# BEEF MEAT QUALITY: INFLUENCE OF MANAGEMENT SYSTEM AND AGE

Nicastro Francesco\*1, Capasso Mario<sup>2</sup>, Montano Teresa<sup>1</sup>, Bracciaferri Corrado<sup>2</sup> and Laura Ranghino<sup>2</sup>

<sup>1</sup>Università di Bari, Dipartimento di Produzione Animale, Bari, <sup>2</sup>Associazione Italiana Allevatori, Roma, Italy

## Introduction

More than a half of Italia's beef production is composed of white breeds. Among these purebreds, a great deal of investigations proved that Marchigiana cattle has a remarkable reproduction and a second sec Marchigiana cattle has a remarkable reproductive and productive capacity due to its perfect adaptability to heat tolerance as well as to its ruster to the second s For beef production and marketing efficiency it is important to know the quality of carcass and of the meat. In particular post-mortem changes pH are likely to have major effects on the ultimate meat tenderness (Thomson et al. 1996). The aim of this study was to evaluate the effects of management system and age on quality carcass traits and meat quality in Marchigiana cattle

## **Materials and Methods**

Forty-eight Marchigiana breed bulls were divided equally into two management systems. Group A was bred in the open feed lot, while gould was bred in open nasture system. Fight animals from each other into the interview. was bred in open pasture system. Eight animals from each group were slaughtered at 20, 22 and 24 months of age. The subjects in the period averaged 700 kg. Carcasses were sectioned for quality traits in terms of dressing percent and carcass weight. Chilling took place at and carcasses were allowed to remain in the cooler for 7 days. Meat quality was evaluated with pH and proximate composition (AOAC). pH of the longissimus dorsi (Ld), gluteus biceps (Gb) and triceps brachii (Tb) muscles was determined at 1 h post-mortem and after 1 and days of ageing. From the same muscles, samples were taken for a horizontal days of ageing. days of ageing. From the same muscles, samples were taken for chemical analyses (water, total protein and ether extract). For statistic analysis data were subject to analysis of variance using the GLM procedure (SAS) considering the effects of age and breeding system.

## **Results** and discussion

Live weight and carcass weight were significantly affected by age and management system (table 1). The oldest animals showed a considerable higher weight at slaughter (699,1 vs 657,9 Kg) and cold carcass (435,7 vs 405,3 Kg) compared to the younger group and confirming the maturity of this breed. In accordance with previously found data (Giorgetti et al. 1988), better results confirming the advantages of breeding the cattle in open feed lot (P < .05) vs open pasture system. cattle in open feed lot (P < .05) vs open pasture system.

Least square means of pH and proximate composition comparing the effects of management systems and ages separated for muscles presented in table 2. The pH in the three different muscles and at different aging are not modified by an increase in carcass weight and bree in system in accordance with statement made by other authors (Sanudo et al. 1992). The pH significantly go down from 1 h after slaughter to and this trend it is the same in all muscles considered which agrees with the results of Barge et al. (1996).

Concerning the chemical composition, two muscles showed differences in management system and different content of protein. Longissing dorsi (P < .01) and tricens brachii (P < .05) had the highest processing and the system and different content of protein. dorsi (P < .01) and triceps brachii (P < .05) had the highest percentage in protein in group A (19,65 vs 18,48 and 18,57 vs 17,62) once age the only differences interesting the management system. These data are first the interesting the management system. the only differences interesting the management system. These data confirm the results reported in breed comparing (Gigli et al. 1992).

## Conclusions

The age of this Italian breed beef in the range considered, had little influence on quality of meat considering the ph and the proximition. While the breeding system suggest some information to a data the proximition of the ph and the ph and the proximition of the ph and the ph composition. While the breeding system suggest some information to reduce the cost of production and producing quality meat.

### References

AOAC (1990). Official Methods of Analysis, Vol.2 (15th ed.) Association of Official BARGE M.T., DESTEFANIS G., BRUGIAPAGLIA A., (1996) - 42nd ICOMST. Analytycal Chemist., Arlington, Virginia, USA.

GIGLI S., IACURTO M., CARRETTA A., FAILLA S., NAPOLITANO F. (1992) Taurus Spe.4, Anno IV, Nov-Dic. strategico: nuovi orientamenti dei consum GIORGETTI A., GUALTIERI M., MARTINI A., BIAGIOLI O. (1988), CNR, Progetto

delle produzioni alimentari.

SANUDO C., DELFA R., GONZALES C., ALCALDE M. J., CASAS M., Economica Agraria (ITEA), 88A, (3), 221. SAS (1990). SAS/STAT User's Guide, Version 6. SAS Inst. Inc., Cary, NC. SANTOLARIA M.P., VIGIL E. (1992) Informacion Tech

THOMSON B.C., DOBBIE P.M. SINGH K., SPECK P.A. (1996) - Meat Science, Vol.44 N.3

Table 1 - Least Squares Means O	Carcass Composition As Influenced	By Age And Breeding System
---------------------------------	-----------------------------------	----------------------------

	Live weight	Carcass	Carcass
	at slaughter	weight cold	dressing
Age (months)	Kg	Kg	%
20	657,9 <b>a</b>	405,3 <b>a</b>	61.5
22	687,3 <b>ab</b>	429,3ab	62.4
24	699,1 <b>b</b>	435,7b	62.3
Breeding			
system			
A	701,8 <b>a</b>	436,4 <b>a</b>	62.1
В	661,1 <b>b</b>	410,5b	62.0
a, b < .05; A, B	< .01.		,•

Age	nII 11	II 041	Jungissiin	Watan	Drotein	Ether
(months)	pHIh	pH 24 h	pH	water	Protein	Extract
20	6.00		6 days	74.02	10.02	1.85
20	6,88	5,54	5,60	74,03	19,05	1,05
22	6,85	5,54	5,59	74,17	18,92	1,49
Broad'	6,81	5,53	5,59	74,05	19,23	1,40
Sucto						
system					Sector Sector	1.00
A	6,84	5,55	5,60	74,14	19,65 <b>A</b>	1,68
В	6,85	5,52	5,59	74,03	18,48 <b>B</b>	1,48
			Gluteus	Biceps		
Age	pH 1h	pH 24 h	ph	Water	Protein	Ether
(months)	1	P	6 days			Extract
20	6.86	5.54	5.59	75,01	18,18	1,65
22	6.82	5 55	5.61	74.06	17,20	1,72
24	6.81	5 53	5 59	74.75	17,61	1,81
Breeding	0,01	5,55	5,55	,		
system						
A	6.81	5 55	5.60	74 85	17.62	1,71
В	6.85	5,55	5 59	74 36	17.71	1,75
	0,05	5,55	Tricons	brachii		
Age	nH 1h	-11 21 h	nH	Water	Protein	Ether
(months)	pri in	pri 24 li	6 dave	water	110000	Extract
20	6.95	5 5 1	5 58	74 88	18 24	1.54
22	6,00	5,51	5,50	74,60	18 18	1 58
24	0,83	5,54	5,00	74,00	17.87	1 40
Bred sug	6,80	5,52	5,58	14,31	17,07	1,40
A A		them protoo;	= <0	74.00	10 570	1.61
B	6,83	5,53	5,60	74,80	10,578	1,01
ab	6,82	5,51	5,57	14,51	17,620	1,40
-, 0 < .05	; A, $B < .0$	01.				

n

at the ticity ges i

attle

oup

sti

erabi ne lai ng th

es al cedin o 24 simu agai

imal

ecnic

 Table 2 - Least Squares Means Of Meat Quality In Different Muscles As Influenced By Age And Breeding System

 Longissimus thoracis