MCassab

Tel.: 11 2162.7841
mcassab@mcassab.com.br

WWW.MCASSAB.COM.BR

MCassab

PHYTASE LEVELS ASSESSMENT (MICROTECH 5000 PHYTASE) IN THE BROILER FEEDING

USP (PIRASSUNUNGA – SP)

Nutrição Animal

SUMMARY

An experiment was conducted with the purpose to assess the phytase levels (Microtech 5000 Phytase) in the broilers feeding from 1 to 42 days old. 1,200 birds were used, distributed in 4 experimental treatments (T1: Control diet - with suitable nutritional levels; T2: Formulated diet with 100 g/ton of phytase; T3: Formulated diet with 200 g/ton of phytase; T4: Formulated diet with 300 g/ton of phytase), with 25 repetitions of 12 animals each. Performance data were assessed (weight gain, feed intake, feed conversion, adjusted feed conversion, mortality) and at the end of the experiment, 3 birds per repetition were slaughtered for carcass, chest and legs yield assessment. The right tibia was removed from a bird per repetition for the determination of bone ashes. For performance assessment, the birds were weighed on the housing day, on 21, 33 and 42 days. The birds were fed with a diet based on corn and soybean meal, mash, following the standards established by Rostagno et al. (2011) to lower performance broilers, divided into the following phases: 1 to 21 days, 22 to 33 days, and 34 to 42 days of age. The results demonstrated that the enzyme supplementation in the diet, with a nutritional value of phytase (it entered formulated), maintains the performance of the birds, the level of mineral content of the bones and even improves the performance of the birds chest.

INTRODUCTION

The search for balance between nutrition and productive characteristics of the broilers is a constant challenge faced by nutritionists. Given the genetic progress presented by birds in the last years, nutritionists struggle in the search for alternatives that enable the formulation of more efficient and economical feed. In this context, a promising method for achieving those goals and that has received a great attention in the last years, it is the use of exogenous enzymes as additives in the birds feed.

Among the exogenous enzymes, phytase is highlighted, which is studied and used in the feed formulation for monogastric in order to make complexed nutrients available in the phytate molecule present in the ingredients of vegetable origin (Dari, 2004).

PURPOSE

The purpose of this work was to assess phytase levels (Microtech 5000 Phytase), with a nutritional value, in the feed of broilers in the period from 1 to 42 days old.

MATERIAL AND METHODS

1,200 birds were used (Cobb), in 4 experimental treatments with 25 repetitions of 12 animals each, distributed as follows:

- T1: Control diet - with suitable nutritional levels;
- T2: Diet formulated with 100 g/ton of phytase (full enzyme nutritional matrix);
- T3: Diet formulated with 200 g/ton of phytase (full enzyme nutritional matrix over 30%);
- T4: Diet formulated with 300 g/ton of phytase (full enzyme nutritional matrix over 50%).

Performance data were assessed (weight gain, feed intake, feed conversion, adjusted feed conversion, mortality) and at the end of the experiment, 3 birds per repetition were slaughtered for carcass, chest and legs yield assessment. From the birds slaughtered, in a bird the right tibia was removed to make the determination of bone ashes.

The test was conducted in the experimental aviary from FZEA/USP in the period from 1 to 42 days, and the baseline diet was formulated considering the recommendations of nutritional requirements, established by Rostagno et al. (2011) and the other diets were formulated with the full nutritional matrix of the enzyme, according to the level of inclusion of phytase, which kept all isonutritional diets. Diets were provided in three phases: initial (1 to 21 days), growth (22 to 33 days) and final (34 to 42 days). The data obtained were analyzed with the aid of the GLM procedure of Minitab system (2010) and the means compared by the Tukey test at a 5% level of probability.

RESULTS

The performance data showed that, at the different phases assessed, the levels of inclusion of phytase assessed did not affect negatively the performance of broilers. It means, the use of phytase with a nutritional value in the diet allowed to maintaining the same performance as the birds of the control diet, without the inclusion of phytase (Table 1).

TREATMENT	CONSUMPTION	GAIN, g	CONVERSION, g
T1	4.797	2.747	1,74
T2	4.794	2.736	1,74
T3	4.847	2.738	1,76
T4	4.816	2.732	1,75
SEM	22	11	0,004
P, %	0,821	0,972	0,094

Table 1. Performance of the broiler supplemented with different levels of phytase in the diet (1 to 42 days).

T1: Control diet - with suitable nutritional levels; T2: Formulated diet with 100 g/ton of phytase; T3: Formulated diet with 200 g/ton of phytase; T4: Formulated diet with 300 g/ton of phytase

For the carcass yield, no significant differences for yield of yeld carcass and legs yield were observed ($p > 0.935$ and $p > 0.137$, respectively). However, there was an improvement in the breast yield of birds fed with the inclusion of 300 g/ton of phytase in the diet (Figure 1), which may have been the result of an improvement in the availability of nutrients present in the diet and, thus, a better usage of them by the birds.

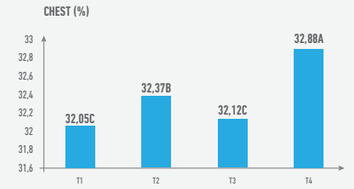

Figure 1. Figure 1. Effect of Phytase levels on the percentage of broiler breast meat at 42 days.

T1: Control diet - with suitable nutritional levels; T2: Formulated diet with 100 g/ton of phytase; T3: Formulated diet with 200 g/ton of phytase; T4: Formulated diet with 300 g/ton of phytase

For analysis of mineral content in the tibia of the birds there was no difference among the treatments assessed (Figure 2). This shows that the nutritional valuations assigned to the phytase are consistent and that part of the phosphorus of the diet comes from its release by the enzyme, when it acts on the phytate of the vegetable ingredients.

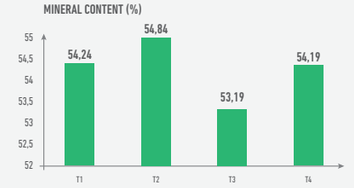

Figure 2. Bone minerals of the broiler tibia supplemented with different levels of phytase in the diet (1 to 42 days).

T1: Control diet - with suitable nutritional levels; T2: Formulated diet with 100 g/ton of phytase; T3: Formulated diet with 200 g/ton of phytase; T4: Formulated diet with 300 g/ton of phytase

The inclusion of phytase also contributed to the reduction in the use of Dicalcium Phosphate and Soybean Oil in feed (Figures 3 and 4), ingredients that directly impact on the cost of the diets. The average of the three phases of feeding was considered.

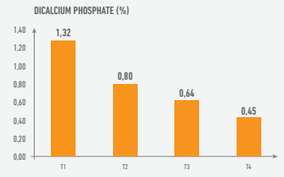

Figure 3. Use of Dicalcium Phosphate in the diets of broiler with different levels of Phytase.

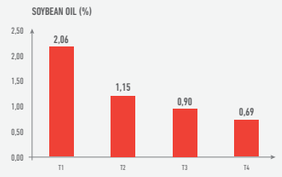

Figure 4. Use of Soybean Oil in the diets of broiler with different levels of Phytase.

T1: Control diet - with suitable nutritional levels; T2: Formulated diet with 100 g/ton of phytase; T3: Formulated diet with 200 g/ton of phytase; T4: Formulated diet with 300 g/ton of phytase

CONCLUSION

The use of Phytase Microtech 5000 Phytase in the diet of broilers demonstrated to be functional and viable and their inclusion level will depend on the cost / benefit ratio, in function to the nutritional value of the diet.

Literature mentioned

DARI, R.L. A utilização de fitase na alimentação de aves. In: CONFERÊNCIA APINCO 2004 DE CIÊNCIA E TECNOLOGIAS AVÍCOLAS, 2004, Santos-SP: FACTA, Volume: 1, p.127-143.

ROSTAGNO, H.S., ALBINO, L.F.T., DONZELE J.L., et al. Tabelas brasileiras para aves e suínos: composição de alimentos e exigências nutricionais. [Brazilian tables for birds and swine: food composition and nutrient requirements.] 3. ed. Viçosa: Universidade Federal de Viçosa, 2011. 252p.

SAS INSTITUTE INC. SAS System for Microsoft Windows, Release 6.12. Cary. NC, USA, 2002.