

Distress and burnout among NZ dairy farmers: research findings and policy recommendations

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Abstract. The wellness and wellbeing of farmers are crucial to maintaining sustainable agricultural production and resilient farming communities. Dairy farming is one of the most intensive forms of pastoral farming in New Zealand and is characterised by long hours of monotonous hard work. The consequences for many farmers can be depression, anxiety and/or burnout. As these mental states influence sufferers' decision-making abilities, they potentially cost the country many millions of dollars per year. Starting in 2010-11 dairy farmers were interviewed over three consecutive years when they attended health pit stops at major dairy events nationally. This paper presents the baseline data, discusses the research findings and offers policy recommendations for improving farmers' emotional wellness.

Keywords: Distress, burnout, emotional wellness, extension.

Introduction

Wellness is a way of life aimed at optimal health and well-being in which an individual integrates body, mind and spirit so as to live more fully within the human and natural context (Myers and Sweeney 2005). Ideally, it is an optimal state of health and well-being that each individual is capable of achieving in all domains of his or her life (Myers et al. 2001). Wellness is more than being healthy or not being sick, it is about achieving life's full potential, and is a journey not an end state. From this holistic perspective mental unwellness or illness, is part of being unwell and it is clear that unwell people, including farmers, cannot achieve their full potential. In his paper the term emotional wellness is used instead of the term mental illness, because of stigma. Stigma around mental illness is a serious issue in the farming community where many people, particularly males, are stoic and do not seek help when they need it (Nicholson 2008). Very little local research has been done on farmer wellness but what has been done focuses on the causes of emotional unwellness, particularly farmer stress and its dynamics (Botha 2013). Research is important because it can contribute to the design of effective intervention strategies, can help keep track of progress with these strategies and, when used appropriately, the findings can help to underpin anti-stigma campaigns and other efforts like building community resilience. Serious injuries and preventable deaths are at the extreme end of social unwellness and the number and nature of Accident Compensation Corporation (ACC) claims, as well as the number of preventable deaths in the New Zealand pastoral sector, reveal a very poor health and safety record, indicating that many farmers, from a holistic perspective, are unwell.

The challenge is to identify and reach, early on, those farmers who are at risk of developing emotional unwellness due to stress, hereditary (genetic) and or circumstantial predispositions, and to provide them with appropriate information, encouragement, self-help strategies and linkages to formal support networks.

The Dairy Farmer Wellness and Wellbeing Programme (hereafter referred to as the programme) is a change management strategy specifically targeted to change the behaviours and attitudes of New Zealand dairy farmers and their families (Botha, 2013). The end goal is to improve and maintain dairy farmers' emotional wellness. The programme started in 2010-11 and is reviewed and revised annually. The main feature of the programme is farmer health pit stops (also referred to as pit stops) that are held during major dairy events nationwide. At the pit stops dairy farmers have the opportunity to get a free physical health check by health professionals and to receive a free emotional wellness screening by social researchers. Telephone follow-ups occur with farmers who have screened positive for any of a variety of health and/or emotional wellness issues and who agree to be contacted. This is discussed further in the next section of the paper.

The aim of the emotional wellness part of the programme is to get a baseline understanding and yearly updates thereafter, of New Zealand dairy farmers' emotional wellness status and to inform potential intervention strategies. The purpose of this paper is to present the baseline data, discuss the findings and offer policy recommendations for improving farmers' emotional wellness.

Methodology

Terms and concepts used

Farmers' emotional wellness was assessed by investigating the levels of depression, anxiety and burnout they experience. These three concepts are proxies for psychological distress symptomatology (sets of symptoms), with blurry cause-effect relationships (Iacovides et al. 2003). Psychological distress is a term that includes sadness, frustration, anxiety, and a number of other negative mood states (Carney and Freedland, 2002).

Depression is generally described by the Free Dictionary as the condition of feeling sad or despondent; or as 'a psychiatric disorder characterized by an inability to concentrate, insomnia, loss of appetite, anhedonia, feelings of extreme sadness, guilt, helplessness and hopelessness, and thoughts of death'. Anhedonia is the inability to experience pleasure from activities usually found enjoyable, while the Free Dictionary describe anxiety as a state of apprehension, uncertainty and fear. Comorbid depression and anxiety is a term that is used to describe depression and anxiety that co-exist, i.e. occur at the same time.

Schaufeli and Buunk (2003, p. 388) describe burnout as '...a persistent, negative, work-related state of mind in 'normal' individuals that is primarily characterised by exhaustion, accompanied by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work'. They also say that: 'It is a psychological condition that develops gradually but may remain unnoticed for a long time for the individual involved'. Burnout consists of two parts: disengagement and exhaustion (Demerouti et al. 2002). Disengagement is the process of withdrawing from involvement in a particular activity, situation, or group and in a farming context it means losing an interest in farming and related activities. Disengagement is primarily related to satiation, i.e. a sense that farming has lost its meaning to the individual and the experience of monotony (Demerouti et al. 2002, cited in Botha and White 2012b, p. 13). In other types of jobs it has been associated with job resources and performance feedback, as shown by various authors (all were cited in Botha and White, 2012b, p. 13):

- rewards and job control (Landsbergis 1988)
- job security (Dekker and Schaufeli 1995)
- participation in decision making (Jackson et al. 1987)
- support from supervisors (Leiter 1989).

The causes of burnout have not been assessed in this study and it is suggested that any one or more of the causes of dairy farmer stress, as discussed by Botha and White (2013b, p. 23-26) could apply. These stressors were divided into four categories, i.e. farming, financial, relationship and health, and workload. Debt, children and farmers' own health were key stressors during 2012-13.

Exhaustion is extreme tiredness and is caused by mental fatigue (Demerouti et al. 2002), job demands and physical workloads (Jannsen et al. 2001), poor environmental conditions (Whitehead 1987; Leiter and Maslach 1988) and time pressure and unfavourable shift-work schedules (Kandolin 1993).

In a systematic review Gulliver et al. (2012) reported that it is estimated that up to one half of those with depression and only one third to one half of those affected by anxiety disorders seek professional help. Moreover, people often seek help from informal sources, such as friends or family rather than from formal sources such as doctors or psychologists who can provide evidence-based treatments. In the three surveys we checked whether farmers talked to someone, including health professionals, during the year past when they felt distressed. Moreover, an online community of interest of 40 farmers and 4 workshops were used to identify how farmers affected by emotional unwellness can be assisted.

Disturbed sleep is associated with distress and even cardio-vascular disease (Kashani et al. 2012). Hence we tested farmers for sleep disturbances. Bruce and Aloia (2006, p. 207) said that: '...sleep disturbances can take the form of medical disorders; sleep-wake pattern abnormalities (i.e. circadian rhythm disorders); limited quantity of sleep (i.e. insomnia); or limited quality of sleep (i.e. perceived poor sleep and sleep fragmentation)'.

Research process

Changes to the questionnaire In order to keep the questionnaire short, data about on-farm roles were not collected during year one of the programme. During its second year, on-farm roles were classified following New Zealand's national health database. This, however, has proved to be impractical for use in the dairy industry as New Zealand's national health database is atypical

of the way on-farm roles are classified elsewhere. The typology was: Manager; Sharemilker not owning cows; Farm owner with staff; Sharemilker owning cows; and unpaid family worker.

A questionnaire to measure distress and burnout was designed during the first year of the programme and used during the following years. The questionnaire was refined at the start of year two to reflect lessons learned during year one. The focus of the questionnaire was on depression and anxiety as distress symptomatology, and from year two onwards included questions on burnout. The questions were from a range of sources.

The PHQ-4 instrument was adapted from a time period of four weeks in 2010-11, to two weeks in the following surveys. By shortening the period from four to two weeks the sensitivity of the PHQ-4 instrument increased. Sensitivity is the ability of a test to identify correctly those who have the disease. Specificity is the ability of a test to identify correctly those who do not have the disease and validity is the ability of a test to indicate which individuals have the disease and which do not.

The simplest, but sometimes hardest form of seeking help during times of distress, is to talk to someone and many choose not to talk to a health professional (Gulliver et al. 2012). During the first two surveys we asked farmers if they talked to anyone about feeling stressed during the previous year and recorded their answers. During 2012-13 we asked the same question and included health professionals specifically to check who they preferred to talk with.

Without distinguishing between the different forms of sleep disturbances, we scanned farmers for disturbed sleep during 2011-12 and 2012-13 by asking them if they experienced disturbed sleep and why?

OLBI field test As part of a telephone survey we field tested the OLBI during 2011-12. When testing OLBI in the field, the dairy farmer participants had no problem with answering its 16 questions, finding them easy to understand and answer. The OLBI has been integrated with the pit stop stress questions since 2011-12.

Sampling During the first two years data was collected at main dairy events which caused an oversampling of older farmers. Therefore, during 2012-13, the pit stops were also held at road shows and smaller events like DairyNZ discussion groups in the North and South Islands, Dairy Women's Network regional group activities and visits to three large corporate farms, i.e. Synlait, Dairy Holdings Ltd and Bel Group Dairy Farms.

Time of year Data was mostly gathered during non-busy periods on New Zealand dairy farms i.e. between December and 1 June. In New Zealand the dairy season starts on 1 June, the traditional date for changing farms. With sharemilkers moving cows from one farm to another it is called Gypsy Day or Gypsy/Week. This is also the time when many cows go to other farms for grazing. Winter is the usual time for feeding hay and silage to make up for the slow pasture growth rate and the busiest time on a dairy farm is around July/September with spring calving. Days start early when farmers get up to check the paddocks for newborn calves and start the morning milking. Between October and December is spring and it is another busy time. The cows produce the most milk and most farms milk their cows twice a day at approximately 5 am and 3 pm; however the timing of milkings will vary from farm to farm. This is also the time of year that mating occurs in order to get the cows in calf for the next season.

Online community of interest The online community of interest consisted of farmers who were interviewed during the pit stops and screened positive for stress and/or burnout and who were willing to be contacted. Members of this online community of interest who were contactable were phoned six months later to find out: how well the pit stop mental health findings lined up with their moods at the time of the pit stops; if the pit stop experience actually prompted them to seek help; what they thought could be ways of supporting them when they are stressed; and to field test the OLBI questions with them. Internationally, there is no data available on burnout among farmers, and we tested the OLBI with farmers because we suspected that burnout may be an issue on NZ dairy farms.

Measuring instruments

Depression and anxiety The Patient Health Questionnaire nine item scale (PHQ-9) assesses depression (Sidney and Kennedy 2008) and the Generalised Anxiety Disorder seven-item scale (GAD-7) assesses anxiety (Kroenke et al. 2007). Though originally developed to diagnose generalised anxiety disorder, the GAD-7 also proved to have good sensitivity and specificity to screen for panic, social anxiety and post-traumatic stress disorder (Kroenke et al. 2007).

Burnout A self-assessment tool that measures burnout in people, called the Oldenburg Burnout Inventory (OLBI) was used to measure farmers' levels of disengagement and exhaustion.

Scales used

Depression and anxiety PHQ-4 consists of the first two items of the PHQ-9 (Sidney and Kennedy 2008) and GAD-7 (Kroenke et al. 2007, p. 319) respectively, and according to the latter authors 'constitute the two core DSM-IV items for major depressive disorder and generalized anxiety disorder, respectively. Each ranges from a score of 0 to 6'.

Löwe et al. (2010, p. 86) tested PHQ-4 for 'reliability and validity, with PHQ-2 and GAD-2 scores of 3 corresponding to percentile ranks of 93.4% and 95.2%, respectively, and PHQ-2 and GAD-2 scores of 5 corresponding to percentile ranks of 99.0% and 99.2%, respectively'. The cut-off points for PHQ-2 and GAD-2 scores are therefore a score of 3 or higher.

PHQ-4 was developed with an educational grant from Pfizer Inc. and no permission is required to reproduce, translate, display or distribute the instrument. It also '...serves as a good measure of 'caseness' (i.e., the higher the score, the more likely there is an underlying depressive or anxiety disorder), (Pfizer, n.d), which made it easy and suitable for use in our surveys.

Burnout The OLBI consists of 16 questions, 8 each for disengagement and exhaustion. In terms of assessing farmer burnout with OLBI, Botha and White (2012a, p. 12) noted that: 'There are, to date, no established cut off points in a New Zealand context for the OLBI scales. We have used values below and above the 25th (<1) and 75th percentiles (>3) respectively as cut off points for very low and very high scores for exhaustion, and disengagement. We also labelled scores between 1-1.5 (25th - 37.5th percentiles) as low and >1.5 to <2.5 (37.5th and 63rd percentiles respectively) as average scores for exhaustion and disengagement. Scores from 2.5 to 3 (63rd – 75th percentiles) were labelled as high'.

Limitations

Respondents were self-selected at all the pit stops and participation was entirely voluntary. This means that the sample is not random and therefore may have issues associated with self-selection bias (Skitka 2012). The main concern is that distortion happens due to certain characteristics being over-represented because they correlate with willingness and availability to be included. Extrapolation of the findings to the general dairy farming population is therefore unreliable.

Findings

Demographics

Gender and age During 2012-13, 506 farmers were interviewed, 63% males and 37% females, compared to 58% and 65% males and 42% and 35% females during 2010-11 and 2011-12 respectively. The male: female ratio therefore has not changed substantially between the three surveys.

The age distribution of respondents is shown in Table 1 alongside the age distributions reported in the previous two surveys (2010-11 and 2011-12) and is compared to national data on dairy farmers as described by Taylor et al. (2009). Table 1 shows that the age distributions of 2012-13 survey respondents compare well to the 2011-12 study, but less so to the 2010-2011 survey.

Table 1. National data on the age of farmers and survey respondents' age

Age bands	% of respondents			Taylor et al. (2009)
	2010-11 (n = 518)	2011-12 (n = 295)	2012-13 (n = 506)	
20-45	50%	60%	65%	64%
46-75	50%	40%	35%	36%

It is suspected that the increase in the 45 years and younger age band in 2012-13 was due to our deliberate focus on collecting more data than previously at smaller dairy events and large corporate farms. The age distribution of the 2012-13 survey compares very well to the 2006 national age distribution of New Zealand farmers and farm workers, as described by Taylor et al. (2009).

Ethnicity Table 2 shows the ethnicities of respondents for the three surveys, as well as the national population ethnicity distribution. The ethnicity distribution of the New Zealand dairy farming population is unknown, hence we cannot compare our samples to it.

Table 2. Respondents' ethnicities in 2010-11 and 2012-13 (% of respondents)

Ethnicity	2010-11 (n = 518)	2011-12 (n = 295)	2012-13 (n = 506)
NZ European	87	92	80
NZ Maori	4	3	4
European-Maori	2	1	2
Pacific	0	0	0
Non-NZ origin	7	4	14

Table 2 shows that there has been a considerable increase from a low 4% of immigrant farm workers in 2011-12 to 14% in the 2012-13 sample. This may be due to our strategy of targeting more farm staff and younger participants. The total number of immigrant farm workers is not known for the 2012-13 season, but Callister and Tipples (2010) provided an indication of Filipino farm worker numbers in New Zealand by reporting that in the 2008-09 season, 898 Filipino workers were employed on dairy farms while 322 permits were issued to those of South American origin, predominantly Brazilians and Chileans.

Roles on-farm Farmers' on-farm roles for the 2012-13 survey are shown in Table 3. The two biggest groups were owner operators and employed workers.

Table 3. Respondents' on-farm roles during 2012-13

On-farm role	Number of respondents	% respondents
Owner operator	113	24
Farm owner with no farm tasks involvement	4	1
Farm owner with some farm tasks involvement	55	12
Equity farm manager	13	3
Farm / stock manager	83	17
50/50 sharemilker	46	10
Lower order sharemilker	24	5
Unpaid worker	6	1
Employed worker	96	20
Contract milker	20	1
Other	18	4
Total	478	

n = 506; missing values = 16; number of respondents holding more than 1 role = 12

Talking to someone when feeling down

As indicated before, one form of help seeking we checked for during the three surveys was whether or not respondents talked to someone when they felt down. Table 4 shows the percentages of respondents that talked to someone (including, but not necessarily a health professional) about feeling emotionally unwell during the year past.

Table 4. Percentages of respondents that talked to someone about feeling emotionally unwell during the year preceding each of the 2010-11, 2011-12 and 2012-13 surveys

Talked to someone (anybody) during the preceding year about feeling stressed?	% of respondents		
	2010-11 (n = 518)	2011-12 (n = 295)	2012-13 (n = 506)
Yes	15	5	42
No	85	95	58

In 2012-13, when asked about talking to someone, or specifically to a mental health professional, about feeling emotionally unwell during the year past, 58% respondents said they did not talk to anybody (Table 4), while 87% said that they did not talk to a health professional (not illustrated in table). The 58% (Table 4) is not comparable to the previous years' findings of 85% (2010-11) and 95% (2011-12) respectively, as it is considerably lower. The distinction in

our questioning between talking to 'someone' and 'talking to a mental health professional' may have influenced this change.

Prevalence of emotional unwellness

Table 5 shows respondents' self-assessed PHQ-4 scores for depression and anxiety during the three consecutive surveys. It indicates that during 2012-13, 8% of respondents scored equal or higher than the cut-off score of 3 on the PHQ-4 scale. One per cent scored 3 or higher for comorbid depression and anxiety. This 1% is included in the 3% who scored 3 or higher for depression and the 5% who scored 3 or higher for anxiety, as shown in the table. This means that there was a total of 2.5% of respondents who screened positive for depression symptoms, another 4.5% who screened positive for anxiety symptoms and another 1% who screened positive for comorbid depression and anxiety.

Table 5. A comparison of respondents' self-assessment scores for depression and anxiety (% of respondents)

Scales	2010-11	2011-12	2012-13
Depression scores (PHQ-2)			
0 to 2 (not depressed)	91	95	97
3 and higher (depressed)	9	5	3
Anxiety scores (GAD-2)			
0 to 2 (not anxious)	92	95	95
3 and higher (anxious)	8	5	5
Total for depression & anxiety scores of 3 & higher (PHQ-4)	17	10	8

From these figures there appears to be a decline in the prevalence of emotional unwellness, as measured by the PHQ-4 screening instrument, over the three consecutive years. The reason for the decline from 2010-11 to 2011-12 is the improved sensitivity of the PHQ-4 instrument during 2011-12. By factoring this in, we conclude that the prevalence of emotional wellness has been rising slightly since 2010-11. The reasons are unknown but we suspect the impact on dairy farmers of the 2008 drought may have eased by 2010, as discussed later in the paper.

Burnout

Disengagement In both the 2011-12 and 2012-13 surveys the same OLBI scale cut-off points as before were used and the results are shown in Table 6. During 2012, Botha and White (2012a) explored if the OLBI could be used for assessing New Zealand farmers by testing it in a group of dairy farmers who had screened positive for depression and/or anxiety during the 2010-2011 Health PitStop events. Hence, in this regard, these farmers could be viewed as a clinical population. Botha and White (2012a) found that high and very high levels of disengagement occurred in that particular (clinical) population, with respectively 47% and 28% respondents, in total 75%. In contrast, two mixed populations were used in the 2011-12 and 2012-13 surveys, and as shown below, because of this difference between the populations, the results are markedly different.

Table 6. Disengagement, exhaustion and total burnout levels during 2011-12 and 2012-13 (% of respondents)

Category	Disengagement score		Exhaustion score		Total burnout score	
	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13
Very low	0	0	0	0	0	0
Low	3	2	1	2	1	1
Average	86	87	78	75	88	73
High	11	10	19	22	11	25
Very high	0	0	2	1	0	1

According to Table 6 the levels of disengagement were very similar between the 2011-12 and 2013 surveys, 11% and 10% respectively, in contrast to the 75% found in the clinical population during 2010-11.

Exhaustion Table 6 shows that the levels of exhaustion in respondents were similar in the 2011-12 and 2012-13 surveys (78% and 75% respectively). Moreover, it is clear that exhaustion during the same two surveys was a bigger issue than disengagement, as twice as many respondents were found to be in the high and very high exhaustion bands, compared to what was found for the same levels of disengagement. The reasons for this are explored later in the paper.

Burnout In total, 11% of respondents had a high, and 88% an average burnout level during 2011-12 (Table 6). The prevalence of average burnout levels decreased from 88% to 73% during the same period of time. Burnout seems to have increased during 2012-13, with 26% of respondents assessed as high and very high compared to 11% in 2011-12.

Disturbed sleep

Without distinguishing between its different forms, we scanned respondents for disturbed sleep during 2011-12 and 2012-13. The results are shown in Table 7.

Table 7. Percentages of respondents with disturbed sleep during 2011-12 and 2012-13

Disturbed sleep?	% of respondents	
	2011-12	2012-13
No	75	73
Yes	25	27

The finding that 25% of respondents suffered from disturbed sleep in the 2011-12 survey and 27% in the 2012-13 survey is very similar. The reasons have been reported by respondents in both surveys and varied between individuals, but the causes included stress, young children and chronic pain. In both surveys 6% of respondents said that they have always been, as they put it, 'poor sleepers'.

Discussion

The way in which the data was collected, i.e. at pit stops, was determined by the funding organisation for the programme and it would be impractical, time consuming and too expensive to get a 100% representative sample by selecting interviewees at the pit stops according to age, gender, production system and their on-farm role. Representation has improved over time through our strategy of collecting data at events other than only the major ones.

The high percentage of respondents (87%) who did not talk to a mental health professional when they felt stressed indicates that most dairy farmers and dairy farm workers prefer to talk to family or friends when needed. A strategy to help farmers should bear this in mind and not solely focus on help provided by the health sector.

The prevalence of emotional wellness has been rising slightly since 2010-11. The reasons are unknown but we suspect the impact on dairy farmers of the 2008 drought, which may have eased by 2010. According to NIWA (2013), 'much of New Zealand encountered very dry conditions at the start of 2008, with the Waikato experiencing its driest January in a century. Severe moisture deficits continued throughout the north island until April/May, with the estimated cost to agriculture exceeding \$1 billion, and an 11% fall in sheep numbers'. When comparing this to national data, the significance of the result depends on which indicator is used as a comparison. On the one hand Oakley Browne (2006) concluded that 5.7% of New Zealanders (aged 16 and over) will experience a major depressive disorder over a 12-month period. Compared to this, our findings during 2011-12 and 2012-13 of the prevalence of depression as 5% and 3% respectively among dairy farmers are slightly lower than national data. Furthermore, according to Ministry of Health (2008, p. xi): 'one in ten adults (10.9%) had ever been diagnosed with a mood disorder (mostly depression)'. Compared to this, our findings of 10% in 2011-12 and 8% in 2012-13 are also slightly lower.

On the other hand, for depression and anxiety Ministry of Health (2008, p. xi) reported that: '...one in fifteen adults (6.6%) was found to have a high or very high probability of a mood or anxiety disorder'. Compared to this, the prevalence of 17%, 10% and 8% respectively during our 2010-11, 2011-12 and 2012-13 surveys are higher than the 2007-08 national estimated probability of 6.6% of a mood or anxiety disorder.

Seeing that burnout was measured during a time that farmers were not very busy, the finding that 26% farmers suffered from burnout during 2012-13 is considered high. Burnout is likely to

increase during very busy times on dairy farms like calving and mating, when farmers get tired because of the long hours they work.

Debt continues to cause stress and farmers could make more use of the Mark and Measure seminars offered by DairyNZ, get advice from their accountants or recruit consultants with the right skill sets to help them. DairyNZ is the industry good organisation, representing New Zealand's dairy farmers. All dairy farmers who produce milk from cows that is supplied to a dairy company pay a levy, which is used for industry good activities. Industry good activity has been defined as an activity which is financially beneficial to New Zealand dairy farmers, and would not be undertaken by individuals or groups of dairy farmers because either it is too expensive for them to do on their own or the benefits could not be captured by those making the investment. Mark and Measure is a farm business governance development program designed for dairy farmers and their consultants to attend together. It is presented by experienced DairyNZ staff, along with leading governance professionals including accountants, bankers, Institute of Directors and farmers who are practising good governance. Mark and Measure help farmers to increase profitability, run better businesses and reduce debt, which may help to alleviate their distress.

There are very busy periods of time on New Zealand dairy farms, but the normal workload on dairy farms is huge for many farmers and has been identified in other studies, for example Tipples (2007), as an issue. In 2006, 27% of dairy farm employees worked over 70 hours per week compared to the industrial norm of 40 hours per week (Tipples 2007). When the workload becomes too much and a farmer appoints a staff member, it could actually increase stress. From the findings, it is clear that exhaustion during 2011-12 and 2012-13 was a bigger issue than disengagement, as twice as many respondents were found to be in the high and very high exhaustion bands, compared to disengagement bands. The high prevalence of exhaustion is concerning and most likely linked to high workloads.

The dairy labour market is complex and has been changing considerably over the last three decades. In this regard Callister and Tipples (2010, p. 4) noted that, 'In particular there has been a widespread conversion from small, family-owned and managed farms that were traditionally characterised by high levels of self-employment to large-scale 'factory' style farms that are dependent upon non-family, mainly casualised, and partially seasonal labour who typically work long hours'. The extent of these conversions was significant; the average herd size has more than tripled in the last 30 seasons, and has increased by more than 120 cows in the last 10 seasons (New Zealand dairy statistics 2012). From 2008 to 2009, South Island cow numbers grew 13 percent to 2.1 million and South Island dairying is 'characterised by larger herd sizes (2620 herds milking 1,431,558 cows with an average herd size of 546 cows), higher production yield per cow and per hectare than in the North Island' (Tipples et al. 2010, p. 2). The large farms tend to be owned by corporations/equity partnerships and therefore cannot rely on traditional family labour supply sources. These conversions caused the industry to be 'plagued by issues of recruitment and retention of employees and its social sustainability has been in question' (Callister and Tipples 2010, p. 10, 18). Against this backdrop it is evident that many dairy farmers struggle with employment, staffing and farm staff issues. Getting suitable advice when appointing staff will help many farmers and receiving training and support in managing staff well may also help. Some people will never be good people managers regardless of how much training they receive and they need support in managing staff.

Time management has been studied since the 1880s (Harper and Mousa 2013) and it has been shown that time management behaviours moderate relations between stressors like role conflict, role overload, work-family conflict, and family-work conflict, and strain (Jex and Elacqua 1999). Very little, however, is known about how New Zealand dairy farmers spend their time on-farm and how much time is wasted because of issues like, for example, poor planning, bad habits or insufficient equipment. In this regard, Tipples (2007, p. 11), concluded that 'In academic and research terms further exploration of 'time' issues is essential'. Ergonomic designs and studies of dairy farm tools and sheds and how farmers spend their time will provide the necessary information to design better stress related intervention programmes for farmers.

Strenuous physical work, like on dairy farms, is a predictor of both exhaustion and disturbed sleep (Åkerstedt et al. 2002), while Bruce and Aloia (2006) indicated that disturbed sleep can have negative effects like impaired cognitive function on older adults. Disturbed sleep can also cause exhaustion which can then cause issues with decision-making. Harrison and Horne (2000, p. 239) for example indicated that 'there is indirect evidence of a greater willingness to take risks with increasing fatigue'. They concluded that there are several areas for concern in terms of the impacts of sleep deprivation on decision-making, which are also of relevance to dairy farming, like: lack of innovation, inflexibility of thought processes, over-reliance on previous

strategies, unwillingness to try out novel strategies and inability to deal with surprise and the unexpected. Disturbed sleep may be related to on-farm accidents and it certainly is related to poor decision-making in other occupations, as shown above.

Comparing our findings to national data, Paine et al. (2005, p. 22) found that 'approximately one-quarter [25%] of adults in New Zealand may suffer from a chronic sleep problem, highlighting insomnia as a major public health issue in New Zealand'. Our findings of 25% in 2011-12 and 27% in 2012-13 are therefore consistent with that of Paine et al. (2005).

On addressing the issue of sleep deprivation in the context of work performance, Harrison and Horne (2000, p. 247) said: 'Clearly, sleep is the best anodyne for the sleep-deprived decision maker. If the crisis persists, then this individual needs to be replaced temporarily by someone equally competent who has had adequate sleep'. This may be a solution in other contexts, but for many dairy farmers few replacements are available. Now that disturbed sleep has surfaced as an issue in the dairy industry it should be investigated further. This could perhaps be done at the pit stops.

It is a big challenge to identify and reach farmers who are in emotional trouble, i.e. experiencing depression, anxiety, comorbid depression and anxiety, or burnout. Identifying and getting information to those farmers who need it, and motivating them to change the behaviours that contribute towards their emotional unwellness, requires a team effort between different role players. This can be partly addressed by a pan-industry action plan like the Agriculture Sector Action Plan (Department of Labour 2013). This plan focuses on goals relating to four areas that feature most consistently in injuries and fatalities across the sector, or are seen as having wider effects on the health and safety of those making their livelihood in the industry.

DairyNZ's HR Toolkit (DairyNZ n.d.) is a valuable resource for farmers and the industry to use and they need to be encouraged to make use of it. It is valuable because it is a free internet downloadable resource that contains best practice recommendations for a wide range of staff management processes, from job analysis through to performance management, like examples and templates for a wide range of human resource topics including developing a HR strategy, where to start when employing people, finding the right person, getting people started on farm, keeping your team working, retaining and motivating staff, and managing conflict and ending employment.

There is a need to find integrated solutions for on-farm stress and emotional unwellness. The solutions that are being presented at the moment are relevant yet over-simplified, as they largely ignore on-farm systemic interactions and wider contexts. Farmers are, for example, encouraged to exercise and eat healthy diets, but this ignores the difficulties associated with implementing these recommendations on dairy farms due to odd hours of work and farmers' levels of fitness and ability to exercise. A research project for this is required to identify and develop farming contextualised tools and approaches to help farmers, for example, to make physical activity enjoyable, build activity into a daily on-farm routine, exercise with care and develop easy to use nutritional plans and recipes.

There has been a rapid growth of the New Zealand population in urban centres, but although the number of people living in rural NZ is growing, the proportion of the population living in rural NZ is falling (Trading Economics 2013); this effects the way central government sees rural NZ and the people living there. It is not currently focusing on farmer wellness as there are more needy clients, for example, clients living in the most deprived areas in New Zealand, like South Auckland, were 2.6 times more likely to be seen for mental health issues by government services, than clients living in the least deprived areas (Ministry of Health 2012), where most dairy farmers live.

However, the government has resources and systems available to support farmers and other people on farms when they are or become mentally unwell and experience mental illness, which, from our perspective is too late for what is required by the industry, which is farmers who are well and who can produce quality products. Access to these services is hard for many farmers because they are remote from them and time away from their farms is difficult to manage. The challenge is to get farmers to use the resources that are available. There are five major New Zealand farmer networks, i.e. Federated Farmers (Feds), NZ Young Farmers (NZYF), Dairy Women's Network (DWN), Rural Women NZ (RWNZ), and Rural Support Trusts (RSTs). They should work together to help farmers understand and manage the issues of and related to stress and burnout. They should also help farmers to address these issues through training and on-farm mentoring and assistance and encourage farmers to use existing resources. Policy

recommendations were made by Botha (2013) to these networks on collaboration. These recommendations cover the following topics:

- Organisational resource use efficiency
- Networking and collaborating with government and other health promotion organisations and initiatives to address mental illness stigmas through awareness raising and advocacy
- Supporting the development of and encouraging the use of farmer self-help strategies on-farm
- Enhancing capability in rural communities and the primary sector that will help with the early identification and management of potential farmer wellness issues
- Monitoring and evaluating the effectiveness of collaborative primary and secondary prevention activities
- Encouraging and supporting research that enhances the networks' understanding of the issues and solutions associated with stress and poor farmer mental health.

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