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Effects of Feeding Graded Levels of Brewers Dried Grains with or without Probiotics Supplementation in Replacing Groundnut Cake in The Diet of Weaner Rabbits

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ABSTRACT
A total of Fifty four (54) weaner rabbits (*Oryctalogus cunniculus*) of similar body weight and age were used in this experiment to determine the effects of replacing Brewers dried grains (BDG) for Groundnut Cake (GNC) with or without probiotics supplementation. A 3x3 factorial experiment was adopted such that there were (3) replacement levels (0, 30 and 60%) of BDG for GNC by three supplement levels (no supplement, probiotics A and probiotics B which lasted for a period of eight (8) weeks.The result showed that increase in the inclusion level of BDG had significant effect (P<0.05) on the feed intake and feed to gain ratio, but had no effect (P>0.05) on the rate of weight gain. The Nitrogen intake and Nitrogen digested showed significant effect (P<0.05) as the level of BDG was increased but had no effect (P>0.05) on the faecal Nitrogen and Nitrogen Digestibility. The Cost of feed per kg, cost of rearing, selling price showed no significant effect (P>0.05) on the level of inclusion of BDG while the gross profitability and feed cost efficiency showed significant effect (P<0.05) on the inclusion of BDG. There was a significant effect (P<0.05) of the supplementation of the feed intake and feed to gain ratio but no significant effect (P>0.05) of the supplementation was observed on the rate of weight gain, Supplementation had significant effect (P<0.05) on Nitrogen intake and Nitrogen digested but had no significant effect (P>0.05) on the faecal Nitrogen and Nitrogen digestibility. Supplementation had significant effect (P<0.05) on the Gross profitablility and cost efficiency but had no significant effect (P>0.05) on the cost of feed, cost of rearing, selling price. Weaner Rabbit fed probiotics B significantly preformed better than weaner Rabbits fed probiotics A. Taking feed intake, feed to gain ratio, nitrogen intake and nitrogen digested as consideration for the performance of the rabbits, it is recommended that 30% inclusion of BDG supplemented with probiotics A is the best replacement level of GNC. Probiotics A had a better feed to gain ratio and nitrogen digestibility than probiotics B.
Key words: BDG, probiotics, Rabbit, growth performance, nitrogen digestibility, cost of feed.

INTRODUCTION

One of the solutions to the present animal intake deficit in developing economies lies in the intensive utilization of livestock with short generation interval (Adeyemi, 2005). Protein source for livestock feed are expensive and in most cases also directly required and competed far by man as food. Meeting the protein needs of livestock has continued to be a critical factor in the production of quality animal feeds.

Rabbit is a paradiquatic example of micro-livestock and short cycle animal whose meat is widely accepted. Rabbit has elicited much interest because it is easy to manage, highly prolific, breader, efficient converter of plant nutrient and requires little capital outlay. Rabbit meat is white, fine grained, low in fat and calorie value, rich in protein and some mineral and vitamins (Aduku *et al.,* 1990).

Feed cost is always the longest single item expenditure in livestock production and protein source are among the ingredients used for livestock feeds. Brewer's dried grains (BDG) is a by-product of the brewery industry which is available and not directly required by man because it is a waste.

The major limitation to the use of BDG as a plant protein source is its high fiber content (Omudike, 1993) further processing or use of additives that can be breakup non starch polysaccharides in BDG into easily digestible smaller polymer may improve its nutritive value and utilization (Isikwenu *et al.,* 2008). The use of probiotics in monogastric diets is said to have numerous benefits such as: It ensures total protection of gut, a natural performance enhancer, effectively reduce salmonella shedding and probiotic support proliferation and colonization of micro-organism.

This study is aimed to determine the performance of weaner rabbits fed on different level of BDG supplemented with probiotics in replacement for GNC, to determine the nutrient digestibility of rabbits fed BDG diets to replace GNC and to determine which of the two probiotics fed will give a better performance by the rabbits.

MATERIALS AND METHODS

54 weaner rabbits of mixed breeds averaging 0.2kg – 0.3kg in body weight and aged 5weeks were used in this study. The rabbits on arrival at the experimental site were housed in a metal hutch with wire mesh at the base for easy collection of faeces and urine. The hutches were disinfected before the rabbits were introduced and they

were given anti-stress with antibiotics for seven days and allowed to adapt to the environment. The rabbits were randomly allocated to nine (9) dietary treatments with two (2) rabbits per replicate and each treatment had three (3) replicates.The hutches were cleaned on daily basis all through the experimental period. Feeders and drinkers were made available in each hutch since experimental animals were housed and fed differently.

The rabbits were allocated to nine (9) dietary treatments in a Completely Randomized Design (CRD) each treatment had three (3) replicates with two (2) rabbits allocated to each replicate. Each rabbit was fed *adlibitum* diet for the eight (8) weeks study period. The nine experiment diets had BDG replacing GNC at 0, 30, 60% dietary levels, with GNC in the control diet being at 18.7%. During the experiment, feed and water were supplied *ad-libitum* throughout and the performance of the animals were monitored. Quality of feed consumed was monitored daily for the 8 weeks trial period by taking note of the difference between feed served and feed left after 24 hours. The rabbits were also weighed on weekly basis during this period to determine weight gain.

The performance of the rabbits was monitored, the initial live weight of the rabbits were recorded at commencement of the experiment, weekly weight and daily feed intake were also recorded, while feed to gain ratio were also recorded and cost implication were calculated. At the last week of the study (on the 8th week), the faeces and the urine of the rabbits were collected by the total faecal collection method.. The nitrogen digestibility was also calculated.

$$\text{Feed to gain ratio} = \frac{\text{AV. Feed intake (g)}}{\text{AV weight gain (g)}}$$

Nitrogen digestibility in (%)

$$= \frac{\text{Nitrogen intake - Nitrogen feces}}{\text{Nitrogen intake}} \times 100$$

Proximate analysis was conducted using the method of A.O.A.C (1990). Association of Official Analytical Chemist. Sample of the test diets and faeces were analyzed for the proximate constituents using the methods.

All data obtained were subjected to analysis of variance (ANOVA) using factorial design of Completely Randomized Design (CRD) Model and significant differences between means were compared using Duncan Multiple Range Test Steel and Torrie (1980).

RESULTS

Table 4.1 shows the growth performance of rabbit fed at different levels of BDG with or without probiotics supplementation.

The feed intake of 84.60g/rabbit/day in rabbits fed on the 60% BDG level was significantly higher (P< 0.05) while rabbits fed on 30% BDG had an intake of 82.23g which is significantly (P<0.05) higher than 81.97g consumed by rabbit fed 0% BDG. Rabbits fed on probiotics A (83.67g) had a higher feed intake value (P<0.05) when compared with rabbits fed on NSA and probiotics B that had feed intake values of 82.53 and 82.70g respectively.

The weight gained by rabbits fed on 0, 30, 60% were all comparable (P> 0.05), with weight gain values of 10.56, 10.33 and 9.77g respectively. Similarly there was no significant (P> 0.05) effect of supplement added to the observed body weight gain values obtained on the experimental rabbits.

There was significant effect (P< 0.05) of the diets feed on the obtained feed to gain ratio: The rabbits fed 60% BDG diets had the poorest (P< 0.05) feed to gain ratio of 8.65g when compared with rabbits on the other experimental diets. Rabbits fed on 30% BDG diet had a feed to gain ratio of 7.86g/rabbit/day while those on the control (0% BDG) diet had the best feed to gain ratio.

Table 4.2 shows nitrogen digestibility of rabbit fed different levels of BDG with or without probiotics supplementation.

The nitrogen intake of 2.22g/rabbit/day fed on the 60% BDG diet was significantly higher (P<0.05) than those fed the other BDG levels. Rabbits fed on probiotics B (2.22g) had higher nitrogen intake value (P<0.05) when compared with rabbit fed on NSA and probiotics A that had nitrogen intake values of 2.19 and 2.20g respectively.

The nitrogen digested of 1.65g/rabbit/day fed on the 60% BDG diet was significantly higher (P<0.05) than those fed the other BDG levels. Rabbits fed on probiotics B (1.66g) had higher nitrogen balance value (P< 0.05) when compared with rabbit fed on NSA and probiotics A that had nitrogen digested values of 1.60g and 1.65g respectively.

The nitrogen digestibility by rabbits fed on 0, 30, and 60% were all comparable (P > 0.05), with nitrogen digestibility values of 70.88, 70.66 and 73.79g respectively. Similarly there was no significant (P>0.05) effect of supplement added to the observed Nitrogen digestibility values obtained on the experimental rabbits.

Table 4.3 shows economic implication of rabbits fed different levels of BDG with or without probiotics supplementation.

The cost of fed by rabbit by rabbits fed on 0, 30 and 60% BDG supplemented feed were all comparable (P>0.05) with cost of feed values of 7.59 effect of 71.09 and 66.62 respectively. Similarly there was no significant (P>0.05) effect of supplements, added to the observed cost of feed values obtained on the experimental rabbits.

The cost of rearing rabbits fed on 0, 30 and 60% were all comparable (P>0.05) with cost of rearing values of 1126.58, 1103.05 and 1095.25 respectively. Similarly there was no significant (P>0.05) effect of supplement, added to the observed cost of rearing values obtained on the experimental diets.

The gross profitability of 36.97 rabbits fed on the 60% BDG diet was significantly higher (P < 0.05) than those fed the other BDG levels. Rabbits fed on probiotics B (35.84) had a higher gross profitability value (P<0.05) when compared with rabbit fed on NSA and probiotics A that had gross profitability values of 35.47 and 34.80 respectively.

The feed cost efficiency of (0.55g) 0f rabbits fed on the 60% BDG diet was significantly higher (P<0.05) than those fed the other BDG levels. Rabbits fed on probiotics B (0.51) had a higher feed cost efficiency value (P<0.51) when compared with rabbits fed on NSA and probiotics A that had feed cost efficiency values of 0.50 and 0.49 respectively.

DISCUSSIONS

Result showed that there was increase in feed intake with increasing level Brewers dried grains (BDG). Rabbit which consumed high level of fibre might be as a result of BDG with considerable level of protein which range from 19 – 25% reported by Alawa and Umunna (1993), (Olomu, 1995), kwari *et al.,* (1999) and Oluponna *et al.,* (2002). The increase in feed intake with increasing level of BDG is in agreement with the literature that poor quality feed encourages high feed intake for monogastric to meet their other nutrient requirement apart from energy (Olumu, 1995). It was reported by Aduku *et al*., (1998) that feed intake increased with increasing level of crude fibre in the diet of weaner rabbits. It was also reported by Adama *et al*., (2007) that there was increase in feed intake when varying levels of BDG was fed to broilers chick. This result, is in contradiction with the reports of Rijal *et al*., (2009) and Classen and Copper (1999) who both reported that feed intake decreased with increasing level of BDG when Brewer's dried grains was fed to swine and GNC was replaced with BDG in the diets of cockerel chicks respectively. It also contradicts the reports of Adeniji and Ehinmidu (2007) who observed no significant difference in the feed intake values when pullet chicks were fed with cotton seed cake with or without fish meal supplementation. The feed intake values of (81.97-84.60) recorded in this study were generally higher than the values 54-66.65) reported by Adegbola and Osuji (1990). for rabbit fed 60% maize and varying levels of cassava leaves. Rabbit feed containing probiotics supplementation showed significant difference. Probiotics is known to work well in other monogastric animal specie Abe *et al*., (1995), (Alvrez, 2001), Kritas and Morrison (2005) also shown to improve growth performance. The result showed that rabbits fed probiotics A and B supplementation had higher feed intake values when compared to those fed no supplement. Wang *et al.,* (2009) had earlier reported that dietary supplementation with Bacillus probiotics in growers pig increased feed intake. This result contradicts the observation of Harper *et al*., (1993) and Davis *et al.,* (2008) who reported no significance difference in feed intake values when probiotics was fed to broiler chicks. There was higher feed intake value in rabbits fed probiotics B when compared to those fed probiotics A. This could be as result of the probiotics containing different strain of micro-organism which have different efficacy and some strain, may provide certain benefit for the host where as others do not (Weichselbaum, 2009).

There was no significant difference in the observed weight gain of the rabbits. A similar finding was observed by Classen and copper (1999) and (Rijal, 2009) when BDG replaced GNC in the diets of cockerel chicks and swine respectively. In contradiction, Onifade and Babatunde (1997) reported that high indigestible fibre content in the diet of monogastric (rabbit, poultry) interferes with nutrient availability at the tissue level and maintenance several reports contradicts the observation in this study, (Isikwenu, 2001) and Adama *et al.,* (2007) reported increased in weight gain of chicks with increased level of BDG. Dada *et al*., (1999), Adeniji and Ehinmidu (2007) also reported increase in weight gain with increased level of BDG in the diets of weaner pigs and increase in weight gain of pellet chicks when cotton seed cake is substituted for Soya bean meal with or without fishmeal supplementation. BDG have been widely used/tested and incorporated into livestock feed without any detrimental effects on body weight gain of monogastrics (Farinu, 2004), Ajayi *et al.,* (2005), Aderemi *et al.,* (2006), Afolabi *et al.,* (2006), Adeyemi and Longe (2007). The weight gain values of 9.77 – 10.56g recorded in this study area quite comparable to the mean of 10 – 20g reported by (Cheeke, 1991). For rabbit reared in the tropical condition. The result obtained in this study, is higher than 4.88 – 8.71 reported by Jakthan *et al.,* (2005). For rabbit fed maize Stover as a fibre source. There was no significant difference in the observed weight gain of the rabbit fed probiotics. A similar findings was observed by Davis *et al*., (2008), Kornegay and Risley (1996), Wang *et al*., (2009), Martens (1992), Zeyner and Bodlt (2006) when the diets of monogastric (pigs and rabbits and broiler chicks) was supplemented with probiotics. This result contradicts the finding of (Hentges, 1992), Konstantinov *et al.,* (2008) who reported in an improvement in weight gain of weaned piglets. Several reports, Zani *et al*., (1998), Bontempo *et al.,* (2006) and (Hentges, 1992). Contradicts this result, indicating that probiotics supplementation resulted in an improvement in weight gain of monogastrics.

There was an increase in the feed to gain ratio values recorded with increasing level of BDG. This is similar to what was observed in feed intake values and it is an indication that feed utilization decreased with increasing level of feed intake. The result agrees with the literature that BDG contains high concentration of non-starch polysaccharides and some tannins which have been shown to interfere efficiency of feed utilization in monogastrics, inhibits the absorption of essential nutrients, inhibits digestive enzymes invitro and invivo, hence, decreases feed utilization Lacassagne *et al.,* (1998). It also agrees with Adeniji and Ehinmidu (2007) who reported that feed utilization decreased with increased level of cotton seed cake (CSC) in the diets of pullet chicks to replace soyabean meal. The result showed that rabbits fed probiotics supplementation had lower feed to gain value, when compared to rabbits fed no supplements. It was earlier reported that probiotics can produce some useful enzymes (alpha) – amylase, arabinase, cellulose, dextranase, levansucrase, maltase, alkaline protease, neutral protease and [beta] – glucanase] (Hentges, 1992) that were found to improve feed efficiency of weaned piglets. Zani *et al.,* (1998), Huang *et al.,* (2004) however, some studies on monogastrics reported lack of positive effect of probiotics on feed to gain ratio Chen *et al*., (2006) and Apgar *et al.,* (1993).

The result showed that the nitrogen intake increased as the level of BDG increased. A similar finding was observed by Amaefule *et al.,* (2006) andTram and Preston (2004) who reported increase in nitrogen intake with increase in the level of inclusion of BDG in the diets of pigs. The difference in the nitrogen intake could be attributed to the difference in the crude protein contents of the diets. However, Stanogias and Pearce (1992) reported that nitrogen intake was not affected by the level of inclusion of BDG in the diets of pigs. The result showed that there were higher values of nitrogen intake in rabbit fed with probiotics supplementation when compared to rabbits fed no supplement. This is an agreement with the literature that probiotics are able to stimulate the rate of glucose transport through brusborder vesicle from porane Jejenum invitro Breves *et al*., (2000) which may have contributed to improved nutrient uptake in monogastric fed probiotics supplementation. Sliwinski *et al*., (2002) reported that probiotics help to bind ammonia which increase nitrogen intake.

There was no significant increase in the nitrogen digested with increase in the level of BDG. This is in contrast with the findings of Adeniji and Ehinmidu (2007) who reported that the nitrogen digested decrease with the increase in the inclusion level of cotton seed cake in the diets of pullets chicks. The trend of nitrogen digested is similar to that of nitrogen intake. The result showed that there were higher values of nitrogen digested in rabbit fed with probiotics supplementation as compared to those fed no supplement. This might be as a result of higher nitrogen intake recorded on rabbit fed probiotics supplementation. (Scheuermann, 1993) and Giang *et al*., (2011) reported an improved nitrogen digested in growers pig fed probiotics.

There was no significant difference in the nitrogen digestibility as observed with varying levels of BDG. This may suggest that the crude fibre contents in all the dietary treatment were similar and therefore, did not affect the digestibility of the rabbits. Amaefule *et al.*, (2006) had observed that difference in nitrogen intake did not result in significant, nitrogen utilization, suggesting that the differences in nitrogen intake were not biologically important. The result obtained in this study contradicts the literature that dietary fibre depresses nitrogen digestibility Delorme and Wojeik (1990) however, other reports which contradict this result indicated that nitrogen digestibility was lowered with increase in the level of cotton seed cake in the diets of pigs and BDG in the diet of pigs Adeniji and Ehinmidu (2007). There was no significant difference in the nitrogen digestibility of the rabbit fed probiotics supplement compared to those fed no supplement however, Chen *et al*., (2005) found an improved digestibility of nitrogen in growers pig fed a diet supplemented with a mixture of lactobacillus. This result agrees with the findings of (Scheuermann, 1993), Kornegay and Risley (1996) and Wang *et al.,* (2009) who all reported that probiotics supplementation did not affect nitrogen digestibility in growers and finishers pig.

There was no significant difference in the cost of feed per kg, rearing cost and selling price as observed with increasing level of BDG in the diet. The result contradicts several reports which indicated that cost of feed per kg and rearing cost decreased with increased level of BDG in the diets of monogastric Igwebuike *et al.,* (2004), Adama *et al.,* (2007), Duruma *et al*., (2000), Adeniji and Ehinmidu (2007), Amaefule *et al*., (2006). Result showed that there was an increase in gross profit and feed cost efficiency with increasing level of BDG. This is an indication of a favourable cost analysis which could be interpreted to mean a positive response of rabbits to the inclusion of BDG in replacing GNC. It was similar to what was observed by Igwebuike *et al.,* (2004) and Duruma *et al.,* (2000) when BDG was included in the diets of chicks to replace GNC.

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Figure 1: Treatment Design

3 x 3 factorized design treatments.

BDG Levels	Supplement	Diet
	No Supplement	1
0	Probiotics A	2
	Probiotics B	3
	No Supplement	4
30	Probiotics A	5
	Probiotics B	6
	No Supplement	7
60	Probiotics A	8
	Probiotics B	9

INCLUSION RATE OF THE PROBIOTICS

Probiotics A ------ is total gut integrity at inclusion rate 250g/tone of feed.

Probiotics B ……. Biotronic at inclusion rate 40g/tone of feed.

TABLE 1 COMPOSITION OF EXPERIMENTAL DIETS EXPRESSED IN (KG/100KG).

	Levels of BDG replacement for GNC (%)								
Ingredients	1	2	3	4	5	6	7	8	9
BDG	0	0	0	5.61	5.61	5.61	11.2	11.2	11.2
GNC	18.7	18.7	18.7	13.09	13.09	13.09	7.5	7.5	7.5
Probiotics A	0	+	0	0	+	0	0	+	0
Probiotics B	0	0	+	0	0	+	0	0	+
Maize	40	40	40	40	40	40	40	40	40
Corn bran	21	21	21	21	21	21	21	21	21
Wheat offal	15.30	15.30	15.30	15.30	15.30	15.30	15.30	15.30	15.30
Fishmeal	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Bone meal	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Limestone	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Salt	0.35	0.35	0.35	0.35	04.35	0.35	0.35	0.35	0.35
Premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Lysine	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	100	100	100	100	100	100	100	100	100

Analyzed Values									
M.E(cal/kg)	2706.99	2706.99	2706.99	2669.946	2669.946	2669.946	2633.07	2633.07	2633.07
CP%	19.90	19.77	19.50	16.90	16.85	16.70	16.20	15.95	15.50
E. E	5.70	5.50	5.43	5.00	4.90	4.80	4.50	4.44	4.45
C.F %	5.10	5.20	6.00	4.60	5.00	5.20	4.60	5.20	5.25
N.F.E	44.98	50.20	50.10	52.17	54.69	44.50	52.60	50.14	56.61
Ash	8.08	8.50	8.56	8.14	8.65	10.0	9.26	9.10	8.50
Moisture	9.33	11.25	10.50	10.20	9.56	10.10	9.34	10.15	10.02
Dry Matter	90.67	8.75	89.5	89.8	90.44	89.9	90.66	89.85	89.98

Composition of Vitamin Mineral Premix

Vit A 8000000iu; Vit D3 1500000iu, Vit E 700iu, Vit k3 1-5y; Vit B1 2g; Vit B2 2-5g; Niacin, 15g; pantothenic acid, 5.5g; Vit B6 2g; Vit B12 0.01g, folic acid, 0.5g; Biotin H2, 0.25g; choline chloride, 175g; cobalt, 0.2g; copper 3g; iodine, 1g; iron 21g; manganese, 40g; Selenium 0.2g; Zinc 31g; Anti-oxidant, 1.25g.

Table: 2: Growth Performance Characteristics of Rabbits fed different levels of BDG to replace GNC

Parameters	**Feed intake (g/rabbit/day)**	**weight gain (g/rabbit/day)**	**feed to gain ratio**
Level of BDG (A)			
0%	81.97^c	10.56	7.81^c
30%	82.23^b	10.33	7.86^b
60%	84.60^a	9.77	8.65^a
SEM	2.69	0.14(NS)	0.035
Supplements (B)			
NSA	82.53^c	10.60	7.81^c
PA	83.67^a	10.19	7.86^b
PB	82.90^b	9.87	8.65^a
SEM	3.38	0.15(NS)	0.035
AxB	NS	NS	NS

(a,b,c) treatment means with different superscript along the same column are significantly different (P< 0.05),
± SEM = Standard error of mean
NS = No significant difference (P >0.05)

Table 3: Nitrogen Digestibility of Rabbit fed different levels of BDG to replace GNC

Parameters	Nitrogen Intake (g)	Faecal Nitrogen(g)	Nitrogen Digested(g)	Nitrogen Digestibility(%)
Level of BDG (A)				
0%	2.19^{c}	0.58	1.62^{c}	70.88
30%	2.20^{b}	0.58	1.63^{b}	70.66
60%	2.22^{a}	0.58	1.65^{a}	73.79
SEM	0.000019	0.000030(NS)	0.00010	4.70(NS)
Supplements (B)				
NSA	2.19^{c}	0.59	1.60^{C}	73.10
PA	2.20^{b}	0.57	1.65^{b}	71.26
PB	2.22^{a}	0.58	1.66^{a}	70.96
SEM	0.000019	0.00013(NS)	0.000022	5.27(NS)
AxB	NS	NS	NS	NS

(a,b,c) treatment means with different superscript along the same column are significantly different (P< 0.05),
± SEM = Standard error of mean
NS = No significant difference (P >0.05)

Table 4: Economic Implication of Rabbit Fed different levels of BDG to replace GNC

Parameters	Cost of Feed (₦)	Cost of Rearing (₦)	Selling Price (₦)	Gross Profitability (₦)	Feed Cost Efficiency
Level of BDG (A)					
0%	75.59	1126.58	1500	33.15^{c}	0.44^{c}
30%	71.09	1103.05	1500	35.99^{b}	0.50^{b}
60%	66.62	1095.25	1500	36.97^{a}	0.55^{a}
SEM	0.0021 (NS)	41.39 (NS)	3333.33 (NS)	0.63	0.000063
Supplements (B)					
NSA	71.03	1107.28	1500	35.47^{b}	0.50^{b}
PA	71.18	1113.03	1500	34.80^{c}	0.49^{c}
PB	71.09	1104.69	1500	35.84^{a}	0.51^{a}
SEM	6.70 (NS)	123.84 (NS)	3333.33 (NS)	1.85	0.0011
AxB	NS	NS	NS	NS	NS

(a,b,c) treatment means with different superscript along the same column are significantly different (P< 0.05),
± SEM = Standard error of mean
NS = No significant difference (P >0.05)