

DIETARY SUPPLEMENTATION OF HERBAL METHIONINE (METHIOREP) ON THE PERFORMANCE OF LARGE WHITE YORKSHIRE PIGS

M. Murugan, M. Muthulakshmi, H. Gopi, L. Radhakrishnan and Shivi Maini
Pig Breeding Unit, Post Graduate Research Institute in Animal Sciences, Kattupakkam

Abstract: A growth trial was conducted to assess the dietary supplementation of herbal methionine on the performance of Large White Yorkshire pigs at Pig Breeding Unit, Post Graduate Research institute in Animal Sciences, Kattupakkam. A total of 24 weaned LWY piglets were selected and they were randomly divided into three groups comprising of eight piglets in each group. Male and female were equal in number for each treatment group. The piglets in group I was fed with standard grower feed routinely fed pigs in this unit without any supplementation of amino acid source and the crude protein content in the diet was 17%. Group II piglets were fed with diet containing 16 % CP and additionally received the dietary supplementation of DL methionine @1 kg/ tonne of feed. Group III piglets were fed with diet containing 16% CP and supplementation of methiorep @1 kg / tonne of feed. Trial was completed at seven months of age. It was found that there was no significant difference in body weight, average daily weight gain, feed intake and feed efficiency between treatments throughout the experiment. The major advantage of using methiorep was that the feed cost was reduced by Rs. 1.55 per kg of feed.

Keywords: Methiorep supplementation, Growth, cost of production, grower pigs.

Introduction

Dietary crude protein levels do not indicate the quality of the proteins in a feed, protein quality is based on the presence and balance of essential amino acids in the feed ingredients. Methionine is essential, non polar sulphur containing amino acid, lipotropic and chelating agent that plays a vital role in maintaining healthy and highly productive pigs. Methionine is commonly supplemented as dry DL-methionine or as liquid DL-methionine hydroxy analog-free acid. Synthetic methionine is metabolized into highly toxic compounds such as methylpropionate, thereby, adversely altering the performance of grower pigs. In addition to this, the inclusion of synthetic methionine is now prohibited in organic feed formulation. A natural alternative to synthetic methionine is “Methiorep premix”. This is a scientifically developed polyherbal formulation comprising the blend of herbs that mimics the activity like that of methionine in free & conjugated form. Ingredient herbs namely *Mucuna pruriens*, *Trigonella foenumgraecum* and many more are rich protein sources with highly bioavailable methionine and other sulphur containing amino acids. Other ingredient

herbs namely *Azadirachta indica* and *Boerhaavia diffusa* owe a potential hepatoprotective activity. Hence this study was taken with the objective to compare the performance of pigs under different forms of methionine available in the market.

Methodology

Experimental design: Completely randomized design

Twenty four weaned Large White Yorkshire piglets were selected and randomly divided into three groups comprising of eight piglets in each group. The piglets in group I was fed with standard grower feed routinely fed pigs in this unit without any supplementation of amino acid source and the crude protein content in the diet was 17 % . Group II piglets were fed with diet containing 16 % CP and additionally received the dietary supplementation of DL methionine @ 1 kg/ tonne of feed. Group III piglets were fed with diet containing 16 % CP and supplementation of methiorep @ 1 kg / tonne of feed. The production parameters viz., Average daily feed intake, feed conversion efficiency, fortnightly body weight and average daily weight gain were recorded. Cost of production on feed basis was work out to find out economic feasibility of supplementation in the grain based diet.

Results and Discussion

Body weight (Kgs):

The body weight of pigs under different treatment was presented in Table 1. It was found that there was no significant difference between treatments throughout the experiment. This result indicates that there was no significant improvement at 1% level in either form of methionine. This is in agreement with findings of Li *et al.* (1998) they reported that there was no significant difference in body weight of pigs fed with 20 % CP against 18% CP with lysine and methionine supplemented diet. However, Live weight gains and DM conversion improved linearly with level of supplementary DL-methionine (Hang, et al., 2009) in Large White x Mong Cai crossbred pigs fed with cassava leaves and cassava root products providing 20 and 30% of the diet dry matter (DM) with different levels DL-methionine supplementation. Nguyen Thi Hoa Ly (2006) observed a 23% increase in growth rate in pigs when DL-methionine was added at 0.15% of the DM of diets with 17 to 25% ensiled cassava roots and 15% ensiled cassava leaves (DM basis).

Table 1. Body weight (kgs) of pigs under different treatments

SL.NO.	AGE IN MONTHS	GROUP I CONTROL	GROUP II DL-METHIONINE	GROUP III METHIOREP
1	2	13.06 ± 1.08	13.05 ± 1.28	13.12 ± 0.87
2	3	16.72 ± 1.49	16.78 ± 1.13	17.67 ± 1.89
3	4	29.67 ± 2.27	29.78 ± 1.93	30.00 ± 2.63
4	5	48.89 ± 2.98	48.78 ± 2.34	49.67 ± 3.35
5	6	66.44 ± 3.46	65.56 ± 3.25	66.22 ± 3.58
6	7	84.44 ± 3.80	83.56 ± 2.91	83.89 ± 3.12

NS – Non significant

Average daily weight gain (g):

It was found that there was no significant difference between treatments throughout the experiment (Table 2). There was no consistent improvement in average daily weight gain at different fortnight in this present study between supplemented and unsupplemented groups. Li *et al.* (1998) found that there was no significant difference in average daily weight gain of pigs fed with 20 % CP against 18 % CP with lysine and methionine supplemented diet. In contrast, Live weight gains improved linearly with level of supplementary DL-methionine (Hang, *et al.*, 2009) in Large White x Mong Cai crossbred pigs.

Table 2. Average daily weight gain (g) of pigs under different treatments

SL.NO.	AGE IN MONTHS	GROUP I CONTROL	GROUP II DL-METHIONINE	GROUP III METHIOREP
1	3	122.00 ± 9.82	124.33 ± 8.50	151.67 ± 9.12
2	4	431.67 ± 11.08	433.33 ± 10.05	411.00 ± 11.25
3	5	640.67 ± 13.31	633.33 ± 12.18	655.67 ± 12.78
4	6	585.00 ± 15.24	559.33 ± 14.85	551.67 ± 13.96
5	7	600.00 ± 14.52	600.00 ± 15.10	589.00 ± 16.08
Average daily weight gain		475.87 ± 13.85	470.10 ± 14.47	471.81 ± 15.14

NS – Non significant

Average daily feed intake (g):

It was found that there was no significant difference between treatments throughout the experiment (Table 3). However there is a lower feed intake was observed with DL-methionine supplemented groups. Similarly findings were also reported by Hang, *et al.*, 2009 in Large White x Mong Cai crossbred pigs fed with varying levels of DL-methionine

in the diet. Li *et al.* (1998) also stated reported that there was no significant difference in body weight of pigs fed with 20% CP against 18% CP with lysine and methionine supplemented diet.

Table 3. Average daily feed intake (g) of pigs under different treatments

SL.NO.	AGE IN MONTHS	GROUP I CONTROL	GROUP II DL-METHIONINE	GROUP III METHIOREP
1	3	482.21± 17.52	500.11± 18.85	496.41± 19.31
2	4	1156.25± 21.20	1147.10± 22.31	1140.10± 20.85
3	5	1584.03± 28.64	1533.32± 30.12	1541.43± 27.84
4	6	1701.24± 30.13	1745.40± 29.22	1755.82± 29.27
5	7	1825.47± 29.63	1794.25± 28.77	1870.25± 28.09
Average daily feed intake		1349.84 ± 29.20	1324.04 ± 30.14	1360.81 ± 31.72

NS – Non significant

Feed efficiency

Feed efficiency of pigs under different treatment (Table 4) was found that there was no significant difference between treatments throughout the experiment. This result indicates that at 0.1 per cent inclusion might not sufficient enough to boost the feed efficiency in either form of methionine ie synthetic and ayurvedic product. This was found to be true with findings of Hang, *et al.*, 2009 reported that dry matter conversion improved linearly with level of supplementary DL-methionine in the pig ration.

Table 4. Feed efficiency of pigs under different treatments

SL.NO.	AGE IN MONTHS	GROUP I CONTROL	GROUP II DL-METHIONINE	GROUP III METHIOREP
1	3	2.53± 0.06	2.49± 0.08	3.06± 0.07
2	4	3.73± 0.10	3.78± 0.09	3.60± 0.12
3	5	4.04± 0.11	4.13± 0.12	4.25± 0.10
4	6	3.44± 0.13	3.20± 0.14	3.14± 0.12
5	7	3.29± 0.14	3.34± 0.13	3.15± 0.14
Feed Efficiency		3.41± 0.11	3.39± 0.12	3.44± 0.12

NS – Non significant

Table 5. Economics of production on feed basis

SL.NO.	PARAMETERS	GROUP I CONTROL	GROUP II DL- METHIONINE	GROUP III METHIOREP
1	Number of pigs	6	6	6
2	Initial body weight (Kgs)	13.06	13.05	13.12
3	Final body weight (kgs)	84.44	83.56	83.89
4	Weight gain (Kgs)	71.38	70.51	70.77
5	Feed intake (kgs)	1214.86	1191.64	1224.73
6	Cost of feed including cost of supplements (Rs.)	22.0	21.70	21.36
7	Feed conversion ratio	3.41	3.39	3.44
8	Cost of production on feed basis (FCR x Cost of feed / kg in Rupees)	75.02	73.56	73.47
9	Economic gain per kg feed by supplementation in Rupees	-	1.46	1.55

In the present study, cost of production in different treatment groups were assessed on feed basis since the trial involved only 24 weaned piglets. Based on the observation, cost of production was reduced by Rs. 1.46 to 1.55 due to supplementation of synthetic and ayurvedic respectively. Hence It was concluded that there was not any significant difference observed in growth performance of pigs between the treatments. The major advantage of using methiorep was that the feed cost is reduced by Rs. 1.55 per kg of feed. Moreover, it has been stated by the company that the methionine is produced from natural source which is highly beneficial.

References

- [1] Li, D.F., W.T. Guan, H.M. Yu., J.K. Kim and In. K. Han (1998). Effects of amino acid supplementation on growth performance for weanling, growing and finishing pigs. *Asian J. Anim. Sci.*, 11(1): 21-29.
- [2] Du Thanh Hang, Nguyen Quang Linh, TR Preston, H Everts and AC Beynen (2009). Effect of supplementary DL-methionine in pig diets with cassava leaves as a major protein source. *Livestock Research for Rural Development*, 21 (1).
- [3] Nguyen Thi Hoa Ly (2006). The use of ensiled cassava leaves for feeding pigs on-farm in central Vietnam. Workshop-seminar "Forages for Pigs and Rabbits" MEKARN-CelAgrid, Phnom Penh, Cambodia, during 22-24 August.