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Short communication

Prevalence and major causes of ruminal lesions in intensive cattle fattening units

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Abstract

Ruminal acidosis is frequent in cattle fattening systems associated with grain-rich fibre-poor diets. This study aimed to assess the prevalence of ruminal lesions compatible with ruminal acidosis intensive fattening farms and its risk factors on farm. Rumens of 218 out of 1960 bullocks from six farms were classified in slaughterhouses, and the management practices and the type of feed were compared. The prevalence of lesions compatible with ruminal acidosis was high (65%), where 47% and 18% of the animals had ruminal lesions compatible with subacute and acute disease, respectively. Prevalence of lesions differed significantly between the farms, with differences in the management and feeding practices. Ruminal lesions compatible with ruminal acidosis are prevalent in cattle fattening units in Portugal and husbandry and feeding practices are likely to have an impact.

Key words: ruminal lesions, ruminal acidosis, cattle, feedlot, management

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Introduction

Acidosis or grain overload is caused by the overconsumption of rapidly fermentable carbohydrates and is the second leading cause of mortality and morbidity in intensive fattening systems (Hernández et al. 2014). Ruminal acidosis can be subacute (SARA) - excessive amounts of concentrate and low levels of forage over extended periods of time (Kovacs et al. 2020, Neubauer et al. 2020); or acute - exuberant toxaemia that can be lethal in less than 24 hours (Smith 2015). Other risk factors include poor stable management, disruptive eating patterns, sudden changes in diet, and stress (Hernández et al. 2014). Evaluation of the ration and management practices, assessment of the animals' faeces, and identification of other health problems related to SARA are tools that help support the diagnosis (Kovacs et al. 2020). Macroscopic lesions in the ruminal mucosa in a slaughterhouse can be a valuable diagnostic tool and include parakeratosis, papillary atrophy, star-shaped scars, and perforations (Rezac et al. 2014). The aim of this work was to study the prevalence of ruminal lesions compatible with ruminal acidosis in Portugal, and to identify risk factors at the farm level.

Materials and Methods

Six Portuguese intensive beef cattle farms were used, comprising 1960 male cattle. Rumens were examined in slaughterhouses from a total of 218 carcasses. The percentage of animals sampled from each farm varied between 8% and 26%. Ruminal mucosae were classified into three stages (Rezac et al. 2014): Stage 1: Healthy mucosa, with exuberant papillae, with no signs of inflammation, ulceration, or other lesions; Stage 2: Consolidated portions of the ruminal mucosa, with papillae smaller than normal and parts with total absence of papillae, compatible with current SARA; and Stage 3: Active rumenitis lesions, presence of focal or multifocal ulcerations, star-shaped scars, devoid of papillae, compatible with present or past situations of acute ruminal acidosis. Animal density, uniformity of animals in the group, food trough space, and food distribution pattern were used on a scale of good, acceptable and poor to assess quality of management and housing. Feed was assessed according to De Campeneere et al. (2002) and Ferret et al. (2008).

Results and Discussion

Seventy-four out of the 218 (34%) rumens were normal, 104 (48%) had stage 2 lesions, and 40 (18%) animals had stage 3 lesions, which is similar to the 32% prevalence reported by Rezac et al. (2014). There were statistically significant differences ($p<0.05$) in the percentage of lesions between Farms D and B, D and C, F and A, and F and E.

Farm D showed no stage 2 lesions and only 20% of stage 3 lesions. This may be associated with limited concentrate given in the first 6 months in feedlot, reducing the time ruminal mucosa is exposed to excessive amounts of concentrate, so reducing SARA (Neubauer et al. 2020); and only acceptable food trough space, which may trigger competition at feeding time, leading to excessive ingestion of concentrates at some points in time. Farm F presented the worst findings with only 10% of normal rumens. This result is explained by the absence of straw given in the ration except for the one available in the bedding, which does not seem to be enough to maintain healthy ruminal mucosae. Housing and management parameters were all good but the uniformity of animals, assessed as acceptable. Farm B had 38% of type 2 lesions and 25% of type 3 lesions. This can be explained by a high % of starch and a total % of neutral detergent fibre (NDF) on the low side of the recommended values, associated with acceptable, instead of good, levels of animal density, food trough space and distribution of feeding pattern. Farm C had more stage 3 lesions (38%) than healthy rumens or stage 2 lesions (28%), which may be associated with poor distribution of feeding pattern observed on this farm, leading to long periods of time with no access to food and possible engorgement when food becomes available. Farm A and E showed low stage 3 lesions, respectively 3.7% and 6.3%. These good results were possibly influenced by good management of feeding, in all but one parameter, namely animal density (Farm A) and food trough space (Farm E). These two farms had, however, high prevalence of type 2 lesions, 57% and 53%, respectively. This could be associated with the total % of NDF in the ration being close to the minimum recommended limits, and high starch on Farm A, added to the suboptimal animal density and food trough space, contributing to poor access to fibre over time (De Campeenere et al. 2002).

Prevalence of ruminal lesions seems to be underreported in fattening cattle units in Portugal. The classification of ruminal mucosae in slaughterhouses is a useful and practical tool that can be used as an important ancillary diagnostic tool by the assistant veterinarian of the farm, both at the individual level and the herd level. Feeding with higher values of starch and lower NDF were associated with a greater number of lesions compatible with subacute ruminal acidosis, and higher number of cases of acute acidosis were more common where management errors were identified.

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