

CHARACTERISTICS OF HORSE MEAT CONSUMPTION AND PRODUCTION IN ITALY

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Introduction

In Italy at present the consumption of products of animal origin is 10 times higher than fifty years ago. Meat consumption *pro capite* is about 82 kg/year. BSE occurrence in the nineties caused a reduction of 20% of bovine meat demand; the trend in the last years shows a general reduction of this kind of consumption. National production however cannot satisfy the needs, and more than half of the meat supply comes from importation (ISTAT 2001).

In Italy horse meat consumption is the highest among all European Community countries.

Aim of this study was to investigate horse meat consumption characteristics in Italy, in particular if the BSE occurrence affected consumer's behaviour towards this kind of meat, and which is at present the production situation.

Horse meat consumption in Italy

Horse meat consumption in Italy is widespread since ancient times. In the past however this kind of food was not always considered suitable for human nutrition: *e.g.* in the 8th century Pope Gregorio III defined "abominable" consuming horse meat and "unclean" the people eating it (Badiani and Manfredini, 1994).

Since 1928, Italian legislation didn't allow to sell horse meat together with other meats in the same stores. Only in the 1999 the law 526, in 12th paragraph, provided the abolition of this prohibition allowing selling this kind of meat in the markets, even if in separated counters. Probably, this prohibition was depending on the fact that in the past, when horses were employed in agriculture, most equine meat was coming from working horses at the career's end, in prevalence aged and in bad health conditions, and the conservation systems were not yet adequately developed. Breeding exclusively for meat production is in Italy a relatively recent employment of this species.

In the 15 European Community Countries average individual horse meat consumption is 0.4 kg/year (Martin-Rosset, 2001), while in Italy, which is the Country with the highest consumption, it is about 1.3 kg/inhabitant/year, representing 1.6% of the total individual meat consumption per year (82 kg) in Italy (ISTAT 2001).

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The parameter “average consumption *pro capite*” is however not representative of the situation, because a large part of the population never eats this aliment, due to the feeling of a sort of “cannibalism” towards an animal beloved as a pet or a sport companion. In an IRVAM survey made in Italy in 1989, 56% of the interviewed families declared to never eat horse meat, while 11% of them affirmed to be regular consumers (“at least once a week”) (Badiani and Manfredini, 1994).

Trend and distribution of horse meat demand in Italy

Trend in years

In the last years the trend of the slaughtered horses was clearly decreasing (Table 1); but with the occurrence of BSE in cattle, that reduced considerably beef consumption in Italy, in 1999 the number of slaughtered horses started to increase, due to the interest of the consumers toward different kinds of meat.

Table 1: Slaughtered horses in the last 5 years

Year	Slaughtered head	Comparison with previous year (%)
1995	260522	-2.9
1996	247593	-5.0
1997	240044	-3.1
1998	226842	-5.5
1999	227152	+0.1
2000	234904	+3.3
2001 (9 months)	212644	+25.7

Source: ISTAT 1995-2000

This tendency continued in 2001 as well: in the first 9 months there was an increasing in slaughtering of more than 25% in comparison with the same period of the previous year.

This tendency seems confirmed by the figures of the tons of importation meat as well (Table 2): comparing the meat imported every month in 2001 with the amount imported in the same month in 2000, it can be observed that there was an increase of imported equine meat in 2001, on average about 38% higher than in the same months of 2000; pork and mutton importation increased as well, but less relevantly: 13% and 22%, respectively. As regards pork the increase was observed only in January and February, afterwards a reversal of trend occurred. In the same period beef import was on average 42% lower (ISTAT 2001).

It has to be observed, however, that the imported quantities of the considered kinds of meat are very different from each other, *e.g.* equine meat is on average 2.4% of total imported meat, while pork represents 74.2%.

Table 2: Importation of several kinds of meat in from January to August 2001, compared to the same period in 2000

	tons	difference 2001/2000
beef	162102	-42.1
pork	535602	+13.5
mutton	20976	+21.8
equine meat	15944	+37.8

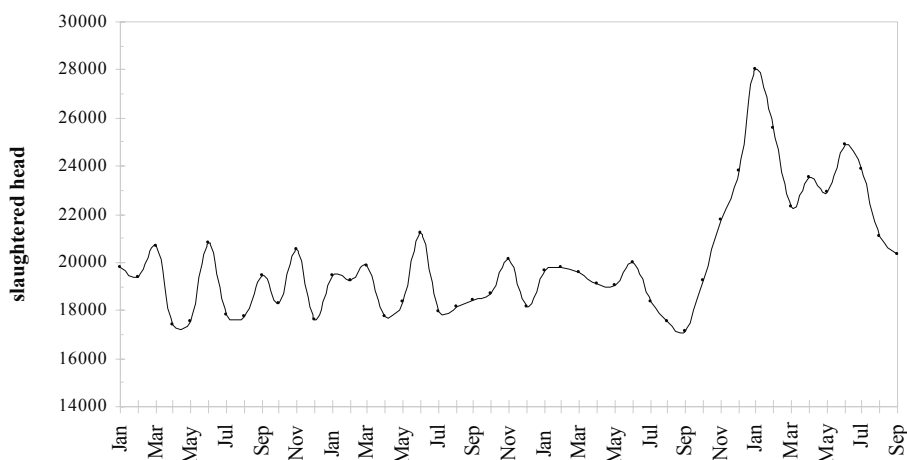
Source: ISTAT 2001

Seasonal trend

Horse meat is not consumed evenly during the year: usually an increase of the offer appears in November, due to the great number of foals led to slaughtering in this period, inducing therefore a lowering of the prices and an increase of the consumption. These foals, prevalently of local breeds, descend from the mountain pastures where they stayed in summer suckling the mares (Figure 1). The peak of the number of slaughtered horses, observed in the last months of 2000 and in the first of 2001, is most likely due to the great worry of the consumers for the BSE crisis that was observed in that period (De Roest *et al.*, 2001).

In summer horse meat consumption is usually lower than in the other seasons, maybe due to a lesser availability of the product (Manfredini and Badiani 1993; Badiani and Manfredini, 1994).

Figure 1: Seasonal trend of the slaughtered horses (years 1998-2001)



Source: ISTAT 1998-2001

A reduction in meat consumption during summertime is observed for other kinds of meat as well (Figure 2). As regards pork and mutton consumption's trend in Italy, the peaks appear clearly in correspondence of the festivities (Easter, Christmas) (ISTAT, 2001).

Distribution of the consumption in the national territory

Horse meat consumption is distributed unevenly in the national territory: in some regions this kind of food is more appreciated than in others (Figure 3); the largest percentage of horses slaughtered for meat production is observed in Puglia in Southern Italy (32%), followed by Lombardia (14%), Piemonte (11%) and Emilia Romagna (9%) in Northern Italy. In the rest of Italy the remaining 34% is distributed; this disposition seems to remain constant in time (Catalano, 1978; Catalano and De Stefano, 1983; ISTAT, 2000), and it seems depending more on cultural and traditional factors than on the availability of equines in the territory; *i.e.* in Tuscany, where many stud farms are present, the habit of equine meat eating is completely absent.

Horse meat production in Italy

In Italy there are about 350.000 horses. Equine meat production however is not sufficient to meet the national demand, which is satisfied by import, mainly from Extra European Community Countries: in the nineties, 80% of the horses imported for slaughtering was coming from Poland (Badiani and Manfredini, 1994; Segato *et al.*, 1999). Importation regards live animals and fresh or frozen meats as well (ISTAT, 2001). It was estimated that about 80% of the internal demand of horse meat is cov-

Figure 3: Italian regions with higher horse meat consumption

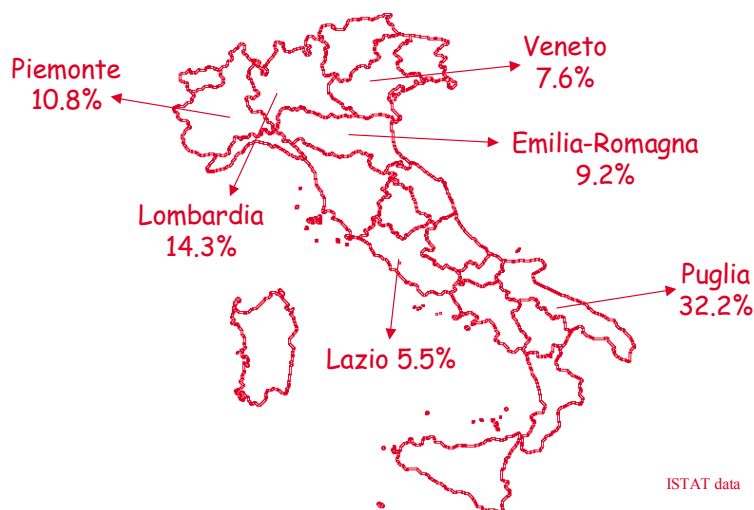
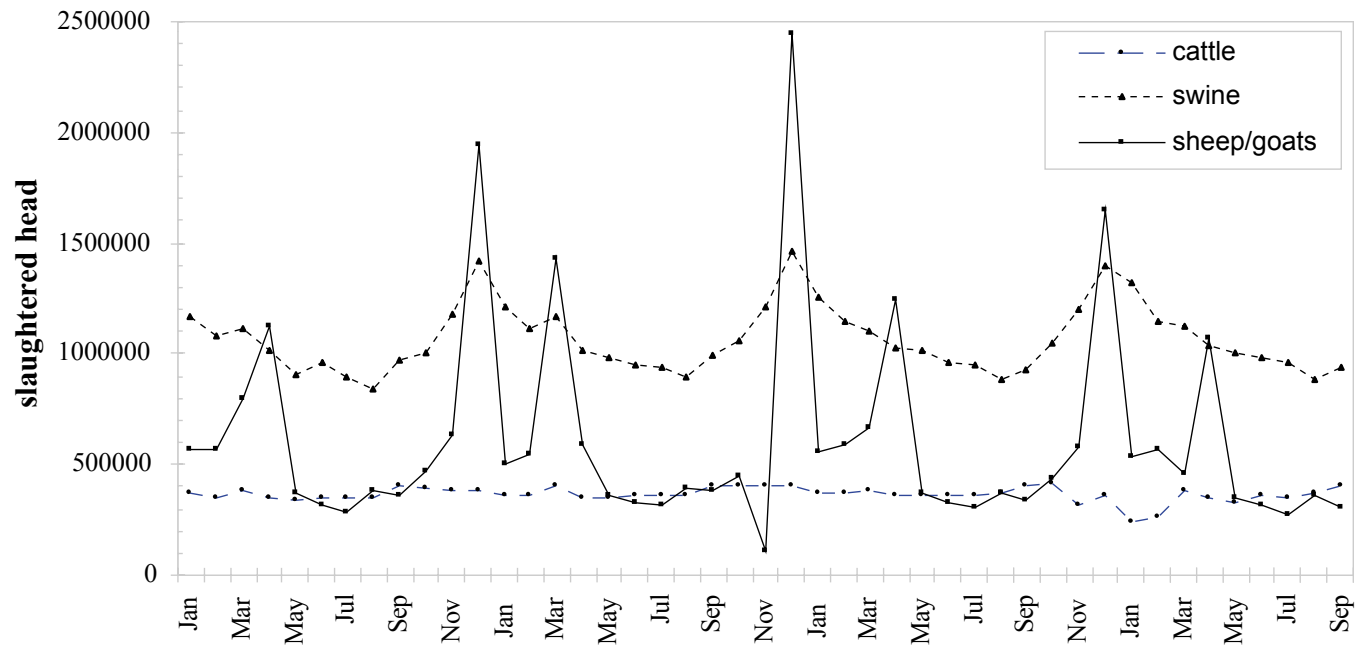


Figure 2: Seasonal slaughtering trend of other species (years 1998-2001)



Source: ISTAT 1998-2001

ered by importation (Badiani *et al.*, 1993; Catalano and De Stefano, 1983). The percentage of national meat demand satisfied by import or by internal production is at present difficult to assess, many animals being slaughtered clandestinely. On the other hand many horses imported for slaughtering are kept alive and employed mainly for saddle service.

Breeding horses exclusively for meat production was generally considered not very convenient by Italian breeders, due to several reasons:

in Italy wide grasslands for extensive husbandry are scarce, so most horses are relegated in the mountain or “marginal” areas, where heavy breeds cannot be reared, so often local breeds with light body weight and therefore low meat production are employed;

imported horses have prices so low, that for Italian breeders generally it is impossible to compete, due to the national production costs.

This was the situation before BSE occurrence that altered deeply the meat market, determining a rise of the prices of all “alternative meats”: equine steak price, *e. g.*, rose from 9 to 16 euro/kg; foal fillet from 12 to 23 euro/kg; prices of horses for slaughtering doubled, from 1 to 2 euro/kg. In the meanwhile, horses stealing increased as well: in Central Italy a trebling of horse thefts was observed (personal communications).

Horse breeds for meat production in Italy

Most horse meat of Italian provenience comes from cast race or saddle horses, at the end of the career or slaughtered for health problems. There are farms for equine meat production, but until few years ago there were no breeds exclusively selected for this purpose. A large contribute to the national production was given mainly by local, ancient equine populations, not specialised, but very resistant to parasites and difficult environmental conditions, to which they are suited since centuries, like *e. g.* the Bardigiano and Tolfetano populations (Catalano, 1976, 1978; Catalano *et al.*, 1983; Catalano and De Stefano, 1983). Usually the mares foal in April and then are kept grazing, receiving no integration, until October-November when the foals are sold for slaughtering; usually these animals weight about 250-300 kg; if there is the possibility of housing, or the foal body conditions are poor, or the market prices are considered not satisfactory by the breeder, these animals can be weaned and fattened until 10-15 months of age (Catalano and Quarantelli, 1979; Catalano, 1982).

Cavallo Agricolo Italiano da Tiro Pesante Rapido. The C.A.I.T.P.R. is the only Italian heavy breed (live weight 700-900 kg). Once bred for heavy draught and work in agriculture, now it is employed for meat production and draught competitions. Estimated population is about 6500 animals, of which 4500 are recorded in the Stud Book. It is bred in prevalence in the Po valley plain, origin area of this breed, and in specialised farms in Central Italy.

Haflinger. The Haflinger is one of the most widespread breeds in Europe; in Italy it was once employed for agriculture works in the Alps; at present it is bred in the whole national territory, employed mostly for leisure riding and carriage pulling.

Estimated population is 13000 animals; 5500 are recorded in the Stud Book (A.I.A., 2000).

Bardigiano. The Bardigiano Horse is an ancient breed of the Northern Italy Apennine; its diffusion is limited to a few provinces. Now the selection programme aims to a horse lighter and taller than the traditional type, once bred for work, in order to obtain a horse for leisure riding and light carriage pulling, being meat production not sufficient to cover the costs sustained by the breeders. Estimated population is 3500 animals; 1500 of them are registered in the Stud Book (Catalano *et al.*, 1983; Catalano and Martuzzi, 1985; Catalano *et al.*, 2001).

Franches Montagnes. The Franches Montagnes breed, of Swiss origin, is now widespread in whole national territory. Estimated population is 3000 animals, 2500 are registered in the Stud Book. (Italian Franches Montagnes Breeders Association, personal communication, 2001).

Other local breeds. Cavallo del Catria: 400 mares (Catalano and Martuzzi, 1986; personal communication, 2001) Tolfetano: 850 mares (A.I.A., 2000); Murgese: 800 mares (A.I.A., 2000).

Characteristics of horse carcasses and meat in Italy

Due to the different horses origins, breeds and husbandry systems mentioned before, there is great variability among the equine carcasses and meats consumed in Italy. In table 3 several Italian researches are compared with French studies. A comparison with the results of these researches is difficult, because the animals are of different ages and breeds. Moreover while in all considered studies the dressing percentage was calculated as hot carcass weight/ body weight, in the studies of Lacheretz *et al.* and Campodoni *et al.* the dressing percentage was calculated in the first case as hot carcass weight/body weight, and in the second as hot carcass weight/empty body weight: in this case the dressing percentage results higher, being “empty body weight” lighter than “body weight”.

According to several surveys, carried out in Italy, the meat coming from sport horses seems more appreciated by consumers, due to the more intense colour, subtler muscular fibres, lower fat content than the meat from heavy breeds; differently from other species, organoleptic characteristics of the meat from aged horses are the same as those from 30 months old animals (Catalano *et al.*, 1986; Manfredini and Badiani, 1993).

A good deal of surveys about this matter was carried out in the seventies and in the eighties. At present in Italy no more many studies regarding horse meat characteristics are carried out (Segato *et al.*, 1999).

In Italy horse meat is presented in many ways, as sausage or smoked, steak and several other preparations, that differ from zone to zone; in the Parma province there is the tradition to eat it uncooked and minced (“pesto”); in part of the Emilia region a “donkey stew” (“stufato di asinina”) is very appreciated, that is actually made with horse cheeks (masseters).

Table 3: Characteristics of horse carcasses

Reference	n.	Age ⁽¹⁾	Breed or type	Live weight (kg)	Dressing percentage HCW/BW ⁽²⁾	Muscle (%)	Fat (%)	Bone (%)
Martin-Rosset <i>et al.</i>, 1980	13	6m	Heavy French breeds	327	59.6	68.3	9.6	17.5
	20	12m	Heavy French breeds	483	64.9	70.1	10.9	15.6
	20	18m	Heavy French breeds	573	57.4	71.8	9.4	16.1
	20	24m	Heavy French breeds	627	61.0	69.8	12.9	14.9
	15	30m	Heavy French breeds	735	60.0	69.0	14.2	14.5
Catalano <i>et al.</i>, 1986	19	~6m	Franches Montagnes, Haflinger, Bardigiana and crossbreeds	226.4	60.0	72.4	9.7	17.7
	20	~15m	"	280.0	59.1	67.7	9.5	16.1
	20	A	Sport and draught-horse	514.0	60.0	69.1	13.4	14.2
Lacheretz <i>et al.</i>, 1990	37	6-10m	Heavy French breeds	406.4	62.0 ⁽³⁾	69.3		
Manfredini <i>et al.</i>, 1992	10	~12m	Haflinger	325.3	63.3			
	10	~12m	Croatian population	346	61.6			
	10	A	Croatian population	462.6	59.8			
	10	A	Saddle-horse	470.0	60.9			
Badiani <i>et al.</i>, 1993	8	4-7m	Franches Montagnes	278.1	61.67			
Campononi <i>et al.</i>, 1993	10	~8m	Derived Franches Montagnes	310	68.2 ⁽⁴⁾	63.68	16.43	15.74

(1) m = months, A = adult

(2) HCW /BW: hot carcass weight/ body weight

(3) CCW/BW: cold carcass weight/body weight

(4) HCW/EBW: hot carcass weight/empty body weight

Conclusions

BSE occurrence seems to have affected significantly consumers' choices in Italy, addressing them toward meats other than bovine; in particular horse meat consumption increased and the prices paid by consumers in 2001 are from 30 to 50% higher than in 2000. National production is not sufficient to cover the needs since long time, and the internal demand is satisfied by import, mainly from East Europe Countries. Importation of equine meat in 2001 increased, resulting on average 45% higher than in the same months of 2000.

Considering the particular orographic situation of the Italian territory, the horse meat market conditions and the high demand for living animals, that determines the importation of a large amount of riding horses and ponies as well, a way to increase horse meat production in Italy and to decrease import high expenses, could be encouraging and supporting the production of sport horses, for saddle service or carriage pulling. These horses, with an employment and economical value when alive, will become anyway meat producers when their career comes to an end.

Keywords: horse, meat consumption, meat production

SUMMARY - In Italy equine meat consumption has always had a certain importance. Average annual horse meat consumption is about 1.3 kg *pro capite*, representing 1.6% of the total meat amount consumed in one year (82 kg/head). Anyway almost half of the Italian population never eats this kind of meat. Recently there was a considerable increasing of horse meat consumption due to BSE occurrence in bovines. National production is not sufficient to meet market requirements. Most horses for meat production are imported from Eastern European Countries. Horse breeding for meat production is generally considered by breeders not convenient for two main reasons: in Italy wide pasture lands for extensive breeding are lacking, and the prices of horses imported from the Countries where these pastures exist are very low. Most meat of Italian provenience comes from sport horses slaughtered at career's end, or from foals of local breeds returning in fall from mountain pastures.

RIASSUNTO - Il consumo di carne equina ha sempre rivestito una certa importanza in Italia. Il consumo medio annuo *pro capite* di carne di cavallo è di circa 1.3 kg, che rappresenta l'1.6% della quantità totale di carne consumata in un anno (82 kg/ a testa). Tuttavia quasi metà della popolazione italiana non si ciba mai di questo tipo di carne. Recentemente si è verificato un considerevole incremento del consumo a causa dell'insorgenza della BSE nei bovini. La produzione nazionale non è sufficiente per coprire le richieste del mercato; la maggior parte dei cavalli importati per la produzione della carne proviene da Paesi dell'Europa dell'Est. L'allevamento del cavallo per la produzione della carne è generalmente considerato degli allevatori non conveniente per due ragioni principali: in Italia mancano ampie superfici pascolative per l'allevamento estensivo, ed i prezzi dei cavalli importati dai Paesi dove questi pascoli esistono sono molto bassi. La maggior parte della carne di provenienza italiana viene da cavalli sportivi macellati a fine carriera, o da puledri di razze locali che tornano in autunno dai pascoli montani.

References

Associazione Italiana Allevatori (editor) (2000) - Popolazioni equine riconducibili a gruppi etnici locali. A.I.A., Roma, 22pp.

A. Badiani, M. Manfredini (1994) - La produzione della carne di cavallo. Zoot. Nutr. Anim 20, (suppl.): 5-43.

A. Badiani, M. Manfredini, N. Nanni (1993) - Qualità della carcassa e della carne di puledri lattoni. Zoot. Nutr. Anim. 19 (1): 23-31.

- G. Campodoni, G. Preziuso, D. Gatta, B. Colombani, M. Orlandi (1994) - Rilievi in vita e al macello e qualità della carne in puledri derivati Franches Montagnes. *Zoot. Nutr. Anim.* 20: 35-44.
- A.L. Catalano (1976) - L'allevamento equino per la produzione della carne. Situazione attuale e prospettive in Italia. *L'Italia Agricola* 113 (6): 34-49.
- A.L. Catalano (1978) - Allevamento del cavallo per la valorizzazione dei terreni marginali e dei pascoli montani. *Zootec. Nutr. Anim.* 4 (5-6): 449-455.
- A.L. Catalano (1982) - Prove di produzione di puledroni da carne con diete contenenti insilato di mais (nota preliminare). *Zootec. Nutr. Anim.* 8 (5): 499-508.
- A.L. Catalano, C. De Stefano (1983) - Situazione attuale, indirizzi produttivi e problemi dell'allevamento del cavallo per la produzione della carne. *Ob. Docum.Veter.* 4 (11): 23-33.
- A.L. Catalano, G. Gonzi, A. Marusi (1983) - Il Cavallo Bardigiano. Origini, evoluzione e nozioni di ippicoltura ad uso degli allevatori. Associazione Nazionale Allevatori del Cavallo Bardigiano (editor) Novastampa Verona, Italy, 69pp.
- A.L. Catalano, F. Martuzzi (1985) - L'allevamento del cavallo in provincia di Parma. *L'Avvenire Agricolo* 93 (1): 1-9.
- A.L. Catalano, F. Martuzzi (1986) - Cavallo del Catria, dal Registro Anagrafico al Libro Genealogico. *Inf. Zootec.* 23 (18): 72-77.
- A.L. Catalano, F. Martuzzi, A. Summer (2001) - Morpho-aptitudinal evaluation for saddle service of Bardigiano horse breed stallions. *Proc. A.S.P.A. XIV Congress*, 641-642, 746 pp.
- A.L. Catalano, N. Miraglia, C. De Stefano, F. Martuzzi (1986) - Produzione di carne da cavalli di diverse categorie. *Ob. Docum.Veter.* 7 (12): 69-73.
- A.L. Catalano, A. Quarantelli (1979) - Caratteristiche di carcassa e composizione chimico-bromatologica delle carni di puledri da latte. *Clin. Vet.* 102 (6-7): 498-506.
- De Roest K., Menghi A., Montanari C. (2001) - Carne bovina, "l'effetto BSE" mette a rischio le stalle. *Agricoltura*, 29 (12): 46-48.
- I.S.T.A.T. (Annate varie) - Annuario Statistico Italiano. Istituto Nazionale di Statistica, Roma.
- A. Lacheretz, C. Ravaille, R. Darre, J.Y. Barraud (1990) - Le laiton et l'avenir des chevaux de trait - Etude pondérale, économique et de promotion. *Rev. Méd. Vét.* 141 (10): 749-757.
- M. Manfredini, A. Badiani, N. Nanni (1992) - Rese di macellazione, sviluppo dei componenti del quinto quarto e caratteristiche quanti-qualitative delle carcasse di puledro e cavallo. *Agric. Ric.* 14 (131): 23-40.
- M. Manfredini, A. Badiani (1993) - Il cavallo e la produzione di carne. *Proc. Convegno Nazionale Parliamo di..carni complementari*, 63-77.
- W. Martin-Rosset, R. Bocard, M. Jussiaux, J. Robelin, C. Trillaud (1980) - Rendement et composition des carcasses du poulain de boucherie. *Bull. Techn. CRZV Theix, INRA* 41: 57-64.

F. Martuzzi, C. Sussi, A.L. Catalano (2001) - Horse meat production and consumption in Italy. Book of Abstracts of the 52nd Annual Meeting of EAAP, (7): 323.

W. Martin-Rosset (2001) - Horse meat production and characteristics. Book of Abstracts of the 52nd Annual Meeting of EAAP, (7): 322.

S. Segato, G. Cozzi, I. Andrighetto (1999) - Effect of animal morphotype, sex and age on quality of horse meat imported from Poland. Proc. of the A.S.P.A. XIII Congress. 674-676.