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Efficacy of poly herbal liver tonic products in promoting growth performances in post-weaned ghungroo piglets

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Abstract

Twenty one growing Ghungroo piglets maintained at National Research Centre on Pig farm were used to study the efficacy of herbal formulation Yakrifit (Ayurvet Limited, India) on growth rate of post-weaned Ghungroo piglets. The animals were divided randomly into three groups (C, T_1 and T_2), so that there was no significant difference between the groups initially. The treatment groups were supplemented with the herbal formulations in fortnight interval for a period of one week. Weekly observations for performance parameters were taken up to 10 weeks. The results depicted that body weight attained after 10 weeks post-weaning was significantly higher in T_1 and T_2 as compared to control. The trend of body weight indicated that initially there was no difference between body weight of various groups, however after 2 weeks of treatment with Yakrifit liquid and bolus was significantly ($P<0.05$) better than the control group. Overall, the growth rate was significantly higher in all the treatment groups. Yakrifit bolus gives maximum profit followed by Yakrifit liquid.

Introduction

The aim of efficient pig production is to maximize growth, which can be aided by the inclusion of specific growth promoting substances to the feed. Yakrifit (Ayurvet Limited, India), a polyherbal product containing ingredients *Andrographis paniculata, Eclipta alba, Picrorhiza kurroa, Phyllanthus niruri, Tephrosia purpurea, Boerhaavia diffusa* are documented for their hepatoprotective, hepatoregenrative, hepatostimulant properties and well evident for growth enhancing activity (Kirtikar and Basu, 1975; Pradhan and Dey, 1996; Chandrasekaran et al., 2010). The efficacy testing of these two herbal preparations has been done extensively in ruminants; however, the similar reports in non-ruminants are scanty (Bhatt et al., 2009; Hadiya et al., 2009). Pre-weaning growth rate is majorly determined by the mothering ability of sows (Mavromichalis, 2010). Managemental and role of supplementation comes into play a major role after weaning only (Berkeveld et al., 2007). So, the present investigation has been designed to study of effect of growth promoters, viz., Yakrifit liquid and bolus in different physical forms on the growth performance of post-weaned Ghungroo piglets.

Materials and Methods

Twenty one growing piglets of four litters of Ghungroo breed maintained at farm complex, National Research Centre on Pig, Rani, Guwahati were selected for the experimental study. The animals were divided randomly into three groups, so that there was no significant difference between the groups initially (Table-1).

The growing piglet had been maintained under standard feeding regimen of farm. The grower ration (18% CP and 2700 Kcal/Kg ME) consisted of maize 55.00 parts, wheat bran 17.50 parts, soybean meal 15.00 parts, ground nut cake 10.00 parts, mineral mixture 2.00 parts and salt 0.50 part. The aforementioned feed was provided to the post-weaned piglets at the rate of 500 gms per day per piglet up to 0-4 weeks, 600 gms per day per piglet upto 5-8 weeks and 700 gms per day per piglet from 8 weeks onwards upto 10 weeks. This feed was offered to them twice a day at 10:00 AM and 4:30 PM. Each group of pigs was maintained in separate sheds and the management of all animals was done by single attendant in order to avoid any managemental differences. Water was offered to them *ad libitum.* The treatment groups were supplemented with the herbal formulations in fortnight

interval for a period of one week as per the dose schedule (Table 2).

Different growth parameters like initial body weight, final body weight, weekly body weight gain, total gain, total feed intake (Kg) etc. were recorded. During the experimental period the health condition were monitored. The Experiment was conducted from 1st December, 2009 to 28th February, 2010 for a period of 3 months. At the end of the experiment, the economics for offering supplementation to each group was calculated.

Results and Discussion

This protocol outlines to study the efficacy of herbal formulation Yakrifit liquid and bolus on growth related parameters and liver tonic activity in piglets. Both the products are claimed to be growth promoters by enhancing liver activity function in pigs. Liver tonics help to increase the secretion and flow of bile for better digestion. They help to maintain the liver parenchyma in healthy state and regulate liver functions like detoxification of metabolic products, toxic drugs and chemicals and treatment of hepatic dysfunction (Dwivedi et al., 1986). Yakrifit is a poly-herbal product containing ingredients such as *Andrographis paniculata, Eclipta alba, Picrorhiza kurroa, Phyllanthus niruri, Tephrosia purpurea, Tinospora cordifolia* and *Boerhaavia diffusa* etc., each with documented hepato-protective and hepato-stimulant properties. Yakrifit has earlier been found to counteract hepatopathy and restore liver functions in bovines (Pradhan and Dey, 1996). The present study indicates its value as an anabolic agent and a liver tonic- in promoting growth and performance in piglets. Weekly body weight (Kg) and average daily gain (gm/day) is depicted in the Table-3, 4. Overall, the body weight attained after 10 weeks post-weaning was significantly higher ($P<0.05$) in T_1 and T_2 as compared to control. The trend of body weight changes indicated that initially there was no difference between body weight of various groups, however after 2 weeks of treatment with Yakrifit liquid and bolus body weight attainment in piglets was significantly ($P<0.05$) better than the control group. The overall, the growth rate was significantly higher in all the treatment groups (Table 4). Unlike body weight in Table 1, here growth rate was significantly ($P<0.01$) higher in all the treatment groups as compared to control. During the entire experimental period the rectal temperature, pulse, respiration rate was observed and was found to be within the normal range. The daily appetite was good and gross appearance of the animals was found to be bright and active. There was no incidence of disease. The colour consistency of faeces and fecal output was normal as healthy animals. From the economic analysis (Table 5), it was found that Yakrifit bolus is maximum profitable followed by Yakrifit liquid. The herbal ingredients of Yakrifit have been documented as hepatoprotective and hepatostimulant by different authors. According to Choudhury (1968), the active constituents of *Andrographis paniculata*, viz. andrographolides increase the biliary flow and liver weight while Dwivedi et al. (1986) remarked that it sis effective in protecting liver damage. Mehra and Handa (1968) reported *Eclipta alba* with wedelolactone as the main active constituent, to be Antihepatotoxic. Of the other ingredients, *Picrorhiza kurroa* containing picrosides is a good stomachic and useful in jaundice while *Phyllanthus niruri* containing phyllanthin and hypophyllanthin, is an excellent remedy for jaundice (Kirtikar and Basu, 1975). Dymock et al. (1976) recorded that *Tephrosia purpurea* is useful in the treatment of liver disorders in general while Narendranath et al. (1985) remarked that it helps in eliminating toxins. *Tinospora cordifolia* is useful in the treatment of liver dysfunctions (Peer et al., 1990).

Table 1: Experimental design

S. No	Group Name	Animals/ group	Type of animals	Average body weight (Kg)	Treatment
1.	C	7	Piglets (2-3 months old)	6.50±0.31*	No Treatment
2.	T_1	7	Piglets (2-3 months old)	6.49±0.22*	Yakrifit liquid
3.	T_2	7	Piglets (2-3 months old)	6.56±0.22*	Yakrifit bolus

* Groups do not differ significantly

Table 2: Dose Schedule

Day of treatment	Group C	Group T_1	Group T_2
1st week	No Treatment	1 Yakrifit bolus/ piglet/ day	25 ml Yakrifit Liquid / piglet/ day
2nd- 3rd week	No Treatment	No treatment given	No treatment given
4th Week	No Treatment	1 Yakrifit bolus/ piglet/ day	25 ml Yakrifit Liquid / piglet/ day
5th-6th week	No Treatment	No treatment given	No treatment given
7th Week	No Treatment	1 Yakrifit bolus/ piglet/ day	25 ml Yakrifit Liquid / piglet/ day
8th-9th week	No Treatment	No treatment given	No treatment given
9th-10th week	No Treatment	1 Yakrifit bolus/ piglet/ day	25 ml Yakrifit Liquid / piglet/ day

Table 3: Weekly body weight (Kg) (Mean ± SE) of control and treatment groups (n=21)

Weeks	Control (n=7)	T_1 (Yakrifit liquid) (n=7)	T_2 (Yakrifit Bolus) (n=7)
0	6.50±0.31	6.49±0.22	6.56±0.22
1	7.14±0.21	6.99±0.44	7.30±0.21
2	7.43±0.22[a]	8.27±0.21[b]	8.06±0.32[b]
3	8.56±0.56[a]	9.43±0.31[b]	9.04±0.45[ab]
4	9.43±0.45[a]	11.05±0.65[b]	10.16±0.51[ac]
5	10.33±0.65[a]	12.05±0.29[b]	11.39±0.24[c]
6	11.93±0.32[a]	13.59±0.90[b]	13.24±0.88[b]
7	12.83±1.02[a]	14.88±1.02[b]	13.11±0.92[c]
8	13.40±1.03[a]	15.61±1.06[b]	13.87±1.04[a]
9	15.00±1.05[a]	16.21±1.09[b]	16.51±1.05[b]
10	16.47±1.20[a]	18.50±1.40[b]	18.64±1.30[b]
Overall	10.82±0.685[a]	12.10±0.811[b]	11.63±0.522[c]

[a-c] Columns with different superscripts depicts significant difference at 5% level of significance

Table 4: Weekly average daily gain (Mean ± SE) for various treatment groups (n=21) in gms/day

Weeks	Control (n=7)	T_1 (Yakrifit liquid) (n=7)	T_2 (Yakrifit Bolus) (n=7)
0-1	91.83±0.73[a]	106.31±0.18[b]	61.10±0.19[d]
1-2	126.53±0.21[a]	108.51±0.19[b]	108.94±0.16[b]
2-3	161.53±21.73[a]	140.67±24.79[b]	148.30±15.05[b]
3-4	124.35±0.07[a]	159.27±0.05[b]	189.67±0.03[c]
4-5	128.73±0.09[a]	157.94±0.02[b]	263.95±0.03[c]
5-6	232.98±14.12[a]	197.59±6.65[b]	193.88±4.17[b]
6-7	128.14±1.23[a]	128.57±0.04[a]	160.41±0.30[c]
7-8	91.12±0.12[a]	146.29±0.02[b]	154.49±0.03[b]
8-9	214.90±3.60[a]	322.20±1.95[b]	198.64±1.56[c]
9-10	224.55±0.06[a]	338.46±0.10[b]	265.98±0.60[d]
Overall	152.46±1.55[a]	180.58±3.12[b]	174.53±5.14[b]

[a-d] Columns with different superscripts depicts significant difference at 5% level of significance

Table 5: Economics for feeding trial

Particulars	Control	T_1 (Yakrifit liquid)	T_2 (Yakrifit bolus)
Final body weight attained (Kg/pig)	16.47	18.50	18.64
Initial body weight (Kg/pig)	6.50	6.49	6.56
Body weight gain/pig	9.97	12.01	12.08
Income = Cost of pork (Live weight gain basis) per pig@ Rs. 85.00 per Kg	847.45	1020.85	1026.80
Feed consumed per pig	40.6	40.6	40.6
Cost of feed per pig @ Rs. 12.00 per Kg	487.20	487.20	487.20
Rate of Growth promoters (Rs.)	0	Rs. 180 per litre	4 bolus strip-Rs. 22.00
Amount of Growth promoters used (Kg)	0	700 ml	28 bolus
Cost of growth promoter per pig	0	126.00	154.00
Cost of labour (Rs/pig)	180.00	180.00	180.00
Cost of medicine	35.71	35.71	35.71
Total expenditure	702.91	828.91	856.91
Net income per pig = Gross income – Expenditure	144.54	191.94	169.89
Percent monitory gain over control per pig	-	32.79%	17.54%

The combination of these herbs in polyherbal liver tonic formulation apparently retains and enhances their proven hepato-beneficial effects.

Conclusion

From the experiment this can be concluded that all the two product supplementations helped in improving the growth rate in piglets. The growth rate was found to be more in case of Yakrifit bolus supplemented group followed by Yakrifit Liquid.

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