodriguez, D. (2013.). The Ecuadorian poultry industry, specialist in animal production: AVES. Head of Balanced Operations "The Farmer". Obtained from
Available in
http:/www.engormix.com/mbr453 965/m vz-rodrigues-diegosaldana

Toapanta Guanoluisa M., (2019). Characterization of the backyard bird production system of the Cevallos canton, Ecuador. Technical University of Ambato. Faculty of Agrarian Sciences, Tungurahua. Ecuador.