FARMER ATTITUDES PREDICTIVE OF PROFITABILITY

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Abstract

How manager attitudes, personality, behaviour and socio demographic characteristics influence farm performance is at best only partially understood. The present study expands this understanding by analyzing attitudes and attributes of eighty dairy farmers in Great Britain in relation to their farm profitability. Business goals, temperament, purchasing behaviour and growth mindset were found to be associated with profitability. A model consisting of six question responses is presented predicting 40% of profitability variation. These six questions all related to attitudes. Other assessed variables such as behaviour and socio demographic characteristics did not warrant inclusion in the final model. These results represent a major step forward in explaining how farm managers influence the profitability of their businesses.

1. Introduction

Many farm businesses struggle to remain profitable and financially viable. Though often discussed in passing, the role of the farmer in influencing the businesses success or failure is poorly understood. Studies have however shown that attitudes, beliefs and associated behaviours can be predictive of farm profitability. For example, Mäkinen (2013) reported that farmer 'Management Thinking' and 'Strategic Thinking' variables were highly predictive of dairy farm operating margin. Herrmann (2016) also reported that 'Commitment' and 'Discipline' measures of managers were strongly correlated to farm cooperative performance.

Attitudes, beliefs, objectives and values can be defined and contrasted as follows. An attitude is an expression of favour or disfavour toward a person, place, practice or event that may be relatively transient or amenable to change. A belief, or conviction, is a psychological state where someone holds a specific premise to be true or not. As they are both closely related concepts, attitudes and beliefs shall be henceforth referred to together as attitudes.

Values relate to what a person holds to be an idealised state of existence.

'Values refer to the goodness or badness of results, the situation, things, etc. ... Values express the farmer's needs and motives; goals and objectives express the means to follow those values.' (Ohlemér et al. 1998)

Gasson (1973) explained farmer behaviour through the prism of goals and values, postulating that farmers could be classified into one of four value based categories. These classifications were:

Instrumental (e.g. means to an end, making money);

Expressive (e.g. self-respect, creativity, challenges);

Social (e.g. tradition, prestige, family); and,

Intrinsic (e.g. independence, enjoyment, lifestyle).

Gasson's value scheme has been used by several researchers to predict outcomes e.g. (Bergevoet et al. 2004; Hansson 2008). The design, effort expended, and decision-making on farm are likely to be influenced by the reasons a farmer is farming. Objectives, and associated attitudes, have thus been studied as potential predictors of much about a farm business, not just performance.

Attitudes and objectives relating specifically to profit have been described in numerous ways. These include 'Managerial Thinking', 'Business Orientation', 'Entrepreneurial Orientation', 'Profiteer', 'Profit Maximiser' etc. Entrepreneurial Orientation, Strategic Thinking, and instrumental values have been found to be predictive of financial performance (Mäkinen 2013). In that study, these measures loaded on a construct labelled Managerial Thinking that was highly predictive of farm operating margin ($\beta = 0.59$).

Table 1 Attitudes and objectives predictive of farm outcomes

Source	Size of effect	Sample
Barnes (2006)	Multifunctional attitude associated with technical Efficiency (β 0.02).	61 dairy farmers in Scotland
Ferguson and Hansson (2013)	Expansion predicted by business values (2.38) and belief in future profits (2.19). Exit planned predicted by belief in future profits (0.59). (Odds ratios)	282 dairy farmers in Sweden
Hasson (2008)	'Idea of Profitability' 0.09 and 'Expected profitability' 0.03 to long-term economic efficiency. (Regression coefficients)	507 dairy farmers in Sweden
Herrmann (2016)	Farmers that prioritised their career and were committed increased owner equity more over three years. r=0.39.	51 mixed farms in east Germany
Mäkinen (2013)	Management thinking (MT) composed of 5 factors, 28 questions predicted operating margin (β 0.59). The factors loadings on MT included Entrepreneurial orientation (0.58), Strategic thinking (0.55) and Intrinsic values (0.44)	117 Dairy farmers in Finland
Manevska-tasevska and Hansson (2011)	Interest In farming negatively associated to technical efficiency (-0.05 to -0.04). Profit maximisation 0.14 to 0.21, increasing production 0.14 to 0.1 & standard of living objectives 0.09 to 0.14 (regression co-efficients).	300 Grape growers in FYR Macedonia
Vandermersch and Mathijs (2004)	Prioritising reducing inputs and costs: higher gross margin (model partial R^2 = 0.12). Focus on pedigree and yields negative (partial R^2 0.05). Model R^2 0.21.	79 Flemish Farmers
Nuthall (2010)	Self-rated ability model β 0.49 - 0.51 to financial performance, objective of risk reducer (β 0.13) and profiteer (-0.07).	657 Farmers in New Zealand
Rauch and Frese (2007)	Entrepreneur success correlated to; Need for achievement 0.3**,** Innovativeness 0.27, Proactive 0.27, Generalized self-efficacy 0.25, Stress tolerance 0.2, Locus of Control 0.13, Risk taking 0.1	Meta analysis of entrepreneurship
Rosenberg and Cowen (1990)	Farmers' understanding of employee motivations predicts milk yield (β 0.433). Somatic cell counts (-0.23).	87 dairy farms in California
Thomas and Thigpen (1996)	Opposition to regulations and environmental rules were associated with higher gross income. Participation in such programs associated with opposition.	1,063 arable farmers in Texas
Wilson *et al*., (2001)	Maintaining the environment (0.019) and maximising profits (0.017) in the top 2 of priorities. Placing both in the top two would predict approximately 4% greater efficiency.	73 wheat farmers in the East of England.
Wilson *et al*., (2012)	High performing farmers characterised by attention to detail, focus on margins and cost control as being important.	24 farmers in England.
Willock *et al*., (1999)	Achievement in farming objective predicts business orientated behaviour (Cor 0.45). Quality of life objective correlates to business orientated behaviour (0.287).	252 Farmers in east of Scotland

The beliefs and objectives summarised in Table 1 appear advantageous for profitable farming. Viewing farming as both a lucrative business and way of life is particularly predictive of financial performance (Mäkinen 2013). Encouraging farmers to embrace these aspirations and associated concepts may increase farm profitability.

Other motivators and attitudes are also predictive of profitability. Herrmann (2016) recently reported that farms run by those who prioritised their own leisure and enjoyment had a smaller increases in owner equity over three years than those that did not with Pearson coefficients ranging from 0.25 to 0.49 - a large effect.

Nuthall (2010) reported that those who have risk reduction as an objective were more profitable. Having the view that farming delivers more than just food but also environmental and social outputs was associated with greater technical efficiency (Barnes 2006) and a need for achievement was found to be important for entrepreneurs' business success in non agricultural contexts (Rauch & Frese 2007).

In summary, is clear that farmer attitudes are predictive of a wide range of outcomes on farms. The present study investigates if certain goals, personality, beliefs, attitudes, practices and management background are associated with profitability using a questionnaire completed by eighty dairy farmers linked to their farm management accounts over a three-year period. A profit measure is selected followed by exploratory correlation analysis. A linear model is then presented predicting variation in the chosen proxy profit measure - profit before resource costs. The findings are then summarized, interpreted, and discussed.

2. Materials and methods

An 83-item questionnaire was developed in the winter of 2011/12 based on a literature review and the experience of farm management consultants working with the participants. The majority of items were statements to which participants agreed or disagreed. Farm management style, staff management practices, goals and objectives and biographical information were assessed.

Experienced farm management researchers edited and proofed the questionnaire followed by pilot testing. Please consult the appendix to view the final version of the questionnaire. The participation in the study in illustrated in Figure 1. The questionnaire was then posted to 234 Promar International clients during the spring of 2012. Following written, and verbal reminders, 101 responses resulted (a 43%

response rate). Due to incompleteness and an outlier, 21 were discounted resulting in a final sample of 80.

2.1 Questionnaire development and collection

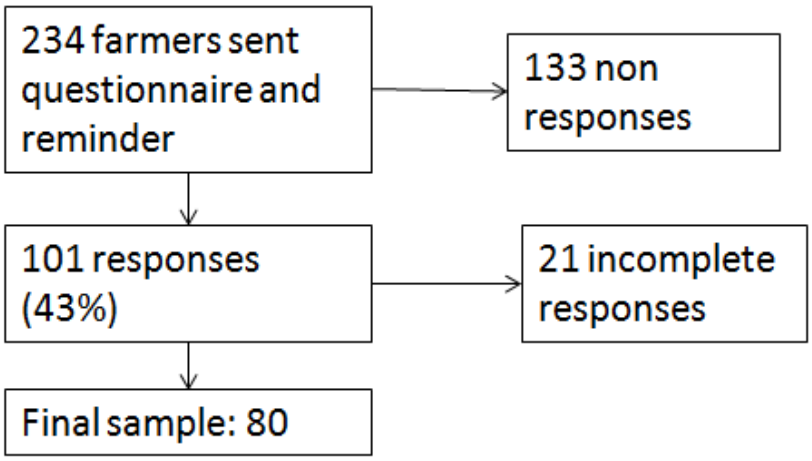

Figure 1 Study participation illustration

2.2 Sample characteristics

Table 2 Summary statistics of sample

	Value	Standard deviation
Age	50.5	9.2
Cows	198	110
Yield/cow (L)	7,595	1,210
Profit before resource costs (£)	153,459	89,800
PBRC + Wages (£)	216,050	114,501
PBRC/ Turnover	22%	8%
(PBRC + Wages) / Turnover	31%	7.6%

Participants subscribed to Promar International's[1] Farm Business Accounts (FBA) service. The participants were either specialist dairy or mixed dairy and were not

[1] Promar International is a large agriculture consultancy firm about 30 years in existence. The lead author was embedded with them for three years as part of a Knowledge Transfer Partnership with the University of Reading.

wholly representative of dairy farms in Great Britain. The size of their milking herds varied from 34 to 453 with a sample average herd size of 198 (Table), much larger than the UK average of 126 (DairyCo 2013a). Areas such as south Wales and Scotland were underrepresented. However, in some respects, the sample matched dairy farmers in GB. The average yield per cow was 7,595 litres, similar to the UK average of 7,604 in 2011/12 (DairyCo 2013b) and the average age of the participants was 51 compared to the national average of 51.4 (Farm Business Survey Team 2012).

2.3 Selecting the dependent variable

A profit-based measure was deemed most relevant to Management Capacity. The measures 'Return on Assets' and 'Return on Equity' were considered, but discounted as land valuations were not updated regularly in the data set. Net Farm Income was identified as being a relatively fair measure of profitability to assess the performance of a manager as it adjusts for rent and unpaid family labour. However, it was not possible to calculate NFI in this study as an estimate of unpaid family labour was unavailable. Therefore, a similar measure of profitability was selected.

Profit Before Resource Costs (PBRC) is a profitability measure that does not include costs such as rent or finance. Rent and finance are mostly attributable to the farm's resource endowment. The ability of the current manager, at least in the short and medium term, can have limited impact on these.

To adjust for business size, PBRC/turnover was calculated. As can be seen in Table , Profit Before Resource Costs does not include rent or depreciation charges but does include wages. Imputing unpaid family labour was not possible with the available data but wages were accurately recorded. PBRC and PBRC/turnover was thus also calculated with wages added back to the profit to adjust for any unpaid family labour. This is, in one sense, a superior measure to Net Farm Income as only bank-reconciled figures were used and the farmer was not required to estimate unpaid family labour. Such estimation would likely have introduced inaccuracy to the data.

To minimise the effect of annual variation, the average scores were calculated over three financial years - 2011/12 to 2013/14. The questionnaire was collected during the spring of 2012, near the end of the first of these three financial years. Thus, the

questionnaire collection occurred one third of the way through the financial period assessed.

Table 3 Trading summary illustrating Profit Before Resource Costs from example farm management accounts prepared by Promar International

BUSINESS TRADING SUMMARY		
LAST YEAR 31-Dec-10		**THIS YEAR 31-Dec-11**
£		**£**
502,128	Livestock	608,856
0	Crops	6,250
1,800	Forage	380
0	Commercial	0
33,521	Sundry	26,662
537,449	**BUSINESS TURNOVER**	**642,147**
211,037	Livestock	190,726
0	Crops	4,785
31,219	Forage	37,654
0	Commercial	0
0	Sundry	0
242,256	**VARIABLE COSTS**	**233,165**
291,091	Livestock	418,130
0	Crops	1,465
-29,419	Forage	-37,274
0	Commercial	0
33,521	Sundry	26,662
295,193	**BUSINESS GROSS MARGIN**	**408,982**
54,157	Wages	51,136
76,380	Power and Machinery	93,366
19,910	Administration	23,241
28,453	Property Charges	28,047
178,901	**DIRECT OVERHEAD COSTS**	**195,790**
116,292	**PROFIT (before resource costs)**	**213,192**
9,326	Land Rent	10,975
0	Quota Leasing	0
22,511	Machinery,Fixtures Investment Depreciation	37,016
23,009	Finance Charges (incl interest and charges)	21,207
54,846	**TOTAL RESOURCE COSTS (incl depn)**	**69,198**
61,446	**PROFIT**	**143,993**

The four profit measures each adjust for certain biases that might mask the influence of the farm manager but are inherently similar, and generally highly correlated. The correlations do however go as low as r=0.43 (Table). To identify an underlying profit

measure, Principal Component Analysis was performed on the four dependent variables. The package 'psych' (Revelle, 2015) for ‘R’ open source statistical analysis software was used for the PCA analysis (R Core Team, 2013). Promax rotation was specified, as it does not assume components are independent.

Table 4 Correlation matrix of profit measures (Pearson's r)

	PBRC	**PBRC + Wages**	**PBRC/ TO**	**(PBRC + Wages) / Turnover**
PBRC	1.00	0.93	0.65	0.62
PBRC + Wages	0.93	1.00	0.43	0.58
PBRC/ TO	0.65	0.43	1.00	0.81
(PBRC + Wages) / Turnover	0.62	0.58	0.81	1.00

Table 5 Profit component loadings

Label	PC1 (Profit component)
Average Profit Before Resource Costs	0.92
Average Profit Before Resource Costs + Wages	0.86
Average Profit Before Resource Costs/Turnover	0.85
(Average Profit Before Resource Costs + Wages)/Turnover	0.87

The first of the components predicted 77% of variation, while the second, 18%. The third component accounted for 5% of variation. Using the Kaiser criterion, one significant component was retained (Eigenvalues 3.07, 0.72, 0.20, 0.01). Henceforth, this first component is referred to as profitability. The loadings of which, are presented in Table . This is the proxy used for Management Capacity and is the dependent variable in this study. Figure 2 illustrates first the scree plot used to determining the number of profitability components to retain and secondly the QQ plot used to inspect the distribution of the data and identify an outlier.

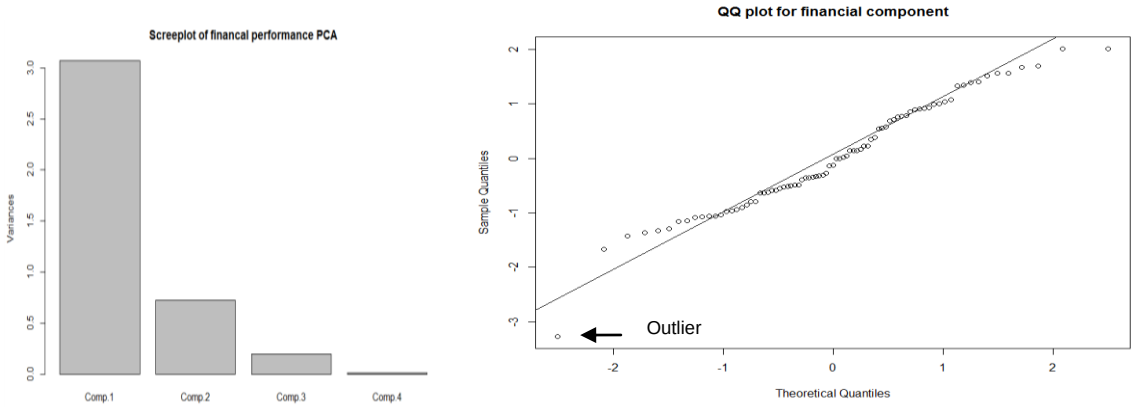

Figure 2 Scree plot for financial variables PCA (left) and QQ plot of component 1's scores illustrating the normality of the component profitability measure. The removed outlier is indicated in the bottom left.

3 Exploratory data analysis

A scatter plot with profitability and a histogram of each variable was inspected. Many of the responses distributions were skewed significantly with most participants answering similarly such as in the examples in **Figure 3** and **Figure 4**. Some questions had a broad range of responses such as in Figure 5.

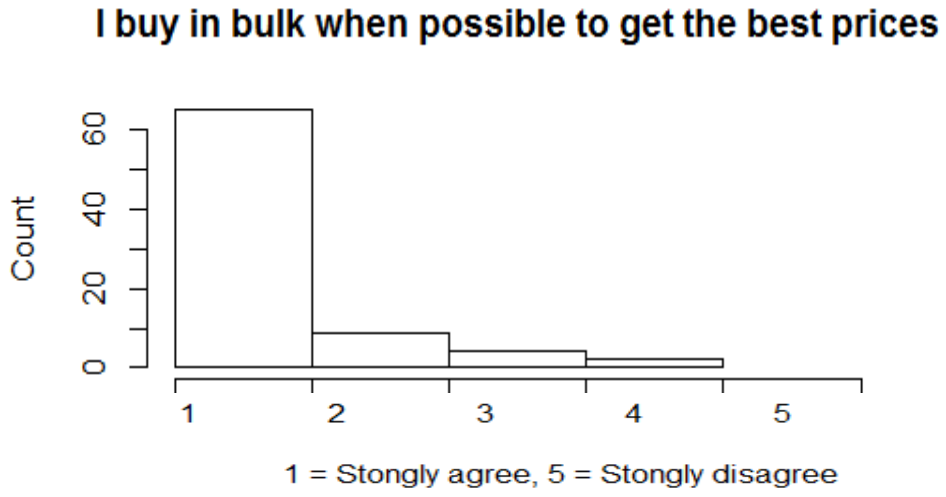

Figure 3 Histogram bulk buying behaviour

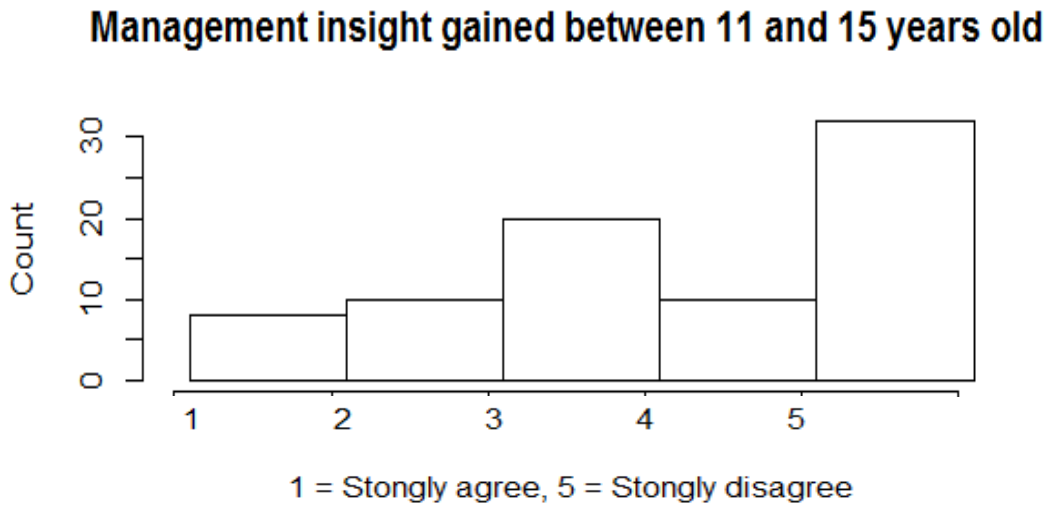

Figure 4 Histogram of self assessed management insight gained between the ages of 11 and 15 years old

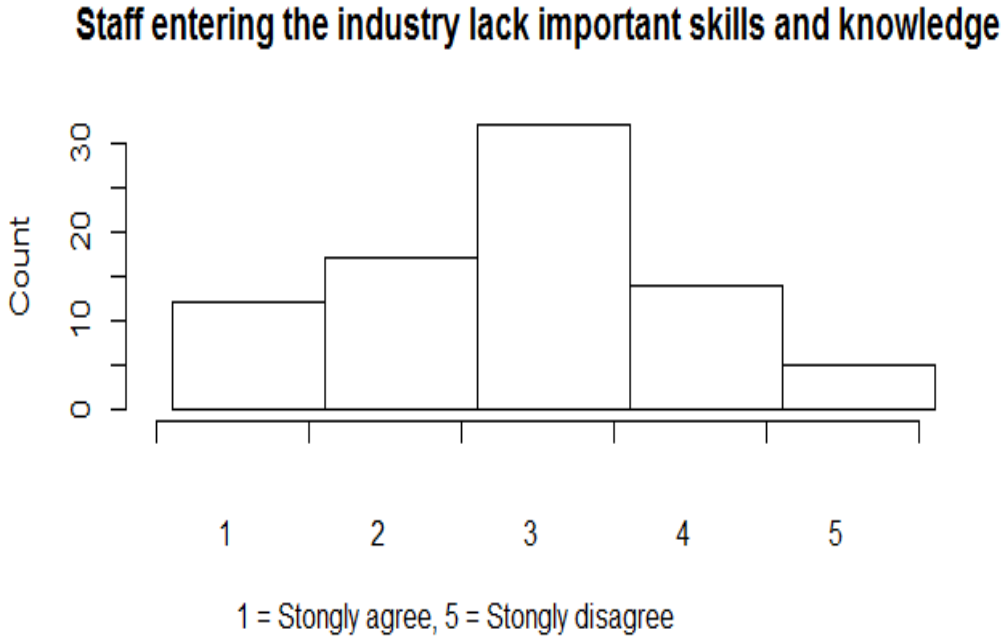

Figure 5 Histogram of attitudes relating to novice staff skills

3.1 Correlations to performance

Statistically significant correlations to financial performance close to or at the p-value of 0.05 threshold are listed in Table 6 and Table 7 along with mean scores and standard deviations for each response. Spearman's non-parametric correlation analysis was used which does not have a normality assumption.

An indicator of late responder bias was found in that financial performance was significantly negatively correlated to days taken to return the survey (Table 6). This would indicate the sample is skewed more towards higher performers.

Table 6 Correlations to profitability, mean and standard deviation, 1 generally is agree strongly with the statement, 5 disagree strongly (1/2)

	Variable	rho	N	p	Relation-ship	Mean	Std Dev	Comment/ Interpretation
1	My farm is completely orientated towards maximising profit*	0.31	80	0.006	Positive	2.5	1	Most farmers did not agree strongly with this statement.
2	People think I work too hard	0.30	80	0.008	Negative	2.1	1.1	Most participants agreed with this statement.
3	I buy in bulk when possible to get the best prices*	0.30	80	0.006	Positive	1.8	1	Indicative of strategic and planned purchasing, most agreed with this statement.
4	Increasing turnover is essential for long term success	0.29	80	0.010	Negative	2.5	1.1	
5	When things go wrong I sometimes lose my cool and don't salvage the situation as well as possible*	0.29	80	0.010	Negative	3.4	1.3	Indicative of emotional stability.
6	How much insight into farm management did you gain between 11 and 15 years old*	0.29	80	0.008	Negative	3.6	1.4	Agreement may indicate aversion to learning new methods and techniques.
7	Training provision to staff	0.29	80	0.008	Positive	0.8	0.8	Count of training provided, off farm, on farm, other. (0-2)
8	I worry about milk price a lot	0.28	80	0.011	Negative	2.9	1.1	
9	I buy most of my inputs from 1 or 2 local suppliers	0.28	80	0.012	Negative	3.5	1.4	Related to item three. There was a broad distribution in responses to this question.
10	Level of educational attainment of manager	0.27	80	0.015	Positive	2.2	1.7	Scale 0- 5. 5= University level education

Variables included in linear regression model in Table 8 (*)

Table 7 Correlations to profitability, mean and standard deviation, 1 generally is agree strongly with the statement, 5 disagree strongly (2/2)

	Variable	rho	N	p	Relation-ship	Mean	Std dev	Comment / Interpretation
11	How much insight into farm management did you gain between 16 and 20 years old	0.26	80	0.019	Negative	2.1	1.2	See item 6
12	I don't usually pay for staff training as they may leave after &/ I would rather do it myself	0.25	80	0.024	Negative	3.4	1.2	Related to item 7 and 19. Indicating of a cynical outlook and poor people management skills.
13	Content cows are a major source of pride*	0.25	80	0.024	Negative	1.7	0.8	Perhaps better farmers take cow comfort as a given.
14	How important is the trait milk yield when selecting replacement genetics?	0.24	80	0.034	Negative	3.2	1.7	Broad range of responses received.
15	Days for questionnaire return.	0.23	77	0.042	Negative	22	23	Speed of return associated with profitability
16	I get the most output from cows and land possible	0.23	80	0.036	Positive	2.1	1.1	See item 1
17	Increasing net worth is essential to long term success	0.23	80	0.03	Positive	1.5	0.7	Most agreed with this statement.
18	Staff entering the industry lack important skills and knowledge	0.22	80	0.045	Positive	2.8	1.1	See item 7 and 12. Appreciating that new staff need training is associated with profitability.
19	Age leaving full time education	0.21	80	0.065	Positive	18	2.6	Less predictive than item 10, level of attainment.
20	My family and / or staff often influence big decisions	0.21	80	0.059	Positive	2.2	1.1	Most agreed with this statement.

Variables included in linear regression model in Table 8 (*)

The hours worked and the date of questionnaire return were marginally correlated indicating the busiest farmers returned their surveys later (Spearman's rho=0.21, p=0.07).

However, no correlation was found between hours worked and financial performance. The same is true for general self-rated management ability indicating effort in the form of hours and general self-rated management ability are not predictive of financial performance. Respondents were also asked how surplus profits were used during profitable years. Nine of the 80 respondents reported investing profits off farm and were more profitable than those who did not (t test, p =0.06).

Eleven farmers reported repaying loans early and these were significantly less profitable than those who do not repay loans early (t test, p=0.04). Early loan repayment may be overly cautious and an inefficient use of resources. Alternatively, it may be a sign of a stressed business correctly choosing to repay expensive forms of credit. The largest relationship based on Spearman's rho correlation coefficient is with respondents' own assessment of their farms' orientation towards profit. This and five other variables are included in a linear regression model in Section 4 and are discussed in more detail there and in Section 5.

3.2 Age, Management Experience and Education

Age and years of management experience were not correlated to financial performance but level of educational attainment was (rho = 0.27, p=0.015). 14 of the 80 participants had a university agricultural education (Figure 6) and they were not significantly more profitable than the non-university graduates (p=0.13).

51 of the 80 respondents had some form of agricultural education beyond A Levels and were significantly more profitable than those without an agricultural education (t-test, p<0.001). Läpple *et al*., (2013) reported that discussion group participation significantly predicted financial performance.

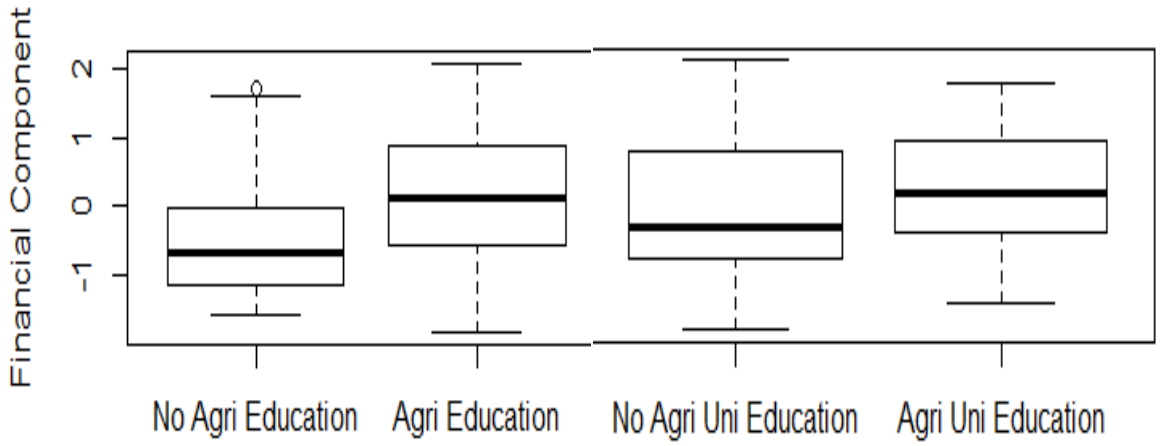

Figure 6 Agricultural and university agricultural education

Läpple *et al*., (2013) also reported that agricultural education moderated the beneficial effect they found for discussion group participation. Those with the least education benefited the most from participation. However, the least educated had a more negative view of discussion groups in the present study. Educational attainment and viewing farm walks and discussion groups as essential were correlated (rho = 0.29, p=0.01).

3.3 Variables not correlated to profitability

The most prominent variables that are not predictive of performance are discussed in this section. A literature review (not yet published) concluded that age, decision-making processes, and Locus of Control were unlikely to be predictive of financial performance. This is supported by the negligible non-significant correlations to profitability found in this study (not presented). The correlations did not approach the p-value of 0.05 or less significant threshold for presentation in Section 3.1. For example, Locus of Control proved to be not correlated to profitability with Spearman's rho of just 0.11 (p=0.32). This is contrary to the findings of Nuthall (2010a) but consistent with the recent findings of Herrmann (2016).

Also of note was that farmers own general self-rated management ability was not associated with profitability. The literature review identified self-rated ability on specific management skills as likely to be highly predictive of profitability based on Nuthall (2010a). He found that 25% of profitability could be predicted by

assessments of five specific skills. This indicates accuracy of self-assessments requires specificity and multiple measures. The broader measure used in this study thus lacked predictive validity. For more questions that proved not to be predictive, please consult the questionnaire in the appendix. All the questions were assessed for associations to profitability and if were not included in section 3.1 Correlations to performance, they were not significantly associated with profitability at the $p< 0.05$ threshold.

4 Linear regression model

To assess the relative importance of the variables correlated with farm profitability, multi-variate linear regression was performed. Variables with the largest correlations to financial performance in Section 3.3 were included in an initial model and variables were eliminated based on p-values and model AIC values. This is similar to a stepwise model selection approach (Vandermersch and Mathijs, 2004). This continued until all variables in the model were significant. The final model presented in Table 8 contains six variables.

Most of the variables are independent of each other. Various interaction effects were tested for but were found to be statistically insignificant. The QQplot of the model residuals indicate they are mostly normally distributed (Figure 7). The R^2 value of 0.40 for the model indicates 40% of the variation in profit was predicted by these six questions. To translate the results into pounds and percentages, the model was run again with each of the four original profitability measures (Table 9). Large changes in profit are predicted by each 1/5 point change in each Likert scale response to each of the six questions.

For example, a change of ~£31,000 Profit Before Resource Costs is predicted for just a one point change in the response to how orientated a farm is to maximising profit. This is the most influential variable on profitability in the model. The focus on profit is presumably primarily at the discretion of the manager but could be somewhat endogenous. The second most important variable related to self-assessed management insight gained during teenage years. Indicating that they learned a 'great deal' is negatively associated with profitability. These variables and the remaining four model variables are discussed in more detail in Section 5.

Table 8 Linear model explaining profitability R^2 = 0.40 (Adj = 0.35).

	Variable	β	Co-efficient	Std. Error	T - value	p - Value
	Intercept		-0.14	0.51	-0.28	0.78
1	My farm is completely orientated towards maximising profit	0.31	0.32	0.09	-3.36	0.00
2	How much insight into farm management did you gain between the ages of 11 & 15	-0.26	-0.19	0.07	2.85	0.01
3	When things go wrong I sometimes lose my cool and don't salvage the situation as well as possible	-0.26	-0.20	0.07	2.71	0.01
4	Staff entering the industry lack important skills and knowledge	0.25	0.22	0.09	-2.64	0.01
5	Content cows are a major source of pride	-0.24	-0.32	0.13	2.51	0.01
6	I buy in bulk when possible to get the best prices	0.18	0.18	0.09	-2.00	0.05

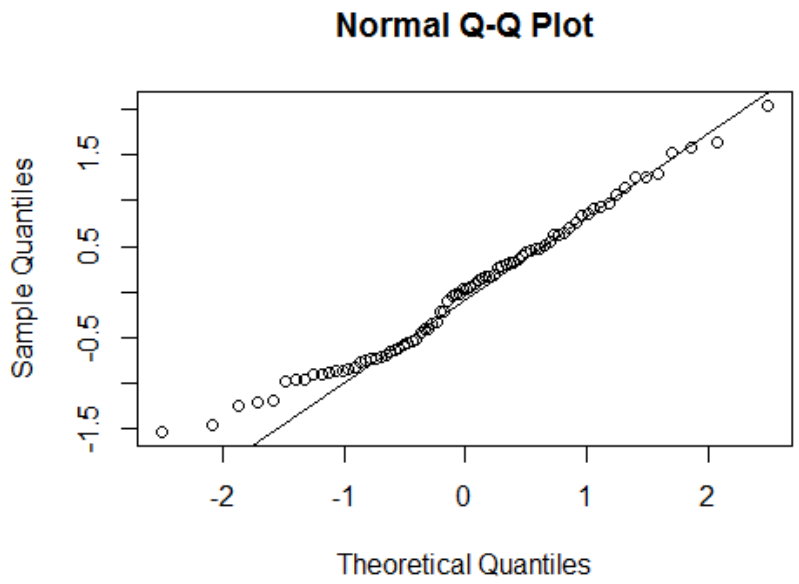

Figure 7 QQplot for the residuals from the linear model presented in Table 8

Table 9 Model values for predicting four PBRC measures

	Variable	PBRC	PBRC/ Turnover	PBRC + wages	(PBRC+ wages) / Turnover
	Intercept	£180,283	18.3%	£ 248,060	26%
1	My farm is completely orientated towards maximising profit	£ 30,951	2.5%	£ 28,220	1.5%
2	How much insight into farm management did you gain between the ages of 11 & 15	-£19,060	-1.5%	- £ 14,814	-1.3%
3	When things go wrong I sometimes lose my cool and don't salvage the situation as well as possible	-£ 10,998	-1.6%	- £ 13,482	-1.8%
4	Staff entering the industry lack important skills and knowledge	£15,874	1.3%	£ 21,675	1.8%
5	Content cows are a major source of pride	-£ 22,788	-1.9%	-£32,130	-2.6%
6	I buy in bulk when possible to get the best prices	£19,060	0.3%	£ £30,594	0.9%
	Model R^2	0.33	0.31	0.30	0.35

5 Findings, interpretation and summary

5.1 Profitability Objective

This study has identified that certain attitudes, beliefs, goals and practices are associated with profitability. The linear model's most important variable by standardised coefficient (β) was how much participants agreed that their farm is completely orientated towards maximising profit.

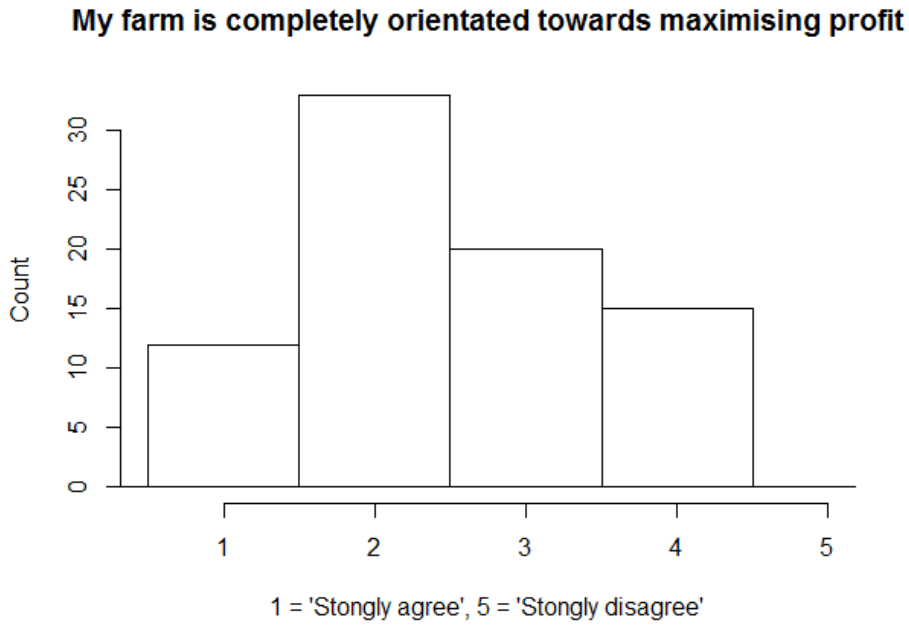

Figure 8 Histogram of responses regarding farms focus on profit

That farmers are motivated by factors besides profit is well-documented (Edwards-Jones, 2006; Gasson, 1973) but the large association found with profitability is noteworthy. The correlation coefficients show that about 10% of profitability variation can be predicted by how profit focused farmers are. Most agreed tentatively (33/80), a few agreed strongly (12/80), (20/80) were neutral and (15/80) disagreed (Figure 8). By farmers own assessment, there is scope to make the majority of farms more profit orientated. Purchasing of inputs in bulk appears to be one way to achieve this but most farmers report already doing this. As seen by variable 6 in the model, those few that do not, were much less profitable

5.2 Growth Mindset

Variable 2 and 4 of the model related to attitudes towards learning and staff. Those indicating they gained a 'great deal' of management insight during their teenage years and those believing that novice staff are adequately skilled were less profitable. Together, they indicate a potentially important underlying variable - a 'growth' or 'fixed' view of human ability. Many farmers appear to have a fixed view and this is associated negatively with farm performance. Several related variables not included in the model were also strongly correlated to profitability. The largest of

these was provision of training by managers (rho - 0.29), as was the educational attainment level of the manager. In particular, an agricultural qualification appears beneficial. These correlations support the assertion that a growth mindset is associated with profitability.

Two other questions were asked that are more directly related to Growth Mindset. These were 'Management is a skill that can be honed and improved' and 'Good managers are born, not trained'. Responses to both did not correlate to profitability, perhaps due to social desirability bias. The training provision and perceptions of learning questions were perhaps not as impacted by social desirability bias.

Interventions to increase growth mindset have been shown to affect self-rated performance in some contexts (Visser 2013). Heslin and Vandewalle (2008) illustrated that a growth mindset can be created among managers and that it remained 6 weeks after the intervention. Therefore, it is possible that farm managers with a fixed mindset could be coached to have more of a growth mindset and so potentially improve performance.

Growth mindset has been shown to be important in many contexts, e.g. manager mindset influences how employee appraisal accuracy (Heslin & Vandewalle 2011). However, this is one of the first studies where profitability has been associated directly with growth mindset like variables. As such the current finding has implications for management studies in general, not just in agriculture (Heslin and VandeWalle, 2008; Mischel, 2014).

5.3 Personality and attitudes

Variable 3 and 6 of the linear model relate to personality, the first of which was how farmers react when things go wrong and those that 'lose their cool' were less profitable. These two findings indicate that emotionally stable
and conscientious farmers are likely to be more profitable.

Finally, variable five, having pride when cows are content might indicate that this is seen as an achievement or optional. Content cows is likely to be taken as a given by better managers. This interpretation is consistent with the findings of Vandermersch and Mathijs (2004) and Braun (2012).

5.4 Findings summary

The areas found to predict profitability in the model in descending order of importance following are;

- Profit objective,
- Growth mindset - beliefs about their own and staff development,
- Attitude - viewing content cows as a source of pride, and,
- Purchasing behaviour.

Several other variables such as if the participant agreed that other people think they work too hard were also strongly correlated to profitability (Table 6 & 7) but were not included in the model.

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Appendix - questionnaire

Farm Success and Management Study

Promar International Ltd,
Alpha Building,
London Road, Nantwich,
CHESHIRE, CW5 7JW

15/03/2012

Dear (mail merge name)

Some time ago, I wrote to you inviting you to take part in the above survey. You will remember that it is part of a study examining farm management practices in the dairy industry. However, if our records are correct, you have not yet had time to fill in and return the questionnaire in the pre-paid envelope provided.

The response to our survey, so far, has been most encouraging. However, we would not like to leave out those who have been too busy to take part as we would like to include as many people as possible from all parts of the country. We would, therefore, still be very grateful if you could help us by completing the questionnaire.

In case the original questionnaire has been mislaid, a further copy is enclosed in this document together with a pre-paid envelope for its return. We are aware privacy concerns are paramount and your responses will be treated in the strictest confidence, used only for the purposes of this study and will not be passed on to third parties. The results of the survey will be published using data for groups only. Individuals' data will not be revealed.

By completing the survey you are agreeing to take part. If, however, you wish to withdraw at any stage, please contact me and I will withdraw your responses from the analysis. If you have any questions regarding this survey please email XXXXXXXXX. Alternatively call XXXXXXX and ask for Niall O'Leary.

Kind regards,

Niall O'Leary

Niall O'Leary
*(*Project leader*)*

Guidelines

1. This should <u>only</u> be completed by the person with the primary responsibility for day to day decision-making on your farm.
2. Please answer all questions to reflect <u>your</u> farm situation as accurately as possible. While some questions may appear irrelevant in isolation, they remain important parts of the survey.
3. Please turn over the page to begin the survey.

A. Management style *FBA account code: XXXX*

1	With TEN being the best, FIVE being average and ONE being the worst,how would you rate your management skills?	/10
2	On average, how many hours do you work a week?	hours
3	How many hours a week are spent doing managerial work? (E.g. planning, instructing, ordering, selling.)	hours
4	On average, how many days holiday do you take a year?	days
5	Including yourself, how many layers of management exist on your farm?	

Please tick ONE box that indicates your level of agreement with the following statements on a scale of 1 - 5.		Agree strongly 1	2	3	4	Disagree strongly 5
6	I write down options and calculate financial consequences before making big decisions	❑	❑	❑	❑	❑
7	I worry about milk price a lot	❑	❑	❑	❑	❑
8	I worry what others think of my farm	❑	❑	❑	❑	❑
9	Talking to others about farming ideas stimulates and increases my enthusiasm for farming	❑	❑	❑	❑	❑
10	It is difficult adapting to new policies and rules	❑	❑	❑	❑	❑
11	I tend to mull over big decisions a lot before acting	❑	❑	❑	❑	❑
12	I normally don't rest until the job is completed	❑	❑	❑	❑	❑
13	I find farm walks and discussion groups essential	❑	❑	❑	❑	❑
14	I rarely critically assess my own performance	❑	❑	❑	❑	❑
15	I often seek the advice of third parties (E.g. accountant / vet / consultant)	❑	❑	❑	❑	❑
16	I often sell animals and assets when cash flow is tight and so don't always get the best price possible	❑	❑	❑	❑	❑
17	I buy most of my inputs from 1 or 2 local suppliers	❑	❑	❑	❑	❑
18	I prefer to rely on memory as opposed to making records whenever possible	❑	❑	❑	❑	❑
19	I spend a lot of my time fixing problems rather than actually managing the farm	❑	❑	❑	❑	❑
20	I consult my family and staff about issues and changes	❑	❑	❑	❑	❑
21	My family and / or staff often influence big decisions	❑	❑	❑	❑	❑
22	People think I work too hard	❑	❑	❑	❑	❑
23	I have studied or seen firsthand agricultural systems in other countries different to my own.	❑	❑	❑	❑	❑
24	I keep many written / electronic records to inform future decision-making	❑	❑	❑	❑	❑
25	I buy in bulk when possible to get the best prices	❑	❑	❑	❑	❑

26. Are you an active member of a buying group?Yes ❑ / No❑

27. How often do you compare farm spending and income to pre prepared budgets?***(Please tick one)***

at least once a month ❑ **/** at least once a year ❑ **/** less than once a year ❑ **/** never ❑**.**

28. How often do you compare farm spending and income to industry benchmarks?
(Please tick one)

at least once a month ❑ **/** at least once a year ❑ **/** less than once a year ❑ **/** never ❑**.**

29. When selecting replacement genetics, which traits are most important to your farm? *Please rank in order of importance. (1 most important, 6 least important)*

Trait	**Rank**	**Trait**	**Rank**
Milk yield		Conformation Traits	
Fat and protein content		Profit Lifetime Index (PLI)	
Fertility		Lifespan	

B. Staff on your farm

1. Including yourself, paid staff and unpaid family labour, how many staff work on your farm?

Full time Pa[ ]e Seasonal [ ] [ ]

2. How many of these staff are family members? [ ]

Please tick ONE box that indicates how much you agree with the following statements on a scale of 1- 5.		Agree strongly 1	2	3	4	Disagree strongly 5
3	Staff entering the industry lack important skills and knowledge	❑	❑	❑	❑	❑
4	Staff understand the long term objectives of the farm business	❑	❑	❑	❑	❑
5	Paying for staff training is a worthwhile investment	❑	❑	❑	❑	❑
6	I don't usually pay for staff training as they may leave after and / or I would rather do it myself	❑	❑	❑	❑	❑
7	I hire staff with skills I lack	❑	❑	❑	❑	❑

8. What training do you and your staff do at least once a year? (Please tick all appropriate)

- ☐ Organised training, by you or an employee, for other staff on farm
- ☐ Formal training, off farm
- ☐ Formal training, by a 3rd party, on farm
- ☐ No formal training

Other training (Please explain) _____

C. Goals and objectives

1. Do you have clearly defined goals and objectives for your business? Yes ❑ No ❑

1.b If yes, are they written down?Yes ❑ No ❑

2. In 10 years time, your business is likely to be; (Please tick one)
the same size ❑ / smaller ❑ / larger ❑/ sold ❑.

3. Is there an identified successor for the farm?Yes ❑ / No ❑

4. During particularly profitable years how have you mostly used the surplus? (Please tick one)
Reinvestment on farm to minimise tax ❑ / capital investment on farm ❑ / personal drawings ❑ / early repayment of loans❑ / invested off farm ❑.

Please tick ONE box that indicates your level of agreement with the following statements on a scale of 1 - 5.		Agree strongly 1	2	3	4	Do not agree 5
5	I plan for plenty of leisure time and holidays	❑	❑	❑	❑	❑
6	Environmental compliance is a significant burden	❑	❑	❑	❑	❑
7	I reduce financial risk by diversifying my income	❑	❑	❑	❑	❑
8	I reduce financial risk by keeping cash reserves and minimising debt	❑	❑	❑	❑	❑
9	I get the most output from cows and land possible	❑	❑	❑	❑	❑
10	I strive to create a pleasant and enjoyable working environment for both myself and my staff	❑	❑	❑	❑	❑
11	I actively try to reduce pollution	❑	❑	❑	❑	❑
12	I enjoy testing new production systems and products	❑	❑	❑	❑	❑
13	I am actively planning for retirement	❑	❑	❑	❑	❑
14	Increasing net worth is essential to long term success	❑	❑	❑	❑	❑
15	Increasing turnover is essential for long term success	❑	❑	❑	❑	❑
16	I don't borrow unless it is absolutely necessary, so non-critical investment is limited to cash surpluses	❑	❑	❑	❑	❑
17	Loans are essential for success	❑	❑	❑	❑	❑
18	I take part in community activities and / or socialise regularly	❑	❑	❑	❑	❑
19	Having the best infrastructure, machinery and equipment is essential for long term success	❑	❑	❑	❑	❑
20	Happy well fed cows always repay the investment	❑	❑	❑	❑	❑
21	I am a farmer by circumstance rather than choice	❑	❑	❑	❑	❑
22	My living standard is my main priority when farming	❑	❑	❑	❑	❑
23	Appearing to be successful is very important	❑	❑	❑	❑	❑
24	Content cows are a major source of pride	❑	❑	❑	❑	❑

Please tick ONE box that indicates your level of agreement with the following statements on a scale of 1 - 5.		Agree strongly 1	2	3	4	Don't agree 5
25	Increasing yields is the most efficient way to increase profit	❑	❑	❑	❑	❑
26	I review my cash flow at least once a month	❑	❑	❑	❑	❑
27	Cutting costs is the most efficient way to increase profit	❑	❑	❑	❑	❑
28	My farm is completely orientated towards maximising profit	❑	❑	❑	❑	❑
29	My farm is a family heirloom to be passed on	❑	❑	❑	❑	❑
30	Most jobs on the farm bore me	❑	❑	❑	❑	❑
31	I enjoy farming and the lifestyle it affords me	❑	❑	❑	❑	❑

D. Personal views on management

Please tick ONE box that indicates your level of agreement with the following statements on a scale of 1 - 5.		Agree strongly 1	2	3	4	Don't agree 5
1	It is safer not to rely on others to get important jobs done well and on time.	❑	❑	❑	❑	❑
2	I never try anything that might not work	❑	❑	❑	❑	❑
3	New methods and technologies that are not fully proven are not worth the risk	❑	❑	❑	❑	❑
4	When I know I'm right I can be very determined and can make things happen	❑	❑	❑	❑	❑
5	Some people are just lucky and everything works out for them easily	❑	❑	❑	❑	❑
6	I can rely on staff to get jobs done well and on time	❑	❑	❑	❑	❑
7	Staff sometimes struggle to do even simple tasks properly	❑	❑	❑	❑	❑
8	Poor results are usually due to things completely out of my control	❑	❑	❑	❑	❑
9	Good managers are born, not trained	❑	❑	❑	❑	❑
10	When things go wrong I sometimes lose my cool and don't salvage the situation as well as possible	❑	❑	❑	❑	❑
11	I reckon 'good luck' doesn't exist - 'luck' is really good management, and 'bad luck' poor management	❑	❑	❑	❑	❑
12	I plan ahead to ensure my goals are achieved, and often do budgets and commit my ideas to paper	❑	❑	❑	❑	❑
13	It is within in my control whether or not my farm will be successful in the long term	❑	❑	❑	❑	❑
14	Management is a skill that can be honed and improved	❑	❑	❑	❑	❑
15	I have managed to largely achieve my goals to date	❑	❑	❑	❑	❑

E. Your details

Age: ____ Gender M ❑ / F ❑ Name: _____

Contact email address: _____

1. How many years have you lived on your current farm? Year ☐

2. How many years have you managed your current farm? Year ☐

3. How many years did you manage any previous farms(s)? Year ☐

4. Including yourself, how many generations of your family have been farmers? ☐

Up to 20 years of age, how much insight into farm management did you gain:(Tick one of the five boxes)

5. 11 to 15 years of age?A GREAT DEAL ❑ ❑ ❑ ❑ ❑ NOT MUCH

6. 16 to 20 years of age? A GREAT DEAL ❑ ❑ ❑ ❑ ❑ NOT MUCH

7. What age did you leave full time education? ☐

8. Please state any post secondary qualifications (beyond GSCE / O level) and area of study.

_____

9. The farm provides: less than 60% ❑/ 60 to 90% ❑ / 91 to 100% ❑ of your personal drawings. (Please tick one)

10. Please list other sources of drawings / business interests (e.g. dividends, house rental or private businesses) _____

If you have any comments please write them here.

_____

_____

_____

_____

_____

Promar International would like to thank you for your cooperation in completing this survey. Please return this survey in the enclosed, addressed and postage paid envelope.