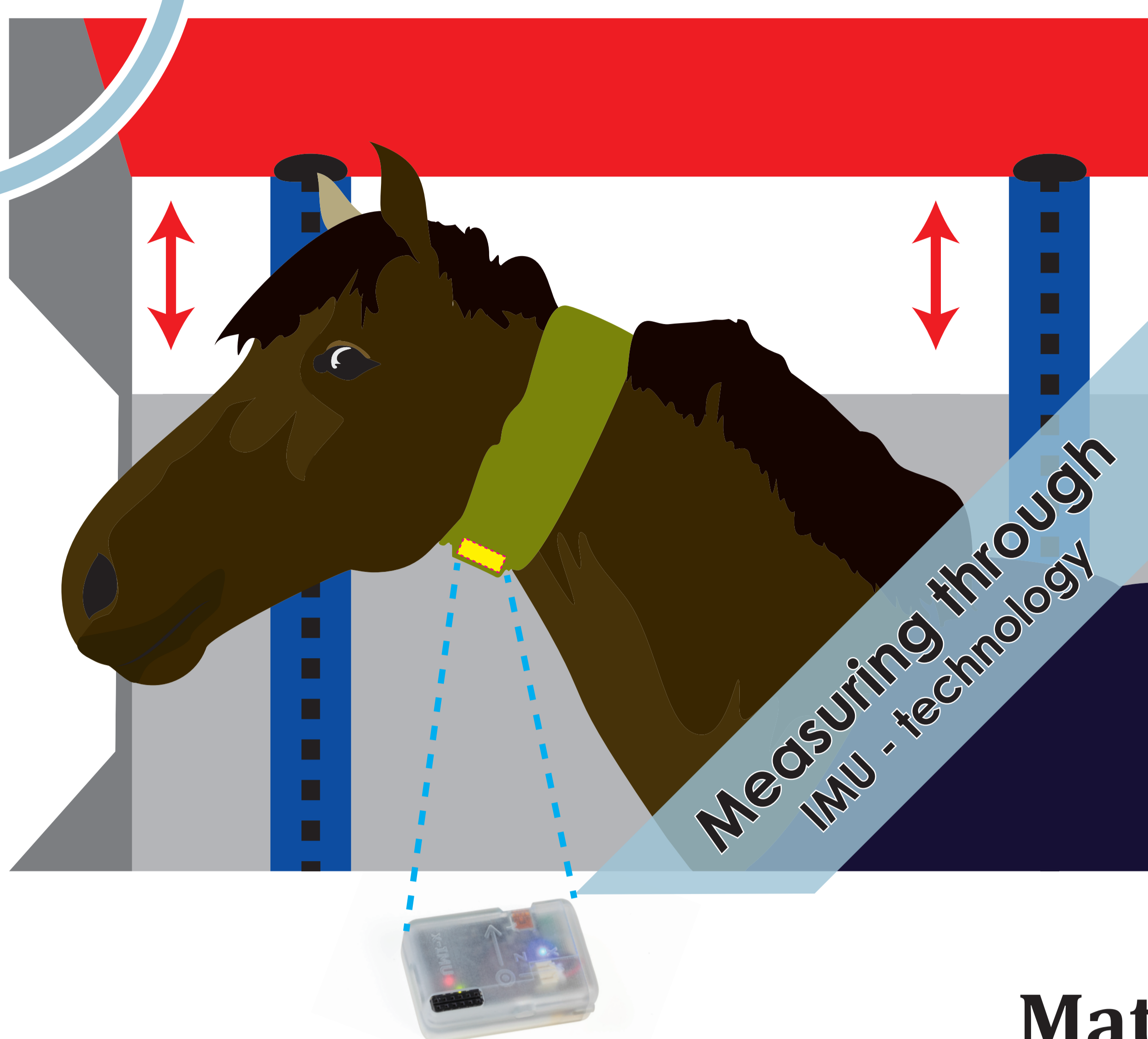


# Measuring neck angle of horses under different ceiling heights with an inertial measurement unit

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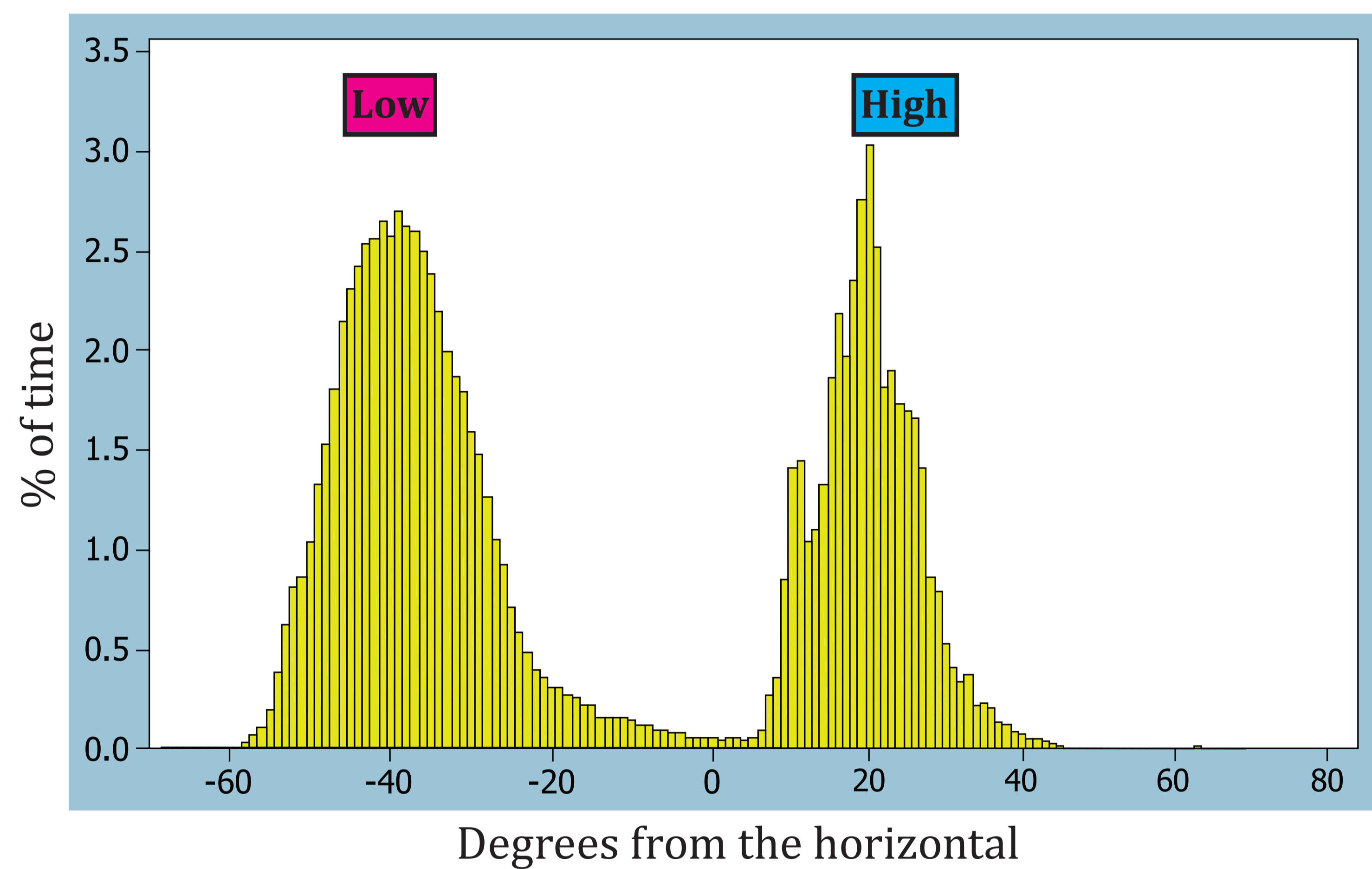
## Introduction

It is important for the well-being of the horse that it is comfortable in the stable, and for example not prevented from standing in natural postures. This is especially important for horses, since they spend most of their time standing. By measuring the neck angle, the effect of a low ceiling can be studied.

## Materials and methods

In this pilot study, the neck angle of three horses of different sizes (height at withers: 158cm, 168cm and 174cm) was measured at ceiling heights down to 200 cm, using an inertial measurement unit (IMU), fastened to the ventral aspect of the horses necks with adhesive tape. The horses were kept in loose boxes where the ceiling height could be varied (200-250 cm) and the neck angle was registered 4 times per second between 16.00 and 07.00 during a total of 23 nights.

## Example of neck angle distribution

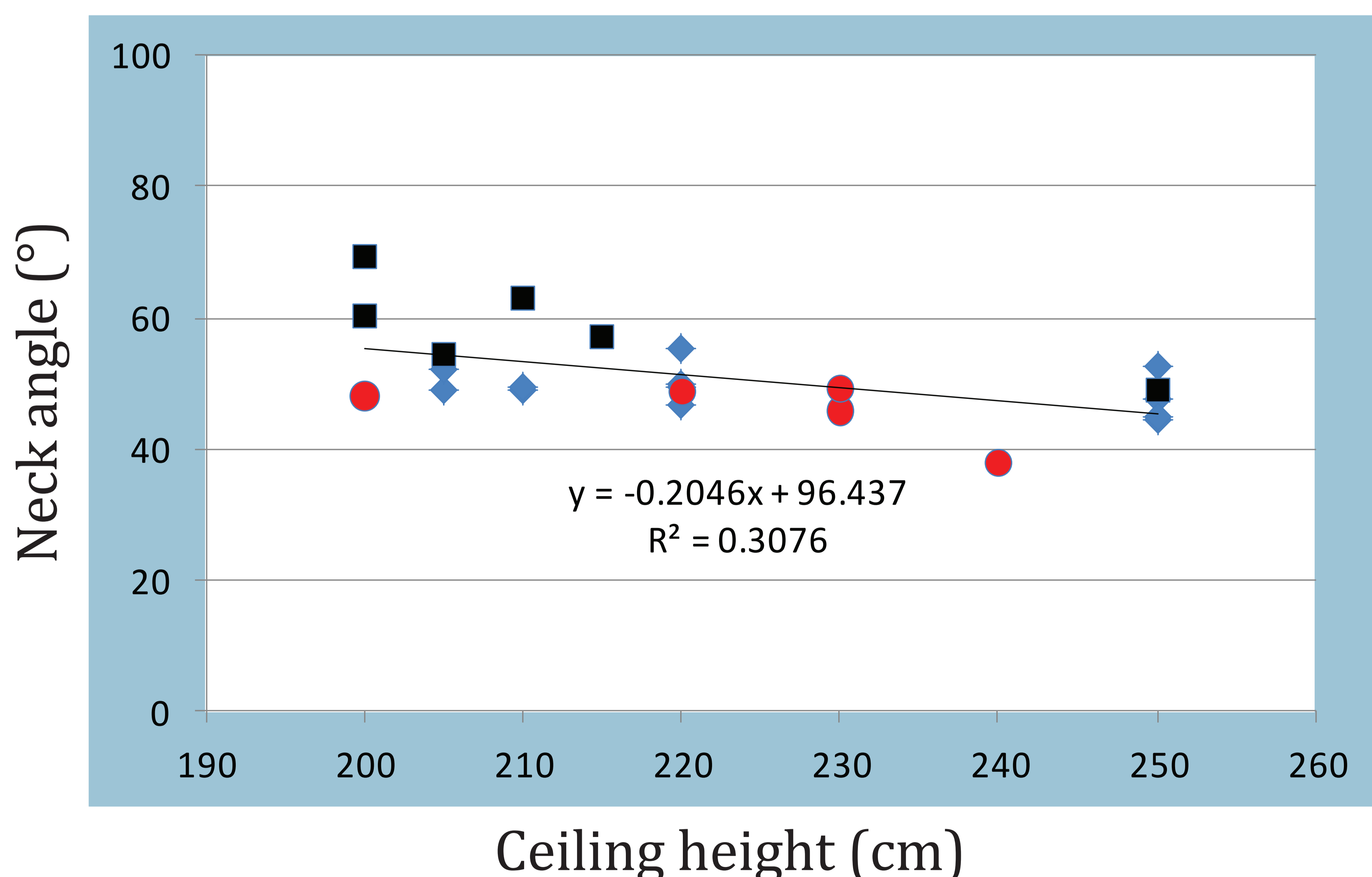


## Results

The neck angle of all three horses was constant, irrespective of ceiling height, and no association between ceiling height and neck angle could be detected.

The measurements also generated interesting data about the horses behaviour during the night, for example that most of the time was spent with the head close to the floor. Probably searching for feed in the bedding, even though there was no feed available.

## Neck angle vs ceiling height



## Conclusion

A low ceiling probably has little effect on the natural standing posture of a horse as long as it does not physically interfere with the space normally occupied by the head.