A NOTE ON THE INCIDENCE OF BOAR TAINT IN THE CARCASSES OF NON CASTRATED PIGS SLAUGHTERED IN CATALUNYA.

A. DIESTRE, D.CALSINA, G. CASADEMONT and J. M. MONFORT.

Institut Català de la Carn. Granja Camps i Armet. Monells (Girona), Spain.

INTRODUCTION.

Advantages and disadvantages in meat production using entire animals has been widely studied. Conclusions in all species have been that non castrated males have growth rate and feed conversion of 5 to a 20% greater than castrated ones. Besides, their carcasses have more muscle and less fat (Turton 1962, Crighton 1980).
In pigs, the presence of a sexual odor in some carcasses of boars has limited its production in most countries. However, in Spain because there is no clear legislation about this aspect pigs productors pressure has driven to a generalization of non castration of males for meat production. In Catalunya, where nearly a third of the pigs reared in the country are killed, almost all the males slaughtered are entire from a few years ago.
Up to 1968, the terminology "sexual odor" better know as "boar taint" was a bit imprecise, though Craig et al. (1962) established its location at the fatty tissue. Patterson (1968), found out that the steroid 5-αandrost-16-3-one (androstenone) was responsible of this odor in boars fat. Later on, a lot of research has been carried out in order: to evalute its incidence in carcasses; to determine the consumers response; to find an efective method of screening tainted carcasses in the slaughter line; to prevent its presence according to rearing sistems, by selection or by inmunological methods (Claus et al. 1971, Anonymous 1975, Lesser et al. 1977, Andresen 1979, Walstra 1979, Forland 1980, Walker 1980, Malmfors et al. 1980, Moerman 1981).
In this note, first results are presented about the work carried out in our Institute, as an response to an inquietude of some sectors of meat industry in Catalunya. Results consist in the determination of boar taint through sensory evaluation of fat samples obtained from boar carcasses. Also, the possible relationship between accessory sex glands size and sex odor intensity was studied.

MATERIALS AND METHODS.

Subcutaneous back fat samples and accessory sex glands were collected from a number of 202 boar carcasses at two slaughterhouses in the province of Girona. Mean carcass weight and standar deviation was 74.7 $\pm$ 10.4 kg. The glandulae bulbo-urethralis (gl. bulb.) and glandulae vesicularis (gl. ves.) were dissected from fat and conective tissue. The gl. ves. was emptyied of its seminal fluid content. Afterwards, each gland was weighted and the length of the gl. bulb. was recorded. Fat samples were divided in two and packed into polythene bags and air was evacuated prior sealing. The samples were stored at -10ºC awaiting sensory testing and a analitic test to obtain androstenone concentration whose results will be presented in a next publication.
Sensory test was carried out by means of soldering iron method described first by Jarmoluk et al. (1970). Each fat sample was heated with the tip of a soldering iron and the temperature held constant. The smoke was evaluated by every member of a selected panel. It was selected out of 15 people initialy predisposed. Only 4 people were capable to tell the differences of intensity through smelling among different concentrations of androstenone (0, 0.5, 1.0, 3.0 μg androstenone/ml of diethyl ether). The samples were evaluated using a 6-point scale (0=absent, 1=dubious, 2=slight, 3=present, 4=strong and 5=very strong). Every sample was tested 3 times by each of the 4 selected members. The mode of the observations was used as the indicator of boar taint. According to Walstra (1979), this estimation is the best representative of the boar odor intensity, being a 6-point scale and at least 12 repetitions preferred.

RESULTS AND DISCUSSION.

Table 1 shows the distribution of the carcasses analized overall and grouped into weight ranges according to boar taint scores. About 97% of carcasses were negative of boar taint, nearly 3% had slight odor, and no cases of clear sex odor were recorded. Besides, no clear relationship between boar odor and carcass weight was found. In the carcass weight ranges studied the percentages affected was similar.
Walstra (1974), points out a low incidence of boar carcasses with strong sex odor. According to him, it was necesary to analized 2,206 boar carcass to collect enough number of them to

carry out a consumer test. He found that 93% of the carcasses analized were free for boar odor, about 6% presented a slight odor, and only 1% had strong odor. Joseph and McClaughlin (1977), found that about 24% of young boars showed sex odor. However, in their study gilts and hogs presented an incidence of 2 and 9% respectively. Malmfors and Hansson (1974), found that nearly 40% of an amount 500 Swedish Landrace and Yorkshire boars had no odor. The other 40% scored "unsure" and only 20% scored tainted. It is usually found that the incidence of boar taint is low.

Its seems to be no relationship between animals age and weight and boar taint in normal slaughter weights. Walstra (1974), did not find differences between carcasses below and over 80 kg. This author points out that an increase in androstenone content usually takes place from 120-180 days of age, existing a wide interboar variation (Walstra 1979).

Table 2 presents mean values, standard deviations and coefficients of variation of weight and size of accessory glands. The wide interboar variations are reflected in the magnitude of the coefficients of variation. Forland et al. (1980), found coefficients of correlation in the range of 0.6-0.8 between the size of the accessory sex glands and the level of androstenone in the subcutaneous fat of boars. The correlation between boar tain and the size of these glands was between 0.28-0.34. It seems, that the great variability in size of accessory sex glands does not allow a clear detection of boar taint. In our results, several boars presenting a great development of these glands (gl. bulb. lenght over 14 cm) showed no boar taint. Probably size of accessory glands not give a good prediction of taint, though its correlations with androstenone level in fat and taint scores are positive.

REFERENCES.

ANDRESEN, Ø., 1979. A rapid radioimmunological evaluation of the androstenone content in boar fat. Acta vet. scand., 20: 343-350.

ANONYMOUS, 1975. The E.A.A.P. working group on production and utilisation of meat from entire male pigs: Report on 1975 meetings. Livest. Prod. Sci., 2: 317-324.

CLAUS, R., HOFFMANN, B. and KARG, H., 1971. Determination of 5-a-androst-16-en-3one, a boar taint steroid in pigs, with reference to relationship to testosterone. J. Anim. Sci., 33: 1293-1297.

CRAIG, H. B., PEARSON, A. M. and WEBB, N. B., 1962. Fractionation of the component (s) responsible of sex odor/flavor in pork. J. Food Sci., 27: 29-35.

CRIGHTON, D. B., 1980. Endocrinology of meat production. In: Developments in Meat Science - 1. Ed. by R. Lawrie, p 1. Applied Science Publishers LTD., LONDON.

FØRLAND, D. M., LUNDSTROM, K. and ANDRESEN, Ø., 1980. Relationship between androstenone content in fat, intensity of boar taint and size of sex accessory glands in boars. Nord. Vet. Med., 32: 201-206.

JARMOLUK, L., MARTIN, A. H. and FREEDEN, H. T., 1970. Detection of boar taint (sex odor) in pork. Can. J. Anim. Sci., 50: 750-752.

JOSEPH, R. L. and McCLOUGHLIN, P. M., 1977. The detection of boar odour by a laboratory panel. Proceedings of the European Meeting of Meat Research Workers, No. 23 (1977).

LESSER, D., BARON, F. J. and ROBE, J. O., 1977. Boar bacon: A consumer survey. J. Sci. Food Agric., 28: 1120-1131.

MALMFORS, B. and HANSSON, I., 1974. Incidence of boar taint in Swedish Landrace and Yorkshire boars. Livest. Prod. Sci., 1: 411-420.

MALMFORS, B., LUNDSTROM, K., HANSSON, I. and GAUNE, B., 1980. Research on boars and boar taint in Sweden. French-Swedish symposium on Monogastric Animals. Sept. 28- Oct. 4, 1980.

MOERMAN, P. C., 1981. Report of a Symposium on Boar Taint (Zeist, Jan. 29-30, 1981). 32nd Annual Meeting of the E.A.A.P., 31 Aug.-30 Sept., 1981.

PATTERSON, R. L. S., 1968. 5α-androst-16-ene-3-one: Compound responsible for taint in boar fat. J. Sci. Food Agric., 19: 31-37.

TURTON, J. D., 1962. The effect of castration on meat production and quality in cattle, sheep and pigs. A. B. Ac., 30(4): 447-459.

WALKER, N., 1980. The effect of controled growth rate on the performance of boars and the odour of subcutaneous fat at 85 and 122kg live weight. Livest. Prod. Sci., 7: 163-173.

WALSTRA, P., 1974. Fattening young boars: Quantification of negative and positive aspects. Livest. Prod. Sci., 1: 189-196.

WALSTRA, P., 1979. The E.A.A.P. working group on production and utilization of meat from entire male pigs: Conclusions of the 3rd meeting, Oct. 1977. Livest. Prod. Sci., 6: 319-321.

TABLE 1.-

Distribution of overall carcasses and grouped into three weight ranges, according to boar taint scores

Scores	Weight ranges			Total
	∠75 kg	75 - 85 kg	≻85 kg	
0= absent	99 (97.1%)	71 (97.2%)	26 (96.3%)	196 (97.0%)
1= dubious	-	1 (1.4%)	-	1 (0.5%)
2= slight	3 (2.9%)	1 (1.4%)	1 (3.7%)	5 (2.5%)
3= present	-	-	-	-
4= strong	-	-	-	-
5= very strong	-	-	-	-
Total	102	73	27	202

TABLA 1.-

Distribución del total de las canales y agrupadas en tres rangos de pesos las notas de olor sexual.

TABLE 2.

Mean values, standard deviations and coefficients of variation of gl. ves. weight (g), gl. bulb. weight (g) and length (cm).

	Carcass weight ranges (kg)						Total	
	∠ 75		75 - 85		≻ 85			
	$\bar{X}$	s.d.(C.V.)	$\bar{X}$	s.d.(C.V.)	$\bar{X}$	s.d.(C.V.)	$\bar{X}$	s.d.(C.V.)
Carcass weight	66.5	± 6.3(9.5)	80.1	± 3.3(4.1)	90.9	± 5.3(5.8)	74.4	± 10.4(14.0)
Gl.ves.weight	58.9	± 27.9(47.4)	76.4	± 34.0(44.5)	92.4	± 31.6(34.2)	69.7	± 33.0(47.4)
Gl.bulb.weight	107.7	± 40.4(37.5)	134.3	± 39.3(29.3)	148.9	± 43.4(29.1)	122.8	± 43.5(35.4)
Gl.bulb.length	10.1	± 1.3(12.9)	11.2	± 1.4(12.5)	11.9	± 1.4(11.8)	10.7	± 1.5(14.0)

TABLA 2.

Valores medios, desviaciones típicas y coeficientes de variación del peso de la gl. ves. (g) y del peso (g) y la longitud (cm) de la gl. bulb.