Piling on the pressure: crime and stress in British farming

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Abstract

Farmers in Britain face a range of stressors – events that negatively affect wellbeing – that impact on their ability to manage their business successfully. Extant research has identified stressors such as weather, finance, regulation, staffing and time pressures. However, no research has examined how agricultural crime affects the mental health of farmers. This article is the first to explore whether agricultural crime should be considered as a farmer stressor, and how this compares to the impact of other, more widely acknowledged farmer stressors on the day-to-day running of a farm in Britain. An online survey was employed to reach farmers across Britain to obtain quantitative data, but also qualitative data relating to stressors. Results in this first tranche of data indicate that agricultural crime has a clear place in the list of farmer stressors, with only weather, finance and time pressures being reported more often as a top three stressor by participants. The article concludes that there is a clear research gap regarding crime as a farmer stressor. It is argued that the findings of this research support the need for a wider discussion among key stakeholders to examine how agricultural crime is impacting upon the viability of British farms, and to ensure that agricultural crime is considered as a key farmer stressor so that its effects can be better addressed alongside other stressors.

Keywords: agricultural crime; farmer; farming stressors; comparison; victimisation; rural

Introduction

Farming is a stressful occupation (Truchot & Andela, 2018). Farmers in Britain are having to contend with a wide range of stressors on a daily basis in a bid to keep their businesses viable. A wide range of academic research has been conducted internationally since the 1970s looking at the factors that impact the most upon farmers. While farmers tend to conform to the traditional rural masculine idea of farmers being the strong, stoic type (Connell, 1995), it is possible that the increasing level of stress that farmers are under may create a challenge to this traditional rural masculinity in the future.

Despite this extensive exploration of farmer stressors in the academic literature, to date, no research has explored the role that agricultural crime plays in influencing farmer stress. As a result, this paper will present key findings from the exploratory research undertaken to establish how farmers view agricultural crime in light of the range of other, more recognised stressors that they are facing. It is essential to try to understand the interconnection between recognised stressors and the stress created as a result of being a victim of agricultural crime to enable service providers dealing with farmer mental health, finances, and the impact of victimisation to have a better understanding of how these different stressors affect farmers in Britain.

Farmer stressors

With the ongoing uncertainty of Brexit and the impact this may have on United Kingdom agriculture (Hubbard et al., 2018), coupled with the impact of the COVID-19 pandemic, stress factors affecting the British farming community are expected to rise. Booth, Briscoe and Powell (2000) noted that farmers are one of the professional groups at highest risk of suicide in England and Wales. This was supported by research conducted by Hounsome et al. (2012) who found that the farming community scored higher than the non-farming population on a questionnaire designed to assess psychological morbidity.

British farming is facing a looming crisis as a result of a reduced labour force, coupled with a demand for increased productivity, particularly as negotiations continue on the terms of the United Kingdom's exit from the European Union. Latest figures show that the number of holdings in the United Kingdom has increased from 218,000 in 2018 to 219,000 in 2019 (Defra, 2020). However, despite this, the total labour force has decreased over the same period by 0.3 percent to 476,000 while productivity has increased by 3.8 percent (Defra, 2020). This is important to consider when examining the farmer stressors that extant research has identified. Furthermore, it is notable that Malmberg, Hawton and Simkin (1997) concluded that deprivation, poverty and hardship continue to be seen as an urban issue. This may suggest a continuing misunderstanding of the nature of many rural areas, and the cognitive dissonance among rural communities aiming to retain the concept of the rural idyll. This is despite the array of research exploring the stress factors that affect farmers across the world.

There has been a wide range of international research over the past four decades devoted to exploring farmer stressors across various countries, where similarities may exist, but also differences in these stress factors. The vast majority of this research has taken place in developed nations, such as the United States (Walker et al., 1986; Kearney et al., 2014), Canada (Roy et al., 2013; Roy et al., 2014), Australia (Gunn et al., 2012; Perceval et al., 2017), and the United Kingdom (McGregor et al., 1995; Booth & Lloyd, 2000). Despite the differences in the agricultural sector across these, and other countries, it is surprising that the results are often similar when trying to identify key farmer stressors. Each piece of research makes use of a slightly different methodology dependent upon the background of the researchers, or may replicate previous research methodologies in a slightly different setting. Despite this, the findings are often stark in their similarity.

Some of the earliest research looking at farmer stressors came from researchers in North America. Walker et al. (1986) identified the top three stressors as financial problems, unpredictable weather, and agricultural policies and regulations. At the same time, Olson and Schellenberg (1986) found that farmers were stressed about issues around market price fluctuations, machinery costs, planting and weather conditions. Even twenty years' later, the picture is fairly similar, with Kearney et al. (2014) concluding that factors such as weather, problems with machinery, market prices, health care costs and not enough time with family created the greatest stress among American farmers.

Interestingly, while much of this research focused on male farmers, Walker and Walker (1987) found that differences appeared in the type of stressor experienced, with work-related stressors being reported more often among male farmers, and female farmers reporting a much wider diversity of stressors, including work, family and political issues. Despite these differences however, Walker and Walker concluded that problems in balancing work and family life was the best predictor of stress symptoms.

Much of the research that has taken place in Australia relates to droughts across the country over various time periods. Gunn et al. (2012) found that younger farmers and female farmers tended to report higher levels of stress. This is in contrast to the findings of Kilkennen et al. (2007) who concluded that there was little evidence of rural women experiencing higher levels of psychological distress than rural men. Polain, Berry and Hoskin (2011) further found that older farmers felt higher levels of stress as a result of challenges to their status in the community, relationships with friends and family, government compliance requirements, and a reluctance to access mental health services for fear of being labelled. However, much of the research from Australia has been focused on the need for service providers and rural mental health support services to change their approach so that they are better placed to provide community-based primary mental health care for the farming community (Fuller et al., 2007; Fragar et al., 2008).

Much research conducted with United Kingdom farmers has reported similar findings. Hawton et al. (1998) reported financial factors, government legislation and increased

paperwork as the key factors affecting farmer stress. Pollock et al. (2002) similarly found that government policy, finance and time pressures correlated with higher stress levels. As with the findings of Gunn et al. (2012), research conducted by Weigel, Weigel and Blyndall (1987) found that older farmers were less stressed. However, in contrast to Kilkinnen et al. (2007), Booth and Lloyd (2000) found that women farmers in the United Kingdom had significantly higher levels of psychiatric morbidity. However, it is not clear from the discussion of Booth and Lloyd whether this is due to women experiencing higher levels of stress, whether the stress is more prolonged or whether they have fewer coping mechanisms to deal with stressors than their male counterparts. Interestingly, similar research has been carried out in 'non-Western' countries such as Nigeria (Olowogbon et al., 2019), Iran (Jahangiri et al., 2020) and China (Wang, 2005). Despite the very different nature of agriculture across Africa, the Middle East and Asia, in all of this research, economic and financial worries were mentioned as the top stressors among farmer participants, showing some level of similarity of farmer stress at a global level.

Intriguingly, among United Kingdom research there is little consensus on the role of isolation in contributing to farmer stress. While Gregoire (2002) suggests that geographical and social isolation may be an important factor, several studies among United Kingdom farmers have suggested the opposite to be true (McGregor et al., 1995; Deary et al., 1997; Pollock et al., 2002). Despite this, there does seem to be consensus among international research that prolonged stress among farmers can result in stress-related physical symptoms, such as diabetes, ulcers and heart disease (Salleh, 2008), as well as an increased propensity towards suicide (Zekeri & Wilkinson, 1995; Perceval et al., 2017; Malmberg et al. 1997). Furthermore, numerous researchers have identified that a key barrier to addressing prolonged stress and its implications is the relentless influence of the traditional rural masculine (Brandth, 1995; Smith, 2018) and its impact on help-seeking behaviour (Bryant & Garnham, 2014; Roy et al., 2014; Thornicroft, 2008; Boulanger et al., 1999).

Despite these and other studies of farmer stressors both internationally and in the United Kingdom, no existing research has addressed the role of agricultural crime in farmer stress, and how this compares to other farmer stressors. Smith (2018) found that farmers were working under immense levels of stress as a result of crime, more than anticipated. Such stress has a negative impact on wider decision-making, health and safety, risk management, business continuity, productivity and traditional rural masculinity. As a result, it is key to explore the role of agricultural crime on a British sector that already operates under multiple stressors.

Considering the range of stressors that the British farming community have to deal with, it is possible that the inexorable rise in agricultural crime may prove to be too much for some farmers, with some farmers having already considered giving up their livelihood (Smith, 2018). By adopting an approach that considers agricultural crime alongside more well-established farmer stressors, it is suggested this will enable 'United Kingdom Farming PLC'[1] to become more robust and able to better manage farmer stressors, and to use those

skills and services to enable the farming community to meet the challenge of feeding the nation in a safe and sustainable way in the post-Brexit environment.

Methodology

This article presents data from an online survey conducted with the aim of identifying baseline data to establish how agricultural crime compares with other, more recognised stressors affecting the farming community in Britain. The survey was conducted with ethical clearance from the Harper Adams University Research Ethics Committee (reference: 1258-201912-STAFF). Informed Consent was obtained from all participants via an Informed Consent Statement covering anonymity, right to withdraw, data protection, and participation was voluntary in accordance with the Market Research Society Code of Conduct (MRS, 2019).

The questions were, in part, based on research previously carried out by Truchot and Andela (2018) to ensure that the impact of agricultural crime as a stressor could be compared directly against already established farmer stressor criteria. The work by Truchot and Andela (2018) was identified as a key source of farming stressor questions due to the robust methodology used by the researchers, and the wide-ranging topics covered by the questions asked of farmers. Moreover, making use of existing question sets in this research allows direct comparison between that piece of research and the findings reported in this article. To obtain new data on the impact of agricultural crime on farmer stress questions were added, both within the general farming stressors questions, but also questions specifically relating to the direct impacts of agricultural crime. These crime-related questions were based on the findings of previous research (Smith, 2018).

The 12 indicators of mental health issues were identified based on symptom information of Post-Traumatic Stress Disorder on the NHS website (NHS, undated). The questions asked were a mix of single option answers, multi-option answers and Likert scale questions. The latter specifically related to the key questions around farmer stressors, masculinity traits, service provider interaction after victimisation and crime-related impacts. Where the responses were used in the subsequent analyses, a Cronbach's Alpha analysis was carried out to assess internal consistency of the items within each set of questions. The results of this analysis are as follows:

Farmer Stressors	$\alpha = .95$
Masculinity Traits	$\alpha = .59$
Service Provider Interaction	$\alpha = .92$
Crime-related Impacts	$\alpha = .96$

The items addressed in the farmer stressor, service provider interactions, and crime-related impacts questions showed particularly high levels of internal consistency indicating the items measured the intended subject matter. While the α value for masculinity traits was not as high as the other three question sets, it should still be regarded as showing a moderate

level of internal consistency (Hinton et al., 2014). It is suggested that, as this set of questions were based on masculinity traits identified by previous research as either representing the ideal, or being the opposite of what is considered to represent the traditional rural masculine, further consideration of this aspect should be undertaken in order to improve the internal consistency of this scale.

To obtain data across the range of key issues, questions were established and grouped into thematic areas that addressed the requirements of the research questions: General demographic information; About the farm; Indicators of rural masculinity; Victimisation; Direct impacts of agricultural crime; and General farming stressors.

A short pilot study was conducted to confirm that each question was clear and the instructions were easy to follow, as the target population of the questionnaire was wide-ranging in educational levels. As this questionnaire was addressing issues that have not been researched before in Britain, it was essential to ensure the questions would yield the data anticipated. The pilot study also identified areas where revisions were required to make the questionnaire fit for purpose. The pilot study was conducted by eight people in total, all of whom were known to the researcher and had a knowledge of farming, but none of whom were farmers. This allowed the researcher to obtain feedback from the pilot participants that would inform the questionnaire without taking people directly from the target population.

Once all issues raised by the pilot study had been resolved, and technical checks had been made to ensure the survey worked as expected, it was then launched via an online survey tool, Online Surveys (www.onlinesurveys.ac.uk). The details of the survey were then disseminated to the farming community of Britain. To reach as many of the target population as possible, the survey was conducted online. It was anticipated this would enable data to be obtained from a sample representative of the target population. A stratified, self-selecting, convenience sampling method was employed. While random sampling was not employed, by stratifying the target population the research could be directed at those people to whom the subject area was most relevant, thus avoiding the issue of outliers often seen with convenience sampling (Parsons, 2017).

Using an online survey allowed potential participants to choose whether or not they would complete the survey, although it was recognised this may introduce self-selection bias (Sharma, 2017). Furthermore, while a self-selecting convenience sample allows research to be conducted quickly, easily, and at low cost, it is recognised that such sampling methods easily introduce the potential for participant bias and thus draw conclusions that are representative of the target population (Etikan et al., 2016; Leiner, 2016).

The survey was promoted across a range of social media platforms, including Facebook, Twitter, LinkedIn and Instagram. In addition, details were circulated in the National Farmers Union (NFU) member newsletter, at the NFU annual conference, via the Rural Services Network newsletter, the farming press, national farmer mental health charities, and various policing outlets including local force contacts, and the office of the Police and

Crime Commissioner for North Yorkshire who is the current chair of the National Rural Crime Network.

The survey was kept open for a period of three months for responses. This ensured participants from a range of farming sectors could complete the questionnaire. A total of 1,570 people accessed the questionnaire, and complete results were obtained from 80 participants. This equates to a 5.1 percent response rate based upon total views of the questionnaire. Response rates for web-based questionnaires are recognised to be lower than other methods, averaging six to 15 percent (Lozar Manfreda et al, 2008; Van Mol, 2017). In addition, it is recognised that a low response rate may also be due to the general unwillingness of farmers to talk about these kinds of issues. However, it is arguable that despite this, the findings of this exploratory study gave a broad indication of the role of agricultural crime as a stressor, and may well be seen as an underestimate.

It is noted that, while the pool of potential participants in the total target population (farmers, spouses, workers across England, Wales and Scotland) numbers approximately 358,000 (Defra, n.d.), it is difficult to establish a response rate based on this figure due to the nature of the non-parametric sampling methodology employed, the use of an online questionnaire method and the nature of the dissemination of the questionnaire information. This makes it almost impossible to establish how many people within the target population actually saw the details of the questionnaire. As a result, and in accordance with the pragmatic approach to this research, this exploratory study made use of the methodology considered as the best way to obtain an approximation of the current position of how agricultural crime as a stressor compares to more well-established farmer stressors. However, while the demographics of the participants did generally reflect that of the target population (Defra, 2019), it is noted that by using an online only survey, some level of bias would inevitably be present in the sampling methodology. Tables 1, 2 and 3 present the key demographic, and victimisation data provided by the participants.

Table 1: General demographic characteristics of survey participants

Characteristics		Survey Participants	
		n	%
Gender	Male	40	50
	Female	40	50
Age Range	18-35	14	17.5
	35-44	10	12.5
	45-54	15	18.8
	55-64	27	33.8
	65+	14	17.5
Employment Status	Farmer	52	65.0
	Farm Worker, Full Time	3	3.8
	Farm Worker, Part Time	3	3.8
	Farmer Family Member	16	20.0
	Other	6	7.4

Agricultural Sector	Arable	42	52.5
	Beef (Suckler)	18	22.5
	Beef (Finishing)	11	13.8
	Dairy	6	7.5
	Fresh Produce	2	2.5
	Fruit	3	3.8
	Pig	4	5.0
	Poultry (Broiler)	2	2.5
	Poultry (Laying)	3	3.8
	Sheep	31	38.8
	Other	24	30.0

Table 2: Crime experiences of survey participants

		N	**%**
Victim	Yes	72	90
	No	8	10
Repeat Victimisation	1	15	20.8
	2	19	26.4
	3	11	15.3
	4	5	6.9
	5	7	9.7
	6	3	4.2
	8	3	4.2
	10+	9	12.5

Table 3: Crime types experienced by survey participants

Crime Type	N	%
Theft of tractor	1	1.4
Theft other large machinery	3	4.2
Theft quad bike/ATV/mule	6	8.3
Theft – other vehicle	5	6.9
Theft of tools	28	38.9
Criminal Damage	40	55.6
Trespass	48	66.7
Poaching/Lamping	23	31.9
Hare coursing[2]	24	33.3
Theft livestock	6	8.3
Livestock worrying[3]	14	19.4
Injury to livestock	7	9.7
In-field slaughter of livestock	1	1.4
Crop damage by vehicles	25	34.7
Theft agricultural chemicals	1	1.4
Fraud	2	2.8
Cybercrime	0	0
Threats of violence	19	26.4
Violence	4	5.6
Other	18	25.0

Results data were exported into Microsoft Excel, reviewed and cleaned where necessary. All qualitative responses to open-ended questions in the survey were saved in a separate file for separate analysis and inclusion as required. The coded quantitative data were then imported into SPSS to enable appropriate statistical analysis to take place. Using guidance from Pallant (2013), two key statistical tests were identified, driven by the data obtained by the survey. To establish how agricultural crime impacts upon British farmers, and how that compares to other stressors that they experience, the three statistical tests used were a Mann Whitney U-Test, Kruskal Wallis Test and Spearman Rho. The first is a non-parametric test of difference between two independent groups based on a categorical independent variable and a continuous dependent variable. The second, similar to the Mann Whitney U-Test, allows comparison of more than two groups. The third is a measure of association between two identified variables, where the data can be ranked.

According to West (1999, p. 66), with 80 participants, the results of this survey provide a 95 percent confidence level with a +/- 10 percent margin of error. While a larger sample size would certainly have reduced the margin of error, thus enabling a higher level of confidence that the results were representative of the target population, given the time and cost restraints of the research, a higher level of statistical accuracy would have been hard to achieve. As such, from a pragmatic standpoint, it was decided that some meaningful, indicative data with the reported level of accuracy from this sample size would be sufficient for this exploratory piece of research.

In addition, a brief analysis of the qualitative data obtained from the open question (question 30) asking participants to list their top three stressors was undertaken. This examined the number of times each stressor was mentioned to provide a top three reported stressor list. In addition, to illustrate the kind of things participants mentioned in this open question, a word cloud was created using www.wordcloud.com. All of the responses were collated into a word document with all capitalisation removed. All non-relevant words, such as conjunctions (and; but), as well as some adjectives (close; due) and some nouns and verbs (thought; look) were removed from the word list used to create the word cloud so that the key words relating to the subject were included. This left a word list of 184 words included in the analysis.

Results

Descriptive analysis

An analysis of the descriptive statistics was conducted to evaluate the mean and standard deviation for each of the farmer stressor items included in this key section of the survey. The descriptive statistics are presented in Table 4. In addition, an analysis of the responses given to an open question was undertaken to establish whether there were any patterns between the responses in this survey and previous literature.

There are some key indicators that agricultural crime is playing a major part in farmer stress in this sample. When looking at the mean responses, there are twelve items that show a mean between 4.00 and 4.99. This equates to the response category of 'Quite Often' when asked how often they experience stress due to each item on a day-to-day basis in relation to the general running of the farm.

Table 4: Descriptive statistics for each farmer stressor item

		N	Mean	Std. Dev.
Current Finance	Bank Pressure	80	2.88	1.479
	Difficulty repaying loans/debts	79	2.47	1.376
	Fear of business interruption or bankruptcy	79	2.39	1.234
	Having to contract loans	78	1.79	1.073
Future Finance	Market instability	80	3.54	1.262
	Having to sell at a loss	80	3.76	1.324
	Reduction in financial margins	80	3.89	1.312
	Reduction in subsidies	80	3.91	1.608
	Results from work don't live up to expected gains	80	3.84	1.364
	Uncertainty about the future	80	4.41	1.447
agricultural crime	Fear of becoming a victim of crime	79	4.94	1.213
	Theft of machinery/livestock	80	4.35	1.442
	Worry about how to best protect my farm from crime	80	4.86	1.177
	Worry about increased insurance premiums due to crime claims	80	4.05	1.500
	Worry about leaving my family alone	80	3.89	1.559
Relationships with Friends and Family	Conflict with other farmers	80	1.83	0.952
	Family members who don't share my professional values	80	2.35	1.502
	Other farmers or workers who don't share my professional values	80	2.18	1.188
Issues of Isolation	Lack of health services in the area	79	2.24	1.211
	Lack of services nearby (e.g. banks, post offices)	79	2.89	1.493
	Lack of shops nearby	79	2.37	1.242
Issues with Legislation	Adapting to continuously changing regulations	80	4.11	1.350
	Excessive regulations	80	4.25	1.364
	Fear of making a mistake in the paperwork	80	4.40	1.455
	Fear of sanctions due to bad filing of returns	80	3.95	1.525
	Pressures with agricultural policies	80	3.84	1.513
	Regular checks by administrators	80	3.68	1.508

	Very complicated and complex hygiene standards	80	3.03	1.458
Issues of Succession	Fear of having to find a successor outside the family	79	1.90	1.205
	Fear of not being able to pass the farm on to my children	80	3.09	1.737
	Fear my children will face the same difficulties as me	80	3.51	1.714
Issues of Time	Lack of time to complete tasks properly/do the job well	80	3.81	1.332
	Lack of time to participate in leisure activities	80	4.25	1.428
	Lack of time to participate in social activities	80	4.04	1.400
	Lack of time to rest	80	4.05	1.368
	Not enough time to meet people, or go out with friends	80	3.81	1.397
	Too much physical work	80	3.34	1.377
	Too much workload	80	3.93	1.403
Issues of unpredictability	Being exposed to machinery breakdown	80	3.36	1.193
	Frequent changes in work due to unexpected events	80	3.53	1.222
	Having to use increasingly sophisticated equipment	80	2.99	1.297
	Weather unpredictability	80	4.31	1.681

It is notable, on the basis of the descriptive statistical analysis of the Likert scale responses, the top three stressors as reported by the participants are fear of becoming a victim of crime *($\bar{x}$ = 4.94)*, worry of how to best protect my farm from crime *($\bar{x}$ = 4.86)* and uncertainty about the future (finance) *($\bar{x}$ = 4.41)*. Indeed, of those items that recorded a mean of between 4.00 and 4.99, four related to agricultural crime; issues with legislation and issues of time both had three items; and future finance and issues of unpredictability both had one item. This is in stark contrast to much of the literature that seems to indicate that stress around finances, weather and government regulations top the categories proving most stressful for farmers, both internationally and in the United Kingdom (Walker et al., 1986; McGregor et al., 1995; Kearney et al., 2014). Indeed, even the research on which the above items were based on found that time issues, future finances and legislation were the top three stressors reported (Truchot & Andela, 2018).

Interestingly, despite the above results, when participants were asked directly to list their top three stressors as part of an open, more qualitative question, the responses were rather different. This open question resulted in the top three stressors being identified as weather (with 38 mentions), finances (30) and excessive legislation (22). Crime came a very close fourth on the list with just over a quarter of participants putting it in their top three (21), followed by issues of time (20), staffing (10) and machinery breakdown (9). When asked

directly about their top three stressors, despite the responses already provided about their experience of stress, it is notable that the responses tend to fall in line with what has been found by other research.

A small amount of qualitative data was also obtained through an open question asking the participant to list the top three farmer stressors they experience on a daily basis. Figure 1 provides a visual illustration of the top 220 words mentioned by participants in response to this question. Some of the responses were illustrative of the role that agricultural crime plays in farmer stress:

> "Time spent dealing with poachers/hare coursers"
> "Continued aggression"
> "Worry about theft and damage while we are out"
> "Being a victim of crime"
> "…coming and stealing everything we work so hard to do/replace"
> "Dog attacks happening when we are not there to protect our livestock"

Figure 1: Word cloud illustrating the qualitative responses

Inferential analysis: Agricultural crime as a stressor

The first analysis examines six of the key aspects of the direct impact of agricultural crime, how they interact and influence the way farmers are feeling about victimisation, and how it is affecting their working life, with results detailed in Table 5a. These analyses found

that each correlation showed a statistically significant relationship between the variables. It is interesting to note that feelings of being watched show a large positive correlation with worries about their own safety *(r = .687, n = 70, p < .001)*, and the safety of their family *(r = .568, n = 70, p < .001)*. Furthermore, medium positive correlations were seen where participants reported thoughts of giving up farming altogether due to the fear of repeat victimisation *(r = .387, n = 70, p ≤ .001)* and worry that they are unable to prevent repeat victimisation *(r = .402, n = 70, p ≤ .001)*.

Table 5b presents the significant results from analyses looking at the influence of age on a range of factors that relate to or influence farmer stress responses. Firstly, it is noticed that older farmers feel that the words that reflect their perception of ideal farmer traits include 'dirty' *(r = .263, n = 76, p = .022)* and 'manual' *(r = .261, n = 76, p = .023)*. However, older farmers also responded to say they felt that farmers are also 'incapable' *(r = .235, n = 76, p = .041)* and 'weak' *(r = .265, n = 76, p = .022)*. While all of these findings have a small, positive correlation, it is key to note that the strongest correlation is seen in the category 'weak'.

With regards to the relationship between age and satisfaction with service providers, again the results show that there is a positive correlation. This suggests that older farmers are most satisfied with the service they received after being a victim of crime from farmer charities *(r = .329, n = 64, p = .008)*, local mental health charities *(r = .285, n = 64, p = .022)*, national mental health charities (r = .318, n = 64, p = .010) and religious organisations *(r = .276, n = 61, p = .032).* The strongest correlations are noted in relation to farmer charities and national mental health charities.

The only statistically significant relationship between age and general stressors shows there is a small, negative correlation with younger farmers significantly more likely to worry about family members not sharing their professional values *(r = -.265, n = 80, p = .017).* This further follows with the relationship between age and direct crime impacts. The only statistically significant results in this analysis found that there is a small, negative correlation between age and feelings of being watched *(r = -.251, n = 70, p = .036),* suggesting that younger farmers who have been a victim of crime exhibit higher levels of feelings of being watched. In addition, there was a medium, negative correlation between age and a change in alcohol intake *(r = -.321, n = 72, p = .006)*, again suggesting that younger farmers are significantly more likely to experience a change in their alcohol intake after being a victim of crime.

Table 5: Significant results of key agricultural crime impact correlations, and impact of age on masculinity traits, general stressors, satisfaction with service providers after victimisation, and crime impact

5a. Correlations of key agricultural crime impacts		**N**	**Rho**	**P**
Lack of sleep	Worry about using large/heavy machinery	72	.344	.003
Feelings of being watched	Worry about my own safety	70	.687	.000
	Worry about the safety of my family	70	.568	.000
Fear of being a victim of crime again	Thoughts of giving up farming	70	.387	.001
	Loss of trust	71	.297	.012
Worry can't prevent being a victim of crime	Thoughts of giving up farming	70	.402	.001
5b. Impact of age on masculinity traits, general stressors, satisfaction with service providers after victimisation, and crime impact				
Masculinity Traits	Dirty	76	.263	.022
	Incapable	76	.235	.041
	Manual	76	.261	.023
	Weak	75	.265	.022
General Stressor	Family members who don't share my professional values	80	-.265	.017
Service Providers	Farmer charities	64	.329	.008
	Local mental health charities	64	.285	.022
	National mental health charities	64	.318	.010
	Religious Organisations	61	.276	.032
Crime impact	Change in alcohol intake	72	-.321	.006
	Feelings of being watched	70	-.251	.036

A Mann Whitney U test was used to explore the differences between experience of general stressors between those who have been a victim of agricultural crime, and those who have not. The significant results are presented in Table 6a. This analysis found that, when asked about fear of repeat victimisation, there was a small, statistically significant difference between those who had been a victim *(md = 6, n = 71)* and those who had not been a victim *(md = 4, n = 8), U = 142.0, z = -2.46, p = .014, r = .28*, with victims more likely to worry about repeat victimisation. Furthermore, when asked about worries around weather

unpredictability, there was a small, significant difference between those who had been a victim *(md = 5, n = 72)* and those who had not been a victim *(md = 3.5, n = 8), U = 157.5, z = -2.16, p = .031, r = .24*, again with victims being more worried about issues of weather unpredictability. Noticeably however, when considering worries about family members who do not share their professional values, it was found that the opposite was true. A small, significant difference was found between those who had been a victim *(md = 2, n = 72)* and those who had not been a victim *(md = 3.5, n = 8), U = 167.5, z = -2.02, p = .044, r = .23*, with non-victims being significantly more likely to worry about family members not sharing their professional values.

Again, a Mann Whitney U test was employed to explore the difference in responses to several variables when controlled for gender. Interestingly, the first thing to note is that there were no significant differences seen in gender responses relating to satisfaction levels with service providers after victimisation. Significant results were found when looking at gender in relation to masculinity trait ideals, general stressors, and the direct impacts of crime as detailed in Table 6b. While many of the results show a small effect, there were several where the effect size was a little greater. However, although a small effect size, it is interesting to note that the only significant difference seen in what participants considered as ideal farmer traits found that male participants were more likely to consider that a farmer should be gentle *(md = 3, n = 37)* than female participants *(md = 2, n = 39), U = 545.5, z = -1.97, p = .049*.

Only one general stressor variable shows a significant difference with a medium effect, with female participants more likely to worry about having to sell at a loss *(md = 4, n = 40)* than were male participants *(md = 3, n = 40), U = 505.0, z = -2.92, p = .003*. In contrast, a number of factors that were directly attributable to being a victim of crime show a medium effect. In all cases reported below, female participants were more likely to experience these direct crime impacts than were male participants. Those with the largest effect size found that female participants were more likely to report a loss of confidence *(md = 4, n = 34)* than male participants *(md = 2.5, n = 36), U = 341.0, z = -3.235, p = .001*; also that female participants were more likely to experience nightmares after being a victim of crime *(md = 3, n = 34)* than male participants *(md = 1, n = 36), U = 340.5, z = 3.329, p = .001*.

Table 6: Significant results of impact of agricultural crime on general stressors, and the impact of gender on masculinity traits, general stressors, and crime impact

6a. Impact of agricultural crime on general stressors		**N**	**U**	**Z**	**P**	**R**
Victim of agricultural crime	Fear of being a victim again	79	142.0	2.46	.014	.28
	Weather unpredictability	80	157.5	-2.16	.031	.24
	Family members who don't share my professional values	80	167.5	-2.02	.044	.23

6b. Impact of gender on masculinity traits, general stressors, and crime impact						
Masculinity traits	Gentle	6	545.5	-1.97	.049	.23
General Stressors	Difficulty repaying loans/debts	9	553.0	-2.30	.021	.26
	Fear of business interruption/bankruptcy	79	570.0	-2.14	.032	.24
	Market instability	80	587.0	-2.15	.032	.24
	Having to sell at a loss	80	505.0	-2.92	.003	**.33**
	Uncertainty about the future	80	547.0	-2.50	.012	.28
	Worry about increased insurance premiums after due to crime claims	80	583.0	-2.14	.033	.24
	Worry about leaving family alone	80	572.5	-2.24	.025	.25
	Fear about making a mistake in paperwork	80	594.0	-2.04	.041	.23
	Fear of not being able to pass the farm on to the children	80	553.0	-2.42	.015	.27
	Fear that children will face the same problems as me	80	577.0	-2.18	.029	.24
	Lack of time to rest	80	595.5	-2.02	.043	.23
	Too much physical work	80	596.0	-2.03	.043	.23
Impacts of crime	Thought of giving up farming	70	426.5	-2.22	.027	.27
	Worry about additional paperwork	67	399.0	-2.07	.039	.25
	Avoiding certain situations	70	418.5	-2.35	.019	.28
	Fear of being a victim again	72	480.5	-2.11	.035	.25
	Loss of pedigree/blood lines	68	405.0	-2.49	.013	**.30**
	Worry about not having anything to pass on	70	424.0	-2.30	.021	.27
	Worry about replacing stolen/damaged items	70	412.5	-2.45	.014	.29
	Lack of sleep	72	390.0	-2.96	.003	**.35**
	Repeated illnesses	70	358.0	-3.08	.002	**.37**
	Worry about my physical health	71	418.0	-2.47	.014	.29
	Worry about my safety	72	389.5	-2.97	.003	**.35**
	Worry about the safety of my family	72	440.0	-2.42	.016	.28

Worry about lone working	72	395.0	-2.90	.004	**.34**
Feeling anxious	72	407.5	-2.77	.006	**.33**
Feeling vulnerable	71	435.0	-2.31	.021	.27
Feelings of being watched	70	358.0	-3.05	.002	**.36**
Flashbacks	68	341.5	-2.94	.003	**.36**
Loss of confidence	70	341.0	-3.24	.001	**.39**
Nightmares	70	340.5	-3.33	.001	**.40**

A Kruskal Wallis test was used to explore the differences between job type and the impact of agricultural crime on participants. Two crime impacts were found to show statistically significant differences as shown in Table 7. Dunn's post hoc analysis found strong evidence that full-time farm workers *($\bar{x}R = 68.17$)* were more likely to show change in alcohol use than were part-time farm workers *($\bar{x}R = 18.00, U = -1.039, p = .026$)*, farmers *($\bar{x}R = 32.46, U = -3.079, p = .002$)* and farmer family members *($\bar{x}R = 38.61, U = 2.384, p = .017$)*. In addition, other workers *($\bar{x}R = 51.17$)* were more likely to show change in alcohol use than were farmers *($\bar{x}R = 32.46$)*. In addition, full-time farm workers *($\bar{x}R = 56.33$)* were more likely to report angry outbursts than were farmers *($\bar{x}R = 30.83, U = -2.114, p = .035$)*, and other workers *($\bar{x}R = 51.33$)* were more likely to report angry outbursts than farmers *($\bar{x}R = 30.83, U = -2.334, p = .020$)*. Those who classified themselves as other workers include gamekeepers and agricultural machinery service/repairs. These results were not adjusted using the Bonferroni adjustment due to the fact that, while aiming to reduce the occurrence of Type I error, it may actually increase the likelihood of a Type II error which would lead to important difference being deemed non-significant (Perneger, 1998).

Table 7: Impact of employment type on crime impact

	N	df	X^2	P
Change in alcohol intake	72	4	14.45	.006
Angry outbursts	71	4	11.00	.027

Discussion and implications

This research has taken a key step forward in the understanding of the role that agricultural crime plays in the gamut of stress factors that farmers experience in the daily task of running a profitable business. Previous research has identified that farmer stressors have included finances, weather, professional values and government bureaucracy. As a result of the findings of this exploratory work, agricultural crime should be considered seriously as a key factor affecting the stress that British farmers experience.

Not only does agricultural crime act as an additional stressor for farmers, with fear of repeat victimisation being positively associated with previous experience of crime, it also seems to have significant influence on one of the most cited stressors in previous literature: weather unpredictability (Walker et al., 1986; Kearney et al., 2014). It is possible that the

additional pressure that victimisation creates may well be exacerbating existing stressors. It is suggested that, while weather unpredictability was the only recognised farmer stressor that victimisation had a significant positive effect on, unless levels of agricultural crime in Britain are not tackled, the potential for a much wider impact on general farmer stressors may continue to develop, having a devastating effect on the mental health and wellbeing of British farmers in the future. It is interesting that those farmers who had not been a victim of crime reported higher levels of stress relating to family members not sharing their professional values. One could argue this may be due to those participants, having not experienced victimisation, do not understand the impact that agricultural crime can have on the business and wider farming community. Moreover, the fact that family members may be approaching the business in a very different way could be because they have been a victim of crime in the past and this may have changed the way they think about farming.

The findings that show no significant difference in how male and female participants rated the helpfulness of service providers after being a victim of crime suggests the potential for further exploration around this subject. It would be useful to examine these results in more detail, and explore the role of other variables such as crime type. This finding was unexpected, as it was thought that there may be some service providers that would be preferred over others between male and female participants. This may be due to the relatively small sample size, but further investigation may be a useful source of information, particularly for those service providers in understanding their role in helping the farming community after victimisation, and possibly tailoring their approach in providing that support.

Gender was considered a key variable, given the ongoing influence of the traditional rural masculine (Brandth, 1995; Connell, 1995) and the wide range of variables in this research that gender influences. When asking participants to indicate the traits that they felt best represented farmer character, it was anticipated that there would be some difference between the way male and female farmers responded to this question. Interestingly, only one significant result was identified from the analysis which found that males were significantly more likely to expect a farmer to be gentle than female participants. This is surprising for two reasons. A farmer being considered as gentle is a clear indicator of the ongoing challenge to the traditional rural masculine indicating the presence of a ‘counter-masculinity’ (Smith, 2018) is very much at play in British farming. The fact that male participants were more likely to suggest farmers should be gentle, despite the even split between male and female participants, is an interesting and unexpected finding. Driven by stereotypes, one would assume that it would be female participants who would be more likely to respond in this way. Further research on the role of masculinity in response to agricultural crime may reveal more information on the interactions of the two variables.

The impact that gender has on the range of stressors that are experienced by the farming community is laid bare by the wide range of general stressors that female participants were significantly more likely to experience in contrast to the findings of Kilkinnen et al. (2007). These covered almost all of the categories of stressors identified by Truchot and Andela

(2018) and the direct crime impacts added as part of this research. The only categories that did not show a significant difference is the experience of stress were relationships with friends and family, issues of isolation and issues of unpredictability. One could argue that the first suggests that male and female participants are equally as worried about their relationships with others as it is important that farmers need and rely on that community support, regardless of gender. The lack of worry about isolation tends to fall in line with previous research that indicated isolation was not a key factor in farmer stress (Pollock et al., 2002). It is likely that issues of unpredictability have an equal impact on male and female participants due to the potential wide range of farm business-level implications that may arise as a result of a poor harvest or machinery breakdown.

Age plays a much smaller part in how participants differed in their responses. When addressing the issue of masculinity traits, the results were surprising. While older participants were more likely to feel that farmers should be 'dirty' and 'manual', which feeds into the discourse around the persistence of the traditional rural masculine, they were also more likely to suggest farmers are represented by the words 'incapable' and 'weak'. While these latter traits are very much in contrast to the traditional rural masculine, it is likely that these older participants may be more disillusioned than their younger counterparts. Moreover, it suggests there may be some impact upon farmer self-confidence if they feel these words best represent farmers. This may be due to the influence of prolonged stress experienced by the participants, and their feelings about their success in managing to overcoming these stressors. Such responses may furthermore represent an issue surrounding poor mental health in the older farming community as a result of the prolonged exposure to farmer stressors. Associated with this is the fact that the only general stressor that younger farmers reported as being significantly impactful was that family members do not share their professional values, reflecting the findings of Walker and Walker (1987). This may indicate some generational conflict around how to do things, and that younger farmers see the struggles of their parents and want to try and do things differently.

Interestingly, the only direct crime impacts that differed significantly by age relate to younger participants reporting changes in alcohol intake and feelings of being watched. It is not clear from these findings whether the change in alcohol intake is positive or negative. However, it is possible that alcohol may be used more widely by younger participants to cope with the effects of victimisation alongside other stressors. If this were to be the case, it is potentially creating a physical and mental health issue for these participants in the long-term. This is supported by the findings that show that older participants are significantly more satisfied with the help received from certain service providers. This suggests it is younger participants who feel they are not receiving adequate assistance after victimisation that may be exacerbating their response to crime and its effects suggesting a different approach is needed by service providers (Fuller et al., 2007; Fragar et al., 2008).

Interestingly, differences seen in the direct effect of victimisation between employment types indicate that full-time farm workers and other workers may be most affected by agricultural crime. This may be due to the fact that, other than farmers, these are the people

who are most reliant on the success of the farm for their employment, and so are the most likely to display negative emotional responses after experiencing victimisation. The reason farmers do not figure in the significant results of this analysis may due to the persistence of the traditional rural masculine, and the perception that farmers are strong and just get on with things (Brandth, 1995).

Crime impact correlations raise some interesting issues surrounding how crime affects feelings of safety, loss of trust, and thoughts about giving up farming. Moreover, it raises questions about how impactful agricultural crime is on the lives of British farmers and how this affects their mental health. The suggestion that agricultural crime should be considered further as a farmer stressor is repeated with the qualitative aspect of this research. Truchot and Andela (2018) concluded that time, future finance, and government legislation were the most impactful farmer stressors, with weather also discussed by several other researchers. In this brief analysis, agricultural crime was listed as the fourth most stressful aspect of farming, although descriptive statistics put crime impact in first and second place, with four of the five direct crime impacts among the highest mean response. This qualitative research seems to imply a notable level of fear and worry about agricultural crime, with the mental health of farmers potentially being greatly affected and farmers talking about feeling suicidal as a direct result of victimisation. The word cloud provides a visual representation of the key impacts participants talked about: loss, police, worry, fear, frustration. However, it is recognised that much more detailed qualitative research is needed to explore these issues further and draw conclusions based on a more in-depth study.

This research, in particular the quantitative data analyses, has shown that agricultural crime plays a significant role in farmer stress, and the wider impact this has on other farmer stressors, and should be a key consideration when thinking about how service providers respond to farmers who have been a victim of agricultural crime.

Conclusions

This research has shown that, while some farmer stressors are particularly well understood, there is a clear need for a better understanding of the role that agricultural crime plays in farmer stress, and how it interacts with those more recognised stressors. This survey has shown that several variables affect the level of worry associated with agricultural crime, and how this compares to worry around general farming stressors. Worry about both general farming stressors and crime-related stressors are affected by age, gender and job role. Most importantly, however, these results show that crime rates highly on the list of worries that farmers, farm workers and farmer family members are subjected to on a daily basis while trying to keep the business going. Moreover, this research suggests that agricultural crime may potentially prove to be the factor that leads to farmers giving up farming altogether unless services and support can be improved to help those who have been a victim of agricultural crime moving forward.

Limitations of the research

While this research has provided some interesting and compelling preliminary findings, it is recognised that there are limitations to the study that should be addressed by any future research into this novel subject. The sample size was small and, as such, this makes it difficult to draw conclusions from this study to the wider population. While the sample size did allow for statistical analysis at the 95 percent confidence level, a larger sample would have reduced the margin of error and thus provide results that would be representative of the target population.

There are, of course, inherent issues with running an online only survey. However, this method was chosen for its low cost and easy dissemination. This does lead to a non-parametric sample and the possibility of bias. If possible, this may be addressed by somehow conducting a random sample selection and employing a different survey methodology, should time and finances allow. This research was predominantly quantitative in nature. While this does provide a starting point for investigation, this survey did not explore the usefulness of qualitative data to its full potential in order to examine the attitudes and behaviours of the sample to its full extent. It is anticipated that a qualitative approach would enable much richer, depth data to be obtained and examined.

Recommendations for further research

It is recognised that this piece of research was exploratory in nature, with the aim of gaining some initial understanding of the role that agricultural crime plays in farmer stress in comparison to more widely accepted farmer stressors. As such, it is essential that more research be undertaken to extend these preliminary findings. It may be particularly useful to further explore aspects such as farming type, size of farm and number of employees and how this may affect the impact of crime-related stress. This will enable policy makers and rural service providers to have a better understanding of the role that agricultural crime plays in the development of stress among the farming community, and the implications this may have on stress-related illness.

Such further research would aim to identify a larger sample so that the data created can be extrapolated up to the target population of farmers across Britain. The inclusion of farmers in Northern Ireland would provide useful experiences so that differences and similarities could be further explored.

Further exploration of services available to farmers, level of uptake, and benefits would be useful. In addition, further exploration of the role of the traditional rural masculine as a potential barrier to help-seeking behaviour should be undertaken both in relation to crime-related stress, but also other farmer stressors. Finally, it is essential to extend the qualitative research in this field to enable a wider exploration of the key quantitative findings. This will

allow a better understanding of farmer behaviour and culture in relation to agricultural crime, stressors, help-seeking, and physical wellbeing.

Notes

[1] PLC is a public limited company in the United Kingdom, equivalent of a publicly traded company carrying the Inc. designation in the United States. United Kingdom Farming PLC is often used as a term encompassing all business and output related work undertaken in United Kingdom agriculture as a whole.

[2] Hare coursing is a bloodsport where dogs are used to chase, catch, and kill hares. See: https://www.lincs.police.uk/reporting-advice/wildlife-and-rural-crime/hare-coursing/

[3] Livestock worrying is where a dog attacks or chases livestock or is at large in a field with sheep causing injury, suffering or death of the animals. See: https://tinyurl.com/nxk7rehb

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