

Application of a sub-optimal protocol to evaluate broiler response to additional methionine supplied as either Alimet® or DLM

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Abstract

The response of broilers to supplementation of a methionine deficient diet with either methionine hydroxy analogue (Alimet®) or DLM was evaluated at two centres. Supplementation levels were calculated to give a final concentration of methionine in the diets of 92% of commercial practice. At this point the birds would be sensitive to any difference in the efficacy of the methionine sources. In total three trials were carried out evaluating broiler performance over the complete growing cycle using diets containing no added growth promoters. The results showed no difference in performance between the two methionine sources when included on an equimolar basis (Alimet®88%; DLM 99%).

Materials and Methods

Trials were carried out at Roslin Nutrition, Scotland and De Schothorst, the Netherlands. At Roslin 8 replicates of 40 birds were allocated to each of three treatments: Control (no added methionine); Alimet® and DLM. The final concentration of methionine in the Control and supplemented diets for Starter, Grower and Finisher were: Control: 0.32%, 0.33% and 0.29%; Methionine Supplemented: 0.414%, 0.408% and 0.37% respectively. At De Schothorst there were two trials involving a) 2,720 birds with 8 replicates per treatment and b) 816 birds with 12 replicates per treatment. In both cases there were two treatments: Alimet and DLM. In these trials the diets were formulated with a digestible methionine level at 92-93% of the level used in commercial Dutch broiler diets. All diets were formulated from a standard raw material matrix to reflect commercial practice, no added growth promoters were included in any of the trials.

In all trials birds were maintained in floor pens with feed and water available at all times. Performance was measured throughout the trials as weight gain, feed consumed and feed conversion ratios calculated.

Results and Discussion

Roslin Nutrition: The results for broiler performance over the 42 day experimental period are shown in Table 1.

	Body Weight (kg)	Feed intake (kg)	FCR
Control	2.133 ^a	4.486 ^a	2.103 ^a
DLM	2.266 ^b	4.663 ^{ab}	2.060 ^{ab}
Alimet®	2.346 ^b	4.711 ^b	2.008 ^b
SEM	0.033	0.068	0.043

Values with no common superscript differ significantly ($p < 0.05$)

Supplementing the control diet with methionine resulted in a significant improvement in performance over the 42 day experimental period. The concentration of this essential amino acid in the test diets was <90% of the level used in commercial practice and at this concentration the birds would have been below the plateau on the response curve. At this point, where birds would have been sensitive to the efficacy of the added amino acid, there was no statistical difference between the two methionine sources.

De Schothorst (1): The results for broiler performance over 38 days are shown in Table 2:

	Body Weight (kg)	Feed Intake (kg)	FCR
DLM	2.123	3.636	1.747
Alimet®	2.093	3.617	1.764
Lsd (p<0.05)	0.037	0.051	0.036

There was no significant difference in any of the performance parameters measured for diets supplemented with either DLM or the methionine hydroxy analogue, Alimet®, to reach 92-93% of the digestible amino acid requirements specified under the CVB recommendations. At this level of inclusion which is below the requirements of the broiler both sources were equally effective at promoting growth and feed efficiency.

De Schothorst (2): The results from the second trial carried out over 35 days are shown in Table 3:

	Body Weight (kg)	Feed Intake (kg)	FCR
DLM	2.025	3.251	1.638
Alimet®	1.997	3.230	1.651
Lsd (p<0.05)	0.057	0.065	0.030

In this second trial at De Schothorst there was again no difference in performance of broilers fed diets formulated to 92-93% of the CVB digestible methionine recommendations with either DLM or Alimet®.

All three trials were designed to test the hypothesis that there was no difference in performance of broilers fed diets formulated to be sub-optimal for methionine supplemented with either DLM or the methionine hydroxy analogue, Alimet®. The final level of methionine in these diets was calculated to be below the recommended level used in commercial practice in order to test the response to the two sources of the amino acid at a point where the birds would be sensitive to the efficacy of the amino acid source. In all three experiments where the amino acids sources were added on an equimolar basis (Alimet® at 88% and DLM at 99%) there were no significant differences in growth rate, feed intake or feed conversion ratio between the treatments.

Conclusions

In order to evaluate the sensitivity of response of broilers to a limiting nutrient it is essential to measure performance at a point which is below the plateau of the response curve – 10-15% below the level used in commercial practice. In these three experiments we have tested the hypothesis that there is no difference in the ability of two sources of the essential amino acid methionine to support growth at this sub-optimal level of diet supplementation. The ability of the birds to respond equally well under these conditions demonstrates that there the two sources, DLM and Alimet®, are equivalent in their provision of the limiting amino acid.

References

Roslin: A. Knox and J. McNab (2003) A comparison of the performance of broiler chicks fed on wheat-based diets deficient in the total content of sulphur containing amino acids with and without the addition of either DL-methionine or Alimet®. Roslin Nutrition Limited, Scotland

De Schothorst (1): J. Pos, H. Enting and A. Veldman (2004) The effect of Alimet® on broiler performance in comparison with DL-methionine in a commercial broiler diet with sub-optimal methionine content. De Schothorst Report no: BET-2004-01

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