Growth rate and carcass characteristics of indigenous (Ashanti Dwarf) pig

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SUMMARY

Fourteen Ashanti Dwarf pigs were grouped according to sex and raised intensively after weaning. Each pig received feed equivalent of 5 per cent live weight daily. The feed contained about 18.4 per cent crude protein and 13.2 MJ (ME) per kilogram diet. The animals were weighed monthly. All the seven boars were castrated at 5 months of age. The growth rate of the males was higher than the females in the first 4 months. The females overtook the males in growth rate from the 5th month until they were slaughtered at the age of 10 months. Mean slaughter weight of females (60.5 kg) was significantly higher ($P<0.05$) than the castrates (53.6 kg). Dressing percentage of castrates (79.1 per cent) was similar to that of the females (80.5 per cent). The percentage fat trimmed and carcass length of the females were significantly ($P<0.05$) higher than those of the castrates. Primal cuts, 4 per cent lean cuts, back fat thickness, and *Longissimus dorsi* area were similar ($P>0.05$) for both sexes.

Original scientific paper. Received 12 Sep 97; revised 14 Dec 98.

RÉSUMÉ

BARNES, A. R. & FLEISCHER, J. E.: *La proportion de croissance et les caractéristiques de carcasse du cochon indigène (Ashanti Dwarf).* Quatorze cochons d'Ashanti Dwarf étaient groupés selon le sexe et élevés intensivement après le sevrage. Chaque cochon recevait l'équivalent en ration de 5 pour cent de poids vif quotidiennement. La ration contenait approximativement 18.4 pour cent de protéine brute et 13.2 MJ (ME) par kilogram de régime. Les animaux étaient pesés mensuellement. Tous les verrats (7) étaient châtrés à l' âge de 5 mois. La proportion de croissance des mâles était plus élevée que celle des femelles dans les quatre premiers mois. Les femelles ont dépassé les mâles en proportion de croissance à partir de 5 ième mois jusqu' à ce qu'elles soient abattues à l' âge de 10 mois. Le poids d'abattage moyen des femelles (60.50 kg) était considérablement plus élevé ($P<0.05$) que les châtrés (53.60 kg). Le pourcentage d' habillage des châtrés (79.1 pour cent) était semblable à celui des femelles (80.5 pour cent). Le pourcentage de saindoux dégraissé et la longueur de carcasse des femelles étaient considérablement ($P<0.05$) plus élevés que ceux des châtrés. Les morceaux primordiaux, le pourcentage de 4 morceaux de Maigre, L'épaisseur de la Graisse Dorsale et la partie de Longissimus dorsi étaient semblables pour les deux sexes.

Introduction

The Ashanti Dwarf pig (ADP), an indigenous pig of Ghana, is generally a small, relatively rough-coated animal (Fig. 1). The head is relatively long and narrow with a prolonged snout. Along the tail is a belt of longer-raised bristles. Pathiraja (1986) reported that meat production from indigenous pigs is quite low. Bourn *et al.* (1994) reported that the indigenous Nigerian black, hairy pig is being gradually replaced by various exotic breeds including Large White, Landrace, Hampshire, and Duroc. Although the production potential of indigenous breeds is low, they form a valuable genetic resource base which must be maintained, since they are well adapted to the different, sometimes harsh, production systems in the developing countries (Livingstone & Fowler 1984).

At the Agricultural Research Station of the University of Ghana, Legon, for example, in 1983 when there was food shortage countrywide due to drought, the exotic breeds at the research

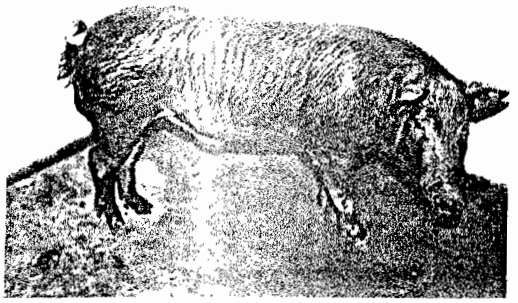

Fig. 1. Ashanti Dwarf pig.

station easily succumbed to starvation while the ADP survived. They became a little leaner, but nevertheless quite healthy. They are able to handle fibrous feed much better than exotic breeds (Rigor & Kroeske, 1985). The ADP is found in all the 10 regions of the country where it is kept mostly under "scavenging" conditions. The ADP population in the northern sector of the country is about 50 per cent of the national pig population (Barnes, 1994). MOFA (1996) also estimated that 40 per cent of the pigs in the southern sector of the country is ADP.

A trial was therefore carried out to study the growth rate and to characterize the ADP carcass. The results may help pig nutritionists and pork producers in raising ADP for meat production.

Materials and methods

Fourteen ADPs selected from litters ranging from 6 to 10 (litter size), and weaned at 8 weeks were used in the study. The pigs comprised seven gilts and seven young entire boars. The pigs were grouped by sex, with four in one group and three in the other group. They were fed on a compound diet containing about 18.45 per cent crude protein and 13MJ (ME) per kg diet (Table 1). Each pig received a quantity of diet equivalent to 5 per cent of the body weight. Water was provided *ad libitum.* All the young boars were castrated late (5 months). Pigs were dewormed and weighed monthly.

All the animals were slaughtered when they were 10 months old (Rigor & Kroeske, 1972).

TABLE 1

Percentage Composition of Diet

Ingredients	*Percentage*
Maize	51.70
Wheat bran	15.00
Fishmeal	7.00
Soyabean meal	8.00
Palm kernel cake	16.50
Shell grit	0.80
Salt	0.50
Vitamin premix	0.50
	100.00
Crude protein (percent) =	18.4
Energy (MJ/kg (ME)) =	13

Stunning was done by using a hammer to hit the poll. After bleeding, the carcass was scalded in a scalding tank containing hot water at 65 °C for 5 min and then scraped. The hairs left over the body were removed by singeing. After evisceration, the carcass, with the head and feet on, was chilled overnight at 5 °C. The warm and chilled weights of each carcass were recorded. Each carcass was split longitudinally into halves through the middle of the vertebral column (Naumann, 1952).

Carcass length (CL) was measured from the anterior edge of the *Os-Sacrum* (aitchbone) to the anterior edge of the first rib in the right half of the carcass. Back fat thickness (BFT) was estimated as an average of the measurements taken opposite to the first thoracic vertebra, the last thoracic vertebra, and the last lumbar vertebra. The *longissimus dorsi* muscle area or the loin eye area (LEA) between the 10th and 11th ribs was measured by a calibrated plastic grid (Christian *et al.,* 1970). Dressing percentage was calculated as weight of chilled carcass with the head and feet on divided by the live weight at slaughter, expressed as a percentage (Bereskin & Davey, 1978). Each carcass was cut into standard primal cuts (ham, loin, shoulder picnic, shoulder butts and belly) (Naumann, 1952). All the primal cuts

minus the belly were trimmed of fat in excess of 0.6 cm. These cuts formed the 4 per cent lean cuts of the carcass. All the data were subjected to one-way analysis of variance.

Results

In the first 4 months of the study, the monthly average weights of the boars (males) were slightly higher than those of the gilts (females), though the differences were not statistically significant ($P>0.05$) (Fig. 2). From the 5th month until the animals were slaughtered, the females grew faster than the males. Consequently, the mean slaughter weight of the females (60.5 kg) was significantly ($P<0.05$) higher than that of the males (53.6 kg).

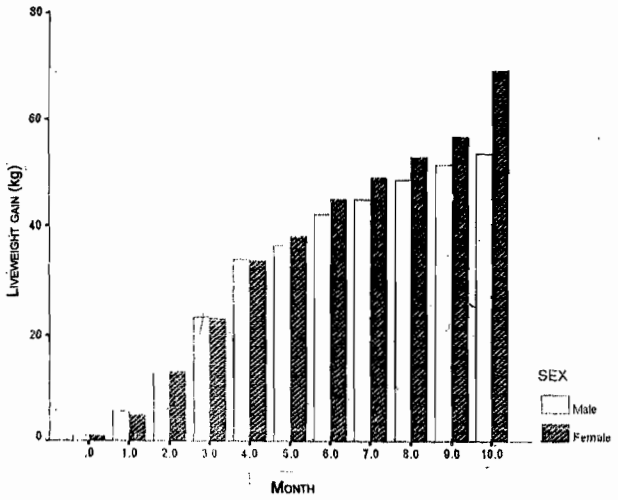

Fig. 2. Monthly live weight gains of Ashanti Dwarf pigs.

Table 2 shows carcass parameters of experimental animals. The mean percent primal cuts of the castrates and the gilts were similar, 68.8 and

TABLE 2

Effect of Sex on Carcass Parameters

Animal no.	*Sex*	*LW slaughter weight (sw) kg*	*Chilled weight (CW) kg*	*Dressing (%)*	*% primal cut (PC)*	*% 4 lean cuts (LC)*	*BFT (cm)*	*Loin eye area (LEA) (cm^2)*	*% total fat trim (TFT)*	*Carcass length (CL) cm*
19	M*	58.5	45	76.9	70.2	56.8	1.6	20.96	0.3	64.4
03	M	55.7	42.7	76.7	69.3	57.1	1.7	19.02	4.2	65.0
20	M	47.5	35.0	73.7	72.5	64.5	1.9	18.06	5.1	62.0
08	M	53.0	41.2	77.4	68.4	58.2	1.6	22.57	4.3	65.4
01	M	56.5	46.6	8.25	64.8	48.4	3.3	15.48	4.7	64.7
04	M	58.5	48.6	83.1	67.4	52.6	2.9	23.54	3.5	65.2
06	M	61.0	50.9	83.4	69.1	53.8	2.8	21.93	5.5	65.5
Average		55.81	44.28	79.1	68.8	55.9	2.2	20.22	4.4	64.6
13	F*	53.0	41.2	77.3	71.8	54.8	2.0	20.64	3.8	64.0
11	F	53.0	41.2	77.4	69.9	55.8	1.9	20.96	5.8	65.0
18	F	65.5	53.2	81.0	68.4	52.6	2.4	24.83	6.0	68.0
10	F	58.5	46.4	79.3	68.5	622.5	2.1	25.15	4.7	66.4
02	F	63.0	51.8	82.2	67.1	50.9	2.6	19.35	6.0	65.7
12	F	65.5	54.5	83.2	67.1	52.4	2.9	24.83	6.6	69.0
14	F	77.5	64.5	83.2	69.7	53.0	2.8	24.83	6.5	68.8
Average		62.28	50.4	80.51	68.9	54.5	2.3	22.94	5.6	66.7

M* - Male, F* - Female

68.9 per cent, respectively; though the dressing percentage of the gilts (80.5 per cent) was higher than that of the castrates (79.1 per cent). The difference (1.4 per cent) was, however, not significant ($P > 0.05$). The mean BFT of the castrates was slightly less (2.3 cm) than that for the gilts (2.4 cm), while the absolute mean value of LEA for the castrates was also less (20.2 cm^2) than that for the gilts (22.9 cm^2). The difference, though, was not significantly different ($P>0.05$). The mean total fat trimmed from the gilts (5.6 per cent) was significantly ($P<0.05$) higher than the value (4.4 per cent) for the castrates. This was positively correlated to the BFT. Carcass length of the gilts (66.7 cm) was significantly longer ($P<0.05$) than that of the males (64.6 cm).

Discussion

The relatively fast growth rate of males compared to females (8.4 cf 7.9 kg/month) in the first 4 months confirmed the findings of Wood (1983). He reported that male pigs normally outgrew their female counterparts. The surprising findings, however, were that the females caught up with the growth rate of the males and even outgrew them from the 5th month to slaughter day. Probably the stress caused by the castration slowed the growth rate initially. It was also observed that the males intermittently fought among themselves. This probably led to expending of energy that might have been used for muscle tissue accretion. The females were, however, docile and this led to uninterrupted growth rate. Mature weight of indigenous pigs in sub-Saharan Africa has been recorded as between 40 and 80 k (Rigor & Kroeske, 1972). There was no significant difference in dressing percentage between the sexes; this is similar to the findings of Jogi, John & Arora (1993) who worked with Indian pigs. On the contrary, Sukhdeo *et al.* (1980) recorded non-significant effect of weight at slaughter, but significant effect of sex on dressing percentage in Large White and their cross-bred pigs.

The relatively high but not significant mean LEA of the females was not expected, since in general, the LEA and BFT are negatively correlated (Barnes & Bekoe, 1991; Bereskin & Davey, 1978).

The similar primal cuts of both males and females in this study was expected, since the dressing percentages were also quite similar and fat was not trimmed from the cuts. The 4 per cent lean cuts of the castrates was, however, slightly higher than the 4 per cent lean cuts of the females. On the contrary, Wood (1983) and Barnes & Bekoe (1991) reported that female pigs were leaner than castrates in Large White. The boars in this study were castrated late in life; hence, they may not have had the opportunity to increase their fat deposition. Rigor & Kroeske (1972) suggested that, for indigenous pigs, it would be advantageous to slaughter at live weight beyond 40 kg, but less than 70 kg. This is because the rate of protein accretion peaks between 40 and 80 kg in lean and obese pigs (Pathiraja, 1986).

The significantly long carcass of the female supports the findings of Christian *et al.* (1970) and Singh *et al.* (1997) that heavy slaughter pigs normally have longer carcasses.

In this study, the female carcasses were significantly ($P<0.05$) heavier than the male carcasses.

Conclusion

The ADP boars outgrew the gilts before they were castrated at the age of 5 months. The mean slaughter weight of gilts at 10 months was heavier than that for castrates. Carcass characteristics were similar for both sexes. All carcass parameters, with the exception of percent fat trimmed and carcass length, were similar.

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