Guide to Interpreting Research for Horse Owners

Part 6 - Research Ethics

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In the previous instalments in this series we have considered how researchers design studies to test specific hypotheses in a valid and reliable way, and how they analyse the results of these studies to answer their original question. When we consider research in the field of equine science, one of the most important considerations is the horse itself. The vast majority of the research we conduct is aiming to improve the health and welfare of horses as a population, but researchers are also acutely aware of the welfare of the specific animals which are involved as subjects in these studies.

Any study taking place in the UK which uses live horses and is published in an academic journal must have been through an **ethical approval** process to ensure that the horses have been treated appropriately in line with **The Animals (Scientific Procedures) Act 1986 (ASPA)**. When considered in a research setting, ethics refers to moral principles that govern how people and animals are treated when they are a part of a study. ASPA regulates the use of animals in any experimental or other scientific procedure which may cause pain, suffering, distress, or lasting harm to the animal, which is defined as anything more so than the introduction of a needle in line with good veterinary practice. ASPA covers all 'protected animals' which is any living vertebrate (including horses) or cephalopod, such as the octopus. This legislation does not cover the use of humans in research, which is dealt with by a separate set of regulations which we will not discuss here.

All research organisations, such as universities, have their own internal **animal ethics committee.** Once researchers have designed a study involving animals, they will put together a proposal to this committee, explaining what they want to do and why. If the ethics committee deems that a study *is* likely to cause pain, suffering, distress, or lasting harm to a living vertebrate or cephalopod, then this is classified as a **regulated procedure**, and researchers need to apply for a licence for the project, which is considered by an external committee appointed by the Home Office.

When designing research studies to follow ethical principles there are three rules which researchers follow, known as **the three R's; replacement, reduction, and refinement. Replacement** refers to replacing the use of animals within research studies where possible, including developing new experimental methods to address research questions in equine science without the need to involve live horses in research at all. If we are interested in studying the behaviour or physiology of horses specifically then logically horses are required as subjects in the research, but if we are studying the rider for example, then many studies use riding simulators to replace the live horse (Figure 1).

Figure 1: Riding simulators can be used to replace horses within research studies which only need to assess the rider and not the horse.

Reduction means keeping the number of animals in a study to a minimum through correct study design and analysis of the data. This minimum is worked out using statistical method known as a **power calculation,** which gives the lowest number of horses which are needed to find a statistically significant difference in the measured variable if such a difference in fact exists. The last of the 'R's', **refinement** means designing the study methodology to minimise any pain, suffering, distress or lasting harm experienced by the animals used in the research and designing studies to actively improve research animal welfare.

We know from the previous article in this series, that the larger the sample of horses in the study the better this is from a statistical point of view, as more numbers increases reliability of the results. When we apply the ethical consideration of reduction, we want the minimum number required to detect a significant effect of the intervention/independent variable. We can refine the study design to allow consideration of greater numbers with no additional pain or suffering by observing existing industry practices to assess their effect without the need for structured interventions.

One example of such a study is when researchers wanted to develop a method for assessing pain levels in horses using facial expressions, they used horses which were already undergoing a surgical procedure (castration) and compared their facial expressions pre- and post-surgery (Dalla Costa *et al*., 2014). All horses received anaesthetic and pain relief medication as a matter of course, but as with all surgeries, there is still likely to be some pain. This project allowed the validation of the Horse Grimace Scale (Figure 2), which can be used as an indicator of pain in horses, and has underpinned a lot of other valuable work into pain and discomfort

in the horse, and as the horses were already undergoing a clinical procedure, then there was no additional pain or discomfort as a result of the study.

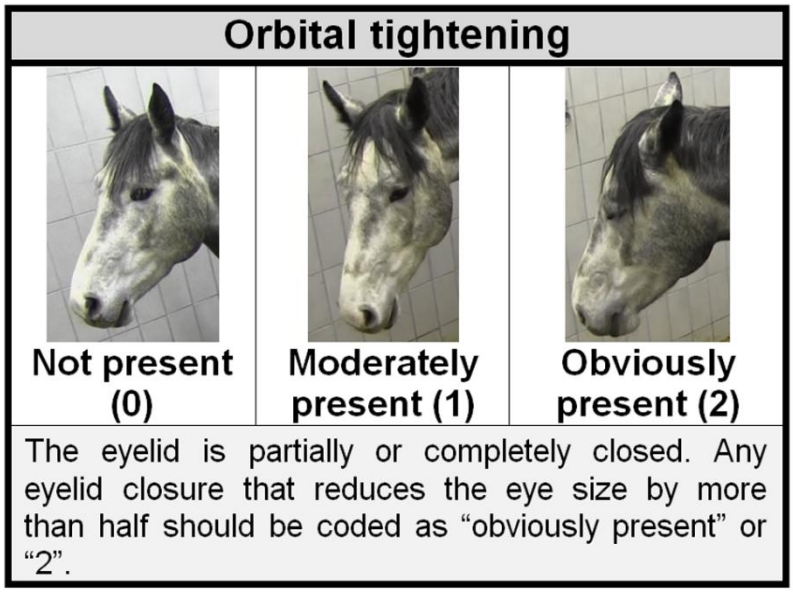

Figure 2: An example of one of the facial indicators of pain which makes up the Horse Grimace Scale (Dalla Costa et al., 2014)

Another example is **epidemiological** studies, which look at the effect of a particular factor on risk of disease or injury by collecting data on a group of horses that have developed the disease or injury, and a comparable group of horses which have not developed it. They will then compare the factors that these horses have been exposed to in their lives, to see if the injured group (known as the case group) has been exposed to certain things significantly more that the non-injured (control) group. An example of this is a study by Parkin *et al*. (2004) which looked at a group of horses which sustained fatal limb fractures in racing and found that the case (fracture) group was significantly more likely to have not undergone any gallop work in their training when compared to the control horses. This type of study allows the researchers to learn something which can be applied to improve the welfare of the horse, without the need to apply any intervention which could potentially lead to pain and suffering, such as increased risk of fracture in this example.

Figure 3: Racehorses in training, similar to those studied by Parkin et al. (2004). Photo by Lumin Osity on Unsplash

As a minimum, all studies conducted using horses must have received ethical approval from an ethics committee within the organisation that the researchers were working. These days, most academic journals require details of this ethical approval to be provided within the final article. Additionally, if a study takes place in the UK, and involves a regulated procedure, details of the relevant Home Office licence should be included. Studies conducted in other countries may refer to their own equivalent legislation. When you are reading about a research study involving horses check to see if you can spot the references to the ethical approval gained, and whether the researchers have designed the study with the 3 R's in mind.

In the next instalment in this series, we will go into more detail on the processes of research, how an idea or research question is transformed into the final published article.

References

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