final report

PEOPLE

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Equine safety management program

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Abstract

Due to the high level of risks associated with people working with horses, serious injuries and even fatalities, it has been recognised that a supportive documented risk assessment and management process needs to be available for employers and other organisations. Such a program should also assist employers to demonstrate compliance with their occupational health and safety legislative risk management obligations.

The Equine Safety Management Program has been developed to assist organisations manage the risks associated with working with horses. The program is a consistent approach for assessing riders/handlers, matching their suitability and exposures to varying risk levels of horses, then placing them in an appropriate working environment. The results of this study demonstrated the Equine Safety Management Program produced a high level of agreement between different assessors when evaluating different riders and horses.

Executive Summary

The objective of this project was to evaluate the repeatability of Equine Safety Management Program as part of a commercial study.

Injuries and fatalities associated with horse riding and associated activities are a significant cost to the community generally, and the agricultural industry specifically.

Recent research on *Horse-related injury in Australia*, based on 20 years data from 1979 to 1998 by Cripps RA. *Horse-related injury in Australia.* Australian Injury Prevention Bulletin 24, AIHW Cat. No. INJ26, (May 2000) indicates that:

- Between 1979 and 1998, there were an estimated 20 horse related deaths per annum in Australia.
- In Queensland, the rate of 0.25 horse related deaths per 100,000 people is significantly higher than the national average (almost double), and higher than any other State or Territory. In Queensland, the estimated rate of 29.4 horse related incidents per 100,000 people is also significantly higher than the national average, and higher than any other State or Territory.

While injuries to the hip, leg and shoulder are the most prevalent, the risk from serious head injury is still implied. Activities involving horses can never be without risk. The person in charge of the work activity should be operating according to safe systems that have mitigated all foreseeable risks.

Such is the impact of the horse injuries and fatalities that anecdotal evidence indicates liability insurers and brokers are hesitant to provide insurance where the business activity involves the use of horses.

The Equine Safety Management Program has been developed to assist organisations to manage the risks associated with working with horses. The Program consists primarily of an assessment tool which considers the four critical aspects of rider and handler safety when working with horses:

1. Rider skills and attitudes
2. Horse skills and background
3. Environment in which the rider and horse will be required to work
4. Tasks which the rider and horse will be required to undertake

By assessing and matching the four critical categories, risks to riders/handlers are therefore reduced.

The project commenced in 2007 with the Australian Agricultural Company (AAco) who supported training for staff in the use of the tool, supply of premises and equipment, and stock and riders. This included constructive feedback from all who participated in the project to enhance the tool's success.

During the project various riders were assessed and rated by multiple assessors according to their level of riding capabilities as either a beginner, novice, intermediate or advanced. The assessment categories included areas such as, planning and use of equipment, rider application of safety, rider style, rider response to tasks and rider precision. The basis of evaluation criteria is categories for riders' abilities according to the "British Horse Society", which is an internationally

recognised standard and principle for assessing a rider's capabilities. Next, numerous horses were put through a series of challenges by advanced riders including various obstacles to assess their level of risk, especially as the obstacles and tasks increased in the level of difficulty. Riders and horses were then matched accordingly to the relevant job tasks and working environment. This raw data and results was collated to allow for further independent research of the tool's application, its validity and reliability being used by various assessors (or people who would be using the tool in the workplace).

Statistical analysis determined the consistency between multiple assessors using the Equine Safety Management Program to rank different riders and horses. The study showed there was a high level of agreement between the assessors using the Program, with 94.0% (110 out of 117) of the ratings for the riders being in agreement with the majority rating, and 84.7% (94 out of 111) for the horses. Kappa coefficient of agreement, or kappa statistic (K) values, confirmed the high degree of statistically significant agreement between assessors when ranking riders and horses, with "excellent" (*K*=0.83) agreement for assessing riders, and "good" agreement (K=0.60) for assessing horses.

These results demonstrate that different assessors using the Equine Safety Management Program under these reported conditions have a high level of agreement when evaluating different riders and horses.

The Equine Safety Management Program is designed to be a practical and suitable risk assessment tool that could be integrated into the workplace. The main benefit for industry is the program is an "easy to use", repeatable indicator that can successfully support stockman or those in a supervisory position placing riders/handlers and horses in a working environment. The Program will also assist employers to demonstrate compliance with their occupational health and safety legislative risk management obligations (Deacons Lawyers 2006).

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1 Background

Injuries and fatalities associated with horse riding and associated activities are a significant cost to the community generally, and the agricultural industry specifically. For example, recently released research from Farmsafe Australia has identified horses account for up to 11% of all farm related injuries, which require medical attention. Of the horse injuries presented to hospitals 20% are serious enough to require admission and 40% of injuries require the farmer to have 5 or more days off work. Horse related injuries have a higher cost on average than any other type of farm injury ($1 338).

Such is the impact of the horse injuries and fatalities that anecdotal evidence indicates liability insurers and brokers are hesitant to provide insurance where the business activity involves the use of horses.

The impact of horse-related injuries and fatalities are not limited to the agricultural sector, but also affects other equine related industries such as:

- Pleasure riding – pony clubs, riding schools, trail riding etc
- Thoroughbred industry – breeders and trainers
- General – coaches, breeders, trainers

In order for an employer to comply with occupational health and safety (OHS) legislative requirements and exercise due diligence within a workplace it has been identified, that all risks associated with the workplace environment and practices need to be identified, assessed and controlled. One of the major risks an employer faces within the agricultural and livestock industry is working with the unpredictable nature of livestock.

Recent case law such as the “MacLachlan case” (Inspector Chris Chadwick vs BH MacLachlan (NSW) P/L 2004. NSWIRComm 331) have highlighted the need on the part of employers to actively manage risks associated with the use of horses.

The Equine Safety Management Program has been developed by Safety in Focus to assist organisations to manage the risks associated with working with horses. The Program consists primarily of an assessment tool which considers the four critical aspects of rider and handler safety when working with horses:

1. Rider skills and attitudes
2. Horse skills and background
3. Environment in which the rider and horse will be required to work
4. Tasks which the rider and horse will be required to undertake

By assessing and matching the four critical categories, risks to riders/handlers are therefore reduced. Extensive searches have revealed that there is currently no product available in Australia or internationally which provides an objective assessment and matching tool for the equine industry.

It was recognised in the development of the Program that research was needed to determine the repeatability of the assessment in the field. This report documents that research which was undertaken in conjunction with the Australian Agricultural Company (AAco).

2 Project objective

By December 31st 2008, evaluated repeatability of the Equine Safety Risk Management Program.

3 Methodology

3.1 How does the Equine Safety Management Program work?

The Program is a guide to assessing the individual elements of rider safety and assessments must only be undertaken by suitably qualified and competent assessors.

Step 1: is an assessment of rider competency based on internationally established competencies (Equestrian Federation of Australia EFA and the British Horse Society).

Step 2: is a risk assessment of the horse.

Step 3: is pairing of the category of rider with an appropriate category of horse and implementing specific controls to eliminate or minimise any residual risks associated with the horse.

Step 4: is to risk assess the environment in which the rider will ride the horse, the work tasks required in accordance with the riders capabilities and implement specific controls to eliminate or minimise any identified risks.

Assessments for horse and rider (Steps 1 and 2) involve two components:

1. Collection and review of historical information
2. A series of challenge based assessments to determine the rating of the horse or rider/handler.

3.2 Project design and statistical analysis

The AAco strongly supported the project which began in 2007 and included 2 days of training and assessments with a number of their employees. The first day was at Canobie Station and the second day was located at Kalmeta Station, both in northern Queensland.

Prior to the commencement of the assessment process of both riders and horses, each assessor received training in the use of the tool. Assessors were identified on the basis of: previous exposure to the matching of riders and horses; an advanced level of equine handling and riding ability; and being able to demonstrate underpinning knowledge of horsemanship and safety skills.

The risk management tool was used in a paper medium to assess numerous riders and horses in a working station environment. Riders that participated in the pilot had varying degrees of riding capabilities and exposures to both the handling and riding of horses. There was an even mix of all levels of riders' abilities ranging from beginners to advanced. A total of 13 riders were assessed by 11 different assessors.

Twelve station horses were made available and put through a series of challenges by advanced riders, and rated according to the assessors' evaluation as to whether they were at a low, medium, high or unacceptable level of risk. The challenges for both the riders and the horses were of a set pattern to allow for consistency of the rating process. The environment for the assessments also did not vary, i.e. the same yards, arenas and equipment were used.

The raw data from each of the rider and horse assessments were collated and forwarded to a statistician to evaluate the degree of agreement (or similarity or concordance; Fleiss, 1981) between the assessors. The results are based on the following statistical assumptions:

1. There are no differences between the days (in terms of probabilities of agreement)
2. The riders, horses and assessors are representative of the overall populations of interest, respectively
3. These patterns of agreement will extend across the whole data ranges, i.e. if riders of rating 1 or horses of rating 4 had been observed

The Kappa coefficient of agreement, or kappa statistic (*K*), is a commonly-used measure of the degree of association between assessors allocating subjects to discrete categories. It is calculated as 'the ratio of the proportion of times that the assessors agree (corrected for chance agreement) to the maximum proportion of times that assessors could agree (corrected for chance agreement). If there is complete agreement among the assessors, then $K = 1$; whereas if there is no agreement (other than the agreement which would be expected to occur by chance) among the assessors, then $K = 0$.' (Siegel and Castellan, 1988). *K* can be statistically tested using the Normal approximation, with variance as listed on page 289 in Siegel and Castellan (1988).

3.3 Legal review

In 2006 the Equine Safety Management Program was reviewed by Deacons Lawyers' Michael Tooma and Katherine Morris who were asked to review the content of the overall program, level of assessor ability required and specifically the Horse and Rider Assessment tool for its risk management structure, liability issues, the document and processes and its value as a legal defence in a court of law.

4 Results and discussion

4.1 Horse and rider assessment

The pooled data for the overall categorical ratings on days 1 and 2, are provided in Tables 1 and 2. These data indicate a high level of agreement between the assessors, with 94.0% (110 out of 117) of the ratings for the riders being in agreement with the majority rating, and 84.7% (94 out of 111) for the horses.

Across both tables, many of the rows show total agreement between the assessors. In many of the cases with disagreements, only one assessor differed. The most notable row regarding lack of agreement is for the horse 'Madonna' in Table 2. Without this row, the overall agreement percentage for horses would lift to 88.2%.

There was little evidence that assessors differed in their performance, as shown in Table 3. A Chi-square test (with 11 degrees of freedom) on the 'all data' columns gave a non-significant value of 10.7 ($P = 0.47$). Given the high percentage of agreement, a much larger sample size would be needed to detect any differences between the assessors. The patterns in the current data set are indistinguishable from random drift.

Table 1. Categorical counts of 13 riders rated by up to 11 assessors

Day	Rider	Overall Rating				
		1	2	3	4	5
1	1	0	11	0	0	0
	2	0	10	0	0	0
	3	0	0	9	1	0
	4	0	0	1	9	0
	5	0	0	0	0	10
2	6	0	9	0	0	0
	7	0	0	8	1	0
	8	0	7	0	1	0
	9	0	0	0	6	2
	10	0	0	0	0	8
	11	0	0	7	1	0
	12	0	0	8	0	0
	13	0	8	0	0	0

Definition of Rider Ratings 1-5 represented: 1=no score, 2=beginner, 3=novice, 4=intermediate, 5=advanced.

Table 2. Categorical counts of 12 horses rated by up to 11 assessors

Day	Horse	Overall Rating			
		1	2	3	4
1	Custer	0	11	0	0
	Russel	9	1	0	0
	Statue	0	7	3	0
	Voodoo	0	1	9	0
2	Raymond	9	1	0	0
	Lylla	0	3	7	0
	Madonna	4	4	1	0
	Danny	0	1	8	0
	Lady Di	1	7	0	0
	Chang	0	8	0	0
	Black Mamba	1	7	0	0
	Sam	0	8	0	0

Definition of Horse Risk Ratings 1-4 represented: 1=low, 2=medium, 3=high, 4=unacceptable.

Table 3. Categorical counts of agreement by assessors

Assessor	Riders data		Horses data		All data		
	Agree	Disagree	Agree	Disagree	Agree	Disagree	% agree
1	12	1	10	2	22	3	88.0
2	7	1	3	1	10	2	83.3
3	13	0	10	2	23	2	92.0
4	11	1	9	3	20	4	83.3
5	11	0	11	1	22	1	95.7
6	13	0	10	2	23	2	92.0
7	13	0	11	1	24	1	96.0
8	13	0	10	2	23	2	92.0
9	10	3	9	3	19	6	76.0
10	5	0	4	0	9	0	100.0
11	2	1	3	0	5	1	83.3
12	0	0	4	0	4	0	100.0

The calculated values of *K* are 0.83 for the riders, and 0.60 for the horses data. Both these values are significantly ($P < 0.001$) greater than zero. Fleiss (1981) states that 'values greater than 0.75 or so may be taken to represent excellent agreement … and values between 0.40 and 0.75 may be taken to represent fair to good agreement beyond chance.' The calculated *K* values thus confirm the high degree of agreement in these data sets, with better agreement for the riders than for the horses.

4.2 Legal review

The report from Deacon Lawyers, dated 3rd November 2006, included the following opinion on the value of the Program:

4. Use as a defence?

4.1 "We consider that the use of the Equine Safety Management Program will assist businesses which pair riders and horses to demonstrate compliance with their occupational health and safety legislative risk management obligations. The use of the Equine Safety Management Program is likely to be viewed by a court as a mitigating factor in a prosecution for breach of occupational health and safety legislative obligations involving a safety incident involving a rider of a horse."

4.2 "However, the Equine Safety Management Program would certainly not be sufficient alone to provide a defence to a prosecution for breach of occupational health and safety obligations".

5 Conclusions and recommendations

This project demonstrated the Equine Safety Management Program is a suitably reliable risk management tool that could be used in any industry where there is a mix or exposure of riders/handlers to various horses, either in a workplace or social environment. The research findings clearly identified the value in using the tool to provide a consistent approach to matching riders/handlers to horses. The program should also assist employers to demonstrate compliance with their Occupational Health and Safety Legislative risk management obligations.

The next stage of this project is for this tool to be developed as a commercial safety management program, where it will be made available to all industries that require the appropriate matching of riders/handlers to horses in a working or social environment. Hence, they will benefit from the consistency, reliability and justification in decision making that this tool can offer. Safety In Focus can be contacted on 0267 922342 (or www.safetyinfocus.com.au) for further information on the Equine Safety Management Program.

6 Acknowledgements

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