



Australian Government
Department of Agriculture



Benchmarking On-farm Benefits of Adoption of ProHand Principles

Final Report
APL Project 2009/2330

April 2010

Rural Solutions SA
Graeme Pope
PO Box 245
Nuriootpa SA 5355

Disclaimer: The opinions, advice and information contained in this publication have not been provided at the request of any person but are offered by Australian Pork Limited (APL) solely for informational purposes. While APL has no reason to believe that the information contained in this publication is inaccurate, APL is unable to guarantee the accuracy of the information and, subject to any terms implied by law which cannot be excluded, accepts no responsibility for loss suffered as a result of any party's reliance on the accuracy or currency of the content of this publication. The information contained in this publication should not be relied upon for any purpose, including as a substitute for professional advice. Nothing within the publication constitutes an express or implied warranty, or representation, with respect to the accuracy or currency of the publication, any future matter or as to the value of or demand for any good.

Table of Contents

1.0	Acknowledgements	1
2.0	Executive Summary	1
3.0	Background to Research	2
4.0	Objectives of the Research Project	2
5.0	Introductory Technical Information	2
6.0	Research Methodology	3
7.0	Results and Discussion of Results	3
8.0	Implications and Recommendations	12
9.0	Intellectual Property	13
10.0	Technical Summary	14
11.0	References	14
12.0	Publications Arising	14
	Attachment 1 - Letter to Participants	15
	Attachment 2 - Questionnaire	16

List of Tables

Table 7.1	Percentages of respondents working in each area	3
Table 7.2	Principal Components Analysis – Question 2	4
Table 7.3	Principal Components Analysis – Question 3	5
Table 7.4	Principal Components Analysis – Question 4	6
Table 7.5	t tests comparing each score against 3.0 (neutral point)	12

List of Figures

Figure 7.1	Distribution of scores on “Improved handling techniques from ProHand”	7
Figure 7.2	Distribution of scores on “Reduced negative handling following ProHand”	7
Figure 7.3	Distribution of scores on “Other staff don’t change”	8
Figure 7.4	Distribution of scores on “There was nothing wrong to begin with”	8
Figure 7.5	Distribution of scores on “Staffing time issues”	9
Figure 7.6	Distribution of scores on “Improved working conditions”	9
Figure 7.7	Distribution of scores on “No benefits seen”	10
Figure 7.8	Distribution of scores on “Working with pigs easier”	10
Figure 7.9	Distribution of scores on truck driver response	11
Figure 7.10	Distribution of scores on staff turnover	11

1.0 Acknowledgements

The Project's Principal Investigator, Graeme Pope Rural Solutions SA, acknowledges the assistance given by Professor Grahame Coleman, Monash University, Victoria and Dr Barb Frey, WA in the development of this Project, their assistance in drafting an industry Questionnaire and with analysis and interpretation of its results.

2.0 Executive Summary

ProHand Pigs – a *Professional Pig Handling Training Program for Stockpeople* – aims to improve the key attitudes and behaviours of stockpeople that influence pig behaviour, productivity and welfare. The program has been available to industry for well over 10 years, but its content was most recently revised in 2008/09, with the new version being made available by Australian Pork Ltd for national delivery by trained Facilitators since March, 2009.

Between April, 2009 and February, 2010 ProHand Facilitators Graeme Pope, SA and Dr Barb Frey, WA have delivered ProHand training to approximately 190 stockpeople across those two states.

Past research in the Australian pig industry conducted by Professors Paul Hemsworth and Grahame Coleman (Animal Welfare Science Centre) in Victoria to examine the potential on-farm benefits through application of ProHand pig handling principles, has previously shown a reduction in fear responses in pigs, resulting in improvements in reproduction and growth performance, ease of handling and welfare outcomes. These benefits are highlighted within the ProHand training program to provide stockpeople with good production reasons for on-farm adoption of routine “positive” pig handling behaviours.

During Day #2 sessions of ProHand, trainees are encouraged by their course Facilitator to share their experiences in recognising any change/s which they have observed in either their pigs, or in farm staff attitudes and/or behaviour, since completion of their Day #1 session approximately four (4) weeks earlier.

The main objective of the Project was to capture this feedback through a process of formal questioning via personal Questionnaire, so the results obtained could be used by ProHand Facilitators during future courses to help demonstrate to trainees the benefits of ProHand training and on-farm adoption.

A Questionnaire with five (5) questions requiring either a “tick-the-box”- style response, or a written opinion, was designed and circulated either electronically, or by post, to approximately 190 stockpeople in SA and WA who had completed both Day #1 & #2 sessions of ProHand training since April, 2009. Eighty one completed responses were received that were suitable for results analysis and interpretation.

The majority of respondents strongly believed they had improved their routine pig handling techniques and reduced the incidence of routine “negative” handling since completing ProHand training. A lesser majority of respondents believed their pigs were easier to work with and their working conditions had improved (*“Less physical effort is now required to complete pig handling tasks”*) since adoption of ProHand pig handling principles.

The results of this Project confirm that delivery of the ProHand training program in its current format, when coupled with the routine on-farm implementation of more frequent “positive” pig

handling principles, will result in measurable change in stockperson attitudes and behaviours, and an improved animal welfare outcome.

3.0 Background to Research

While the ProHand program has been available for uptake by industry since the early 1990's, course Facilitators have traditionally not sought feedback from trainees as to what farm-specific changes in routine pig handling practices were being made as a direct result of completing this training.

Australian Pork Ltd also needed to better understand and measure the impact this training program was having across industry, to justify (any) on-going or future financial support for its delivery.

An analysis of past-trainees' adoption behaviours and benefits would also provide extra "positive" information for ProHand Facilitators to use when promoting or delivering the course to new trainees.

Any deficiencies in ProHand program content or delivery would be identified through this feedback process, allowing improvements or corrections to be made, thereby improving the longevity and uptake of this training opportunity.

The importance of being able to measure the impact of ProHand training on stockperson and pig behaviours has also increased since the skill set "*Move and Handle Pigs*" has been identified as a core stockperson workplace competency.

4.0 Objectives of the Research Project

This Project sets out to –

1. To provide APL, ProHand Facilitators and industry with evidence of ProHand benefits observed on trainee's farms.
2. To measure the extent of stockperson attitudinal and behavioural change following completion of ProHand training.
3. To provide the network of ProHand Facilitators with this information, to assist in their promotion and delivery of future ProHand training courses.

5.0 Introductory Technical Information

The benefits of routine adoption of ProHand pig handling practices, as measured by improvements in productivity (growth rate, litter size, ease of handling) and stockperson attitudes, have been substantiated experimentally on 20+ commercial Australian farms in one study and on a large commercial farm in a second study, well over 10 years ago. These benefits include improvements in average daily gain of 5% and litter size (pigs/sow/year) of 7%.

However, there has not been an evaluation of the benefits of ProHand when delivered in a normal production setting. There are other potential benefits to be gained through improved pig handling behaviours in terms of worksite efficiencies (time taken to move pigs or load pigs), stockperson work satisfaction, frustration or safety, and farm staff empathy with the animals they manage, which were either not quantified in the original substantive research or not included as part of the program's content.

The Questionnaire developed as part of this Project was designed to capture this information.

6.0 Research Methodology

A draft Questionnaire was initially developed by Graeme Pope, Rural Solutions SA and circulated to Professor Grahame Coleman, Monash University and Dr Barb Frey (ProHand Facilitator/Veterinarian), WA for comment and editing.

The Questionnaire provided respondents with a total of five (5) questions, the first which sought to establish where on-farm they conducted the majority of their routine pig handling/moving tasks, while the others focused on what changes they had/not made to their routine pig handling and what (if any) benefits/effects they had seen on-farm after making those changes.

To accommodate differences in literacy skills and encourage Questionnaire completion, trainees were given the opportunity to answer all parts of the Questionnaire as a “tick-the-box” response, as well as being encouraged to add their own written comments at the end of each question. Unfortunately, very few respondents chose to add their personal comments.

Questions were structured to include multiple examples (44 in total) of how stockperson attitude and behaviour may have/not changed since their completion of ProHand training, with a selection of response scales (*Never-Occasionally-Always* and *Strongly Agree-Neutral-Strongly Disagree*) used to enable qualitative analysis of their answers.

A final version of the Questionnaire was circulated to a database of trainees in SA and WA who had completed ProHand since April, 2009 either emailed in electronic format where email addresses were known, or by post with a reply-paid envelope addressed to Graeme Pope.

An explanatory letter (*Attachment 1*) was also attached to each trainee’s Questionnaire (*Attachment 2*), signed-off by Graeme Pope (and jointly by Dr Barb Frey when forwarded to WA), providing trainees with background to the Project and their invitation to participate in its completion. The Questionnaire took trainees about seven (7) minutes to complete.

Graeme Pope also conducted on-site visits to three (3) large farms, to further encourage trainees to complete their Questionnaires. A total of 81 completed Questionnaires were eventually received for results analysis by Professor Grahame Coleman, Monash University, Victoria.

7.0 Results and Discussion of Results

A total of 81 responses were received. The percentages of respondents who reported working in each area are given in *Table 7.1*. The percentages do not sum 100% because many respondents reported working across several areas of production.

Table 7.1 Percentages of respondents working in each area

Mating	Weaners	Farrowing	Dry Sow	Grower Finisher	Pre Sale/ Load out	All Sections
30.0%	16.3%	32.5%	22.5%	22.5%	17.5%	33.8%

The evaluations of ProHand were analysed using Principal Components Analysis (PCA) followed by an Oblimin rotation. PCA produces groupings of variables through an analysis of the variance that each Questionnaire item has in common with other items. This helps interpretation of the results by

providing a basis for combining responses to similar items into a single composite score. On the basis of these analyses, Questionnaire responses to items that grouped together were summed to produce a composite score that was used for subsequent analysis.

It can be seen from Table 7.2 that respondents answered the questions in Question 2 on two distinct dimensions. The first dimension focused positive behavioural changes by the respondent and included items such as “I allow single pigs to re-join their pen mates before moving the whole group forward again” and “I avoid crowding pigs into a restricted space when appropriate”. The composite variable that was obtained by summing the items in this first component was labeled **“Improved handling techniques from ProHand”**.

The second dimension focused on reduced “negative” handling by the respondent and included items such as “I apply less “negative” handling to those pigs at the rear of a moving group of pigs” and “I am less aggressive now when I remove pigs in large groups from shelters”. The composite variable that was obtained by summing the items in this second component was labeled **“Reduced negative handling following ProHand”**.

Table 7.2 Principal Components Analysis – Question 2

Pattern Matrix ^a	Component	
	1	2
I allow single pigs to re-join their pen mates before moving the whole group forward again	.710	
I avoid crowding less pigs into a restricted space when appropriate	.689	
I reduce group sizes if practical when moving pigs	.680	
I report things like broken gates or floors to my manager so they can be fixed, to help me and other staff when shifting pigs inside the sheds	.629	
I talk more quietly to reassure pigs of my presence	.627	
I ask for assistance more frequently from my workmates when moving pigs	.626	
I think more about how I can make it easier & less stressful for the pigs while I’m moving them around the piggery	.599	
I use stock boards more thoughtfully now when moving pigs	.482	
I leave lame, sick or injured pigs behind when removing groups of pigs from pens		
I apply less “negative” handling to those pigs at the rear of a moving group of pigs		-.725
I am less aggressive now when I remove pigs in large groups from shelters		-.721
I think more about what the pigs are experiencing & thinking when they are being moved		-.641
I use less routine “negative” (kicks, hits & slaps) behaviours overall		-.599
I’ve slowed down my movements when moving pigs		-.598
I use more routine “positive” (hand resting on a pig’s back, pats) behaviours overall		-.561
I use less shouting & banging to make pigs move		-.500
I give pigs more time to explore their surroundings before I pressure them to move	.481	-.488
I use other goads (e.g. prodders, polypipe) less often now to make pigs move		

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 11 iterations.

It can be seen from Table 7.3 that respondents answered the questions in Question 3 on three distinct dimensions.

The first dimension focused on perceived lack of change in other staff and included items such as “Other staff on the farm aren’t trying to change their own behaviour” and “I am not being encouraged by

others to change my behaviour”. The composite variable that was obtained by summing the items in this first component was labeled **“Other staff don’t change”**.

The second dimension focused on beliefs that no change was necessary by the respondent and included items such as “I don’t believe there was anything wrong with my behaviour before I completed the ProHand training” and “I’m happy with the way my pigs react to me anyway, without making any changes”. The composite variable that was obtained by summing the items in this second component was labeled **“There was nothing wrong to begin with”**.

The third dimension focused on concerns about staffing and time and included the items “We are always too short staffed to have time to make any changes” and “I don’t have the time to slow down at work”. The composite variable that was obtained by summing the items in this second component was labeled **“Staffing time issues”**.

Table 7.3 Principal Components Analysis – Question 3

Pattern Matrix ^a	Component		
	1	2	3
Other staff on the farm aren’t trying to change their own behaviour	.916		
I am not being encouraged by others to change my behaviour	.671		
Other staff on the farm don’t seem too concerned about my behaviour	.615		
I don’t believe there was anything wrong with my behaviour before I completed the ProHand training		.807	
I’m happy with the way my pigs react to me anyway, without making any changes		.768	
I don’t believe changing my routine behaviour will affect the pigs		.584	.570
We are always too short staffed to have time to make any changes			.794
I don’t have the time to slow down at work			.758

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 17 iterations.

It can be seen from Table 7.4 that respondents answered the questions in Question 4 on three distinct dimensions. The first dimension focused on perceived improvements in working conditions and included items such as “The pigs seem to be less excitable and stressed now when we move them” and “I am more relaxed working on the job now”. The composite variable that was obtained by summing the items in this first component was labeled **“Improved working conditions”**.

The second dimension focused on beliefs that no benefits had occurred and included such items as “No benefits seen, because I have not changed my routine behaviour” and “Our pigs are growing faster now but we really haven’t changed anything else”. The composite variable that was obtained by summing the items in this second component was labeled **“No benefits seen”**.

The third dimension focused on concerns ease of working with pigs and included the items “It is physically easier to load our market pigs now”. The composite variable that was obtained by summing the items in this second component was labeled **“Working with pigs easier”**.

Table 7.4 Principal Components Analysis – Question 4

Pattern Matrix^a

	Component		
	1	2	3
The pigs seem to be less excitable and stressed now when we move them	.779		
I am more relaxed working on the job now	.752		
I feel less frustrated and physically tired after a day's work	.732		
I get along better with my workmates now	.639		
We talk more now about what else we could improve around the piggery	.561		
We have less arguments now amongst the farm staff when we are shifting pigs - reverse coded	.495		
No benefits seen, because I have not changed my routine behaviour		.638	
Our pigs are growing faster now but we really haven't changed anything else		.632	
We save time now when moving pigs within the piggery	.540	.605	
Our truck driver has said our pigs are easier to load and unload these days			
We have less staff turnover on the farm now			
It is physically easier to load our market pigs now			.840
It is physically easier to load our market pigs now			.757
I enjoy working with pigs more now			.571
I respect pigs more now			.547
We have changed our staff rosters to fit in with our new handling routines			.544
Most staff at the farm seem to like pigs more now			.504

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 17 iterations.

Two items that did not fit into the PCA analyses were analysed separately. These were “*Our truck driver has said our pigs are easier to load and unload these days*” and “*We have less staff turnover on the farm now*”.

The distributions of responses on each of the composite variables and the two additional items are given in Figures 7.1 to 7.10.

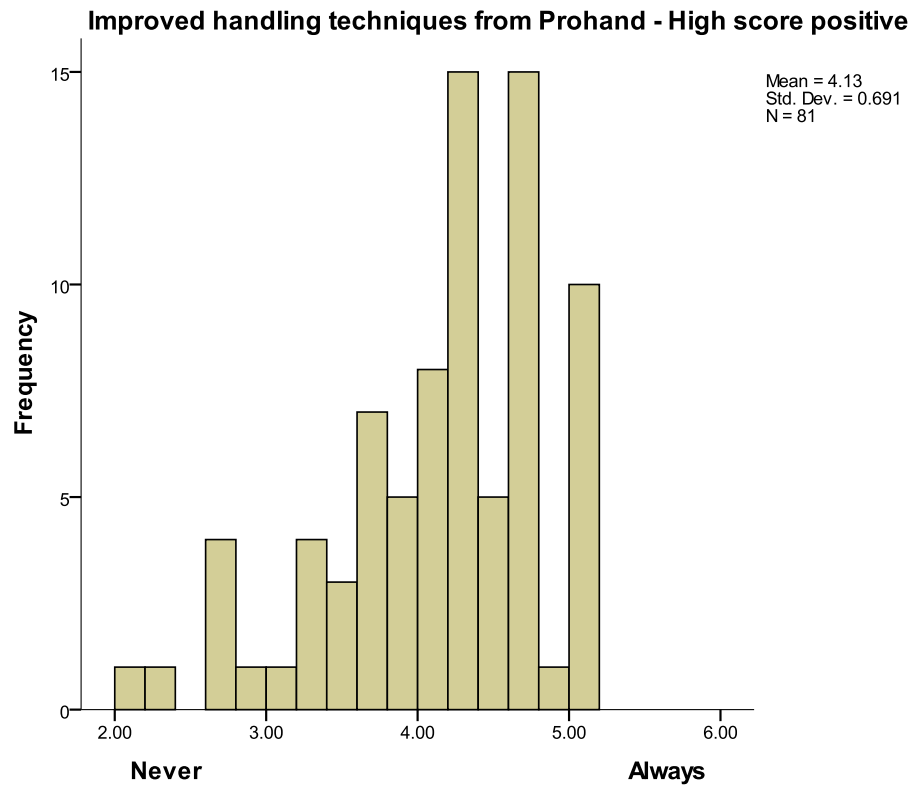


Figure 7.1 Distribution of scores on “Improved handling techniques from ProHand”

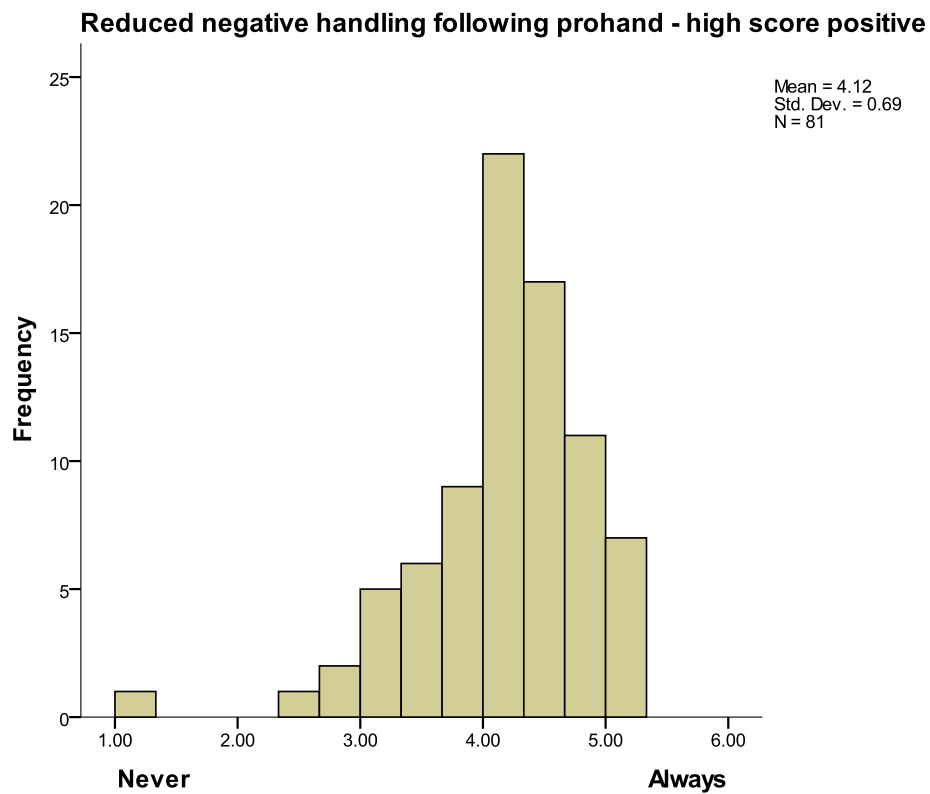


Figure 7.2 Distribution of scores on “Reduced negative handling following ProHand”

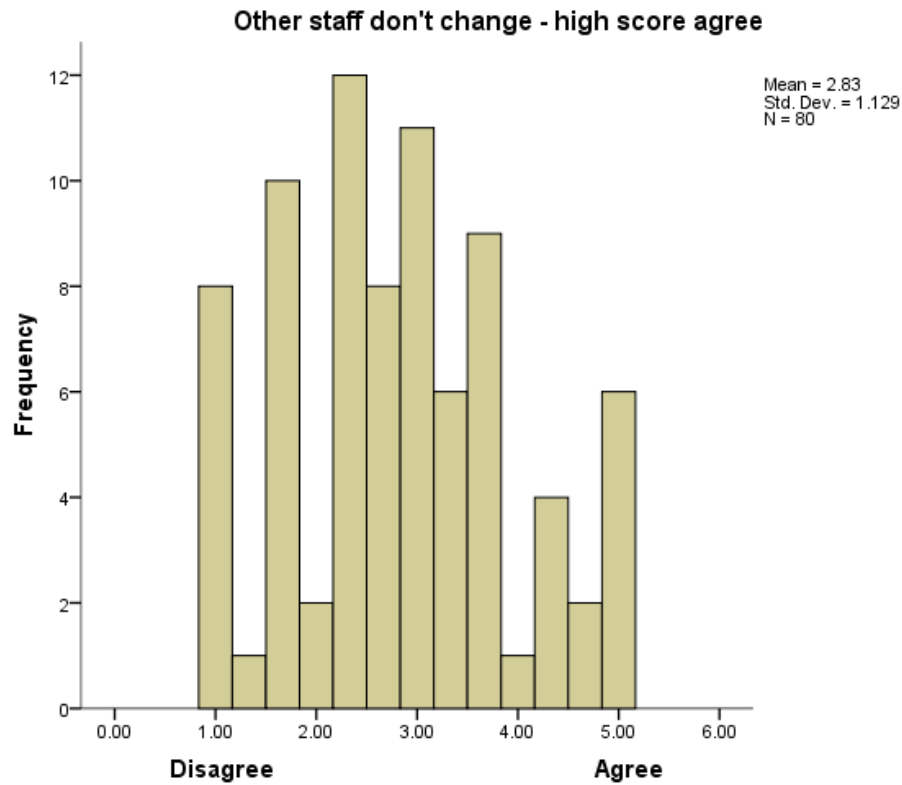


Figure 7.3 Distribution of scores on “Other staff don’t change”

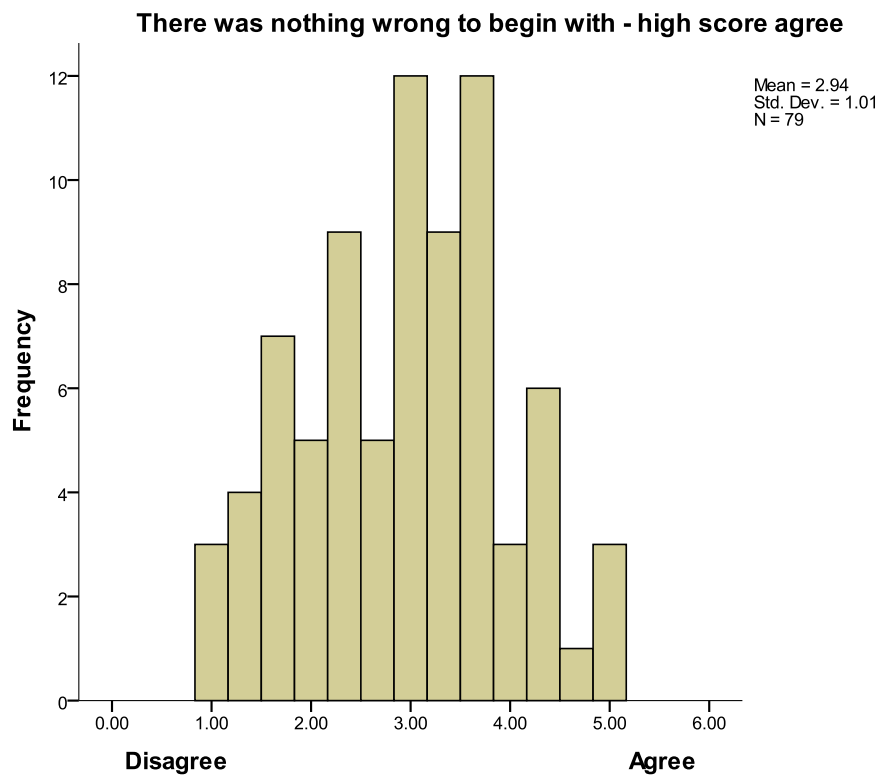


Figure 7.4 Distribution of scores on “There was nothing wrong to begin with”

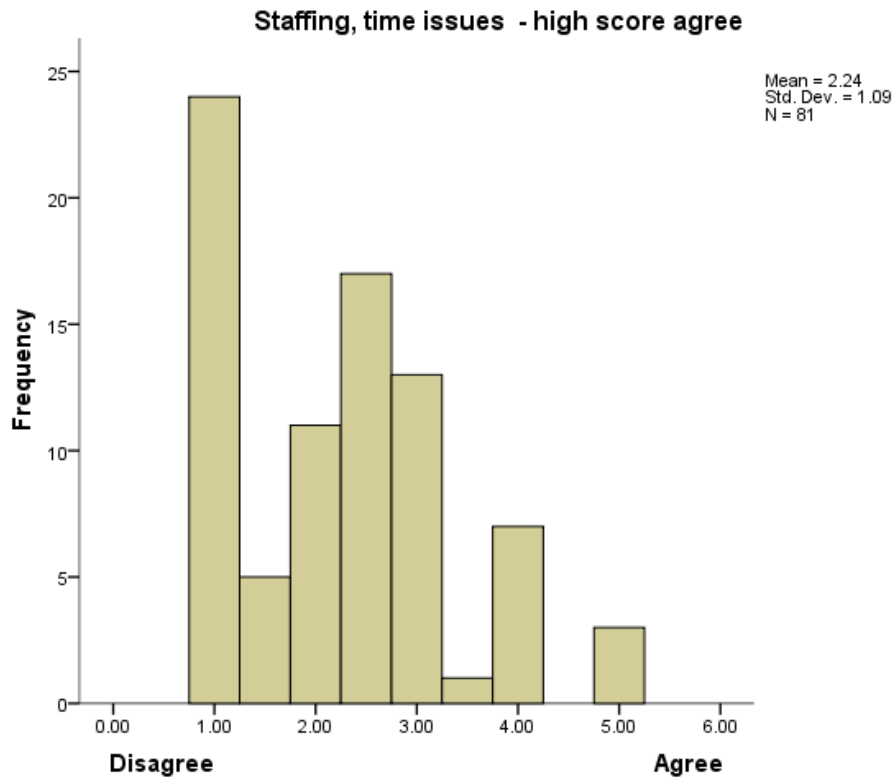


Figure 7.5 Distribution of scores on “Staffing time issues”

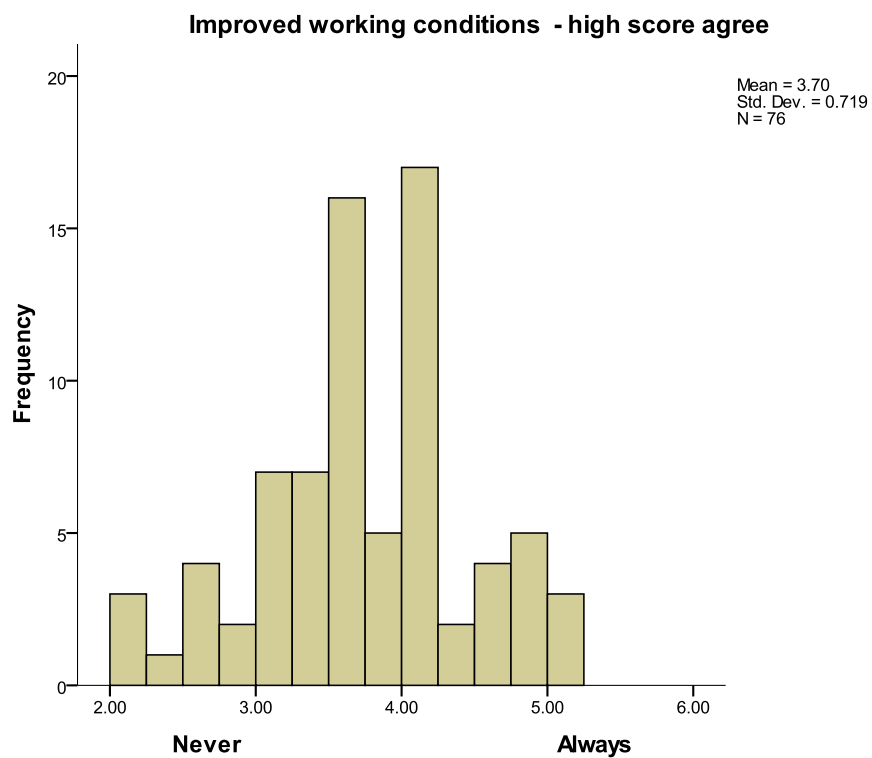


Figure 7.6 Distribution of scores on “Improved working conditions”

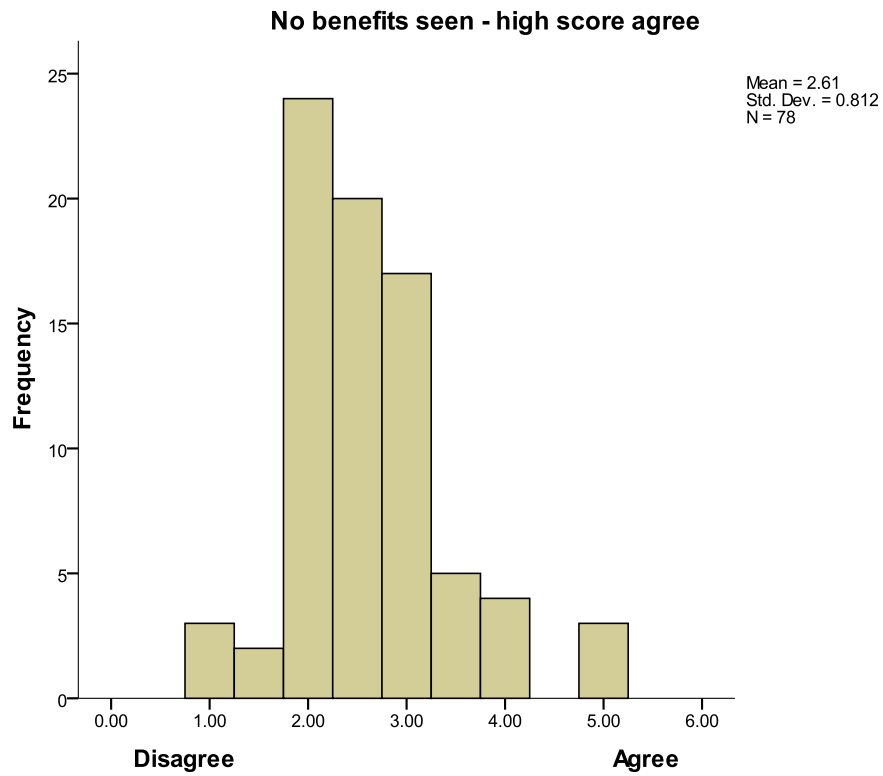


Figure 7.7 Distribution of scores on “No benefits seen”

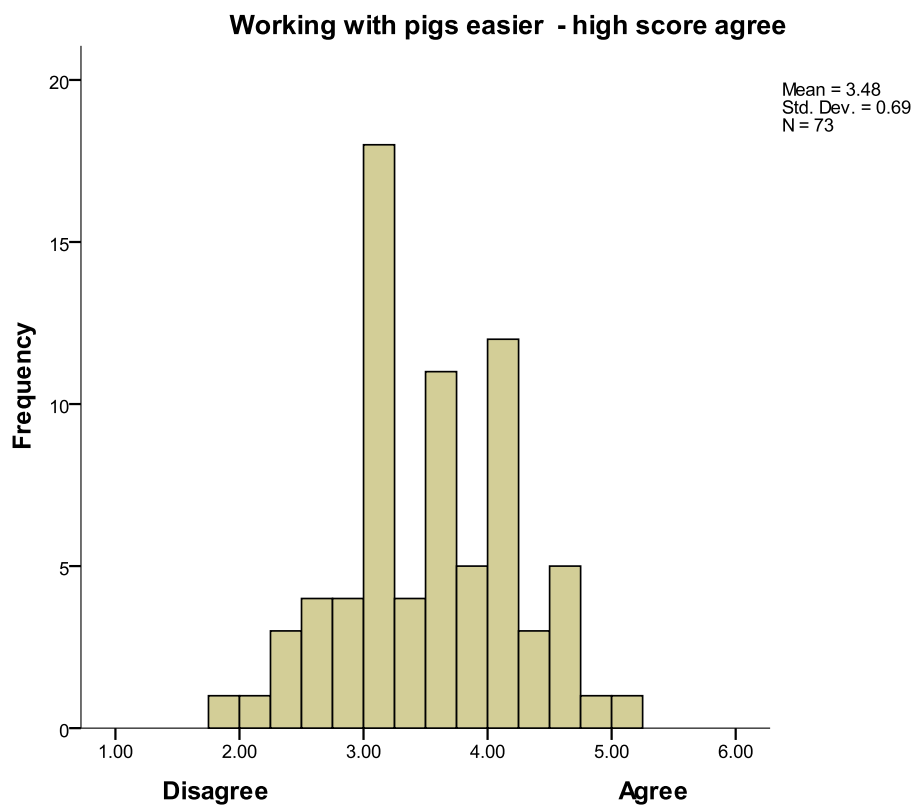


Figure 7.8 Distribution of scores on “Working with pigs easier”

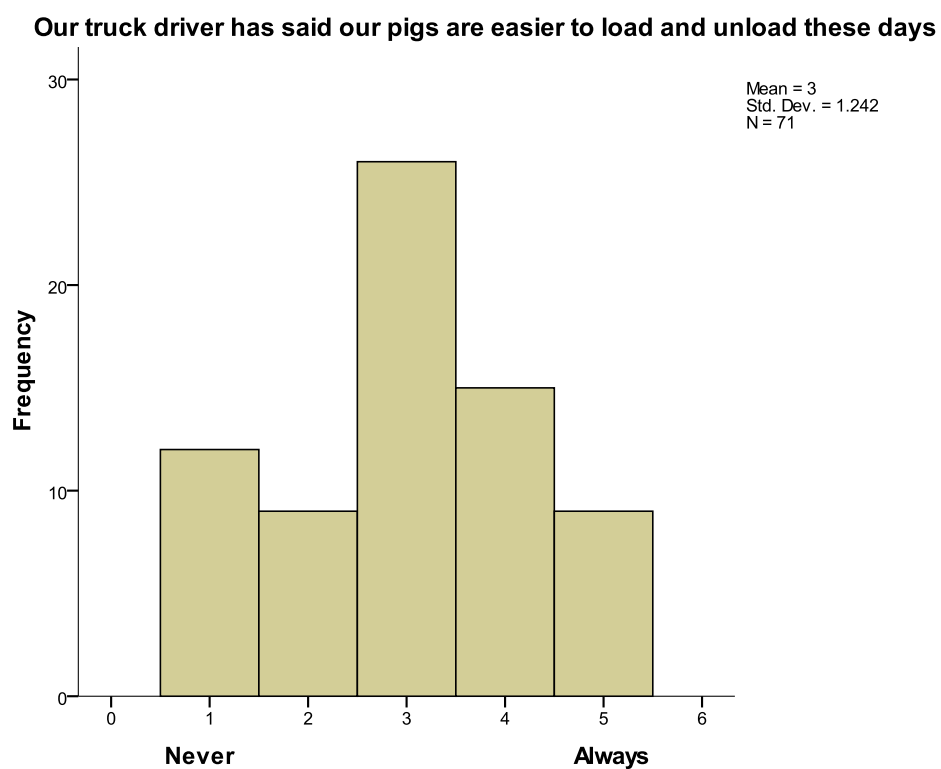


Figure 7.9 Distribution of scores on truck driver response

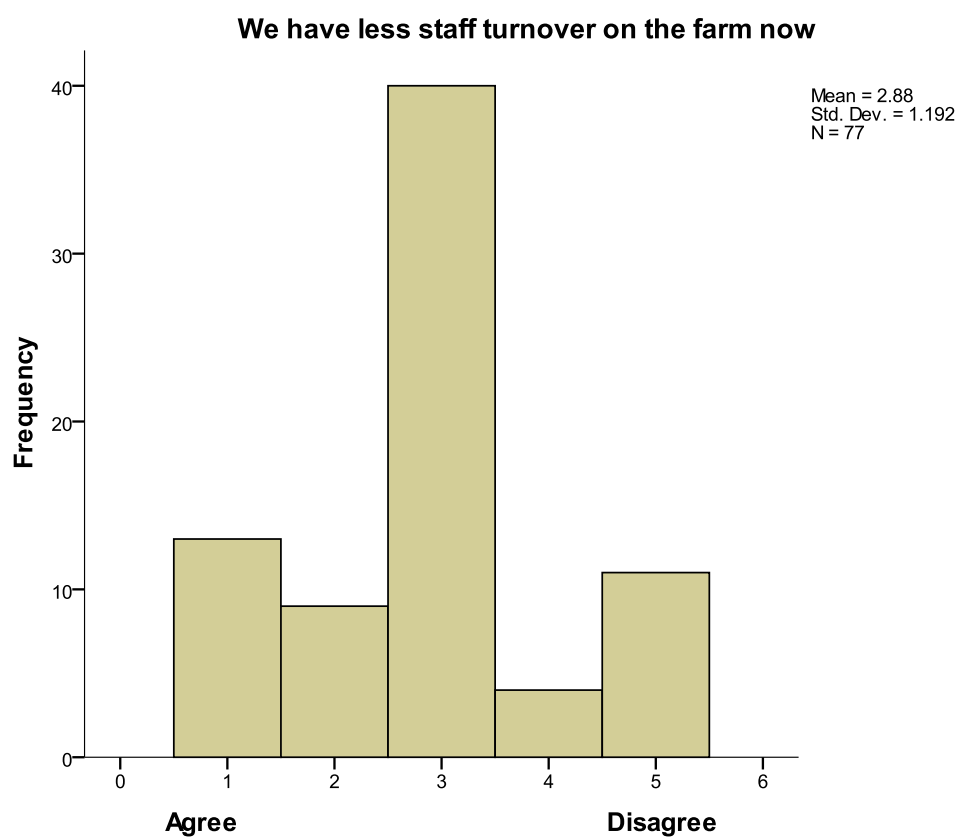


Figure 7.10 Distribution of scores on staff turnover

To determine whether respondents saw significant changes following ProHand, each score was compared to the score of no change (ie. 3.0) using t tests. These results are given in Table 7.5. It can be seen that respondents saw significant improvements in “Improved handling techniques from ProHand” ($t_{80}=14.75$, $p<.01$), “Reduced negative handling following ProHand” ($t_{80}=14.58$, $p<.01$), “Improved working conditions” ($t_{75}= 8.52$, $p<.01$) and “Working with pigs easier” ($t_{72}= 5.98$, $p<.01$).

Furthermore, on average, respondents disagreed that there were “Staffing and time issues” ($t_{80}= -5.98$, $p<.01$) and also disagreed there were “No benefits seen” ($t_{77}= -4.25$, $p<.01$). There was no significant effect for any of the other scores.

Table 7.5 t tests comparing each score against 3.0 (neutral point)

One-Sample Test	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean Difference
Improved handling techniques from ProHand - High score positive	14.75	80.00	.00	1.13
Reduced negative handling following ProHand - high score positive	14.58	80.00	.00	1.12
Other staff don't change - high score agree	-1.39	79.00	.17	-.17
There was nothing wrong to begin with - high score agree	-.56	78.00	.58	-.06
Staffing, time issues - high score disagree agree	-6.27	80.00	.00	-.76
Improved working conditions - high score agree	8.52	75.00	.00	.70
No benefits seen - high score agree	-4.25	77.00	.00	-.39
Working with pigs easier - high score agree	5.98	72.00	.00	.48
Our truck driver has said our pigs are easier to load and unload these days	.00	70.00	1.00	.00
We have less staff turnover on the farm now	-.86	76.00	.39	-.12

8.0 Implications and Recommendations

From these results, the two main indicators of on-farm behavioural change being implemented following ProHand training with the highest mean (combined) responses were “Improved Handling Techniques” and “Reduced Negative Handling”. Both recorded means of over 4.0 (with a mean score of 3.0 indicative of “no change”) amongst a group size of 81 respondents.

This result provides strong evidence that attitude and behaviour change has occurred amongst a large number of ProHand trainees, given both these mean scores were derived from the answers respondents provided to a selection of 18 different sub-questions, combined together and designed to measure qualitative aspects of their routine pig handling behaviour, before-and-after training.

In response to questioning on how trainees viewed the pig-handling behaviour of their workmates before-and-after ProHand training, and whether or not trainees considered they needed to change their own behaviour, both mean scores are close to 3.0, which indicates a predominantly neutral position with these two issues.

A pleasingly high mean score was achieved in response to six (6) combined sub-questions which related to trainee’s perceived improvements in their working conditions, brought about through positive changes in workforce cooperation and feelings towards other farm staff members, as well as towards the animals they interact and work with.

A high positive mean score recorded for five (5) sub-questions dealing with trainee's perceptions of how they and their colleagues empathised more with pigs following ProHand training (*"Working With Pigs is Easier"*) is also a positive result for industry and the training, as it reflects an improvement in farm staff job satisfaction levels, potential job retention rates and stockperson beliefs that the program can deliver both tangible and intangible outcomes.

Anecdotal evidence received by Graeme Pope from trainees after their completion of the Unit #2 Day #1 ProHand session would suggest this improvement in empathy towards pigs during handling and movement comes from trainees' increased knowledge and appreciation of the animal's natural characteristics (sight, curiosity, herding instincts etc), and how they can influence a pig's behaviour.

The results of the Questionnaire indicate ProHand is having its major influence on pig welfare and productivity through an increase in frequency of "positive" stockperson behaviours, encouraging greater thoughtfulness amongst stockpersons when moving/ interacting with their animals, and a reduction in "negative" behaviours.

As examples, a comment often made to ProHand Facilitator Graeme Pope during delivery of Day #2 ProHand is *"We just slow down now and let the pigs take a bit more time before we start having to push them in a certain direction"*, or *"You are better backing away from a group of stressed pigs and let them settle down rather than keep on pushing them to move forward"*.

The results of the Questionnaire also indicate there are on-farm benefits to be realised through adoption of ProHand principles in terms of improved stockperson job satisfaction and their empathy towards their animals.

Facilitators can deliver the ProHand program with the knowledge that attitudinal and behavioural change will occur on those farms where previous routine handling may have been more frequently "negative" than necessary. The responses listed in Question #2 of the Questionnaire (and in Table 7.2 within the Results section of this report) are examples of on-farm behavioural change being implemented post-training, and should be referred to by Facilitators during delivery of the program as examples of what farm managers and staff can expect as practical outcomes from the Program.

The fact that the mean response to the composite variable *"There was nothing wrong (with my behaviour) before completing ProHand"* was close to 3.0 (neutral) may also be a positive outcome for industry, indicating that many trainees having completed the training had decided their existing attitude towards handling pigs and patterns of behaviour were already consistent with the principles highlighted within the ProHand training program.

However, despite this belief, their responses indicate that they still saw benefits from completing ProHand.

Ideally, it would have been preferable to obtain "before and after" responses on the Questionnaire so that change could have been measured directly, but these results do show that participants saw benefits of ProHand after they had completed the training.

9.0 Intellectual Property

Not applicable.

10.0 Technical Summary

On the basis of Questionnaire results received from 81 stockpersons who had completed ProHand training since April, 2009, the Project has demonstrated this training program has the capacity to change trainee attitude and behaviour towards pigs and their routine handling.

Further, respondents believed that they had significantly increased the frequency with which they “positively” handled their animals and decreased their frequency of “negative” handling, leading to improvements in their overall working conditions and ease of working with pigs.

11.0 References

Not applicable.

12.0 Publications Arising

Not applicable.