



Sarah Giles – Presenting Author

# Equine Obesity: The prevalence and risk factors in domestic, herd-living, populations



Giles, S.L.<sup>1</sup>, Rands S.A.<sup>2</sup>, Nicol, C.J.<sup>1</sup> and Harris P.A.<sup>3</sup>

<sup>1</sup>Animal Welfare and Behaviour Group. School of Clinical Veterinary Science. University of Bristol. UK

<sup>2</sup>School of Biological Sciences. University of Bristol. UK

<sup>3</sup>Equine Studies Group. WALTHAM Centre for Pet Nutrition. UK

## Background

Equine obesity is an increasingly common non-communicable disease in developed countries. Previous prevalence estimates vary widely from 1.4% to 45%. It has important health and welfare consequences and is strongly associated with laminitis, a disease which can cause chronic lameness in horses.

The necessary and proximal cause of obesity is the obvious energy intake/expenditure imbalance. As outdoor, group-living herbivores, horses and ponies can control their own energetic intake, it was therefore important to look beyond this and examine the relative importance of other management, and individual animal factors in outdoor living animals.

The study of body condition in equines is complicated by physiological changes between seasons. Historically a survival strategy to enable them to store energy during the summer and conserve energy during the winter when food is scarce, equines have developed mechanisms which adjust appetite, activity and metabolic rate according to day length. Horses and ponies are therefore designed to survive on sparse, fibrous, highly seasonal forage.

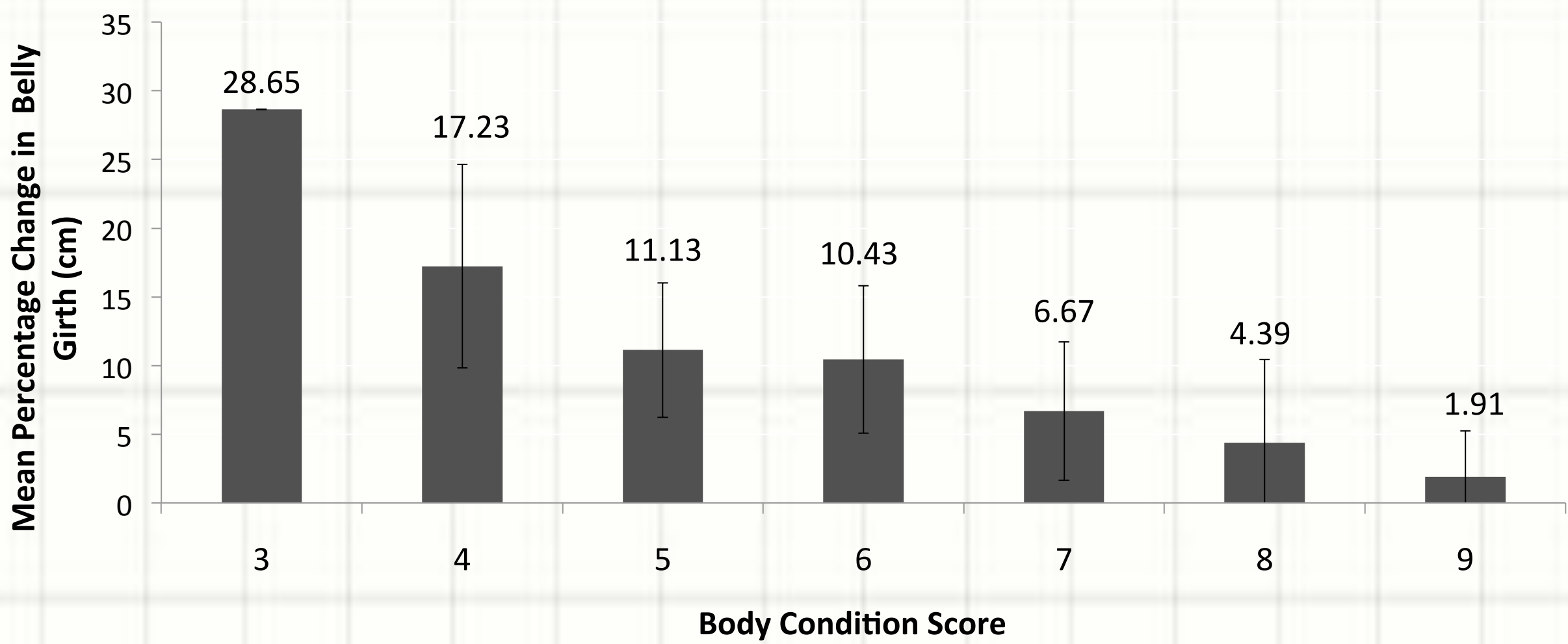


## Aims

- To estimate obesity prevalence, allowing for seasonal variation
- To identify risk factors associated with obesity in equines

## Results

- The prevalence of obesity fluctuated seasonally within our study population, it was 27% (95% CI 19.79% - 35.32%) at the end of winter rising to 35% (95% CI 28.87% - 40.19%) at the end of summer ( $p<0.001$ ).
- Final winter and summer regression models were identical and both contained the predictor variables breed category and whether or not a horse was a youngster (binary). Native UK breeds appeared to be at a greater risk (compared to lightweight breeds as baseline, OR (odds ratio) winter = native cobs 14.39,  $p=0.006$ , native ponies 6.19,  $p=0.03$ , OR summer = native cobs 11.06,  $p=0.002$  and native ponies 3.57,  $p=0.02$ ) and horses aged 4 years and below were less likely to be obese than older horses (OR winter = -0.17,  $p=0.008$  OR summer = -1.44,  $p=0.08$ ).
- As body condition increased, the percentage seasonal belly girth change decreased ( $p<0.001$ , see figure below), suggesting that seasonal variation is being lost as equines become obese.

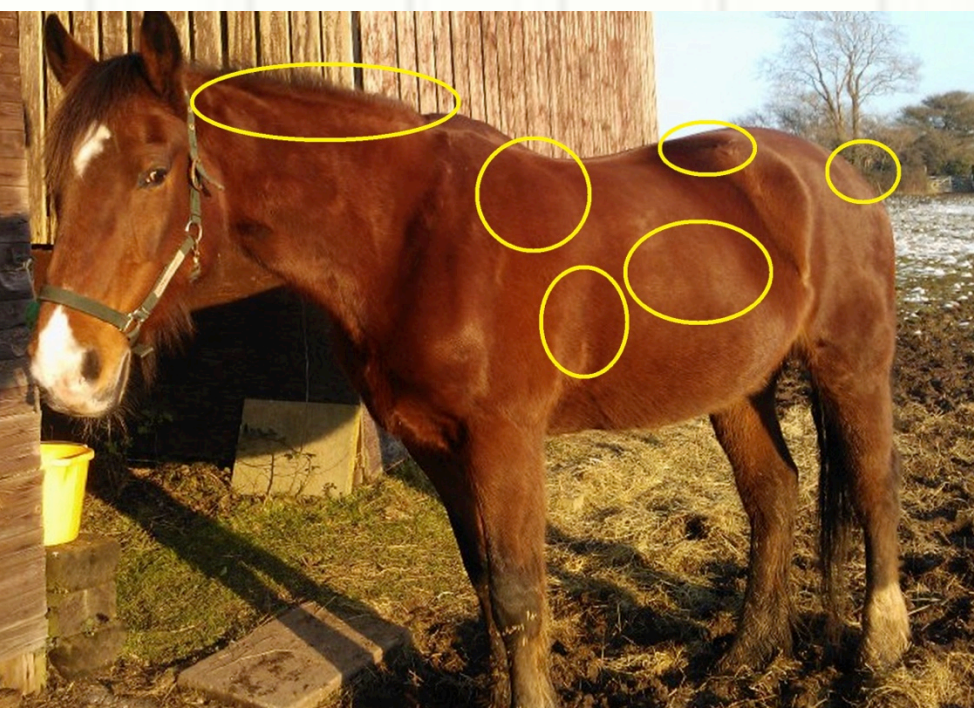


## Methods

Our sampling frame was horses and ponies kept at local charitable organisations and also those whose owners attended a local riding club meeting in January 2011 and consented to participate. 127 animals were recruited. Inclusion criteria were that the herd had to comprise of at least 2 individuals and they had to live outdoors for at least 6 hours per day (seasonal changes were likely to be clearest in outdoor living animals).

Obesity was classified as binary variable, obese or non-obese, using the Henneke 9 point body condition score (see figure below), where categories 0-6 were non-obese and 7-9 classified as obese. A tape measure of belly-girth was used to assess seasonal change, as this is the area of the horse most prone to short term changes in body condition.

Risk factor information was obtained via two owner questionnaires (winter and summer). Results were analysed statistically using a mixed effects logistic regression model, where 'herd group' was included as a random effect.



The areas of the horse measured by the Henneke 9 point score, each of these areas is scored separately from 1-9 and an average obtained. These are thought to be the main regions for fat deposit in horses.

## Conclusions and Potential Relevance

- The prevalence of obesity was high (between 27% and 35% year-round), this is of concern given associated health and welfare implications, such as insulin resistance and laminitis.
- The prevalence did vary seasonally, suggesting seasonal trends in body condition may be present in domestic, partially outdoor living populations.
- Supplementary feed did not have a strong association with obesity in our study population, this is surprising given its noted importance in other companion animals. This highlights the need to consider alternate risk factors in outdoor living equines.
- There appears to be a reduction in seasonal belly girth change as body condition score increases. This may have weight management implications, and the metabolic consequences warrant further investigation.
- The strong association between obesity and breed type, where UK native breeds appear to be most at risk, could be due to differences in genetic susceptibility or adaptation strategies to ancestral environment.