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"An Incredible Amount of Stress before You Even Put a Shovel in the Ground": A Mixed Methods Analysis of Farming Stressors in Canada

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Abstract: Farming is widely regarded as a highly stressful occupation, and many farming stressors have been studied globally. Research on farming stressors in Canada is scarce, yet there is some indication that Canadian farmers have high perceived stress scores and score more severely across mental health outcomes compared to the general population. This study provides a comprehensive exploration of farming stressors in Canada with the aim to inform avenues to reduce stress and/or boost the well-being of farmers. An exploratory sequential mixed-methods design was used. First, qualitative data were collected from 75 in-depth interviews with farmers and industry professionals from Ontario, Canada from 2017 to 2018. These data were then used to inform items measuring self-reported stress across 12 farming stressors in a national cross-sectional survey of farmers' mental health conducted February–May 2021. Results from both data sources provide an initial understanding of the episodic and chronic stressors faced by farmers in Canada, and the context within which these stressors are experienced. Implications and focus areas for stress reduction and well-being promotion are discussed in this paper.

Keywords: stress; stressor; agriculture; qualitative; interview; mixed-methods; mental health; wellbeing

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1. Introduction

The aim of this study was to describe farming stressors with the intention of identifying opportunities for effective stress-reduction avenues. Over three decades of research have supported the notion that farming is a highly stressful occupation [1]. Farmers worldwide consistently score more severely on measures of stress than the general population [2,3]. Recently, farmers in Canada have scored more severely on the Perceived Stress Scale than population norms [4,5]. Moreover, some sociodemographic variables have been correlated with higher self-reported stress for farmers globally, including age [6], gender [6], education, and commodity [7,8]—in Canada, women (compared to men) and swine production (compared to other commodity sectors) have been associated with higher perceived stress [9].

Although investigations of occupational stressors for farmers in Canada are sparse, stressors affecting farmers globally have been well-documented (see [10] for a detailed summary of farming stressors in North America). Some of these stressors include workload and time pressure, financial strain (e.g., debt, markets), unpredictability (e.g., weather, machinery breakdown), uncertainty about the future (e.g., of the agricultural sector, personal farm), government regulation/policy/legislation, geographic and social isolation, conflicts with associates or family members, and farming hazards (e.g., handling chemicals/pesticide exposure, operating machinery) [10–15]. Given the variability of these stressors over time, it is important to have a current understanding of how occupational

stressors impact Canadian farmers' mental health to inform avenues aiming to reduce stress and boost well-being. Additionally, Canadian farmers may face unique stressors compared to farmers in other countries as the Canadian agricultural sector has unique features, such as supply management for dairy and poultry [16].

Despite the breadth of literature on farming stressors and stress, there are few publications on stress-reduction interventions that have been designed for farmers. Derringer and Biddle [17] conducted a systematic review of stress-reduction interventions in farming and rural populations and found a total of three published stress-reduction interventions for farmers between 1980 and 2020. No significant improvement in psychosocial stress outcomes was reported in any of those three studies, and notably, participation was consistently low [17]. The authors highlighted the importance of culturally tailoring stress-reduction interventions to increase effectiveness and participation [17]. Supporting the delivery of interventions and programs specific to farmers, participants in Hagen et al. (2022) emphasized the importance of health care providers having a background understanding of the challenges farmers face [18].

Chronic stress has detrimental impacts on mental [19] and physical health [20–22], as well as relationships with family [23], friends, and coworkers [24]. It also affects productivity [25] and safety [26] at work. The high occupational stress associated with farming has been reported to negatively impact physical and mental health more than other occupations [27]. Indeed, occupational stressors have been associated with symptoms of anxiety and depression in farmers [28], and levels of anxiety, depression, emotional exhaustion, and cynicism (two components of burnout) in Canadian farmers remain high [5]. Beyond high stress, there are additional current threats to the sustainability of farming as an occupation. The farming population of Canada is declining and aging [29]. Larger and fewer farms [29] may contribute to the social and geographical isolation of farmers and their increased loneliness [30]. Farmers will continue to face the direct impacts of climate change, including extreme weather events and drought, which may exacerbate physical and mental occupational stressors [31,32]. Therefore, it is important to prevent farmer resignation due to occupational stress and burnout, and also to minimize occupational stress for younger generations [33]. A thorough understanding of farming stressors, including identifying where stress can be reduced and by whom (e.g., farmers, industry, policy makers), is necessary to inform efforts to reduce farming stress.

The overall goal of the present study was to comprehensively understand the occupational stressors facing farmers in Canada, with the longer-term intention of identifying opportunities for effective strategies to reduce their stress and improve their well-being. Although quantitative farmer-stressor scales provide a broad understanding of which stressors are perceived to cause the most stress in the population, these scales do not capture which aspects of stressors farmers appraise as stressful, or the ways in which stressors may compile. An in-depth understanding of the current stressor landscape farmers face, using qualitative methods, and a broad understanding of the top occupational stressors they experience, using quantitative methods, are merited. Hence, the first objective of this study was to explore how farmers in Ontario, Canada experience occupational stressors, and the second objective was to quantify the perceived stress that farmers in Canada attribute to specific farming stressors.

2. Materials and Methods

2.1. Study Design

An exploratory sequential mixed-methods design was used [34]. First, semi-structured interviews were conducted to provide an in-depth understanding of the farmers' experiences with farming-related stressors. Then, a quantitative online survey was conducted to quantify the perceived stress attributed to stressors impacting farmers in Canada.

2.2. Qualitative Methods

2.2.1. Study Design and Recruitment

The qualitative methodology has been thoroughly detailed elsewhere [9,18]. Briefly, one author (BH) conducted 75 semi-structured, one-on-one, qualitative interviews in Ontario, from July 2017 to May 2018, with farmers and industry professionals who worked with farmers. Participants were recruited via the email and social media networks of a farmer working group that was collaborating with the research team; the first 75 participants to contact the researchers were interviewed for this study. Interviews were 45–75 min long. They were audio recorded and professionally transcribed, and the transcriptions were verified for accuracy by one researcher (BH). The participants completed a short demographic survey before the interview began. The study protocol was approved by the University of Guelph Research Ethics Board (REB #17-02-035).

2.2.2. Discussion Guide

A semi-structured interview guide was used to ask about a wide variety of topics. For the present paper, only stress and stressors are being reported on. Participants were asked, "What are some of the everyday stresses that you experience in farming?", "How do those stresses impact your mental wellness?", and "Some reports, including a recent Canadian one we conducted, show that farmers may experience high stress and struggle with their mental wellness. What are your thoughts on this?".

2.2.3. Participants

Half (50%, n = 37) of participants who completed the demographic survey (74/75) identified as men, and half (n = 37) identified as women. The age range of participants was 25–78 years old (SD 13.3). The majority (69%, n = 51) of participants identified as farmers, followed by industry professionals (19%, n = 14), veterinarians (8%, n = 6), and 1 (1.4%) each from the agricultural government, academia, and agricultural journalism. Most (87%, n = 65) of the interviews were conducted in person, with the remainder conducted over the phone if the participants lived > 200 km from the University of Guelph. Informed verbal consent was provided by all participants prior to beginning their interviews.

2.2.4. Analysis

We selected the use of thematic analysis to reflect the participants' rich, detailed descriptions of their experiences and their attitudes towards stressors while also using our influence as researchers and experiences in Canadian agriculture to answer the research questions. This thematic analysis was guided by Braun and Clarke's recommendations [35]. We used a combination of inductive and deductive approaches to analysis, prioritizing the participants' meanings behind their experiences. We used both semantic (data-driven) and latent coding, with neither prioritized. While data pertaining to a wide variety of topics were collected and analyzed, only those pertaining to the objectives of the present paper are reported here. The total analysis consisted of 6 phases: (a) familiarization with the data and writing familiarization notes; (b) open-coding and collaborative production of an initial unstructured codebook; (c) systematic coding of all transcripts using the codebook; (d) collaboratively generating initial themes from the coded data during bi-weekly coder meetings, assisted by visual memoing; (e) developing and reviewing themes; and (f) refining, defining, and naming themes, including sub-themes [35]. Detailed notes were taken across every phase of the analysis. A collaborative approach was used to achieve richer interpretations using multiple perspectives and standpoints; two authors (BH and AJB) have professional ties to farming and years of experience researching Canadian farmers' mental health, and one author (BH) has family ties to farming, and one author (RT) is a current farmer. The authors embraced the influence their experiences had on the analysis—throughout the analysis, multiple interpretations of the data were explored and discussed among the research team. In addition to this collaborative approach, we used data reliability and authenticity techniques, including a detailed audit trail and reflexivity

notes [36]. The results are presented in this paper using verbatim explanatory quotes; expletives were not removed from the quotes presented here to preserve participants' voices and describe the results in rich detail [36]. The exemplary quotes that are presented here were chosen to represent descriptions that many participants provided [35]. Quirkos© software (Quirkos, Edinburgh, UK) was used to support data organization and coding.

2.3. Quantitative Methods

2.3.1. Study Design and Recruitment

The quantitative data used for this study were part of a larger survey of many variables, including perceived stress, burnout, anxiety, depression, alcohol use, and resilience. For a complete description of the quantitative methods, see Thompson et al. [5]. In short, a national, cross-sectional survey was conducted online from February to May 2021. The participants were recruited via provincial agricultural organizations' email listservs and social media. To be eligible to complete the survey, participants had to identify as a farmer in Canada, be over the age of 18 years, and be able to read and write in English or French. Written informed consent was obtained from all participants, and responses were collected anonymously. As an incentive, participants could provide their email address in a separate online form, which was not connected to the main survey, to be entered into a draw for one of five prizes of CAD 200. This study protocol was approved by the Research Ethics Board of the University of Guelph (REB#21-01-001).

2.3.2. Questionnaire

Among the survey questions, we included "Please indicate the extent to which the following farming-related factors are a source of stress:" in reference to 12 stressors (Table 1), with six possible response options: "none", "very little", "some", "quite a bit", "a great deal", and "not applicable". The 12 stressor items were compiled from existing farmer stressor scales and the results of our qualitative data analysis.

Table 1. Stressor items from the 2021 Survey of Farmer Mental Health in Canada, and their sources.

Stressor Items	Source
Workload and time pressure (e.g., increased workload at peak times, work-life balance)	[11–13] *
Government regulation/policy/legislation (e.g., filling in government forms, adjusting to new policies)	[11–13] *
Geographic isolation (e.g., proximity of health care services)	[11–13] *
Financial stress (e.g., debt, worrying about commodity prices)	[11–13] *
Unpredictability (e.g., bad weather, machine break down, technology)	[11–13] *
Uncertainty about the future (e.g., of the agricultural sector, markets)	[13] *
Hazardous working conditions (e.g., handling chemicals, operating machinery)	[11,12] *
Conflicts with associates or family members	[13] *
Succession planning	[13] *
Treatment of farmers in society and media	*
Activists (e.g., trespassers)	*
Climate change impact (e.g., on profitability, operational planning, damage to crops)	[11] *

* stressors generated from the qualitative data analysis. Many stressors found in the qualitative data analysis can be found in existing farming stressor measures.

2.3.3. Statistical Analyses

Proportions were calculated to report the extent of self-reported stress attributed to each of the 12 stressors. Chi-squares were used to compare frequencies by gender. Statistical significance was set to $p < 0.05$. All analyses were conducted using R version 4.1.1 (Vienna, Austria [37]).

3. Results

3.1. Qualitative Results

Figure 1 shows a summary of the stressor themes generated. In all, the farmers described 13 individual stressors that they experienced day-to-day, and 4 stressor themes were generated that farmers did not explicitly identify as stressors but were common across individual stressors: the all-encompassing "lifestyle" of farming; constant, high-stakes decision making; comparison to others; and lack of control over day-to-day stressors.

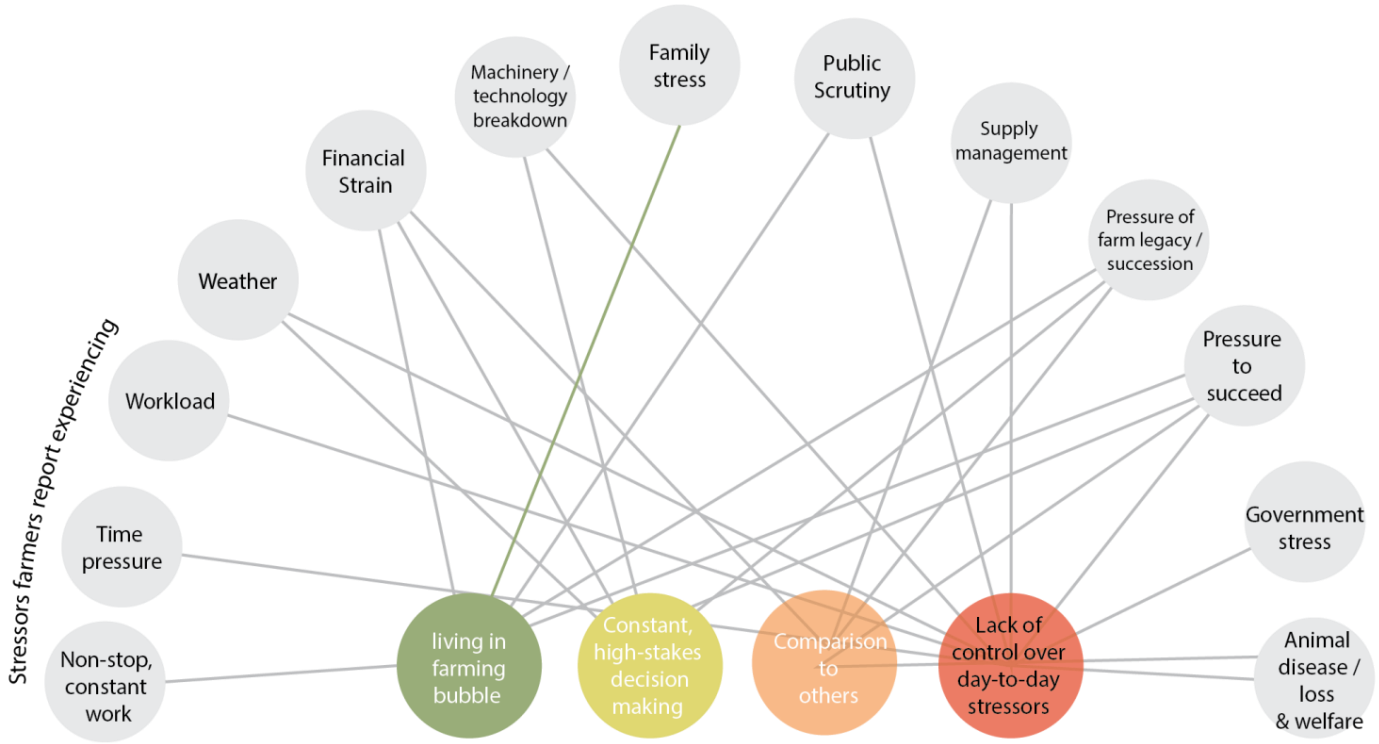

Figure 1. Visual representation of the 13 individual stressors farmers described experiencing day-to-day and the four stressor themes generated.

3.1.1. Perceived Lack of Control over Day-to-Day Stressors—"It's a Constant Anxiety of What's Gonna Happen? Am I Gonna Lose Everything?"

Farmers commonly used language such as "instability", "unpredictability", and "uncertainty" to describe farming and the combination of "many variables out of your control" which contributed to "living under a constant, daily amount of stress." Many farmers brought up that "the unpredictability is what is really hard" and described "always dealing with uncertainty," explaining, "there's so many factors that you don't have control over: weather, and diseases, and prices." Some farmers talked about feeling helpless due to the unpredictability, as one emphasized,

> "you could do everything perfectly and you don't get the right weather, you get a disease or something and even though you did everything right you still might not get a decent harvest and still have to pay the bills."

And another explained,

> "the unpredictability whether it's the markets, the weather, government. If you knew a bit more certain what the future was gonna be like I think you'd be a lot less anxious about what's happening around you."

Uncertainty Surrounding the Future of Supply Management—"It's Been a Great System but If It Goes, We're Done"

Many farmers in supply-managed commodities [16]—chicken, turkey, eggs, and dairy in Canada—described stress that is "always in the background" caused by being "always at the mercies of the government" regarding the future of supply management. Given the high stakes of large initial investments in quota costs (e.g., hundreds of thousands to millions of dollars), many supply-managed farmers worried about the government ending the quota system. This was described as a source of constant worry, "there's always that nagging thing at the back of your head that what happens if, you know, the quota goes, right?" and they described this worry as career-ending "that's always in the back of your head and you can't think about it because if you do you go nuts. You can't move forward if you're worried about that." One participant described a farmer leaving chicken farming early because:

> "He worried about that more it seems to me than the average poultry grower. He was convinced every year that, that would be it. That there would be some free trade agreement that would kill supply management in Ontario."

This worry also affected farmers just getting into supply management, "what if [supply management] gets taken away? What's going to happen with our quota? We haven't even got the animals in the barn yet" through to farmers approaching retirement: "I'm 55 and because, you know, I'm now a widow . . . all I have right now is the farm and the quota . . . [if] supply management is eliminated how will that affect us?" Another farmer described,

> "We're in a supply managed crop and always watching what governments are gonna be doing, what new trade pacts they're gonna be signing. Are we gonna be on the chopping block because of something somebody decided in a back room. It's always the unknown that we don't know about. So it feels like we're always at risk, there's always an uncertainty there that you're just not sure about."

Unpredictable and Extreme Weather—"You're in Mother Nature's Good Graces or You're Not. She Has One Crabby Year and Everything You Own Goes to the Bank."

Many farmers experienced "get[ting] very anxious" over the weather because "you really don't have much control over [it]". Farmers described "always looking at the weather forecast, looking at the sky seeing if it's gonna rain" and experiencing "sleepless nights worrying about is it going to rain tomorrow?" They described the devastation they felt when losing crops due to weather, "he broke down right in the middle of the field because it was a high value crop that he absolutely needed to make the bill payments." One farmer described "watching [their] crops wither away and just feeling helpless. There's nothing you can do". Another said,

> "I remember different times you'd hear rain drops in the middle of the night and I would cry because I was so upset because we've worked so hard to get that hay to where it was and then all of a sudden it was being ruined and so of course then you think, 'well again what are our cows going to eat because it's raining? And because the hay's not going to be good enough, and because the hay's not good enough in protein and content that it needs that the cows won't produce enough milk'."

Unpredictability and Volatility of the Markets—"We're at the Whim of the Market, Right?"

In Canada, the production of some commodities is controlled under the supply management system, whereas other commodities have free markets, or "price takers". Many farmers "in the pork industry, in the cash crop industry, in the beef some of those kinds of markets where they're price takers" described stress due to market volatility. Some felt that their work did not pay off, saying "You could be the best producer and if the market turns on you [you might not make a profit]" and explaining,

> "you thought oh the market's gonna be okay this year and then all of a sudden the drought and it's totally out of your control . . . It's frustrating to think that I could've had this kind of money, and maybe I'll break even this year rather than even make money."

Lots of farmers described the stress of losing profits quickly with market swings. For example, "the prices are changing every minute and you make a decision to market it and all of a sudden the market will suck 25 cents a bushel. Well now you just gave up $10,000 worth of profit or what have you. I mean heck, that's got to be hard, right?" As one farmer said in response to a question on fixing one aspect of farming without any restrictions,

> "[in an ideal world] I would take the uncertainty out of the market so that you knew when you worked hard that you would get paid. I mean, we don't want to get paid a lot. We just want to pay the bills and have something."

Unpredicted Machinery Breakdown, Financial and Time Cost to Fix Machinery—"Sometimes Things Just Go Wrong and You Just Wonder Why Am I Doing This?"

Some farmers described machinery breakdown as different from other "external, natural" factors out of their control, such as the weather, because "it feels like something I should have some level of control over." They described the unpredictability of machinery breakdown as stressful because it "causes lots of interruptions and you just can't get into a mode where you're producing", especially in combination with other factors that are out of farmers' control. "Something breaks and you know the field was ready to plant, the weather's right, you lose the whole day 'cause you tried to fix that." The breakdown takes priority over everything else they must do. For example:

> "the button you pushed doesn't work, well that button you pushed is a $4000 or a $5000 fix. Well it isn't I'll do it next week. If it's a feed system or manure system it's got to be fixed, and it's probably got to be fixed today but it won't be so it may not be fixed a week so all of a sudden that focus goes there, and there's other things that you're doing".

This leaves farmers trying to catch up on work following a breakdown "you get rushed, and stressed, and you start cutting corners, and then sometimes you can get away with it and sometimes you don't."

Animal Disease/Loss and Associated Moral Dilemmas—"I Had No Control over My Barn No Matter What the Fuck I Did. Couldn't Win."

Many livestock farmers discussed stress from the unpredictability of animal disease and animal loss, saying "they get up every morning and they go out to check on their flocks and they don't know what they're going to find"; "you never knew when you walked in the barn door what you were gonna get,"; and "every little thing that happens—could that be a communicable disease? Could that be a reportable disease and I lose everything?" As one farmer told,

> "We've had it before where a day before shipping it got really hot and we lost a few thousand chickens . . . and then just the uncertainty of not knowing if that's gonna come along. So you never know what the summer's gonna be like and there's a lot of things out of our hands . . . that we have no control over . . . that can make it very difficult."

Some participants described feeling that animal disease and loss were somewhat in their control because some prevention efforts are in farmers' control;

> "disease, it's sort of in your control 'cause you can vaccinate, you can keep the barn clean, you can bio-security and one way you kind of view it as something you can control and then when it flares up that really affects you because you think you did something wrong."

Because these farmers felt responsible for preventing disease, they described feeling greater stress when disease hit their livestock; "that's about the most soul sucking thing you can have is high cell count in a dairy herd, like, 'cause you feel like you're doing everything to calm that and you just can't." Multiple farmers who experienced high loss described the "feeling of being responsible for all those lives", saying; "I always want to try to save everybody so that's always a struggle for me. I take it personally whenever an animal doesn't make it . . . Yeah, it's hard." Farmers described losing their animals after trying everything within their control to save them;

> "we were losing all these calves and you've got eight little healthy calves and you're doing well and then all of a sudden one takes sick, and another, and another and it becomes a very, very emotional part that you lay awake at night wondering, 'what do we do? What do we treat them with? How do we help this problem?'"

One farmer described feeling responsible for making decisions after receiving conflicting recommendations from veterinarians for new diseases, "one vet would tell you one thing and then the next vet would come in and tell you something totally different and so as a farmer you just didn't know what to do" and explained how this contributed to them feeling responsible for the loss of their livestock. Another farmer explained,

> "When it's a calf you do your best to raise the babies and to have them born alive and to get them bouncing and doing well but sometimes you can do everything to your last will but there's something wrong and you beat your head and you think well what did I do wrong then? In fact my husband asked me that one time: 'What are you doing to the baby calves?' and I said nothing and I burst into tears and he said, 'oh I'm sorry' and I said I'm doing the best I can. I don't know what's wrong."

Still, some farmers described learning to accept that they have done everything within their control, saying,

> "if it is an animal that's unwell and we do use antibiotics I truly believe in not letting any animal suffer. So we are not antibiotic-free by any means. So if I know I've given it, I know it's good for 12 h . . . that that's as much as I could do, so that's a learning curve for me. I have to learn to–a lot of things are out of your control to a certain extent too so that's something I struggle with I guess is learning that I have tried everything 'cause I always feel like I haven't. I always feel like there must be something I haven't thought of."

Government Regulations and Perceived Misinformed Public Pressure—"There's a Very Small Segment of Society That Knows Diddly Squat about Primary Production That's Telling Us How to Do It."

Many participants described "a lot of stress associated with changing policies and regulations that they feel like they don't have any control over" and stated that some new policies were not evidence-based and were instead designed to appease the public. For example, "with the new regulations coming out with growing crops that don't always seem to follow science, they just follow public mainstream opinion it adds more stress because it makes it harder to grow crops" and "then you have society imposing rules and regulation on farmers when they don't have a clue what's going on, on the farm." Instead of praising new regulations to improve farming, multiple farmers explained "we're constantly being given new guidelines and new things that we have to do to prove to the general public that, you know, we're good to our animals and we're good to the land". This level of control some participants said they believed the public has over their farming practices was described as a source of stress because "it's hard to see other people having such a big impact on your business essentially without being educated . . . it's frustrating." For example, new regulations on antibiotic-free meat were described by one farmer as a

cause of stress because they felt morally obligated to provide antibiotics to their animals, explaining,

> "I feel that if they understood that the lamb that I sell *is* actually antibiotic free because [the lamb] couldn't have anything for, you know, 60-20-45 [days], whatever the withdrawal is [for a particular antibiotic]. So it is perfectly good meat, but that lamb lived a really good life because I was able to save it [via antibiotics], but I don't think they [the public] want to listen to that unfortunately."

Alternatively, a few farmers who were willing to change their practices to meet the demands of the public spoke about how the public is not willing to pay for these practices, "The lack of the buyers willing to buy local. You keep being told they're going to buy local, they want to buy local." As another farmer explained,

> "they [the public] say we want producers to provide analgesia for hogs at the castration just as an example and 'yes I would be willing to pay more for my pork if I knew that animal was getting that analgesia' and then when they follow those people and ask them what they actually buy, they don't. They buy the cheaper stuff, right?"

Hence, participants described significant stress and frustration around government regulations influenced by public demands that are deemed to be neither well-informed nor realistic and/or the public not being willing to actually pay for the changes for which they are advocating.

High Job Demand with Little Environmental Control—"You Can't Time It, You Can't Program Livestock to Be Convenient to You. Everything Is on Their Schedule."

Many participants described farming as "a feat of endurance" saying, "working a 20 hour day is normal, and working a 20-hour day seven days in a row is normal", and described only working and sleeping; "it's all I can do to get through my chores and sleep enough to go through my chores again". They felt as if their farm work was "never-ending", and reported feeling that despite working for themselves, they were on their livestock or the weather's schedule. As one farmer explained,

> "like there's the basic chores on a dairy farm and then there's all the crap that might happen, like everything happens. You walk in the barn in the wintertime and there's a frozen waterline or whatever. You don't know what's–when you open that barn door every day it's a new day."

Some farmers described constant unpredictable setbacks that kept them from feeling on top of their work;

> "When there's breakdown, when their penning or it's ventilation or something breaks, or when there is sickness or scour and then you can't get over it, or when a tractor engine blows up . . . you have to fix things and it all kind of relates to time, taking your time."

This led them to liken their work to being "on a rollercoaster and there is no getting off it" or "on a treadmill . . . and that treadmill never stops." Many farmers expressed exasperation towards their "perpetual list of stuff to do on the farm", saying "it feels like you're working, working, working and you just can't get on top of things." They explained that the extremely high workload makes them feel out of control;

> "feeling like we're always behind and everything's urgent. It's when—and that urgency is when you feel like you're losing control of your day and you're losing control of your priorities 'cause you're dealing with the things that are urgent versus the things that are important and you should be doing."

Some participants described the "deteriorating" feeling of "always hav[ing] that stressor in the back of your mind", "that constant weight on my shoulders that I always have something to do" even when things are going well;

> "We have great employees for the first time ever, the crops are doing well, the pigs are doing well, the prices are good . . . there's a little bit of freedom and a little bit of monetary freedom and a little bit of opportunity to kind of breathe . . . this is probably the best it's ever been and it's still kind of stressful. Maybe not an acute stress but a definite kind of like numb, constant worry."

A few farmers who felt they were not in control of their workload described losing enjoyment in their work, "all you end up is just working, and then working, and then working you don't give a fuck anymore. And you don't care. Don't care about anything." They also described stopping taking care of themselves;

> "you fall asleep in your clothes and wake up in your clothes and go back to work 'cause it didn't matter 'cause all you're doing is milking cows, and feeding cows, and fixing problems and you do that every day for however many days seven years is."

3.1.2. All-Encompassing, "Lifestyle" Nature of Farming—"It's All Intertwined. Farming Is Your Life. Life Is Your Farm. Your Farm Is Your Community."

Participating farmers did not talk about farming as their occupation; instead, they described farming as "not really a job, it's a lifestyle." Farming was central to all aspects of the participants' lives—many participants grew up and live on farms inherited from their parents or grandparents, run their farms alongside their family members and spouses, and live within farming communities. Many participants emphasized that farming was central to their identities. As one farmer explained, "we don't get into farming because it's easy. We get into farming 'cause it's a passion." However, many participants also described a lot of stress associated with farming when "your job is your life, your job is your lifestyle"; they had difficulty disconnecting from farming and felt an immense pressure to be successful in farming, which made smaller, day-to-day stressors feel very stressful.

Inability to Disconnect from the Farm—"You're Living on the Property That You Do Your Business [on]. So It Never, Ever, Ever Really Stops."

Almost all of the participants said they lived on their farms. They explained that because "your home is part of [your job] you don't get that [work/life] separation" and this "leads to a constant state of stress." They described an inability to "walk away and forget about that work" due to living on their farms, saying "it's very hard to relax and forget about all the other things you should be doing" and "you don't feel like you are able to recharge" because "there's just no down time. There's just no getting away from it . . . there's always something you should be doing." One farmer described the inability to disconnect from their work for even a meal due to living at their workplace;

> "on any day you'd be sitting there having a meal and you'd look out the window and even if it was a rainy day like this you'd be saying 'oh, my God I've got to get out and I've got to get that done. I've got to go and fix that, I've got to do that' and that puts a lot of pressure on a person. You're living at your workplace 365 [days a year], 24 h a day and I found that hard."

Some participants emphasized that as a result of always being reminded there is work to be conducted because they live at their workplace, they never take vacations, saying "I didn't even have a day off a year" and "I haven't had a holiday in 25 years." With no time off, these farmers described farming as a constant state of stress, "being on a treadmill" or a "cycle". As one farmer said: "people say, 'oh are you having a good long weekend?' A long weekend? Every day feels the same." One farmer explained how even when they do leave the farm for a vacation, they do not receive a true break from farming because the people they vacation with (family, friends) are also involved with the farm;

> "you'll want to get away from everything and what do you do? You go on vacation with the people who are associated with the farm. So guess what you talk about when you're on vacation, the farm!"

Working with Family—"The Stress of [Trying] Not [to] Tak[e] Work Home with You When Home Is Where You Work"

Many participants worked on family farms, and therefore their coworkers were their family (spouses, children, parents, siblings). Working with family was described by many participants as a source of stress because they had trouble dissociating work conflicts and relationship conflicts, leading these conflicts to compile, which ultimately damaged their personal relationships. For example, some participants said that farming "can be very stressful on a husband and wife because they're often working together on the barn" and because of this "it's probably that much harder for couples to be couples when you're with each other all the time." Farmers said that working with family is different from working with coworkers because "it's not like you're just going to work and you get to say goodbye at 5:00 right? You live with these people and they're there around the clock so it can be stressful." Indeed, some farmers talked about how having family members as coworkers "can be really damaging to just your personal relationship" and knew "a lot of families that, you know, they farm together but they don't ever spend any time together [not working] . . . it's purely business just because of whatever issues have kind of arisen on the farm." A few participants described treating their partners less professionally than they would coworkers, explaining "my poor husband is like, 'you're not very nice to me in the barn' and it's like, 'well would you just please fucking listen? And stop thinking you know everything 'cause you don't.'" One farmer explained how having no separation between family and coworkers contributed to stress because they do not talk to anyone who is not involved with the farm;

> "The one thing is that, you know, you work with your husband, you know, you sleep with your husband, and your family is there so you're always together. It used to be, now most of us have gotten off-farm jobs to help pay for what we do but when you're doing everything together all the time that's a stressful thing too because, you know, you're always talking about the business, or the family and you really never get that break, and you never get, you know, somebody who's gone to work and comes back and talks about something different, that's a bit of a break, you know, to understand that there is different, you know, there is something else out there."

External Pressure to Succeed from Family, Friends, and Community—"[The Stress] Had Nothing to Do with Milking the Cows. It Was More to Do with All the Pressure."

Because farmers' work and home lives are intertwined, many farmers described feeling a lot of pressure from everyone around them—their parents and extended families, children, friends, and communities—to be successful. One farmer described the constant, background pressure that amplifies the stakes of day-to-day stressors;

> "So it's not only it's a place to work, it's a place to raise your family, it is a place where you succeed or fail as a family. It is a place where your value, and your worth was defined by how you farm. So that is an incredible amount of stress before you even put a shovel in the ground, right?"

Some participants described feeling pressure from their parents from a young age to continue their family farm. A few said they "got into the family business 'cause they thought they had to," or "he wasn't really into the cows anyway. He did it for his dad which is not a good reason to do it." One farmer explained the pressure successors feel to continue their family's farm, even though they would not choose farming as their profession;

> "I'm sure there's lots of young guys who are farming and maybe if they hadn't have grown up on a farm and they were working for their dads then maybe actually happier to go do something else. But they feel like an obligation. That's another thing. A lot of farmers, they feel quite obligated to their families to keep the business going and maybe kind of subvert their own interests maybe for a while even and sometimes a while becomes a lifetime, right?"

The few participants who continued their family farm for this reason described stress from being "stuck in [their] situation." Many farmers whose farms have "been in the family for generations", regardless of whether they initially wanted to continue their family's farm or not, described feeling "a lot of pressure" to "make a success of it" because they "don't want to be seen as running down the family farm." They felt pressure to live up to their ancestors' successes, stating "in generation farms where you throw in the pressure of like great grandpa you know, did it this way, and bought this farm and it's like this legacy . . . that is a heck of a lot of pressure, right?". Other participants explained that this pressure causes constant, high stress: "he was the oldest of 6 sons and he had to take over the farm . . . [the stress] had nothing to do with milking the cows. It was more to do with all the pressure." Farmers described losing "the whole family farm" as "heartbreaking" because they felt they were "sell[ing their] family history", and as one farmer said, "it's all he has left of his parents." Farmers who inherited their farms also felt "responsible for the payments that were going to help your parents retire." As one farmer described,

> "And the big stressors there are the fact that often they're third or fourth generation farms and the incumbent farmer if they can't make a go of it feels like a failure. It feels like they let everybody down. That they're going to have to sell the farm that's been in the family since forever. It was started by their great, great grandfather. Land was cleared, trees were there. They cleared them off, they farmed it, they've been successful and they're not anymore."

Some participants described "a lot of pressure on a lot of these young guys who have families, who have kids who want to get involved to grow to make room for them" and make sure their farm is successful before "pass[ing] the plate to somebody else." Some farmers described this as the sole reason they farm, explaining "it's my kids that definitely just keep me [farming]. If they weren't around it'd be different." They explained that if they lost their farm, "That's it, you've blown it, you blew it for your kids, for your grandkids, you're done, that's it." One farmer summarized pressure on both sides of succession;

> "I heard of a situation here just yesterday about a farmer that had been expanding and spending millions of dollars to grow his farm and his son got home from agricultural college and he worked for dad for about a month and said, 'well jeez I don't think this is what I want to do'."

Neighborhood Watch—"Your Farm Is Your Community"

Some participants described the pressure to hide when things are going wrong on the farm from their community. They explained that being unsuccessful "smears your image" in their communities, and they "worry about what people would think" when experiencing animal/crop disease or loss. They explained that because farmers "don't want to let anybody know there's something going wrong" they will not talk to anyone about it or ask for help from their peers "so that they don't look bad in their family or their community" and instead "they'll try and fix it [alone]." A few livestock farmers specifically described being "very hesitant to share information [within their community] that they have a particular illness" due to "this, like, weird stigma that all of your birds get sick, you must be doing something wrong." One industry professional described how their clients were treated differently in their community when they had a disease in their barn;

> "even though that producer was really diligent with biosecurity, and reported, and did everything—they still were treated by the community—I don't know what the word is, like infectious diseases they weren't welcome at church on Sunday . . . they were thought as being dirty and having bad biosecurity, and it had nothing to do with that."

Unwillingness to Leave Farming—"There Is Life after Farming. That's Important to Remember."

As their occupation was synonymous with their life, many participants felt that there was "no other option" but to farm. When things go wrong, rather than getting out of farming, participants said they would "go to the wall to save the farm" and "farm 'til the money's gone." Participants described the immense pressure they felt to be successful because if they were not, they would lose "everything" in their lives. They explained that "[it] feels like losing the family farm is the end of the world. It's the worst thing that could happen to you." One farmer explained the difference between losing the farm and losing a job;

> "It doesn't matter what kind of farmer you are, whether you're an organic, conventional, whatever you do...you never want anything to go bad, or you never want to hurt anything because it's not the same as having a 100 foot garden. This is, you could lose everything. And that's like this is losing your job, this is losing your home."

3.1.3. Comparison to Others

Comparison to Other Farmers—"A Hard Time Measuring Up"

Some farmers compared themselves to the people who taught them to farm; "growing up, like, I totally idolized my dad right? I always had, you know, like the superhero glasses on about dad, like, when he milked cows, like, everything was perfect . . . I always have a hard time measuring up to that." When participants were from multi-generation farms, they were compared to the previous generations, and shared that this comparison "probably causes me the most stress." One farmer who married into a multi-generation farm talked about the stress he felt from comparison to his father-in-law;

> "my wife she lost her dad right after we got married and . . . everything that he did was perfect. Like, he was a dairy farmer too, and I'll never measure up to that. And so, like, that's about my hardest thing to deal with is just, like I can have the best numbers in the world . . . I can say look here's my numbers, I'm progressing, I'm moving forwards, things are getting better but, like, none of that matters. But I don't think you're doing it great so therefore you're doing it wrong. And, like, I really struggle with that."

Farmers from supply-managed and non-supply-managed commodities compared themselves to each other. Those from non-supply-managed commodities often described being "envious of the supply-managed farmers" because "dairy farming or chicken and that, they have a lot more revenue." Farmers from non-supply-managed commodities commonly associated supply management with wealth; "and I found out late that he's a chicken farmer. He had all sorts of money." As one farmer put it, "that's just the way it is with supply management. They just seem to have a bit of an edge on the rest of us." However, farmers from supply-managed commodities found this comparison "irritating," saying "they seem to think we're all rich which is very far from the truth." As one farmer explained, the initial investment for farms in supply-managed commodities is large for many farmers in order for them to build regulation-meeting barns and invest in quota;

> "a lot of people say well why should supply management farmers be stressed out? Well, they are incredibly stressed out . . . I have a $2 million mortgage and if interest rates go up I'm done. I have over-extended myself."

Many supply-managed farmers described "carrying a heck of a heavy debt load" due to the cost of quota; "like $1 million [in quota] is not uncommon. You go buy chicken quota, buy milk quota today and all of a sudden you've got one heck of a big bill on your plate right?" Supply-managed farmers were stressed by this high debt load combined with the "stress of making sure that they can produce enough milk to fill their quota" and worrying about the future of supply management; "it's several million dollars now to put up a new

barn and there's no guarantee that the quota system is going to stay relevant." A few supply-managed farmers were also envious of non-supply-managed farmers, describing "we're in supply management so we don't have, you know, those kind of subsidies or help from the government when things go poorly like, you know, the beef industry, or the pork industry".

Farmers with small farms commonly compared themselves to those with larger farms. Many small-scale farmers described feeling as if they have less support from the government and assistance programs compared to large farms, saying "there's no support from our Ministry of Agriculture. I know I'm not a big player, I know that. I'm small" and "the government sets up all these programs and then they make it so a farmer can't get into them, or make use of them . . . they don't seem to support the average farmer out there. They just support the guy that's real big." As one farmer said,

> "If you're a corporation and you're into the cash cropping, and you've got your 5000 acres of corn and your 5000 acres of wheat and you have a big conglomerate behind you it's different than the stress of the family farmer and trying to find solutions for land that isn't perhaps ideal."

Small-scale farmers described having more financial stress than large farms; "if you have a lot of land and, you know, they're okay [financially]. The small ones are not okay [financially]" and "the big guys have kind of taken over and kind of shoved the little guy out." Conversely, farmers with a lot of land described having a high debt load and high stakes on each crop; "the bigger the farm the higher the stress, the higher the debt load and everything amplifies." As one participant explained,

> " . . . guys who were say 40–50 bushel soybeans normally I've heard yields as low as 3 bushels per acre. So you spend $80 on seed, say $40 to spray it and another $40 for fertilizer and you get $30 back. And if you have that on big acres I know I keep going back to financial stress but that is a big one."

However, a couple of the participants also recognized that all sizes of farms have high financial stress, saying "I think it doesn't matter how successful, how big, how small your farm is I think there is—if you're trying to make a living from this it's not the easiest way to make a living." One small-scale farmer recognized the difference in stress that large-scale farmers might have, explaining,

> "There's not many farms our size that are 150 acres. Now some of these guys are farming 4000 or 5000 acres of farmland and I guess it's great but this past spring whenever they were battling the weather they've got 3000 acres to put in. They sometimes brought that on themselves because getting bigger they need to get bigger to make money or they've chosen to do that. Some of this certainly can be brought on with their position to go big or go home type of thing. Which I, you know 'cause the outlays for some of these equipment they've got $500,000, $600,000 tractors that they're driving around now and how do you pay for that when you have a crop failure?"

Comparison Non-Farmers—"They're Obtaining Goals That They Had Set When They Were Younger and You're Getting Older and You Still Haven't"

The farmers compared themselves to others their age who chose a different career path and described this as a source of stress. Some farmers compared their financial success to non-farmers, explaining that "people who are just as capable as me, who are of similar capacity . . . are making way more money, seemingly more job security." As one farmer explained,

> "for me the hardest was I was in my early 30 s was seeing successful people my own age because 30 is old enough now, early 30 s where a lot of people who took a very clear path to something lucrative right out of the gate are doing pretty good, you know? They're doing all right. So I had people in technology, finance,

> whatever and they would come and they would say oh, 'we came to Niagara this year and last year we went to Australia, and the year before that we went to Argentina' and it's like right, all I could afford to go to other wineries in the area and buy a bottle if I was feeling generous, right? I was broke."

The farmers also compared their general success to non-farmers, explaining that "You run into people that you used to see and you find out they're succeeding at this or their lives are different. Maybe they're obtaining goals that they had set when they were younger and you're getting older and you still haven't . . . " Some farmers compared themselves to their non-farming friends at key milestones, such as retirement, "you talk to friends, and my age I'm 60, friends that I grew up with and that, they're 60. They're talking about retirement and I'm like holy, I will never retire" and buying a home "the biggest stress in their life is that, like the real estate market is, like, crazy right now . . . in contrast to people who don't have a regular pay cheque going into their bank account and have a $5 million mortgage on a farm . . . "

3.1.4. Constant, High Stakes Decision Making—"Always Uncertain If You're Going in the Right Direction"

Many farmers talked about the stress they attributed to the number and financial magnitude of the decisions they make. They described feeling "overwhelmed" by decision making due to the combination of a variety of factors. For primary decision makers, making high-risk decisions alone was a source of stress; "you're depending on your own intellect and your own wisdom, and your own perspective to know what to do, and to do it." The participants explained that they are largely making decisions with no "right" choice, only a "better" choice, so farmers described feeling "always uncertain if you're going in the right direction." On top of that, many participants talked about the high stakes involved in decision making, (e.g., "just the amounts of money that are involved in decision-making. That can be—I mean that on its own can be incredibly scary or stressful") and the long-term impacts of the decisions they make. Many decisions have high financial implications, and farmers may not know if they have made the "right" decision for years, fearing "paying for" a poor decision long-term; "you make a bad decision in your selection of a bull or whatever that could affect you for two, three years down the road, right?"

Risk taking was a salient aspect of the decisions many participants described making. Farmers explained being bombarded with decisions to make around adopting "so much new stuff coming along whether it's seed, or equipment and technology" that is "changing so rapidly now", assessing the risk of investing in something new that might not pay off versus keeping their current practices, technology, or equipment; "is it the right decision for the future or did I just waste my money on that new item that isn't gonna make me any money?" In comparison to assessing the risk for monetary gains, farmers also described assessing the risk of monetary loss and making decisions based on what losses they can afford; "What are the consequences to making the wrong decision? Is it financial? Are they gonna be able to feed their family or is it just that they're not gonna have good crops, forages to feed their cattle?"

Whether farmers primarily produced crops or livestock was another factor that influenced the stress associated with decision making. For example, crop farmers discussed how decision making is amplified because they "have one shot each year to make money." As one farmer explained, "the tough part is also that you invest all these crop inputs in the spring and you're basically gambling to put things in the ground waiting for a crop to come off." On the other hand, one of the most stressful decisions for livestock farmers to make was "deciding what's right for the animals but whilst being fair and true to your business as well" when it came to livestock disease/loss; "the daily responsibility of looking after livestock and the immense responsibility that comes along with that. The making hourly, daily decisions about health care options, or how they're going to do something from an animal health standpoint, but also from a financial aspect." The farmers described the great financial loss that comes with animal loss;

> "like [the price of treatment is] $50 a pig. That's 10 pigs, that's $500 a week, plus the feed you put in them, plus this, and this, and this . . . that was happening for years. And so I got to be calling vets, they'd come over, they'd do their tests, they'd go more or less there's a super bug in this part of the barn where we don't really have medicine for this."

They discussed deciding whether "to get a vet out and then it can cost more money, and then you might end up losing the cattle or the pig anyways." As one farmer explained,

> "The best cow it was an easy decision but those mediocre ones well, should I call the vet or should I just kind of see if she gets better on her own? And there's several circumstances that just stand out in my mind over the years. Like one time I hurried through chores to go to this [statutory holiday] party that the neighbours were having and we went to the party you know, had some food, some drinks and I come home and walked in the barn and it was the best cow and she had what they call milk fever and I almost ran to the phone. Here we are at 11:00 at night and the vet said I'll be right there. And he was there quick but she was dead by the time she got there. And stuff like that, like it's pretty high pressure."

However, decision making was described as both a contributor to high levels of stress and an outcome impacted by high levels of stress. Multiple farmers said that high stress "makes [them make] irrational decisions" which they face the consequences of later; "I make some questionable decisions [when highly stressed]. I make decisions that I look back on and that was really stupid. And I think it's because at the time you're not really thinking. You're just trying to get through it".

3.2. Quantitative Results

The items in the quantitative stressors scale were informed by the qualitative data; greater insights into the stressors that were given a lot of attention, or were talked about with passion in the qualitative interviews, can be gained from the data in the quantitative stressors scale.

3.2.1. Survey Participants

A total of 1167 farmers participated in the survey. Most participants were men (60.7%; 39.3% women), did not work off of their farm (64.2%), were oilseed and grain farmers (53.2%), had no previous diagnosis with a mental illness (84.6%), and were married (82%). The average age of the participants was 49 years (SD 13.7; IQR 38–60, range 20–93), and 49.5% of the participants were from Ontario, although all provinces and territories were represented. A complete description of the survey participants can be found in Thompson et al. [5].

3.2.2. Farming Stressors

The proportions of participating farmers identifying with various levels of stress attributed to the 12 farming stressors are presented in Figure 2. The stressors to which over 50% of farmers attributed "quite a bit" or "a great deal" of stress were workload and time pressure (62.6%), government regulation/policy/legislation (55.9%), unpredictability (55.0%), financial strain (52%), and uncertainty about the future (50.1%). Additionally, 50% of the women attributed "quite a bit" or "a great deal" of stress to the treatment of farmers in society and the media. The stressors to which over 50% of farmers attributed "none" or "very little" stress were hazardous working conditions (55.2%) and geographic isolation (63.8%). Further, 62.4% of men attributed "none" or "very little" stress to conflicts with associates or family members. Significantly more women than men reported greater stress from all the stressors, except for government regulation/policy/legislation and activists, for which there were no differences by gender.

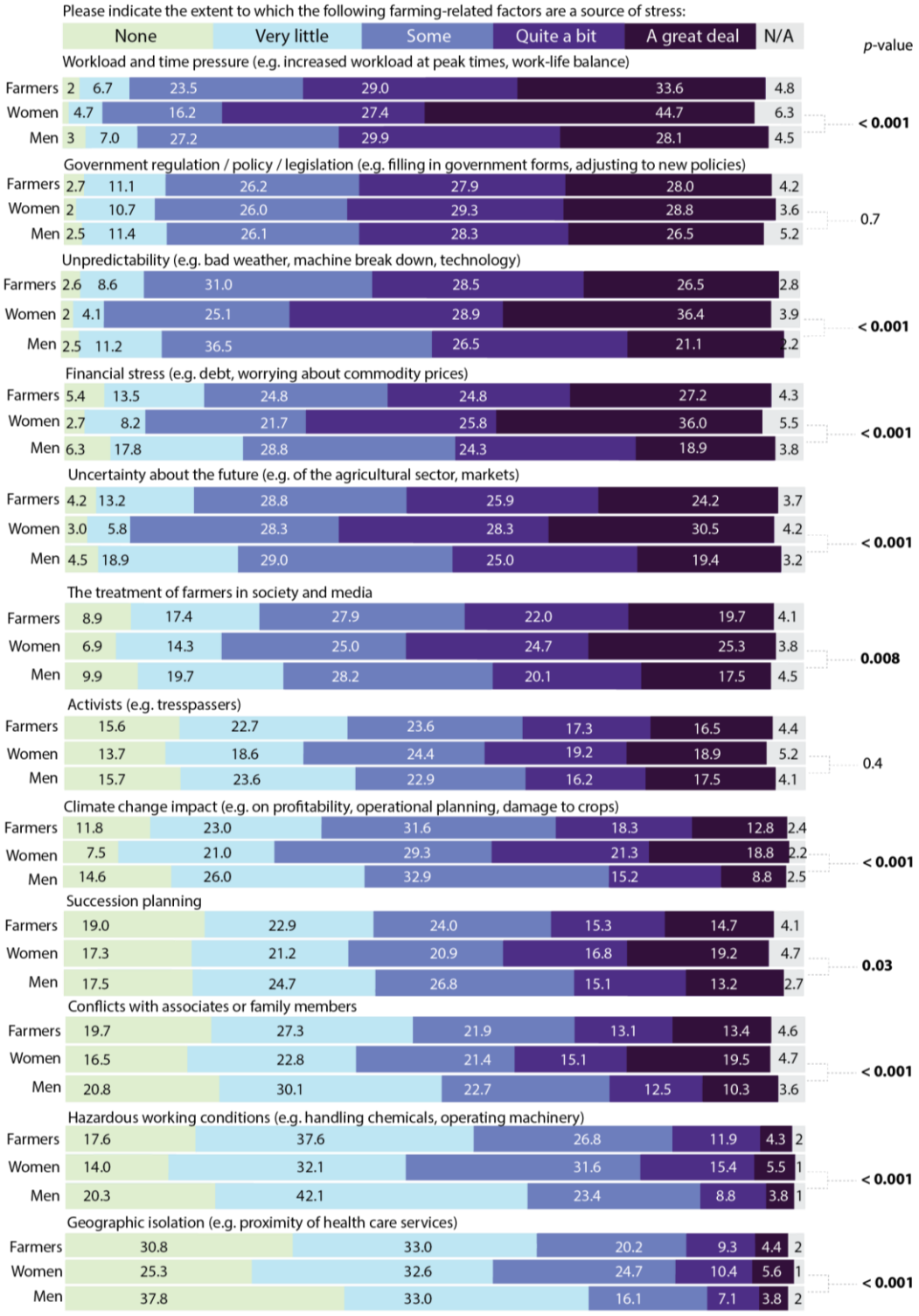

Figure 2. Stress attributed to 12 farming stressors by participants, and comparison by gender (women and men lines). Significant differences ($p < 0.05$) are indicated in bold.

4. Discussion

The goal of this study was to conduct a comprehensive exploration of farm stress, with the intention to inform avenues to reduce stress and/or boost well-being for farmers in Canada by meeting the research objectives: (1) to explore how farmers in Ontario, Canada experience occupational stressors; and (2) quantify the perceived stress that farmers in Canada attribute to specific farming stressors. Our findings met these objectives by ex-

panding our understanding of the context within which farmers experience day-to-day occupational stressors and identifying important focus areas for future stress reduction avenues.

The themes generated from the qualitative data better illuminate the context that daily farming stressors are experienced in. Farming stressors, such as machinery breakdown, bad weather, crop/animal disease and loss, and paperwork, are acute or episodic stressors–stressors that have clear start and end points [38]. However, the context that farmers described deepened our understanding of how farmers experience these episodic stressors in two ways. First, farm stressors were described as cumulative—one "small" stressor (e.g., machinery breakdown) in the context of all the other "background" stressors farmers had described (e.g., pressure to succeed, high financial stakes on their crop, other farmers in the community already finished harvesting) had much higher stress impact than the stressor alone. Second, the context within which episodic stressors were described revealed that the common thread between them was a chronic stressor—lack of control. Chronic stressors persist for an extended period of time, have no foreseeable ending point, are out of the individual's control, and impact many aspects of their lives (family, marriage, work, health, finances, housing) [38,39]. Indeed, farmers described the high degree to which their occupations are intertwined with all other domains of their life and how occupational stressors, such as workload, decision making, and lack of control, impact their relationships with family, friends, communities, marriages, and housing—additionally describing how people in these other domains of their lives (spouses, parents, community members) add external pressure on these farmers to succeed, which exacerbates episodic occupational stress. Chronic stress can lead to a myriad of mental and physical health concerns, including cardiovascular disease, immunosuppression, depression, and burnout [39,40]. Indeed, farmers who participated in the quantitative survey of this study also scored more severely than the general population across several measures of mental health outcomes [5] including cynicism and emotional exhaustion, two of the three components of burnout [41], and depression [5].

A comprehensive understanding of the stress context presented here will benefit the field of farmer mental health research to better inform how we investigate farmers' resilience. For example, the Brief Resilience Scale defines resilience as "the ability to bounce back or recover from stress" and its items use language including "make it through", "recover", "snap back", "come through", and "get over" hard times, which imply an ending to the stressor someone is facing, which is appropriate for studying resilience to episodic stressors [39,42]. On the other hand, the Connor-Davidson Resilience Scale, which defines resilience as "persistence and hardiness", asks respondents about their functioning through stress (e.g., "under pressure, I stay focused and think clearly") [43]. The understanding that farmers face many chronic stressors in their daily lives presented here should be understood when aiming to measure farmers' overall resilience. Investigations of farmers' resilience to a specific event, such as a catastrophic loss due to a period of drought/flooding or animal disease, should be measured differently than farmers' overall resilience, and efforts to build resilience in farmers should consider separate avenues for resilience to episodic and chronic stressors [39].

However, the "big picture" understanding of farming stressors presented here also has practical implications for farmers and those working with farmers. For example, this understanding of episodic farming stressors has important implications for general practitioners and mental health professionals working with farmers, who should consider episodic stressors as "the tip of the iceberg" and ask follow-up questions about chronic stressors in farmers' lives. Additionally, gaining a deeper understanding of the stressors farmers deal with should contribute to healthcare providers' "farm credibility", which farmers value in their health care providers [18]. Further, expanding farmers' understanding of farming stressors beyond their own farming background (e.g., livestock farmers understanding crop farmers' stressors and vice versa, supply-managed commodities vs. price takers) may help farmer friends and colleagues better understand and support each other by providing

talking points when checking in on fellow farmers. In addition, in this study, farmers described comparing their stress to the stress of farmers from different commodities and with different farm sizes, and this comparison exacerbated their own stress. This research should aid farmers' understanding that although specific stressors may differ by commodity/farm size, high stress is ubiquitous across all groups, and comparisons with others is likely to be detrimental. Therefore, the results of this study may help farmers better understand and support one another via the erasure of these erroneous divides.

Consistent with the emphasis participants made in the qualitative results, the top stressors that participants reported in the quantitative survey were workload and time pressure, government legislation/policy/regulation, and unpredictability of farming factors (e.g., weather, machinery breakdown). These domains of farming stressors have been previously identified as main sources of stress for farmers in Ireland [7], New Zealand [44], and the United States [15,28]. In Canada, "problems in balancing work and family responsibilities" was identified as the top stressor for both men and women in 1987 [45], and "government policies" and "farm finances" were identified as the main stressors for farmers in a cross-sectional survey conducted by the Canadian Association for Farm Safety in 2005 [46]; however, no quantitative farming stressor investigations have been conducted since that time, to the authors' knowledge. As the stressor context for farmers has changed meaningfully since 2005, with the increasing impacts of climate change and changing farming trends (e.g., consolidating small and medium farms into larger farms), the present study begins to fill this research gap, but continuing to study farming stressors in Canada over time will provide insight into whether top farming stressors are consistent across time and geography. Additionally, identifying trends in farming stressors over time and place will be useful to inform effective stress reduction strategies which target timely farming stressors.

The qualitative data provide further context for the most-endorsed stressors on the quantitative measure. For example, farmers described having constant reminders of their workload due to living at their workplace, which they said contributed to the feeling of overwhelming, never-ending work. In addition to identifying opportunities to reduce and better manage their workloads, avenues to reduce stress and/or boost well-being for farmers in Canada should provide strategies to help farmers temporarily disengage from their overwhelming workloads. Although disengagement coping strategies have been traditionally associated with negative mental health outcomes, such as psychological distress [47], some studies have found a positive effect of disengagement coping strategies (e.g., distraction) and have suggested that their effectiveness might depend on characteristics of the chronic stressor, particularly for chronic stressors with high uncertainty [48,49]. Further, farmers described feelings of defeat and hopelessness when talking about the unpredictability of many aspects of farming, including changing government regulations, the weather, machinery breakdown, animal disease/loss, etc. Reducing the unpredictability of these variables is difficult, however, there is an opportunity to provide strategies around mindset to help farmers cope with the stress of unpredictability. Further research into which coping strategies farmers use and find effective for coping with farming stressors is warranted. Additionally, interview data on what brings farmers joy, purpose, and meaning would be useful and essential to designing well-being avenues.

Finally, the farmers discussed the stress they felt from the perceived lack of control they have over changing government regulations and trade agreements, including the possibility of ending the supply management system in Canada without notice. Supply-managed farmers need to perceive security in the supply-management system so that farmers do not worry about losing their retirement savings, etc., with each change of government [50,51].

Consistent with previous research, we found significant gender differences across the stressors; women attributed significantly more stress to all stressors, with the exception of government regulation and activists for which there were no gender differences. Firth et al. reported that men attributed significantly more stress to filling in government forms and adjusting to new government regulations than women, and women attributed significantly more stress to long hours of work, the introduction of exotic diseases that will affect

farming, not having enough ready cash, debt load, worrying about owing money, and worrying about the viability of the farm [44]. Logstein found that women in Norway were significantly more often concerned about the economy of the farm and not having enough time to perform the work that needs to be conducted on the farm than men [6]. In addition, farming women consistently score more severely than farming men across measures of mental health outcomes associated with farming stressors, such as anxiety, depression, and burnout [19]. Indeed, women from this quantitative sample scored more severely across measures of anxiety and depression than men (for details, see [5]). It is possible that this gender difference could be attributed to men under-reporting their levels of stress as well, as admitting high levels of stress might conflict with their views of masculinity [52]. Further research is warranted to investigate this gender difference more thoroughly to understand why farming women in Canada self-report higher stress and score more severely across mental health outcomes.

The study findings also highlight focus areas for efforts to reduce stress and/or boost well-being to address. For example, farmers described stress caused by the inability to disengage from their farm due to the high workload and high interconnectivity between work and the other domains of their lives. It was clear that participating farmers felt the need to disengage from farming and dissociate from the farm to relieve stress. Recently, Brennan and colleagues reported that working off of the farm significantly reduced the probability of stress [7], and off-farm work has been associated with higher life satisfaction and less social isolation/loneliness in farm women in Norway [53]. It is possible that working off-farm, for farmers who have the time and ability to do so, benefits farmers' well-being by allowing them to disengage from farming while at work and talk to others who are not involved with their farms. Unfortunately, as described in this study, many farmers already have overwhelming workloads which could not support an additional off-farm job. However, similar benefits might be achieved with activities requiring less time commitment, such as off-farm hobbies, clubs, church, or even on-farm disengagement coping strategies, such as distractions [49]. Another focus area for avenues to reduce stress and/or boost well-being among farmers involves comparisons to others. First, farmers made assumptions about other farmers' stressors and expressed frustration that farmers from other commodities and farm sizes did not understand their stresses, identifying a need for continued efforts to normalize speaking with other farmers about stress. Avenues to reduce stress/boost well-being should prioritize the growing understanding that farmers across commodities and farm sizes share worries, and promote dialog about stressors between farmers. Farmers negatively compared themselves to other farmers and non-farmers and described this envy as a source of stress. Envy, specifically envy between coworkers, has been associated with negative mental health outcomes, such as stress, anxiety, depression, and lower resilience [54–56]. Self-compassion and mindfulness have been reported to mediate the relationship between envy and stress in public safety personnel [54]; self-compassion and mindfulness may represent a promising avenue for farmers to help reduce negative comparisons with others alongside the associated stress. Finally, future research should investigate farming stress and stressors within Karasek's demand-control model (DCM) and the job demands-resources model (JD-R). The demands of farming and the lack of control over farming stressors described by participants are consistent with a high-strain job as posited by the DCM, in which job environment is defined by the psychological work demands and the workers' level of control over these demands [50]. However, there may be ways to cope with job demands beyond gaining control over the demands, and this is where job resources, which reduce the strain caused by job demands (e.g., social support), are introduced [51]. Future research should investigate farming stressors through these models as they are popularly used within research among other occupations.

Limitations and Future Directions

The strengths of this study include the engagement of participants from a wide variety of farming and agricultural industry backgrounds and lie in its ability to gain in-depth

data from the interviews, in addition to broad data from the national survey. Nevertheless, several limitations should be noted. Regrettably, we did not see any Lesbian, Bisexual, Gay, Transgender, or Queer (LGBTQ+) representation; future studies are encouraged to purposively sample for LGBTQ+ and Black, Indigenous, and People of Colour (BIPOC) participants. Although the national survey was available in both English and French, the interviews were only conducted in English, which may have limited the eligibility of some of the farmers in Ontario who would have wished to participate but could not due to the language barriers. Finally, the convenience sampling used for the quantitative survey limits the generalizability that can be applied to the broader population. We recommend that future studies adopt a probability sampling strategy to ensure a representative sample and strengthen statistical inferences from the data.

5. Conclusions

We conducted an exploratory sequential mixed-methods study of farming stressors in Canada. The farmers in this study attributed stress to a variety of chronic and episodic stressors, which they described as complexly interrelated, cumulative, and overwhelming. Salient farming stressors from the qualitative data were reflected in the quantitative data as stressors to which over half of the sample attributed high stress. Future research should investigate coping strategies and gender differences in the experiences of stress and coping. Focus areas in avenues to reduce stress and/or boost well-being for this population should include resilience to chronic stress, self-compassion, mindfulness, disengagement coping strategies, risk assessment, and decision-making under stress.

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