

THE CARCASS AND MEAT CHARACTERISTICS OF CHIANA YOUNG BULLS REARED WITH TWO ENERGY LEVELS

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Background

The Chiana is a typical and very ancient breed that is located in Centre of Italy (on the hill of Toscana, Umbria and Lazio). Its characteristics are very peculiar: somatic gigantism, excellent endurance to extreme weather conditions, easy calving for cows of any breed crossed with Chiana, high values for average daily gain (1.200-1.500 kg/d) for carcass yield (62-69%) and good muscular mass development.

The Chiana is used as pure-breed for the production of high quality of meat with young bulls slaughtered normally at very high live weight (600-750 kg); the breeding is carried out at pasture with the mather, up to 6 months of age and then, in intensive or semi-intensive system, up to the slaughtering.

The Chiana are also used like crossbreeding with dairy and rustic bovine breeds to improve the meat yield.

Objective

The aim is to examine the effect of a high energy level in fattening diet, in comparison with normal feeding, at in vita performances, slaughter, dissection and on the quality meat characteristics

Methods

The trial was carried out on 50 Chiana young bulls with a start live weight of 155 kg (in average) at 6 months.

The animals were assigned at two feeding groups at random: A fed on maize silage ad libitum + mais grain and vitaminic mineral supplement; B as A but without mais grain.

The feeding intake was registered for each group, daily; when the individual daily gain has been in decrease according to the EBA evaluation (Pilla;- 1991) the subject was slaughtered.

At slaughter more of 50 parameters were detected; after 8 days of ageing a half-carcass of 18 animals was anatomical dissected and more of 150 parameters were registered according to ASPA Commission norms (1991).

On 5 muscles, colour (lightness, croma and hue) on raw meat, water losses and hardness on raw and cooked meat were determined, to estimate the physical quality of meat.

We have reported in this paper only some indicative parameters of production and of carcass and meat quality.

Results and discussion

Final weight (668.4 kg in average) was more high (+7%) in treated group (A) (table 1), that showed also higher average daily gain (ADG) (+8%) compared to B group. Higher ADG (+9%) was reported in Gigli et al., (1991).

The metabolic energy intake, each day, was in average 107.1 MJ and 69.6 MJ (respectively for A and B group) with corresponding picture for dry matter 8.77 kg and 6.55 kg; which differences (+54% and +34%) were significant. The treated group (A) showed a higher conversion index (+41%) too.

The digestive apparatus content was higher in untreated B group (43.9 vs 37.1 kg) showing higher (+8%) net live weight, while the net dressing percentage was similar (68.20%) as reported by Gigli et al., (1991); and Giorgetti et al., (1988).

Feeding treatment affected carcass evaluation increasing of one class conformation and fatness score. The half-carcass was more heavy in treated group (222.7 vs 201.0 kg; +11%), with less pelvic limb region (32.9 vs 34.2%) and more brisket (16.1 vs 15.1%).

The carcass composition (table 2) was similar for meat (69.93%) and bone (16.81% in average), while more total fat (11.91 vs 10.27%) was present in treated animals in both localizations, particularly in intermuscular fat (+1.07 p.p.). In this experiment we found better qualitative characteristics of carcass compared to data reported in Gigli et al., (1991) (with -1 p.p. of meat and +4 p.p. of fat percentage), and Giorgetti et al., (1988) (-3 p.p. of meat percentage).

The physical quality of longissimus dorsi muscle (LD) was not affected by rations, infact the differences in colour characteristics were very small, but generally B group showed a higher lightness and chroma. The LD of treated animals lossed less water with cooking (-2.13 p.p.), while hardness was the same. The muscle showed higher values in lightness and chroma, less water losses and more hardness compared to Gigli et al.,(1992) and Gigli et al., (1993).

Conclusions

The different ration in Chiana breed affects essentially in vita and at slaughter performances. The final weight and the average daily gain are higher and the carcass conformation is best in treated group; but the fatness was high particularly aroud muscles. The physical LD characteristics are genetically determined and the level of feeding affects no much them.

Literature

- ASPA (1991) - Metodologie relative alla macellazione, alla valutazione ed alla dissezione della carcassa degli animali di interesse zootecnico. - ISMEA ed. Roma.
- GIGLI S., CARRETTA A., FAILLA S., NAPOLITANO F., CATILLO G., SCARDELLA P., PILLA A.M.. (1991) - A terminal sire for meat production; crossbreed between Piedmont bull and Chiana cow. - 43rt Annual Meeting FEZ (Madrid).
- GIGLI S., IACURTO M., CARRETTA A., FAILLA S., NAPOLITANO F., (1992) - Caratteristiche qualitative del muscolo longissimus dorsi di vitelloni di razza Chianina e prima comparazione con soggetti di razza Maremmana e Romagnola. - Taurus (Speciale.) 4:15-31.
- GIGLI S., FAILLA S., CARRETTA A., (1993) - Meat quality characteristics of crossbred Piedmont bulls and Chiana cow in comparison with relative pure breeds. - 39th ICOMST S2p10WP.
- GIORGETTI A., LUCIFERO M., FRANCI O., ROSIB.M., ACCIAIOLIA., LA ROCCA M..(1988) - Risultati di una prova comparativa tra vitelli appartenenti alle razze Chianino Limousine e loro incroci.- Zoot. Nutr. anim. 15: 417-424.
- PILLA A.M: (1991) - Nuovi criteri di valutazione dei riproduttori bovini in performances: 1 Formulazione teorica. - Zoot. Nutr. Anim. 17:7-12.

Table 1 - Productive performances

Group	IN VITA			AT SLAUGHTER			
	Final live weight kg	ADG kg/d	Conversion index MJ/kg	Net live weight kg	Net dressing percentage %	Conformation*	Fatness*
A	690 a	1.354 a	79.62 a	652 a	68.46 a	12.32 a (4+)	7.04 a (2+)
B	647 b	1.251 b	56.47 b	604 b	67.95 b	11.72 b (4)	6.64 b (2)
Mean	668,4	1.300	67.58	628	68.20	12.01	6.84
Standard dev.	58,24	0.1360	28.297	56.2	1.314	0.872	0.552

Note: different letter mean significant difference (P<0.05)

* In bracket CEE Score (2=1+, , 16=5+).

Tab. 2 - Quality

Group	CARCASS			MEAT			
	Meat %	Subcutaneous fat %	Intermuscular fat %	COLOUR		WHC	WBS
				Lightness	Chroma	(Cooked) %	(Cooked) kg/cm ²
A	69.49	3.89 a	8.02 a	41.94	29.14	27.68 b	2.04
B	70.36	3.32 b	6.95 b	42.18	29.78	29.81 a	2.07
Media	69.93	3.60	7.48	42.06	29.46	28.75	2.06
Standard dev.	7.628	0.554	1.097	1.794	1.823	2.580	0.373

Note: See table 1