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Quality of carcasses in I.H.D.H. foals reared in the province of Bari (Italy)

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RIASSUNTO – Qualità delle carcasse di puledri T.P.R allevati in provincia di Bari (Italia). *Allo scopo di contribuire allo studio della produzione di carne equina nella Provincia di Bari sono stati macellati 12 puledri di razza TPR all'età tipica di 11 mesi. Le carcasse, che sono state valutate in considerazione del sesso, sono risultate meglio conformate ma anche più grasse nei maschi. Per questo motivo, il magro totale sulla mezzena delle femmine risulta più elevato dell'1,08% (72,75 vs. 71,67%) e il grasso meno incidente dell'1,5 2% (10,98 vs. 12,50%) (P<0,05). I maschi hanno una resa netta a caldo maggiore dell'1,5 2% (69,77 vs. 68,25%). Nella dissezione della mezzena le regioni più carnose sono risultate lombi, coscia e gamba. I tagli di I qualità rappresentano il 60% del magro totale, essendo il restante 40% costituito dai tagli di II e III qualità.*

Key words: I.H.D.H., foals, quality, carcasses.

INTRODUCTION – There has been a new development in recent years in the province of Bari: Italian Heavy Draught Horse (I.H.D.H.) raising for meat production. The interest of breeders in this new zootechnical development has steadily grown, but in the import-export balance of horse meat, Italy is almost completely dependent on the countries of the East, importing every year 120,000 animals (ISTAT 2003), the real origin of which is impossible to determine. About half of these are slaughtered in Apulia, where some of the highest consumption figures are recorded (ISTAT 2003). This situation indicates that there is a considerable potential for an increase in the rearing of horses for meat production. The evaluation of production costs certainly shows the Apulian equine field as disadvantageous, but it is competitive if the qualitative characteristics of the product are taken considered (Centoducati and Tateo, 2003). For these reasons, the quality of the carcasses of foals was investigated with a view to promoting this product.

MATERIALS AND METHODS – 12 I.H.D.H. foals were used for the test. They were equally divided between the two sexes, naturally suckled and fed in the fattening phases by pasture and feedstuff. The foals were slaughtered at 11 months, according to the Apulian tradition, at an EEC approved slaughterhouse. The carcasses obtained were classified using the EEC evaluation grids (Reg. n° 1208/81-2939/81). After a period of refrigeration at 4°C (2-7 d) dictated by the commercial needs of the meat, the right side was then divided in parts which were then removed and separated into lean, fat and bone according to the ASPA indications (ASPA, 1996). The classification of the lean meat in 1st, 2nd and 3rd quality cuts was performed according to the butchers' tradition.

All data were processed using the GLM from SAS (1998), according to the following linear model:

$$Y_i = M + a_i + E_i$$

where: Y_i = dependent variable, M = overall mean, a = sex ($i=1,2$) E_i = error.

RESULTS AND CONCLUSIONS – The foals carcasses, classified according to the EEC evaluation grids, show differences due to sex. The males fall in the category E and U for shape, class 4 for the external fattening state, and class 3 for internal fattening. The females have a U and R carcass form and fall in class 3 for external adiposity and 2 for internal adiposity (Roy and Dumont, 1976). The carcasses had a cooling loss of 2.13%, passing from a value of 69.1 to a value of 66.88% of water content. In the comparison between the sexes the first parameter taken into consideration, the net warm dressing percentage was 1.52% higher in males than in female (69.77 vs. 68.25%). The division of the right side in fore and hind quarters does not reveal differences due to sex but examining the cuts of the fore quarter, the thoracic cuts of the female are more developed (15.65 vs. 14.57%). In the hind quarter the situation is similar: only the lumbar cut of the female has a statistically significant lower incidence ($P < 0.01$), as the fillet has a lower extent ($P < 0.05$). In the males, on the other hand, the pelvic limb is more developed (32.23 vs. 31.01%). Looking at the percentage of the three fractions, however, there is 1.08% more lean meat in the females (72.75 vs. 71.67%): contrary to what could be expected this difference is due to a more intense fattening process in the males. This same phenomenon can be observed in the hind quarter, with an even greater extent (1.74%) than in the fore quarter (0.21%). The fat fraction therefore assumes a higher value that is statistically significant ($P < 0.05$) in the males with respect to the females: the observed difference is in fact 1.52% (12.50 vs. 10.98%). The cuts with the greatest incidence in the lean part of the fore quarter are the steak and shoulder cuts; for the hind quarter lumbar (78.6 and 76.83%), the proximal pelvic limb (78.52 and 79.08%) and the steaks 7-18 (74.56 and 83.55%) of males and females respectively. With regard to the bone fraction, excluding the distal thoracic and pelvic limb cuts, whose value of which is respectively a third and a half higher, the cut with the smallest element of bone in the fore quarter is the shoulder (10%), while in the hind quarter it is the lumbar (10%). Removable fat is practically absent (4%) in the distal thoracic limb and steaks 1-6 cuts. Naturally, an exception is the abdominal region cut which has a fat percentage of a third of the total weight. In the hind quarter the presence of fat for the majority of cuts is around 10%. In order to establish the incidence of first quality cuts relative to the total lean meat, and as there is no universally accepted classification, either at national or Community level that defines the category in which to include the various cuts, and because the 3rd quality cuts had almost completely disappeared in the area where the slaughtering was carried out, it was decided to combine the 2nd and 3rd quality cuts in a single category. Therefore the cuts were included within the categories according to local sales customs. There was a high presence of 1st quality cuts (45%) on the whole side for both sexes. It can therefore be said that the incidence of these cuts on the total lean meat has a value close to 60% in both sexes, with a higher level in the males (60.98 vs. 59.35%). In the fore quarter the 1st quality cuts are slightly more than a third: 38.49% in the females and 34.37% in the males. As regards the hind quarter, 1st quality cuts account for 3/4 of all the lean meat. The quality of the carcasses obtained from I.H.D.H. foals bred in the province of Bari is interesting. In fact, if we compare the results of this test with those relative to the characteristics of meat bullocks and steers (Muscio *et al.*, 1988; Zezza *et al.*, 1978, 1990), the foals certainly provide higher quality carcasses. Both the shape and the fattening state correspond to the requirements of butchers and consumers. The positive results obtained justify the interest in the I.H.D.H. raising. In the future, therefore, it will be necessary to investigate the further possibilities for the development of this production in both quantitative and qualitative terms looking, in particular, at the alimentary aspects and breeding techniques.

Table 1. Characteristics of carcass and meat

	Male	Female	SEM
Net warm dressing%	69.77	68.25	0.391
Cooling loss%	2.39	1.86	0.085
	Side dissection (%)		
Proximal thoracic limb	10.18	9.83	0.426
Distal thoracic limb	4.39	5.82	0.339
Neck	8.92	8.14	0.284

Streaks 1-6	5.95	6.08	0.184
Briskets 1-6	7.97	8.23	0.272
Streaks 7-18	6.76	6.66	0.476
Briskets 7-18	6.00	6.11	0.280
Diaphragm	0.66	0.68	0.020
Lumbar region	4.56 A	5.38 B	0.210
Fillet	2.46 a	2.62 b	0.049
Abdominal region	6.80	6.20	0.386
Proximal pelvic limb	28.58	27.30	0.696
Distal pelvic limb	3.66	3.71	0.090
Fat kidney	3.39	3.44	0.349
	Fraction incidence (%)		
Lean/side	71.67	72.75	0.747
Lean/fore quarter	73.59	73.80	1.617
Lean/hind quarter	70.91	72.65	1.142
Fat/side	12.50 a	10.98 b	0.465
Fat/fore quarter	11.65	10.63	0.411
Fat/hind quarter	12.84	11.11	0.726
Bone/side	11.96	11.88	0.257
Bone/fore quarter	11.60	10.65	0.411
Bone/hind quarter	10.32	10.79	0.288
	Cut quality (%)		
1 st /side lean	60.98	59.35	0.414
2 nd + 3 rd /side lean	39.02	40.65	0.414
1 st /fore quarter lean	38.49	34.37	1.423
2 nd + 3 rd /fore quarter lean	61.51	65.63	1.423
1 st /hind quarter lean	74.81	74.69	0.622
2 nd +3 rd /hind quarter lean	25.19	25.31	0.622

A, B = P<0.01; a, b = P<0.05.

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