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Hemato-biochemical studies in crossbred (T&D) pigs on dietary supplementation of Indian gooseberry (*Phyllanthus emblica*) and multienzyme

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Abstract

In a completely randomized block design, experimental rations of grower and finisher were fed to 4 groups of animals with 5 animals (11.39 kg \pm 0.17 body wt.) in each group. The ration was supplemented with or without Indian gooseberry (amla) and multienzyme. Thus the 4 rations were a control (C), control with enzyme 0.05% (T₁), control with 1.5 % amla powder and 0.05% multienzyme (T₂), control with 2% amla and 0.05% multi enzyme (T₃) in both the stages. Blood was collected from 3 animals from each treatment group for hemato-biochemical study at the beginning, final stage of grower and finisher pigs in the experiment. There were significantly ($P < 0.05$) higher values of Haemoglobin (Hb), RBC, WBC, increased Lymphocyte count and significant decrease in AST (aspartate transaminase) and ALT (alanine transaminase) and significant increase in serum protein level in T₃ group. The study therefore revealed that 2% amla along with 0.05% multienzyme is beneficial in improving health condition and production healthy crossbred (T&D) pigs

Keywords: Amla, multienzyme, haemato-biochemical and Crossbred pig

Introduction

In recent years, due to public concern over the use of antibiotic as feed additives had led to research on alternative substances with antimicrobial properties and thus use of phyto-genic feed additives like herbs, residues, extracts, essential oils etc. are being explored and practiced in South-asian countries. Herbal plants are a new class of growth promoters and in recent years this feed additives have gained extensive attention in the feed industry. Herbal feed additives or growth promoters have been developed to improve growth rate, feed efficiency and product quality and to reduce feed cost. Though the studies related to herb supplementation have been done, there is little literature available on this aspect in pigs in this part of country. Indian gooseberries (Amla) have been used in Ayurvedic medicine for centuries to treat numerous ailments, including diabetes, although they are better-known in the West for their impressive antioxidant activity. Emblica (*Phyllanthus emblica* L.), an euphorbiaceous plant, is widely distributed in subtropical and tropical areas of China, India, Indonesia and the Malay Peninsula. Emblica fruit is reported to have hypolipidemic (Mathur *et al.*, 1996) [7], hypoglycemic (Abesundara *et al.*, 2004) [1], hepatoprotective (Panda and Kar, 2003) [8]. Therefore, present study was carried out to study effect on haemato-biochemical parameters in the Crossbred (T&D) Pigs on dietary supplementation of amla and multienzyme either alone or in combination.

Materials and Methods

Twenty crossbred (T & D) pigs of about 2 months of age and average body weight 11.39 \pm 0.17 kg, irrespective of sex were randomly divided into four groups with five animals in each group. The experiment was conducted in a randomized block design (RBD) design. The grower and finisher ration was prepared as per BIS 1992 [2]. Two experimental rations were prepared *i.e.* grower and finisher. The rations were designated as C, T₁, T₂ and T₃. The ration was computed in following ways: in Control ration only feed ingredients, control ration with 0.05% multienzyme (T₁), control with 1.5% amla and 0.05% multienzyme (T₂) and control with 2.0 % amla and 0.05% multienzyme (T₃).

At the beginning, final stages of grower and finisher pigs, 5 ml of blood was collected aseptically from anterior venacava as per guidance of Institutional Animal Ethics Committee. Out of 5 ml collected blood 1 ml blood was transferred to EDTA containing vial and was used for RBC, WBC, Hb. Simultaneously, remaining 4 ml of the blood collected was used for serum separation to evaluate glucose, serum protein,

AST and ALT by commercial kit (Crest Biosystems). The results obtained in the present study were analyzed statistically using SAS [9].

Results

Haematological profile and serum biochemical profile are shown below in Table 1 and Table 2, respectively.

Table 1: Effect of Amla and Multienzyme on Haematological Profile (Mean± Se) On Crossbred (T&D) Pigs

Group	RBC(m/mm ³)	WBC(m/mm ³)	Hb(mg/dl)	Monocytes (%)	Lymphocytes (%)	Granulocytes (%)
C	5.21 ^a ±0.28	13.67 ^a ±0.77	11.36 ^a ±0.17	3.60 ^a ±0.57	40.92 ^a ±5.78	55.47 ^a ±5.88
T ₁	6.08 ^a ±0.61	14.46 ^a ±0.66	12.89 ^{ab} ±0.69	4.20 ^a ±1.15	40.84 ^a ±6.54	54.95 ^a ±6.63
T ₂	6.48 ^b ±0.56	15.31 ^b ±0.96	12.50 ^{ac} ±1.00	4.62 ^a ±0.47	39.32 ^a ±5.70	56.05 ^a ±5.97
T ₃	6.71 ^b ±0.62	19.16 ^b ±0.80	13.92 ^d ±1.32	3.91 ^a ±0.36	48.86 ^b ±5.82	47.22 ^b ±5.66

Mean values in a row not sharing common superscripts differ significantly ($P<0.05$)

Table 2: Effect of Amla and Multienzyme on Serum Biochemical Profile (Mean ±Se) On Crossbred (T&D) Pigs

Group	Glucose(mg/dl)	Cholesterol(mg/dl)	ALT(IU/L)	AST(IU/L)	Serum protein(g/dl)
C	84.28 ^a ±1.36	47.77 ^a ±1.56	57.00 ^a ±2.14	67.00 ^a ±2.59	5.66 ^a ±0.07
T ₁	83.19 ^a ±1.24	44.83 ^{ab} ±1.71	44.48 ^b ±1.44	65.77 ^{ab} ±2.42	5.84 ^{ab} ±0.11
T ₂	76.04 ^b ±2.15	43.22 ^b ±1.45	41.71 ^b ±2.64	59.88 ^{bc} ±2.32	6.02 ^b ±0.15
T ₃	74.50 ^b ±2.20	41.77 ^b ±1.74	40.22 ^b ±3.20	54.73 ^c ±3.70	6.28 ^c ±0.21

Mean values in a row not sharing common superscripts differ significantly ($P<0.05$)

Discussions

RBC values in T₃ was significantly ($P<0.05$) different than control but there was no significant difference between C and T₁, T₂ and T₃. Similar finding was reported by Zhou *et al.* (2013) [11] who found that due to supplementation of Chinese Herbal Extract there was increased in plasma erythrocyte that received 1.0g/kg CHE. Similarly WBC count revealed a significant impact ($P<0.05$) showing maximum value in T₃ group while minimum value in group C and T₁. Similar finding was reported by Maneewan *et al.* (2012) [6] who found increasing the level of turmeric there was increased in WBC count in pigs. Amla (2%) and multienzyme (0.05%) supplemented T₃ group had significantly higher Hb value than the C, T₁ and T₂ groups. In respect of lymphocyte and granulocytes count there was increased percentage in T₃ group than the C, T₁ and T₂. Similar finding was observed by Yan *et al.* (2012) [10] where he found that HEM (herbal extract mixture) incorporation increase in lymphocyte count in weaned pigs. Monocytes count was found to be non-significant ($P<0.05$) between the experimental groups. There was significant decrease in serum glucose and cholesterol level in Crossbred (T&D) Pigs supplemented with 2% amla and 0.05% multienzyme. Minimum glucose and cholesterol were observed in T₃ group while the maximum was in Control group. Kalita (2012) [5] and Bora (2013) [3] reported similar findings where they found reduced level of serum glucose and cholesterol level in supplemented group than the control group. ALT and AST level was decreased in T₃ group than the control (C) group. Similar finding was observed by Kalita (2012) [5] and Bora (2013) [3] where they reported that decreased level of ALT and AST due to supplementation of turmeric and curry leaves powder in the experimental diet. The serum protein was increased in the T₃ group which was significantly ($P<0.05$) different between the groups and highest value was observed in T₃ group. Similar observation was reported by Ding *et al.* (2011) [4] due to supplementation of Chinese herbal medicine in the experimental diet.

Conclusion

The results of the study indicated that there was significant ($P<0.05$) increase in RBC, WBC, Hb and lymphocyte count in 2% amla and 0.05% multienzyme supplemented group (T₃) and no significant difference was observed in monocyte count in the experimental groups. There was significant decrease in serum glucose, cholesterol in the experimental group compared to control group. On the other hand there was marked increase in serum protein concentration. There was significant ($P<0.05$) decrease in ALT and AST values in 2% amla and 0.05% multienzyme supplemented groups compared to control group. It can be concluded that 2% amla and 0.05% multienzyme in crossbred (T& D) pigs through feed supplementation can be used to improve health condition as well as production of healthy pig.

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References

- Abesundara KJM, Matsui T, Matsumoto K. α -glucosidase inhibitory activity of some Sri Lanka plant extracts, one of which, *Cassia auriculata*, exerts a strong anti-hyperglycemic effect in rats comparable to the therapeutic drug acarbose. *J Agric. Food Chem.* 2004; 52:2541-2545.
- BIS Bureau of Indian Standards, Manik Bhawan, New Delhi, 1992
- Bora M. Supplementation of curry leaves (*Murraya koenigii*) on growth and nutrient utilization of grower pigs. M.V. Sc. thesis submitted to Assam Agricultural University, College of Veterinary Science, and Khanapara. Guwahati-22, Assam, 2013.
- Ding YY, Zhang CH, He XL, Huang L, Yin ZJ. Growth performances responses and indicators of gastrointestinal health in early weaned pigs fed Chinese Herbal Medicine Additives-supplemented diets. *Journal of animal and veterinary advances.* 2011; 12:1580-1587
- Kalita M. Effect of dietary supplementation of Turmeric Powder (*Curcuma longa*) on Growth performance of

- grower pigs M.V. Sc. thesis submitted to Assam Agricultural University, College of Veterinary Science, Khanapara, Guwahati-22, Assam, 2012.
6. Maneewan C, Yamauchi KE, Mekbungwan A, Maneewan B. Effect of turmeric (*Curcuma longa* Linnaeus) on growth performance, nutrient digestibility, hematological values, and intestinal histology in nursery pigs. *J Swine Health Prod.* 2012; 20(5):231-240.
 7. Mathur R, Sharma A, Dixit VP, Varma M. Hypolipidaemic effect of fruit juice of *Emblica officinalis* in cholesterol fed rabbits. *J Ethnopharmacol.* 1996; 50:61-68.
 8. Panda S, Kar A. Fruit extract of *Emblica officinalis* ameliorates hyperthyroidism and hepatic lipid peroxidation in mice. *Pharmazie.* 2003; 58:753-761.
 9. SAS. SAS user's guide: Statistics. Version 7.0. SAS Institute, Cary, NC, USA,
 10. Yan L, Meng QW, Kim IH. The effect of an herb extract mixture on growth performance, nutrient digestibility, blood characteristics and fecal noxious gas content in growing pigs. *Livest. Sci.* 2012; 145(2):189-195.
 11. Zhou TX, Zhang ZF, Kim IH. Effect of dietary Coptis Chinese herb extract on growth performance, nutrient digestibility, blood characteristics and meat quality in growing-finishing pigs. *Asian-Aust. J Anim. Sci.* 2013; 26:108-115.