

The Use of Wildlife Cameras to Monitor Pig Behavior During Commercial Long Distance Transport

Katja van Driel

katja.vandriel@fera.gsi.gov.uk

Richard Heath

Janet Talling

The Food and Environment Research Agency,
Sand Hutton, York, YO41 1LZ, UK,

Heleen van de Weerd

Peter Kettlewell

Malcolm Mitchell

ADAS Drayton, Alcester Road, Stratford-Upon-Avon,
Warwickshire, CV37 9RQ

SAC, Sir Stephen Watson
Building, Bush Estate, Penicuik,
Midlothian, EH26 0PH

ABSTRACT

In this paper we describe how a wildlife stills camera can be used to monitor behavior during long distance transport. Wildlife stills cameras are normally used to capture images of wild animals *in situ*. A number of features inherent in their design allows for the adaptation of them for monitoring behavior during the transport of live pigs on commercial long distance journeys.

Author Keywords

Wildlife camera, commercial long distance transport, pigs, behavior.

INTRODUCTION

Within the European Union millions of slaughter and breeder pigs are transported annually. The duration of transport can vary widely from a few hours up to several days. European regulations EC1/2005 [1] differentiate between short journeys, 8 hours, and longer journeys, those over 8 hours. These require the use of a higher specification vehicle i.e. one with fans and drinkers onboard. However it is unknown whether there should be a maximum total length of any one journey. For example breeder pigs, are transported for 11 days, moving from Western Europe to Russia. A report of the Scientific Committee on Animal Health and Welfare [2] found a paucity of information on the welfare of pigs during long journeys and the need for further research. A project was set up to identify the risk factors associated with long journeys. An epidemiological rather than experimental approach was taken as this would

allow collection of pertinent data from a large number of commercial journeys, rather than a large amount of detailed variables from a limited number of experimental journeys. A new technique to record behavior during commercial journeys lasting for up to 11 days had to be developed.

METHODS

Working closely with commercial hauliers restricted the options for data collection and lead to a novel solution. To capture all the animals' behaviour during a journey video recorders would need to be used. There are two major problems with video cameras, firstly, they would need a large independent power supply, and secondly they would need a massive memory capacity to capture images from an 11 day journey. Direct observations would require a team to follow each transport from start to finish and the behaviour of the animals could only be observed at stops rather than throughout the journey.

A solution was found in the use of a digital stills camera originally designed to take images of wildlife in the field. This device should allow recording of the behaviour of the animals during the journey, no requirement for research technicians to be present at the end of the journeys, and information on the behaviour patterns of the animals.

These types of camera have been used by wildlife researchers and biologist for some years under field conditions. The Reconyx professional digital infrared camera (PC85) was chosen, as it is a self-contained unit with a built-in, independent battery power supply, which can last at least 10 days at low temperatures. For digital stills cameras the power supply is usually the limiting factor; memory cards can hold 1000s of images (250-400 kb per image), sufficient for 11 day journeys. The Reconyx has a built-in automatic infrared flash, and so can take pictures in low light conditions without disturbing the subjects.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. For any other use, please contact the Measuring Behavior secretariat: info@measuringbehavior.org.



Figure 1. Placement of PC-85 with protective housing and brackets.

The camera can be set to take pictures either on detection of movement or at programmed time intervals. Each picture is stamped with the time, date, temperature and a moon-phase icon. Once programmed and started there is no requirement for further monitoring of the device.

Work was needed with the cameras and housings to fit them to the vehicles to be used for the research. Although the camera is supplied in a plastic housing a further layer of metal protection was needed to shield them from the pigs and potential damage. This also allowed for brackets to be fitted to mount the housing in the truck (see Figure 1).

To obtain the best angle and field of view for the cameras, a mock-up of a truck interior was created and test photographs shot at different angles and heights using a model pig were taken. The ideal position for fitting was found to be at a height of 90cm in the corner of the pen pointing towards the opposite corner of the pen. The view covers most of the pen apart from a small amount of space in the corners to the left and right of the field of view (see Figure 2). It was originally thought that a universal bracket could be made to fit all types of livestock container, however detailed examination of several vehicles has indicated that some customisation will be required.



Figure 2. Showing field of view of pen, with pigs.

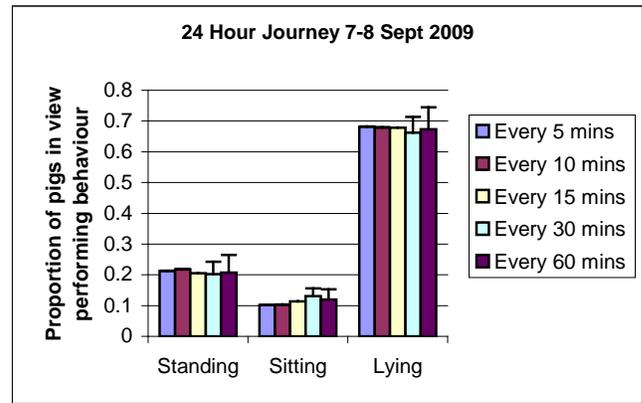


Figure 3. Comparison of pig behavior recorded at different time intervals.

A validation trial was undertaken on a 24-hour transport of slaughter pigs. The camera was fitted by the experimenter, left on the truck for the journey and removed by the haulier, and then the images were downloaded by the haulier and transferred via the internet to the experimenter.

RESULTS

The pen of pigs from which the images were taken contained 12 pigs. The camera was programmed to take photos at 5-minute intervals, and no images were missed. From the images an ethogram focusing on posture changes, was devised. The behaviors scored were: Standing, Dog Sitting, Mounting (other pigs) and Lying Down. During analysis of the images in addition to the behaviors of all the pigs, a note was also made of the number of pigs visible. The proportion of images where only one pig was visible was low (4%). The proportion of pigs in view demonstrating each type of behaviour was then calculated (Figure 3). The results showed that sampling every 15-minutes gave similar results, as 5-minute sampling.

CONCLUSION

The digital stills camera will allow for the first time, data collection on the behavior of pigs during commercial long distance journeys.

REFERENCES

1. EC Council Regulation (EC) No 1/2005 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and regulation (EC) No 1255/97.
2. The welfare of animals during transport (details for horses, pigs, sheep and cattle). Report of the Scientific Committee on Animal Health and Animal Welfare, European Commission, Health and Consumer Protections Directorate-General, Brussels 11th March 2002.