

# Farmers' psychosocial work environment and mental health

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# Preface

Agriculture employs more than a third of the world's population and is carried out in different forms of varying scope and technical level in different parts of the world. Labor-intensive small farms are more common in developing countries, while there are often larger and more technically advanced farms in the USA, Canada, Australia and parts of Europe, where most of the studies included in this systematic literature review originate.

In general, farmers in our part of the world perceive their work as being meaningful and as a way of life. There is much in the occupation that positively affects the health and well-being of farmers, not least the opportunity to work in direct contact with nature and to feel that they are undeniably doing great social good. However, agriculture is one of the most dangerous occupations with a high number of accidents according to a 2020 report from the European Agency for Safety and Health at Work in Bilbao (EU-OSHA). The report describes how stress and psychosocial factors are major risk factors for farmers.

Much of the previous research and improvement efforts in agriculture have focused on the physical work environment. In order to ensure a sustainable and viable work environment for farmers, the Swedish Agency for Work Environment Expertise believes that knowledge about the farmers' organizational and psychosocial work environment must also be developed, compiled and disseminated. This systematic literature review includes reviews of empirical material from selected parts of the world deemed to be relevant to people working in Swedish agriculture and will hopefully contribute to drawing a comprehensive picture of an area that has not been sufficiently explored in Sweden.

The authors of the systematic literature review are Peter Lundqvist, professor in work science at the Swedish University of Agricultural Sciences, Carita Håkansson, associate professor in health sciences at Lund University and Karin Hakelius, doctor in agronomy at the Swedish University of Agricultural Sciences. Catharina Alwall Svennefelt, PhD, has contributed by working on the literature search at the same university. Robin Gullstrand, librarian at Lund University, oversaw the literature search on behalf of the Agency.

Cecilia Waldenström, PhD, has reviewed the quality of the systematic literature review on behalf of the Agency. The responsible process manager at the Swedish Agency for Work Environment Expertise was Thomas Nessen, PhD.

The authors of the systematic literature review chose their own theoretical and methodological starting points and are responsible for the results and conclusions presented in the systematic literature review.

I would like to extend my thanks to both our external researchers and quality reviewers as well as employees at the agency who contributed to producing this valuable systematic literature review.

The systematic literature review has been published on the agency website and in the series systematic literature reviews.

Gävle, January 2023



Nader Ahmadi, Director General

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# Summary

This 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 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.

A systematic international literature search was carried out with a focus on studies concerning farmers, and thus excluded employees and entrepreneurs with a focus on forestry. Furthermore, the search was limited to the period 2005–2021 and to countries that have similar production forms and conditions as in Sweden, mainly Europe, North America and Australia/New Zealand. The literature search resulted in 108 scientific articles based on qualitative and quantitative studies, of which only a few came from Sweden.

Being a farmer is more of a lifestyle than an occupation. The freedom that comes with the occupation is more important to many farmers than a high income. Farmers also have a strong relationship with the place where they live and work, which is important to them and a central part of their identity. The farm symbolizes their values and personality as they have usually built everything from the ground up themselves. The overwhelming majority of farms are family farms, where farmers live and work alongside their partners and children, sometimes with parents or parents-in-law. Many farms have been owned by the family for several generations and farmers live in harmony with the changes of the seasons, much closer to animals and nature than is usual in other occupations and forms of business.

The results show that the health and safety risks identified in farmers' psychosocial work environment are workload, finances, climate change and weather conditions, crime, globalization, 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. The identified health factors are: the bond felt by the farmer to the cultivated land, environmental and social responsibility, the ability to 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 did not come from working on the farm and the ability to work after 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 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. This can involve planning, positive reappraisal (change in attitude to stressful events, humor, and leisure) and getting help and support from others. Furthermore, acceptance can be used as a coping strategy. More negative strategies can involve avoidance, as well as blaming oneself or others. This may also involve suppressing emotions, avoiding problems, or consuming alcohol.

According to several studies, the fact that farmers seem to be less likely to seek out 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 programs for farmers with symptoms of stress and depression. Future suicide prevention efforts for farmers can also be carried out through education, training programs and national campaigns.

In the systematic literature review it has also been established that there is a need for more knowledge regarding: female farmers' working conditions and mental health, and the consequences of changes in the countryside brought about by deteriorating community services and increased crime. Studies and evaluations of various forms of support and interventions to support farmers' mental health are needed on a larger scale. An EU report on the future working environment in agriculture also points to the importance of increased knowledge about the stress factors expected to be linked to climate change, economic and financial stress, increased demands from government agencies and consumers, and negative criticism of agriculture, including militant activists. From a Swedish perspective, there is a strong need for in-depth knowledge of how the psychosocial work environment and mental health touched on in this systematic literature review apply to Swedish farmers in the 2020s, even though international results contribute to increased knowledge that is largely transferable to Swedish conditions.





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Appendix 5 Quality review (MMAT)

Appendix 6 Quality review (AMSTAR)

Appendices can be downloaded from the agency's website, [sawee.se](http://sawee.se).

# 1 Introduction

The focus of this systematic literature review is the psychosocial work environment and mental health of farmers. The term psychosocial work environment is defined in this context as the human interaction with the environment: how people are affected by the work environment, but also how the person changes and is changed by the work environment.

Farmers have a demanding work environment, which has been emphasized both internationally by the ILO (2011) and nationally by the Swedish Work Environment Authority (2012). The Government is also aware of this and has tasked the Swedish Board of Agriculture (Swedish Government, 2021) with developing a strategy and implementing measures to reduce the risk of accidents and improve the working environment in agriculture. The government notes that “investigations into working environment conditions in agriculture point to challenges in the general working environment, to long working days and stress, such as that linked to external factors, which can lead to an increased risk of diseases, accidents and poorer mental health.”

Both Swedish and international research and national action programs have primarily focused on the physical working environment of agriculture and farmers, not least through efforts to prevent occupational injuries (Alwall Svennefelt & Lundqvist, 2020; Douphrate et al., 2013; Lower et al., 2017; Swedish Work Environment Authority, 2012). However, corresponding efforts have not been aimed at the psychosocial work environment and the mental health of farmers, despite the increased need for sound knowledge and active support efforts, as pointed out by the Swedish Government (2021) and the Swedish Board of Agriculture (2022a). In order to improve farmers’ psychosocial work environment and mental health, a systematic literature review can be invaluable to stakeholders and serve as a basis for future work environment efforts.

## 1.1 Agriculture and farmers

Farmers are defined by the Federation of Swedish Farmers (“LRF”) (LRF, 2022) as the people who own and/or lease and are responsible for the normal daily financial and production routines for running a farm. In Sweden, there are approximately 60,000 farmers, which corresponds to 1.3% of the national workforce. A majority of them (58%) are 55 or older. If you include everyone who performs some form of work on Swedish farms, there are a total of 166,000 people, of whom roughly 40% are women (Swedish Board of Agriculture, 2022b). According to the LRF (2022), the majority of farms are family businesses where several members of the family are involved to varying extents. It is also common to have consolidated companies, where agriculture is combined with forestry, tourism or contracting (LRF, 2022).

Agriculture employs more than a third of the world's population, but in varied structures and scope in different parts of the world. In developing countries, this is most commonly labor-intensive small farms, while in our part of the world this often involves larger, highly mechanized companies. But even in Europe, there is great variation in agricultural farms as workplaces, with everything from small part-time farms with low mechanization and old machinery to large companies with many employees and high-tech mechanization (EU, 2021).

Being a farmer is more of a lifestyle than an occupation (Brigance et al., 2018). The freedom this entails is for many farmers more important than having a high income (Kunde et al., 2018). Farmers also have a strong relationship with the place where they live and work, which is important to them and a central part of their identity. The farm symbolizes their values and personality as they have usually built up and developed everything themselves. A study of the values of Finnish farmers showed that autonomy (freedom of action at work and financial independence) was of the utmost importance, followed by finances (making a good living, financial profitability and maximized profit), then societal values (rural development, meeting the needs of citizens, equality for all workers, the common good of the nation, job creation, vibrant countryside, employee well-being and respect for nature), and continuity (carrying on family tradition and the work of their parents). The farmers in the study were proud of their businesses and of being part of a tradition in which family plays an important role. They also felt that they know their job and have the necessary skills to produce high quality goods (Niska et al., 2012). In other studies, farmers describe themselves as entrepreneurs who are innovative, take risks and earn money, which makes them proud (Dessein & Nevens, 2007; Vesala & Vesala, 2010). Many farmers feel that they do meaningful and important work that contributes to people having food (Hagen et al., 2021). The conclusion can be drawn that their degree of pride in being farmers is strongly tied to the aspects that farmers can control themselves, while external factors over which they have no control, such as government regulations and bureaucracy, are more likely to have a negative effect on this sense of pride.

## 1.2 Purpose and research questions

The purpose of this systematic literature review is to map the current research into farmers' psychosocial work environment and mental health.

The systematic literature review will address the following questions based on empirical research:

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

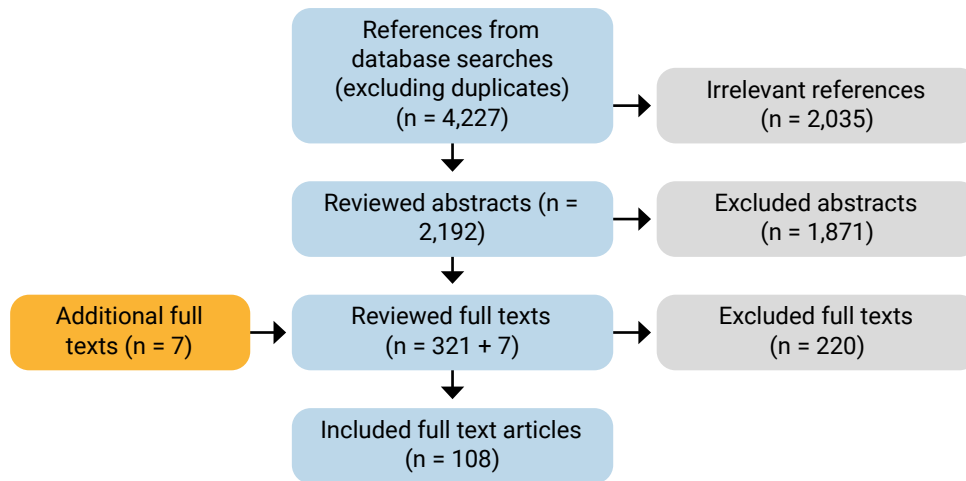
# 2 Methodology

## 2.1 Literature search

An extensive literature search was conducted to investigate health and safety risks and health factors in the psychosocial work environment of farmers, consequences for farmers' mental health and how farmers' psychosocial work environment and mental health can be promoted. Agriculture includes crop farming, livestock production and forestry, the aspects of operations that are most often included in the farmer's work environment. However, forestry is not included as a sole activity as these companies are defined as forestry companies. Furthermore, research on agricultural employees is not included in the systematic literature review.

The literature search was carried out by a librarian at the Lund University Library. This systematic literature review is based on scientific articles, or their equivalent, that were peer reviewed and published in English between 2005 and 2021. The systematic literature review uses material from the Nordic countries and other countries that have contexts and issues judged to be similar to those in Sweden and thus relevant to Swedish agriculture and its working conditions. The review authors first selected five articles that were relevant to check whether these were included in the search results, as well as a list of possible keywords. Two sample searches were conducted, one in the Web of Science and one in the Social Science Citation Index, and the search strategy was developed and determined based on the Population, Exposure, Outcome (PEO) model, Appendix 1. Searches were then conducted in the Social Science Citation Index, Scopus, Pub Med, Google Scholar and PsycInfo (the search in PsycInfo only gave duplicates). Articles that had not studied farmers in countries with similar working conditions were discarded. The search protocol can be found in Appendix 2.

The lists of article titles resulting from each search were assessed by the report authors and were marked with green (relevant), yellow (possibly relevant) or red (irrelevant). Based on this assessment, the librarian compiled a list of the selected references (n=321). These references were shared among the report authors and a table was developed detailing authors, title, purpose, keywords, methodology, exposure, results and conclusion. The report authors then divided these articles among themselves and each article was read in full by one, two or three of the report authors. While reading the articles, answers were sought to the questions on which this systematic literature review is based. During this step, a further number of articles were excluded for not being studies of farmers, having the wrong focus or being from a non-Western country (Figure 1 – flowchart below). The articles that were excluded due to being the wrong article type, wrong focus, wrong population, wrong geographical area or wrong year are presented in Appendix 3. This systematic literature review is based on 108 articles (Appendix 4).



**Figure 1.** Flowchart of the literature screening process

## 2.2 Quality review

The articles were quality reviewed using the Mixed Method Appraisal Tool (MMAT), which is a tool that enables the assessment of articles included in mixed studies reviews. MMAT can be used to quality review qualitative, quantitative (randomized controlled, non-randomized and descriptive) and mixed method studies (Hong et al., 2018). Since all of these types of studies are included in this systematic literature review, they were quality checked with the MMAT. The MMAT review begins with two screening questions to establish whether the article is an original empirical study, then a number of different questions are answered depending on the type of study it is, and in this way the quality is assessed. Each article was quality reviewed by one to three report authors, and in the case of differing assessments, the most stringent assessment was chosen. The quality review with MMAT is presented in Appendix 5.

Of the articles included in this systematic literature review, some are literature reviews that cannot be quality checked with MMAT. Instead, the Assessment of Multiple SysTemAtic Reviews (AMSTAR) (Shea et al., 2007a, 2007b) was used to quality review these (Appendix 6).

## 3 Results

The majority of the studies included in this systematic literature review of farmers' psychosocial work environment and mental health have come from Australia (35 studies) and the USA (26 studies) or Canada (7 studies). Few studies have been carried out in Europe and only thirteen articles shed light on conditions in the Nordic region, of which six are from Norway, five from Finland and two from Sweden.

### 3.1 Health and safety risks in farmers' psychosocial work environment and consequences for their mental health

In this section, we present the health and safety risks that have been identified in the psychosocial work environment of farmers. These health and safety risks are: workload, finances, climate change and weather conditions, crime, globalization, laws and regulations, masculine norms, as well as loneliness, isolation and lack of support. There are also studies that address other risk factors and these are presented at the end of this section. Additionally, we present the consequences that these health and safety risks can have on farmers' mental health.

#### 3.1.1 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 (Wallis & Dollard, 2008). Feeling pressed for time was also one of the most concerning stressors for Australian farmers (McShane & Quirk, 2009), American farmers (Rudolphi et al., 2020) and farmers in an international study (Lunner-Kolstrup et al., 2013). Common stress factors for Finnish farmers included the amount of work, unpredictability and animal illness. Strain related to workload and animal health were associated with symptoms of stress and fatigue (Kallioniemi et al., 2008). A study on stressors among farmers in New Zealand found that increased workload during peak season was one of the main stressors (Firth et al., 2007). In a study from Norway on farmers' workload and mental well-being (Logstein, 2016a), it emerged that farmers had a heavy workload in agriculture and that this, along with employment outside the farm, was associated with anxiety and psychological difficulties. The high workload can lead to farmers feeling that they do not have enough time to spend with family and to recuperate, according to a study from North Carolina (Keraney et al., 2014).

#### 3.1.2 Finances and financial difficulties

The issue of agricultural entrepreneurship and financial problems has been included in many studies (Fennell et al., 2016; Kallioniemi et al., 2008; Kallioniemi et al., 2016; Kearney et al., 2014; LaBrash et al., 2008; Polain et al., 2011; Qualman et al., 2018; Sprung, 2021; Tinc & Sorensen, 2020; Vayro et al., 2020).

The production processes of an agricultural business have unique conditions to take into account, such as when analyzing the financial situation. Many production processes are long – you sow in autumn and thresh a year later and the weather determines how good harvests will be, which also affects livestock production on the farm. In order to achieve the desired production level, inputs are required, such as fertilizer and sometimes also chemical pesticides and diesel. The conclusion to be drawn is that it is financially risky and uncertain to be a farmer.

Heo et al. (2020) show that financial stress reduced life satisfaction among farmers in the USA. LaBrasch et al. (2008) 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 caused worries about finances to arise.

A study among dairy farmers in Australia shows that farmers there had extremely high levels of poor mental health and that this could be linked, among other things, to the financial basis of farming (Wallis & Dollard, 2008). Poor financial situations were also a stressor among Finnish (Kallioniemi et al., 2016), Canadian (Hagen et al., 2021) and younger American farmers (Rudolphi et al., 2020). Another study from the USA shows that financial concerns affect the health and well-being of farmers (Heo et al., 2020). Farmers feel that local banks and other lenders in the USA are not as willing to provide loans or credit as they previously were (Jones et al., 2018). A study of farmers in North Carolina found that a large percentage of respondents identified the following stressors related to finances: concerns about the future of the farm, problems with machinery, market prices for crops/livestock, taxes, and health care costs (Keraney et al., 2014). Some of the most worrisome stressors, according to an Australian study, were personal finances and the economic conditions of agricultural operations (McShane & Quirk, 2009).

A study of stressors among 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 (Firth et al., 2007). 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 (Logstein, 2016a).

A qualitative study of farmers in Australia shows that farmers may leave the occupation if it is not financially viable, and 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 (Bryant & Garnham, 2018). Although harvests and financial losses may be temporarily buffered by other crops and businesses, other sources of income, crop insurance or other government benefits, these losses can still increase stress to the degree that people choose to leave the

occupation, according to an American study (Waldman et al., 2021). The main obstacles preventing young people becoming farmers, but also the reasons farmers leave the occupation, are difficulties in buying agricultural land, constant income crisis, expensive agricultural machinery, increasingly large market players and a tendency among politicians to be uninterested in the agricultural sector (Qualman et al., 2018).

### **3.1.3 Climate change and weather conditions**

Climate change, which leads to conditions such as droughts and floods, affects farmers. Studies have shown that droughts lead to uncertainty about the future, financial problems, small harvests and increased need for labor input from farmers, as well as worries and anxiety (Austin et al., 2018; Edwards et al., 2015; Fennell et al., 2016; Gunn et al., 2021; Hanigan et al., 2018; Polain et al., 2011, Odabasi & Hartarska, 2021). The effect of prolonged drought on older farmers has been examined in a qualitative study from Australia (Polain et al., 2011). In addition to the everyday stress that comes from farming, and aging which brings about changes or ends of relationships, as well as experiencing new technology as increasingly difficult, researchers found that the creeping threat of climate change affected the elderly farmers to a great extent in such forms as increased psychological strain and accompanying fears of feeling stigmatized (experiencing shame and feeling abnormal). A literature review also showed that external factors, such as weather, were an additional stress factor (Lunner-Kolstrup et al., 2013). A study from Australia in which farmers were interviewed regarding their views on how climate change might affect the agricultural sector showed that the concern was significant for everyone (Ellis & Albrecht, 2017). 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 among farmers. 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.

Concerns about climate risks were studied in a quantitative study of North American farmers growing fruit and horticultural products (Han et al. 2022). It was shown that the level of concern was greatly influenced by the farmer's feeling of being prepared and able to deal with climate variations in the form of altered cultivation strategies, choice of suitable crop and possible access to irrigation. They also found that farmers who had recently experienced extreme weather, such as wide variations in temperature and precipitation, tended to feel more concerned about climate-related problems compared to those who had not experienced extreme weather.

Worrying about the weather (Kearney et al., 2014), bad weather (Firth et al., 2007) and weather-related crop damage (Jones et al., 2018) can all affect farmers' mental health. Hossain et al. (2008) 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 (Edwards et al., 2015). The study showed that the more severe the impact of drought on agriculture, the greater the impact on mental health. Farmers who reported that the drought had led to total crop failure or drastically reduced their farm's productivity had significantly higher rates of mental health problems. Hanigan et al. (2018) showed that there was a relationship between the duration of the drought and the anxiety of younger women on the farm (40–54 years). This association could not be seen in older male and female farmers in Australia. Another study from Australia showed that it is not the drought itself that causes psychological distress, but it rather results indirectly from reduced yields, increased costs and debts, and reduced overall income (Yazd et al., 2019). Austin et al. (2018) showed that farmers in Australia experienced significant stress due to the impact of drought periods on themselves, their families and their local communities. Farmers who were younger, lived and worked on a farm, experienced financial hardship, or lived in isolation were at particular risk for drought-related stress. Fennell et al. (2016) focused on the relationship between drought in Australia and stress and the results showed a relationship between drought, small harvests, difficulties keeping livestock, high workload and stress. An important factor in this context is financial, such as the price levels of input goods and costs incurred when machines break down. It is almost exclusively in Australia that studies have been carried out regarding the impact of drought periods on the mental health of farmers. A study from the USA by Berman et al. (2021), however, confirmed that similar problems exist there, with their results showing an association between drought and increased work-related stress among farmers.

Odabasi and Hartarska (2021) noted that changes in climate affected suicide rates among farmers in the United States. An Australian study found that climate change has exacerbated farmers' anxiety about the weather, undermined their self-identity, contributed to chronic anxiety and increased the experienced risk of depression and suicide (Ellis & Albrecht, 2017). A study on the relationship between drought periods and suicide among agricultural farmers in Australia showed that the risk of suicide among men increased with worsening drought (Hanigan et al., 2012).

#### **3.1.4 Crime**

A growing problem in the agricultural sector in England 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 does crime become more common on farms (Smith, 2020). The same study also showed that crime involving the farm contributes to psychological stress for the farmer. The researcher views this development with concern and warns that if it continues, the risk increases that those affected will either give up farming, or in the worst case scenario, take their own lives as a direct result of the impact that agriculture-related crime has on an already stressed and pressured occupational group.

### **3.1.5 Globalization, laws and regulations**

Several Australian articles by Bryant and Garnham (2013, 2014, 2015) argued that the state and its agricultural policies limit the autonomy and ability of farmers to continue running their farms. Furthermore, they believed that pride, self-worth and economic viability are threatened by the withdrawal of subsidies and support.

Farmers are bombarded by stressors that are beyond their control, such as unstable markets, changing government regulations, shrinking labor supply, increasing production costs, changing international politics and changing markets (Jones et al., 2020). 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 (Wallis & Dollard, 2008) showed that these farmers had extremely elevated levels of mental illness, which could be linked to issues such as globalization, 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 USA (Jones et al., 2018). Hossain et al. (2008) identified key areas affecting mental health among farmers in Queensland by conducting a series of focus groups with farmers, organizations with ties to the agricultural sector and medical professionals. The results showed that the increasing burden of laws and regulations contributed to worsening the mental health of farmers.

### **3.1.6 Masculine norms and gender differences**

A study from southwest England, in which interviews were conducted with male farmers who had suicidal thoughts or had attempted suicide, revealed a complex picture of the participants' masculinity and the expectations they felt of themselves as farmers, which contributed to their sense of personal failure and fueled their decision to consider suicide. The results indicated that farmers' decisions to take their own lives are influenced by complex social and personal factors and point to an important aspect of failed masculinity (Woollacott, 2020). In interviews with mostly male Australian farmers, it emerged that the masculine identity of farmers, which was characterized by pride, was about to change and be replaced by an identity characterized more by shame and that this identity shift was important in understanding how suicide will 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 (Bryant & Garnham, 2015).

Female farmers in Canada feel more stressed than males (Hagen et al., 2021). 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 as constant comparisons were

made between the farmers' businesses, creating a feeling of being constantly monitored and judged by other farmers. Female farmers also felt stressed by having, in addition to being a farmer, other roles such as mother, wife and the one responsible for maintaining the home, and they needed to balance the demands of all their roles (Hagen et al., 2021).

### **3.1.7 Loneliness, isolation and a lack of support**

Farmers belong to various social and occupational networks that they feel make demands on them. Many were aware that their network or community judges their decisions and that this can have social consequences (Hagen et al., 2021; Judd et al., 2006). They also experienced expectations of not appearing weak (Hagen et al., 2021). Among the 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, according to studies from Australia (Bryant & Garnham, 2018). According to another study from Australia, farmers felt that the communities to which they belonged could be quite closed, having difficulty allowing outsiders in and being difficult to leave (Judd et al., 2006).

The family is part of the farmer's network. In the past, there were often several generations living close to each other involved in farming, but it has become more 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 (Shortall, 2014). Working together with family can also increase stress when farmers had no outlet other than their own family members, according to a study from Canada (Hagen et al., 2021). Farmers who were not satisfied with the support they received from 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 (Kallioniemi et al., 2008; Kearney et al., 2014; Onwuameze et al., 2013; Peel et al., 2016; Sprung, 2021).

According to an international research overview, there have been structural changes to the countryside and in agriculture which have meant 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 (Stark & Falkowski, 2019). Long working days have also resulted in farmers lacking the time and energy for social contact in Australia (Hossain et al., 2008). 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. This was due, among other things, to a lack of natural gathering places (Hammersley, 2021). The lack of services such as police, fire department and primary care was emphasized: 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 (Hammersley, 2021). Feelings of isolation were also not lessened if the farm had poor mobile coverage or inadequate access to the Internet. However, a study from Australia by McPhedran and De Leo (2013) found that despite the differences in demographic and socio-economic circumstances between farmers and other men in rural areas, farmers were not necessarily more socially isolated than other rural men.

A study in Australia used focus groups for discussions with farmers about suicide (Perceval et al., 2017). They found a combination of individual factors (identity, isolation, loneliness and withdrawal) and social and environmental stressors (relationships and rural structure) were most likely to increase the risk of suicide. In another study, Australian farmers believed the combination of geographic and emotional isolation to be a potential risk factor for suicide (Perceval et al., 2019).

Age, being separated or divorced (Firth et al., 2007), and dissatisfaction with perceived support from family and the industry (Hagen et al., 2021) contributed to poorer mental health in farmers. Loneliness (Kallioniemi et al., 2016) and increased isolation (Hossain et al., 2008) also negatively affected mental health. Single farmers in France who had inherited their farm tended to suffer more from anxiety and worry (Magnin et al., 2017). 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 neighbors and other people were most clearly linked to stress (Kallioniemi, 2008). A Japanese study showed that older farmers (>65 years) who farm in an area with few farming neighbors exhibited depressive symptoms more often than those who have close neighbors. Furthermore, the study showed that symptoms of depression were more common in those who lived alone. This can be interpreted as the lack of formal and informal support affecting the occurrence of symptoms of depression (Kanamori et al., 2021). A study from Australia found that living in a remote area is a greater risk factor for farmers' mental health and well-being when compared to financial stress, common problems such as weather dependence and labor availability, as well as recent adverse events such as machines breaking down or someone falling ill (Brew et al., 2016). A register-based quantitative study of reasons why farmers in 110 different regions of Western Europe left the occupation found that farmers left the occupation to a greater extent in regions with small farms and a higher proportion of livestock production, as well as regions where the proportion of older farmers (>44 years) and the proportion family members working on the farm were lower (Breustedt & Glauben, 2007), which can also be interpreted as a lack of support.

### 3.1.8 Additional risk factors

A study among younger farmers in the United States showed that *being an employer* was one of the primary sources of stress (Rudolphi et al., 2020), and a study from New Zealand showed that *administration involving employees* and *work-environment legislation* caused a lot of stress among farmers (Firth et al., 2007). *Supervising staff* was also linked to higher stress levels. The risk of occupational injury is a stress factor, and if the farmer suffers an accident, this can also result in significant psychological strain, according to a study from Victoria, Australia (Murray et al., 2019).

Onwuameze et al. (2013) found that *exposure to pesticides*, stress, and personal injury were independent risk factors for depression among farmers in the USA. A North American cross-sectional study focused on studying whether there is a relationship between recurrent chemical pesticide poisoning and depression and the display of risky behavior (Beseler & Stallones, 2006). In that study, no correlation could be found between farmers being poisoned and developing depression, but an inverse correlation could be confirmed. Another stressor for farmers in Australia was *natural gas extraction near farms* (Morgan et al., 2016).

A Norwegian study by Zahl-Thanem et al. (2020) of farmers' experiences of *living near predators* noted that predator attacks on livestock are only part of the problem. Financial compensation paid to farmers for accepting predators and as compensation for livestock losses did not appear to alleviate poor mental health among farmers. Their perceived mental ill-health in the form of frustration, anger, anxiety, lack of sleep and reduced quality of life was a clear function of living near predator areas and could not be linked to financial loss. Rather, their mental health issues were caused by other factors, such as the demands of changing one's lifestyle, the work situation, the sense of responsibility and concern for livestock, an emotional attachment to livestock, constant reminders of predators from various predator warning systems, the inability to express their opinions for fear of being attacked on social media and other types of harassment, as well as an overall distrust of the predator management system.

A study in Sweden concluded that *advanced technology and automated systems* in agriculture had both positive and negative aspects (Lunner-Kolstrup et al., 2018). The farmers who were interviewed did not experience any significant mental strain resulting from the technology, except in the event of operational disruptions, but considered the technology to be a necessity for their future work.

Outsiders who *do not understand farming conditions* (Kearney et al., 2014), a perceived *conflict between town and country* (Hossain et al., 2008), as well as *the treatment of farmers in society and the media* were other stressors among farmers. Several studies showed that differences in socio-economic and demographic factors were significant to the suicide rate among farmers (Odabasi & Hartarska, 2021). A literature review concerning poor mental

health and suicide among farmers showed that suicide attempts were primarily related to socioeconomic factors (Santos et al., 2021). A study from the USA found a significantly increased risk of suicide among elderly (>65) male farmers (Browning et al., 2008). Two qualitative studies from Australia revealed that external factors such as the *actions of the government* and the companies that handle the farmers' products, as well as *laws and regulations* and *business deals* could restrict farmers so that they felt they had no possibility of continuing and that they could then go as far as to take their own lives (Bryant & Garnham, 2013; 2014).

### 3.2 Poor mental health among farmers

Mental health problems are generally higher among farmers, especially among older farmers, than other occupational groups. Depression and suicide attempts occur more often among farmers than other occupational groups, 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 psychosocial 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 England and Finland suggests that the mental health of farmers and their partners was significantly worse than that of the general population (Hounscome et al., 2012; Kallioniemi et al., 2016). A study conducted by Torske et al. (2015), 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 occupational groups or their siblings who did not work as farmers. This suggests that work in agriculture can affect mental health. In another study, Torske et al. (2016) 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. There was no difference in depressive symptoms between younger farmers (<39 years) and younger people in other occupations. In contrast, older farmers (50 years and older) had more symptoms of depression than both younger farmers and older people in other occupations, according to a study from Greece (Demos et al., 2013). Above all, older farmers in Australia were those who felt stressed by new technology that was necessary in agriculture and which contributed to further work being added to an already perceived high workload (Perceval et al., 2019). A quantitative study from Australia showed that those in other occupational categories experienced more stress when there was little social support compared to farmers who were not as affected (Stain et al., 2008). A Finnish study comparing farmers, entrepreneurs with and without employees, and employees showed that farmers had the worst work ability, health and quality of life even when age, sex, marital status, education and presence of chronic diseases were taken into account (Saarni et al., 2008). Farmers in Norway had twice as high a risk of

being placed on disability pension as other occupational groups with high education. On the other hand, the risk of disability pension among farmers was lower than for other groups with physically demanding occupations, as farmers can work longer with physical health problems than those in other occupational groups before receiving a disability pension. However, the risk of disability pension among male farmers was higher than for female farmers (Torske et al., 2015).

Farmers in the USA had increased rates of depression, anxiety, and suicide risk (Bjornestad et al., 2021), and suicide was a significant cause of death among farmers in Australia (McLaren & Challis, 2009). 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. This mortality rate from suicide was only slightly lower than the mortality rate of agricultural occupational accidents and represents a significant public health problem (Judd et al., 2006). Vayro et al. (2021) found that the suicide rate among farmers was approximately twice that of the general Australian population. Another study from Australia compared suicide among farmers with other incidents of suicide in rural areas (Kennedy et al., 2020). They found that in agriculture-related suicide deaths, it was more common to have a source of livelihood (business/employment) at the time of death and to have died by the use of a firearm. 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 of mental health support before death. Male farmers in Switzerland also had a higher risk of dying by suicide than men with other jobs (Steck et al., 2020). A study from New Zealand maintained that the risk factors of suicide in agriculture were not very different from the risk factors of suicide in the general population of the country (Beautrais, 2018). However, one risk factor for suicide among farmers highlighted in this study was that farmers have access to firearms: almost 40% of suicides carried out by farmers involved firearms, compared to 8% in the general population during the same period (Beautrais, 2018). A study of suicides among farmers in Scotland found that firearms were significantly more often involved in suicides and undetermined deaths among farmers than among the rest of the male population (Stark et al., 2006). Another study suggested that Australian farmers usually have firearms and are used to using them, such as when they need to shoot predators or kill suffering livestock, and both the availability and habit of using firearms resulted in firearms being used often in suicide (Perceval et al., 2019). Elderly farmers in the USA who completed suicide were also significantly more likely than others to have reported physical health problems (Bower & Gerst Emerson, 2021). There is accordingly much to indicate that working as a farmer is associated with greater risks of poor mental health than for the population in general and that this is exhibited in particular ways. Researchers in Australia point out that the strain on farmers' mental health has increased in recent years (Hogan et al., 2012).

### 3.3 Health factors in farmers' psychosocial work environment

Health factors in the psychosocial work environment of farmers are not as well studied as risk factors. Among other aspects, we have identified the following health factors 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 USA (Brigance et al., 2018). 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 (Bondy & Cole, 2020). In another qualitative study from Australia, the farmers also perceived the ability to perform the work on the farm as a health factor. Being a farmer is to live a different kind of life by *being outside, doing physical work and eating well* and that, farmers believed, was a health factor (Bondy & Cole, 2020).

Health factors for dairy farmers in Finland were *family, working with cattle, healthy animals, a reasonable workload* and *sustainable finances* (Kallioniemi et al., 2018). 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 (Kallioniemi, et al., 2016). Muri et al. (2020) studied Norwegian sheep farmers and found that their motivation for working as farmers was of the utmost importance to their job satisfaction. A study of older female farmers in selected states in the USA showed that their involvement in agricultural work increased life satisfaction and reduced the risk of depression (Witt et al., 2020). Furthermore, the results showed that *working on the 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 USA (Brigance et al., 2018). A study of Australian farmers showed that *increased social support* and an *increased sense of belonging* reduced the risk of suicide (McLaren & Challis, 2009). 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 (Bjornestad et al., 2019). A study on burnout among farmers in Canada demonstrated the positive effect of *support from partners, friends and colleagues* (Jones-Bitton et al., 2019). Having close friends and participating in various groups outside the farm positively affects the mental health of



farmers, as demonstrated in several studies (Logstein, 2016b; Rawolle et al., 2016; Stain et al., 2008; Tinc & Sorensen, 2020). In addition to friends and family members, having social contact with representatives of society – such as civil servants and politicians – play an important role (Hagen et al., 2021; Stain et al., 2008). In a study of male farmers who were employed full-time in Norway, Logstein et al. (2016b) found that good *social relationships* and *reasonable work demands* were associated with good mental health.

Farmers saw themselves as *part of a larger community* in which they exchanged knowledge and services with each other (Brigance et al., 2018), received support in various situations (Judd et al., 2006), and also when they had health problems (Bondy & Cole, 2020; Hammersley, 2021; Rawolle et al., 2016). In general, farmers in Australia found it easier to bring up practical problems than health problems, especially mental health issues (Judd et al., 2006). They used their own networks to talk about problems by focusing on problem solving, rather than on 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 (Judd et al., 2006). 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 (Rawolle et al., 2016). The family is part of a farmer's network and was highlighted as an important factor when it comes to social relations (Kallioniemi et al., 2008; Kearney et al., 2014; Onwuameze et al., 2013; Peel et al., 2016; Sprung, 2021). 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 (Hagen et al., 2021). Another health factor was when the family had *an income that came from work outside the farm* according to Norwegian studies (Logstein et al., 2016a). 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 (Thelin & Holmberg, 2010).

### 3.4 How farmers' psychosocial work environment and mental health can be promoted

#### 3.4.1 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 (Jones-Bitton et al., 2020). Many of the stressors that farmers face are difficult or impossible to eliminate, but the farmers with high resilience felt less stressed than those with low resilience. Farmers reported that support from family, nature and animals helped build up their resilience. The fact that working on the 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 (Hagen et al., 2021). A literature study on farmers' mental health found that resilience was the most important health factor for farmers (Hagen et al., 2019). Resilience is something that can be learned, according to researchers from Australia, and doing so can be helpful for farmers (Greenhill et al., 2009).

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 (Hagen et al., 2021). This can include planning (constructive solutions), positive reappraisal (change of attitude towards stressful events), humor and leisure (Garnefski et al., 2005; Greig et al., 2020), getting perspective on events and getting help and support from others (Greig et al., 2020; Roy et al., 2014). Furthermore, acceptance can be used as a coping strategy (Greig et al., 2020; Gunn et al., 2021). 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 (Kuriger, 2016). Coping strategies that are more negative include avoidance (ignoring), as well as blaming oneself or others (Greig et al., 2020). This can also involve suppressing emotions, avoiding problems or consuming alcohol (Kuriger, 2016). Risky alcohol consumption patterns were 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 (Watanabe-Galloway et al., 2021).

Another strategy farmers use to promote their own health is to try to achieve a *work-life balance*. This can be about taking breaks (Roy et al., 2017), and recovering in other ways (Bondy & Cole, 2020). But it can also, according to researchers from Australia, be about 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 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) (Greenhill et al., 2009). Studies from Australia showed that male and female farmers coped with stress differently. Men could work on and try to find solutions rather than becoming mired in negative thoughts and feelings. Female farmers could instead feel inadequate, sad, isolated and lonely (Judd et al., 2006).

### **3.4.2 The role of healthcare in promoting 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 of 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 fixed (Rawolle et al., 2016). According to some 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 (Bondy & Cole, 2020; Vayro et al., 2020). 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 care for their health (Judd et al., 2006). They 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 (McKenzie et al., 2016). Another difficulty concerning healthcare is that farmers rarely seek healthcare for poor mental health, not least because of a lack of infrastructure (Roy et al., 2013). Vayro et al. (2020) and Anderson et al. (2021) 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 (Vayro et al., 2020; 2021).

Both Sartore et al. (2008) and Kavalidou et al. (2015) emphasize the importance of trained healthcare personnel with an understanding of the particular problems in agriculture. This 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 their study of German farmers, Stier-Jarmer et al. (2020) saw that they were in need of specifically tailored healthcare services with a bottom-up perspective, 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 (Kennedy et al., 2021). The results of an Australian study showed the importance of close contact between farmer and caregiver, in which farmers want their support person to understand life as a farmer (Sartore et al., 2007).

Farmers expressed trust in their family doctors but often resorted to alternative medicine or alternative treatment when they considered their illness to be benign, according to a French study (Magnin et al., 2017). General practitioners, specifically in rural Australia, were important in detecting suicide risk among farm workers (Kavalidou et al., 2015). Sartore et al. (2007) also suggested that Australian GPs should identify and respond to poor mental health in farmers, especially those affected by climate change, such as severe drought. Fennell et al. (2016) found that designing mental health strategies for drought-affected farmers in Australia is a major challenge. It is necessary to find the delicate balance between, on the one hand, raising their awareness of high levels of anxiety and encouraging them to take action themselves or seek help and, on the other hand, creating unnecessary worry and stress. Local networks and collaboration within healthcare were found to be important to minimizing the risk of suicide among farmers (Fuller et al., 2009; Sartore et

al., 2008). Caregiver support influenced suicide rates among farm workers in the USA (Odabasi & Hartarska, 2021). Physical activity for the prevention of anxiety in Australian farmers has also been evaluated and the results showed that increased physical activity led to a generally better state of health and improved mental health, which health and medical services should take into account in their preventive work (Brumby et al., 2011; 2013).

### **3.4.3 Additional 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 USA (Rudolphi et al., 2019). On the other hand, Elkind (2007) 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 programs:* the agricultural movement can contribute to social support, education and mentoring programs for farmers with stress and symptoms of depression, and an evaluation showed that such interventions reduced symptoms (Liang et al., 2021). According to Perceval et al. (2017), future suicide prevention efforts for farmers in Australia should take place through education, training programs and national campaigns. Telephone coaching services proved to be an effective method for German farmers when it came to stress-related preventive measures (Stier-Jarmer et al. 2020). 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 (Kennedy et al., 2021). In the USA, they have developed an Internet-based health program, "Agriculture for Life," with the aim of supporting farmers and families with disabilities, chronic health conditions and aging, that is based on discussions with affected groups and previous research. The program has been developed with the aim of contributing to the well-being of the target group. The focus is on seven aspects: physical, occupational, social, emotional, environmental, spiritual and intellectual well-being. However, the program has not been evaluated (Wilhite et al., 2020). Schweitzer et al. (2011) surveyed the resources available in the USA to support farmers with physical or mental disabilities and their families; the mapping showed that there are, for example, psychiatric clinics, patient organizations, support groups, treatment centers and brochures or websites 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. A qualitative study on male farmers in Canada was conducted with a focus on stress and coping strategies (Roy et al., 2014). Many participants had previous positive

experiences of receiving help from the healthcare system and would be willing to use such help again as well as recommend it to others with poor mental health.

In an Australian study, agricultural advisers were trained in mental health first aid. The aim was to give them the knowledge and tools to talk about psychological problems with their agricultural customers (Hossain et al., 2010). 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 (Sartore et al. , 2008). Roy et al. (2013; 2014) emphasized that future educational efforts in Australia should have a gender perspective as they had identified that male farmers have a higher suicide rate than female farmers. 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, to prevent suicide (Steck et al., 2020). Cuthbertson et al. (2021) highlighted that more traditional educational programs for farmers in the USA 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. Education related to stress, depression and psychological difficulties as a result of prolonged drought and the changing economic and social environment is not only deemed to be important for farmers, but also for those in the agricultural sector who give advice in such fields as animal production, crop cultivation and finances, according to studies from Australia (Hossain et al., 2010). American advisors working in farm-related services underwent a Farm Stress Training Program, a web-based program with the purpose of increasing understanding of poor mental health in farmers (Cuthbertson et al., 2020). The program consisted of four modules focused on role-playing and 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 to plan what to do in the event of an emergency in which a farmer shows signs of poor mental health.

A Future Search action-planning workshop was held with dairy producers in New York state in the USA to discuss the challenges that exist for mental health on dairy farms (Tinc & Sorensen, 2019). The participants consisted of dairy farmers, healthcare professionals, government authorities, agricultural organizations and dairy companies. Together, the group took part in various activities that dealt with the past, present and future. Workshop participants collaboratively developed goals and action steps to take to effect change in a variety of areas, such as peer support and social networks, environment, healthcare, business planning, regulations, milk pricing, marketing and consumer education, as well as education, research, technology and labor.

## 4 Discussion

The majority of the studies included in this systematic literature review are from Australia and North America and come to a lesser extent from various parts of Europe. Some have been carried out in Norway and Finland, while there have been essentially no Swedish studies published internationally in the current time period. However, valuable research from different parts of the world provides an important knowledge base for handling the psychosocial challenges that farmers in Sweden face in their working environment and which need to be taken into account by the relevant organizations, government authorities, researchers and politicians, which is discussed in the following.

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 increased globalization and its impact on market prices for their products and increased production costs, not least for various inputs such as fuel, electricity, nitrogen fertilizer and feed. Climate change, with 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. Sweden was also affected by a severe drought in 2018. Requirements from government authorities for increased documentation, bureaucracy, controls, regulations, fees and reporting are perceived as burdensome and difficult to handle by many farmers, as confirmed in Swedish studies (Bergström Nilsson et al., 2020). Other factors that have been reported as being difficult for farmers to handle, not least in Sweden, are negative attitudes in society, in the media and social media, as well as increased vulnerability and crime in the countryside (Ceccato et al., 2021; Lundqvist et al., 2022 ). Another problem that causes concern, stress and expenses is the increased presence of predators and wild boar in the Nordic countries and other areas of Europe.

Farmers' businesses are often closely linked to other companies in the food supply chain in terms of inputs, production and processing, but also to banks and other financial institutions that can be seen as part of their psychosocial work environment. The farmer can also be involved in agricultural cooperative movements and work collaboratively with the agricultural policy-related administrative agencies. These networks and relationships can, through various types of institutions and participants, and in forms of consultation and marketing, contribute to the development of companies, to learning and to a better psychosocial work environment, but they can also lessen the sense of freedom and lead to a decrease in self-empowerment (Rose et al., 2018).

Even the psychosocial work environment requirements that farmers have increased opportunities to influence can be risk factors as they can exert 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 (Lunner-Kolstrup & Lundqvist, 2013; Pinzke, 2018). Farmers may also feel the personal responsibility to be successful in their occupation, to be good employers, not to fail, to carry on the tradition if the farm has been in the family for several generations, and for male farmers, to live up to masculine standards, or as a female farmer, to suffer of 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 feelings 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 family and colleagues can be additional risk factors for a stressed farmer. All of these aspects are just as relevant in Sweden as in they are in the other countries relevant to the systematic literature review. A doctoral thesis by Nordström Källström (2008) confirmed that loneliness and the deterioration of social services in rural Sweden negatively affects 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 (Hajdu et al., 2020).

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 similar studies have been published concerning Swedish farmers, but over the years there have been signals indicating that there may be similar problems here (Public Health Agency of Sweden, 2020).

Several studies in this systematic 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. This 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. But this may 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 who are doing well (resilience) see many healthy factors in their situation. These include 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 are factors that are important for a sustainable working life and social sustainability, something that is being discussed more and more by the LRF and other Swedish stakeholders, but in the literature reviewed, these sustainability concepts are essentially missing.

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, and 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 Sweden, a large proportion of farmers are members of various interest organizations, in which they have great confidence (Lundqvist et al. 2022), and the LRF also offers special support through regional care groups for those who experience anxiety and other mental health issues (<https://www.lrf.se/mittlrf/regioner/skane/bondekompis/>). In 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, including from a Swedish perspective.

The aspects of psychosocial work environments addressed in this systematic 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) (Jones et al., 2020). Their report covers how new technology, climate change and other developments can affect farming in the future, what technical and organizational 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: (a) new technology and the digitization of agriculture (opportunities for improved work environments, but also risk of increased stress); (b) the significance of climate change (increased risks of storms, droughts, floods and their consequences); and (c) effects of the development of the labor market (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 systematic literature review shows that rural farmers in comparable countries in other parts of the world face similar problems and challenges in terms of their psychosocial work environment and mental health. It can also be stated that there is quite a lot 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. Furthermore, it has become apparent that there has been a lack of Swedish studies, but there is also a lack of international cooperation regarding these specific issues.

## 5 Gaps in knowledge and further necessary research

This systematic literature review shows that many valuable studies have been conducted that describe farmers' psychosocial work environment and mental health from different perspectives and in different contexts.

The greatest gap in knowledge is undoubtedly that there is a lack of in-depth knowledge of how the aspects touched on in this review apply to Swedish farmers in the 2020s, not the least of which is how they are affected by various stressors and how these can be handled individually or with external support.

It would be relevant to carry out studies that include farmers of all ages, in different fields of activity, and in all areas of Sweden. There has been a lack of studies that take a comprehensive approach to the psychosocial work environment of farmers in which – with the help of, for example, the demand-control-support model (Karasek, 1979; Karasek & Theorell, 1992) – the conditions in the psychosocial work environment and the possibilities for supporting Swedish farmers are taken into account. Increased knowledge of the problems and challenges faced by farmers in Sweden, as well as which health factors and opportunities they experience, would also be important to increase understanding and appropriately support and develop this important occupation into a sustainable working life. The psychosocial work environment, mental health and other aspects of a sustainable working life for farmers need to be given greater space in continued sustainability work, which should not be limited to environmental and financial aspects.

The studies included in this systematic literature review have often focused on male farmers, whereas there have been significantly fewer studies on female farmers. There have been no studies of men and women's behavior when actively running the family businesses together or any intergenerational studies, which can also be common. There is also largely a lack of information concerning how minority groups, such as farmers of different ethnic backgrounds or sexual orientation, view the role of a farmer.

Changes in the countryside, with increasingly fewer farmers, reduced community services and a rise in crime, and the accompanying consequences for farmers in the forms of anxiety, fear and loneliness, may need to be studied further in a Swedish context.

Studies and evaluations of various forms of support and interventions to support farmers' mental health are needed on a larger scale. The literature study has shown that there have been measures such as support calls conducted individually and in groups, telephone counseling, training of resource personnel and development of self-help materials, but few of these initiatives have been the subject of scientific studies and evaluations.

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