CARCASS CHARACTERISTICS OF ONCE BRED GILTS AND NULIPAROUS FOR PORK PRODUCTION

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Background.

Sows maximum productivity is reached between the 4th and 6th delivery, but modifications that take place in their body´s composition, significantly lower the commercial value of the carcass when slaughtered and replaced by gilts. Therefore, slaughter of sows after their first delivery, reigning part of the reproductive potential is feasible, obtaining instead good quality carcasses with noticeably higher weights than the usual in the market. These carcasses could be destined to the preparation of high quality salted products such as those obtained from heavy pigs. On the other hand, a current overall trend is to increase weight at slaughter since the high lean tissues content of the current genetic breeding lines, do not produce animals with so much fat as could be observed years ago (Albar *et al.*, 1990; Weatherup *et al.*, 1997). In the case of primiparous sows, muscle growth potential would be expressed during gestation due to anabolism associated to pregnancy. Likewise, higher weight at slaughter is related to an increase in different parameters associated with carcass quality, as reported by various researchers (Bittante *et al.*, 1990; García Macías *et al.*, 1996; Prandini *et al.*, 1996). In most of the tests carried out with primiparous sows, carcass weight reported was lower than that of nuliparous females of the same age; the same happened with dorsal fat thickness (Brooks *et al.*, 1975; Friend *et al.*, 1979). On the contrary, MacPherson *et al.* (1977), observed less fat thickness in the carcass of 135 kg primiparous sows, regarding 120 kg nuliparous ones, subject to a restricted diet. Ellis *et al.* (1996) did not observe significant differences in the carcass yields of nuliparous and primiparous sows with different lactation periods. The *Longissimus dorsi* (LD) muscle area is lesser in the carcass of primiparous compared to heavy nuliparous (Friend *et al.*, 1979), but bigger regarding light nuliparous females in market weight level (Brooks *et al.*, 1975).

Objective.

Compare the main quality characteristics of market weight or higher nuliparous females carcass, with primiparous females slaughtered after their first delivery.

Methods.

Forty two gilts were used, originated by crossing PIC MP 405 males with Landrace x Yorkshire females, mean weight 97 kg and 180 days old, chosen at random from finishing lots of animals destined to market. Gilts were individually identified and distributed as follows: Light nuliparous (LN): fed *ad libitum* (diet A: 3.24 Mcal/kg EM; 21% PB; 1.25% lysine) until slaughter at 189 days of age. Heavy nuliparous (HN): they had restricted feed (2 kg/day) (diet B: 3.21 Mcal/kg EM; 15% PB; 0.61% lysine) and were slaughtered at 330 days of age. Primiparous (P19): were inseminated at 180 days of age and consumed the same ration as HN up to 272 days and later consumed 2.5 kg until delivery. During lactation (19 days), feed was offered *ad libitum* (diet C: 3.21 Mcal/kg EM; 20% PB; 1.08% lysine) and after weaning the young, they once more were fed 2.5 kg of diet B during nine days, and at 330 days were slaughtered together with the HNs. During the whole period of time the test lasted, the animals were kept in standard individual cages. After slaughter, carcasses were weighed and the following measurements were made on the left half carcass: total length, subcutaneous fat thickness along the center line at the withers (GC), at last rib level (GUC) and on Gluteus medius muscle (GGM). After 24 hours, subcutaneous fat thickness was measured (P2) and depth of LD at 6 cm of the center line on the exposed cut surface at the point of the last rib, as well as the surface of that muscle. GLM (General Linear Model) of the SAS (SAS, 1997) statistical program was used to analize all the variables. Mean values were compared by square minimums using the Tuckey Test with a 5% signifficance (α=0.05).

Results and discussion.

Excepting the less age LN carcasses, HN and P19 weights showed significant differences, due to weight losses caused by lactation in the latter. Carcass yield increased 0.70-0.75% for each 10 kg live weight increase of the animals, considering weight variation between LN, HN and P19. These percentage yield increases are similar to those mentioned in tests with heavy pigs (Albar *et al.*, 1990; Bittante *et al.*, 1990). The increase in length of the carcass and weight of the animals have been reported in several works (García Macías *et al.*, 1996; Candek-Potokar *et al.*, 1997), so the difference in weight between HN and P19 should have been expressed in longer carcasses for HNs. This shows primiparous sows have longer carcasses regarding their weight, coinciding with what was found in other works (Legault and Gruand, 1975; Ellis *et al.*, 1996). Significant differences found in fat thickness on the center line and at P2 level, indicate carcasses fatten more when animals weight increases. Fat thickness increase for nuliparous is 1.2 mm at the point of the last rib for every 10 kg of weight increase. These values are somewhat lower than those obtained by other researchers (Prandini *et al.*, 1996), for those same points and animals of different breeds or crosses, probably due to a higher feeding restriction applied in this test. Nevertheless, no differences were observed between LN and P19, which shows that mobilization of body reserves in the lactating females, lessens fattening of those carcasses, coinciding with data reported by Legault and Gruand (1975); Brooks *et al.* (1975) and Friend *et al.* (1979). The LD area and depht showed a trend to increase with age and weight, confirming what Albar *et al.* (1990); García Macías *et al.* (1996) and Ellis *et al.* (1996) reported. Nevertheless in this test, P19 females showed similar values for LD area to LN but lower (P>0.05) than HN. These results are similar to that obtained by Brooks *et al.* (1975) and Friend *et al.* (1979) and show that growth of the LD area was slightly less regarding weight increase, since these were primiparous sows. This may be revealing a conflict between simultaneous requirements for a continued growth of lean tissues and reproduction (Edwards, 1998). If less fattening occurs in the P19 compared to HNs, as well as similar values in the LD area regarding

the LNs, we could infer that the percentage of lean tissue in these primiparous could be equal or higher to P19 confirming what Brooks *et al.* (1975) reported.

Conclusions.

Weight at slaughter of these sows adapts to a market oriented to higher weight carcasses, excellent to manufacture high quality products. The carcass quality of these primiparous gilts is adequate and no different from that of animals in market weight, either in yield, fattening degree and *Longissimus dorsi* development, showing less fat than females of the same age destined to the heavy pigs market.

Pertinent literature.

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Table 1: Least-squares means and residual standard deviation (RSD) of carcass measurements.

	LN	HN	P19	RSD
N° of gilts	12	12	18	
Slaughter weight (kg)	101.0	158.1	140.1	11.30
Age at slaughter (days)	189	330	330	-
Hot carcass weight (kg)	81.2 ***c***	130.6 ***a***	113.5 ***b***	10.71
Killing out (%)	78.24 ***c***	82.52 ***a***	80.93 ***b***	2.18
Carcass length (cm)	80.58 ***b***	94.75 ***a***	94.17 ***a***	3.15
GC (mm)	30.58 ***b***	37.58 ***a***	29.55 ***b***	4.68
GUC (mm)	19.58 ***b***	26.50 ***a***	18.17 ***b***	4.09
GGM (mm)	16.16 ***b***	25.00 ***a***	13.11 ***b***	4.60
P2 (mm)	16.0 ***b***	23.75 ***a***	15.88 ***b***	4.01
DLD (mm)	61.3	65.9	62.33	8.10
ALD (cm^2)	48.40	51.11	48.77	6.95

Midline backfat thickness measurements at the shoulder (GC); at the level of the last rib (GUC) and over Gluteus medius (GGM). Measurements taken on the cut surface of the loin at level of the last rib: eye muscle depth of *Longissimus dorsi* (DLD), fat depth (P2), eye muscle area of *Longissimus dorsi* (ALD). Different letters indicate significant differences ($P<0.05$).