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A Study on Effect of Anti Toxic Nutrient (ATN) in productive and reproductive performance of pigs

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Abstract: *The aim of the study was to investigate the influences of supplementation of dietary inclusion of Anti Toxic Nutrient (ATN) to the normal concentrate feed and to study the production and reproduction performances of pig maintained at institute farm of ICAR-National Research Centre on Pig, Rani, Guwahati, Assam by supplementing the Anti Toxic Nutrient (ATN) @ 0.3% in their normal feed. The animals were maintained in the standard management conditions with regard to breeding, feeding, housing and health care. The aim of the study is to find out the survivability, body weight gain, growth rate and age at puberty of Crossbred (Crosses between Hampshire and Ghungroo), Duroc and Hampshire piglets under the hot and humid climatic condition of Assam. The ATN was provided from 17-A, Chinar Drive, DLF Farms, Chattarpur, New Delhi-110074, India. The Least Square analysis of variance revealed highly significant (P<0.01) effect of body weight gain from 16th week to 21st week of the experiment and significant effect from 1st week to 3rd week and then 11th week to 15th week of experiment between ATN treated and control group. The feed conversion ratio and average daily gain also shows the highly significant effect (P< 0.01).*
Key words: *ATN, Crossbred, Duroc, Growth Performance, Hampshire,Piglets.*

I. Introduction

Pig is one of the most important occupations of rural society especially for the tribal masses of India. Pigs were valued as a source of meat and often fed house hold food waste if kept on a homestead. The activities on a pig farm depend on the husbandry style of the farmer and range from very little intervention (as when pigs are allowed to roam villages or towns and dispose of garbage) to intensive systems where the pigs are housed in a building for the majority of their lives. The present study was planned to find out the effect of Anti Toxic Nutrient (ATN) @ 0.3% as a feed supplement on growth performance and age at puberty in Crossbred, Duroc and Hampshire pigs. The ATN is a unique combination of naturally occurring phyllosilicates, zeolite, clay and small amount of charcoal, processed using a specific technology with addition of certain patented activators. It is 100% natural substances and safe for animal and human consumption. ATN provides a complete solution to restore the balance of nature. ATN is not simply a mix of components but it is a single production that is working as one rather than components combining the effects. ATN contains Zeolites which are crystalline, hydrated aluminosilicates of alkaline earth cations having an infinite, open, three-dimensional structure and are able to gain and lose water reversibly and exchange extra framework cations without changing crystal structure. Clinoptilolite is the most abundant member of this group (Mumpton 1999 and Papaioannou et al. 2005).

Hydrated aluminosilicates, both clays and zeolites, have been used in a broad array of applications in animal health and nutrition. The addition of hydrated aluminosilicates to the diet of food animals, at rates between 5 and 50 g/kg has been reported to improve growth and feed utilization and reduce the incidence and severity of diarrhea (Vrzgula and Bartko 1984 and Pond 1995 and Mumpton, 1999). Many studies have demonstrated that hydrated aluminosilicates, commonly used as anticaking agents for animal feeds, significantly diminish the adverse effects of aflatoxins in animals (Harvey et al. 1993 and Pimpukdee et al. 2004).

II. Materials And Methods

A total of 15 piglets of Hampshire, Duroc and Crossbreds (Crosses between Hampshire and Ghungroo) were taken at the age of 3-4 month of age and the weight of the piglets were taken with electronic balance on the starting day of experiment and then on weekly basis up to 5th month of the experiment. All the piglets were dewormed at three weeks of age. The economic traits viz., individual weight and growth rate (GR) were recorded. The age of first puberty were also recorded. The grower rations provided to the pigs were as follows: Maize= 67.8, Wheat bran=6.7, Ground nut cake= 12.5, Soya bean= 12.5, Salt=0.5 and 0.3% ATN were added to this concentrate mixture along with mineral mixture 2kg. ATN was used to enhancement of performance of animals. It can increase milk production, more meat, better quality of produce, toxin free produce, more offspring, short service period, reduced uses of antibiotic, no antibiotic residue in animals. It reduces the

mortality rate and increases the number of piglets born alive, reduces food consumption-better food conversion, reduces the time of fattening and reduces the incidence of diarrhea.

III. Statistical Analysis:

Statistical analysis was carried out by using SPSS 15 software. A least square model as suggested by Harvey (1987) to estimate the effect of treatment on weekly body weight, monthly body weight gain and feed conversion ratio and was used by using the model; $Y_{ij}=\mu+T_i+e_{ij}$, Where Y_{ij}=is J^{th} observation of dependent factor of i^{th} parity, μ is overall mean, T_i is effect of i^{th} treatment and e_{ij} is the random error with standard assumptions.

IV. Results And Discussions

The estimated individual weight was recorded from the first month of experiment to the fifth month of experiment and it was documented in table 1, table 2, table 3, table 4 and in table 5 respectively. The average daily gain for ATN treated pigs were 0.32±0.05, 0.39±0.11, 0.46±0.13, 0.62±0.17 and 0.50±0.14 kg for ATN treated group on monthly basis. The Average daily gain for control group was 0.24± 0.03, 0.31±0.11, 0.37±0.14, 0.48± 0.18 and 0.40± 0.16 on monthly basis up to 5^{th} month of experiment. The feed conversion ratio (FCR) for ATN treated pigs were 3.89, 3.32, 3.35, 2.94 and 3.99 respectively. The feed conversion ratio (FCR) for control groups were 4.72, 4.17, 4.12, 3.79 and 4.99 on monthly basis up to 5^{th} month of experiment. The growth rate of the treatment and control groups were illustrated in figure 1. Prvulovic et al 2009 and 2012 found the similar effect of ATN regarding body weight gain and FCR in pigs. Experiments with animals fed hydrated aluminosilicates in their diets have given variable effects on feed intake, feed conversion efficiency, and growth rate. The previous studies showed that the supplementation with hydrated aluminosilicates had positive effects on pigs (Vrzgula and Bartko 1984, Papaioannou et al. 2004 and Prvuloviæ et al. 2009) and poultry (Harvey et al. 1993). Contrary to these results, some other authors found that body weight gain was unaffected by hydrated aluminosilicates (Elliot and Edwards 1991, Öztürk et al. 1998). Concentration and type of hydrated aluminosilicates supplemented to the diet could be the most important factors affecting hydrated alumino-silicates. Animal species, environmental conditions and nutritional level also could interfere with these effects.

V. Conclusion

Results obtained in the present investigation confirmed that addition of 0.3%ATN with concentrated feed offered to the pigs shows a positive signs for growth rate, feed conversion efficiency and age at puberty. Further researches are proposed to see the later part of reproduction and carcass quality of the ATN treated pigs.

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Table 1: Body Weight (On first month)

Group	Starting weight on 8/02/15	Wk 1 On 15/02/15	Wk 2 On 22/02/15	Wk 3 on 1/03/15	Wk 4 on 07/03/15	ADG (g/d)	FCR
ATN Treatment Group	26.62±0.72[a]	28.85±1.07[a]	31.03±1.53[a]	32.23±1.43[a]	35.62±1.68	0.32±0.05[A]	**3.89**[A]
Control Group	18.85±2.92[b]	20.32±3.11[b]	21.39±3.16[b]	23.00±3.19[b]	25.07±3.54	0.24±0.03[B]	**4.72**[B]

A,B= Highly significant at 1% level
a,b= Significant at 5% level

Table 2: Body Weight (On second month)

Group	Starting weight on 07/03/15	Wk 5 On 15/03/15	Wk 6 On 22/03/15	Wk 7 on 29/03/15	Wk 8 on 05/04/15	ADG (g/d)	FCR
ATN Treatment Group	35.62±1.68	38.87±1.82	42.24±2.26	45.53±2.25	48.7±2.34	0.39±0.11[A]	**3.32**[A]
Control Group	25.07±3.54	36.87±1.82	39.52±1.88	42.42±2.05	45.18±2.28	0.315±0.11[B]	**4.17**[B]

A,B= Highly significant at 1% level

Table 3: Body Weight (On third month)

Group	Starting weight	Wk 9 On 12.04.15	Wk 10 On 19.04.15	Wk 11 on 26.04.15	Wk 12 on 04.05.15	ADG (g/d)	FCR
ATN Treatment Group	48.7±2.34	52.08±2.50	56.23±2.68	60.92±2.54[a]	65.69±2.49[a]	0.4652±0.13[A]	3.35[A]
Control Group	45.18±2.28	48.29±2.24	51.77±2.19	55.29±2.09[b]	59.29±2.24[b]	0.3776±0.14[B]	4.127[B]

A, B= highly significant at 1% level
a,b= Significant at 5% level

Table 4: Body Weight (On fourth month)

Group	Starting weight	Wk 13 On 11.05.15	Wk 14 On 18.05.15	Wk 15 On 25.05.15	Wk 16 On 01.06.15	Wk 17 On 08.06.15	ADG (g/d)	FCR
ATN Treatment Group	65.69±2.49	68.62 ±2.53[a]	71.31±2.56[a]	73.77 ±2.51[a]	76.38±2.53[A]	78.92±2.58[A]	0.62 ±0.179[A]	2.947[A]
Control Group	59.29±2.24	60.86± 2.23[b]	62.71±2.22[b]	64.71±2.09[b]	66.14±2.12[B]	68.14±2.14[B]	0.48±0.182[B]	3.79[B]

A,B= Highly significant at 1% level
a,b= Significant at 5% level

Table 5: Body Weight (On fifth month)

Group	Starting weight	Wk 18 On 15.06.15	Wk 19 On 22.06.15	Wk 20 On 29.06.15	Wk 21 On 06.07.15	ADG (g/d)	FCR
ATN Treatment Group	78.92±2.58	83.08± 2.55[A]	88.38±2.57[A]	93.92±2.47[A]	100.15±2.28[A]	0.500±0.14[A]	3.99[A]
Control Group	68.14±2.14	71.57±2.26[B]	76.00±2.14[B]	80.71±1.98[B]	86.43±2.10[B]	0.400±0.16[B]	4.99[B]

A, B= Highly significant at 1% level a,b= Significant at 5% level

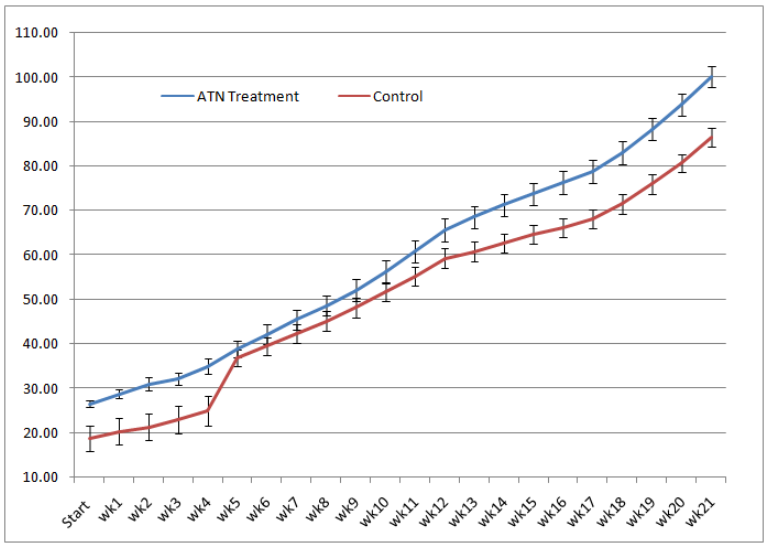

Fig 1: Growth rate (from beginning to fifth month) of the ATN experiment