THE CHARACTERISTICS OF

HIGH PERFORMING FARMS IN THE UK

PRESENTED TO:

AHDB
AGRICULTURE & HORTICULTURE DEVELOPMENT BOARD

BY

THE ANDERSONS CENTRE

And Associates

AHDB Project reference CF/2017/30

produced by:

THE ANDERSONS CENTRE AND ASSOCIATES
Old Bell House
2 Nottingham Street
Melton Mowbray
Leicestershire, UK
LE13 1NW

Project Manager:

GRAHAM REDMAN
Office: +44 (0)1664 503 200
Direct: +44 (0)1664 503 207
+44 (0)7968 762 390
gredman@theandersonscentre.co.uk

THE AUTHORS:

Graham Redman, Partner, The Andersons Centre

Steven Langton, Independent statistician

Stuart Platt, Independent analyst

Joe Scarratt, Partner and Head of Consultancy, The Andersons Centre

Richard King, Partner and Head of Research, The Andersons Centre

Version: *AHDB ~ Top Performers 180604*

Last Saved: *Tuesday, 30 October 2018*

Edition: *30-Oct-18 09:59*

Proof checked by: *Richard King (Partner, Andersons)*

EXECUTIVE SUMMARY

What are the top-performing farmers doing differently to the others? Why can two neighbouring equally sized farms on similar soils with the same fundamental farm systems make radically different amounts of money? This paper set out to find answers using three methods. First, a literature review explored published work from around the UK and beyond. Next, a novel analysis was undertaken interrogating the outputs of the Farm Business Survey matching pairs of similar farms from different performance quartiles (measured as farm income divided by costs associated with it; a return on turnover). Thirdly, six case stories were examined. They demonstrate five outstanding farms operating at a very high level and one farm working hard but not achieving good results.

Only 5% of factors affecting farm performance are out of the farmers' control, according to research. This suggests almost all the determinants of success are down to the individual; the decisions made on the farm and how they are implemented. The literature review identifies that to improve financial performance, changes to the farming system must be made. Not all farms are prepared or realise the need to change if they want to improve, so settle instead for the status quo. A labour force introduces a difficult management task (especially if it's family) and better farmers manage to extract far more from workers than average farmers. Farmers that specialise also do a better job than those with many enterprises as they can focus their time and resources on one thing and enterprises can be scaled. Performance improvement comes down to good, sound farm management planning, such as budgeting, planning, benchmarking and information gathering. Attention to detail is difficult to define, but is clearly important, as is a positive attitude towards work. Farmers that enjoy work will do a better job.

The Farm Business Survey identified some useful patterns. Top-quartile farmers, on average, make approximately £100,000 per year more than the bottom 50% of farms. More specialist farms outperform their peers. Those that have a smaller percentage of their costs as overheads across farming sectors are all more profitable: It identifies those farms that recognise farming as a commodity-based industry, which is defined as a low-margin sector, meaning volumes must be high and costs of production very low.

The case studies put the findings into life. Each of the five successful farms closely monitor their system through sensible management and comparison systems. They budget and plan, they test their figures against others in benchmarking schemes and they use key performance indicators to measure ongoing success or flag up problems. Each farming system fits with the environmental constraints and they manage staff very well, investing in them before other costs. The less successful

farming case study is disappointing as the farmers are too busy to work out their direction in life, so work hard but get nowhere.

The study identified a series of activities dominated by top performers. Placing them into a hierarchy of importance will vary for each farm according to the farm system, environment, existing skills and resources and performance on the farm, but for the industry overall our assessment of factors in order of priority is as follows:

1. Minimise overhead costs
2. Set goals and compile budgets
3. Compare yourself with others and past performance and gather information
4. Understand your market requirements and meet them
5. Give each detail the attention it deserves
6. Have a mindset for change and innovation
7. Continually improve people management
8. Specialise

Farming is an industry that provides far more than simply financial rewards and therefore offers a way of life that most would not swap. It is easy to become too busy to discuss the farm with family or business members, but clear communication is key to ensure everybody is achieving their personal and shared objectives. Most farmers are hard-working – a necessity for success – but to raise performance requires change, which often involves bravery and self-belief to do well. The eagerness to win, focus to be the best and determination to be an outstanding farmer is down to the individual. Higher-performing farms are more resilient to change. The impact of Brexit on agriculture is not clear but might be disadvantageous for some sectors. Shrewd farmers are wise to prepare for it by raising their performance.

CONTENTS

1 INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF THIS REPORT

Two farmers with similar resources might expect to achieve similar financial results. But they often do not. The ability of competent business-minded farmers to turn their resources into cash is a skill not shared by all in the industry. (The same can, of course, be said for all industries.) So, what do the top-performing farmers do differently to those struggling with the financial conundrum of turning a farm into a profit?

This study set out to provide evidence of how UK top-performing farmers operate differently to their less successful peers. Actions have been examined to see how top-quartile farmers make different decisions, do different things and perform activities in differing ways to others. This is therefore intended to provide a guide to farmers looking to raise their *own* performance regardless of which quartile they are classified in or consider themselves to be in. Comparisons are made with poorer-performing farmers to highlight differences. Averages have the potential to be misleading, so ranges of performance are addressed where possible and case studies and direct comparisons are used too. This study is not written to tell farmers how to farm, but to suggest some ways of providing a strategic framework to changing for the better. Why should people change? Well, there is always a way to improve and quite frankly life is too short not to.

The backdrop to this report is Brexit, particularly regarding the opportunities and threats to productivity and profitability it may present. European Union membership currently has substantial influence over UK policy, trade rules, labour availability and regulations that therefore have considerable impact on UK farming. Changes to the farming environment are thus likely to be greater in the next decade than they have been for fifty years. We don't know what the changes will be, but useful scenario analysis work already undertaken by AHDB[1] suggests that because of these changes it could become more challenging to farm profitably in some sectors in coming years. Andersons' own analyses agree with these findings[2]. While there are situations where farming could become more profitable after Brexit, we cannot depend on these outcomes and farms must work to become more competitive to retain a viable long-term and sustainable business in preparation for all scenarios. The conclusions of AHDB's scenario study report open with; '*high-performing farms are in a far stronger position to cope with the changes associated with all scenarios' (AHDB Brexit Scenarios: An Impact Assessment, 2017).*[1]

1.2 THE APPROACH

The purpose of this project was to provide an assessment and ranking of the main factors that differentiate the highest-performing farms from all others in each of the AHDB's six sectors: horticulture, cereals & oilseeds, potatoes, pigs, dairy and beef & sheep. A comment on the replicability of the actions and how they can be implemented is made for each one.

Using a combination of literature review of existing studies, an interrogation of Farm Business Survey (FBS) data (the most comprehensive and reliable dataset of English farm financial information), using a novel analytical approach, and some carefully selected practical farm examples, this work empirically and statistically demonstrates the linkages between certain practices and high performance.

The project has gathered quantitative and qualitative data about UK farms, from several sources, and used it to reach conclusions about what engenders top performance and what top-performing farmers do differently to others. The FBS is undertaken by country. Only the English survey was used here because of time constraints, but the geographical scope of AHDB is broader. However, the study encompasses the rest of the UK through a wider literature review and analysis of practical activities on farms throughout Great Britain and Northern Ireland. In simple terms, if a farmer is doing an outstanding job, the location is seldom the determinant.

1.3 DEFINITIONS

First, we should identify what we mean by 'performance'. This is a superficially simple question but depends on what the individual is trying to achieve and therefore how it is measured. Part of the definition of 'farming' is undertaking activities for commercial gain, and this is what is measured in this study. Most farmers value other benefits of farming, such as accommodation and lifestyle. This is discussed on page 12. However, financial performance can still be measured in various ways: highest profit, greatest balance-sheet increase or highest return on capital. In this study, performance is measured as: income generated by the farm divided by the costs associated with it; a return on turnover:

$$\frac{\textbf{income generated by the farm}}{\textbf{costs associated with it}}$$

Figure 1 ~ Demonstrating Typical Returns on Turnover

	Farm 1	**Farm 2**	**Farm 3**
Income	70,000	450,000	900,000
Costs	50,000	400,000	840,000
Profit	20,000	50,000	60,000
Return on Income Ratio	**1.4**	**1.125**	**1.03**

Using this method, farms of varying sizes can be compared; it simply examines how a farmer manages to convert inputs into outputs. It is the return that a farmer has managed to generate as a proportion of their output. This suggests that a farmer with a large estate receiving millions of pounds of sales and making £200,000 is not as successful as a small new-entrant with minimal turnover and making £100,000. Figure 1 demonstrates that out of the three examples, while the last one is making most profit, its return on turnover is the lowest, and the small farm is generating more profit as a percentage of its turnover. Some might consider the return on capital as a more critical determinant of business performance. This can be debated at length. Businesses can remove nearly all their own capital by borrowing money and therefore improve the return on their own capital but lowering profits (finance costs rise), raising business risk (high gearing) and potentially jeopardising business viability (dependent on continued support by the lender). Other business managers might leave excessive capital in their businesses, leaving an inefficient return on investment.

Many technical published articles discuss efficiency. It facilitates high performance but is not the same as profit. A business that achieves a 15% return on its tenant's capital is arguably efficient, but if that farmer reinvests the profit into another opportunity and earns a 13% return on capital, the profit rises over the newly enlarged business but the efficiency falls. The farmer is likely to feel better off. Furthermore, a farm might make very highly efficient use of land (high yields per hectare), but in doing so has to spend large amounts of other resources, such as labour, and consequently they will make efficient use of land but inefficient use of labour: There is usually a compromise. Langton (2011)[3] identifies that efficiency is not the primary goal of farmers, with profitability ranking higher. Farms, as for any other business, forgo efficiency for greater profit.

The difference between 'productivity' and 'production' is critical. 'Productivity' is the ability of an organisation to generate an output both now and in the future. Production is the process of making the output. These two words are closely related but, to clarify, using a pseudo-

agricultural example offered by the late Steven Covey[4], the goose that lays the golden egg is also made of gold. You could raise production this year by selling the goose, but productivity would fall to zero. Thus, only businesses that consider productivity as well as production are sustainable.

In any commodity-based industry such as agriculture, the best performers simply spend less money producing each unit of output when measured on a financial basis. This does not necessarily mean generating more output per hectare or per head of stock. Indeed, higher output accounts for a mere 10 to 30% of higher profits in top-quartile operators in farming, lower costs contributing to 65 to 90%[5]. However, in a world where margins are (over time) ever tightening, in order to retain a steady profitability in real terms, it is necessary to generate more output at lower costs.

Three pivotal publications on farm performance were published by Defra and written by Steve Langton in 2011 to 2013[6]. They identify relationships between farm accounts and farm efficiency. In these studies, 'economic efficiency' is used to refer to the optimal ratio of output value to input costs. This is similar to the terminology used by Coelli et al [7]. These reports also consider both the whole farm business efficiency (including diversification, agri-environmental schemes, and direct subsidy) and that from farming alone. The matching approach employed in this study uses the agricultural cost-centre only and other parts of the report explore the entire farm more widely.

1.4 CAUSATION

Identifying links between top performers and their activities is relatively easy, but the causation link is not; rich people eat more Wagyu beef fillet than poor people, but that is not why they are rich. Langton (2012)[8] cites a strong relationship between farmers with optimism for the future and farm efficiency, possibly suggesting optimism facilitates better farming (perhaps because the clarity of a vision for the farm business encourages long-term investment). Yet it might also be that long-term confidence is engendered because the farm is performing well. Another example in the same paper is whether debt causes inefficiency, or inefficiency leads to debt. This is discussed in some detail in section 2.9 below. There is evidence that more profitable dairy farms use milk-recording techniques[9]. This might be because better cow knowledge facilitates herd growth, or that people minded to grow a herd are also minded to milk record (large herds often have greater return on income than smaller ones). While the causation might be difficult to prove with certainty for many of the relationships, for the

farmers looking to develop a business, mimicking a top performer is likely to be worthwhile regardless which way round the causation works (perhaps apart from eating Wagyu beef fillet).

2 LITERATURE REVIEW

2.1 INTRODUCTION

An influential tutor of mine (Mr Stansfield) once pointed out (from his book) that the difference between a good and a bad farm manager was *'about a week'*[10]. That was some years ago and is probably closer to a day or two now.

The top 25% of farms, across all farm types, perform 1.8 times better than the bottom 25%. This means a great deal in terms of profit difference between farmers. In 2014–15 to 2016–17, the bottom 25% lost £34,600 per farm from agriculture and lost £11,200 overall after subsidies and diversification. Meanwhile, the top-quartile farmers made £42,000 from farming and made over £115,000 in total[11].

Less than 5% of variation in farm performance is related to geographic factors (such as soil and climate), according to Langton (2012)[12]. He was surprised that the figures came out so low. Geographical information (including soil quality, topography, etc.) in the FBS dataset is limited, resulting in it getting lost in the other random variation between farms. Nevertheless, the point remains, more than 70% of the difference between top- and bottom-quartile farms is because of different decisions made by the farmer. The factors that a farmer cannot change are mostly small. It also assumes that farmers cannot move, which of course is not true but would be a major obstacle for most farmers for multiple reasons beyond just economic.

2.2 IS HIGHER PERFORMANCE BETTER THAN LOWER PERFORMANCE?

More than half of farmers operating in the bottom quartile do not realise they are underachieving, suggesting the benefits of benchmarking or other comparable analysis could be tremendous[5]. (This is a trait across all groups of people, not just farmers[13].) Many (small) farmers do not expect their farm business to provide the same monetary returns that they would receive in other alternative employment. They know that investing their capital assets elsewhere (selling land and capital items and reinvesting elsewhere or renting land to others) and taking a salaried job would return them more income. There are good reasons that many farmers accept this: The farm offers more than a cash income, with other benefits including:

- independence, status and work satisfaction
- (usually generous) housing
- no commute to work or associated costs
- often financial benefits on top of the farm profit

These additional benefits from farming are significant and often undervalued[8]. Thus, from the farmer's perspective, farms produce greater benefits than pure accounting suggests. Nevertheless, the figures are relative, and some farmers make considerably more money from their farms than others. Most people are likely to work more persistently to achieve the minimum income necessary to provide the lifestyle they want or have become accustomed to, but greater effort is then required to exceed that and generate a surplus. Indeed, not all farmers *want* to operate in the top quartile. To clarify, while we should assume that all farmers (like most people) would prefer more money than less, to move from the bottom quartile, or even middle ground, would involve '*doing things differently'*. This is a challenge for many people, especially if nothing major has changed in many years. Clearly, as Einstein is credited to have pointed out:

> *"We should not expect to achieve different results by doing the same thing."*

To raise performance, we therefore need to change. What one person considers 'big change', another might barely notice. One person might define a change as a revolution, while another would see merely evolution. Ask Elon Musk, the entrepreneur responsible for creating Tesla Cars, SpaceX, PayPal and several other businesses, to decide how much change your farm business has made in the last decade. He may not notice much at all. Equally, you might consider yourself progressive compared with neighbours.

Every business has multiple objectives and, with farms, this is arguably stronger than for most other businesses. Profit is the first measure of sustainability in a commercial business, but there are other things a farmer will want to achieve[14]. The workplace being the farmer's home(possibly for many generations) and source of recreation as well as income makes these emotional forces stronger. Risk is also relevant. Most farmers are risk-averse – a sensible approach in the context of a family business that they hope will continue in future generations. Hence many will prefer a safe position at the centre of the distribution, rather than adopting higher-risk strategies that might take them to the top.

2.3 FARM BUSINESS PLANNING

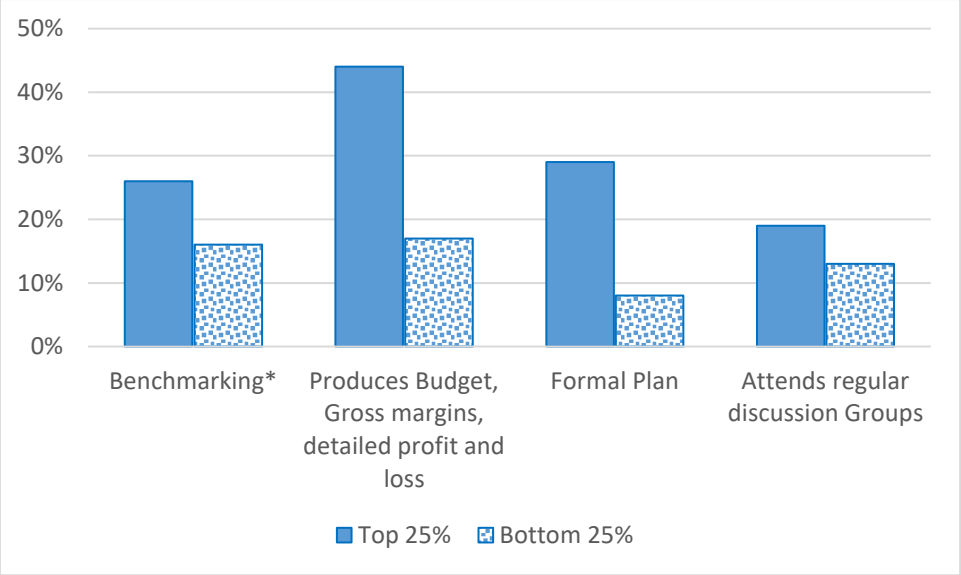
Farms that intentionally carry out farm business management practices are considerably more profitable, particularly at the business level (Langton, 2012). High-performing businesses are likely to:

- set ambitions and long-term goals

- undertake management accounting, including budgeting
- use comparative data including benchmarking
- seek information and advice through means including farm visits and paid advisors
- interact with customers (those buying from the farm)
- adopt formal risk management strategies

This is identified clearly in a recent publication by Defra[15] as shown in Figure 2 below:

Figure 2 ~ Percentage of Farms Carrying out Various Management Practices by Farm Performance



*Source: Defra, data from 2016–17. *Benchmarking is either enterprise level, balance sheet, or international.*

2.3.1 Goal Setting and Business Planning

Farms that write a formal long-term business plan are more profitable than those that don't. Writing your ambitions down is one of the most successful ways to crystallise in your mind what you want to do and therefore for it to happen. It is proven by the FBS. However, only 19% of farmers have a mission or written goal (Defra[15]). Farms that quantify their aspirations by putting numbers against what they would like to achieve, in other words by setting (financial) targets, perform significantly better than those that don't (Langton, 2012). This is not simply an agricultural phenomenon, but true to all sectors of life. A classic script, entitled *Think and Grow Rich* by Napoleon Hill[16], has a key list of activities for achieving (financial) success. It includes setting your mind on a certain profit figure and working out a plan to achieve it. The acronym BHAG is a widely adopted term for a long-term business vision. It stands for 'Big Hairy Audacious Goal', after it was created by Collins and Porras in 1994[17]. Staff of firms with a BHAG understand what the business has to achieve, so know exactly when a decision has to be made

and whether it is the right one or not. On a farm, it's all about who the person is. Targets need not be solely financial: those with clear plans to achieve levels with, for example, environmental improvement also demonstrate higher financial performance than others. This suggests it is as important to have a focus (on anything) as to have a financial goal. Clearly, some aspirations that are not business-orientated may detract from business activities, so there will be a point where this relationship breaks down. Indeed, it is likely that those with commercial targets are also those with stronger environmental aspirations, simply being target-driven people.

2.3.2 Budgeting and Management Accounting

Undertaking detailed financial budgeting each year not only gives an indication of expected profitability but also makes farming activities fundamentally *more* profitable. Some consider budgets to be of limited value when you don't know for sure what the price or yield of a farming enterprise is going to be or what costs might be in a year. However, setting targets, either based on previous performance or others' published material, provides a guide for farmers to work towards and challenges the manager when spending rises above expected levels. Indeed, writing a budget when you *do* know the figures is arguably less meaningful. The Farm Business Survey identifies that those farmers that compile complete farm budgets and make regular use of them are significantly more profitable than those that don't[18]. The financially best performing farms undertake budgeting universally. Yet, two thirds of farmers do not put a budget together or, for that matter, even a cash flow schedule.

Analysis by Langton (2012) identified that higher-performing farms go beyond simple budgeting and use gross margin analyses for each of their enterprises. This allows comparative analysis between other farms that share similarities and, crucially, with the farm's own performance in previous years or other parts of the farm. Properly compiled budgets when coupled with management accounts identify the areas of high and low performance and those parts of the farm that are losing money. They also facilitates the use of key performance indicators – those measurables that give a strong indication of the level of success of an enterprise or entire business. AHDB is compiling a series of suggested business-level KPIs.

2.3.3 Benchmarking and Comparison Work

All top farmers benchmark (Verissimo and Woodford, 2005)[19]. It is a sweeping statement, but the authors claim that formal or informal comparison of performance is essential to be a top performer. Wilson et al in 2012 identified that most high-performing farmers undertake benchmarking activities, allowing them to use other people's knowledge to identify where

performance is edging forwards and what the expectations for performance should be. The Farm Business Survey agrees that benchmarking is significantly related to high profitability, with less profitable farms unlikely to benchmark. Just under half of farms claim to do benchmarking of some description. This sort of activity also demonstrates a curiosity for improvement, a wiliness to accept that other people might be doing things better than you; it's a valuable humbling virtue. Rejecting this mindset assumes superiority of all knowledge, which opens the door to complacency**.**

Higher-performing farmers tend to attend discussion groups, both on business management and other issues. The discussion group effect is even stronger for the business as a whole, with those attending groups on general issues performing particularly well (Langton). Both discussion groups and benchmarking become useful when comparable measurables are set that pitch performance between farms and, between resources (breeding stock or land, for example). Key performance indicators (already mentioned) are crucial for measuring performance. Examples such as kg milk solids per hectare, horsepower per hectare of arable land or daily live-weight gain give clues about performance of various sectors of the farm.

A focus on the finances of a business are important, but beware: excessive interest on profit rather than the factors that create it can be dangerous. A strong *negative* correlation identified by the University of Minnesota Agricultural Extension Service in their survey was the value placed on an income statement rather than the indicators that led to greater income. This suggests that top farmers spend more time working on the key performance indicators that identify that a farm is working towards making a profit rather than the final figure itself. This point is reinforced by investigation into New Zealand beef and sheep farmers. The high-performing farmers in these sectors are driven by much more than profitability alone[20].

2.3.4 Information and Advice

The New Zealand study (Elliot and Wakelin, 2014[21]) identified that all top-performing farms are 'information rich'. While there is a point whereby too much information can confuse the decision maker[22], when looking for clarity on the best course of action, more information is generally better than less. Not only do top farmers source information widely, but their methods are 'discriminating', meaning they test their information sources. Top farmers read widely (1 hour per day) and attend discussion groups, but only those that add to their business information sources. Verismo and Woodford (2005) see benchmarking as an effective information transfer tool, leading to results in other farms.

2.3.5 Knowing your Customers' Requirements

The value of interacting with the person likely to buy your goods on farm is higher than ever. It is easy to assume that one product is close enough to what a processor or manufacturer requires, but consumers' requirements are ever more exacting, whether potato farmers producing specifically to the requirements of what customers require in terms of tuber size, skin finish, delivery date and so on, or the levels of butter fat and protein in milk. Just as the best landlord is the one that speaks with his or her locals, so the farmer should also know who they are delivering goods to.

Knowing exactly what to produce might be a relatively straightforward conversation, or it could be highly complex. But recognising what is of greatest value to customers is critical to add value to both parties and to keep costs down. For example, why produce fat carcasses if your buyer wants lean? It costs more to make fat carcasses and then costs to trim it off; it's simply wasteful. Producing what your buyer requires could either be the difference between a few percentage points of the sale value, which is important for the marginal benefit, or it could be a cancellation of sale (such as antibiotics in milk or ergot in grain); which could be disastrously expensive. Adjusting a commodity to make an added-value commodity – high protein wheat, brightly coloured beans, high protein milk, correct sized apples, clean carrots and so on – would progressively make a small premium on the commodity, a crucial process, and also enable the farm to stand out as one to rely on, potentially then making it even more valuable.

2.3.6 Black Swans and Being Prepared for the Unlikely

Black swans are uncommon in Europe. Indeed, all swans were believed to be white before the late 1600s, when the Dutch explorer Willem de Vlamingh discovered black ones in Australia. Thus, a black swan now signifies an unexpected (unforecastable) event that, after it has occurred, changes the way we think or act. 'Black swans' as a metaphor for risk tend to have negative effects on business. They are, in fact, common, but, being unpredictable, we don't know how the next one will present itself. That is why risk management and insurance is part of our lives[23]. Indeed, spending time preparing for such occurrences is shrewd.

Farms that have, and practise, risk management strategies have higher performance than those that don't, particularly at the farm business level, although such strategies seem to be of less use to grazing livestock farmers than they are to other sectors (Langton, 2012). The more forward-thinking farmer has such policies in place and therefore is often in line with other

management practices, thereby operating at a higher level than most all the time. However, such farms are also more likely to resist extreme events more competently *when* they occur. A greater preparedness for unexpected events enables farms to take greater risks safely and thereby reap greater rewards.

Literature identifies that farms that have a defined purchasing strategy tend to operate better than those that don't. It is possible once again that this technique is typical of the carefully managed farm business and the purchasing strategy makes little difference in itself. Nevertheless, farms that purchase their inputs on a contract rather than ad-hoc outperform the others (Langton, 2012).

Commodity markets are notoriously volatile. There is no evidence that they will change. Indeed, if direct support declines, the risk mitigation role of subsidy might also expose the vagaries of market movements on the vulnerable farm business. There are lots of things that make many farm businesses resilient to unpredictable changes, but preparation for them protects assets, profitability and professional relationships.

2.4 ATTENTION TO DETAIL

Wilson et al (2012) along with Redman (2015) also identify that there is no single action that the best farmers do that is completely different to others; they tend to be better at most processes throughout the farm. Once the farm structure is correct, the attention to detail of every aspect of farming makes a cumulative difference. Look at farming 'winners', one recent example being Eric Wright, whose success at winning the BASIS Best Farmer of the Year is attributed at least in part to his 'attention to detail'[24].

What does 'attention to detail' really mean? Does it mean knowing every finer detail of the farm? This is simply not possible on large, diversified activities, especially when staff are involved. Rather, it is more to do with knowing the value of each activity and therefore how much time should be spent on each one. 'Attention to detail' is a difficult phrase to describe but is easily recognised when it is seen. Some comments from recent publications are useful to describe this:

> *"There is no one reason for this [the farm's high performance] but rather unrelenting attention to detail is applied throughout the business" (FBS researcher who collected data from an exceptionally high-performing farm. Source: Wilson et al, 2012)*

Another useful comment comes from Langton (2012):

> *High performing farms are not the result of a tick-box list of skills that can be captured in a survey form. Instead their success is down to a focus on business, applied consistently across all areas of the farm. Formal business training and business skills may aid this process, but they are not a magic potion that will transform a poor farmer into a high performer.'*

Farmers (indeed most people) don't realise just how many decisions they make throughout the course of a day, most of them leading to financial or time cost outcomes. Sir Alan Sugar is quoted as saying he knows everything that goes on in his business[25]. Clearly, this simply cannot be the case as his business interests are so large, no individual can possibly know them all. Likewise, large or diversified farms have hundreds of variables. Memorising them all does not make somebody a better manager. It is more a matter of knowing what the value of each activity is or might be and therefore allocating the correct amount of time and attention to it, attending enough care for them all so they are completed correctly.

When something is a process, and repeated regularly, it becomes a habit. Habits are repeated without being questioned and so, gradually, bad practice, good practice or outstanding practice become habitual. Thus, the processes of farming, whether poor or outstanding, gradually become engrained into the ways of life of the business owner[26]. Habits are incredibly hard to change. Even when a new one is forcefully imposed on top of an old one, the rut of an old process remains in the brain. Charles Duhigg demonstrates this in his analysis of habits and identifies that habits become so regular, they are repeated subconsciously, and even conscious thought is not sufficient to break them. Ways of thinking become habits as well as actions. Duhigg argues that excellence or poor performance become habitual in themselves. This is summarised neatly by a comment made by management coach Jim Rohn[27]:

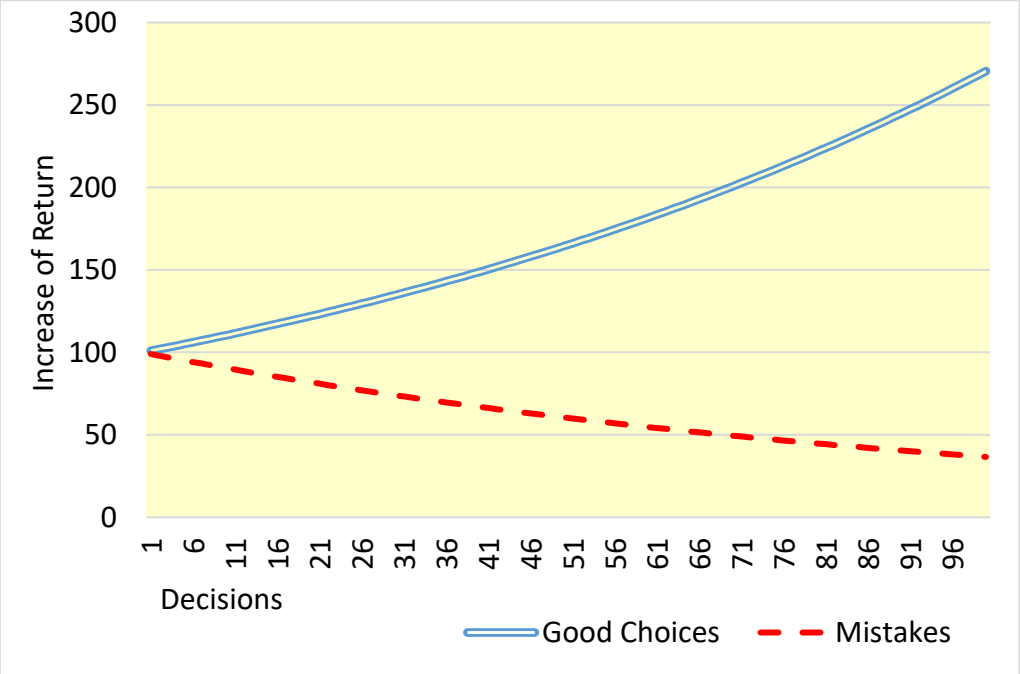
> *Success is a few simple disciplines, practiced every day; while failure is simply a few errors in judgment, repeated every day.*

2.4.1 Aggregation of Marginal Gains

The concept of attention to detail has developed in recent years to one of 'Aggregation of Marginal Gains'. It became popularised from the successes of the UK cycling team in the 2012

London Olympics when Team GB took eight of the eighteen available gold medals, with no other country winning more than one. This remarkable achievement was based on a belief held by the Performance Director of the Team GB cycle team, Dave Brailsford, that if everything that could be managed improved by a marginal 1%, then the impact overall would be noticeable[28]. Not only did he examine wheel size, bike weight, training schedules and so on but also hand cleanliness and sleeping patterns of the racers in question. In fact, he determined to find 100 things that might affect cycling performance and improved them by 1 percent. If 100 equal things improve by 1 percent, then the impact on performance is multiplied, not simply cumulative, giving a 2.7-fold rise of performance. Figure 3 demonstrates this.

Figure 3 ~ Iterative decisions; 100 Good and 100 Bad



The same is true in farming, with the top farmers noticeably doing slightly better at the widest range of things: financial, technical and strategic. It is relatively easy to think of 100 things that managers have some control over on any farm. A conclusion of an OECD paper from 2013[29] states that the authors found no single factor that unequivocally makes some farms better than others but did comment that the range of performance is considerable in all countries they explored. To help an individual generate a list of 100 things, a sample list has been included in the Appendix. This will not be a perfect list for any farm but will provide a start.

2.5 ATTITUDE

The single factor having the greatest impact on performance identified by the University of Minnesota Agricultural Extension Service survey, already mentioned in 2.3.3, was having a positive attitude. In this study, it referred to farmers who considered they had control over their own destiny, were free to make their own decisions and therefore also held responsibility for errors or losses that were incurred. This is not solely an agricultural response but demonstrates how great an impact attitude has on work performance. Clearly, it is possible that the best-performing farmers might have a more positive outlook on life, as being more profitable they probably enjoy a better life, making it almost self-fulfilling. Other strong correlations identified included goal setting and striving for them (already discussed in 2.3.1 above). Working to make more efficient use of machinery was also a strong correlation. Carole Dweck discusses how there are two main mindsets: the 'fixed' and the 'growth'. Again, this is not restricted to agriculture, but those who believe they have enough skills to perform well, i.e. have a fixed mindset, should train rather than learn, and are more focussed on results rather than performance, will not improve. They are more likely to fabricate their yields in conversations, elaborate stories of productivities and so on. Whereas a 'growth mindset' is one that is open to improvement and sees low returns as an opportunity to learn and improve another year[30]. Somebody with a growth mindset is not concerned by other people's performances other than as a learning opportunity but is concerned with personal improvement.

2.6 LABOUR

The University of Minnesota Agricultural Extension Service undertook a survey in 2010 to identify what practical differences were identifiable amongst top-quartile farmers and the rest[31]. 'Top quartile' for them was identified as net farm income per operator and return on assets. Questions covered formal education, attitudes towards management and overall outlook. They identified several factors that farmers can control and change. One of the key points was paying more for (better quality) staff. Other management texts (such as by Koch[32]) are very clear on the need to surround yourself with positive, like-minded people who can do a job to your own standards and unsupervised. Paying more for quality workers is one way of ensuring top-quality staff, but managing them properly is also necessary.

As a farm grows, there comes a point when the farmer cannot personally do everything. Employing staff becomes a necessity. A labour force provides the opportunity to leverage

somebody's time, just as debt leverages cash or rented land leverages an owned land-base. Hiring good land is easier than spotting and recruiting outstanding skills and then motivating people to achieve great things on your behalf. It takes remarkable leadership, motivation and training. As more staff are involved, formalised farm governance becomes necessary to facilitate delegation of management tasks[33].

Langton's research identifies that farms with greater levels of family labour tend to be more efficient, even when the labour is costed at its full economic rate (as it should be for such calculations). The argument is that a business operated by those who own or are in line to inherit it are likely to put greater commitment into the work, possibly with no 'plan B' alternative. However, unpaid labour can also find itself doing low-value work too; it's an easy way to lower the productivity of the workforce. Barnes (2010), though, identifies that paying labour focusses the attention of the employer – a paid workforce is therefore less likely to have unnecessary overtime or do lower-value tasks which add no value to the farm. They have more time away from the farm, meaning the work stops. This can make the workforce very efficient with its time. Paying family labour a full commercial rate is healthy for the economics of the farm and also helps disconnect the often-assumed link between effort and inheritance. This should be dealt with separately.

Langton's work also identifies a higher level of efficiency with greater use of contractors. This is corroborated by Barnes. When work is consistently contracted to a third party, the need to spend large sums of capital on machinery decreases, saving capital expenditure. Contractors also often have higher-specification machinery, spending more of their time doing that particular job than most farmers. It also means specialist skills can be purchased, saving training time and expenditure on farm staff. It is a complex picture in all sectors, though, and really down to good management, identifying those situations where contractors make financial sense (particularly when avoiding investment in machinery and labour) and those where it is better to retain full control.

This is a good example of rational profit maximisers making different decisions to emotionally driven farmers. In Chicago, for most city dwellers, it is considerably cheaper to have a contract with a taxi firm than to own a car. Yet the town is still overcrowded with cars. It is 'nice' to own a car, but expensive[34]. The same is clearly true in many cases in UK agriculture; while there *are* often benefits of owning machinery, on balance, there are many occasions when a full costing would demonstrate a contractor is considerably cheaper.

2.7 SPECIALISATION

Barnes (2010)[14] identified that more specialised farms tended to be more efficient. His paper refers to necessities of specialisation, particularly in the potato sector. The rising expectations of irrigation and storage expenditure for potatoes means that producers have had to become increasingly dedicated to the crop. Potato buyers, too, are requiring more detailed specifications, such as tuber size, skin finish, varietal choices and delivery dates. This is partly dependent on the market segment (processing, ware for chips, seed or pre-pack salads etc.). All this is in a market with highly variable prices. The number of registered potato growers has fallen by over half to about 1,800 between 2000 and 2017, according to AHDB Potatoes[35]. The same effect is also happening in other sectors of farming and in all countries too. Despite that, since 2003, there has been no decline in cropped potato area, with 145,000 hectares in 2017, the same as 14 years earlier. This means the average potato grower is farming about 80 hectares, is more dedicated than before, with greater capital investment, and is more professional. This is partly as transition has demanded it and those less professional have dropped out of potato farming or lost their sales contracts and had departure effectively forced upon them.

Specialisation means labour can concentrate on doing the same task and therefore get better at it. Repeating a task many times gradually turns a job into a process, making it more likely to be close to identical every time it is undertaken. Michael Gerber (2005)[36] explains this in some detail using McDonald's Big Mac as an example to demonstrate if every process is correctly described, then it becomes identically repeatable and thus provides the opportunity to guarantee a product. That makes the task very efficient and reliable. Commodity production is heading in this direction, although environmental vagaries prevent farming reaching the same level that fast-food service has reached.

Dairy farms that undertake a range of activities associated with the dairy farm, such as bringing up the calves and youngstock, growing and preserving the winter forage and so on, tend to outperform those with flying herds and completely bought-in feed[18]. The reasoning is twofold:

1. The farmer has more control of the farm's critical inputs; forage and youngstock. The personal incentives of growing fodder and youngstock for yourself might lead to greater care being taken. Plus, a greater understanding of the input is also good business information for a farm.

2. Other dairy farmers selling surplus surpluses would be inclined to keep the best for themselves. This does not account for purchases from herd sales, but when herds close completely, the proprietor might have lost concentration by then and the quality of the stock may have potentially already deteriorated.

A recent report by the National Sheep Association highlights the benefits of livestock (specifically sheep) in an arable rotation and how it is excellent for soil organic matter, keeps soils healthy, adds nutrient and keeps other pasture areas tidy[37]. Working with neighbours with livestock can be a real benefit, allowing arable farmers to continue to focus on the arable business and livestock farmers to concentrate on stock. Both farms can become bigger from collaboration.

Specialisation is also an indirect way to increase size. The next section discusses optimal size, many of the size issues being concerned about enterprises rather than farms *per se*. For example, a 200-hectare mixed farm with arable, dairy and beef is a small area for three major enterprises. However, if that farm was solely a dairy farm, it would be a reasonable-sized farm.

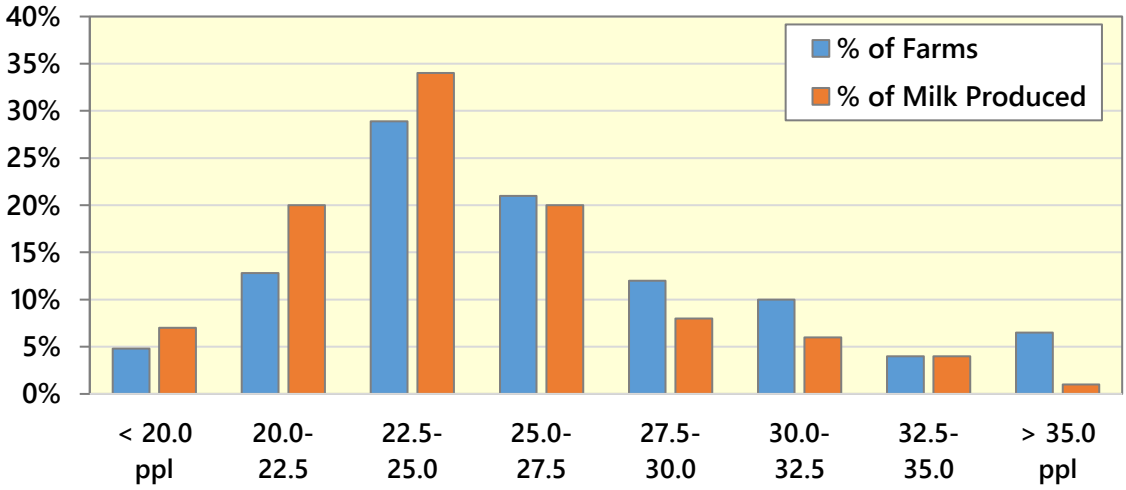
2.8 Optimal and Appropriate Size

Commodity production (including agriculture) is a low-margin business, meaning that to achieve good profits the volume of output must be high and the cost of producing it very low. If the opportunity to add value to something is slim (such as commodities), then the scale of that enterprise matters. Some farmers enhance their agricultural operations with diversified or value-added enterprises, meaning small farm businesses can be highly profitable but the farming element of the firm becomes less relevant.

The costs of producing commodities tend to fall as farm size increases. Figure 4 and Figure 5 (both referred to in [38]) demonstrate a wide range in costs of production of two key UK commodities: wheat and milk. They demonstrate that costs vary by over 100% for wheat and at least 75% for milk. This itself suggests enormous opportunity for improvement by the poorer quartiles of producers in both types of farming. Closer examination demonstrates that for the high-cost producers there is a greater proportion of farms than output generated, explaining that these are mostly small farms (12% of cereals farms produce 4% of wheat and 6% of dairy farms produce only 1% of milk). These farms are likely to be very small. Yet, the data does not necessarily demonstrate that *all* large farms have a lower cost of production and vice versa.

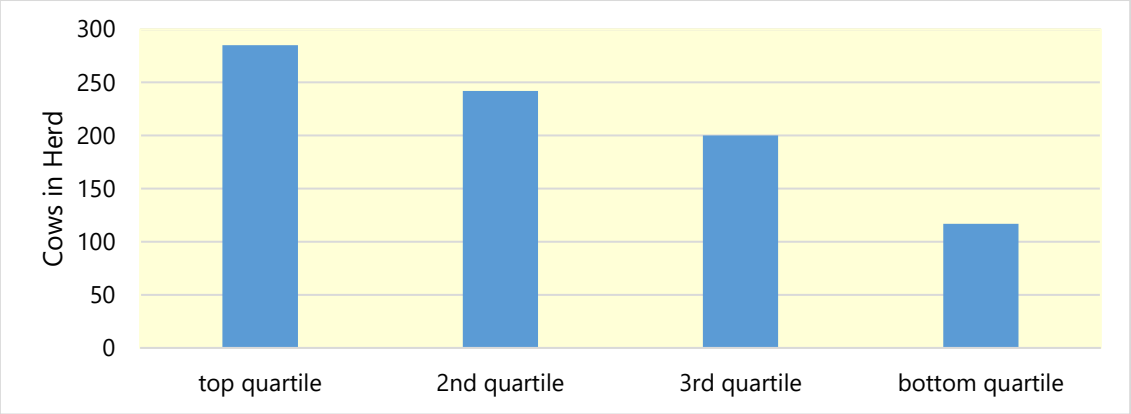
Figure 4 ~ Range of Winter Wheat Cost of Production, 2016 harvest (Defra)

Figure 5 ~ Range of Milk Cost of Production, 2016/17 (Defra)



Data published by AHDB Dairy following a study into the economics and structure of dairy farms in Wales[39] demonstrates the more profitable farms (measured on pence per litre basis) tend to be larger.

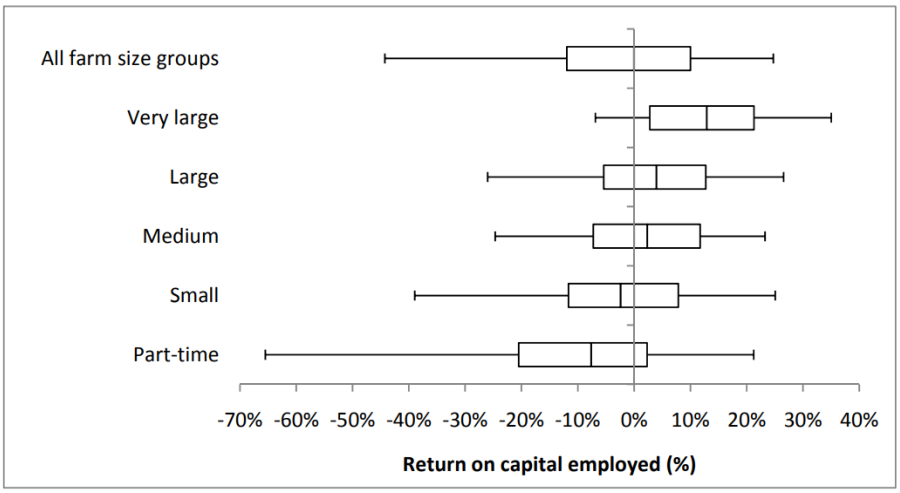
Figure 6 ~ Mean Herd Size by Performance Quartile (ppl) 2016–17 (AHDB Dairy)



Here, we should discuss causation: a successful farm manager on a small farm is likely to progress to manage a larger unit, thereby making the larger farm better. It is also possible that those minded to improve are also minded to grow; size and performance therefore remaining separate. However, simple economic theory of tight-margin businesses with considerable overheads means ensuring that the farm is at least in proportion with its output is critical. For example, a farm with low output must be managed as such, possibly part-time and with equally low overheads as well. If a large farm is doing a good job, it is likely to be in a high quartile, but if it loses money, it could be losing a fortune (again refer to AHDB Wales Dairy Report 2017). This demonstrates that poor small farmers will not simply become great by growing; they will simply have more farming to make errors in!

Langton's studies also suggest larger farmed areas are associated with improved performance over the entire business, i.e. including non-farming activities (e.g. Langton, 2013 [40]). With the arable sector, his study claims there are also increasing returns to larger scales when all costs (cash costs and imputed costs) are included. Finally, Wilson et al (2012)[16] report that amongst the top performers, a greater proportion of them operate large farms. This might be because success leads farm managers to either promotion to larger farms or to profits facilitating purchase of more farming area. It could also mean that good managers can manage more agriculture. It does not simply presuppose that a poor farmer that takes on more farming will inevitably become a better farmer.

Figure 7 ~ Spread of ROCE across Middle 90% of Farms per Farm Size (Defra)



The figure above is taken from a publication by Defra published in August 2011[41]. It shows that the importance of size is not absolute and that there are some part-time farms that generate a return on capital employed of 20% per year. This looks riskier than for very large farms, though, because, while few very large farms make more money than that, only a small proportion lose any money at all. Meanwhile, a minority of part-time farms clearly haemorrhage over half their capital employed each year. Presumably, they have non-farming income financing such a way of life.

Farms with a gradually increasing (dairy) herd size demonstrate higher performance than those (few) with reducing numbers or taking stepped increases in cow numbers (Langton, 2013). It might be to do with keeping more youngstock and existing cows longer, thereby having a smaller replacement cost per cow. What's more, herds only increase through planning and consideration, whether through youngstock and old cow retention or purchases. This suggests that herds that are growing will have a plan in place, which is what is linked to higher performance. Arguably then, the growing herd performs better because the farmer has a considered business direction. Finally, better-performing herds might have more cash to purchase new livestock, so causation is difficult to prove here.

A poor farm that grows without a plan will remain a poor farm and its losses will also grow. Indeed, with more farm and business to manage, it is possible that the original farm also becomes even more poorly managed. Much better is to improve the farm; do not use the farm size as an excuse for inefficiencies and then it will become easier for it to grow[1]. Remember that farm size need not be fixed, but to change it might involve some substantial changes.

There are also many things a farm can do to increase the farm through structural change without major costs. One example is purchasing forage rather than home-growing it, purchasing straw rather than growing it or rationalising enterprises. It is arguably the enterprise size rather than farm size that is of greatest importance. Have fewer and each will be bigger.

2.9 DEBT AND LAND TENURE

Langton (2011)[3] suggests that farms with high levels of debt are generally less efficient (particularly on dairy farms) – remember this is as a return on income, not capital. Barnes (2010)[42], though, notes that farms that take on more risk (particularly involving debt, as well as their percentage of rented land, which is much the same thing) tend to achieve higher levels of technical efficiency. This, he thought, was because the greater risk incurred demanded a higher technical performance to pay for it. Long-term debt is used to pay for business growth, such as land purchase.

Wilson et al (2012)[43] identify that higher-performing farms have low debt, but those in progressive mode ('improver farms') have more while still within manageable levels and meeting repayment plans. This suggests that farms that have reached their optimum size and realised that growth would offer minimal additional return are able to repay their debt, as minimal investments are required to reach their business objectives.

Debt *can* indeed *raise* overall farm efficiency and profitability: a farmer that borrows money can, with the same level of assets, increase their farm size considerably. Borrowing money and paying finance charges is the same as borrowing land and paying a rent; it's leveraging the farm to a new capacity by using others' resources for a fee. If a farm grows and becomes more profitable through leveraged expansion despite paying rent or finance, it will raise the efficiency of use of the owner's assets (return on capital) but possibly reduce the efficiency of each individual resource, such as each hectare. Management will become more efficiently utilised if well implemented. Sometimes the business case for expansion is over-optimistic for investment in land and machinery. Other times, money is borrowed for non-prudent reasons i.e. for unnecessary consumption rather than investment or working capital. A greater proportion of tenanted farms are noted to have been in, or moving into, the higher quartiles of performance than are in the survey sample in the Farm Business Survey data[17]. Clearly, it is *how* debt is used that differentiates top performers.

Compare a farmer against another with the same net worth and those in well-structured debt and sound business should generate a higher return on capital and turnover. However, compare that farmer against another one with a similar size farm and no debt, he will inevitably have a lower return on turnover as he has to pay finance costs. He may, though, find his return on capital is higher, having less of it. Using net worth rather than farming activities is more accurate a comparison.

2.10 NON-AGRICULTURAL DIVERSIFICATION

Diversification outside agriculture is associated with a modest increase in farm business performance on livestock farms (Langton, 2012). Either better managers find other commercial opportunities for farm resources beyond solely food production, or non-farming enterprises provide (management) experience that supports farming activities too. This pattern does not hold true for all sectors of farming. Langton (2011) identifies that the performance of arable enterprises tends to fall on diversified farms, possibly indicating a dilution of management time, but overall farm performance (including returns from diversification) usually rises (more profit for the business but less from farming). Potentially, as arable farms tend to have time in parts of the farming year, they attempt more diversifications rather than simply engaging in the easy opportunities that are presented to the farm without large effort and therefore sometimes diversifying into the wrong things. Undertaking non-agricultural activities distracts farm performance. This does not mean that it affects overall resource efficiency. In other words, while the farming performance tends to fall, on average, the overall farm profitability rises from diversification incomes.

In general, if a farmer is doing a good job with his or her farm, it is likely they are simply good managers and therefore will do a good job managing new non-farming enterprises. The corollary is also true: a poor farm manager is less likely to manage a diversified interest into a considerable success. There are overlaps, such as the ability to create a vision, personal time management, staff management, diplomacy with contractors or customers and so on. There are plenty of cases of farms whose diversification has stretched the farmer's management ability too far and the entire business has suffered as a response.

Causation is difficult to prove. The alternative reason might be that it is the struggling arable farms that diversify most in a desperate attempt to remain viable, i.e. poor performance may cause diversification, not diversification cause poor performance.

2.11 OTHER POINTS

2.11.1 Education

Better farmers appear to have a better education[44]. Although calculating the return on investment of education of the higher revenue earned in one's career compared against the upfront cost of three-years' earnings plus college fees seems not to have been worked out. Kimura and Thi[45] from the OECD confirm this observation internationally but again do not calculate a net present value calculation. Nobody should assume that some training or even a full formal education will necessarily turn them into top performers, although it will help when coupled with the right attitude.

2.11.2 Distant Fields

Farms that operate a ring fence or a very local geography are more efficient than those that require travel[46]. This is not surprising but is a point that many, possibly desperate to expand, tend to overlook in their eagerness to accrue land. Building a land-base is not the same as building a profitable business.

2.11.3 Technology and Innovation

Verissimo and Woodford (2005) identified that top farmers are not the earliest at adopting new technology, leaving others to be distracted by potentially costly and time-consuming new ideas, but are relatively early adopters, entering, where possible, in a gradual way.

High-performing farm businesses make better use of computers (Langton, 2012). This does not necessarily mean if a farmer suddenly buys a laptop and starts communicating electronically, he or she will become a better farmer. More likely, it is an indication of the use of IT throughout the business and has been able to capture some of its benefits in so doing. It might also have a reflection on the ability of the individual to adopt novel and new innovations to facilitate life and work. The link to the next generation of big data and precision farming is currently unproven, although such technologies facilitate expansion, by allowing detailed farming practice over more hectares or head of stock.

2.12 CONCLUSION TO LITERATURE REVIEW

Everybody has different objectives and ambitions and therefore success measurables vary. Indeed, some do not measure success at all, while others may not have considered what success means to them so cannot measure it.

The literature on what makes a successful farmer is focussed on making money, with other benefits either ignored or given a monetary value. Most comments refer to management practices rather than technical points, with observers concentrating on things like attitude. This is easy to identify but difficult to score. Within this is the farmer's attention to detail – their focus on every part of the farm business that they consider matters to them or their customers. Noticeably, many sources note that the best farmers cannot be picked out by one or two things they substantially outperform their peers at but push forward on everything, albeit by a small amount for each factor. A FBS surveyor's comments are relayed in Wilson et al (2012), identifying exactly this:

> *"… noted the farmers pay close attention to detail, plan their business activities, have a passion for farming and take pride in their work."*

The comment gives the sense that this point is critical yet impossible to record in the surveyor's accounts anywhere. Time spent 'attending to detail' is not a line in the profit and loss and 'attitude' is not a balance sheet entry. Wilson et al's study using farmers from the FBS asked what piece of advice they would leave for other farmers is revealing. Summarised in the following table, it is dominated by the two points: first to control costs, and secondly, to give ample attention to detail. All other factors are clearly identified as less critical for most farmers.

Figure 8 ~ Advice top farmers would leave others in farming (Wilson, 2012)

What key advice would you give?	High Performers	Improved Performance
Control costs	√√√√√	√√√√√
Pay attention to detail/focus on key things	√√√√	√√√
Be flexible/ open to change/ look for new opportunities/ react to change fast	√√	√√
Look after cows and they will give you profit	√	√√
Get the right people around you	√	√
Do not buy in livestock as it leaves you open to disease		√
Develop a range of income streams		√

Top-performing farmers clearly have a sound comprehension of what a commodity business model is all about: high turnover and low margin. This means reducing costs of production are paramount when you have minimal control over the sales price. The literature identifies that the greatest variation in cost structure between high and poor performers is overheads, with power and overheads dominating. This is something that is picked up later in the study.

3 FARM BUSINESS SURVEY ANALYSIS

3.1 BACKGROUND TO FARM BUSINESS SURVEY

The Farm Business Survey (FBS) is an annual survey providing information on the financial position and physical and economic performance of farm businesses in England. The sample of farm businesses covers all regions of England and all types of farming, with the data being collected by face-to-face interview with farmers. The Farm Business Survey sample was 1,750 farms in 2016 and is chosen from the population that have at least €25,000 (about £22,000) of standard output, as recorded in the annual June Survey of Agriculture and Horticulture (which currently accounts for approximately 56,700 farm businesses).

Farm Business Survey data is used for all years from 2011–12 to 2015–16. Data is then averaged across years to smooth out the effects of annual volatility for individual farms. Performance is measured as the ratio of total value of agricultural outputs to total cost of agricultural inputs. A farm will record a higher level of performance if it produces more outputs for a given level of inputs, or is more efficient in its use of inputs, or a combination of the two.

3.2 MATCHING METHODOLOGY

The standard approach to comparing performance levels across farms is to compare the top and bottom quartiles. That is, the average for the upper-performing quartile (or top 25% of farms) is compared with the average for the lower quartile. However, there will be factors that are outside of the farmer's control (such as farm location) which will impact on the level of performance and partly explain a farm's position in the sector's performance 'league table'. The approach used in this paper is to match higher-performing farms with lower-performing counterparts with similar characteristics and to then assess the differences between these pairs of matched farms (in boxing parlance, middleweights are matched with middleweights and heavyweights with heavyweights, rather than them being pitched against each other).

The matching approach used geographic location, farm size (in terms of area and activity) and, where the sample size was sufficient, organic status. It then sought to match individual farms in the top quartile with individual farms in the bottom half of the performance distribution that had the closest match with these characteristics. The bottom half rather than lowest quartile was chosen to increase the chance of finding a suitable match. In general, suitable matches were found, although there is a trade-off between characteristics when making individual matches. In addition, the relatively small sample size for the Farm Business Survey meant that finding suitable matches elsewhere within the sample was more problematic in some sectors

(e.g. pigs). The matching of high-performing farms with comparable counterparts in the bottom half of the performance distribution generates what might be seen as a bridgeable gap. That is, it is within the potential of the lower-performing farms to close this gap by emulating their higher-performing counterparts. The analysis then identified the Farm Business Survey variables (e.g. fixed costs (referred to as overheads in this report), variable costs, agricultural output) where there are statistically significant differences between the top-performing farms and their lower-performing counterparts.

In one of the year's analysed (2011–12), the Farm Business Survey collected more detailed data on business management practices undertaken by farms (e.g. benchmarking). However, this was just for a subsample of farms within the main FBS sample and the more restricted availability of this data meant that it could only be analysed to seek to find differences between the top performers and their matched lower-performing counterparts across all sectors. However, where statistical differences were found for particular management practices, the data was then analysed to see if there was any evidence of this varying across sectors.

3.3 SUMMARY OF RESULTS BY SECTOR

This section summarises the results of the matching methodology to compare higher-performing farms with their lower-performing counterparts for each sector. It identifies those variables where there are statistically significant differences and over which individual farmers will have control.

The full details of the results can be found in the separate sector sections in the Appendix. They consider the straight comparison between the top and bottom quartiles as well as the comparison between the matched top-performing farms and their counterparts in the lower half of the performance distribution. Using the matching approach facilitates the removal of the impact of factors such as geographic location which are outside individual farmers' control and so this summary therefore focusses on the matching sets of results (as given in the second table for each sector set of results in the Appendix).

There is a statistically significant difference in interest payments (and associated gearing ratios) between the top performers and their lower-performing counterparts across all sectors, with the bottom performers having higher borrowings and higher interest payments. Clearly, reducing the need for borrowing from improving performance can be seen as a good thing, but this is a consequence rather than a driver of that performance improvement. Conversely,

borrowing to fund a capital investment (that has a sound business case based on realistic assumptions) to improve performance can also be a good thing. However, the Farm Business Survey is not able to differentiate between borrowing for this type of investment and borrowing to cover the shortfall from underperformance, and so interest and gearing ratios, while in the detailed results, are therefore not included in these summary tables.

For each sector, the first table compares the variation of Farm Business Income for top and bottom performers. The data is averaged over 2011–12 to 2015–16. Farm Business Income is like 'Profit'. It represents the return to all unpaid labour and to all their own capital in the farm business, including land and farm buildings. The second table selects those variables from the detailed analysis where there is a statistically significant difference between the top performers and their matched counterparts in the lower half of the performance distribution, farmers have a level of control and they have a material impact on overall performance. The figure for total agricultural costs is shown, together with the percentage of these costs accounted for by selected items.

Farm System

It is difficult to identify through statistical analysis whether a farm is operating the optimal system for the environment and resources it occupies. Should a beef farm be in milk production? Should the arable system really be producing a certain crop, or should the rotation be recalculated? Such questions can only really be addressed by objective consideration. This paper presupposes that farm systems are correct, but this is in fact often a major problem with the farm. If the system fits the internal and external environment, then many of the other issues often start to fall into place; it's part of the farm business management process. The persistent key issue of overheads in this chapter maybe refer to farms that have not identified the optimal farm system for their environment and resources and need a complete farming rethink. This is difficult to demonstrate in literature.

3.3.1 Dairy

Figure 9 compares the average income for the top performers with their matched counterparts in the lower half of the performance distribution. Top performers are earning over four times as much money as similar farms in the bottom quartile; £100,000 more in actual terms.

Figure 9 ~ Dairy Farm Business Income £/year

Mean of top performers	Mean of matched bottom performers	Difference

£136,800	£33,100	£103,700

The variables of most significant difference between the top and bottom sectors are laid out in the next table.

Figure 10 ~ Significant variables between top- and bottom-performing counterparts ~ Dairy

Selected variables	Mean of top performers	Mean of matched bottom performers
Agricultural output (£'000)	533.7	408.7
Dairy specialisation (1)	75.0%	69.5%
Number dairy cows	203.1	153.2
Stocking rate (livestock units/ha)	2.1	1.7
Relative milk price (ppl)	0.8	-0.3
Total agricultural costs (£'000)	431.9	424.7
Of which %;		
Agriculture overheads	39.4%	42.6%
Agriculture variable costs	60.6%	57.4%
Bought feed costs	31.8%	29.0%
Fertiliser costs	4.9%	4.2%
General farming costs	8.2%	10.4%
Machinery costs	13.2%	14.3%

(1) Dairy Standard Labour Requirement (SLR) as a % of total SLR

The table shows a significant difference in agricultural output between the top performers and their matched bottom-performing counterparts, despite size being one of the matching criteria that was used. This partially reflects the difficulty in finding suitable matches within the FBS sample for the larger farms and the trade-off between size and the other matching criteria. Nevertheless, the considerably higher stocking rate reflects how the higher-performing farms tend to focus more on output per hectare rather than output per cow to increase their output.

Higher-performing farms are more specialised, with a greater proportion of their economic output from dairy (75.0%) compared with their matched lower-performing counterparts

(69.5%). They focus their resources, management and skills on one thing rather than dilute them.

The relative milk price variable is statistically significant and shows that the top-performing farms on average receive 1.1ppl more than their matched lower-performing counterparts over the period of this analysis and included in the table. The relative price is used to accommodate the effect of market volatility and to the price differences between farmers. It is not explained by the data whether this price variation is through differing contractual arrangements, including seasonality, or how the milk is presented to the buyer, including milk solids, hygiene and volume. It is presumably a combination of them all, so this part of the gap between top and bottom performers may in practice remain partially out of reach for some.

The total amount of agricultural costs is similar for the top performers and their matched counterparts in the bottom half of the performance distribution, but the inputs used by the top performers generate a much greater value of output for the top performers. But there are statistically significant differences in the breakdown of these costs. The top performers have lower overheads, reflecting a more efficient use of capital; both their machinery and general farming costs, which include energy, fuel, insurance and bank charges, are lower. Conversely, the top performers have higher variable costs, including bought feed and fertiliser. Essentially, the top performers are focussing their expenditure on items that directly contribute to production (grass and cows), whereas bottom performers are spending too much on overheads that have associated costs but earn nothing.

It is notable that most of the significant variables are slightly better for the top performers, not radically changed. It is lots of small incremental steps that makes a dairy farm better than another. Top producers are not spending less than the bottom producers, they are simply spending their money on the things that will earn them money.

3.3.2 Cereals

Figure 11 compares the average income for the top performers with their matched counterparts in the lower half of the performance distribution. Top performers are making almost three times as much money; almost £100,000 more per year.

Figure 11 ~ Cereals Farm Business Income £/year

Mean of top performers	Mean of matched bottom performers	Difference

£157,500	£58,900	£98,600

Figure 12 ~ Significant variables between top- and bottom-performing counterparts ~ Cereals

Selected variables	Mean of top performers	Mean of matched bottom performers
Agricultural output (£'000)	365.4	268.2
Wheat yield (t/Ha)	8.6	7.6
Cereals as a % of total SLR	83.0%	72.7%
AES payments £ per ha	24.4	42.2
Owned land as % of total land	80.8%	59.5%
Unpaid labour as % of all labour	67.9%	55.2%
Total agricultural costs (£'000)	298.5	350.5
Of which %;		
Agriculture overheads	42.5%	57.7%
Agriculture variable costs	57.5%	42.3%
Seed costs	6.6%	5.4%
Fertiliser costs	17.6%	13.2%
Crop protection costs	15.7%	11.6%
General farming costs	8.6%	11.5%
Agricultural labour costs	3.9%	7.6%
Contracting costs as a proportion of all machinery & contracting	30%	20%

Top-performing cereals farms have greater output despite being of similar size to their matched bottom-performing counterparts. This is in part driven by higher yields, while at the same time spending considerably less (£50,000 per year). It is demonstrated here that the higher-performing farms are seeking to optimise yields for a given level of inputs and that they are not chasing higher yields whatever the cost.

Higher-performing cereal farms are more specialised, with cereals accounting for 83% of economic activity, compared with 73% for lower performers. Lower performers are more likely to have some land used for grazing livestock. While it is possible that this reflects the problems of being a 'jack of all trades' – but may simply be related to land quality, since livestock is less common on the best arable land – the matching process removes gross geographic differences but cannot address more local land-quality issues. There was no significant correlation between the number of crops on an arable farm and the overall performance, suggesting the complexity of rotation is not *always* a barrier to success.

Average agri-environment scheme payment rates are higher for lower performers. This corresponds to previous evidence suggesting higher-value schemes may impact on the agricultural cost centre but may also reflect a tendency for farms on poor soils to join such schemes (although the matching methodology seeks to reduce this effect). The negative impact of high-value schemes, such as HLS, on the agricultural performance is at least partially offset by the scheme payments, and so the impact on the overall farm income may be more positive than this analysis suggests.

Owner-occupied farms are more likely to be in the high-performing group. Note that we have not imputed any rents for owner-occupiers, so this is not surprising (ownership was investigated as a potential matching variable but was rejected due to the difficulties this generated in seeking to match very large businesses).

Top performers make more use of contractors; wise use of contractors is an important means of reducing overheads associated with machinery purchase and paid labour. In addition, labour costs are further reduced through a greater use of unpaid labour.

Agricultural costs are significantly lower for the top performers compared with their matched counterparts in the bottom half of the performance distribution. The top performers have higher variable costs (including fertilisers and crop protection products) but lower overheads. General farming costs, which include energy, fuel, insurance and bank charges, are lower for the top performers, reflecting how the bottom performers are spending too much on overheads.

The top-performing farms generate £100,000 more income than poorer farms and spend £50,000 less in the process. This suggests that poorer farmers are only making money with subsidies and other forms of non-farming incomes. They might continue after Brexit,

depending what they are, but losing money from *any* enterprise is a risky business strategy, especially in the face of elevated uncertainty.

3.3.3 LFA Grazing Livestock

Figure 13 compares the average income for the top performers with their matched counterparts in the lower half of the performance distribution. Top performers are making a good living, while the poorer farmers are losing money. The difference between the two categories is almost £50,000 per year for comparable-sized farms.

Figure 13 ~ LFA Grazing Livestock Farm Business Income £/year

Mean of top performers	Mean of matched bottom performers	Difference
£45,200	-£1,600	£46,800

Figure 14 ~ Significant variables between top- and bottom-performing counterparts ~ LFA Grazing Livestock

Selected variables	Mean of top performers	Mean of matched bottom performers
Agricultural output (£'000)	133.9	83.4
Proportion of finished cattle (£)	30%	20%
Proportion of finished sheep (£)	70%	50%
Farm Business Tenancy land	29.1%	16.4%
Full Agricultural Tenancy land	16.6%	31.9%
Total agricultural costs (£'000)	128.7	126.8
Of which %;		
Agriculture overheads	45.9%	52.1%
Agriculture variable costs	54.1%	47.9%
Fertiliser costs	6.9%	4.5%
General farming costs	9.5%	16.0%

The defining point here is that while the total spending on these farms is very close, the output is dramatically different, with high performers managing to turn the same value of resources into drastically more output. It could be either more volume of output or greater value per unit, or both.

The matching process for LFA grazing livestock has removed many of the differences that are seen between the straight (unmatched) comparison between the top and bottom quartiles, suggesting that they were related to either geographic or size differences. This illustrates the strength of the matching process for this type of comparative analysis.

The top-performing farms have a similar agricultural area to their matched counterparts in the bottom half of the performance distribution but produce a much greater level of output. Finished cattle and sheep account for a greater proportion of output for the higher-performing farms. Higher-performing farms have a greater level of Farm Business Tenancy land (and lower level of Full Agricultural Tenancy land) than the lower performers.

The level of costs for the top and bottom performers is similar, but the top performers generate considerably more output for these inputs. Top performers have lower overheads, reflecting a more efficient use of capital, but have higher variable costs, demonstrating their eagerness to invest in crops and livestock. General farming costs, which include energy, fuel, insurance and bank charges, are lower for the top performers, reflecting how the bottom performers are spending too much on overheads.

3.3.4 Lowland Grazing Livestock

The following table compares the average income for the top performers with their matched counterparts in the lower half of the performance distribution. The higher performers are making about £58,000 per year more than the poorest performers.

Figure 15 ~ Lowland Grazing Livestock Farm Business Income £/year

Mean of top performers	Mean of matched bottom performers	Difference
£56,600	£1,500	£55,100

The top performers are generating £100,000 more output than their poorer equivalents.

Figure 16 ~ Significant variables between top- and bottom-performing counterparts ~ Lowland Grazing Livestock

Selected variables	Mean of top performers	Mean of matched bottom performers
Agricultural output (£'000)	183.2	84.8
AES payments £ per ha	42.6	63.7
Beef as a % of total SLR	51.5%	42.1%
Proportion of finished cattle	50%	40%
Total agricultural costs (£'000)	166.0	124.4
Of which %;		
Agriculture overheads	49.2%	55.0%
Agriculture variable costs	50.8%	45.0%
Bought feed costs inc. forage	16.3%	11.8%
Crop protection costs	1.3%	0.8%

Average agri-environment scheme payment rates are higher for the lower performers. This may reflect a tendency for farms on poorer soils to join such schemes. While the matching methodology seeks to reduce the impact of such differences, land quality can vary at a very local level and, for confidentiality reasons, the exact location of FBS farms is not available.

The top performers have significantly more of their SLR derived from beef cattle. The proportion of revenue from finished cattle is also higher for the top performers. This may indicate that finishing stock is a beneficial strategy but may also suggest that that the matching process is not removing all differences in land quality (with lower performers more likely to be on poor land which is less suitable for fattening animals).

Costs for the top performers are a third higher than their lower-performing matched counterparts, but, as noted earlier, produce more than double the output. There is a difference in the breakdown of costs, with top performers having higher variable costs (including bought feed) but lower overheads, reflecting a more efficient use of capital.

3.3.5 Pigs

Figure 17 compares the average income for the top performers with their matched counterparts in the lower half of the performance distribution. Top performers are making over three times as much money as the poorer farmers, equivalent to £100,000 per year more.

Figure 17 ~ Pigs Farm Business Income £/year

Mean of top performers	Mean of matched bottom performers	Difference
£143,800	£40,800	£103,000

Few variables are statistically significant in the pig dataset because of the small sample size. Moreover, after matching, most of the significant variables seem to be detecting a difference between highly specialised pig producers in the top quartile and more mixed farms in the matched subset. It has not been possible to remove this difference by matching, because the top quartile contains very few non-specialised farms, whereas the bottom half contains few specialised ones.

The following table selects those variables from the detailed analysis where there is a statistically significant difference between the top performers and their matched counterparts in the lower half of the performance distribution, but these simply reflect that the lower performers engage in a low level of cereal production (although on average this still represents only 6% – a small proportion of total economic activity) whereas the higher performers are more specialised. While, in general, increased specialisation has been a driver of productivity growth for the agriculture sector, the limited sample size and lack of statistical significance for other variables means that it is difficult to draw much from this result.

Figure 18 ~ Significant variables between top- and bottom-performing counterparts ~ Pigs

Selected variables	Mean of top performers	Mean of matched bottom performers
Cereals as a % of total economic activity (1)	0.3%	6.0%
Total agricultural costs (£'000)	£1,340	£1,160
Of which %;		
Fertiliser costs	0.0	1.7
Crop protection costs	0.1	1.2

(1) As defined by cereal Standard Labour Requirement (SLR) as a % of total SLR

3.3.6 General Cropping (including Potatoes)

The limited sample size meant that potatoes could not be analysed as a separate sector and that therefore the broader General Cropping farm type was analysed. The following table compares the average income for the top performers with their matched counterparts in the lower half of the performance distribution. Once again, the difference between high performers and poor performers is about £100,000.

Figure 19 ~ General Cropping Farm Business Income £/year

Mean of top performers	Mean of matched bottom performers	Difference
£168,900	£66,800	£102,100

The following table selects those variables from the detailed analysis where there is a statistically significant difference between the top performers and their matched counterparts in the lower half of the performance distribution, farmers have a level of control and they have a material impact on overall performance. There are fewer significant values in the tables than in some of the other sectors. This is likely to reflect the difficulty of demonstrating a difference with a small sample and does not necessarily mean that there are fewer real differences.

Figure 20 ~Significant variables between top and bottom counterparts ~ General Cropping

Selected variables	Mean of top performers	Mean of matched bottom performers
Farm assurance members	68%	92%
Total agricultural costs (£'000)	490.3	524.1
Of which %;		
Agriculture overheads	48.2	57.6
Agriculture variable costs	51.8	42.4

There was no statistically significant difference in the economic size and value of output between the top and bottom performers. Rather strangely, the lower performers were more likely to be a member of a farm assurance scheme, with 90% being a member, compared with 70% of the higher performers. It is not clear why this should be the case and as to whether there is anything to read into this.

The total costs for lower performers are higher, but this is not statistically significant. However, there is a statistically significant difference in the breakdown of fixed and variable costs. The top performers have lower overheads (reflecting a more efficient use of capital) and, conversely, higher variable costs directly linked to production.

3.3.7 Horticulture

The matching process included the categorisation into specialist fruit, specialist glass, specialist hardy nursery stock and 'other', thus ensuring that farms are matched with one with a similar production system. The following table compares the average income for the top performers with their matched counterparts in the lower half of the performance distribution. Where the term 'agriculture' has been used, this includes horticulture.

Figure 21 ~ Horticulture Farm Business Income £/year

Mean of top performers	Mean of matched bottom performers	Difference
£107,600	£12,500	£95,100

Top performers are generating Farm Business Incomes of approaching £100,000 more than the poorer performers. In doing this they are turning out far more output, almost three times as much, so are clearly intensive. Total costs are also double.

Figure 22 ~ Significant variables between top and bottom counterparts ~ Horticulture

Selected variables	Mean of top performers	Mean of matched bottom performers
Agricultural and horticultural output (£'000)	683.2	220.4
Log of total area	0.8	0.9
Unpaid labour as % of all labour	38.2	53.1
Agricultural diversity index	0.0	0.1
Total agricultural costs (£'000)	591.5	237.8
Of which %;		
Agriculture overheads	50.4%	57.1%
Agriculture variable costs	49.6%	42.9%
General farming costs	13.7%	18.1%
Agricultural labour costs	29.0%	22.3%
Machinery costs	9.0%	12.4%

The average area of the top performers is less than the bottom performers, but the top performers produce over three times the output.

Poor performers are more likely to have diversification (measured by the proportion of farm business costs associated with the diversified enterprise). This may be due to the diversified enterprises taking management focus from the core business or may simply indicate that struggling horticultural businesses are the ones that seek diversification opportunities.

Top performers tend to be more specialised, with the bottom performers showing greater agricultural diversity.

The top performers have a higher ratio of output to costs than the bottom performers (1.15 compared with 0.93). Nevertheless, total costs for the top performers are higher, with higher variable costs leading to much greater output. By contrast, their overheads (including machinery) represent a smaller share of overall costs, reflecting a more efficient use of capital. General farming costs, which include energy, fuel, insurance and bank charges, are lower for the top performers, reflecting how the bottom performers are likely spending too much on overheads.

3.4 SUMMARY OF MANAGEMENT PRACTICES

The restricted sample size for the business management module (1,178 farms meeting the criterion for analysis) means it was not possible to provide an analysis of management practices broken down by sector. The analysis therefore seeks to identify statistically significant differences in management practices for all sectors combined. The matching process for this part of the analysis includes farm type, in addition to using the geographic location and farm size to ensure top-performing farms are matched with comparable counterparts in the bottom half of the performance distribution.

The analysis tested for overall differences in the proportion of farms reporting the characteristic (e.g. whether there was a difference in the proportion of farms using benchmarking between the top and bottom groups). Before matching, there were consistent overall differences between a simple comparison of the top and bottom performers (of a straight comparison of the average incidence of the top and bottom quartiles) for many of the management practices variables, including business planning. However, there were far fewer differences that were statistically significant after matching the top performers with their comparable counterparts in the bottom half of the performance distribution. This suggests that some of the differences seen in the simple comparison might be due to the relationship with confounding factors, particularly economic size and farm type, which are adjusted for by the matching.

The table below identifies those variables where there are statistically significant differences between the top performers and their matched counterparts in the bottom half of the distribution. The values represent the proportion of farms in that group

Figure 23 ~ Significant variables between top and bottom counterparts ~ Management

Selected variables	Mean of top performers	Mean of matched bottom performers
Risk management – sales made on contract (1)	42%	37%
IT – those who don't own a computer	2%	7%
IT used for official forms	89%	80%
CPD scheme member (1)	42%	36%

(1) Only significant at the 10% level. Table shows proportion of farms reporting the activity or characteristic.

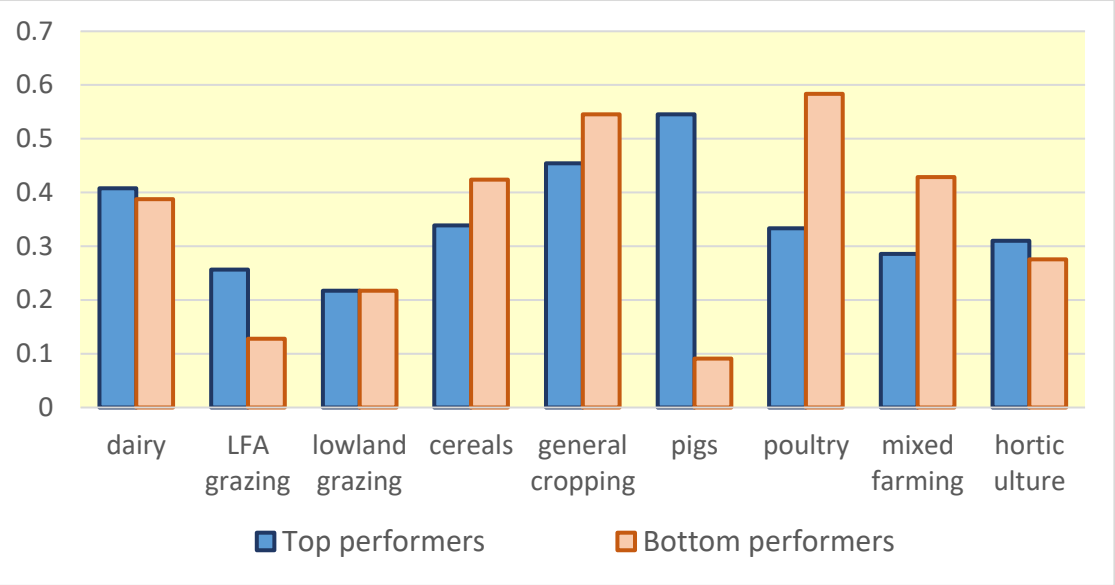
The bottom performers are less likely to have a PC and less likely to use it if they have one for tasks such as completing official forms online and internet banking. Other IT-related questions do not show significant differences between the top and bottom performers, but there is evidence that the picture varies between the different sectors; for example, top performers in the poultry and horticultural sectors show high usage of computers for maintaining accounts and other key business documents. Note, this information was collected in 2012 and many farms will have increased their dependency on IT since then.

Management practices such as business planning do not show a statistically significant difference between the matched top and bottom performers. That is, bottom performers are as likely to undertake business planning (of their own description) as their top-performing counterparts. Identifying and implementing changes through business planning that improve a farm business is a good thing and should help the bottom performers close the performance gap. But this analysis suggests that the quality and attention to detail with which these practices are undertaken to identify and implement improvement actions is a crucial part of this process. Simply *producing* a business plan does not improve your farm, it's the ability to do something with the information that matters. Similarly, joining a gym does not make anybody fitter, it's the exercise that makes the difference.

Membership of CPD (Continual Professional Development) schemes is more common amongst the top-performing group, with the difference being particularly striking in the horticultural sector. Causation is uncertain though. Are better farmers more inclined to want a measure of their professionality or does CPD improve farmers? It is possibly a combination of both. This seems to grind against the information provided in the general cropping section about farm assurance membership.

The matching analysis failed to find many statistically significant differences between the frequency with which management practices are undertaken by the top and bottom performers, but it did identify significant differences by farm type. This may not be surprising and partially explains why many of the statistically significant differences from a straight comparison between the top and bottom quartiles drop away after matching. By way of illustration, the following chart shows the comparison of the proportion of farms undertaking business plan budgeting by farm type.

Figure 24 ~ Proportion of farms performing business plan budgeting (2012)



The chart shows that 41% of top-performing dairy farms undertake business plan budgeting, compared with 39% of their matched counterparts in the bottom half of the performance distribution (the small numbers in the sample means that this is not a statistically significant difference). For the pig sector there is a large difference, albeit based on a very small sample size, with over a half of top performers budgeting, compared with less than 10% of bottom performers. This contrasts with LFA and lowland grazing where around a quarter of the top performers undertake budgeting. The chart also shows how in some farm types (lowland grazing, cereals, general cropping, poultry and mixed) the bottom performers have the same or higher incidence of budgeting than their top-performing counterparts (although once again the small numbers in the sample means that this is not statistically significant). There are similar patterns for differences by farm type for other management practices.

3.5 Overall Summary of Results

The broader picture for top performers compared with their matched counterparts in the bottom half of the performance distribution is that;

- The difference in Farm Business Income for most sectors seems to be about £100,000 per year. For grazing livestock, it is approximately £50,000 per year. Both appreciable numbers, considering the farms are matched and identified as similar
- Top performers tended to be more specialised

- The total costs of top performers are often similar to the bottom performers, but they produce greater output and are therefore considerably more effective in their choice and utilisation of inputs
- The overheads for top performers accounted for a lower proportion of their overall costs, reflecting a more efficient use of capital
- Top performers are focusing their expenditure on items that directly contribute to production, whereas bottom performers are spending too much on overheads

4 PRACTICAL FARM COMPARABLES

This chapter examines six real farming businesses. Five of them identify outstanding practice for various reasons. Each of these is performing in their top quartile, and probably at the top of that. Their business and personal objectives are aligned, their time management is such that while working hard, they make time for other parts of their lives that are important to them. The sixth farm is an antithetical example. It demonstrates how the farmer's logic and therefore focus is confused, which leads to ineffective decision-making and a poorly run farm in need of change.

Each of the case studies is a real farming situation. The examples given were intentionally selected without the knowledge of the results of the previous chapter or the account from the literature review, so as not to be led by others' results. These farmers (five of them) are well read and will inevitably see this report. The names and some details have been changed to prevent obvious identification. The idea of this chapter is to identify best practice and to spot patterns and easy ways to raise any farm's performance, not the individual behind each one.

4.1 VEGETABLE AND POTATO FARM

Richard is an arable farmer in the south of England. He grows early potatoes, cauliflower and cereals, each crop type covering about 120 hectares. He lets surplus land for bulbs and vegetables whenever he can as that is more profitable than occupying it himself and growing cereals, the alternative crop. Fresh produce generates considerably higher value per hectare than combinable crops. He also grows maize and grass silage for a nearby dairy farm which he cooperates closely with. He pumps slurry for the dairy farm and others nearby on a contract basis, which makes use of his labour by undertaking the contract pumping mostly when the labour requirement for the (much higher value) vegetable operations is not so great. He has three full-time staff and uses casual workers as required.

Richard's rotation is labour- and machinery-intensive. The farm has all its own vegetable machinery, such as harvesting rig, but only three tractors, a self-propelled sprayer and an old loader. The capital employed is exceptionally low for the turnover on the farm. Richard and his full-time staff are skilled in machinery maintenance. Richard has ensured his staff have been properly trained to undertake tasks that save considerable sums; it means he can run cheaper machines, saves time and money on maintenance and service bills and keeps machinery running for longer during key work periods such as drilling or harvesting crops. Total capital employed in arable machinery is £450,000, including slurry-pumping equipment. Over the 400

hectares, machinery capital is about £1,090 per hectare. As a percentage of output per hectare of roughly £4,000 per hectare, this works out at about 27%. On an average cereals farm, machinery capital valuation of about £1,000 per hectare is comparable with the average income per hectare of about £1,200, giving a comparable percentage of 84%.

Richard buys no new machinery as he knows his workforce can maintain it well. Some of his machines have worked over 10,000 hours – a very high figure for most farms. He would rather spend money training his staff than on replacing machines and that keeps overheads very low. Richard shares his specialist vegetable harvesting rig and associated casual labour with a neighbour, instantly halving the capital cost. It also means he avoids competing for agency labour with his neighbour. He and the neighbour must plan their harvesting regime carefully together, but this is a small price to pay for cooperation. Richard is aware how much such a collaboration saves him; it is significant. He is still aware that a decline in migrant labour could affect him post-Brexit, but he is spending time thinking about contingencies he could put in place if necessary.

Richard has set up his farm system to fit with the environment. His winter cauliflower is planted in August and cut in November through to March when his potatoes are planted. They are lifted from mid-June through to August, thereby double-cropping two high-value crops in one season. Potatoes are then followed by cereals (or let). This combination of crops not only makes high-value use of the land, but, especially when combined with slurry pumping, reduces work peaks and fills potential troughs, meaning the supply of labour required is remarkably flat for such a farm system. This minimises temporary work requirements and gives more earning opportunity to his staff. Traditional vegetable growers have high spring and autumn labour requirements; this farm saves costs and management effort by spreading the work more evenly and generating work throughout the quieter periods.

Richard is also aware that his success is dependent on the health of his soil and takes a lot out of it, so spends considerable attention looking after it.

The vegetable crops deliver a good return on the tenant's capital attributed to them. This is because the capital invested is so low. Even the working capital is low because the crop is in the ground for a relatively short time, saving inputs. At harvest, the potatoes are washed and sent straight to their buyer processor, saving storage costs, risks and management time.

Richard discusses potato farming with friends in East Anglia, despite operating a rather different system to them. He cross-examines his farm business advisor and uses any

comparable data to check he is optimising his performance. He makes adjustments to his system if he picks up ideas to improve what he is doing.

Richard works hard to ensure the components of the farm fit together to create something greater than the sum of the individual parts. HIs highly organised life allows him time to perform these checks rather than just 'farm with boots on'.

Summary of Vegetable Farm

- Minimising machinery costs through repair and maintenance rather than replacement
- Highly productive, well-trained and engaged labour force, with a flat annual work profile
- Focus of highest value output for land, letting out when more profitable
- Farming system matched to local geography and environment, and caring for soils
- Every activity is costed to aid decision-making; whether collaborating with a neighbour, contract slurry pumping or storing potatoes
- Benchmarking, budgeting, external consultant, are all critical
- Focus on the detail while appreciating the bigger picture

4.2 CEREALS FARM

John has 400 hectares of heavy land on his cereals farm. He grows winter barley, allowing early entry for oilseed rape, winter and spring wheat and spring beans. The farm is part owned, part rented. His variable costs are relatively high, largely because he has a severe case of black-grass – a legacy from the previous tenants – but the gross margins are good overall as his crop yields are unusually high; even the spring cereals. He knows what he can spend on variable costs and what his yields are likely to be. It is all built into his budget, which he uses regularly. John uses lots of sewage cake, lowering the annual cost of fertiliser and adding organic matter to improve his soils, which had been neglected by previous tenants. He is aware that arable farms must manage more than simply the chemical properties of soil to keep soils productive and maintain yields into the future.

John has one full-time staff member, plus himself and a harvest casual worker. He has non-farming diversifications which also involve his worker. He works hard to engage him, ensuring he is well qualified, motivated and eager to improve himself and the farm. The worker is proud to work on John's farm and has been there for many years. About half of John's time is spent on non-farming enterprises (which include commercial office and residential lets). John makes use of former agricultural resources that modern farming has outgrown. His mantra is '*don't leave an opportunity idle*'. It is clear this is put into practice with redundant farm buildings, staff

abilities and his own time. While farming contributes a larger proportion of the business' output, the diversification activities lower the 'commodity risk', make use of some resources such as labour, which he still requires on the farm in busiest times, and so contributes to farm profits as well as makes its own margin. It is all costed, and he knows what the overall contribution is.

Power and labour costs on the farm are £335 per hectare, including the grain dryer. The 'benchmark' for farms of this type is £350 to £400 per hectare. John keeps diesel and machinery costs, including repairs, low, partly as he operates a reduced tillage/low disturbance cultivation system, moving soils as little as possible. He first considered the idea after a farm discussion group session a few years ago where a low-till farmer, a high-till farmer and an organic farmer were comparing their systems. He is focused on profitability, not output, and has calculated that the *marginal* cost of ploughing is about £55 per hectare, meaning ploughing would have to raise yields by about 400kg/ha. He believes this is unlikely. The marginal cost identifies the costs of an operation compared with leaving the machine in the shed. In fact, savings are greater because, without a plough, John needs less horsepower on the farm, saving him much more. John can deploy his time into more profitable activities while his neighbours are still ploughing and working down the clods left from the process. He is aware that he is in a minority running this system on heavy land, so regularly checks his maths, comparing his yields and costs with other arable units.

John is experimental and keen to test new ideas but only if they contribute towards his own personal and professional goals. He tests new ideas gradually, often letting neighbours go first and make the mistakes! He has built up his farm hectarage carefully over several years. He has decided not to rent land beyond a three-mile radius from his yard to save travelling costs and wasting time '*putting tractors on tarmac*'. John is aware that tractors make no money while on a road but costs continue to escalate, especially those difficult to value, such as time and wear and tear. This also demonstrates John's focus not only to identify his ambitions, he also quantifies them, meaning he knows when they have been achieved. He attends discussion groups and tests his thinking with his farm advisor.

Summary of Cereals Farm

- Test new systems with land cultivation gradually
- Take great care of your soil – it's key to all agriculture

- Machinery and power costs are minimised by calculating which really contribute to the bottom line, not the output
- Investment in labour is prioritised over machinery; it is better to have a smart workforce than a new tractor
- Calculate the costs of doing things such as driving tractors on the road, ploughing, keeping idle labour and so on
- Find ways to profit from resources on the farm through diversification and rational decision-making
- Regularly challenge your thinking with a business coach, benchmarking meetings, reading business journals and so on

4.3 BEEF FARM

Joan buys about 500 store cattle per year for finishing in a shed, mostly in two blocks: spring and autumn. They come onto the farm at about 300 to 350kg and are fed an intensive purchased ration, supported by silage. They are kept to approximately 560kg, which takes 170 days, meaning they gain up to 1.5kg live-weight per day. Joan has approximately 250 head of cattle at any one time.

Joan buys high-cost feed, made up of cereals, waste bread, minerals and other feedstuffs, already mixed and ready to feed. It is placed against a barrier by tractor bucket, with straw available in ring feeders. There is no mechanical feeding; it's an unnecessary cost. Joan recognises there is no margin to afford machinery in the beef or sheep sector. She is also aware that her beef enterprise is about as small as it can be to remain truly profitable. It is a high-feed cost system, but because the overheads are so low, the whole system works well. Her secret (it's not a big one) is she keeps the operations very simple, as this keeps out costs. Her budgeting and annual management accounts, that she calculates herself, identify when costs start to creep into the system. Her accounts serve as a regular tool to identify her performance.

Joan has made her farming system part-time when many farmers consume their entire day doing something similar. Modern farming moves on and she has kept pace with time. To retain that discipline, she has other work she has to attend to from mid-morning most days.

Joan's feed price per kilogram of live-weight gain is higher than many, but finishing the cattle quickly and having minimal overheads, including no machinery, makes the total enterprise

profitable. Most beef farmers have substantially more overheads, with machines and trailers to mix and provide feed, move livestock to market and so on. The simple system also means minimal time is used on the enterprise; taking only two hours per day to feed and check. Joan has other work to do so has to be disciplined to complete the feeding and other duties quickly. Only when stores arrive, or finished stock are sold, does it take a little longer but there is no trip to market – she has a series of trusted suppliers who she orders her cattle from, mostly continental-bred sucklers. She occasionally sources a few from local markets, using dealers to buy them for her. Selling the finished beasts involves a telephone conversation with her buyer to confirm delivery dates and numbers and overseeing them loaded into lorries when they leave the farm. Joan recognises that, for her, selling her stock direct and hiring lorries to transport them to the buyer saves her time and money, in terms of time spent transporting animals when she could be at her other job. She avoids running an expensive four-wheel drive vehicle and trailer that she wouldn't otherwise need, so hires large lorries to deliver stock in bulk (mostly delivered in batches in spring and autumn). She makes money from livestock after all costs, including her time and working capital, are paid.

Joan's animals are kept in old finishing sheds. The sheds require minimal maintenance. They might have an opportunity cost as they could be rented to another person to keep beef but would be small as it probably has little alternative use. They are relatively remote, so probably have no alternative use.

Joan has been farming beef for many years but gave it far greater focus about a decade ago when another part-time opportunity also arose for her. The working capital built up is clearly significant but, having grown gradually over the years, has been self-financed from previous stock sales. There is a small overdraft and no core finance.

Joan knows what others spend finishing beef cattle and that the profitability is marginal, but she also appreciates it is more than a labour of love. If it was not profitable, she would not be doing it, preferring to spend time with her family. Yet the enterprise achieves an annual gross margin of approximately £65,000, which is a margin of £130 per finished head. Overheads total £25,000, including small amounts of building depreciation and maintenance but no opportunity cost or finance and excluding her own labour. That leaves £40,000 of profit before finance charges and her time cost. Few beef systems can boast such a set of figures. And this, a two-hour-a-day (plus occasional days of moving cattle in or out) enterprise, fits into other off-farm work that Joan carries out the rest of the day.

Joan has considered expanding her enterprise, but her sheds are full and she has not got the space to create now ones or storage for feed. She does not have the appetite to invest in new buildings elsewhere as it would lower her return on invested capital, even though it might raise the overall profits. She would have to increase in blocks of 30 to ensure filled lorry loads when delivered.

Summary of Beef Farm

- Ruthless removal of overheads has made a beef enterprise truly viable
- Keeping a system very simple exposes costs quickly
- A focus on technical performance to finish beef within a set time frame keeps profitability per animal high and her buyer pleased with timing and carcase quality
- Setting a time deadline means she finishes cattle work by a set time to get to work each day
- Non-cash costs such as own time are important
- Keeping track of costs, time and performance is critical

4.4 DAIRY FARM

Marcus and Eric are two businessmen-farmers in Northern England. They came together eight years ago to form a contract farming agreement with a difference on a dairy venture. Marcus had a dairy farm and Eric had extensive dairy contract farming expertise. They recognised between them there were synergies to combine strengths and form a business that provided good profits for both. Marcus, who owns the farm, was not so interested in farming, having other business interests. Following a public tender for a contract farming agreement, he selected Eric to act as a business partner. Marcus recognises the benefit of sharing the 'pie' with others if it means the pie can get bigger as a result. Both Marcus and Eric own stock in the arrangement and Eric undertakes the farm management. The farm comprises a herd of 500 spring-calving cows with followers.

The herd had to grow to ensure the collaboration's viability and make optimal use of the available cow buildings and dairy, utilise the grass fully (coupled with some purchased fodder) and generate comfortable returns. This business consistently delivers profit (a divisible surplus) of £100,000 per year for each of them; approximately five pence per litre. This is *after* a commercial rental payment on all the land, the individual's own labour has been paid at an equivalent of £30,000 annual salary and depreciation of all investments. This is mainly livestock

and dairy plant (the capital that actually earns the money), but also a small amount of machinery and some infrastructure, such as cow tracks and working capital. After a full rent on all the land is paid and depreciation, but before finance, the total cost of production is 22.0ppl. A return on capital payment of 10% is made on all capital employed in business. This puts the farm in the top 5% of milk producers in terms of costs of production. Marcus and Eric are aware of this. Some other dairy farmers are astounded to learn that one in every 20 dairy farms (5%) can achieve that remarkable level. Relentless removal of costs by accounting for everything fully, including opportunity costs such as rent of owned land, paying for all time spent working on the farm, and other costs such as working capital, crystallise these expenditures in the minds of those focused on the economics of commodity production.

The cows' milk yield is low at about 4,100 litres per year (twice-a-day milking), keeping all direct costs to a minimum. They receive minimal cake (200kg per year), so the farm generates about 3,700 litres per cow from forage. To know the costs are low, they compare their farm business with others each month in a group. If any other farm appears to be doing better (lower cost), they scrutinise the system until they have extracted the answers and made relevant changes. Incidentally, the time they take to do this is also costed into the farm business accounts.

Their milk is sold for processing. Low yields and cow genetics mean high milk solids, so the price is about 2ppl higher than if their yields were at national average levels. As the milk is priced according to constituent solids, it is pointless calculating costs per litre, rather per kilogram of milk solids as it means something tangible. The farm has an exceptional focus on the quality of grass.

The joint venture incurs relatively little of Marcus and Eric's time, but employs a full-time farm manager/herds person. He is critical to the success of the farm so has a good salary plus a strong bonus which is based on the year-end divisible surplus (profit). This has been paid since the start of the arrangement. The monthly financials are shared with the farm manager, who has authority to purchase most items apart from capital. He must justify expenditure as well as other decisions at weekly meetings with Eric and attend a formal annual meeting where everything undergoes scrutiny. He has a clear line of financial authority but is left to make responsible decisions. Eric and Marcus have monthly meetings. They compile their own budgets each year and are convinced that this helps them understand the farm more thoroughly and therefore farm more profitably.

Summary of Dairy Farm

- A very clear line of governance has been established on this farm, with clear expectations of what the farm is intended to return for each participant
- The optimal farm size has been calculated and agreed. No visions to grow beyond economic optimum cloud the owners' objectives
- Financial targets have been set and financial management is very closely monitored
- The farm produces exactly what the buyer is prepared to pay for, thereby making more revenue
- Staff management is outstanding, with a link between performance and staff reward
- A high level of cooperation draws on two individuals' resources and skills
- Clear focus on the purpose of the farm and agreement between the business partners is essential

4.5 PIG FARM

Nathan is a pig farmer. He is young and has just taken on a new tenanted farm but is not new to farming, having had a small tenancy for several years producing high-quality pigs for a local processor. He has had a part-time job in the farm supply trade which has given him useful contacts. Because of his consistently high-quality performance in the past, he was given the opportunity to expand his weaner production enterprise substantially, following growth of the company he supplies. This required a major investment in weaner housing. His landlord at the time, while amenable to developments on his farm, was not prepared to incur tenant's improvements costs, which obligates a landlord to pay the tenant for improvements to a farm when the tenant leaves. Instead, a tender for a nearby estate farm tenancy arose. A £35,000 per year grazing livestock farm tenancy (including a house) was the route to business expansion for Nathan, as opposed to a non-returnable £500,000 investment on his previous farm.

Nathan had £275,000 of net worth but needed £600,000 to invest in sows and portable farrowing units (a bit like shipping containers). There was little chance of achieving

conventional funding so he secured the sums on an asset finance agreement[i]. Nathan also required an overdraft for working capital and borrowed £100,000, using pigs as collateral. All this debt made his loan-to-asset value 70%[ii]. Nathan was in lots of debt and rented all his land, potentially putting him in a very high-risk situation. But he had a 20-year tenancy, a long-term supply contract for weaners with a very secure and good premium and knew he was good at producing them at low cost. Nathan is not interested in grazing livestock production (a requisite of the estate's terms) so he arranged for somebody else to keep cattle and to utilise the land area as a separate business venture.

Nathan did his sums very carefully. While taking on considerable debt, he was buying in his sows in pig at only four weeks from farrowing and these would be sold as weaners, so his additional revenue would begin to flow soon after starting at the new farm. His budgeting was very cautious but still left him an adequate margin to remove all debt within 10 years. Indeed, it is now three years since Nathan took this big decision. He has grown his business further, as a result of high-quality finishing specification and outstanding customer service, such as loading in unsociable hours, providing detailed auditing of pig feeding and management regimes. He always meets his customers' requirements, such as putting video cameras in the pig pens. Nathan continues to have plans for growth but is currently focused on debt consolidation before taking on new capacities. He is clear that borrowing money with an end in mind can be a good way to grow, but solid financial control should be practised at all times.

Summary of Pig Farm

- Use new ideas to overcome barriers, including novel forms of finance
- Keep looking for new ideas in an entrepreneurial way; a farm is a great place from which to diversify
- Budget carefully and cautiously, especially when doing something new and involving other people's money
- Have clear targets, especially regarding repaying debt
- Develop your network and make advantage of it when appropriate; it helps everybody

i Asset Finance is the use of a specific movable asset as collateral in order to borrow money
ii Loan-to-Asset Value is the amount of finance as a proportion of the total asset value

- Always remain aligned to what your customer is asking for
- Once you have achieved your business objectives, decide on new ones

4.6 CEREALS FARM (A POOR FARMING EXAMPLE)

River Farm covers 1,560 arable hectares; a very large farm. The owner, Norman, has eagerly grown his business, which has meant increasing the area. This is his (probably misguided) idea of success. The farm is entirely cereals with no diversified activities, Norman being too occupied managing his farming to be concerned about such distractions. Indeed, much of his thinking time is spent considering '*other people's land'*; in other words, land he is tendering to take on rather than what he already occupies. Short of 150 hectares, the farm is either rented or contract farmed, covering a series of nine contract farming agreements and 10 small tenancies, all short-term FBT agreements[iii]. This means Norman has lots of administration to do, ensuring all the costs associated with each contract farming agreement are kept separate and accounted for correctly. His professional costs are inevitably high. His wife does the accounts which she is good at but doesn't enjoy, feeling she *has* to do them. She is not paid, so Norman does not notice her cost – the opportunity cost of her doing similar work elsewhere or something she would prefer to do. More importantly, it seems they sadly don't have time to discuss these things, being too busy to stop and talk.

With so many separate agreements, some of the land is inevitably far from 'home farm'. Indeed, the furthest plot is approaching an hour's drive. Norman does not appreciate the cost of driving a tractor for an hour. In fact, the furthest land makes no contribution to the farm's profitability (as is the case with much land farmed from afar) but is kept on '*for emotional and personal'* reasons. Many farmers are more sentimental than their persona first suggests. Making commercial decisions can be difficult at times, but sometimes, for the sake of a business, tough choices need to be made. He does not realise it, but Norman is not good at making disciplined decisions.

Norman's eagerness to expand means he was blinded to some of the problems he signed up to when agreeing land parcels: resistant black-grass, low soil-nutrient indices, small awkward fields with high hedge management costs, low fertility, wet corners and so on. It is likely that

iii AHA = Agricultural Holdings Act Tenancies are long-term agreements and FBT = Farm Business Tenancies are short, usually five-year rental agreements

local landowners identified him when trying to let dodgy ground; he has made himself a name. Norman is working to reduce the impact of black-grass but was too slow to prevent its incursion onto the farm in the first place. Yields are generally poor, only partly because of the black-grass but more probably to do with his lack of organisation and forward thinking. Each plot of land has to be managed in a similar manner, which is inappropriate because of the soil variation. Much of the soil has not been properly cared for or maintained in the past, and as a result, organic matter has fallen and phosphate and potash levels are low in some areas. Covering such a wide area, the soil types vary enormously, making his machinery requirement bigger than it should be as some cultivators are not suited to all soil types.

Norman is in his sixties. The farm employs two full-time staff. Overall, the technical performance is poor. Despite being active, Norman does little practical farm work himself and is not fully engaging in the farm business. The staff pick up on this and are consequently less dedicated to doing a great job. They receive weak leadership. Ultimately, Norman is responsible for all the mistakes that are made on the farm, although he does not see it that way, expecting more from the farm staff and scolding them when errors occur. Unsurprisingly, he can be quick to apportion blame, slow to train or coach and is now in a viscous circle that can be easily fallen into. Whoever gains the most from a good decision must also accept liability for mistakes made. Sometimes, it can be easy to blame but mop up credit when it is there to take.

Norman is too busy to undertake benchmarking or complete costings; he doesn't see the point when the market can move so quickly, he thinks, making budgets meaningless overnight. His complacency over the farm subsidy he receives potentially puts him in a dangerous position in the future. He does not realise that he is in the bottom quartile and complains it is impossible to farm profitably without subsidy; "*Doesn't everybody do this?*"

The poor technical application, questionable staff management techniques and fascination with taking on new parcels of land, usually at uneconomic rents or distant locations, means Norman's farm is making no money. But he is not aware of that: this year's results returned a small loss but, because he has little core debt, and a significant depreciation charge in excess of his current hire purchase agreements, the business generated a cash surplus. Farmers like Norman who don't complete a full set of management accounts every year can be easily fooled by a rise of bank position. Financial problems might not be spotted until it's too late. Keeping an eye on cash flow is not enough in a complex business such as farming.

The opportunity on this farm is enormous. If Norman managed to increase his yields by a mere half a tonne per hectare, taking the overall combinable crop yield from 5.5 tonnes per hectare (including all cereals and break crops) to 6 tonnes per hectare, it would be worth £140,000 per year. This farm is very sensitive to changes in yield. A 20% increase in yield would add 1,700 tonnes to his total crop output. Multiple small changes make big differences.

Summary of Key Actions Needed to Improve this Poor Farm

- Ensure private and business objectives are aligned and agreed with all family and business members
- Talk with family members and find out what they truly want from life
- Ensure business objectives are commercially viable
- Be bold enough to make difficult decisions when necessary
- Budgeting and management accounts are essential to identify financial problems
- Strong leadership as well as good staff management pays dividends in all situations
- Look for the hidden costs that don't appear directly on the profit and loss, such as opportunity costs and time spent in a tractor on a road

4.7 CONCLUSION TO CHAPTER 4

The six farms discussed in this chapter highlight a number of points that are consistently addressed to achieve outstanding performance. Clarity of a vision is critical to know which business route to take. Once that vision is set, the pathway to getting there can be laid out and therefore necessary staffing requirements can be identified. Each of the top-performing farms not only write their budgets each year (some with help from their advisors) but also undertake partial budgets to test new ideas or identify whether an activity is contributing to the farm accounts or not. Each farm then uses these figures and their own performance with others', either by discussing them or benchmarking with others.

Top farms recognise the importance of good staff. They pay above the odds and reward good practice rather than just turning up to work. Appropriate training, motivation and clear leadership are all paramount if you are to entrust another person to do your work for you.

These farms have demonstrated thought and implemented novel ideas, to fit with the environment, meet financial needs and also to keep commodity-focused. When taking on

high-risk situations (borrowing lots of land and money, for example), financial clarity becomes increasingly paramount.

There are several examples of collaboration, saving costs, passing enterprises of no interest and sharing resources. Each one makes the business more viable and enjoyable a workplace. Figure 25 demonstrates the key common themes that define success in the farms above. Note, the sixth (poor) example, sadly, does not share in any of them.

Figure 25 ~ Summary of common traits on example farms

		Vegetables	Cereals	Beef	Dairy	Pig	Poor Farm
Clear business objectives		✔	✔	✔	✔	✔	
Collaboration with other farms		✔			✔	✔	
Budgeting		✔	✔	✔	✔	✔	
Benchmarking		✔	✔	✔	✔	✔	
Innovative Ideas		✔		✔	✔	✔	
Care for soils and environment		✔	✔	✔	✔	✔	
Working with buyers				✔	✔	✔	
Outstanding staff management		✔	✔		✔		
Remarkable attention to detail		✔	✔		✔	✔	
Enjoy working on the farm business		✔	✔	✔	✔	✔	
Ruthless cost removal where possible		✔	✔	✔	✔		

5 CONCLUSIONS

5.1 TOP TRAITS OF HIGH-PERFORMING FARMERS

This report has studied outstanding farming businesses and what sets them apart from the rest. Common themes become evident, as identified below. Ranking them is difficult as their impacts vary from farm to farm according to farming systems, the farmer's personality and attitude, current levels of farm management, staffing and cost control. However, for a general perspective of importance overall, the following order is identified:

1. Minimise overhead costs
2. Set goals and budgets
3. Compare yourself and gather information
4. Understand the market
5. Focus on detail
6. Have a mindset for change and innovation
7. Continually improve people management
8. Specialise

5.2 HOW TO ACHIEVE THEM ~ IMPLEMENTING SUCCESS

The list of eight points summarises the entire document. But turning them into improvements is the difficult part. Here are some ideas.

1. **Minimise overhead costs.** This is the strongest message of this report. In all sectors, higher-performing farms in the FBS study had lower overheads than the rest. No farmer can operate in the top-performing quartile without a keen focus on cost control. Literature and the farming examples focus on 'low-cost' production; it's what commodities require. Always remember the sector farming is in. Every day, look for ways to trim costs that don't affect turnover. Collaborate with nearby farms or businesses, keep machinery longer and maintain it well, spend time developing and training staff and other key resources, keep necessary staff and machines and no more. Ideas on how to cut costs are almost endless. Make a list of 50 ways to trim costs.
2. **Set goals and budgets.** Sit down. Speak with business partners and family members. Discuss what each wants to achieve (financial and non-financial). Make sure your aspirations are aligned. Write them down, pin them up, discuss them regularly. Share

them with your business advisor if you use one. Without a goal or ambition, you will not know if you have achieved what you are working towards. Work out a plan how to achieve your mutual goals.

Compile annual budgets to show where the year is planned to go. You can identify what is going well and what not so well, helping you to adjust things if necessary. Ideas can be tested using this tool. Think through contingencies by developing a risk plan. Quantify risk. Entrepreneurs don't take higher risks than others, they just understand them better so know what they can do safely. Others guess and are sometimes wrong so make less progress or don't act in case they are wrong, guaranteeing no progress. Use these schedules regularly and frequently.

3. **Compare yourself and gather information**. Farms with more information make more money. It could be through benchmarking, discussion groups, informal discussions, regular reading (not just farming press), farm walks or a combination of all of these. Critically, taking that information to the farm to identify what you can do to farm more profitably is what matters. Knowledge is only useful if you change something as a response. Look to invest knowledge into smarter farming.

4. **Understand the market** and supply what the market is wanting to buy from you. Ensure good communication with your buyers. This should be a comparatively easy one to achieve. Take your main buyer for a coffee, visit them at their site, invite them to your farm. Ask them what would add value to what you produce, what they don't value and, importantly, the service that comes with it: delivery dates, speed of loading, and so on.

5. **Focus on detail.** This is a difficult attribute to identify using a tick-box survey but can be spotted, probably more easily by others. Ask somebody you trust whether they consider you have it. How can you improve everything you do? Make this a continual programme of improvement. Identify 100 things that could be done a little better (that's everything), and as you work through them, one by one, consider the cumulative impact marginal gains.

6. **Have a mindset for change and innovation.** Mindset is also tricky to score. Ask yourself; do you complete a budget begrudgingly and under instruction or willingly as you know it helps? Do you attend a benchmarking group because a friend goes and it's a free lunch but then make no business changes? The farmer's attitude must be correctly focussed on benefitting from opportunities of farming and the rich,

rewarding lifestyle it offers farmers. Remember this while going about daily farming business. Innovate your ways of working. It doesn't mean buying other people's innovations they are trying to sell you but thinking about ways to overcome barriers on your farm to reach your desired goals rather than turning them into excuses or burdens. Actions have to follow; it's like joining a gym!

7. **Continually improve people management**. There is only so much an individual can do in a day, but no limit on the capacity of a team. Empowering staff (including family labour) to do a great job involves investing time and money, but especially time in them. Training, motivation and crystal-clear leadership all contribute to trusting, loyal and hard workers. This task becomes easier when the farm's objectives have been set. Provide all the necessary training and materials people require. Remember, they are helping you to achieve your dream.

8. **Specialise.** Farms that concentrate on doing one farming system rather than many tend to be more profitable. It focusses the mind and prevents distractions. Fewer enterprises gather fewer overheads. It also makes it easier to ensure each enterprise is an efficient and optimal size. Enterprises tend to generate greater overall profit and return on income as they grow, up to a point. So having fewer enterprises retains efficiency of size, especially on smaller farming units. Small farms can be efficient and successful if they are in proportion and costs and time are curtailed to meet the enterprise requirements. Only grow a business once it is operating at a high performance or the mistakes it contains will also grow. If a farm does not grow, resources must shrink to fit it, such as becoming part-time.

Ultimately, to move into a higher performance bracket takes more than a rise of market prices or luck, it means change, sometimes considerable shifts in ways of operating and therefore thinking. To achieve this is arguably more difficult than any technical or management point considered in this entire study as it involves bravery and self-belief. Nobody should do the same and expect different results. Yet more people regret inactivity or indecisiveness than those who regret doing something.

Brexit may cause challenges, but those that are already in or heading towards the top performers list and are working to improve their businesses will be here for the long haul. Good luck, (because there is such a thing), but remember, the best farmers build their businesses on their own decisions. Ultimately, success is about achieving what the individual

aspires to achieve. Success can only be achieved with aspirations then, so these should be set. Happiness should probably be one.

6 APPENDIX 1 ~ 120 WAYS TO BE OUTSTANDING

The study considered management practices rather than technical actions to physically *do* that make a difference. Most single actions are not picked up in academic publications or FBS analysis. Section 2.4.1 on page 20 talks about 100 small improvements but makes no suggestions. Every farm will have different things to improve that make the biggest difference for them, but here is a suggested list of 120 things to improve or questions to challenge a farm with. They are not in any order:

1. Resolve to reduce cattle lameness through better cow tracks, nutrition or other techniques.
2. Identify how livestock health can be improved further through considering changes to their housing and handling areas.
3. Explore your own time management; become more disciplined on time efficiencies by reviewing day-to-day practices – it is these that lead to the costs you incur.
4. Discuss how contractors can improve your cost base by not owning all of your own machinery.
5. Work on improving grass quality that your youngstock are on.
6. Identify the best date for cutting grass for perfect silage, not just good silage.
7. Chase bad debtors more frequently.
8. Compare your staff's wages against others nearby. Are you paying too much or too little?
9. Calculate your staff turnover. What should it be? How can you address that?
10. Renew your machinery replacement policy; when was it last reassessed?
11. Can you keep your oldest tractor another year but maintain it better?
12. How do you raise breeding stock health so they last longer?
13. What is your stocking rate? Calculate it per unit of productivity rather than per hectare, i.e. if some land is less fertile, it should have a different rate.
14. Differentiate between investments and speculations. Consciously decide how much to speculate.
15. Calculate how strong your balance sheet is and therefore how much risk to accommodate.
16. What is the optimum capital to have in the business? Remove any surplus for other investments.
17. Recognise that insurers make money from you. Can you afford to take on more liability yourself that is currently insured?
18. Staff might be your main asset. How robust is their training programme? Formalise it and put it in their annual diaries.
19. How thorough are your staff's terms of employment and contracts? Reread them.
20. Improve on hygiene after being with animals, especially poorly ones.

21. Identify three key reason for mastitis on your farm and take one additional step to reduce each.
22. Calculate how much organic matter you are removing from soils and identify how it is to be replaced. Do you need to replace more to compensate for previous years' losses?
23. Calculate the chemical and biological value of incorporating straw into soils before baling it and exporting it off the farm.
24. Compliment each of your staff *when* you see them, do something positive today. It is free and easy to do. Repeat tomorrow.
25. Thank your staff at the end of each day's work.
26. Work with neighbours to share an item of machinery.
27. Prepare an agenda for when your farm management consultant comes. It will make better use of his or her time.
28. Have a series of questions to put to your farm advisor when you see him or her next.
29. Phone your main customer, take them for a coffee or lunch and ask them what you could do to make your output even more desirable than others'. Then do it.
30. Check your farm structure is correctly aligned with the environment and your resources.
31. Negotiate with the contractor harder.
32. Calculate which overheads you can do without if you stop any individual enterprise.
33. Quantify what each enterprise adds to the farm business. Do this objectively, rather than looking for justifications for keeping them.
34. Buy a grass meter and measure grass growth frequently in the growing season, especially beef and sheep farms. Manage fertiliser and stocking rates accordingly.
35. Question the seed rate you have been using.
36. Identify the key factors that encourage mycotoxins and avoid or manage them carefully.
37. Calculate the potential benefits and costs of environmental schemes.
38. Communicate with landlords about fixed investments or environmental schemes. Check they are part of your agreement or you have the landlord's written consent and tenants' improvements are acceptable.
39. Identify a contingency on how you would farm if migrant labour was not as available as it currently is.
40. Challenge your farm advisor to demonstrate a return to you on his or her costs.
41. Stay awake and alert in meetings. Lean in rather than recline in a seat; it sends strong messages either way.
42. Complete land tenures formally in writing. Use a professional if necessary.
43. Keep livestock feed clean and dry. Do not feed damaged feed to livestock.
44. Give key staff members more responsibility. Allow them to do it their way; it might be better than yours!

45. Calculate how much additional yield is required on your farm from ploughing to make it worthwhile. Is it worth trying a parcel of land unploughed?
46. How can you raise the yield at the field edges?
47. Are you borrowing the right amount of money? Would you make more money if you borrowed more or less? What is the impact on your return on capital?
48. How could you invest the cash if you took more money out of the business?
49. Challenge your tax advisor/accountant to actively look out for tax savings without spending all the profit.
50. Tighten up the ear tags and NVZ records to minimise the risks of cross-compliance breaches.
51. Check you have the right breeds for your customers' requirements and your farm system.
52. Learn to know when a finished steer or lamb has exactly the right level of fat.
53. Challenge yourself to improve yield without adding cost.
54. Spend time planning the autumn flush and the rams are in prime health.
55. Do you have exactly the right number of rams?
56. What other land-based activity are locals in need of? Explore whether you could provide it and make a revenue from it.
57. Identify how to maintain machinery better and cheaper.
58. Clean machinery, oil and grease it when it is finished with and put it safely away. Is it worth putting it in a shed or are there revenue opportunities for the shed itself?
59. Read business books.
60. Attend local small business (non-farming) discussion groups and seek new ideas and collaborations.
61. Improve your discipline on tightening your calving interval.
62. Negotiate your borrowing rate. Check with other banks that you are paying a low rate.
63. Source low-cost feeds through bakers' wastes, straight feeds or other materials, but make sure that the added cost of feeding/mixing these does not outweigh the cost of buying compounds/blends.
64. Identify how to add a little more value to your output. Can you make it better and worth more?
65. Do the maths and identify whether each enterprise is making a net margin after all your time. If not, change the farm.
66. Be more organised with paperwork. Can you do some to save accountancy of farm secretary costs? What accounts could you do that would give you a better understanding of the farm business?
67. Improve your own PC skills to handle knowledge better.
68. Attend a negotiating training course.
69. Install a sign, warning of health and safety dangers on the farm.
70. Encourage supervised farm visits to encourage locals to buy your farm goods.
71. Calculate the optimum land area for your farm system. Sell any surplus.

72. Identify the time you spend driving farm machinery on a road, what it costs in terms of wear and tear, fuel and wasted time. Calculate if it's worth it.
73. Use a costings book to give you ideas of new enterprises.
74. Complete your own budget before your farm advisor comes.
75. Spend time with staff exploring work processes. Make them more efficient.
76. List your most useful Key Performance Indicators. Keep them updated regularly (monthly for some, daily for others). Can you get it automated on your phone?
77. Explore risk management. Calculate your own business risks so you have a figure on each one. What is the cost of risk?
78. Ask your business partner what their aspirations are for the next 10 years. Are they what you thought they were?
79. Ask yourself, if you had to retire tomorrow would you be content with your farming career?
80. Measure how you have grown the farm business since taking it on. Do not account for rises in capital value that are not down to you, such as land appreciation.
81. Become more regular at milking times. Are they equal times apart?
82. Prepare a fungicide plan. Cost it out at the start of each year. Quiz the agronomist hard before spending more.
83. Put biosecurity wheel dips at the start of your farm drive.
84. Expect all farm visitors to use a boot dip before entering the farm.
85. Ensure all machinery is thoroughly cleaned between fields with black-grass in and ensure all fields are walked to patch-spray with roundup remaining black-grass areas and hand-rogue isolated plants pre-harvest.
86. Cancel any subscriptions you have not used or read for the last 12 months.
87. Use cow tracks and other means to keep grazing livestock out at grass for longer each year.
88. Focus on early grass growth to start the grazing season earlier.
89. Locate storage bins near to where they will be needed, saving travelling time.
90. Calculate the cost of machinery finance. Are you better paying cash and using overdraft? By how much?
91. Explore possibilities to employ underutilised resources.
92. Arrange for staff to meet you daily in the farm office at 7.00 or earlier so all arrive on time. Have a daily briefing to motivate all staff.
93. Have an annual staff away day. Do fun stuff and feed them well. Make them feel special; remember they are helping you achieve your dream!
94. Incentivise staff to earn you money. Consider providing a bonus for good work or performance.
95. Tidy the farm yard. Make it *look* like you are raising standards throughout.
96. Sell any scrap iron or roofing tiles you find in the nettles.
97. Sell any disused machinery.
98. Calculate the correct number of stock on your farm. Get to that number.

99. Enjoy what you do.
100. Identify how else you could allocate your resources to make money. Identify whether this is potentially better than their current use.
101. Identify the one thing that frustrates you most about your farm. Do something about it.
102. Check your machinery is aligned to the right-size tractor or vice versa. Do you have too much or too little horsepower? Build risk into the calculation.
103. Ensure your grain trailers align with combine tank capacity.
104. Listen to others more than you talk to them. Come home with ideas and try them out.
105. Set up a communal work calendar with all staff and directors in your business so everybody knows who is doing what.
106. Identify the activities that are 'mission critical', like milking cows or drilling seed.
107. Identify activities that are important but not urgent and diarise them to make sure they are completed.
108. Put highly visible signs on tanks and bins so delivery drivers know what goes where and where possible hazards are.
109. Tidy the farm office; an organised desk is the sign of an organised mind!
110. Keep a spreadsheet of yields, prices and other key measurables to easily compare performance each year or month.
111. Encourage ramblers to stick to footpaths, not traipse into fields.
112. Consider the size of livestock trailer you need. Would hiring a lorry be better when you need to move them?
113. Calculate the time and cash cost of attending a market to sell stock. Is it a day out or necessary business event?
114. Work out how you would farm if there was no subsidy.
115. Be aware how much support is provided to you my import barriers, even those items we import such as pig and poultry products.
116. Identify where the farm is overcapitalised and slim it down.
117. Sell any land you don't make money from.
118. Create a contingency plan for the next national livestock epidemic.
119. Believe you can achieve more and you will be right.
120. Wake up each morning and smile.

7 APPENDIX 2 ~ POLITICS

7.1 POLITICS, THE EU AND BREXIT

Agricultural policymakers have steered clear of policies addressing farm performance in any meaningful way since Sicco Mansholt, who was the European Commissioner for Agriculture from 1958 to 1972 and a founding architect of the Common Agricultural Policy. Mansholt was ambitious to improve the farming industry but underestimated the nature of inefficient smallholders who felt threatened by the modernising proposals that sought to raise the efficiency of farming[47]. There are ways to raise efficiency through policy and it is timely the UK-devolved governments tackle them. Most people acknowledge that the EU's Common Agricultural Policy does not provide the best way to support an efficient industry, being more focussed on social and environmental issues, and certain policies have allowed some farmers to 'coast' while enjoying a comfortable lifestyle. For example, as commented in OFC 2015**[5]**, it is rarely disputed that direct subsidies can compromise competitiveness. Brexit therefore provides the UK with the opportunity to implement new policies to address farming performance. The UK's agricultural administrations, as a result, are exploring productivity, competitiveness and efficiencies and may implement domestic policies in response. Productivity is on the political agenda for the UK post-Brexit[48].

7.1.1 Agri-Environmental Schemes

Farmers with agri-environmental schemes usually divert land that could have been used for production. Agricultural output therefore tends to fall when a scheme is implemented. For the higher-level, more demanding schemes, this pattern becomes stronger. Yet, for farm business performance (the profitability of farming and environmental schemes), the situation is reversed, with all schemes being associated with increased financial output and the most demanding schemes giving the biggest advantage. Thus, the loss of agricultural output because of agri-environmental schemes is more than offset by the income generated from them. Indeed, it is possible that some farms, while losing output, save more costs by not farming the poorer land. This is also pointed out by Barnes (2010). Those farms that undertake extensive agri-environment works without payment tend to have lower farm business efficiencies (Langton, 2011), demonstrating that the schemes are effective at returning public goods.

While they add to farm profitability, it is not certain whether there is a bias for better farms to be part of these schemes because, arguably, they are of greater benefit to poorer farms that

struggle to make a profit from agriculture or low-output farms whose return per hectare is less. Few high-output-per-hectare horticulture farms have environmental schemes, for example, but a majority of grazing livestock farms do.

8 APPENDIX 3 ~ BIBLIOGRAPHY

[1] Baker, S., Swales, D. (2017), Brexit Scenarios: An Impact Assessment. Pub: AHDB, Horizon.

https://ahdb.org.uk/brexit/documents/Horizon_BrexitScenarios_Web_2017-10-16.pdf

[2] For example, see: The Andersons Centre (2017), 'Prospects for UK Agriculture Seminar', Melton Mowbray, UK: The Andersons Centre.

[3] Langton, S. (2011), Cereals Farms: Economic Performance And Links With Environmental Performance. Pub: Defra Agricultural Change and Environment Observatory Research Report No. 25.

http://webarchive.nationalarchives.gov.uk/20130222210236/http://www.defra.gov.uk/statistics/files/defra-stats-foodfarm-environ-obs-research-arable-cereals-110505.pdf

[4] Covey, S. (1989), *The 7 Habits of Highly Effective People*. Pub: Free Press

[5] Redman, G. (2015), The Best of British Farmers; What gives them the edge? by The Andersons Centre for The Oxford Farming Conference.

[6] The documents may be found at https://www.gov.uk/government/collections/agri-environment-analysis under 'Economic and environmental performance'.

[7] Coelli, T., Rao, D.S.P., Battese, G.E. (1998), 'Additional Topics on Stochastic Frontiers'. In: *An Introduction to Efficiency and Productivity Analysis*. Springer, Boston, MA (see p51).

[8] Langton, S. (2012), Grazing Livestock Farms: Economic Performance And Links With Environmental Performance. Pub: Defra Agricultural Change and Environment Observatory Research Report No. 30.

http://webarchive.nationalarchives.gov.uk/20130403192957/http://www.defra.gov.uk/statistics/files/defra-stats-foodfarm-environ-obs-research-cattle-grazingrep-120308.pdf

[9] Redman, G., King, R., Evans, A. (2018), Results of data received through the Welsh EU Conditional Aid Scheme. Pub: AHDB Stoneleigh.

https://dairy.ahdb.org.uk/activity-in-wales/publications/#.WvQ3WYgvzct

[10] Stansfield, M. & Giles, G. (1990), *The Farmer as Manager*, 2nd ed. Pub: Wallingford, CAB International.

[11] Defra, (2018), The Future Farming and Environment Evidence Compendium.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/683972/future-farming-environment-evidence.pdf

[12] Langton, S. (2012), Grazing Livestock Farms: Economic Performance and Links With Environmental Performance. Pub: Defra Agricultural Change and Environment Observatory Research Report No. 30.

http://webarchive.nationalarchives.gov.uk/20130403192957/http://www.defra.gov.uk/statistics/files/defra-stats-foodfarm-environ-obs-research-cattle-grazingrep-120308.pdf

[13] Dobelli, Rolf (2014), *The Art of Thinking Clearly: Better Thinking, Better Decisions*. Pub: HarperCollins.

[14] Pike, A., (2008), Understanding Behaviours in a Farming Context: Bringing theoretical and applied evidence together from across Defra and highlighting policy relevance and implications for future research. Pub: Defra, London.

[15] See Note 11.

[16] Hill, N., (1937), *Think and Grow Rich*. Pub: Penguin.

[17] Collins, J., Porras, J. (1994), *Built to Last: Successful Habits of Visionary Companies*. Pub: Harper Business.

[18] Defra, (2018), Business Management Practices on Farms, England 2016/17. Pub: National Statistics.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/682764/fbs_businessmanagement_statsnotice_22feb18.pdf

[19] Verissimo, A. & Woodford, K. B. (2005), Top Performing Farmers are Information Rich: Case Studies of Sheep and Cattle Farmers in the South Island of New Zealand. Pub: IFMA 2005 Brazil, 15th Congress – Developing Entrepreneurship Abilities to Feed the World in a Sustainable Way.

https://researcharchive.lincoln.ac.nz/bitstream/handle/10182/420/Verissimo_Woodford.pdf?sequence=1

[20] Elliott, M.K., & Wakelin, R.D.N., (2016), Drivers of top performing farmers. Pub: Hill Country – Grassland Research and Practice Series 16: 25–28

http://www.rmpp.co.nz/site_files/13089/upload_files/nzgrassland_publication_2759HighPerformingFarmers(1).pdf?dl=1

[21] Elliott, M.K., & Wakelin, R.D.N., (2016), Drivers of top performing farmers. Pub: Hill Country – Grassland Research and Practice Series 16: 25–28

[22] Gladwell, Malcolm., (2005), *Blink; The Power of Thinking without Thinking*. Pub; Penguin.

[23] Taleb, Nassim Nicholas (2010), *The Black Swan; The Impact of the Highly Improbable*. Publisher; Penguin.

[24] Farmers Guide (23 Jan 2018), 'Leicestershire Farmer Crowned BASIS Best Farmer of the Year'

https://www.farmersguide.co.uk/2018/01/leicestershire-farmer-crowned-basis-best-farmer-of-the-year/

[25] Sugar, A., (2011), *The Way I See It*. Pub: Macmillan.

[26] Duhigg, Charles (2012), *The Power of Habit*. Pub: Random House Publishing Group.

[27] www.jimrohn.com

[28] https://jamesclear.com/marginal-gains

[29] Kimura, S., and Le Thi, C., (2013), Cross Country Analysis of Farm Economic Performance. Pub: OECD FAO Paper No. 60.

[30] Dweck, Carol (2017), *Mindset*. Pub: Random House Publishing Group.

[31] Olson, K., (2010), Top-performing farmers characterized by attitudes, goals.

http://www.agweek.com/business/agriculture/2930008-top-performing-farmers-characterized-attitudes-goals

[32] Koch, Charles (2007), *The Science of Success*.

[33] Cooney O. Governance: A Model for Dairy Farming.

http://www.cooneyleesmorgan.co.nz/governance-a-model-for-dairy-farming

[34] Thaler, R. & Sustein, R., (2008), *Nudge: Improving Decisions about Health, Wealth, and Happiness*. Pub: Yale University Press.

[35] AHDB; GB Potatoes, Market intelligence 2017–2018. Pub: AHDB.

https://potatoes.ahdb.org.uk/sites/default/files/publication_upload/GBPotatoes_21_11_2017%20WEB_0.PDF

[36] Gerber, Michael (2005), *The E-Myth: Why most small business don't work and what to do about it*. Pub: Harper Business.

[37] National Sheep Association (2018), *The Benefits of Sheep in Arable Rotations.* Pub: National Sheep Association.

https://www.nationalsheep.org.uk/policy-work/10424/the-benefits-of-sheep-in-arable-rotations/

[38] Figure Farm Accounts in England – Results from the Farm Business Survey 2016/17. Pub: Defra, Dec 2017.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/667253/fbs-farmaccountsengland-14dec17.pdf

[39] Redman et al. See 9.

[40] Langton, S., (2013), Dairy Farms: Economic Performance And Links With Environmental Performance. Pub: Defra Agricultural Change and Environment Observatory Research Report No. 31.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/183529/defra-stats-foodfarm-environ-obs-research-cattle-dairy-130205.pdf

[41] Defra (Aug 2011), Balance sheet analysis and farming performance.

http://webarchive.nationalarchives.gov.uk/20130125184541/http://www.defra.gov.uk/statistics/files/defra-stats-foodfarm-crosscutting-monthlybrief-aug11annex1-110901.pdf

[42] Barnes, A.P., Revoredo-Giha, C., Sauer, J., Elliott, J. and Jones, G., (2010), A report on technical efficiency at the farm level 1989 to 2008. Report for Defra, London.

http://webarchive.nationalarchives.gov.uk/20101109181006/http://www.defra.gov.uk/evidence/economics/foodfarm/reports/agriculturalefficiency/agri-efficiency.pdf

[43] Wilson, P., Lewis, M., Crane, R., Robertson, P., McHoul, H., Bonner, J., Davenport, R. and Riley, M., (2012), Farm Level Performance: Identifying Common Factors Determining Levels of Performance. Pub, Rural Business Research.

[44] Wilson et al. see 42.

[45] Kimura, S., and Le Thi. see 28.

[46] Wilson et al. See 42.

[47] Teasdale, A., and Bainbridge, T., (2012), *The Penguin Companion to European Union*. Pub: Penguin Books

[48] For example, refer to Mr Gove's speech at the Oxford Farming Conference 2018. (https://www.ofc.org.uk/video/rt-hon-michael-gove)