THE EFFECTS OF INCLUSION OF GRADED LEVELS OF BREWERS DRIED GRAINS (BDG) IN THE DIETS OF EARLY-WEANED PIGS ON THEIR PERFORMANCE UP TO 10 WEEKS OF AGE

F.N. MADUBUIKE

School of Agriculture,
Imo State University,
Okigwe, Nigeria.

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ABSTRACT

Forty-eight (48) Yorkshire female and castrated male pigs early weaned at 21 days, with average initial body weight of 8.14 kg were used to assess the effects of including graded levels of Brewers dried grains (BDG) in their diets on their performance until 10 weeks of age. Brewers dried grains were added to the 18 per cent crude protein corn-soy bean meal diets at the rate of 0, 5, 10 or 15% level, each BDG level constituting a treatment.

Inclusion of BDG up to 15% had no adverse effect on the total gains and average daily weight gains of the test pigs. However, although the average daily feed intake and feed: gain ratio did not differ between the control pigs and those pigs with 5 and 10% BDG in their diets (between which there was no difference), the 15% BDG increased both average daily feed intake and feed: gain ratio. Not only did the pigs on 15% BDG consume more feed per unit of gain, they also scoured more frequently than the others, showing a lower degree of tolerance for increased fibre level (unlike the older pigs reported in the literature). The results of this study thus confirm the feasibility of using BDG in the diet of early weaned pigs, although the degree of tolerance appears to be age or body weight dependent.

Key Words: Early weaned pigs; brewers dried gains.

INTRODUCTION

Generally feed cost had been shown to account for between 55 to 85 per cent of the total cost of commercial pig production (Pond and Maner, 1974); and for the early weaned pig the feed demand is more critical (Madubuike, 1984). In today's biting global inflation, the livestock producer appears most hit in terms of serious scarcity and high cost of feeds (Babatunde *et al* 1975). The generally low production level of cereal grains and oil seed cakes and the sharp increases in the human populations in the developing countries (including Nigeria) have also complicated this problem (Tegbe, 1983). Waldroup, (1971) had earlier proposed that as the world population continues to grow at these alarming rates, the competition between humans and non-ruminant animals (whose nutritional requirements are similar to those of man) for existing protein sources becomes more severe. Hence Oyenuga, (1973) observed that the

average Nigerian was getting only a quarter of the minimum daily animal protein requirement. Consequently the search for alternative feed ingredients for the non-ruminants becomes rather imperative to save both man and the livestock industry, although Fetuga *et al.* (1974) had opined that lack of information on the composition and utilization of the many and varied protein sources indigenous to Africa was the major problem rather than a real shortage of the sources of protein as widely believed. However Tegbe *et al.* (1984) rather suggested that one of the means of increasing animal protein production in the developing countries was through the use of cheap and readily available agro-industrial by products in the diets of our livestock.

In this direction, considerable success has been registered with inclusion in growing pig diets of cane molasses (Babatunde *et al.*, 1974); plantains (Oyenuga and Fetuga, 1974); wheat bran (Sharda *et al.*, 1979); Rice and rice bran (Robies and Ewan, 1982), Rice offals and wheat offals (Tegbe *et al.*, 1984).

With the ever-increasing number of Breweries in Nigeria, and the waste disposal problem likely to be posed by the Brewers dried grains (Major by-product of Breweries), this study was designed to evaluate the possibility of using this 'waste' as a feed ingredient for early weaned pigs. Babatunde *et al* (1975) had earlier noted that Brewers dried grains being fermentation products, are rich in both the B-vitamins and unidentified growth factors, as well as in digestive energy and crude proteins (NRC, 1979) and possesses a potential as feed ingredient for growing-finishing pigs.

The objective of this study was to investigate the effects of addition of graded levels of Brewers dried grains to the diets of early weaned pigs, on their performance up to 10 weeks of age.

MATERIALS AND METHODS

Forty-eight (48) 21 day old female and castrated male Yorkshire pigs with an average initial body weight of 8.14 kg were used in this study, to assess the effects of different levels of BDG in their diets on performance up till 10 weeks of age. The treatments were (1) basal 18% crude protein corn-soybean meal diet with 0% BDG; (2) Corn soybeanmeal diet with 5% BDG; (3) Corn-soybeanmeal diet with 10% BDG, and (4) Corn-soybeanmeal diet with 15% BDG. The BDG was added to replace some of the corn and soybean meal in the diets as shown in Table 1.

The pigs, based on sex and closeness of body weights, were randomly assigned to the four treatment groups. Each treatment group of 4 pigs (for each of the three replicates) was housed in separate concrete floored pens and given feed and drinking water *ad libitum*.

The animals were weighed at the beginning of the experiment and weekly thereafter. Total feed intake for each treatment group was also measured weekly. The experiment lasted 49 days. All data were subjected to one way classification of the analysis of variance according to Snedecor and Cocharan, (1976).

RESULTS AND DISCUSSION

The results of this study are summarised in Table 2. The average initial body weights (kg) of the pigs used in this study were similar, and at the end of the period, the average final body weights were not significantly different ($P > 0.05$). The total gains (kg) and average weight gain did not differ significantly ($P > 0.05$) among treatments. These results agree with those of Babatunde *et al* (1975), Wahlstrom and Libal, (1976) and Tegbe (1983), who reported that inclusion of BDG in diets of pigs below 15 per cent level resulted in no significant differen-

Table 1
Percent composition of the 18% crude protein experimental diets

	Diets			
	1	2	3	4
Brewers dried grains (%)	0	5	10	15
Ingredients				
Brewers dried grains (23.3% CP)	–	5.0	10.00	15.00
Yellow corn (8.8% CP)	71.50	69.00	66.00	63.00
Soybean meal (48.5% CP)	24.50	22.50	20.00	18.00
Lysine (as Lysine-Hcl)	0.25	0.25	0.25	0.25
Methionine	0.35	0.35	0.35	0.35
Vitamin mix	0.50	0.50	0.50	0.50
Antibiotics	0.50	0.50	0.50	0.50
Dicalcium Phosphate	1.90	1.90	1.90	1.90
Salt	0.50	0.50	0.50	0.50
TOTAL	100.00	100.00	100.00	100.00
Calculated nutrient levels in the experimental diets				
Crude Protein (%)	18.17	18.24	18.03	18.06
M.E. (Kcal/Kg)	3231.20	3163.88	3062.50	2978.60
Lysine (%)	1.20	1.15	1.13	1.10
Methionine (%)	0.66	0.68	0.68	0.69
Ca (%)	0.55	0.56	0.57	0.57
P (%)	0.52	0.53	0.53	0.54

Table 2
Summary of performance characteristics of early weaned pigs fed diets containing varying levels of brewers dried (BDG) up to 10 weeks of age

	Dietary levels of BDG (treatments)				
	0	5	10	15	
Parameters	1	2	3	4	SE
Av. initial body wt (kg)	8.17[a]	8.13[a]	8.11[a]	8.15[a]	0.16
Av. final body wt (kg)	33.65[a]	34.58[a]	34.02[a]	34.14[a]	0.79
Total gain (kg)	25.48[a]	26.46[a]	25.91[a]	24.99[a]	1.01
Av. daily weight gain (kg)	0.52[a]	0.54[a]	0.53[a]	0.51[a]	0.02
Av. total feed intake (kg)	69.10[a]	68.58[a]	69.54[a]	73.90[a]	1.12
Av. daily feed (kg)	1.41[a]	1.40[a]	1.42[a]	1.51[b]	0.02
Feed: gain	2.71[a]	2.60[a]	2.68[a]	2.98[b]	1.12

a, b, means in the same row with different superscripts differ significantly ($P < 0.05$).

ces in the average daily weight gain of pigs. The fact that these earlier investigators worked with pigs with higher body weights, 17-55kg pigs (Babatunde *et al.*, 1975), sows, (Wahlstrom and Libal, 1976) and 30-65 kg pigs (Tegbe, 1983) and reported no difference in these parameters shows that pigs irrespective of body weights could tolerate Brewers dried grains in their diets up to 15% level without any deleterious effects. Depression in body weight had only been reported when Brewers dried grain was included in pig diets beyond 20% level (Deltoro and Fernandez, 1982; Tegbe, 1983). There was however a slightly higher but not significant average daily weight gain ($P > 0.05$), although there was no basis for this observation. In the report of Babatunde *et al* (1975), the 5 and 10% BDG levels promoted growth equally, at a rate slight higher than the 15% level though not significantly.

The average daily feed intake of the pigs did not differ ($P > 0.05$) between the pigs that had no BDG in their diets (control) and those that had either 5 or 10% BDG levels. These pigs however consumed significantly ($P < 0.05$) less feed than those pigs with 10% BDG in the diets. Feed utilization efficiency (feed:gain) of the pigs also followed this trend. Hence the pigs with 15% BDG in their diets consumed more feed per unit of gain.

This result is in agreement with that of Babatunde *et al.*, 1975) who reported that the F/G ratio of pigs (17-55 kg body weight) that received 15% BDG in their diets was highest when compared with those on 0, 5 or 19% BDG levels, but disagrees with other results, that inclusion of BDG in the diet of sows only beyond 40% level (Wahlstrom and Libal, 1976) or 25% in finishing pigs of 30-82 kg body weight (Tegbe, 1983) affected feed intake and feed; gain ratios. Omole and Ajayi, (1976) working with rabbits observed decreased feed efficiency only when 30% BDG was included in their diets.

Given the observation in this study that the pigs (834 kg body weight) with 15% in their diets scoured more frequently than

others and showed poor efficiency of feed utilization, it would be safe to suggest that tolerance of BDG (fibre) by pigs may be age or body weight dependent, as the investigators earlier referred to who worked with heavier or older pigs reported normal tolerance (without scouring) of higher dietary levels of BDG. Although some fibre in the diet of pigs is known to aid digestion of the pigs through increased bowl movement (Pond and Maner, 1974), other workers had reported that the poor performance of young pigs on all plant proteins (high in fibre) may be related to their inadequate digestive enzyme development (Lewis *et al.*, 1957, Pond *et al.*, 1971). It is possible that the 15% BDG (Higher fibre level) may have also depressed digestion, and the pigs only made up their gain through increased feed intake and which jointly may have become responsible for the observed scouring.

CONCLUSION

Early weaned pigs fed diets containing 0, 5, 10 or 15% Brewers dried grains, gained similarly throughout the experiment period. Feed intake and feed: gain ratios were only affected when BDG was included in the diet at 15% level. There was evidence therefore to support the feasibility of use of the cheap BDG in the feeding of early weaned pigs. Care should however be taken not to include the BDG up to 15% level for pigs below 10 kg body weight as there was cause to suspect that tolerance of BDG by pigs may be age or body weight dependent.

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