Effect of iron dextran injection on growth performance of crossbred and desi piglets under farm and village conditions

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Abstract

Aim: To study the effect of iron dextran injection on growth performance of crossbred and desi piglets under farm and village conditions.

Materials and Methods: The experiments were conducted in Pig Breeding Farm, Ranchi Veterinary College, Ranchi and different villages on crossbred and desi preweaned piglets. The piglets were divided into three treatment groups as T_1 (control), T_2 (injected iron dextran @ 1 ml (50mg) I/M twice at 3rd and 14th days of age) and T_3 (injected iron dextran @ 2 ml (100mg) I/M once at 3rd day of age).

Results: The average body weight of crossbred piglets in farm condition of T_1, T_2 and T_3 groups at weaning (8 week) were 7.162±0.365, 9.985±0.281 and 9.572±0.295 kg, respectively. The piglets of T_2 group showed better performance over T_3 and T_1 groups in farm and village conditions on crossbred and desi piglets.

Conclusion: On the basis of present findings it may be concluded that iron dextran (50mg/ ml) injection should be given to all piglets @ 1 ml I/M during preweaning period at 3rd and 14th day of age for better growth of piglets.

Keywords: Desi and crossbred Piglets, Growth, Iron dextran injection, Farm and Village conditions.

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Introduction

Pig is associated with human civilization since long back as Barah Awatar mentioned in holy book "Vishnu Puran". Even today in some part of the country, especially tribal dominated state/ region, it is known as festive food. As such, pig farming is an age old practice in our country. In plateu region of Jharkhand, it is very popular among tribal & socio-economically backward people in rural and semi-urban areas. Pig farming is very lucrative and easy source of regular income as fast growing, important source of animal protein, short generation interval and better feed conversion efficiency with higher dressing percentage. Piglets are traditionally weaned at about 56 days of age, when they can utilize as feed themselves of both animal and plant origin and have developed immunity to resist infection. However, 15 to 20 % of total piglets born do not survive till weaning age. The highest pig mortality upto 80 % of total death occurs during pre-weaning period (0-8 weeks) specially, during first week of life. The preweaning mortality was up to 21 % in 2-3 weeks of age **[**1**].** The piglet anaemia, caused by iron deficiency, is one of the major reasons of preweaning mortality. When a piglet is born, it has sufficient iron to last for 3-7 days, after that sufficient iron must be supplied either through parenteral or oral sources. Under natural conditions, baby pigs may obtain sufficient iron from soil, but most pigs today are farrowed and reared indoors and thus have no access to soil. Unless iron is obtained from another source, the pigs may die. Workers [2] observed higher body weight gain with iron dextran injection in suckling piglets. Keeping in view the above ideas, the present study has been planned to see the effect of different doses of iron dextran (50 mg/ ml) injection in preweaning piglets in farm and village conditions.

Materials and Methods

The experiments were conducted in farm viz. Pig Breeding Farm, Ranchi Veterinary College, Ranchi and different villages viz. Kuchu, Borea and Garu. In

Table-1. Average body weight (kg) at various ages in different treatment groups under farm condition in crossbred piglets

Age (week)	Different treatment groups		
	T_1	T_2	T_3
At birth	0.998 ± 0.032(56)	0.977 ± 0.035(57)	0.964 ± 0.032(58)
1st	2.048 ± 0.057(56)	2.096 ± 0.064(55)	2.002 ± 0.061(57)
2nd	2.892 ± 0.088(56)	3.137 ± 0.095(54)	2.953 ± 0.098(56)
3rd	3.655 ± 0.121(56)	4.152 ± 0.111(54)	3.943 ± 0.122(56)
4th	4.349 ± 0.149 [a](54)	5.204 ± 0.130 [b](54)	4.923 ± 0.160 [b](56)
5th	4.898 ± 0.196 [a](54)	6.205 ± 1.076 [b](54)	5.927 ± 0.188 [b](55)
6th	5.566 ± 0.244 [a](54)	7.428 ± 0.197 [b](53)	7.049 ± 0.223 [b](55)
7th	6.357 ± 0.314 [a](54)	8.730 ± 0.247 [b](53)	8.364 ± 0.248 [b](55)
8th	7.162 ± 0.365 [a](52)	9.985 ± 0.281 [b](53)	9.572 ± 0.295 [b](55)

Mean under same superscripts in a row did not differ significantly. Figures in parentheses indicate number of observations.

farm condition, a total of 232 pre-weaned piglets from 32 different sows (171 preweaned crossbred piglets from 21 sows and 61 desi piglets from 11 sows) were taken and divided into three treatment groups as T_1, T_2 and T_3. All piglets of different experimental groups were fed the standard farm diet consisting of crushed maize (67%), G.N. cake (20%), wheat bran (5%), fish meal (7%), salt (0.5%) and Min. Mixture (0.5%) + Rovi mix (20g). In village condition, a total of 82 pre-weaned crossbred piglets from 10 different sows were taken and divided into three treatment groups as T_1, T_2 and T_3. All piglets of different experimental groups were fed the feed available with the farmers in the village condition. Piglets of first group (T_1) were kept as control, second group (T_2) were injected iron dextran @ 1 ml (50 mg/ ml) I/M twice at 3rd and 14th days of age and third group (T_3) were injected iron dextran @ 2 ml I/M once at 3rd day of age in both conditions viz. farm and village. The guidelines and rules of Animal Ethics Committee were followed during the experimental period. The body weight of all piglets was taken at birth and at weekly interval upto 8th weeks of age with the help of spring balance. Statistical analysis of data collected during the experiment were analysed [3].

Results and Discussion

The average body weight of crossbred piglets in farm condition for different treatment groups during preweaning period are presented in Table-1. The difference in body weights of the piglets in T_2 and T_3 groups were non-significant. The average body weights of T_1, T_2 and T_3 groups at weaning (8th week) were 7.162±0.365, 9.985±0.281 and 9.572±0.295 kg, respectively. The body weight of the rabbit of T_2 and T_3 group were significantly ($P<0.05$) higher than T_1. But T_2 & T_3 were non-significant among themselves. The average body weight of crossbred piglets for T_2 group was higher than T_3 and T_1 groups during 3rd week of age. Almost similar findings were reported by Worker [4] who also reported significantly higher body weight of piglets injected with 200 mg of Iron in piglets weaned at third week of age. The parenteral and oral Iron supplemented groups of piglets showed significantly higher body weight than unsupplemented groups **[**2,5,6**].** Workers [7] also observed that Fe injected pre-weaning affected initial post-weaning performance. From 4th week onward the body weight was significantly ($p<0.01$) lower in T_1 control group than T_2 and T_3 groups (Table-1). The poor growth rate in T_1 group might be due to deprived of Iron through parenterally and hence low haemoglobin level; anorexia and diarrhoea also be attributed cause. Workers [8] also reported significant increase in the body weights of all treated piglets in comparison to their respective iron-deprived groups. Growth rate was interfered when haemoglobin level drops to about 5 g% [9].

The body weight of desi piglets under farm conditions for different treatment groups are presented in Table-2. The parenteral administration 50 mg of Iron at 3rd and 14th days of age (T_2) and 100 mg of Iron at 3rd days (T_3) showed, significantly ($p<0.01$) higher body weight gain from 4th to 8th week of age over untreated group (T_1). However, T_2 had shown significantly ($p<0.01$) higher body weight from 1st to 3rd week of age over T_1 and T_3. The body weights of piglets on untreated groups were almost similar to the findings of Worker [10] who reported 3.8 to 4.0 kg body weight at 60 days of age. The responses of Iron dextran injection for desi piglets were similar to crossbred piglets.

Table-2. Average body weight (kg) at various ages of different treatment groups in desi piglets under farm condition.

Age (week)	Different treatment groups		
	T_1	T_2	T_3
At birth	0.709 ± 0.039(21)	0.685 ± 0.406(20)	0.685 ± 0.043(20)
1st	1.070 ± 0.053 [a](20)	1.331 ± 0.068 [b](19)	1.105 ± 0.043 [a](19)
2nd	1.505 ± 0.082 [a](19)	2.116 ± 0.111 [b](19)	1.631 ± 0.750 [a](19)
3rd	1.900 ± 0.108 [a](19)	2.631 ± 0.171 [b](19)	2.258 ± 0.126 [a](19)
4th	2.131 ± 0.113 [a](19)	3.026 ± 0.179 [b](19)	2.800 ± 0.146 [b](19)
5th	2.333 ± 0.098 [a](18)	3.395 ± 0.225 [b](19)	3.205 ± 0.172 [b](19)
6th	2.523 ± 0.167 [a](13)	3.826 ± 0.243 [b](19)	3.774 ± 0.185 [b](19)
7th	3.015 ± 0.240 [a](13)	4.389 ± 0.259 [b](19)	4.353 ± 0.200 [b](19)
8th	3.454 ± 0.282 [a](13)	5.021 ± 0.311 [b](19)	4.921 ± 0.249 [b](19)

Mean under same superscripts in a row did not differ significantly. Figures in parentheses indicate number of observations.

Table-3. Average body weight (kg) at various ages in different treatment groups under village condition in crossbred piglets.

Age (week)	Different treatment groups		
	T_1	T_2	T_3
At birth	0.919 ± 0.037(26)	0.878 ± 0.045(28)	0.936 ± 0.043(28)
1st	1.813 ± 0.078(23)	1.836 ± 0.099(25)	1.768 ± 0.096(25)
2nd	2.574 ± 0.111(23)	2.800 ± 0.173(24)	2.596 ± 0.132(24)
3rd	3.252 ± 0.178(23)	3.822 ± 0.191(23)	3.437 ± 0.165(24)
4th	3.967 ± 0.223 [a](21)	4.856 ± 0.221 [b](23)	4.336 ± 0.217 [ab](22)
5th	4.490 ± 0.268 [a](20)	5.873 ± 0.289 [b](22)	5.009 ± 0.262 [ab](22)
6th	4.910 ± 0.269 [a](20)	6.709 ± 0.281 [b](22)	5.848 ± 0.287 [c](21)
7th	5.450 ± 0.336 [a](20)	7.732 ± 0.352 [b](22)	6.800 ± 0.328 [c](21)
8th	5.900 ± 0.394 [a](20)	8.509 ± 0.373 [b](22)	7.709 ± 0.354 [b](21)

Mean under same superscripts in a row did not differ significantly. Figures in parentheses indicate number of observations.

The average body weight of crossbred piglets for different treatment groups under village conditions are presented in Table-3. The parenteral injection of 50 mg of Iron on 3rd and 14th day (T_2) and 100 mg of Iron parenterally (T_3) on 3rd day in crossbred piglets indicated non-significant effect with that of untreated group (T_1). The effect on body weight for T_2 and T_3 were also non-significant from birth to 3rd week of age. The piglets with T_2 group showed significantly ($p<0.01$) higher body weight than control during 4th to 8th week of age. However, T_2 group of piglet showed significantly ($p<0.01$) higher body weight than T_3 during 6th and 7th week. It is very clear from the findings that 50 mg of Iron injection on 3rd and 14th day (T_2) certainly showed better performance over 100 mg Iron injection on 3rd day (T_3) and untreated control (T_1) groups. No information is available for the performance of Iron dextran injection on crossbred piglets in village condition. The performance of crossbred piglets on different treatments under farm condition was better than village condition.

Supplementation of 50 to 150 ppm Fe in the grower and finisher diet increased the daily gain of growing pig [11]. The piglets injected with iron dextran injection had better growth performance than supplemented with iron in paste form and drinking water [12]. Combination of L-Carnitine + Fe supplementations increased the growth performance of growing pig whereas supplementation of L-Carnitine without Fe does not have any effect on growth performance [13]. Above findings are almost similar with the findings of present study. Workers [14] also reported that supplementation of iron and copper during last week of gestation was beneficial for maintaining normal haemoglobin levels and total erythrocyte counts in new born piglets which may be beneficial in the growth performance of the piglets.

Conclusion

On the basis of present findings, it may be concluded that iron dextran injection should be given to all piglets @ 1 ml I/M during preweaning period at 3rd and 14th day of age for better growth.

Author's contribution

Raghuvir Ranjan carried out the experiment. Chandra

Mani Prasad designed the experiment, guided during the experiment and helped in drafting of manuscript. Sanjit Kumar Singh analysed data, sample and wrote the final draft of manuscript. All authors read and approved the final manuscript.

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Competing interest

Authors declares that they have no competing interest.

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