MEAT QUALITY IN LOMBARDIA REGION ITALY

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Introduction

Lombardia is the most developed region of Italy for meat technology. This area is the best indicator of economic productivity from agriculture and the highest profitability from food. Lombardia produces 14% of the national meat production. After the negative affect of BSE on meat consumption up to 2001, livestock breeders relaunched the market starting from the development and certification of production regulations . The application of Reg CE 1760 made it possible to give the consumer additional information about meat. This information concerns the place and name of the producer, animal place of origin and the stock farming characteristics with particular reference to meat quality. This study presents data on quality and organoleptic analysis on 605 meat samples obtained from an equal number of male cattle belonging to three different French breeds bred in Lombardia for meat production.

Materials and Methods

Beef cattle were imported from France at the age of 10-16 months, weighing 200-400 kg. They were fattened intensively for 6\12 months and then butchered at the age of 18-24 months, weighing 600-700 kg. Feeding was controlled to prevent the animals from growing fat and producing fat meat, which consumers don't like. To monitor the results of this stock-farming system and to inform consumers about meat quality characteristics, the production and labelling regulations provided the basis for the collection of meat samples to be sent for laboratory analysis. Samples 2.5 cm. thick, taken from *Longissimus dorsi* muscle between the 5th and 7th thoracic vertebra, were collected in the slaughter-house three days after butchery. Laboratory analysis to define chemical, quality and organoleptic characteristics of the meat followed ASPA methodologies.

The following parameters were considered:
- pH: 24 hours post-mortem, using a HANNA pHmeter HI 98150 (Hanna Instruments Italia Srl., PD)
- colour, using a Minolta, Chroma Meter CR-300 colorimeter (Instruments Lab Control s.n.c., RE)
- tenderness, as resistance to cutting, expressed as the kgf required to cut 5 cylinders of cooked meat with a diameter of 12.7 mm and thickness of 25 mm, with longituadinal axis parallel to the muscular fibres, using an Instron 5544 and Warner Bratzler device.
- weight loss after cooking, using gravimetric method on meat cylinders with the same size as the samples used for tenderness measurement, with double weighing before and after bain-marie cooking at 75°C.
- proteins, total fat and ash with NIR.

Results and Discussion

Both 24h pH post mortem and meat colour appears to have been influenced by sensitivity to stress and a nervous disposition in males, compared to females. This was also observed in animals with hypertrophic muscles, compared to animals with a normal muscle growth (Table I).

Differences in lipid content and colour between cattle breeds were observed in relation to nutrition, organoleptic properties and shelf life, in meat for retail sale. Traditionally, Blonde D'aquitaine have less fat which is characteristic of this genetic type (Table I). In Charollais beef there is less resistance to cutting, though not significantly, probably because of a higher lipid content. There is no significant difference between the other parameters. This result is related not only to correct feeding during breeding, but also to proper management of pre-slaughter loading and unloading of animals at the slaughter house and with stressful events. Cattle with muscle hypertrophy are more susceptibility to stress and consequently to producing dark, firm and dry beef (DFD).

Table 1: Effect of genetic breed on quality and organoleptic meat characteristics.

Values expressed in %	Limousine	Charolaise	B. D'aquitaine	P
Weight carcass, kg	376.86[a]	413.84[b]	461.17[c]	0.02
Yield in weight after slaughter %	61.78[a]	59.12[b]	64.23[c]	0.03
pH at 45 minuts	6.73	6.71	6.89	NS
pH at 24 hours	5.77[a]	5.65[a]	5.86[b]	0.04
Weight loss after cooking , %	30.30	29.30	31.78	NS
Weight loss of raw meat after 3 days	5.11	5.14	5.98	NS
Shelf-life	5.80	5.70	6.00	NS
Colorimetric characteristics,				
L	42.18	43.21	41.01	NS
a*	21.63[a]	22.04[a]	19.13[b]	0.04
b*	13.31	13.78	12.04	NS
Cutting resistence, kgf	3.38	3.19	3.56	NS
Protein %	22.85	21.55	23.08	NS
Fat %	2.87[a,]	3.59[a,]	1.91[b]	0.05

[a,b,c]($p < 0.05$). Different letters on the same line mean significant difference

Conclusions

Fat content is an **important meat quality** factor and the results of this study showed very low meat fat levels, which is not what consumers want. **Post-mortem** meat pH after 24 hours and colour were influenced by susceptibility to stress and aggression in **male cattle as well as** animals with muscular hypertrophy. These factors must be considered in relation to proper **animal management.**

The results of this study have shown the excellent quality and nutritional characteristics of meat obtained from animals that were produced using the Reg Ce 1760/2000 meat labelling system. In Brescia in 2001, 10 livestock breeders, 5 slaughter houses and 14 butchers used these regulations, and a total of 190 animals were slaughtered, labelled and certified. In 2005, 38 breeders, 9 slaughter houses and 27 butchers were involved and a total of 2318 animals were slaughtered and certified.