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To cite this article: Ilaria Cerchiaro, Barbara Contiero & Roberto Mantovani (2005) Analysis of factors affecting health status of animals under intensive beef production systems, Italian Journal of Animal Science, 4:sup3, 122-124, DOI: [10.4081/ijas.2005.3s.122](https://doi.org/10.4081/ijas.2005.3s.122)

To link to this article: <https://doi.org/10.4081/ijas.2005.3s.122>



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Published online: 02 Mar 2016.



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ABSTRACT

From 2001 to 2003 health data of 588 groups of fattening beefs (38723 animals) of 29 farms and 5 genetic types (Charolais, Female Charolais, French Crosses, Limousine and Polish Friesian) were collected and statistically analysed considering farm, breed, initial body weight, housing system, season, year, diet, average daily gain and density. The main causes of culling were problems of the locomotor and respiratory systems. As regards the genetic type and the initial body weight, the Polish Friesian breed and the lightest weights increased the probability of dying or getting injured respectively of 70 and 34%, while this probability decreased of 8.5% for every 100 g of daily growth higher than the mean value. As regards the other factors, bedding reduced the risk of culling by 33% in comparison with the slatted floor, while this risk increased of 10% for every m² available/animal over the mean density.

Key words: Health problems, Intensive production system, Beef

Introduction

The present Italian annual bovine meat consumption is about 1.43 million tons, i.e. about 24 kg/year/citizen. Only 60% of the beef consumption comes from animals slaughtered in the country (ISTAT, 2002) and the main regions where bovine meat production takes place are Piemonte, Lombardia, Veneto and Emilia Romagna. The Veneto region (North-eastern Italy) contributes to a 13% of the beefs reared in the country and to a 20% of the national bovine meat production (ISTAT, 2002). In recent years the number of Veneto beef farms has remarkably decreased (reduction of 9.6%/year; ISTAT, 2002). However, the number of heads farmed has remained constant, showing a progressive shift towards larger fattening units with intensive farming systems. In this situation a correct and careful management has become a very impor-

tant task in order to preserve both competitiveness and profitability. To this purpose, the control of the management factors affecting animal health could strongly affect not only animal welfare but also the farm profit. The aim of this study was to investigate the main factors related to the state of health of the beefs farmed under intensive breeding systems in the Veneto region.

Material and methods

From 2001 to 2003 health data belonging to 588 fattening groups (batches) for a total of 38723 beefs housed in 29 farms located in the Veneto region were collected. The animals within group of fattening were homogeneous by age and belonged to one of five different genetic types: Charolais (CHA), Female Charolais (FCHA), French Crosses (FC), Limousine (LIM) and Polish Friesian (PF). Data recorded were number of dead and injured

animals, and, for each animal, the type of affection (R: respiratory system; D: digestive disorder; L: locomotor system; N: nervous system; U: urinary apparatus; F: fractures). Data were analysed by logistic regression (SAS, 1990) including the effects of farm (29 levels), genetic type (5 levels), mean batch initial body weight (corrected for the effects of the farm and the genetic type: 1-Light: 311 kg; 2-Medium: 335 kg; 3-Heavy 391 kg), housing system (1: bedding; 2: slatted floor), season (1-Winter: January-March; 2-Spring: April-June; 3-Summer: July-September; 4-Autumn: October-December), year (3 levels) and diet (1-Dry: based mainly on hay; 2-Wet: based on corn silage or pressed sugar beet pulps). The model included also the average daily gain (ADG) and the density (m² available/animal) as covariates. Factors were compared using the Wald Chi-Square Test (SAS, 1990).

Results and conclusions

The main causes of injury and death (about 42% of incidence) were problems of the locomotor system and particularly lameness (Figure 1). This is in accord with the results of Murphy *et al.* (1987) that found lameness as one of the most important problems of beefs housed intensively. Cozzi *et al.* (2005) have also noted, in spite of the use of permanent bedding, that about 8% of the bulls considered in their study suffered from lameness. Despite the absence of control in this study,

according to Blowey (1993), lameness has resulted to be especially due to environmental and/or nutritional causes. The second main cause of health problems (average incidence of 24.3%) were respiratory problems. The only exception was for FCHA, whose respiratory problems have resulted more important than the locomotor ones (42.6% vs. 26.2%). Digestive problems, mainly diagnosed as diarrhoea and ruminal meteorism, showed a general incidence of about 9% and were the third source of health problems in the beefs. Other injury or death causes had little importance (usually <5% incidence). The only exception was for the urinary problems in the FC genetic type, that showed a 12.3% of incidence (Figure 1).

Table 1 shows the comparisons between the relative risks (Odd Ratios) for the analysed factors with a significant incidence. The farm effect had the highest magnitude. This suggests that, despite generally similar management practices, differences in individual practices and management attitude remain of great influence on the percentage of dead and injured animals among different farms. Other important explanatory variables were genetic type, ADG, batch initial body weight, housing system and the density of the animals. Within the genetic type effect, the comparison that showed the lowest significant incidence of health problems was the contrast between FCHA and PF, that showed a 70% higher probability of dying or getting injured than FCHA. This reflects a more

Figure 1. Incidence (overall and within genetic type) of the single health problems in different systems (R: respiratory; D: digestive; L: locomotor; N: nervous; U: urinary) or related to fractures (F).

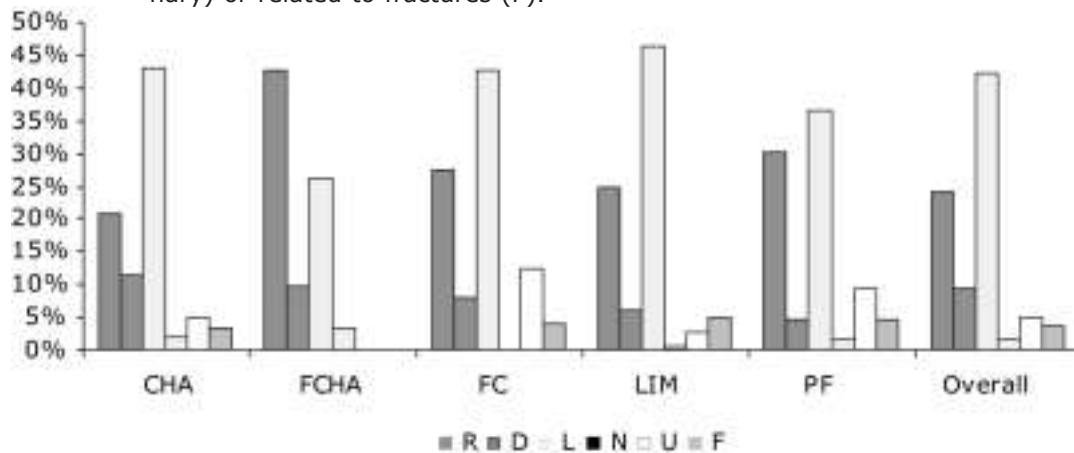


Table 1. Estimate of the odd ratios for the effects with statistical significance.

Comparisons	Wald Test Confidence Limits at 95%		
	Odd Ratios	Minimum	Maximum
CHA vs PF	1.26	0.85	1.87
FC vs PF	0.93	0.62	1.38
LIM vs PF	0.77	0.56	1.06
FCHA vs PF	0.27	0.16	0.46
Bedding vs Slatted floor	0.67	0.53	0.85
Wet vs Dry feeling	0.75	0.38	1.50
Light vs Heavy initial weight	1.34	1.13	1.60
Medium vs Heavy initial weight	1.14	0.95	1.37
ADG	0.15	0.06	0.38
Density	1.10	1.01	1.21

careful control of the environmental conditions and sanitary procedures when FCHA are reared. Indeed, the PF breed, that has a lower market value, was characterised by the highest percentage of dead and injured animals (3.73 for PF vs. 2.41% for the other breeds). It is impossible, at this stage of analysis, to distinguish between the effects of farming practices during fattening in the Veneto farms and the residual effects of the previous weaning and rearing period in the Countries of origin. About the housing effect, the use of bedding showed to reduce the risk of culling by 33%. This means that there are 7 eliminated animals on the bedded floor every 10 dead and injured animals on the slatted one. As regards the initial body weight, the lightest weights showed a higher risk of culling (34%) than the heaviest ones, most probably because of the longer productive cycle and therefore of the longer stay in the farm. The probability of dying or getting injured decreased of 8.5% for every 100 g of daily growth above the average value. On the contrary, this probability increases of 10% for every m² available/animal over the average density. This result is the only one that is apparently in contradiction with the expectations but it could be explained by the positive relationship existing between space availability and movement possibility, that predisposes the animals to a higher incidence of locomotor problems. Year, season and feeding regimen did not show any relationship with incidence of the health problems. This indicates that the intensive beef production system is constantly affected by a sim-

ilar incidence of healthy problems in different years and seasons. However, because of the general low incidence of the healthy problems, it is not possible to differentiate within season and year the causes of injury and death. In conclusion, the present study can be considered a guide to face the problem of culling in intensive beef production systems. Particularly, the study indicates that a careful management and especially bedding, length of the fattening cycle, ADG and density are strategic factors for controlling the incidence of health problems in beefs.

Authors are grateful to farmers belonging to beef producer association AZOVE (Associazione Zootecnica Veneta) and to G. Borin, L. Tondello, G. Dalle Rive, C. Ceccato, E. Florian and P. Lanza for their contribution to the study.

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