

A COMPARISON OF LACTATING PERFORMANCE OF CREOLE AND LARGE WHITE SOWS IN A TROPICAL HUMID CLIMATE: PRELIMINARY RESULTS*

COMPARACIÓN DE INDICADORES DE PRODUCCIÓN LECHERA EN CERDAS CRIOLLAS Y LARGE WHITE EN UN MEDIO TROPICAL HÚMEDO: PRIMEROS RESULTADOS

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ADDITIONAL KEYWORDS

Local breed. Pig. Lactation.

PALABRAS CLAVE ADICIONALES

Raza local. Cerdo. Lactación.

SUMMARY

A total of one hundred and twenty seven lactations were used to study the effect of genotype (Creole vs Large White) on lactating performance. This experiment was conducted in Guadeloupe (F.W.I., 16° Lat. N., 61° Long. W) between June 2001 and April 2003. Over a 28-d lactation length, average daily feed intake was significantly lower ($p < 0.01$) in Creole (CR) than in Large White (LW) sows when it was expressed in kilograms or in grams per kilogram of metabolic body weight (3.1 vs 4.3 kg/d and 73 vs 80 g/d/kg^{0.75}). After farrowing, first parity CR sows were 26 kg lighter compared to primiparous LW sows. This difference was accentuated in multiparous sows (i.e., -95 kg). On average, body weight (BW) loss during lactation was not affected by the genotype. However, the backfat

thickness loss was significantly higher ($p < 0.001$) in CR than in LW sows (16 vs 30 mm). Litter size at birth and at weaning were significantly reduced ($p < 0.01$) in CR than in LW sows (8.7 vs 10.3 and 7.7 vs 9.1, respectively). The piglet BW gain and mean BW at weaning were significantly lower ($p < 0.01$) in CR compared to LW sows (190 vs 208 g/d, and 6.35 vs 7.06 kg respectively). Daily feed intake pattern during lactation differed between LW and CR sows. CR daily feed intake increased constantly whereas LW daily consumption increased rapidly during the 1st wk and remained around 4.8 kg over the last 3 wk of lactation. In conclusion, LW sows have better lactating performance than CR sows.

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RESUMEN

Se usaron un total de ciento veintisiete lactaciones para estudiar el efecto del genotipo

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(Criollo vs Large White) sobre los indicadores de producción lechera de las cerdas. Este experimento se hizo en Guadeloupe (FWI, 16° Lat. N, 61° Long W) entre junio 2001 y abril 2003. Sobre una duración de lactancia de 28 d, el consumo diario promedio, expresado en kg o en g/kg de peso metabólico, fue significativamente más bajo ($p < 0,01$) en cerdas Criollas (CR) que en Large White (LW), (3,1 vs 4.3 kg/d y 73 vs 80 g/d/kg^{0.75}). Después del primer parto, el peso de las cerdas CR fue 26 kg más bajo que el de las cerdas LW. Esta diferencia fue más alta en cerdas multiparas (95 kg). En promedio, la pérdida de peso vivo durante la lactación no fue afectada por el genotipo. Sin embargo, la pérdida de espesor de grasa de la espalda fue significativamente más elevada ($p < 0,001$) en cerdas CR que en LW (16 vs 30 mm). El tamaño de la camada al nacer y al destete fueron más bajos ($p < 0,01$) en cerdas CR que en LW (8,7 vs 10,3 y 7,7 vs 9,1, respectivamente). El consumo diario durante la lactancia fue diferente entre las cerdas LW y CR. El consumo diario de las cerdas CR subió constantemente, mientras el de las LW subió rápidamente en la primera semana, y se quedó alrededor de 4,8 kg para las 3 últimas semanas de lactancia. En conclusión, las cerdas LW tienen mejores indicadores de producción lechera que las cerdas CR.

INTRODUCTION

The pig livestock in Guadeloupe (F.W.I, 16° Lat. N., 61° Long. W) is constituted of two mains populations. The exotic breeds (Large White and Large White Landrace) imported from France are reared in commercial farms and represents about 60 to 70 percent of the total population size. The Creole pig (CR), the indigenous breed of Guadeloupe, generally reared in family farms using natural resources and is described as resulting from a cross

between Iberian stocks introduced into West Indies as early the 16th century and French, English, and American breeds introduced throughout centuries (Canope et Raynaud, 1981). As a result, CR is today a highly polymorphic pigs population with a high variation of color patterns, size and production level (Canope, 1982; Canope et Raynaud, 1981). According to these latter studies, CR sows were characterized by an early sexual maturity and a lower prolificacy. However, the CR pig is known for its hardiness and adaptation to harsh environment. Little information is available on Creole sow performance during the lactation period.

The objective of this study was to evaluate the effect of breed (CR vs LW) and parity on performance and feeding behavior of lactating sows and their litters. The present paper will focus on performance of sows.

MATERIALS AND METHODS

This study was conducted at the experimental facilities of INRA in Guadeloupe (West French Indies, lat 16°N, long 61°W) and involved a total of 57 sows (22 and 37 CR and LW sows, respectively). Sows were reared in mixed contemporary groups of eight to ten animals. The data covered the period between June 2001 and April 2003; a total of 143 lactation was studied. Fourteen to ten days before farrowing, sows were moved to an open front farrowing room equipped with pens on a metal slatted floor and infrared lights to provide supplemental heat for the piglets. During the first week (wk) of lactation, the feed

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allowance was progressively increased until day (d) 5. The lactation diet was based on corn, wheat middling, soybean and contained 17.5 percent crude protein and 14.2 MJ of DE/kg. Lactating sows had free access to water via low-pressure nipple drinker. Litter size was standardized within breed by cross-fostering within 48 hours (h) after birth. Creep feed (15.3 MJ of DE/kg, 20 percent crude protein) was provided to the piglets after d 21 of lactation. The piglets were weaned at 4 weeks of age.

At farrowing and at weaning, sows backfat thickness and body weight (BW) were measured. Sow's daily feed intake was determined as the difference between feed allowance and refusals collected on the next morning. Piglets were individually weighed every 7 days from birth to weaning. Every week, one sample of feed was taken for DM and successive samples were pooled for each replicate for further analysis.

The effects of breed (CR vs LW), parity (primiparous vs multiparous), their interaction, and the effect of group were tested according to an analysis of variance (GLM procedure, SAS Inst. Inc., Cary., NC, 1990).

RESULTS

As presented in **table I**, average daily feed intake (ADFI) was lower ($p<0.001$) in CR than in LW sows when it was expressed in kilogram (3.1 vs 4.3 kg.d⁻¹) or in gram per kilogram of metabolic BW (73 vs 80 g.d⁻¹.kg^{0.75}). The patterns of daily feed intake of LW and CR sows over a 28-d lactation are presented in the **figure 1**. At the

beginning of lactation period, the sows were restrictively fed, so that ADFI increased similarly for both breeds until d 3. In CR sows, ADFI remained constant between d 3 and d 6 and increased progressively between d 6 and d 25 (+76 g/d, $p<0.05$). In contrast, ADFI increased between d 3 and d 8 (+380 g/d, $p<0.05$) and plateaued from d 8 around 4.8 kg/d in LW sows.

The BW at farrowing was significantly higher ($p<0.001$) and backfat thickness at farrowing was lower ($p<0.001$) in LW than CR sows (218 vs 157 kg and 16 vs 29 mm, respectively). At farrowing, the BW difference between breeds was accentuated in multiparous sows than primiparous sows (95 vs 26 kg). Breed did not affect the BW during lactation. However the breed to parity interaction was significant: the primiparous Creole sows lost more BW than multiparous sows (9.9 vs 4.5 percent of BW at farrowing; $p<0.01$). The backfat thickness loss was higher ($p<0.001$) in CR than in LW sows (3.7 vs 1.8 mm).

Litter size at birth, at day 1 (i.e. after cross-fostering) and at weaning were significantly reduced ($p<0.01$) in CR than in LW sows (8.8 vs 10.2, and 7.7 vs 9.1 piglets, respectively). An interaction between breed and parity was found for litter size at weaning ($p<0.05$); the litter size at weaning was reduced in primiparous than in multiparous CR sows (-1.6 piglets, $p<0.05$) whereas the effect of parity in LW sows was not significant. The average piglet BW at birth and at weaning were significantly lower ($p<0.01$) in CR sows than in LW sows (1.03 vs 1.38 and 6.34 vs 7.06 kg, respectively). Moreover, irrespective

Table 1. Effect of breed and parity on sow performance over a 28-d lactation (Least squares means). (Efecto de la raza y del número de parto sobre indicadores productivos de la cerda en 28 d de lactancia (medias ajustadas)).

Item	Breed				RSD ^a	statistical analysis ^b
	Creole		Large White			
	primiparous	multiparous	primiparous	multiparous		
No. of sows	19	41	14	53		
Parity	1.0	3.0	1.0	4.6		
Lactation length	27.8	28.2	26.9	27.9	1.9	
Daily feed intake ^c						
- kg/d	3.16	3.01	4.29	4.39	0.63	B**, G**
- gk ^{0.75}	76.8	69.1	92.1	68.7	14.8	B**, P**, B P*
Body weight						
- After farrowing, kg	147	167	173	262	27	B**, P**, B P**, G**
- Loss, kg	5	17	11	11	10	P**, B P*, G**
- Loss, percent	4.5	9.8	5.8	4.0	5.3	
Backfat thickness, mm						
- After farrowing	27.0	31.2	14.0	18.2	5.1	B**, P**
- Loss	3.4	4.1	1.8	1.9	2.5	B**, G**
Litter size						
- At birth	8.1	9.3	9.8	10.8	2.5	B**, P*, G*
- At d 1 ^d	8.2	9.5	9.7	10.7	1.9	B**, P**, G**
- At weaning	6.9	8.5	9.5	8.7	1.9	B**, B P*, G**
Piglet BW, kg						
- At Birth	1.01	1.04	1.43	1.33	0.20	B**
- At weaning	6.35	6.34	7.03	7.09	1.08	B**
- Piglet BW gain ^e , g/d	192	187	209	206	33	B*

^aRSD: Residual standard deviation; ^bFrom an Generalised Linear Model analysis including the effect of breed (B), parity (P), breed - parity interaction (BP) and effect of contemporary group of sows (G), as fixed effects. Statistical significance: *p<0.05; **p<0.01. ^cAverage Daily Feed Intake over a 28-d lactation; ^dAfter cross-fostering; ^eAdjusted by litter size at weaning.

to the parity number, the piglet BW gain was higher (p<0.05) in LW sows than in CR sows (210 vs 190 g/d).

DISCUSSION

The voluntary feed intake was lower in CR than LW sows especially at the beginning of the lactation period. This

reduced ADFI could be related to the lower energy requirements for maintenance and production in CR sows. Moreover, as reviewed by O'Grady *et al.* (1985), the lactation feed intake was related to the condition score of sows at farrowing. Dourmad (1991) found a negative relationship between backfat thickness at farrowing and feed intake especially in the beginning of

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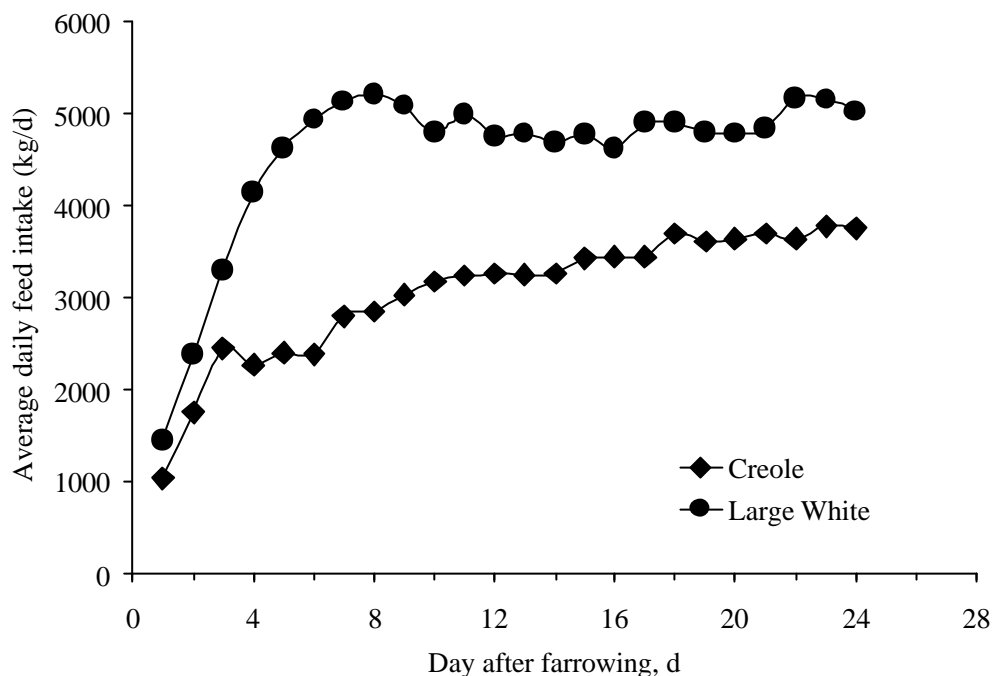


Figure 1. Effect of breed (Large White ●, Creole ◆) on daily feed intake during the lactation period. (Efecto de la raza (Large White, Creole) sobre el consumo diario durante la lactancia).

lactation. These results suggest that the decrease of ADFI in CR sows was related to their high adiposity at farrowing.

According to Canope (1982), the CR sows was less prolific than LW ones. However, this genotype difference between both breeds is accentuated in our study in relation to genetic improvement of prolificity of LW sows. In addition, the reduction daily BW gain in CR piglets is similar to the value reported by Canope (1982) (-15 vs -25 g.d⁻¹.piglet⁻¹). According to Noblet and Etienne (1989), milk production can be estimated from piglet BW gain and litter size. From our results, it can be

calculated that milk production is reduced of about 1.4 kg/d in CR sows compared to LW sows. The decrease in the ability of sows to produce milk and (or) the decrease of suckling demand could explain the reduction of milk yield in CR sows. On the one hand, as milk production depends on litter size (Esley, 1971), the lower milk production in CR sows could be primarily attributed to a lower number of nursing piglets. On the other hand, as reported by King *et al.* (1997), piglet BW affects the milk yield: the heavier piglets are more efficient for obtaining milk during suckling. Consequently, the lower milk production in

CR sows could be also related to their smaller piglets.

CONCLUSION

The present study demonstrates the

lower lactating performance when CR sows are compared to LW sows. Further studies are required to know whatever the difference in milk production observed between CR and LW sows as in the results of maternal and/or piglet influences.

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