

MAREMMAN AND PODOLIC CATTLE IN ITALY: A BRIEF REVIEW

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Introduction

The Maremman and Podolic breeds originated from „*Bos primigenius*” or „*Uro*”, which may have arrived in Italy and expanded to other Western European countries from Central Europe in the 5th century BC. During the centuries, the breeding goals for these breeds changed from a triple-purpose animal (milk, meat and draught) to dual purpose (draught and meat); the number of animals declined and these two breeds were confined to poor, unhealthy and isolated areas where their typical toughness and resistance to diseases were appreciated.

After World War II, numbers decreased even more steadily, following the improvement of agriculture and the widespread introduction of cosmopolitan cattle breeds (Friesian and Brown Swiss particularly). In the last 30 years the ranges designated to rearing these two breeds were increasingly restricted as intensive cattle fattening took over grazing areas.

Currently, the Maremman breed has only been located in „Maremma”, a specific area in the Lazio and Toscana regions, characterised by hills and plains with poor forage production, in the centre of Italy. The Podolic breed lives particularly in the inner mountain zones in southern regions characterised by a harsh climate and difficult orography.

Stock composition

The actual estimated number of these two breeds are about 90000 head for Podolic and 10000 head for Maremman. In 1999 the numbers of animals registered in the herdbook were 16774 and 4691 respectively. This

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corresponds to 15.4% and 4.3% of the total number of animals controlled by ANABIC from a total of 5 breeds represented in the Association. Other breeds include Chianina (26.9%), Marchigiana (40.4%) and Romagnola (13.1%; AIA 1999).

The regional distribution of animals in the two discussed breeds is shown in Table 1. The Maremman population is present more in Lazio (78%) than in Toscana (21%), and the percentage of cows controlled (56%) is similar to that of young animals and heifers (44%), while bulls registered in the herdbook make up about 2%. Ninety percent of Podolic cattle live in Basilicata (60%) and Calabria (30%). More cows are registered (75%) than heifers (15%), while fewer young animals (9%) and bulls (0.6%) are less considered. A rise is expected in the number of controlled cows (+3.8%) in the Maremman breed, while a slight decline (-1.2%) may take place in the Podolic breed.

Table 1. - NUMBER OF ANIMALS REGISTERED IN HERDBOOK (1999)

Region	Breed			
	Maremman		Podolic	
	N°	%	N°	%
Basilicata			9,840	58.7
Calabria			4,914	29.3
Campania			1,718	10.2
Puglia			302	1.8
Lazio	3,673	78.3		
Marche	26	0.5		
Toscana	992	21.2		
Animal Type				
Cows	2,616	55.8	12,632	75.3
Heifers	951	20.3	2,563	15.3
Youn animals	1,034	22.0	1,483	8.8
Bulls	90	1.9	96	0.6

The semi-extensive rearing system used for both these breeds requires large farms and consequently, a relatively high number of cows per farm. This is not completely possible in Italy where farm dimensions are moderate (Table 2). In fact, 38% of the Maremman farms keep more than 60 cows, only 13% have more than 100 cows while 42% breed fewer than 30 cows (23% < 15). The situation for Podolic is more difficult, 10% over 60 cows and only 3% over 100 cows and 61% under 30 cows (26% < 15).

Table 2. - THE PERCENTUAL DISTRIBUTION OF FARM CATEGORIES BY THE NUMBER OF COWS

N° of cows	Cow Number Category					
	1-15	16-30	31-45	46-60	61-100	>100
Breed						
Maremman	23.4	19.1	12.8	6.4	25.5	12.8
Podolic	26.0	35.1	18.3	10.6	6.7	3.3

Reproductive performances

Maremman and Podolic cows first calve before 48 months of age (75% before 42 months), which is late in comparison with the other beef cattle. On the other hand, our two breeds have a very long reproductive life (until 12-14 years of age) and consequently a low "recovery rate" (12-13%) in comparison with more cosmopolitan breeds (Friesian and Brown Swiss) and Italian beef cattle (Chianina, Marchigiana, Romagnola and Piemontese; Montemurro 1996; Jannella et al. 1977; Gigli & Romita 1988).

The calving period is linked very strictly to forage availability, so most of these rustic cows calve during the spring season (Table 3). The calving interval is brief enough in 80% of the cows (less than 16 months). The percentage of twin calving is very low (less than 2%). This is very important for these breeds which live outside throughout the year. In fact calving complications are absent so that no human assistance is required. Thus, in comparison with other breeds, the number of calves per cow is very high.

Table 3. - REPRODUCTIVE PERFORMANCE

Breed	Calving, %	Calving interval (months)	Twin calving, %	Calving assistance	Calves per cow N°
Maremman	80 (February-May)	14	1.2	No	7
Podolic	60 (March-May)	16	2	No	7

Productive performances

Some experiments were carried out by our research groups and the University of Florence on pure bred young bulls. They were kept on pasture with their mothers up to six months of age. After these six months they received 0.8 MFU/kg DM (Ferrara et al. 1993; Sargentini et al. 1996, 1998;

Gigli et al. 1993). Generally, between 12 to 18 months of age, Maremman cattle display greater *in vivo* measurements than Podolic (Table 4). The live weight of Maremman is also higher (+18% at 360 days but only +5% at 540 days). Heart girth and body length are longer in Maremman until 510 days of age (from +6% and +4% to +1.3% and +0.5% respectively). Rump width is initially higher in Maremman (+5%) up to 420 days (+1.5%). However, it becomes greater in Podolic from 450 (+5%) to 540 (+10%) days.

Table 4. - *In vivo* MEASUREMENTS (MM=MAREMMAN, PO=PODOLIC)

Age (days)	Live weight (kg)		Heart girth (cm)		Body length (cm)		Rump width (cm)	
	MM	PO	MM	PO	MM	PO	MM	PO
360	312.3	264.2	159.1	149.5	133.1	128.2	37.6	35.8
390	339.2	286.9	162.6	154.5	136.0	132.5	38.7	36.9
420	365.9	317.7	166.1	159.5	138.7	134.8	39.6	39.0
450	391.8	363.8	169.1	166.6	141.1	139.2	40.5	42.5
480	416.5	382.3	171.7	169.9	143.2	142.2	41.4	43.3
510	439.5	401.0	174.0	171.7	145.0	144.3	42.1	44.6
540	460.2	437.7	176.0	180.1	146.6	150.1	42.8	47.1

The relative growth rate of all measurements is higher in the Podolic breed. For live weight, it is 66% as opposed to 47% in Maremman. Heart girth and body length grow 20% vs 10% recorded for Maremman bulls. This also confirms the common growth trend of these two measurements. Growth rates of rump width are 30% vs 14%, respectively.

Carcass and side weights (Table 5) are obviously higher in young Maremman bulls (13% and 11%), while the two types of dressing percentages are a little higher in Podolic (+4.15 and +3.74 percent points respectively); finally there was no difference between the two breeds in terms of quarter and pelvic limb percentages.

Table 5. - SLAUGHTER PERFORMANCE AT 18 MONTHS OF AGE (MM = MAREMMAN, PO = PODOLIC)

Breed	Carcass weight (kg)	Dressing (%)	Net dressing (%)	Side weight (kg)	Hind-quarter (%)	Fore-quarter (%)	Pelvic limb*
MM	280.9	52.88	58.65	134.3	42.43	57.57	32.76
PO	249.2	57.03	62.39	121.2	42.69	57.31	32.17

*Proximal and distal

Meat quality

Physical characteristics generally are very important in consumer opinion. All parameters considered (Table 6) are higher in the Podolic breed (Gigli et al. 2000a-b). The Colour is lighter (+13.5%), with sufficiently saturated Chroma (+2%) and the Hue is also higher (+10%). Drip loss, on the other hand, is greater in Podolic, particularly for raw meat (+39%), while in cooked meat the difference is less (+17%). Hardness values are greater for raw meat (+29%) and dramatically higher for cooked meat (+106%) in Podolic cattle. This is probably due to less selection for beef production in the Podolic breed and also to more difficult environmental conditions.

Table 6. - MEAT QUALITY CHARACTERISTICS (*Musculus longissimusdorsi*)

Breed/Sex	Colour			Hardness		Drip loss	
	Lightness	Chroma	Hue	Raw meat (kg)	Cooked meat (kg)	Raw meat (%)	Cooked meat (%)
Maremman							
Males	38.14	26.88	32.02	7.15	5.52	1.09	24.87
Females	35.10	25.09	31.69	7.00	6.47	1.16	24.81
Mean	36.62	25.98	31.85	7.07	5.99	1.12	24.84
Podolic							
Males	42.45	26.44	35.94	9.75	12.95	1.61	29.78
Females	40.77	26.52	34.49	8.47	11.76	1.52	27.75
Mean	41.61	26.48	35.21	9.11	12.35	1.56	28.76

Beef characteristics of the sexes are different between the two breeds: in Podolic, males display the highest values for all parameters, aside from Chroma that has same value. Raw meat hardness shows a higher difference (15%) between sexes, while Lightness and Hue differ less (4%). In Maremman, males have higher values for Lightness (+9%) and Chroma (+7%), and lower values in raw meat drip loss (-6%) and cooked meat hardness (-15%).

However, the average physical parameters for both breeds fall within the range defined in the standard, Identification of the Geographically Protected "White Young Bull of Central Apennine".

Conclusions

The number of animals in our rustic breeds, particularly those of Maremman, is low and the percentage of controlled head of cattle is only 50%.

However, these breeds can live in disadvantaged habitats and may be kept under extensive conditions without much assistance. Therefore, they can be used in marginal zones, where other breeds could not be reared and human presence is on the decline.

It is necessary to increase the numbers of these animals and to expand their farm area with the help of the European Union allotted for extensive agriculture. Extending the presence of these two breeds in other countries, where similar environmental conditions exist, would also be desirable.

The trend of *in vivo* performance is satisfactory enough for rustic breeds. Differences between the Maremman and Podolic breeds are very small, in terms of genetic and environmentally specific characteristics. The main data on carcass composition are also similar, and only little, different from those of the other three, rustic ANABIC breeds. The physical parameters of beef are satisfactory for both breeds. It is presumed that they will improve in the future with more „meat selection" and the institution of specific IGP standards.

REFERENCES

1. AIA (1999): Associazione Italiana Allevatori, Relazione Annuale 1999.
2. Ferrara, L., S. Gigli, A. Di Luccia, A. Carretta, F. Manniti, F. Polimeno, M. Fioretti, A. Di Giacomo (1993): Efficienza produttiva in vitelloni Podolici, Bufalini, Frisoni e Romagnoli alimentati con due diversi livelli nutritivi. *Agricoltura e Ricerca* 144: 9.
3. Gigli, S., L. Ferrara, S. Failla, F. Napolitano, A. Di Luccia, F. Manniti, L. Martoccia, G. Zehender, M. Mormile (1993): Caratteristiche qualitative della carcassa e della carne di vitelloni Podolici, Bufalini, Frisoni e Romagnoli alimentati con due diversi livelli nutritivi. *Agricoltura e Ricerca* 144: 29.
4. Gigli, S., M. Iacurto, A. Giorgetti, R. Bozzi, B. Poli, O. Franci, S. Failla, M. Lucifero (2000a): Quality meat traits of a specialised meat breed (Chianina) and of a rustic breed (Maremmiana) reared in Italy. *Proceedings of World Congress on Meat Italian Bovine Breeds*; 10-15, November, Merida - Mexico.
5. Gigli, S., M. Iacurto, S. Failla, F. Brini, M. Mormile (2000b): Podolica cattle, south mountain Italian breed: early quality evaluation: *Proceedings of XI Meeting of the Mountain Grassland; Quality Valorisation of Animal Production Mountain*; 13-17 September, Luz St. Sauver - France.
6. Gigli, S., A. Romita (1988): Caratteristiche produttive della razza Maremmana. In *Salvaguardia e log valorizzazione del bovino Maremmano nella realtà agrozootecnica del territorio laziale*. Ed. CNR: 97.
7. Jannella, G. G., M. Lucifero, L. Secchiari (1977): I parametri riproduttivi della razza bovina Maremmana. *Zoot. Nutr. Anim.* 3: 193.
8. Montemurro, N. (1996): Attività riproduttiva in „Il bovino Podolico: attualità e prospettive future". *Taurus Speciale* 5: 85.
9. Sargentini, C., R. Negrini, R. Bozzi, R. Funghi, A. Martini, D. Rondina, E. Innocenti, A. Giorgetti (1996): Performance in vita e post-mortem di vitelli Maremmani puri. *Taurus Speciale* 7: 69.
10. Sargentini, C., R. Bozzi, M. Lucifero, A. Giorgetti, A. Martini, D. Rondina, F. Forabosco, R. Negrini (1998): Accrescimenti di bovini Maremmani puri dallo svezzamento a 20 mesi di età. *Taurus Speciale* 9: 7.

MAREMANSKO I PODOLSKO GOVEDO U ITALIJI: KRATAK PREGLED

Sažetak

Broj životinja naših izvornih pasmina, osobito maremanske, je malen. Postotak kontroliranih grla goveda je samo 50%. Međutim, ove pasmine mogu živjeti u nepovoljnim prebivalištima/habitatima i mogu se držati u ekstenzivnim uvjetima bez mnogo pomaganja. Stoga se mogu držati u rubnim zonama gdje se druge pasmine ne mogu uzgajati i gdje je ljudska prisutnost sve manja.

Potrebno je povećati broj tih životinja i proširiti područje njihovih farma uz sredstva Europske unije namijenjena za ekstenzivnu poljoprivredu. Proširenje ovih dviju pasmina na druge zemlje, gdje postoje slični okolišni uvjeti bilo bi također poželjno.

Trend in vivo performance prilično zadovoljava u pogledu ove dvije izvorne pasmine. Razlike između maremanske i podolske pasmine su vrlo male što se tiče genetskih i specifičnih karakteristika u odnosu na okolinu. Glavni podaci o sastavu trupla također su slični i samo se malo razlikuju od onih ostale tri izvorne pasmine. Fizički parametri govedine zadovoljavaju obje pasmine. Pretpostavlja se da će se poboljšati u budućnosti s više "mesne selekcije" i postavljanjem specifičnih IGP standarda.

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