The impact of social, economic and environmental determinants on farmers' mental health – an international perspective

Peter Lundqvist

Abstract

This short version of a systematic literature review aims to provide an overview of research relevant to farmers' psychosocial work environment and mental health. It contains knowledge about challenges faced by farmers, their consequences in the forms of stress and risk of mental illness, and the capacity to deal with these challenges themselves or through various forms of support. Important aspects also include the occupation's health factors and opportunities for development that contribute to a good working environment. The research was limited to the period 2005–2021 and to countries that have similar production forms and conditions, including in Europe, North America (United States and Canada) and Australasia (Australia and New Zealand).

The results show that the health and safety risks identified in farmers' psychosocial work environment are workload, finances, climate change and weather conditions, crime, globalisation, laws and regulations, masculine norms and loneliness, isolation, and a lack of support. Issues involving poor mental health are generally more prevalent among farmers, especially older farmers, than in other occupational groups. Farmers have a higher incidence of depression and suicide attempts than other occupational groups, and mental illness among farmers has increased in recent years. Health factors in the psychosocial work environment of farmers are not as well studied as risk factors, with the identified health factors being: the bond felt by the farmer to the cultivated land, environmental and social responsibility, the ability to work, be outside, work physically and eat well, a good working and living environment, working with animals, a reasonable workload, self-motivation, social support and a sense of belonging, an income other than that from working on the farm, and the ability to work after the retirement age. Farmers' ability to withstand and recover from the stress they face in their occupational role (resilience) varied between individuals. Support from family, nature

Peter Lundqvist, Professor, Department of People and Society, Swedish University of Agricultural Sciences, Alnarp, Sweden.

and animals, and setting limits to work commitments, relaxing, or doing activities other than working also contributed to strengthening their resilience. Resilience is something that can be learned, which can be helpful for farmers. Farmers use different personal strategies to manage the stress they are exposed to (coping), and different coping strategies can also contribute to building farmers' resilience, which can involve planning, positive reappraisal (change in attitude to stressful events, humour and leisure) and getting help and support from others. Furthermore, acceptance can be used as a coping strategy. Negative strategies can involve avoidance, as well as blaming oneself or others. which may also involve suppressing emotions, avoiding problems, or consuming alcohol.

According to several studies, the fact that farmers seem to be less likely to search for and make use of resources and mental health services is due to a lack of regional resources and occupation-specific understanding of the target group. Farmers had the greatest confidence in, and were therefore most receptive to, information about mental health from doctors, as well as from their spouses/family members and friends. The wider agricultural community can contribute to social support, education and mentoring programmes for farmers with symptoms of stress and depression. Future suicide prevention efforts for farmers can also be carried out through education, training programmes and national campaigns.

Keywords: depression, workload, promoting health, farmer, work-life balance, stress, social support, mental health.

Introduction

The struggles that farmers have to deal with regarding health and safety on their farms are well known and well documented[1]. The main focus of research has been on fatal and non-fatal injuries, as agriculture is among the sectors with the highest levels of occupational injuries[2]. There have also been several intervention programmes and strategies to reduce the number of injuries, such as the "Safe Farmers Common

1. K.J. Donham, A. Thelin, *Agricultural medicine: Rural occupational and environmental health, safety, and prevention*, John Wiley & Sons 2016.
2. S. Pinzke, C. Alwall Svennefelt, P. Lundqvist, *Occupational injuries in Swedish agriculture: development and preventive actions*, "Journal of Agricultural Safety and Health" 2018, Vol. 23(4), p. 355–373, DOI:10.13031/jash.12816; A. Jones, M. Jakob, J. McNamara, *Review of the future of agriculture and occupational safety and health (OSH): Foresight on new and emerging risks in OSH*, European Agency for Safety and Health at Work, European Risk Observatory Report, Bilbao 2020, Spain, DOI:10.2802/769257.

Sense" in Sweden[3], the Vision Zero Strategy for Agriculture[4] by ISSA Agriculture in 2019, and the EU-funded Sacurima project[5].

When it comes to psychosocial working conditions, stress and mental health among farmers, there has been far less focus within farmer organisations, among researchers or within intervention programmes. In order to form a knowledge base for future actions in Sweden, an international literature review was implemented, focusing on studies from countries with similar agriculture to that carried out in Europe, North America (the United States and Canada) and Australasia (Australia and New Zealand).

The questions raised for this study were:

- What are the health and safety risks and health factors in farmers' psychosocial work environment, and what consequences do they have on mental health?
- How can farmers' psychosocial work environment and mental health be promoted (by society, the industry/colleagues/family, and in their own actions)?

Method

A systematic literature review was based on scientific articles that were peer reviewed and published in English between 2005 and 2021. Two sample searches were conducted, one in the Web of Science and one in the Social Science Citation Index, and the searches were then conducted in the Social Science Citation Index, Scopus, Pub Med and Google Scholar. After concluding the research process, this systematic literature review was finally based on 108 articles, but only a selection of the most important studies is presented in this paper[6]. In order to read the full study, please see: Swedish Agency for Work Environment Expertise (2022).

3. C. Alwall Svennefelt, P. Lundqvist, *Safe Farmer Common Sense' – A National Five-Year Education-Based Program for Prevention of Occupational Injuries in Swedish Agriculture-Background, Process, and Evaluation*, "Journal of Agromedicine" 2020, Vol. 25 (2), p. 221–230, https://www.tandfonline.com/doi/pdf/10.1080/1059924X.2019.1659203.
4. ISSA Agriculture, *Guide for individual farmers. Vision Zero Strategy for agriculture*, International Section of the International Social Security Association on Prevention in Agriculture 2019, http://visionzero.global/vision-zero-agricultural-sector, access 7.11.2024.
5. J. Leppälä, P. Griffin, J. McNamara et al., *Safety Culture and Risk Management in Agriculture: Sacurima Cost Action CA16123 Highlights and Conclusions*, "Natural resources and bioeconomy studies" 2021, Vol. 63, Natural Resources Institute Finland, Helsinki 2021, https://jukuri.luke.fi/handle/10024/547926.
6. In order to read the full study, please see: Swedish Agency for Work Environment Expertise (SAWEE), *Farmers' psychosocial work environment and mental health, Swedish Agency for Work Environment Expertise*, "Systematic literature review" 2022, Vol. 8, Gävle, https://media.sawee.se/2023/03/Farmers_psychosocial_work-environment_and_mental_health_digital.pdf.

Results

Most of the studies in this literature review came from Australia (35), the United States (26 studies) or Canada (7), with only a few studies from Europe and only 13 publications from the Nordic countries.

Risk factors for farmer stress and mental health

The main risk factors for farmer stress and mental health in this review are: workload, finances, climate change and weather conditions, crime, globalisation, laws and regulations, masculine norms, as well as loneliness, isolation and lack of support.

Workload

A study among dairy farmers in Australia showed that those farmers had extremely high levels of poor mental health, and that this could be linked, among other issues, to the workload on the farm[7]. Feeling pressed for time was also one of the most concerning stressors for Australian farmers[8], American farmers[9], and farmers in an international study[10]. Strain related to workload and animal health were associated with symptoms of stress and fatigue[11]. A study on stressors among farmers in New Zealand found that increased workload during the peak season was one of the main stressors[12].

7. A. Wallis, M.F. Dollard, *Local and global factors in work stress: The Australian dairy farming examplar*, "Scandinavian Journal of Work Environment & Health" 2008, p. 66–74, Retrieved from <Go to ISI>://WOS:000259091900009.
8. C.J. McShane, F. Quirk, *Mediating and moderating effects of work–home interference upon farm stresses and psychological distress*, "The Australian Journal of Rural Health" 2009, Vol. 17(5), p. 244–250, DOI:10.1111/j.1440–1584.2009.01085.x.
9. J.M. Rudolphi, R.L. Berg, A. Parsaik, *Depression, anxiety and stress among young farmers and ranchers: A pilot study*, "Community Mental Health Journal" 2020, Vol. 56(1), p. 126–134, DOI:10.1007/s10597–019–00480-y.
10. C. Lunner-Kolstrup, M. Kallioniemi, P. Lundqvist et al., *International perspectives on psychosocial working conditions, mental health, and stress of dairy farm operators*, "Journal of Agromedicine" 2013, Vol. 18(3), p. 244–255, DOI:10.1080/1059924x.2013.796903.
11. M.K. Kallioniemi, A.J. Simola, H.R. Kymäläinen et al., *Stress among Finnish farm entrepreneurs*, "Annals of Agricultural & Environmental Medicine" 2008, Vol. 15(2), p. 243–249.
12. H.M. Firth, S.M. Williams, G.P. Herbison et al., *Stress in New Zealand farmers*, "Stress and Health" 2007, Vol. 23(1), p. 51–58, DOI:10.1002/smi.1119.

Finances and financial difficulties

The production processes of an agricultural business have unique conditions to take into account, for example when analysing the financial situation. Many production processes are long – you sow in autumn and thresh a year later, and the weather determines how good the harvests will be, which also affects livestock production on the farm. In order to achieve the desired production level, additional input is required, such as fertilisers and sometimes also chemical pesticides and diesel. The conclusion to be drawn is that being a farmer is financially risky and uncertain. W. Heo[13] et al. show that financial stress reduced life satisfaction among farmers in the United States, while L.F. LaBrasch[14] et al. examine the relationship between the number of hours of sleep and financial concerns among farmers in Canada. The results show that farmers lost a lot of sleep, especially during work-intensive periods (the dividing line was set to less than six hours of sleep per night). However, it could not be clarified whether financial concerns resulted in sleep deprivation or whether sleep deprivation impacted the financial concerns.

A study among dairy farmers in Australia shows that farmers there had extremely high levels of poor mental health, which could be linked, among other things, to the financial situation of farming[15]. A poor financial situation was also a stressor among Finnish[16], Canadian[17] and younger American farmers[18], and another study from the United States shows that financial concerns affect the health and well-being of farmers[19]. Farmers feel that local banks and other lenders in the United States are not as willing to provide loans or credit as in the past[20]. A study of stressors among

13. W. Heo, J.M. Lee, N. Park, *Financial-related psychological factors affect the life satisfaction of farmers*, "Journal of Rural Studies" 2020, Vol. 80, p. 185–194.
14. L.F. LaBrasch, P. Pahwa, W. Pickett et al., *Relationship between sleep loss and economic worry among farmers: A survery of 94 active Saskatchewan noncorporate farms*, "Journal of Agromedicine" 2008, Vol. 13(3), p. 149–154, DOI:10.1080/10599240802371862.
15. A. Wallis, M.F. Dollard, *Local and global factors in work stress: The Australian dairy farming examplar*, "Scandinavian Journal of Work Environment & Health" 2008, p. 66–74, Retrieved from <Go to ISI>://WOS:000259091900009.
16. M.K. Kallioniemi, A. Simola, J. Kaseva et al., *Stress and Burnout Among Finnish Dairy Farmers*, "Journal of Agromedicine" 2016, Vol. 21(3), p. 259–268, DOI:10.1080/1059924x.2016.1178611.
17. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.
18. J.M. Rudolphi, R.L. Berg, A. Parsaik, *Depression, anxiety and stress among young farmers and ranchers: A pilot study*, "Community Mental Health Journal" 2020, Vol. 56(1), p. 126–134, DOI:10.1007/s10597–019–00480-y.
19. W. Heo, J.M. Lee, N. Park, *Financial-related psychological factors affect the life satisfaction of farmers*, "Journal of Rural Studies" 2020, Vol. 80, p. 185–194.
20. M.S. Jones, D.B. Reed, M.L. Hunt, *Suicide: An unrecognised epidemic among farmers*, "Workplace Health & Safety" 2018, Vol. 66(9), p. 464–464, DOI:10.1177/2165079918784055.

New Zealand farmers found that one of the events that caused the most stress was if the farm had not made a profit in the past year[21], while a study from Norway showed that the level of income from agriculture was more strongly associated with financial worries and poor mental health when a large proportion of the total household income was derived from agriculture[22]. A qualitative study of farmers in Australia shows that farmers may leave the occupation if it is not financially viable, and if the financial stress becomes too great. This is usually a difficult decision, as there is enormous pressure from the combined forces of the traditional nature of being a farmer, family expectations and the culture they belong to[23].

Climate change and weather conditions

Climate change, which leads to conditions such as droughts and floods, directly affects farmers. Studies have shown that droughts lead to uncertainty about the future, financial problems, small harvests and increased need for labour input from farmers, as well as worries and anxiety[24]. A literature review also showed that external factors, such as weather, were an additional stress factor[25]. A study from Australia, in which farmers were interviewed regarding their views on how climate change might affect

21. H.M. Firth, S.M. Williams, G.P. Herbison et al., *Stress in New Zealand farmers*, "Stress and Health" 2007, Vol. 23(1), p. 51–58, DOI:10.1002/smi.1119.
22. B. Logstein, *Farm-related concerns and mental health status among Norwegian farmers*, "Journal of Agromedicine" 2016a, Vol. 21(4), p. 316–326, DOI:10.1080/1059924x.2016.1211055.
23. L. Bryant, B. Garnham, *Farming exit and ascriptions of blame: The ordinary ethics of farming communities*, "Journal of Rural Studies" 2018, Vol. 62, p. 62–67, DOI:10.1016/j.jrurstud.2018.07.004.
24. E.K. Austin, T. Handley, A.S. Kiem et al., *Drought-related stress among farmers: findings from the Australian Rural Mental Health Study*, "Medical Journal of Australia" 2018, Vol. 209(4), p. 159–165, DOI:10.5694/mja17.01200; B. Edwards, M. Gray, B. Hunter, *The impact of drought on mental health in rural and regional Australia*, "Social Indicators Research" 2015, Vol. 121(1), p. 177–194, DOI:10.1007/s11205–014–0638–2; K.M. Fennell, C.E. Jarrett, L.J. Kettler et al., *"Watching the bank balance build up then blow away and the rain clouds do the same": A thematic analysis of South Australian farmers' sources of stress during drought*, "Journal of Rural Studies" 2016, Vol. 46, p. 102–110, DOI:10.1016/j.jrurstud.2016.05.005; K.M. Gunn, D.A. Turnbull, J. Dollman et al., *Why are some drought-affected farmers less distressed than others? The association between stress, psychological distress, acceptance, behavioural disengagement and neuroticism*, "Australian Journal of Rural Health" 2021, Vol. 29(1), p. 106–116, DOI:10.1111/ajr.12695; I.C. Hanigan, J. Schirmer, T. Niyonsenga, *Drought and Distress in Southeastern Australia*, "Ecohealth" 2018, Vol. 15(3), p. 642–655, DOI:10.1007/s10393–018–1339–0; J.D. Polain, H.L. Berry, J.O. Hoskin, *Rapid change, climate adversity and the next 'big dry': Older farmers' mental health*, "Australian Journal of Rural Health" 2011, Vol. 19(5), p. 239–243; S. Odabasi, V. Hartarska, *Farmer suicides: Effects of socio-economic, climate, and mental health factors*, "Journal of Mental Health Policy and Economics" 2021, Vol. 24(2), p. 61–71, Retrieved from <Go to ISI>://WOS:000661254400003.
25. C. Lunner-Kolstrup, P. Lundqvist, *Lantbrukets & landsbygdens psykosociala puls. Screening av psykosociala arbetsförhållanden, psykisk hälsa och sociala nätverk bland lantbrukare och landsbygdsföretagare. Sveriges lantbruksuniversitet. Fakulteten för land¬skapsarkitektur, trädgårds- och växtproduktionsvetenskap*, LTJ Rapport 2013:20, Alnarp 2013, https://pub.epsilon.slu.se/10578/.

the agricultural sector, showed that the concern was significant for everyone[26]. They worried about the climate and what the weather will be like in the future, which led to their identity as farmers being negatively affected and to increased worries and anxiety. In summary, this study showed that there was a connection between human health and the well-being of ecosystems, and that this connection was especially apparent for people living in rural areas.

Worrying about the weather[27], bad weather[28] and weather-related crop damage[29] can all affect farmers' mental health. D. Hossain[30] et al. identified key areas affecting the mental health of farmers in Queensland, and one of the primary factors that contributed to poor mental health was drought. A larger study in Australia on the impact of drought on people living in rural areas showed that drought has negative effects on mental health and that those most affected were farmers[31]. The study showed that the more severe the impact of drought on agriculture, the greater the impact on mental health. Farmers who reported that drought had led to total crop failure or drastically reduced their farm's productivity had significantly higher rates of mental health problems. An important factor in this context is financial, such as the price levels of input goods and costs incurred when machines break down. Studies regarding the impact of drought periods on the mental health of farmers have been carried out almost exclusively in Australia, and a study on the relationship between drought periods and suicide among agricultural farmers showed that the risk of suicide among men increased with worsening drought[32].

26. N.R. Ellis, G.A. Albrecht, *Climate change threats to family farmers' sense of place and mental wellbeing: A case study from the western Australian wheatbelt*, "Social Science & Medicine" 2017, Vol. 175, p. 161–168, DOI:10.1016/j.socscimed.2017.01.00937.
27. G.D. Kearney, A.P. Rafferty, L.R. Hendricks et al., *A cross-sectional study of stressors among farmers in eastern North Carolina*, "North Carolina Medical Journal" 2014, Vol. 75(6), p. 384–392, DOI:10.18043/ncm.75.6.384.
28. H.M. Firth, S.M. Williams, G.P. Herbison et al., *Stress in New Zealand farmers*, "Stress and Health" 2007, Vol. 23(1), p. 51–58, DOI:10.1002/smi.1119.
29. M.S. Jones, D.B. Reed, M.L. Hunt, *Suicide: An unrecognised epidemic among farmers*, "Workplace Health & Safety" 2018, Vol. 66(9), p. 464–464, DOI:10.1177/2165079918784055.
30. D. Hossain, R. Eley, J. Coutts et al., *Mental health of farmers in Southern Queensland: Issues and support*, "Australian Journal of Rural Health" 2008, Vol. 16(6), p. 343–348, DOI:10.1111/j.1440–1584.2008.01014.x.
31. B. Edwards, M. Gray, B. Hunter, *The impact of drought on mental health in rural and regional Australia*, "Social Indicators Research" 2015, Vol. 121(1), p. 177–194, DOI:10.1007/s11205–014–0638–2.
32. I.C. Hanigan, C.D. Butler, P.N. Kokic et al., *Suicide and drought in New South Wales, Australia, 1970–2007*, "Proceedings of the National Academy of Sciences of the United States of America" 2012, Vol. 109(35), p. 13950–13955, DOI:10.1073/pnas.111296510938.

Crime

A growing problem in the agricultural sector as reported in the United Kingdom is that farmers are subjected to crime. In step with the increasingly common use of expensive technical aids, such as GPS equipment, machinery and vehicles, so too is crime becoming more common on farms[33]. The same study also showed that crime involving a farm contributes to psychological stress for the farmer.

Globalization, laws and regulations

Farmers are exposed to stressors that are beyond their control, such as unstable markets, changing government regulations, a shrinking labour supply, increasing production costs, changing international politics and changing markets[34]. In a study among dairy farmers in Finland, it was highlighted that the most common stress factors were external, such as the EU's agricultural policy. A study of dairy farmers in Australia[35] showed that these farmers had extremely elevated levels of mental illness, which could be linked to issues such as globalisation, with its transition from national regulation to a pure market economy. Farmers who once experienced independence must now devote a great deal of time to administration and documenting their cultivation and animal husbandry to demonstrate accountability to various authorities, according to a study from the United States[36]. D. Hossain[37] et al. identified key areas affecting mental health among farmers in Queensland by conducting a series of focus groups with farmers, organisations with ties to the agricultural sector and medical professionals. The results showed that the increasing burden of laws and regulations affected the mental health of farmers.

33. K. Smith, *Desolation in the countryside: How agricultural crime impacts the mental health of British farmers*, "Journal of Rural Studies" 2020, Vol. 80, p. 522–531, DOI:10.1016/j.jrurstud.2020.10.037.
34. A. Jones-Bitton, C. Best, J. MacTavish et al., *Stress, anxiety, depression, and resilience in Canadian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2020, Vol. 55(2), p. 229–236, DOI:10.1007/s00127–019–01738–2.
35. A. Wallis, M.F. Dollard, *Local and global factors in work stress: The Australian dairy farming examplar*, "Scandinavian Journal of Work Environment & Health" 2008, p. 66–74, Retrieved from <Go to ISI>://WOS:000259091900009.
36. M.S. Jones, D.B. Reed, M.L. Hunt, *Suicide: An unrecognised epidemic among farmers*, "Workplace Health & Safety" 2018, Vol. 66(9), p. 464–464, DOI:10.1177/2165079918784055.
37. D. Hossain, R. Eley, J. Coutts et al., *Mental health of farmers in Southern Queensland: Issues and support*, "Australian Journal of Rural Health" 2008, Vol. 16(6), p. 343–348, DOI:10.1111/j.1440–1584.2008.01014.x.

Masculine norms and gender differences

In interviews with mostly male Australian farmers, it emerged that the masculine identity of farmers, which was characterised by pride, was about to change and be replaced by an identity characterised more by shame, and that this identity shift was important in understanding how suicide could be seen as a possible way out for farmers. For example, when the viability of the farm was threatened and under financial pressure, farmers experienced shame that they had a bad reputation, and that their masculine identity was threatened, which caused poor mental health and sometimes led to suicide[38].

Female farmers in Canada feel more stressed than males[39]. The female farmers in that study described how they still felt like women in a man's world, which meant they had to work harder to prove they could manage the job, which led to increased stress. They also felt undervalued in the network of farmers they were a part of, due to constant comparisons being made between the farmers' businesses, creating a feeling of being constantly monitored and judged by other farmers. Female farmers also felt stressed by the fact that in addition to being a farmer, they had other roles, such as a mother or wife, and were in charge of their household, and that they needed to balance the demands of all their roles[40].

Loneliness, isolation and a lack of support

Among networks of farmers, there was a clear understanding of what it means to be a good farmer, which can lead to feelings of pride and joy, but if they or others were perceived as being bad farmers, this could lead to stress, as shown in studies from Australia[41]. According to another study from Australia, farmers felt that the communities to which they belonged were rather closed, making it difficult to allow outsiders in and difficult to leave[42].

The family is part of a farmer's network. In the past, there were often several generations living close to each other involved in farming, but it has become more

38. L. Bryant, B. Garnham B., *The fallen hero: Masculinity, shame and farmer suicide in Australia*, "Gender Place and Culture" 2015, Vol. 22(1), p. 67–82, DOI:10.1080/0966369x.2013.855628.
39. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.
40. Ibidem.
41. L. Bryant, B. Garnham, *Farming exit and ascriptions of blame: The ordinary ethics of farming communities*, "Journal of Rural Studies" 2018, Vol. 62, p. 62–67, DOI:10.1016/j.jrurstud.2018.07.004.
42. F. Judd, H. Jackson, C. Frase et al., *Understanding suicide in Australian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2006, Vol. 41(1), p. 1–10, DOI:10.1007/s00127–005–0007–1.

common to work alone in Western Europe and for the partner, usually the woman, to work outside the farm, which has also contributed to feelings of isolation[43]. Working together with family can also increase stress when farmers have no outlet other than their own family members, according to a study from Canada[44]. Farmers who were not satisfied with the support they received from their family felt more stressed than those who felt satisfied with their support, and stress increased when it was not obvious who would take over the farm[45].

According to an international research overview, there have been structural changes to the countryside and in agriculture, which means that there are now fewer farmers and more non-farmers, while natural gathering places and opportunities for support in everyday life have disappeared; this has contributed to an increase in the level of stress among the remaining farmers[46]. In Australia, long working days have also resulted in farmers lacking the time and energy for social contact[47]. According to an Irish qualitative study, isolation, with increasingly fewer social contacts, was a major problem especially for farmers who were single or elderly, and therefore more vulnerable. This could lead to having no one to talk to or get relief from when it came to problems, which in turn could make them blame themselves and feel bad, which was due, among other things, to a lack of natural gathering places[48]. The lack of services such as police, fire brigade and primary care was emphasised: having to travel long distances for services such as seeing a doctor reinforced feelings of isolation and lack of support. Being geographically isolated and far from health care and emergency services led to a sense of anxiety and vulnerability[49].

43. S. Shortall, *Farming, identity and well-being: Managing changing gender roles within Western European farm families*, "Anthropological Notebooks" 2014, Vol. 20(3).
44. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.
45. M.K. Kallioniemi, A.J. Simola, H.R. Kymäläinen et al., *Stress among Finnish farm entrepreneurs*, „Annals of Agricultural & Environmental Medicine" 2008, Vol. 15(2), p. 243–249; G.D. Kearney, A.P. Rafferty, L.R. Hendricks et al., *A cross-sectional study of stressors among farmers in eastern North Carolina*, "North Carolina Medical Journal" 2014, Vol. 75(6), p. 384–392, DOI:10.18043/ncm.75.6.384; D. Peel, H.L. Berry, J. Schirmer, *Farm exit intention and wellbeing: A study of Australian farmers*, "Journal of Rural Studies" 2016, Vol. 47, p. 41–51, DOI:10.1016/j.jrurstud.2016.07.006; J.M. Sprung, *Economic stress, family distress, and work-family conflict among farm couples*, "Journal of Agromedicine" 2021, Vol. 27(2), p. 1–15.
46. O. Stark, J. Falkowski, *On structural change, the social stress of a farming population, and the political economy of farm support*, "Economics of Transition" 2019, Vol. 27(1), p. 201–222, DOI:10.1111/ecot.12192.
47. D. Hossain, R. Eley, J. Coutts et al., *Mental health of farmers in Southern Queensland: Issues and support*, "Australian Journal of Rural Health" 2008, Vol. 16(6), p. 343–348, DOI:10.1111/j.1440–1584.2008.01014.x.
48. C. Hammersley, N. Richardson, D. Meredith et al., *„That's me I am the farmer of the land": Exploring identities, masculinities, and health among male farmers in Ireland*, "American Journal of Men's Health" 2021, Vol. 15(4), 15579883211035241, DOI:10.1177/15579883211035241.
49. Ibidem.

Age, being separated or divorced[50], and dissatisfaction with perceived support from their family and the industry[51] contributed to poorer mental health in farmers, with loneliness[52] and increased isolation[53] also negatively affecting mental health. Single farmers in France who had inherited their farms tended to suffer more from anxiety and worrying[54]. A Finnish study found that one in three farmers had symptoms of stress, and that problems with social relationships in the family, lack of mental support and help from a partner, divorce, and lack of mental support from neighbours and other people were most clearly linked to stress[55].

Poor mental health among farmers

Mental health problems are generally higher among farmers, especially among older farmers, than other occupations. Depression and suicide attempts occur more often among farmers than other comparable occupational groups, such as entrepreneurs and self-employed, and poor mental health among farmers has been on the rise in recent years.

The studies presented above show that the combination of many different health and safety risks in the work environment of farmers is related to poor mental health among farmers. But what does poor mental health among farmers look like when compared to other occupational groups? Research from the United Kingdom and Finland suggests that the mental health of farmers and their partners was significantly

50. H.M. Firth, S.M. Williams, G.P. Herbison et al., *Stress in New Zealand farmers*, "Stress and Health" 2007, Vol. 23(1), p. 51–58, DOI:10.1002/smi.1119.
51. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.
52. M.K. Kallioniemi, A. Simola, J. Kaseva et al., *Stress and Burnout Among Finnish Dairy Farmers*, "Journal of Agromedicine" 2016, Vol. 21(3), p. 259–268, DOI:10.1080/1059924x.2016.1178611.
53. D. Hossain, R. Eley, J. Coutts et al., *Mental health of farmers in Southern Queensland: Issues and support*, "Australian Journal of Rural Health" 2008, Vol. 16(6), p. 343–348, DOI:10.1111/j.1440–1584.2008.01014.x.
54. L. Magnin, M. Chappuis, G. Normand. et al., *Health issues and mental distress in French active farmers: A quantitative and qualitative study*, "International Journal of Environmental & Agriculture Research" 2017, Vol. 3(9), p. 12–22.
55. M.K. Kallioniemi, A.J. Simola, H.R. Kymäläinen et al., *Stress among Finnish farm entrepreneurs*, "Annals of Agricultural & Environmental Medicine" 2008, Vol. 15(2), p. 243–249.

worse than that of the general population[56]. A study[57] conducted by M.O. Torske et al., comparing farmers in Norway with their siblings and people in other occupations also found that farmers were more often affected by depression and anxiety than those in other comparable occupational groups, or their siblings who did not work as farmers, which suggests that work in agriculture can affect mental health. In another study[58], M.O. Torske et al. found that the prevalence of symptoms of depression was higher in both male and female farmers compared to the general working population, while no difference emerged regarding anxiety. The differences between farmers and the general working population in the prevalence of depressive symptoms increased with age, and there was no difference in depressive symptoms between younger farmers (<39 years) and younger people in other occupations.

Farmers in the United States had increased rates of depression, anxiety and suicide risk[59] and suicide was a significant cause of death among farmers in Australia[60]. In Australia, one male farmer died by suicide every four days, a rate significantly higher than that of non-farmers and the general male population, making the mortality rate from suicide only slightly lower than the mortality rate of agricultural occupational accidents and representing a significant public health problem[61]. C. Vayro[62] et al. found that the suicide rate among farmers was approximately twice that of the general Australian population. Furthermore, it was shown to be less common in agriculture-related suicides to have had a diagnosed mental illness or to have received some form

56. B. Hounsome, R.T. Edwards, N. Hounsome et al., *Psychological morbidity of farmers and non-farming population: Results from a UK survey*, "Community Mental Health Journal" 2012, Vol. 48(4), p. 503–510; M.K. Kallioniemi, A. Simola, J. Kaseva et al., *Stress and Burnout Among Finnish Dairy Farmers*, "Journal of Agromedicine" 2016, Vol. 21(3), p. 259–268, DOI:10.1080/1059924x.2016.1178611.
57. M.O. Torske, B. Hilt, J.H. Bjorngaard et al., *Disability pension and symptoms of anxiety and depression: A prospective comparison of farmers and other occupational groups: The HUNT study, Norway*, "BMJ Open" 2015, Vol. 5(11), DOI:10.1136/bmjopen-2015–009114.
58. M.O. Torske, B. Hilt, D. Glasscock et al., *Anxiety and depression symptoms among farmers: The HUNT study, Norway*, "Journal of Agromedicine" 2016, Vol. 21(1), p. 24–33, DOI:10.1080/1059924x.2015.1106375.
59. A. Bjornestad, C. Cuthbertson, J. Hendricks, *An analysis of suicide risk factors among farmers in the Midwestern United States*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(7), DOI:10.3390/ijerph18073563.
60. S. McLaren, C. Challis, *Resilience among men farmers: The protective roles of social support and sense of belonging in the depression-suicidal ideation relation*, "Death Studies" 2009, Vol. 33(3), p. 262–276, DOI:10.1080/07481180802671985.
61. F. Judd, H. Jackson, C. Frase et al., *Understanding suicide in Australian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2006, Vol. 41(1), p. 1–10, DOI:10.1007/s00127–005–0007–1.
62. C. Vayro, C. Brownlow, M. Ireland et al., *"Don't… break down on Tuesday because the mental health services are only in town on Thursday": A qualitative study of service provision related barriers to, and facilitators of farmers' mental health help-seeking*, "Administration and Policy in Mental Health and Mental Health Services Research" 2021, Vol. 48(3), p. 514–527.

of mental health support before death. Researchers in Australia point out that the strain on farmers' mental health has increased in recent years[63].

Health factors among farmers

Health factors in the psychosocial work environment of farmers are not as well studied as risk factors. Among other aspects, the following health factors were included in the research: a connection between the farmer and the cultivated land, environmental and social responsibility, the ability to carry out the work, to be outside, to work physically, to eat well, a good working and living environment, to work with animals, a reasonable workload, self-motivation, social support and a sense of belonging, an income that does not come from working on the farm, and the ability to work after retirement age.

The connection between a farmer and the cultivated land, as well as taking both environmental and social responsibility were health factors that positively affected life as a farmer, according to a study from the United States[64]. According to American farmers, the ability to carry out the work was a health factor that was a prerequisite for the agricultural enterprise to flourish[65]. In another qualitative study from Australia, the farmers also perceived the ability to perform work on the farm as a health factor. Being a farmer means having a different lifestyle by being outside, doing physical work and eating well, and that, according to farmers, is a health factor[66].

Health factors for dairy farmers in Finland were family, working with cattle, healthy animals, a reasonable workload and sustainable finances[67]. Another study by the same authors highlighted factors that protected farmers from burnout, including a positive working and living environment, where people lived and worked close to nature and had great freedom and variety in their work[68]. A study of older female farmers in selected states in the United States showed that their involvement in agricultural

63. A. Hogan, E. Scarr, S. Lockie et al., *Ruptured identity of male farmers: Subjective crisis and the risk of suicide*, "Journal of Rural Social Sciences" 2012, Vol. 27(3), p. 6.
64. C. Brigance, F.S. Mas, V. Sanchez et al., *The mental health of the organic farmer: Psychosocial and contextual actors*, "Workplace Health & Safety" 2018, Vol. 66(12), p. 606–616, DOI:10.1177/216507991878321136.
65. M. Bondy, D.C. Cole, *Striving for balance and resilience: Ontario farmers' perceptions of mental health*, „Canadian Journal of Community Mental Health" 2020, DOI:10.7870/cjcmh-2020–007.
66. Ibidem.
67. M.K. Kallioniemi, J. Kaseva, C. Lunner-Kolstrup et al., *Job resources and work engagement among Finnish dairy farmers*, "Journal of Agromedicine" 2018, Vol. 23(3), p. 249–261, DOI:10.1080/10599 24x.2018.1470047.
68. M.K. Kallioniemi, A. Simola, J. Kaseva et al., *Stress and Burnout Among Finnish Dairy Farmers*, "Journal of Agromedicine" 2016, Vol. 21(3), p. 259–268, DOI:10.1080/1059924x.2016.1178611.

work increased life satisfaction and reduced the risk of depression[69]. Furthermore, the results showed that working on a farm, as well as the culture of family farming, where the family lives, and living and working together on a farm, affected the general well-being of female farmers.

Participating in social activities positively affected life as a farmer, according to a study from the United States[70]. A study of Australian farmers showed that increased social support and an increased sense of belonging reduced the risk of suicide[71]. An American study of farmers showed that there was a negative relationship between support from friends and family and depression: the better the support, the lower the degree of depression[72], and a study on burnout among farmers in Canada demonstrated the positive effect of support from partners, friends and colleagues[73]. Having close friends and participating in various groups outside the farm positively affects the mental health of 25 farmers, as demonstrated in several studies[74]. In addition to friends and family members, having social contact with representatives of society – such as civil servants and politicians – play an important role[75]. In a study of male farmers in Norway[76], B. Logstein et al. found that good social relationships and reasonable work demands were associated with good mental health.

69. C.D. Witt, D.B. Reed, M.K. Rayens et al., *Predictors of job satisfaction in female farmers aged 50 and over: Implications for occupational health nurses*, "Workplace Health and Safety" 2020, Vol. 68(11), p. 526–532, DOI:10.1177/2165079920931895.
70. C. Brigance, F.S. Mas, V. Sanchez et al., *The mental health of the organic farmer: Psychosocial and contextual actors*, "Workplace Health & Safety" 2018, Vol. 66(12), p. 606–616, DOI:10.1177/216507991878321136.
71. S. McLaren, C. Challis, *Resilience among men farmers: The protective roles of social support and sense of belonging in the depression-suicidal ideation relation*, "Death Studies" 2009, Vol. 33(3), p. 262–276, DOI:10.1080/07481180802671985.
72. A. Bjornestad, L. Brown, L. Weidauer, *The relationship between social support and depressive symptoms in Midwestern farmers*, "Journal of Rural Mental Health" 2019, Vol. 43(4), p. 109–117.
73. A. Jones-Bitton, B. Hagen, S.J. Fleming et al., *Farmer burnout in Canada*, "International Journal of Environmental Research and Public Health" 2019, Vol. 16(24), DOI:10.3390/ijerph16245074.
74. B. Logstein, *Predictors of mental complaints among Norwegian male farmers*, "Occupational Medicine-Oxford" 2016b, Vol. 66(4), p. 332–337, DOI:10.1093/occmed/kqw019; T.A. Rawolle, D. Sadauskas, G. van Kessel et al., *Farmers' perceptions of health in the Riverland region of South Australia: 'If it's broke, fix it'*, "Australian Journal of Rural Health" 2016, Vol. 24(5), p. 312–316; H.J. Stain, B. Kelly, T.J. Lewin et al., *Social networks and mental health among a farming population*, "Social Psychiatry and Psychiatric Epidemiology" 2008, Vol. 43(10), p. 843–849, DOI:10.1007/s00127–008–0374–5; P.J. Tinc, J.A. Sorensen, *Stakeholders Team up for Action in New York Dairy (STAND): A collaborative action-planning workshop to combat toxic stress among New York dairy farmers*, "Journal of Agromedicine" 2020, Vol. 25(1), p. 122–125, DOI:10.1080/1059924x.2019.165920243.
75. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366; H.J. Stain, B. Kelly, T.J. Lewin et al., *Social networks and mental health among a farming population*, "Social Psychiatry and Psychiatric Epidemiology" 2008, Vol. 43(10), p. 843–849, DOI:10.1007/s00127–008–0374–5.
76. B. Logstein, *Predictors of mental complaints among Norwegian male farmers*, "Occupational Medicine-Oxford" 2016b, Vol. 66(4), p. 332–337, DOI:10.1093/occmed/kqw019.

In general, farmers in Australia found it easier to bring up practical problems than health problems, especially mental health issues[77]. They used their own networks to talk about problems by focusing on problem solving, rather than on their feelings about the problems. On the other hand, many farmers thought that their veterinarian was also a good person to talk to about their own health problems, as veterinarians have medical knowledge[78]. The participants in another study from Australia also described how their health was positively affected by community activities and social support from friends and families[79]. The family is part of a farmer's network and was highlighted as an important factor when it comes to social relations[80]. Family members could be discussion partners, pitch in with work on the farm, counteract feelings of loneliness and vulnerability, and make it possible to disconnect from agricultural operations and relax, according to Canadian studies[81]. Another health factor was when the family had an income that came from work outside the farm, according to Norwegian studies[82]. Farmers in Sweden also continue to work after retirement age to a much greater extent than the rest of the population, which can be seen as a health factor[83].

77. F. Judd, H. Jackson, C. Frase et al., *Understanding suicide in Australian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2006, Vol. 41(1), p. 1–10, DOI:10.1007/s00127–005–0007–1.
78. Ibidem.
79. T.A. Rawolle, D. Sadauskas, G. van Kessel et al., *Farmers' perceptions of health in the Riverland region of South Australia: 'If it's broke, fix it'*, "Australian Journal of Rural Health" 2016, Vol. 24(5), p. 312–316.
80. M.K. Kallioniemi, A.J. Simola, H.R. Kymäläinen et al., *Stress among Finnish farm entrepreneurs*, "Annals of Agricultural & Environmental Medicine" 2008, Vol. 15(2), p. 243–249; G.D. Kearney, A.P. Rafferty, L.R. Hendricks et al., *A cross-sectional study of stressors among farmers in eastern North Carolina*, "North Carolina Medical Journal" 2014, Vol. 75(6), p. 384–392, DOI:10.18043/ncm.75.6.384; O.E. Onwuameze, S. Paradiso, C. Peek-Asa et al., *Modifiable risk factors for depressed mood among farmers*, "Annals of Clinical Psychiatry" 2013, Vol. 25(2), p. 83–90; D. Peel, H.L. Berry, J. Schirmer, *Farm exit intention and well-being: A study of Australian farmers*, "Journal of Rural Studies" 2016, Vol. 47, p. 41–51, DOI:10.1016/j.jrurstud.2016.07.006; J.M. Sprung, *Economic stress, family distress, and work-family conflict among farm couples*, "Journal of Agromedicine" 2021, Vol. 27(2), p. 1–15.
81. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.
82. B. Logstein, *Farm-related concerns and mental health status among Norwegian farmers*, "Journal of Agromedicine" 2016a, Vol. 21(4), p. 316–326, DOI:10.1080/1059924x.2016.1211055.
83. A. Thelin, S. Holmberg, *Farmers and retirement: A longitudinal cohort study*, "Journal of Agromedicine" 2010, Vol. 15(1), p. 38–46.

Promotion and support of farmers' mental health

Farmers' strategies for promoting their own good health

One important consideration is how farmers themselves handle the stress they face in their working lives. The mental capability to cope with this is usually called resilience, which refers to the ability to withstand and recover from stress. A study in Canada showed that, on average, farmers showed poorer resilience than the general population[84]. Many of the stressors that farmers face are difficult or impossible to eliminate, but farmers with high resilience felt less stressed than those with low resilience. Farmers reported that support from their family, nature and animals helped build up their resilience. The fact that working on a farm felt meaningful, as well as setting limits to their work commitment and relaxing or doing other activities, also contributed to strengthening their resilience, according to another study from Canada[85]. A literature study on farmers' mental health found resilience as the most important health factor for farmers[86]. Resilience is something that can be learned, according to researchers from Australia, and doing so can be helpful for farmers[87].

The results of assorted studies also show that farmers use different personal strategies to manage the stress they are exposed to, which is usually referred to as coping, and different coping strategies can also contribute to building up farmers' resilience[88]. This can include planning (constructive solutions), positive reappraisal (change of

84. A. Jones-Bitton, C. Best, J. MacTavish et al., *Stress, anxiety, depression, and resilience in Canadian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2020, Vol. 55(2), p. 229–236, DOI:10.1007/s00127–019–01738–2.
85. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.
86. B.N.M. Hagen, A. Albright, J. Sergeant et al., *Research trends in farmers' mental health: A scoping review of mental health outcomes and interventions among farming populations worldwide*, "PLOS ONE" 2019, Vol. 14(12), DOI:10.1371/journal.pone.0225661.
87. J. Greenhill, D. King, A. Lane et al., *Understanding resilience in South Australian farm families. Rural Society*, "The Journal of Research Into Rural and Regional Social Issues in Australia and New Zealand" 2009, Vol. 19(4), p. 318–325.
88. B.N.M. Hagen, A. Sawatzky, S.L. Harper et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.

attitude towards stressful events), humour and leisure[89], getting perspective on events and getting help and support from others[90]. Furthermore, acceptance can be used as a coping strategy[91]. Other possibilities include work-related coping strategies, such as coping with active problem-solving and constructive thinking, social coping strategies, such as leisure activities and social support, as well as taking care of one's own health by taking proper breaks at work and sleeping well, according to researchers from New Zealand[92]. More negative coping strategies include avoidance (ignoring), as well as blaming oneself or others[93]. This can also involve suppressing emotions, avoiding problems or consuming alcohol[94], with risky alcohol consumption patterns found more often among farmers than non-farmers. Identified risk factors for risky alcohol consumption were: male sex, lower socio-economic status and psychological problems, for example depression, according to a literature review[95].

Another strategy farmers use to promote their own health is to try to achieve a work-life balance, which can be about taking breaks[96] and recovering in other ways[97]. According to researchers from Australia, it can also refer to being more than a farmer (involved in hobbies and sports and valuing other social roles, such as being active in the local community and being a parent), having opportunities put work

89. N. Garnefski, N. Baan, V. Kraaij, *Psychological distress and cognitive emotion regulation strategies among farmers who fell victim to the foot-and-mouth crisis*, "Personality and Individual Differences" 2005, Vol. 38(6), p. 1317–1327, DOI:10.1016/j.paid.2004.08.014; B. Greig, P. Nuthall, K. Old, *An analysis of farmers' human characteristics as drivers of their anxiety*, "Journal of Agromedicine" 2020, Vol. 25(1), p. 135–146, DOI:10.1080/1059924x.2019.1656692.
90. B. Greig, P. Nuthall, K. Old, *An analysis of farmers' human characteristics as drivers of their anxiety*, "Journal of Agromedicine" 2020, Vol. 25(1), p. 135–146, DOI:10.1080/1059924x.2019.1656692; P. Roy, G. Tremblay, S. Robertson, *Help-seeking among male farmers: Connecting masculinities and mental health*, "Sociologia Ruralis" 2014, Vol. 54(4), p. 460–476, DOI:10.1111/soru.12045.
91. B. Greig, P. Nuthall, K. Old, *An analysis of farmers' human characteristics as drivers of their anxiety*, "Journal of Agromedicine" 2020, Vol. 25(1), p. 135–146, DOI:10.1080/1059924x.2019.1656692; K.M. Gunn, D.A. Turnbull, J. Dollman et al., *Why are some drought-affected farmers less distressed than others? The association between stress, psychological distress, acceptance, behavioural disengagement and neuroticism*, "Australian Journal of Rural Health" 2021, Vol. 29(1), p. 106–116, DOI:10.1111/ajr.12695.
92. C.R. Kuriger, *Coping strategies that New Zealand dairy farmers use to combat stress*, University of Waikato 2016.
93. B. Greig, P. Nuthall, K. Old, *An analysis of farmers' human characteristics as drivers of their anxiety*, "Journal of Agromedicine" 2020, Vol. 25(1), p. 135–146. DOI:10.1080/1059924x.2019.1656692.
94. C.R. Kuriger, *Coping strategies that New Zealand dairy farmers use to combat stress*, University of Waikato 2016.
95. S. Watanabe-Galloway, C. Chasek, A.M. Yoder et al., *Substance use disorders in the farming population: Scoping review*, "Journal of Rural Health" 2022, Vol. 38(1), p. 129–150, DOI:10.1111/jrh.12575.
96. P. Roy, G. Tremblay, S. Robertson et al., *„Do it all by myself": A salutogenic approach of masculine health practice among farming men coping with stress*, "American Journal of Men's Health" 2017, Vol. 11(5), p. 1536–1546.
97. M. Bondy, D.C. Cole, *Striving for balance and resilience: Ontario farmers' perceptions of mental health*, "Canadian Journal of Community Mental Health" 2020, DOI:10.7870/cjcmh-2020–007.

aside (getting away from the farm and having time for children, family, friends and the local community), and taking care of oneself (exercise, personal time, and time with friends)[98]. Studies from Australia showed that male and female farmers coped with stress differently. Men could work and try to find solutions rather than becoming mired in negative thoughts and feelings. Female farmers could instead feel inadequate, sad, isolated and lonely[99].

Healthcare in order to improve farmers' health

One difficulty facing healthcare in promoting the health of farmers is that farmers take on physical and mental health challenges in the same way they take on the challenges on their farm. Many farmers see their health as they would a machine: it only needs to be fixed if it does not work, much like a tractor that breaks down and needs to be repaired[100]. According to studies from Australia, farmers do not want to admit when they are unwell, and there is also a sort of prevailing idea that farmers should manage everything themselves[101]. Farmers in Australia usually do not have someone to take over if they become ill or injured, and do not consider it possible to take time off to look after their health[102], and therefore wait to seek support until they can no longer work, or the end of close relationships leave them no other option but to ask for external help[103]. Another difficulty concerning healthcare is that farmers rarely seek healthcare for poor mental health, not least because of a lack of infrastructure[104].

98. J. Greenhill, D. King, A. Lane et al., *Understanding resilience in South Australian farm families. Rural Society*, "The Journal of Research Into Rural and Regional Social Issues in Australia and New Zealand" 2009, Vol. 19(4), p. 318–325.
99. F. Judd, H. Jackson, C. Frase et al., *Understanding suicide in Australian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2006, Vol. 41(1), p. 1–10, DOI:10.1007/s00127–005–0007–1.
100. T.A. Rawolle, D. Sadauskas, G. van Kessel et al., *Farmers' perceptions of health in the Riverland region of South Australia: 'If it's broke, fix it'*, "Australian Journal of Rural Health" 2016, Vol. 24(5), p. 312–316.
101. M. Bondy, D.C. Cole, *Striving for balance and resilience: Ontario farmers' perceptions of mental health*, "Canadian Journal of Community Mental Health" 2020, DOI:10.7870/cjcmh-2020–007; C. Vayro, C. Brownlow, M. Ireland et al., *'Farming is not just an occupation but a whole lifestyle': A qualitative examination of lifestyle and cultural factors affecting mental health help-seeking in Australian farmers*, "Sociologia Ruralis" 2020, Vol. 60(1), p. 151–173, DOI:10.1111/soru.12274.
102. F. Judd, H. Jackson, C. Frase et al., *Understanding suicide in Australian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2006, Vol. 41(1), p. 1–10, DOI:10.1007/s00127–005–0007–1.
103. S. McKenzie, G. Jenkin, S. Collings, *Men's perspectives of common mental health problems: A meta-synthesis of qualitative research*, "International Journal of Men's Health" 2016, Vol. 15(1), p. 80–104.
104. P. Roy, G. Tremblay, S. Robertson, *Help-seeking among male farmers: Connecting masculinities and mental health*, "Sociologia Ruralis" 2014, Vol. 54(4), p. 460–476, DOI:10.1111/soru.12045.

C. Vayro[105] et al. and L. Anderson[106] et al. highlighted the reluctance of farmers to seek support and talk about the stressors and difficulties they encountered in their daily lives, despite the relatively high rate of reported suicide. According to several studies, the fact that farmers seem to be less likely to seek out and use resources and services for mental illness is due to a lack of regional resources and occupation-specific knowledge of the target group. Motivation to seek help was also influenced by access, accessibility and the possibility of receiving support from the same person over time[107].

Both G.M. Sartore et al. and K. Kavalidou et al. emphasise[108] the importance of trained healthcare personnel with an understanding of the particular problems in agriculture, which can be an effective strategy to improve care systems and pathways to early intervention in rural areas, as well as providing relevant support for poor mental health. Similarly, in a study of German farmers[109], M. Stier-Jarmer et al. saw that they were in need of specifically tailored healthcare services with a bottom-up perspective, and a grounded understanding of all of the specific conditions and challenges that apply to their work. It was therefore important to have intervention efforts that are adapted to farmers in order to reflect the context of the lives of individual farmers to the greatest possible degree[110]. The results of an Australian study showed the importance of close contact between farmer and caregiver, in which farmers want their supporting person to understand life as a farmer[111].

105. C. Vayro, C. Brownlow, M. Ireland et al., *'Farming is not just an occupation but a whole lifestyle': A qualitative examination of lifestyle and cultural factors affecting mental health help-seeking in Australian farmers*, "Sociologia Ruralis" 2020, Vol. 60(1), p. 151–173, DOI:10.1111/soru.12274.
106. L. Anderson, Z. Gascho, N. Gentry et al., *Impact of stress management strategies and intervention on the mental health of farmers: A Critically Appraised Topic*, "Critically Appraised Topics" 2021, Vol. 38.
107. C. Vayro, C. Brownlow, M. Ireland et al., *'Farming is not just an occupation but a whole lifestyle': A qualitative examination of lifestyle and cultural factors affecting mental health help-seeking in Australian farmers*, "Sociologia Ruralis" 2020, Vol. 60(1), p. 151–173, DOI:10.1111/soru.12274; C. Vayro, C. Brownlow, M. Ireland et al., *"Don't… break down on Tuesday because the mental health services are only in town on Thursday": A qualitative study of service provision related barriers to, and facilitators of farmers' mental health help-seeking*, "Administration and Policy in Mental Health and Mental Health Services Research" 2021, Vol. 48(3), p. 514–527.
108. G.-M. Sartore, B. Kelly, H.J. Stain et al., *Improving mental health capacity in rural communities: Mental health first aid delivery in drought-affected rural New South Wales*, "Australian Journal of Rural Health" 2008, Vol. 16(5), p. 313–318; K. Kavalidou, S. McPhedran, D. De Leo, *Farmers' contact with health care services prior to suicide: Evidence for the role of general practitioners as an intervention point*, "Australian Journal of Primary Health" 2015, Vol. 21(1), p. 102–105.
109. M. Stier-Jarmer, C. Oberhauser, D. Frisch et al., *A multimodal stress-prevention program supplemented by telephone-coaching sessions to reduce perceived stress among German farmers: Results from a randomised controlled trial*, "International Journal of Environmental Research and Public Health" 2020, Vol. 17(24), DOI:10.3390/ijerph17249227.
110. A. Kennedy, C. Cosgrave, J. Macdonald et al., *Translating co-design from face-to-face to online: An Australian primary producer project conducted during COVID-19*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18, p. 4147.
111. G.-M. Sartore, B. Kelly, H.J. Stain, *Drought and its effect on mental health: How GPs can help*, "Australian Family Physician" 2007, Vol. 36(12).

Other ways of promoting farmers' health

Information: farmers had the greatest trust in and were thus most receptive to information about mental health from doctors, but also from their spouses/family members and friends. Among other information channels, farmers were interested in receiving information about mental health from agricultural magazines and via personal information, according to a study from the United States[112]. On the other hand, P.D. Elkind[113] claimed in a literature review that support given to farmers solely through information strategies is not enough, but that farmers also need support in developing good coping strategies.

Support, education and mentoring programmes: the agricultural movement can contribute to social support, education and mentoring programmes for farmers with stress and symptoms of depression, and an evaluation showed that such interventions reduced symptoms[114]. According to M. Perceval[115] et al., future suicide prevention efforts for farmers in Australia should take place through education, training programmes and national campaigns. Telephone coaching services proved to be an effective method for German farmers when it came to stress-related preventive measures[116]. Web-based interventions are not only facilitative during a pandemic, but also when working with limited resources or geographic constraints, as is common in Australia[117]. R.A. Schweitzer[118] et al. surveyed the resources available in the United States to support farmers with physical or mental disabilities and their families; the mapping showed that these are, for example, psychiatric clinics, patient organisations, support groups, treatment centres and brochures or websites

112. J.M. Rudolphi, R. Berg, B. Marlenga, *Who and how: Exploring the preferred senders and channels of mental health information for Wisconsin farmers*, "International Journal of Environmental Research and Public Health" 2019, Vol. 16(20), DOI:10.3390/ijerph16203836.
113. P.D. Elkind, *Perceptions of risk, stressors, and locus of control influence intentions to practice safety behaviors in agriculture*, "Journal of Agromedicine" 2007, Vol. 12(4), p. 7–25, DOI:10.1080/10599240801985167.
114. Y.N. Liang, K. Wang, B. Janssen et al., *Examination of symptoms of depression among cooperative dairy farmers*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(7), DOI:10.3390/ijerph18073657.
115. M. Perceval, K. Kolves, P. Reddy et al., *Farmer suicides: A qualitative study from Australia*, "Occupational Medicine-Oxford" 2017, Vol. 67(5), p. 383–388, DOI:10.1093/occmed/kqx055.
116. M. Stier-Jarmer, C. Oberhauser, D. Frisch et al., *A multimodal stress-prevention program supplemented by telephone-coaching sessions to reduce perceived stress among German farmers: Results from a randomised controlled trial*, "International Journal of Environmental Research and Public Health" 2020, Vol. 17(24), DOI:10.3390/ijerph17249227.
117. A. Kennedy, C. Cosgrave, J. Macdonald et al., *Translating co-design from face-to-face to online: An Australian primary producer project conducted during COVID-19*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18, p. 4147.
118. R.A. Schweitzer, G.R. Deboy, P.J. Jones et al., *AgrAbility mental/behavioural health for farm/ranch families with disabilities*, "Journal of Agromedicine" 2011, Vol. 16(2), p. 87–98, DOI:10.1080/1059924x.2011.554766.

with information. Knowledge of what support is available has also been disseminated to help raise awareness of the effects of poor mental and physical health on farmers with disabilities and their families, and to potentially reduce the stigma associated with these health issues. The intention of the mapping was also to improve the support for these groups in the long term, that is to develop routines for how referrals are written and to whom.

In an Australian study, agricultural advisers were trained in mental health first aid, with the aim being to give them the knowledge and tools to talk about psychological problems with their agricultural customers[119]. The training of volunteers in mental health first aid, which enabled them to provide advice and support to farmers experiencing poor mental health, was evaluated and found to be an effective early intervention strategy for farmers in Australia[120]. According to studies in Switzerland, it was also important to identify difficulties and problems for male farmers at an early stage and to offer support that would appeal to them by being adapted to their needs and preferences, and prevent suicide[121]. Courtney Cuthbertson[122] et al. highlighted that more traditional educational programmes for farmers in the United States could be beneficially expanded to also include mental health. Strengthening knowledge about mental health, including the warning signs of stress and suicide risk, can help farmers practice their communication skills and enable them to seek help when needed. American advisors working in farm-related services underwent a Farm Stress Training Programme, a web-based programme with the purpose of increasing the understanding of poor mental health in farmers[123]. The programme consisted of four modules focused on role-playing and a discussion of realistic scenarios involving vulnerable farmers and their families. Participants were taught to identify signs and symptoms of stress, identify warning signs of suicide, and plan what to do in the event of an emergency in which a farmer shows signs of poor mental health.

119. D. Hossain, D. Gorman, R. Eley et al., *Value of mental health first aid training of advisory and extension agents in supporting farmers in rural Queensland*, "Rural and Remote Health" 2010, Vol. 10(4), Retrieved from <Go to ISI>://WOS:000286342700028.
120. G.-M. Sartore, B. Kelly, H.J. Stain et al., *Improving mental health capacity in rural communities: Mental health first aid delivery in drought-affected rural New South Wales*, "Australian Journal of Rural Health" 2008, Vol. 16(5), p. 313–318.
121. N. Steck, C. Junker, M. Bopp et al., *Time trend of suicide in Swiss male farmers and comparison with other men: A cohort study*, "Swiss Medical Weekly" 2020, Vol. 150, DOI: 10.4414/smw.2020.20251.
122. C. Cuthbertson, C. Eschbach, G. Shelle, *Addressing farm stress through extension mental health literacy programs*, "Journal of Agromedicine" 2021, p. 1–8, DOI:10.1080/1059924x.2021.1950590.
123. C. Cuthbertson, A. Brennan, J. Shutske et al., *Developing and implementing farm stress training to address agricultural producers' mental health*, "Health Promotion Practice" 2020, Vol. 3(1), DOI:10.1177/1524839920931849.

Conclusion

The majority of the studies included in this systematic literature review are from Australia and North America, and to a lesser extent from various parts of Europe. However, valuable research from different parts of the world provides an important knowledge base for handling the psychosocial challenges that farmers in Europe face in their working environment, and which need to be taken into account by the relevant organisations, government authorities, researchers and politicians, which is discussed below.

The psychosocial work environment of farmers is affected by a wide range of external factors that farmers have limited opportunities to influence. Farmers in different countries find it stressful that they have little opportunity to influence the increasing globalisation and its impact on market prices for their products and increased production costs, not least for various inputs such as fuel, electricity, nitrogen fertilisers and feed. Climate change, namely droughts, floods and unpredictable weather, has become an ever-increasing risk factor as a source of stress experienced by farmers in large parts of the world.

Even the psychosocial work environment requirements that farmers have increased opportunities to influence can be risk factors, exerting immense pressure in the form of heavy workloads, especially during intensive periods. Swedish studies confirm that these risk factors can lead to a risky work environment and jobs that carry a risk of personal injury and ill health, as well as difficulty in finding competent personnel and the possibility of relief at work[124]. Farmers may also feel the personal responsibility to be successful in their occupation, to be good employers, not to fail, to carry on tradition if a farm has been in the family for several generations. For male farmers this can also be to live up to masculine standards, and for female farmers to suffer the consequences of masculine norms, not having time for family or opportunities to participate in social contexts. Farms can be geographically isolated, which can contribute to a feeling of loneliness. As farmers age, various health problems may also arise. Problems in relationships, divorce, as well as a lack of understanding and support from their family and colleagues can be additional risk factors for a stressed farmer. All of these aspects are just as relevant in Sweden as they are in the other countries relevant to the literature

124. C. Lunner-Kolstrup, P. Lundqvist, *Lantbrukets & landsbygdens psykosociala puls. Screening av psykosociala arbetsförhållanden, psykisk hälsa och sociala nätverk bland lantbrukare och landsbygdsföretagare. Sveriges lantbruksuniversitet. Fakulteten för land¬skapsarkitektur, trädgårds- och växtproduktionsvetenskap*, LTJ Rapport 2013:20, Alnarp 2013, https://pub.epsilon.slu.se/10578/; S. Pinzke, *Stress och trötthet som orsak till olycksfall inom jordbruket: En kunskaps-sammanställning. Sveriges lantbruksuniversitet, Fakulteten för landskapsarkitektur, träd¬gårds- och växtproduktionsvetenskap*, LTV Rapport 2018:6, Alnarp, https://pub.epsilon.slu.se/15739/.

review. A doctoral thesis by H. Nordström Källström[125] confirmed that loneliness and the deterioration of social services in rural Sweden negatively affect farmers' quality of life. These factors can contribute to leaving the farm and the occupation prematurely, and other factors that can influence farmers in that regard are financial problems or a lack of faith that their agricultural business has a future[126].

When combined with a heavy workload, external factors that are difficult to influence can lead to various forms and degrees of mental health issues, ranging from anxiety and stress-related symptoms to more severe anxiety, depression and, at worst, suicidal thoughts, attempted suicides or completed suicides. Studies related to suicide have mainly been carried out in Australia and North America, the majority of which pointed out that farmers were overrepresented in relation to suicide when compared to other population and occupational groups. No such studies have been published concerning Swedish farmers, but over the years there have been signals indicating that there may be similar problems in Sweden[127].

Several studies in this literature review have highlighted that male farmers especially lack the ability to talk about their feelings and mental health issues, and are reluctant to seek help. Instead, they employ a variety of positive or negative coping strategies to deal with the stress they are exposed to, which can include planning (constructive solutions), positive reevaluation, or acceptance. This may also involve work-related coping strategies, such as coping with active problem-solving and constructive thinking, or social coping strategies, such as leisure activities and social support, as well as taking care of one's own health by taking proper breaks at work and sleeping well. However, this could also involve negative reactions such as avoidance (ignoring), as well as blaming oneself or others, suppressing emotions or consuming alcohol.

Farmers who are better able to withstand stress and are doing well (resilience) see many healthy factors in their situation, including the farming lifestyle, living close to animals and nature, having self-determination (autonomy), but also exercise, hobbies, sports and other social roles, as well as spending time away from the farm and having time for children, family, friends and involvement in the local community. These factors are important for a sustainable working life and social sustainability.

125. H. Nordström Källström, *Mellan trivsel och ensamhet: Om sociala villkor i lantbruket. Sveriges lantbruksuniversitet*, "Acta Universitatis agriculturae Sueciae: doctoral thesis" 2008, Vol. 74, Uppsala 2008.
126. F. Hajdu, C. Eriksson, C. Waldenström et al., *Sveriges förändrade lantbruk: Lantbrukarnas egna röster om förändringar sedan 1990-talet och strategier inför framtiden. Sveriges lantbruksuniversitet*, SLU Future Food Reports 11, Uppsala 2020, https://www.slu.se/globalassets/ew/org/centrb/fufood/publikationer/future-food-reports/slu-fu-turefood_rapport_11.pdf.
127. Swedish Agency for Work Environment Expertise (SAWEE), *Farmers' psychosocial work environment and mental health, Swedish Agency for Work Environment Expertise*, "Systematic literature review" 2022, Vol. 8, Gävle, https://media.sawee.se/2023/03/Farmers_psychosocial_work-environment_and_mental_health_digital.pdf.

Farmers who cannot cope with pressure, stress and setbacks on their own need support and help. Several studies demonstrate the usefulness of various support measures in the form of training and information efforts, as well as telephone advice and support, but it has become clear that for farmers to make use of the various support measures, it is important that those who deliver them are credible people farmers can trust. In the cases where care is sought, it is important for staff to have an understanding of the specific conditions of agriculture. Support and assistance to farmers in various forms has been highlighted as an important area of development, which aligns with the increasing necessities within this sector.

The aspects of psychosocial work environments addressed in this literature review also align well with the review of the work environment in agriculture carried out by the European Agency for Health and Safety at Work (EU-OSHA)[128], whose report covers how new technology, climate change and other developments can affect farming in the future, what technical and organisational changes those developments can bring, and how this may affect the working environment for farmers and others who work in the sector. Some of the biggest challenges from a health and safety perspective concern: (1) new technology and the digitisation of agriculture (opportunities for improved work environments, but also the risk of increased stress); (2) the significance of climate change (increased risks of storms, droughts, floods and their consequences); and (3) effects of the development of the labour market (the persistent majority of self-employed farmers who are not covered by work environment legislation and are not inspected in the same way as companies with employees). The report also points out that farmers in Europe are at risk of continuing to be exposed to stress and psychosocial risks as a result of: financial pressure; increasing requirements regarding rules and administration; increasing demands from consumers and society on food production; increased negative criticism of agriculture and reduced appeal; the emergence of new public health problems and diseases in animals and plants; threats and violence from militant environmentalists and animal rights activists; as well as crime in rural areas.

In conclusion, it can be stated that this literature review shows that rural farmers in comparable countries face similar problems and challenges in terms of their psychosocial work environment and mental health. It can also be stated that there is a relatively large amount of knowledge about the problems in general, but that the focus has been to a lesser extent on preventive measures and on how different stakeholders can take action to support farmers.

128. A. Jones, M. Jakob, J. McNamara, *Review of the future of agriculture and occupational safety and health (OSH): Foresight on new and emerging risks in OSH*, European Agency for Safety and Health at Work, European Risk Observatory Report, Bilbao 2020, Spain, DOI:10.2802/769257.

Bibliography

Alwall Svennefelt C. & Lundqvist P., *Safe Farmer Common Sense' – A National Five-Year Education-Based Program for Prevention of Occupational Injuries in Swedish Agriculture-Background, Process, and Evaluation*, "Journal of Agromedicine" 2020, Vol. 25 (2), https://www.tandfonline.com/doi/pdf/10.1080/1059924X.2019.1659203.

Anderson L., Gascho Z., Gentry N. et al., *Impact of stress management strategies and intervention on the mental health of farmers: A Critically Appraised Topic*, "Critically Appraised Topics" 2021, Vol. 38.

Austin E.K., Handley T., Kiem A.S. et al., *Drought-related stress among farmers: findings from the Australian Rural Mental Health Study*, "Medical Journal of Australia" 2018, Vol. 209(4), DOI:10.5694/mja17.01200.

Bjornestad A., Brown L., Weidauer L., *The relationship between social support and depressive symptoms in Midwestern farmers*, "Journal of Rural Mental Health" 2019, Vol. 43 (4).

Bjornestad A., Cuthbertson C., Hendricks J., *An analysis of suicide risk factors among farmers in the Midwestern United States*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(7), DOI:10.3390/ijerph18073563.

Bondy M., Cole D.C., *Striving for balance and resilience: Ontario farmers' perceptions of mental health*, "Canadian Journal of Community Mental Health" 2020, DOI:10.7870/cjcmh-2020–007.

Brigance C., Mas F.S., Sanchez V. et al., *The mental health of the organic farmer: Psychosocial and contextual actors*, "Workplace Health & Safety" 2018, Vol. 66(12), DOI:10.1177/216507991878321136.

Bryant L., Garnham B., *The fallen hero: Masculinity, shame and farmer suicide in Australia*, "Gender Place and Culture" 2015, Vol. 22(1), DOI:10.1080/0966369x.2013.855628.

Bryant L., Garnham B., *Farming exit and ascriptions of blame: The ordinary ethics of farming communities*, "Journal of Rural Studies" 2018, Vol. 62, DOI:10.1016/j.jrurstud.2018.07.004.

Cuthbertson C., Brennan A., Shutske J. et al., *Developing and implementing farm stress training to address agricultural producers' mental health*, "Health Promotion Practice" 2020, Vol. 3(1), DOI:10.1177/1524839920931849.

Cuthbertson C., Eschbach C., Shelle G., *Addressing farm stress through extension mental health literacy programs*, "Journal of Agromedicine" 2021, DOI:10.1080/1059924x.2021.1950590.

Donham K.J., Thelin A., *Agricultural medicine: Rural occupational and environmental health, safety, and prevention*, John Wiley & Sons 2016.

Edwards B., Gray M., Hunter B., *The impact of drought on mental health in rural and regional Australia*, "Social Indicators Research" 2015, Vol. 121(1), DOI:10.1007/s11205–014–0638–2.

Elkind P.D., *Perceptions of risk, stressors, and locus of control influence intentions to practice safety behaviors in agriculture*, "Journal of Agromedicine" 2007, Vol. 12(4), DOI:10.1080/10599240801985167.

Ellis N.R., Albrecht G.A., *Climate change threats to family farmers' sense of place and mental wellbeing: A case study from the western Australian wheatbelt*, "Social Science & Medicine" 2017, Vol. 175, DOI:10.1016/j.socscimed.2017.01.00937.

Fennell K.M., Jarrett C.E., Kettler L.J. et al., *„Watching the bank balance build up then blow away and the rain clouds do the same": A thematic analysis of South Australian farmers' sources of stress during drought*, "Journal of Rural Studies" 2016, Vol. 46, DOI:10.1016/j.jrurstud.2016.05.005.

Firth H.M., Williams S.M., Herbison G.P et al., *Stress in New Zealand farmers*, "Stress and Health" 2007, Vol. 23(1), DOI:10.1002/smi.1119.

Garnefski N., Baan N., Kraaij V., *Psychological distress and cognitive emotion regulation strategies among farmers who fell victim to the foot-and-mouth crisis*, "Personality and Individual Differences" 2005, Vol. 38(6), DOI:10.1016/j.paid.2004.08.014.

Greenhill J., King D., Lane A. et al., *Understanding resilience in South Australian farm families. Rural Society*, "The Journal of Research Into Rural and Regional Social Issues in Australia and New Zealand" 2009, Vol. 19(4).

Greig B., Nuthall P., Old K., *An analysis of farmers' human characteristics as drivers of their anxiety*, "Journal of Agromedicine" 2020, Vol. 25(1), DOI:10.1080/1059924x.2019.1656692.

Gunn K.M., Turnbull D.A., Dollman J. et al., *Why are some drought-affected farmers less distressed than others? The association between stress, psychological distress, acceptance, behavioural disengagement and neuroticism*, "Australian Journal of Rural Health" 2021, Vol. 29(1), DOI:10.1111/ajr.12695.

Hagen B.N.M., Albright A., Sergeant J. et al., *Research trends in farmers' mental health: A scoping review of mental health outcomes and interventions among farming populations worldwide*, "PLOS ONE" 2019, Vol. 14(12), DOI:10.1371/journal.pone.0225661.

Hagen B.N.M., Sawatzky A., Harper S.L. et al., *What impacts perceived stress among Canadian farmers? A mixed-methods analysis*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(14), DOI:10.3390/ijerph18147366.

Hajdu F., Eriksson C., Waldenström C. et al., *Sveriges förändrade lantbruk: Lantbrukarnas egna röster om förändringar sedan 1990-talet och strategier inför framtiden. Sveriges lantbruksuniversitet*, SLU Future Food Reports 11, Uppsala 2020, https://www.slu.se/globalassets/ew/org/centrb/fu-food/publikationer/future-food-reports/slu-fu-turefood_rapport_11.pdf.

Hammersley C., Richardson N., Meredith D. et al., *"That's me I am the farmer of the land": Exploring identities, masculinities, and health among male farmers in Ireland*, "American Journal of Men's Health" 2021, Vol. 15(4), 15579883211035241, DOI:10.1177/15579883211035241.

Hanigan I.C., Butler C.D., Kokic P.N. et al., *Suicide and drought in New South Wales, Australia, 1970–2007*, "Proceedings of the National Academy of Sciences of the United States of America" 2012, Vol. 109(35), DOI:10.1073/pnas.111296510938.

Hanigan I.C., Schirmer J., Niyonsenga T., *Drought and Distress in Southeastern Australia*, "Ecohealth" 2018, Vol. 15(3), DOI:10.1007/s10393–018–1339–0.

Heo W., Lee J.M., Park N., *Financial-related psychological factors affect the life satisfaction of farmers*, "Journal of Rural Studies" 2020, Vol. 80.

Hogan A., Scarr E., Lockie S. et al., *Ruptured identity of male farmers: Subjective crisis and the risk of suicide*, "Journal of Rural Social Sciences" 2012, Vol. 27(3).

Hossain D., Eley R., Coutts J. et al., *Mental health of farmers in Southern Queensland: Issues and support*, "Australian Journal of Rural Health" 2008, Vol. 16(6), DOI:10.1111/j.1440–1584.2008.01014.x.

Hossain D., Gorman D., Eley R et al., *Value of mental health first aid training of advisory and extension agents in supporting farmers in rural Queensland*, "Rural and Remote Health" 2010, Vol. 10(4), Retrieved from <Go to ISI>://WOS:000286342700028.

Hounsome B., Edwards R.T., Hounsome N. et al., *Psychological morbidity of farmers and non-farming population: Results from a UK survey*, "Community Mental Health Journal" 2012, Vol. 48(4).

ISSA Agriculture, *Guide for individual farmers. Vision Zero Strategy for agriculture*, International Section of the International Social Security Association on Prevention in Agriculture 2019, http://visionzero.global/vision-zero-agricultural-sector, access 7.11.2024.

Jones A., Jakob M., McNamara J., *Review of the future of agriculture and occupational safety and health (OSH): Foresight on new and emerging risks in OSH*, European Agency for Safety and Health at Work, European Risk Observatory Report, Bilbao 2020, Spain, DOI:10.2802/769257.

Jones M.S., Reed D.B., Hunt M.L., *Suicide: An unrecognised epidemic among farmers*, "Workplace Health & Safety" 2018, Vol. 66(9), DOI:10.1177/2165079918784055.

Jones-Bitton A., Best C., MacTavish J. et al., *Stress, anxiety, depression, and resilience in Canadian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2020, Vol. 55(2), DOI:10.1007/s00127–019–01738–2.

Jones-Bitton A., Hagen B., Fleming S.J. et al., *Farmer burnout in Canada*, "International Journal of Environmental Research and Public Health" 2019, Vol. 16(24), DOI:10.3390/ijerph16245074.

Judd F., Jackson H., Frase C. et al., *Understanding suicide in Australian farmers*, "Social Psychiatry and Psychiatric Epidemiology" 2006, Vol. 41(1), DOI:10.1007/s00127–005–0007–1.

Kallioniemi M.K., Kaseva J., Lunner-Kolstrup C. et al., *Job resources and work engagement among Finnish dairy farmers*, "Journal of Agromedicine" 2018, Vol. 23(3), DOI:10.1080/1059924x.2018.1470047.

Kallioniemi M.K., Simola A., Kaseva J. et al., *Stress and Burnout Among Finnish Dairy Farmers*, "Journal of Agromedicine" 2016, Vol. 21(3), DOI:10.1080/1059924x.2016.1178611.

Kallioniemi M. K., Simola A. J., Kymäläinen H.R. et al., *Stress among Finnish farm entrepreneurs*, "Annals of Agricultural & Environmental Medicine" 2008, Vol. 15(2).

Kavalidou K., McPhedran S., De Leo D., *Farmers' contact with health care services prior to suicide: Evidence for the role of general practitioners as an intervention point*, "Australian Journal of Primary Health" 2015, Vol. 21(1).

Kearney G.D., Rafferty A.P., Hendricks L.R. et al., *A cross-sectional study of stressors among farmers in eastern North Carolina*, "North Carolina Medical Journal" 2014, Vol. 75(6), DOI:10.18043/ncm.75.6.384.

Kennedy A., Cosgrave C., Macdonald J. et al., *Translating co-design from face-to-face to online: An Australian primary producer project conducted during COVID-19*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18.

Kuriger C.R., *Coping strategies that New Zealand dairy farmers use to combat stress*, University of Waikato 2016.

LaBras L.F., Pahwa P., Pickett W. et al., *Relationship between sleep loss and economic worry among farmers: A survery of 94 active Saskatchewan noncorporate farms*, "Journal of Agromedicine" 2008, Vol. 13(3), DOI:10.1080/10599240802371862.

Leppälä J., Griffin P., McNamara J. et al., *Safety Culture and Risk Management in Agriculture : Sacurima Cost Action CA16123 Highlights and Conclusions*, "Natural resources and bioeconomy studies" 2021, Vol. 63, Natural Resources Institute Finland, Helsinki 2021, https://jukuri.luke.fi/handle/10024/547926.

Liang Y.N., Wang K., Janssen B. et al., *Examination of symptoms of depression among cooperative dairy farmers*, "International Journal of Environmental Research and Public Health" 2021, Vol. 18(7), DOI:10.3390/ijerph18073657.

Logstein B., *Farm-related concerns and mental health status among Norwegian farmers*, "Journal of Agromedicine" 2016a, Vol. 21(4), DOI:10.1080/1059924x.2016.1211055.

Logstein B., *Predictors of mental complaints among Norwegian male farmers*, "Occupational Medicine-Oxford" 2016b, Vol. 66(4), DOI:10.1093/occmed/kqw019.

Lunner-Kolstrup C., Lundqvist P., *Lantbrukets & landsbygdens psykosociala puls. Screening av psykosociala arbetsförhållanden, psykisk hälsa och sociala nätverk bland lantbrukare och landsbygdsföretagare. Sveriges lantbruksuniversitet. Fakulteten för land¬skapsarkitektur, trädgårds- och växtproduktionsvetenskap*, LTJ Rapport 2013:20, Alnarp 2013, https://pub.epsilon.slu.se/10578/.

Lunner-Kolstrup C., Kallioniemi M., Lundqvist P. et al., *International perspectives on psychosocial working conditions, mental health, and stress of dairy farm operators*, "Journal of Agromedicine" 2013, Vol. 18(3), DOI:10.1080/1059924x.2013.796903.

Magnin L., Chappuis M., Normand G. et al., *Health issues and mental distress in French active farmers: A quantitative and qualitative study*, "International Journal of Environmental & Agriculture Research" 2017, Vol. 3(9).

McKenzie S., Jenkin G., Collings S., *Men's perspectives of common mental health problems: A meta-synthesis of qualitative research*, "International Journal of Men's Health" 2016, Vol. 15(1).

McLaren S., Challis C., *Resilience among men farmers: The protective roles of social support and sense of belonging in the depression-suicidal ideation relation*, "Death Studies" 2009, Vol. 33(3), DOI:10.1080/07481180802671985.

McShane C.J., Quirk F., *Mediating and moderating effects of work–home interference upon farm stresses and psychological distress*, "The Australian Journal of Rural Health" 2009, Vol. 17(5), DOI:10.1111/j.1440–1584.2009.01085.x.

Nordström Källström H., *Mellan trivsel och ensamhet: Om sociala villkor i lantbruket. Sveriges lantbruksuniversitet*, "Acta Universitatis agriculturae Sueciae: doctoral thesis" 2008, Vol. 74, Uppsala 2008.

Odabasi S., Hartarska V., *Farmer suicides: Effects of socio-economic, climate, and mental health factors*, "Journal of Mental Health Policy and Economics" 2021, Vol. 24(2), Retrieved from <Go to ISI>://WOS:000661254400003.

Onwuameze O.E., Paradiso S., Peek-Asa C. et al., *Modifiable risk factors for depressed mood among farmers*, "Annals of Clinical Psychiatry" 2013, Vol. 25(2).

Pinzke S., *Stress och trötthet som orsak till olycksfall inom jordbruket: En kunskaps-sammanställning. Sveriges lantbruksuniversitet, Fakulteten för landskapsarkitektur, träd¬gårds- och växtproduktionsvetenskap*, LTV Rapport 2018:6, Alnarp, https://pub.epsilon.slu.se/15739/.

Pinzke S., Alwall Svennefelt C., Lundqvist P., *Occupational injuries in Swedish agriculture: development and preventive actions*, "Journal of Agricultural Safety and Health" 2018, Vol. 23(4), DOI:10.13031/jash.12816.

Peel D., Berry H.L., Schirmer J., *Farm exit intention and wellbeing: A study of Australian farmers*, "Journal of Rural Studies" 2016, Vol. 47, DOI:10.1016/j.jrurstud.2016.07.006.

Perceval M., Kolves K., Reddy P. et al., *Farmer suicides: A qualitative study from Australia*, "Occupational Medicine-Oxford" 2017, Vol. 67(5), DOI:10.1093/occmed/kqx055.

Polain J.D., Berry H.L., Hoskin J.O., *Rapid change, climate adversity and the next 'big dry': Older farmers' mental health*, "Australian Journal of Rural Health" 2011, Vol. 19(5).

Rawolle T.A., Sadauskas D., van Kessel G. et al., *Farmers' perceptions of health in the Riverland region of South Australia: 'If it's broke, fix it'*, "Australian Journal of Rural Health" 2016, Vol. 24(5).

Roy P., Tremblay G., Robertson S., *Help-seeking among male farmers: Connecting masculinities and mental health*, "Sociologia Ruralis" 2014, Vol. 54(4), DOI:10.1111/soru.12045.

Roy P., Tremblay G., Robertson S. et al., *"Do it all by myself": A salutogenic approach of masculine health practice among farming men coping with stress*, "American Journal of Men's Health" 2017, Vol. 11(5).

Rudolphi J.M., Berg R., Marlenga B., *Who and how: Exploring the preferred senders and channels of mental health information for Wisconsin farmers*, "International Journal of Environmental Research and Public Health" 2019, Vol. 16(20), DOI:10.3390/ijerph16203836.

Rudolphi J.M., Berg R.L., Parsaik A., *Depression, anxiety and stress among young farmers and ranchers: A pilot study*, "Community Mental Health Journal" 2020, Vol. 56(1), DOI:10.1007/s10597–019–00480-y.

Sartore G.-M., Kelly B., Stain H.J., *Drought and its effect on mental health: How GPs can help*, "Australian Family Physician" 2007, Vol. 36(12).

Sartore G.-M., Kelly B., Stain H. J. et al., *Improving mental health capacity in rural communities: Mental health first aid delivery in drought-affected rural New South Wales*, "Australian Journal of Rural Health" 2008, Vol. 16(5).

Schweitzer R.A., Deboy G.R., Jones P.J. et al., *AgrAbility mental/behavioural health for farm/ranch families with disabilities*, "Journal of Agromedicine" 2011, Vol. 16(2), DOI:10.1080/1059924x.2011.554766.

Shortall S., *Farming, identity and well-being: Managing changing gender roles within Western European farm families*, "Anthropological Notebooks" 2014, Vol. 20(3).

Smith K., *Desolation in the countryside: How agricultural crime impacts the mental health of British farmers*, "Journal of Rural Studies" 2020, Vol. 80, DOI:10.1016/j.jrurstud.2020.10.037.

Sprung J.M., *Economic stress, family distress, and work-family conflict among farm couples*, "Journal of Agromedicine" 2021, Vol. 27(2).

Stain H.J., Kelly B., Lewin T.J. et al., *Social networks and mental health among a farming population*, "Social Psychiatry and Psychiatric Epidemiology" 2008, Vol. 43(10), DOI:10.1007/s00127–008–0374–5.

Stark O., Falkowski J., *On structural change, the social stress of a farming population, and the political economy of farm support*, "Economics of Transition" 2019, Vol. 27(1), DOI:10.1111/ecot.12192.

Steck N., Junker C., Bopp M. et al., *Time trend of suicide in Swiss male farmers and comparison with other men: A cohort study*, "Swiss Medical Weekly" 2020, Vol. 150, DOI: 10.4414/smw.2020.20251.

Stier-Jarmer M., Oberhauser C., Frisch D. et al., *A multimodal stress-prevention program supplemented by telephone-coaching sessions to reduce perceived stress among German farmers: Results from*

a randomised controlled trial, "International Journal of Environmental Research and Public Health" 2020, Vol. 17(24), DOI:10.3390/ijerph17249227.

Swedish Agency for Work Environment Expertise (SAWEE), *Farmers' psychosocial work environment and mental health, Swedish Agency for Work Environment Expertise*, "Systematic literature review" 2022, Vol. 8, Gävle, https://media.sawee.se/2023/03/Farmers_psychosocial_work-environment_and_mental_health_digital.pdf.

Thelin A., Holmberg S., *Farmers and retirement: A longitudinal cohort study*, "Journal of Agromedicine" 2010, Vol. 15(1).

Tinc P.J., Sorensen J.A., *Stakeholders Team up for Action in New York Dairy (STAND): A collaborative action-planning workshop to combat toxic stress among New York dairy farmers*, "Journal of Agromedicine" 2020, Vol. 25(1), DOI:10.1080/1059924x.2019.165920243.

Torske M.O., Hilt B., Bjorngaard J.H. et al., *Disability pension and symptoms of anxiety and depression: A prospective comparison of farmers and other occupational groups: The HUNT study, Norway*, "BMJ Open" 2015, Vol. 5(11), DOI:10.1136/bmjopen-2015–009114.

Torske M.O., Hilt B., Glasscock D. et al., *Anxiety and depression symptoms among farmers: The HUNT study, Norway*, "Journal of Agromedicine" 2016, Vol. 21(1), DOI:10.1080/1059924x.2015.1106375.

Wallis A., Dollard M.F., *Local and global factors in work stress: The Australian dairy farming examplar*, "Scandinavian Journal of Work Environment & Health" 2008, Retrieved from <Go to ISI>://WOS:000259091900009.

Watanabe-Galloway S., Chasek C., Yoder A.M. et al., *Substance use disorders in the farming population: Scoping review*, "Journal of Rural Health" 2022, Vol. 38(1), DOI:10.1111/jrh.12575.

Vayro C., Brownlow C., Ireland M. et al., *'Farming is not just an occupation but a whole lifestyle': A qualitative examination of lifestyle and cultural factors affecting mental health help-seeking in Australian farmers*, "Sociologia Ruralis" 2020, Vol. 60(1), DOI:10.1111/soru.12274.

Vayro C., Brownlow C., Ireland M. et al., *"Don't… break down on Tuesday because the mental health services are only in town on Thursday": A qualitative study of service provision related barriers to, and facilitators of farmers' mental health help-seeking*, "Administration and Policy in Mental Health and Mental Health Services Research" 2021, Vol. 48(3).

Witt C.D., Reed D.B., Rayens M.K. et al., *Predictors of job satisfaction in female farmers aged 50 and over: Implications for occupational health nurses*, "Workplace Health and Safety" 2020, Vol. 68(11), DOI:10.1177/2165079920931895.

received: 12.11.2024
accepted: 26.11.2024