MHA®

Using HMTBa as a source of methionine **improves efficiency of phytase**

What is MHA®?

MHA is a feed supplement proven to be an effective source of methionine. In dry granular powder form, MHA is the leading source of 2-hydroxy-4-(methylthio) butanoic acid (HMTBa) inclusions in premixes and farm feed mills. MHA delivers organic calcium, reduces nitrogen excretions and supports performance, especially during heat stress.

Phytase is an enzyme that degrades non-digestible phytic acid (the most prevalent form of phosphorus) found in grains and oilseeds, releasing digestible phosphorus, calcium and other nutrients. Up to 90% of total phosphorus in grains and oilseeds can be bound and unavailable in the form of phytic acid (phytate).

A smart way to supplement methionine

- Reduction of stress
- Synergistic action with phytase.
- Improvement in performance.

Supplementation of diets deficient in phytase with certain organic acids (including HMTBa) improves utilization of phytate. Proving this fact, two experiments were conducted by the Department of Poultry Science, University of Georgia, USA. 0-16 days broiler chicks were kept in batteries in order to determine the effect of supplementation of different organic acids on the utilization of phytate. In both experiments, birds were fed a basal diet based on corn and soybean. Low feed intake is the main cause of performance loss at high temperatures.

In experiment 1, the basal diet was supplemented with citric acid, malic acid, fumaric acid and 3.23% EDTA, 2.90%, 2.90% and 3.65%, respectively, replacing the equivalent in corn. The additions of all acids increased percentage of bone ash numerically, but only the effect of citric acid was significant. The addition of citric acid and malic acid also resulted in significantly increased retention of P and the disappearance of phytate P ($P < 0.05$).

The experiment was conducted in two randomized 2 x 2 factorial with two sources of methionine added at equimolar concentrations HMTBa (0.227%) and DL-Methionine (0.2%) with or without 500 U / kg phytase.

In this study, the addition of phytase to the diet significantly increased body weight, feed intake, the percentage of bone ash, milligrams of bone ash, the disappearance of phytate P and reduced the incidence of rickets by P deficiency. The source of methionine did not affect weight gain, feed intake, feed efficiency (confirming 88% activity of liquid HMTBa), milligrams of bone ash or the incidence of rickets by phytase deficiency. However, the birds supplemented with HMTBa had a higher percentage of bone ash and disappearance of phytate compared to groups supplemented with DL-methionine, only when the enzyme was added to the diets. The additions of citric acid and HMTBa improved utilization of phytate, as shown by their disappearance and greater percentage of bone ash (Table 1). HMTBa may have reduced the pH of the digestive tract, creating a more favorable environment for the action of phytase.

Table 1: The effect of Met source and phytase on BW gain (BWG), feed intake, gain:feed, percentage of bone ash, milligrams of bone ash, phytate P disappearance, and P rickets incidence, experiment 2

Methionine source	DLM	HTMBA	DLM	HTMBA
Phytase units/Kg	0	0	500	500
BWG, g	324 +/-8b	335 +/-8b	394 +/-9a	393 +/-8a
Feed consumption, g	404 +/- 13b	416 +/- 10b	485 +/- 10a	483 +/- 11a
Feed efficiency	0,80 +/- 0,01	0,81 +/- 0,00	0,81 +/- 0,01	0,81 +/- 0,01
Bone ash, %	28,5 +/- 0,3c	29,0 +/- 0,6c	31,2 +/- 0,2b	33,2 +/- 0,5a
Bone ash mg/tibia	277 +/- 12b	283 +/- 12b	333 +/- 9a	354 +/- 9a
Phytate P disappearance, %	36,7 +/- 3,1c	39,5 +/- 2,2c	51,0 +/- 2,2b	59,9 +/- 2,9a
P rickets incidence, %	90,9 +/- 1,9a	91,3 +/- 3,1a	78,3 +/- 4,8ab	65,0 +/- 7,6b

[a–c]Means within a column with no common superscript are significantly different ($P < 0.05$).
[1]Values are means ± SE for 6 replicate pens of 10 chicks per pen.

References

Liem, A, Pesti, G.M, and Edwards, H. M (2008) The Effect of Several Organic Acids on Phytate Phosphorus Hydrolysis in Broiler Chicks. Poultry Science Vol. 87 (4), pp. 689-693. http://ps.fass.org/cgi/content/full/87/4/689.

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Novus Nutrition Products Africa ▪ Unit 3 Oxford Office Park ▪ Highveld Techno Park ▪ Centurion ▪ South Africa ▪ +27 12 665 5377