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Influence of probiotic supplementation on the growth performance of Large White Yorkshire pigs

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Abstract

An experiment was conducted in a commercial pig farm, with 32 Large White Yorkshire piglets which was subjected to two feeding regimens viz., swill feed and swill feed supplemented with probiotics comprising of sixteen weaned piglets in each group to study the production performance under monsoon maritime climate. In the second group, a commercial probiotic "Biobloom" was fed @ 5g / pig / day . Body weight, body weight gain, feed intake and feed efficiency of the experimental animals were recorded at fortnightly intervals. The trial was conducted from 56 to 180 days of age. The results revealed that there was a highly significant difference in body weight between the treatment groups ($P<0.01$) at the end of the trial, 65.88 ± 1.82 kg for probiotic fed group and 55.25 ± 2.18 kg for swill feed fed group. The average daily body weight gain was higher ($P<0.01$) in probiotic treated group (0.66 ± 0.08) than swill feed fed group (0.48 ± 0.06). There was no significant difference in feed intake between two experimental groups. The feed conversion efficiency in swill feed supplemented with probiotics was better (6.10 ± 0.18) when compared to swill feed fed group (7.42 ± 0.41). It was concluded that swill feed supplemented with probiotic fed group fared better in terms of body weight gain and feed conversion efficiency. Therefore, it is obvious from the study that the probiotic feeding could play an imminent role in the swine growth.

Keywords : growth, Large White Yorkshire pigs, probiotic supplementation, swill feed

INTRODUCTION

In most of the pig enterprises feed alone accounts for nearly 80 per cent of the total cost of production (Banerjee, 1998). Utilizing the locally available food materials and efficient use of agricultural by-products and food waste offer the best possibility of reducing the cost of production of pork to a greater extent. Probiotics, which has been defined by FAO/ WHO as " live microorganisms which when administered in adequate amount confer a health benefit on host " .The probiotics supplementation is considered as a viable option in overcoming the negative effects of swill feeding. Probiotics are viable microbial cultures that purportedly increase the gastrointestinal population of beneficial bacteria, thereby improving the growth performance of animals (Estienne *et al.*, 2005). Hence this study was designed to assess the effect of probiotic supplementation with swill on the growth performance of Large White Yorkshire (LWY) pigs in a commercial farm.

MATERIALS AND METHODS

An experiment was designed to study the influence of probiotic supplementation on the growth performance of Large White Yorkshire pigs. A total of 32 Large White Yorkshire piglets weaned at the age of 56 days were randomly selected based on their body weights and divided into two groups, each containing 16 piglets as follows: Group - I : Fed with swill feed alone as control and Group- II : Fed with swill feed supplemented with probiotics. Swill feed composed of kitchen waste and table waste without any treatment (Table 5). Piglets in Group II was fed with swill feed supplemented with commercial probiotic "Biobloom" (Sarabhai Pharmaceuticals) was fed @ 5g / pig / day, a total of 80 g for 16 pigs per day after mixing it with swill feed thoroughly. Swill feed was collected from the students hostel, hotels and restaurants in and around the farm. Animals were fed with swill feed two times a day (morning 10-11am and in evening by 3-4pm). Details of the proximate composition of feed samples on dry matter basis is given table 1. Both groups were fed *adlibitum*. The data on feed intake, body weight gain, fortnightly body weight, and feed conversion efficiency were recorded. Data collected in this experiment were subjected to student 't' test for the interpretation of results (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

Body weight

It was observed that pigs fed with probiotic supplemented swill feed (Group-II) recorded significantly higher body weight at second and sixth fortnights ($P<0.05$) and seventh and eight fortnights ($P<0.01$) of the study period over unsupplemented one (Group-I). At the

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Table 1. Proximate composition (%) of swill feed on DM (Dry matter) basis

Moisture	75.84 ± 1.95
Crude protein	14.10 ± 1.48
Crude fibre	6.02 ± 0.97
Ether extract	17.55 ± 1.93
Total ash	5.90 ± 0.85
N.F.E	56.43 ± 1.71
Acid insoluble ash	1.01 ± 0.02

end of the experiment, there was 10.25 kg difference in favour of probiotic supplemented group (Table 2). In a similar study on the influence of probiotic on growth performance of piglets Nousiainen (1992) recorded improved post weaning growth in probiotic supplemented piglets. Similarily Bohmer *et al.* (2006) Jeresiunas *et al*. (2006) and Casey *et al.* (2007) also recorded significantly higher body weight in probiotic supplemented piglets.

Body weight gain

The average daily gain though not statistically different between the treatment groups from first to fifth fortnight of the study, sixth and seventh fortnight witnessed significantly ($P<0.05$) better gain for group II and the probiotic supplemented group had a significantly ($P<0.01$) higher average daily gain of 0.67 ± 0.02 kg at eighth fortnight compared to unsupplemented swill fed group (Table 3). This is in agreement with the findings of Suita (1990), Gamko and Baladzhaev (1993), Jost and Bracher (1999), Jasek *et al.* (1994a,b) and Bontempo *et al.* (2006). On the contrary Risley *et al.* (1992) observed inconsistent improvement in weight gain of probiotic supplemented piglets, while Taras *et al.* (2007) observed insignificant increase in body weight gain of probiotic supplemented piglets.

Feed intake

The difference in average daily feed intake (Table 4) among the two experimental groups *viz.,* probiotic treated and untreated groups was found to be not significant. This was in agreement with the findings of Jasek *et al.* (1994a,b) who observed no difference in feed intake between probiotic treated and untreated groups. However, contrary to the present finding, Jost and Bracher (1999), Van Heugten *et al.* (2003) and Anna *et al.* (2005) observed increased feed intake in probiotic supplemented group than the unsupplemented group.

Feed efficiency

The difference in feed efficiency between probiotic supplemented and unsupplemented groups in the present study was found to be significantly ($P<0.01$) higher (Table 5). In agreement with this finding Jasek *et al.* (1994) observed more efficient feed conversion in probiotic supplemented piglets than the unsupplemented piglets. However Risley *et al.* (1992) observed inconsistent improvement in feed gain ratio in probiotic supplemented groups. In contrast to the present finding Jost and Bracher (1999) reported no significant difference in feed conversion efficiency between probiotic supplemented and unsupplemented groups.

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Table 2. Body weights (kg) of white yorkshire pigs that were fed with swill feed supplemented with probiotic at different fortnightly intervals of study. Values are mean ± S.E.

Fortnight	Group I (Swill fed group)	Group II (Swill feed supplemented with probiotic)	t	P
1	16.88^{a} ±0.80	18.50^{a} ±0.77	1.45^{ns}	0.15
2	20.50^{a} ±0.90	23.13^{a}±0.90	2.05*	0.04
3	25.38^{a} ±1.47	28.31^{a} ±1.23	1.53^{ns}	0.13
4	31.19^{a} ±1.46	33.88^{a} ±1.46	1.30^{ns}	0.20
5	36.81^{a} ±1.68	40.63^{a} ±1.76	1.56^{ns}	0.12
6	41.75^{a} ±1.67	47.94^{a}±1.87	2.46*	0.01
7	48.00^{a} ±2.19	56.19^{a}±1.86	2.84**	0.00
8	55.25^{a} ±2.18	65.50^{a}±1.82	3.60**	0.00

Different superscripts in a row indicates that values differ significantly ; ns Not significant
* Significant at five per cent level (P<0.05) ; ** Significant at one per cent level (P<0.01)

Table 3. Average daily gain (kg) of white yorkshire pigs that were fed with swill feed supplemented with probiotic at different fortnightly intervals of study. Values are mean ± S.E.

Fortnightly Interval	Group I (Swill fed group)	Group II (Swill feed supplemented with probiotic)	t	P
1	0.34^{a}±0.03	0.43^{a} ±0.03	1.84	0.07^{ns}
2	0.32^{a} ±0.01	0.33^{a} ±0.01	0.72	0.47^{ns}
3	0.34^{a} ±0.05	0.37^{a} ±0.03	0.43	0.66^{ns}
4	0.41^{a} ±0.03	0.40^{a} ±0.02	0.27	0.78^{ns}
5	0.39^{a} ±0.02	0.48^{a} ±0.03	1.92	0.06^{ns}
6	0.40^{a} ±0.01	0.52^{a} ±0.04	2.74	0.01*
7	0.48^{a} ±0.04	0.61^{a} ±0.02	2.28	0.02*
8	0.52^{a} ±0.03	0.67^{a} ±0.02	3.19	0.00*

Different superscripts in a row indicate that values differ significantly ; ns Not significant ;
* Significant at five per cent level (P<0.05); ** Significant at one per cent level (P<0.01)

Table 4. Average daily feed intakes (kg) of different treatment groups of white yorkshire pigs

Feeding Regimens	**Average daily feed intake (kg) (X ± S.E.)**
I - Swill feed	2.85 ± 0.26
II -Swill feed supplemented with Probiotics	2.88±0.26
F value	0.03^{ns}

NS- Not Significant

Table 5. Fortnightly feed efficiency of white yorkshire pigs that were fed with swill feed supplemented with probiotic at different fortnightly intervals of study. Values are mean ± S.E.

Fortnightly interval	Group I (Swill fed group)	Group II (Swill feed supplemented with probiotic)	t	P
1	5.99^{a} ±0.52	5.94^{a} ±0.51	0.07	0.94^{ns}
2	7.59^{a} ±0.37	7.40^{a} ±0.36	0.36	0.71^{ns}
3	7.93^{a} ±0.63	7.91^{a} ±0.62	0.03	0.97^{ns}
4	8.10^{a} ±0.52	7.66^{a} ±0.40	0.65	0.52^{ns}
5	7.18^{a} ±0.39	7.22^{a} ±0.39	0.07	0.94^{ns}
6	7.63^{a} ±0.44	6.53^{b}±0.27	2.11	0.04*
7	7.30^{a} ±0.54	5.54^{b}±0.18	3.08	0.00**
8	7.13^{a} ±0.26	6.06^{b}±0.16	3.42	0.00**

Different superscripts in a row indicate that values differ significantly ; ns Not significant
* Significant at five per cent level (P<0.05) ; ** Significant at one per cent level (P<0.01)

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