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# Final report

## Improving work environment and safety within the horse sector through novel methods and tools

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## Part 1: Detailed summary


Studien omfattade två delar: 1) En enkätstudie med syfte att identifiera hur anställda inom hästnäringen upplever sitt nuvarande jobb och vilka faktorer de anser är viktigast för att ett jobb ska uppfattas som attraktivt samt att undersöka skillnader mellan det nuvarande arbetet och anställdas idealbild av ett attraktivt arbete, 2) En interventionsstudie på två ridskolor och två travstall med syfte att utveckla och utvärdera metoder och verktyg för systematiskt arbetsmiljöarbete anpassat för hästsektorns behov, med särskilt fokus på att främja motivation. Det övergripande syftet var att skapa kunskap om hur ett långsiktigt arbetsmiljöarbete praktiskt kan integreras och vara kontinuerligt fungerande inom hästnäringen och därmed på sikt bidra till ett säkrare och hållbarare yrkesliv inom hästrelaterade yrkesgrupper.

En enkätstudie genomfördes med anställda från 30 ridskolor och 30 travstall slumpmässigt utvalda inom tre regioner i Sverige - Dalarna, Uppland och Västra Götaland. Totalt svarade 150 personer på enkäten, 90 svar från anställda på ridskolor och 60 på travstall. Enkäten om attraktivt arbete innehåller 87 påståenden som är kopplade till tre kategorier (arbetsförhållande, arbetsinnehåll och arbetstillfredsställelse), som i sin tur innehåller olika dimensioner. Respondenterna tar ställning till dels hur viktigt påståendet är för att ett arbete ska vara attraktivt och dels hur väl det stämmer med deras nuvarande arbete. Generellt sett upplevde anställda på ridskolor och travstall sitt nuvarande jobb som attraktivt, särskilt på travstall. De viktigaste dimensionerna för att ett jobb skulle uppfattas som attraktivt enligt respondenterna var lojalitet, relationer, stimulans och att vara eftertraktad. De två dimensioner med störst skillnad mellan nuvarande jobb och ett idealjobb, och därmed de som är i störst behov av förbättring, var lön och adekvat utrustning.



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Fyra arbetsplatser, två ridskolor och två travstall, valdes ut för interventionsstudien genom bekvämlighetsurval baserat på geografiskt läge, engagemang i arbetsmiljöarbete på arbetsplatsen och vilja att delta i studien. Baslinjedata samlades in via enkäter (om säkerhetsklimat, motivation för arbetsmiljöarbete och implementering av systematiskt arbetsmiljöarbete) och genom individuella semistrukturerade intervjuer med chef och medarbetare samt styrelseordföranden för de två ridskolorna. Alla arbetsplatser fick använda metoden Visit, som bygger på att de anställda besöker sin egen arbetsplats för att kritiskt granska och diskutera vad som kan förbättras. De satte sedan upp en handlingsplan med prioriterade åtgärder och under två års tid stöttade forskargruppen arbetsmiljöarbetet på de fyra arbetsplatserna. De fick utifrån identifierade behov använda flera olika metoder och verktyg för att förbättra arbetsmiljön under perioden. Därefter utvärderades resultatet genom intervjuer och enkäter. Hög personalomsättning på arbetsplatserna försvårade dock uppföljningen. Interventionen gav insikter om framgångsfaktorer för ett välfungerande systematiskt arbetsmiljöarbete, där några av de viktigare var: personalens delaktighet, variation i arbetsuppgifter (arbetsorganisation), enkla och kostnadseffektiva lösningar samt delat ansvar. En metod som alla fyra arbetsplatserna var positiva till var Visit, eftersom den var lätt att implementera, engagerade och gav nya insikter om arbetsmiljön. Generellt sett förbättrades arbetsmiljön i viss mån på alla fyra arbetsplatserna under interventionen, men förbättringarna ansågs inte vara betydande för den övergripande arbetsmiljön. Någon tydlig positiv eller negativ utveckling av medarbetarnas motivation kunde inte påvisas, men det fanns indikationer på ett samband mellan ett implementerat och fungerande systematiskt arbetsmiljöarbete och en hög motivation för arbetsmiljöförbättringar. Att få besök av forskargruppen för att diskutera sina specifika arbetsmiljöutmaningar upplevdes som nyttigt och inspirerande och bidrog till nya idéer. Hindrande faktorer till arbetsmiljöförbättringar var bl.a. begränsningar i resurser (t.ex. tid, ekonomi), brist på kunskap, kulturella faktorer och att inte äga sin egen anläggning (d.v.s. ingen kontroll över beslut och prioriteringar). Resultaten är baserade på begränsade data och behöver bekräftas av mer omfattande studier.

Idag kämpar många arbetsgivare inom hästsektorn med hög personalomsättning och utmaningen att hitta och lära upp ny personal dränerar verksamheter på tid, energi och pengar. Svårigheten att rekrytera och behålla personal har blivit ett allvarligt hot mot sektorns överlevnad på sikt. För att i framtiden kunna erbjuda säkra, hållbara och attraktiva anställningar med hög status måste arbetsmiljön och arbetsförhållandena inom branschen utvecklas och förbättras. Denna studie har ökat kunskapen om hur anställda på ridskolor och i travstall upplever sitt nuvarande jobb och vilka faktorer de anser vara viktigast för att ett jobb ska uppfattas som attraktivt. Att skapa attraktiva jobb är viktigt ur flera aspekter och inte minst för organisationernas förmåga att rekrytera, behålla och engagera medarbetare. Resultaten visade att det är flera aspekter gällande arbetsmiljö och arbetsförhållanden som upplevs som attraktiva i det aktuella arbetet, framför allt i travstallet, men också att det finns brister och utmaningar, framför allt på ridskolor. Att utveckla och bibehålla en säker, hälsosam och attraktiv arbetsplats är viktigt i konkurrensen både vid rekrytering av presumtiv arbetskraft och för att kunna bibehålla erfarna och engagerade medarbetare. Vidare ger studien praktiska råd om hur ett systematiskt arbetsmiljöarbete kan genomföras och hur man involverar personalen. Det finns starka argument för att arbetsgivare ska arbeta systematiskt och främjande med arbetsmiljön på arbetsplatsen, framför allt då det i Sverige finns lagstadgade skyldigheter genom arbetsmiljölagen, men också då forskning visat att ett kontinuerligt och regelbundet arbetsmiljöarbete och ett hälsofrämjande ledarskap har positiva och långsiktiga effekter både på individ-, grupp- och samhällsnivå. Resultaten lyfter även fram specifika utmaningar och barriärer för genomförandet av arbetsmiljöförbättringar och denna kunskap kan användas för

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att identifiera framtida åtgärder och insatser för att ytterligare förbättra arbetsmiljön inom hästnäringen. Initiativ som utbildning i systematiskt arbetsmiljöarbete och ledarskap har genomförts av bl.a. Hästsportens folkhögskola, men för att nå bredare och mer långsiktiga förändringar av arbetsmiljö och säkerhet behöver hela sektorn involveras och engageras.

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# Part 2: Main report

## Introduction

Work environment issues are a major concern for the horse sector. The sector is generally highly traditional, with many work tasks still performed manually with old-fashioned tools and equipment (Wallertz & Bendroth, 2009; Löfqvist & Pinzke, 2011; Löfkvist, 2012; Bergman Bruhn, 2022) leading to high workloads and physical strain. Productivity and profitability have generally not been a priority in horse operations (Fyrberg, 2012), leading to a low interest in and a lack of willingness to invest in mechanisation. Furthermore, handling and working with horses is a hazardous activity as horses are large, powerful and unpredictable animals (Thompson et al., 2015). Several studies world-wide have identified the horse sector as a high-risk work environment (Leppälä et al., 2015; Chapman & Thompson, 2016; Chapman et al., 2020; Flunker et al., 2020). Despite this, research focusing on the work environment and safety in the equine sector has been limited.

The work in horse stables includes heavy lifting, repetitive work and awkward working postures, which are all identified risk factors for development of musculoskeletal symptoms (Löfqvist, 2012). In 2012, Löfqvist published her thesis focusing on workload in the human-horse work environment. The study analysed postures during different activities (e.g. mucking out, feeding, preparing bedding) and included riding instructors at Swedish riding schools. The results showed a high prevalence of musculoskeletal symptoms in the riding instructors despite a low average age. Furthermore, the daily routine work tasks entailed a high physical strain and there was a correlation between workload and perceived musculoskeletal symptoms. A previous study of Swedish riding and trotting schools supports Löfqvist's results (Adolfsson and Geng, 2008) and also showed that the risk of occupational injury was highest when working in close proximity to the horses. Furthermore, Geng et al. (2013) showed not only high physical strain but also problems with long working hours (average 10 hours per day) and unpaid overtime in trotting stables.

The safety culture and climate in the horse sector is an unexplored research area, despite the high-risk work environment in the sector. A recent survey involving respondents from 25 different countries found a general acceptance of injury risks during horse interactions, and some respondents even de-emphasized the importance of safety-first principles (Chapman et al., 2020). The results also showed that respondents who derived an income from horse-related activities had a higher propensity for risk-taking in general, and risk-taking in sports and occupational settings in particular. Considering these results, increasing the focus on the safety culture within horse-related occupations could represent a fruitful approach to improving occupational safety and health in the equine sector.

Due to the high injury prevalence in the horse sector, during 2016–2017, the Swedish Work Environment Authority conducted a targeted supervisory effort focusing on the work environment management in the sector. In total, deficiencies were identified in 49% of the inspections carried out within that project, and it was concluded that the horse sector's view of the work environment must fundamentally change to reduce ill-health in the sector (Swedish Work Environment Authority, 2018). The regulations on systematic work environment management in Sweden were introduced in 2001, to ensure employee rights to health and safety and stimulate safe working conditions (AFS 2001:1). The regulations require employers to systematically investigate, follow up, and take action to prevent accidents and illness among staff. The requirements include examining and assessing risks, planning measures to counter identified hazards and implement improvement measures. The employer

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has the main responsibility for the work environment, but it is important that the individual employees participate in everyday systematic work environment management.

Previous studies have shown that small-scale businesses, which operations in the horse sector often are, commonly have limited capability of risk assessment and prevention (Hasle & Limborg, 2006). A review study on occupational health in small and medium sized enterprises (SME) showed that managers often have little knowledge of current rules and policies and let their own values and their own culture dominate the work environment (Hasle & Limborg, 2006). This is in line with the findings of the Swedish Work Environment Authority's targeted supervisory effort in the horse sector, i.e. that the knowledge of work environment regulations was scarce. To overcome this challenge, it is recommended that action processes should be carried out with a third part and a high level of commitment from the staff (MacEachen et al., 2010). However, it may be that participants fail to complete an intervention before the results have been achieved. Important keys for successful participation in interventions, are a description of the intervention framework and how it was adapted to individual's needs and situation, as well as measurable changes (Staveborg Kerkelä et al., 2015). By being proactive, that is, getting things to happen, solving problems and seeing opportunities to reach the goal, participants can become more motivated in an intervention process. For example, it may be a matter of striving for changes in order to achieve a better working environment (Parker et al., 2010). A key factor in the companies' efforts to achieve a functioning work environment management is to involve the staff. Dialogue between employer and employees increases the knowledge of work environment and improve the working climate and the awareness of risks (Birgersdotter et al., 2002). In addition, dedicated and motivated staff contributes to create an attractive workplace. In order to create collaboration and to get started with the work environment management, good practices and procedures are needed.

Diverse methods and tools have been developed to enhance activities, including planning, monitoring and guiding to create attractive and safe jobs (Work Sciences at Dalarna University; Stanton et al., 2005), but Andersson et al. (2006) has implied that managers of small-scale enterprises have neither knowledge nor motivation to use them. Finding methods that engage and motivate both management and employees in improving work environment and safety appears to be crucial to attain a long-term effect and sustainability. Knowledge on effective practical methods and tools for improving work environment within the horse sector and their application to achieve a successfully integrated work environment management is currently lacking. Development and evaluation of methods and tools for improving the work environment specifically adapted to the horse sector and its specific culture and character is therefore needed. Emphasis should be on creating motivation and commitment, since these are considered key factors to achieve a continuous and long-term work environment management within an organisation.

The overall aim of the study was to contribute to the development of safe and healthy working conditions and sustainable careers in horse-related professions by generating knowledge on how long-term work environment management can be practically integrated and continuously operated in workplaces within the horse sector. The specific objective was to develop methods and tools for systematic work environment management adapted for the horse sector´s needs, with emphasis on characteristics that will stimulate motivation and commitment to work environment improvements.

## Material and methods

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The study was approved by the Regional Ethical Review Board in Gothenburg, Sweden (protocol code 366-18, 17 May 2018) and was divided into two parts. The first part was a questionnaire study with the aim to identify how employees in the horse sector experience their current job, what factors they consider most important for a job to be perceived as attractive, and the differences between the current job situation and the ideal image of an attractive job. The second part was an intervention study with a participatory action research approach with the aim to develop and evaluate methods and tools for systematic work environment management adapted for the horse sector's needs, with emphasis on characteristics that will stimulate motivation and commitment of the management and employees.

**Questionnaire concerning Attractive Work**

A questionnaire study was conducted including employees from 30 riding schools and 30 trotting stables randomly selected within three regions of Sweden - Dalarna, Uppland and Västra Götaland. A total of 150 people responded to the questionnaire, 90 responses from employees at riding schools and 60 at trotting stables. The national organisations the Swedish Equestrian Federation and Swedish Harness Racing have been helpful in producing lists of the total number of riding schools and trotting professionals with an A-license in each region. An initial contact with the selected riding schools and trotting stables was taken by phone or email and a visit was planned upon agreement to participate. The questionnaire was then handed out in person at the workplaces, in paper or digitally through a link. The data collection took place between September 2018 and March 2019.

The questionnaire used have been developed by Åteg & Hedlund (2011) and is based on a model on attractive work. It has been used in previous research on attractive work in various sectors and industries (Åteg, Andersson & Rosén 2009; Hedlund, Andersson & Rosén 2010; Lundkvist 2011; Björn, Lindberg & Rissén 2015; Andersson et al. 2017). The questionnaire includes 87 statements, linked to three categories: 1) Work content, 2) Work satisfaction, and 3) Working conditions (table 1). Each category contains a number of dimensions (22 in total). For each statement, the respondent was asked to rate the level of agreement according to a five-point Likert scale from "Not at all" (1) to "Completely" (5). The questionnaire measures how the respondent perceives the importance of each statement for a job to be attractive and how well it corresponds to the current job. In addition, there were three general questions about work: "What is your main reason for working?", "How important is work to you?" and "To what extent do you consider your current job to be attractive?". There were also background questions about age, gender, type of operation (riding school or trotting stable), educational background, employment and if the respondent had staff liabilities. Detailed background information of the respondents to the questionnaire on attractive work can be found in Bergman Bruhn et al. (2020).

**Table 1.** The categories, dimensions and examples of statements within each category included in the questionnaire concerning Attractive Work (Åteg & Hedlund, 2011).

| Category | Dimensions | Examples of included statements |
|---|---|---|
| Work content | Work pace, freedom of action, familiarity, practical work, thinking, physical activity, diversity | 18 statements, e.g.<br>I am familiar with my work (know what and how to perform my work tasks).<br>I take part in the development of the activities of the organisation.<br>I work with my hands and use my practical skills. |
| Work satisfaction | Recognition, status, stimulus, results, sought after | 20 statements, e.g.<br>I have interesting work tasks.<br>I feel that I do a good job. |

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| | | |
|---|---|---|
| | | My work is positively challenging. |
| Working conditions | Work time, physical work environment, leadership, organisation, salary, adequate equipment, localisation, loyalty, relationships, social contacts | 49 statements, e.g.<br>I can influence my working hours.<br>The equipment is modern.<br>I have confidence in my immediate manager.<br>We help and support each other. |

**Intervention study**

An inventory of methods and tools, used and assessed in other industries and businesses, was conducted with particular focus on how different methods can generate motivation and commitment to improve the work environment.

Four workplaces, two riding schools and two trotting stables, were selected for the intervention study by convenience sampling based on geographical location, general engagement in work environment management at the workplace and willingness to participate in the study. The reference group with representatives from e.g. the Swedish Horse Industry Foundation (HNS) and the Swedish Equestrian Federation aided in the selection of suitable workplaces. The managers at the workplaces were contacted by phone, informed about the project and asked to participate before visits to the workplaces were planned. The participating riding schools had eight and nine permanent employees, and both were non-profit organisations. The participating trotting stables were managed by a professional licensed trainer and had approx. 6 and 4 permanent employees. The employees worked full-time or different degrees of part-time.

At the first visit to each workplace, the employees were asked to answer a questionnaire regarding the safety climate at their workplace (The Nordic Safety Climate Questionnaire (NOSACQ-50); Kines et al., 2011) and the motivation for work environment improvements (Hedlund et al., 2010), which served as baseline measurements. The manager was asked to answer a questionnaire regarding the systematic work environment management at the workplace (the Swedish Work Environment Authority's self-assessment tool for systematic work environment management). They were also instructed to fill in a checklist on work environment produced specifically for the horse sector by Prevent and assess the time they spent on different work tasks on a representative day until the next visit. Baseline data was also collected through individual semi-structured interviews with the manager and the employees and also the chairman of the board for the two riding schools (as the chairman has the overall responsibility for the work environment).

All workplaces were guided through a method called Visit (Åteg et al., 2005; Rosén et al., 2005), where the employees visit their own workplace to observe the environment with new eyes, and critically review and discuss positive aspects of the work environment as well as what can improved, and why and how it should be done. The process resulted in an action plan, with prioritised measures, responsible person and time schedule. The workplaces were contacted and visited regularly, based on need, to support their work and to ensure that the work environment management was proceeding according to the action plan was updated. The original plan was to support the workplaces during a year, however, due to the COVID-19 restrictions this period was prolonged with an extra year as visits to the workplaces was prevented.

Comments and questions concerning the methods was collected continuously during the two years, and all contact with the workplaces was documented in a project diary. A final visit was made to evaluate the total effect of the intervention. Group interviews were conducted

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with the manager and employees who had been involved in the study. The evaluation of the intervention was carried out with focus on experiences from participation in the study, evaluation of applied methods, changes in procedures and working routines, improvements in the physical work environment, hazards related to work and motivation to continue improving the work environment. The employees were asked to answer the motivation for work environment improvements questionnaire again. However, due to high staff turnover at the workplaces, very few of the employees who answered the questionnaires in the beginning of the intervention was still employed, thus a comparison of data from the questionnaires before and after the intervention was not meaningful.

## Results and discussion

### Attractive work

The questionnaire results showed that working was stated by employees at riding schools and trotting stables as one of the most important things in life. The main reason for employees at riding schools to work was livelihood and survival while a majority of employees at trotting stables stated self-realization and quality of life (figure 1). The employees at both riding schools and trotting stables considered their current work to be attractive (mean 3.8 and 4.2 respectively on a 5-point Likert scale where 5=completely attractive).

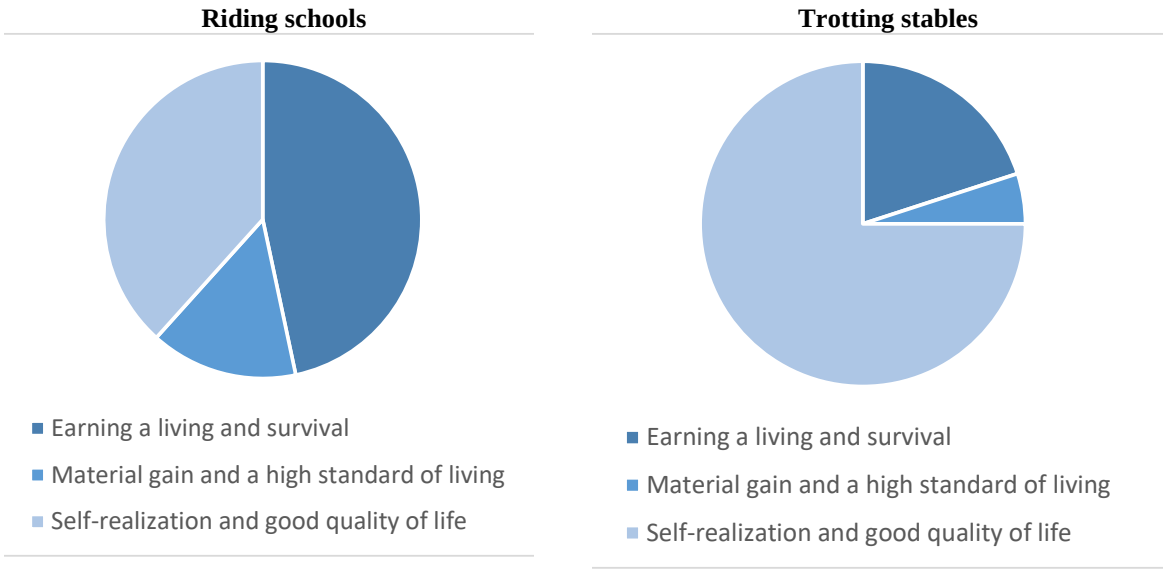


**Figure 1.** The responses of employees at riding schools (N=60) and trotting stables (N=40) to the question "What is your main reason for working?".

Employees at both riding schools and trotting stables rated the dimensions loyalty (to the employer, work colleagues and across organizational boundaries), relationships (e.g. team spirit, cooperation, fairness, openness) and stimulus (i.e. interesting, challenging and personally developing work) as some of the most important qualities for a job to be perceived as attractive and those dimensions were also considered to be relatively attractive in the current work (table 2). The employees at riding schools rated loyalty as the most attractive dimension in the current work, while employees at trotting stables rated stimulus the highest. There were three dimensions that employees at both riding schools and trotting stables rated higher in their current work than the ideal image of attractive work: physical activity, practical work, and social contacts. The largest differences between the experience of the current job and the ideal image of an attractive job, where the current job was ranked

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significantly lower, were within the dimensions salary and adequate equipment ($p<0.05$). All results are presented in Bergman Bruhn et al. (2020).

**Table 2.** The five most important dimensions of the ideal job and the five highest ranked dimensions of the current job according to employees at riding schools and trotting stables (N=150). Mean value on a 5-point Likert scale, where a higher number indicates a higher agreement.

| **Riding schools (N=90)** | | **Trotting stables (N=60)** | |
|---|---|---|---|
| **Ideal job** | | **Ideal job** | |
| Loyalty | 4.6 | Relationships | 4.5 |
| Relationships | 4.5 | Stimulus | 4.5 |
| Stimulus | 4.4 | Loyalty | 4.5 |
| Leadership | 4.4 | Sought after | 4.4 |
| Sought after | 4.3 | Familiarity | 4.4 |
| **Current job** | | **Current job** | |
| Loyalty | 4.5 | Stimulus | 4.5 |
| Familiarity | 4.2 | Sought after | 4.5 |
| Physical activity | 4.2 | Relationships | 4.5 |
| Results | 4.2 | Physical activity | 4.5 |
| Sought after | 4.2 | Practical work | 4.5 |

## Intervention study

The methods and tools used in the study was:

- Visit – a critical evaluation of one's own workplace to give new perspectives on the strengths and shortcomings in the work environment and improvements that can be implemented.
- Action plan - drawing up an action plan with prioritised actions, responsible person and time plan of implementation. Regular follow-up and update of action plan.
- Prevent's checklist - a checklist produced specifically for the horse sector by Prevent to aid in work environment and security checks.
- Photo editing to make easily accessible illustrations (visualisation) of changes in existing environments to create increased motivation for work environment activities (Åteg & Andersson, 2007).
- Support of managers to tailor the implementation of the systematic work environment management, e.g. informing about work environment regulations, providing help and support regarding issues like staffing, organisation and working methods, support in implementation of methods and tools.
- Support in communication with the municipality regarding improvement of the facilities, maintenance and contractual matters.
- Workplace ergonomics training to increase knowledge on how to avoid risk factors and prevent musculoskeletal disorders.
- Ergonomic value stream mapping (Ergo-VMS) – the method is a participative tool to evaluate ergonomics risks, both physical and psycho-social (Jarebrant et al., 2016b). The Ergo-VSM is based on value stream mapping, developed to assess flow efficiency, and reduce waste within the flow. The Ergo-VSM has three parts (Jarebrant et al., 2016a). The first and the second part compiles and visualises the flow in its current state, where especially the first part is focused on the physical work environment and the second part on the psycho-social work environment. The third part develop and elaborate a better future value stream with both the physical and the psycho-social perspective included.

Depending on the outcome of the initial Visit and action plan process, methods and tools for improvement were chosen together with the workplaces.

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*The riding schools*
Both riding schools experienced challenges in the contact with the municipality and had a number of issues that they depended on the municipality to solve. There was a general perception that the municipality did not listen to the association's needs and that resources were not allocated despite the fact that the municipality was obviously responsible as owners of the facilities. The project group with help of a riding school advisor at the Swedish Equestrian Federation assisted in the communication with the municipality during the intervention. Both riding schools reported an improved relation with the municipality in the follow-up interview, but they expressed frustration at the slow processes and continued lack of understanding of their needs. Furthermore, long-term planning was difficult to achieve due to regular changes of the board constellation and the chairman of the board.

The employees identified needs of improvement in the physical work environment on both riding schools. Examples were slippery floors and high noise level in the stable, high doorsteps, deficiencies in equipment, heavy work tasks and awkward working postures (e.g. when handling roughage). Most work tasks were done manually, but vehicles (e.g. tractor and ATV) were used and one riding school had a bale unroller and feed weight cart to facilitate silage handling. The staff facilities were substandard at both riding schools with shortcomings in e.g. access to changing rooms, showers and staff toilets. Some improvements to the physical work environment were achieved, e.g. construction of a chipboard floor in the stable to reduce noise and the risk of horses slipping and elimination of a high doorstep.

The initial employee interviews at the riding schools indicated that there was a perceived lack of staff participation and involvement in the work environment management and that the internal communication needed to be improved. In one of the riding schools, this was supported by the deficiencies in results of the manager's self-assessment of the systematic work environment management at the workplace, which showed that many of the requirements were fulfilled to a high degree (mean 4.6 on a scale 1-6; range 3-6; one data missing), and the Prevent checklist which was completed by two employees. The checklist gave a different result indicating great lacks in the systematic work environment management, in risk assessments and documentation and in participation and staff involvement. The results from the manager's self-assessment of the systematic work environment management at the other riding school showed that some of the requirements were fulfilled and some needed more attention (mean 4.2 on a scale 1-6; range 2-6). At this workplace, the manager completed the Prevent checklist, why there was a greater coherence between the two questionnaires. At both riding schools, the main focus during the intervention was to support the manager in improving the psychosocial work environment and communication and staff involvement in the work environment management. The researchers participated in staff meetings and aided in the process of developing a work environment policy and define core value words.

At one of the riding schools, the stable staff was guided to perform an Ergo-VMS. They thought the method was helpful in visualising where there are needs of improvements and made them question why they do what they do. The procedure led to some additional improvements in routines and the physical work environment, which also had a positive effect on reducing stress levels.

*The trotting stables*
Only one of the managers filled in the self-assessment of the systematic work environment management at the workplace. The results showed that some of the requirements were

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fulfilled, and some needed more attention (mean 3.0 on a scale 1-6; range 1.8-4.3). Generally, the result indicated that the requirements of systematic work environment management was not fulfilled. The Prevent checklist, completed by the manager, gave the same result. Thus, a main focus of the intervention was to increase the manager's knowledge of the requirements and to support the manager in the systematic work environment management and work organisation. Also for the other trotting stable, the initial interviews and the results of the Prevent checklist indicated shortcomings in the systematic work environment management. The interviews indicated that the managers seldom discussed the work environment and safety with the staff, but both the managers and employees were positive to improve the work environment, however the tight time schedule, staff shortage and turnover, and difficulty of long-term planning were hindering factors.

The employees identified needs of improvement in the physical work environment on both trotting stables, similar to those identified at the riding schools. Improvements made during the intervention were e.g. better staff facilities (changing rooms, shower), improved storage of equipment and raising a silo so that the feed cart fitted under for filling (reduced heavy lifting).

*Evaluation*
The intervention provided insights into success factors for a well-functioning work environment management, where the more important ones were: staff participation, variability of work tasks (work organisation), simple and low cost solutions and shared responsibility. A method which all four workplaces favoured was Visit (a critical evaluation of one's own workplace), as it was easy to implement, engaging and gave new insights on the work environment. In general, the work environment improved to some extent in all four workplaces, but the improvements were not considered significant for the overall work environment. Furthermore, being visited by the research group discussing their specific work environment challenges was perceived as useful and inspiring for both manager and employees. Work environment improvements were hindered by e.g. limitations in resources (e.g. time, money), lacks in knowledge, cultural factors and not owning their own facility (no control of decisions, prioritisations and budget). Only one of the workplaces, a riding school, seemed to have a fully implemented systematic work environment management in place at the end of the intervention. The results are based on limited data and needs to be confirmed by more comprehensive studies. Furthermore, the COVID-19 restrictions made it difficult to visit the workplaces to the planned extent, which most likely reduced the effect of the intervention.

A challenge in following up the employee motivation of work environment improvements before and after the intervention was the staff turnover, as only few employees remained during the whole study period. The results from the motivation for work environment improvements questionnaire before and after the intervention is therefore unreliable and inconsistent, why the data is not published in detail. No clear positive or negative development of the employee motivation could be found. A manuscript on motivational factors for occupational safety and health improvements (Bergman Bruhn et al., 2022), with added data from another four riding schools and four trotting stables including the motivation for work environment improvements questionnaire and interviews, has recently been submitted to a scientific journal. The results showed that there was a significant correlation between an implemented and functioning systematic work environment management and a high degree of employee motivation for work environment improvements.

## Conclusions

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Generally, employees at riding schools and trotting stables considered their current job as attractive, especially at trotting stables. The most important dimensions for a job to be considered attractive according to the respondents were loyalty, relationships, stimulus and being sought after. The two dimensions with the largest difference between the current job and the ideal job, and thus the ones that is in most need of improvement, were salary and adequate equipment.

The intervention provided insights on success factors for a well-functioning work environment management, where the more important ones were: staff participation, variability of work tasks (work organisation), simple and low cost solutions and shared responsibility. A method which all four workplaces favoured was Visit (a critical evaluation of one's own workplace), as it was engaging and gave new insights on the work environment. In general, the work environment improved to some extent in all four workplaces, but the improvements were not considered significant for the overall work environment. No clear positive or negative development of the employee motivation could be found, but there were indications that there was a correlation between an implemented and functioning systematic work environment management and a high degree of employee motivation for work environment improvements. Furthermore, being visited by the research group discussing their specific work environment challenges was perceived as useful and inspiring and created new ideas. Work environment improvements were hindered by e.g. limitations in resources (e.g. time, money), lacks in knowledge, cultural factors and not owning their own facility (no control of decisions and prioritisations). The results are based on limited data and needs to be confirmed by more comprehensive studies.

## Relevance for the practical horse sector incl. recommendations

**Relevance for the practical horse sector**

Today, many employers within the horse sector struggle with high staff turnover and the hard task of finding and training new staff drain the operations of time, energy and money. The difficulty of recruiting and keeping staff has become a serious threat to the sector's survival. For the Swedish horse sector to be able to offer safe, sustainable and attractive employments with a high status in the future, work environment and working conditions within the sector must develop and improve. This study has increased the knowledge on how employees in riding schools and trotting stables experience their current job and what factors they consider to be most important for a job to be perceived as attractive. Creating attractive jobs is important from several aspects and not least for the organisations' ability to recruit, retain and engage employees. The results showed that there are several aspects regarding the working environment and working conditions that are perceived as attractive in the current work, especially in the trotting stables, but also that there are shortcomings and challenges, especially in riding schools.

Furthermore, the study gives practical advise on how a systematic work environment management can be implemented and how to involve the staff. The results also highlight specific challenges and barriers for the implementation of work environment improvements in riding schools and in trotting stables, and this knowledge can be used to identify future measures and interventions to further improve the work environment in the horse sector. Initiatives such as training and education in work environment management have been introduced by e.g. the equestrian sports folk high school, but to achieve broader and more long-lasting improvements in workplace safety, the entire sector needs to be involved and engaged.

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**Future research**

One main limitation to this study is the limited number of included workplaces, and that only riding schools and trotting stables are represented. To be able to generalise the results and to understand the horse sector in a broader sense, there is a need to expand the study to include more workplaces and also to study other operations, e.g. breeding, competition, training, and tourism. An interesting aspect of future research is the impact of the organisational and social work environment and how it relates to the perceived physical workload. Aspects such as leadership, work organisation, work pace and participation are relevant to include. Furthermore, motivational factors for work environment improvements are key to achieve a well-functioning systematic work environment management, thus this area of research needs more attention.

Mechanisation is one way of improving the physical work environment, e.g. through automated manure transportation, electrical wheel barrows and bale carts, sweeping machines and automatic feeders. However, the knowledge of existing technology and equipment and its benefits is limited within the horse sector. Thus, there is a need for more studies on the effect of mechanisation regarding aspects such as workload, hazardous exposure, time saving, and economics to aid the users, e.g. riding schools, to find arguments for and make informed decisions on investments in technology and equipment. Furthermore, a closer dialogue between users and developers of equipment should be emphasised as this will drive the development of user-friendly and well-adapted equipment. There is also a need to do independent comparative evaluations of equipment from different manufacturers to identify pros and cons. This could increase the trust in new equipment available on the market and possibly increase the willingness to pay, especially if there are reference stables where the equipment can be seen and tried before buying.

There are reasons to alter the ways we commonly house horses, with focus on improving not only the welfare, safety and health of the horse caretaker due to a better work environment, but also the welfare of the horses. Group housing could be a viable alternative to traditional individual housing and has the potential to decrease work time, but more knowledge and recommendations are needed on best practices and system design. Interdisciplinary research studying the perspectives of the horse, the human, the organisation, and the environment is advised.

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# Part 3: Result dissemination

| | |
|---|---|
| **Scientific publications, *published*** | Bergman Bruhn, Å., Rydell, A., Andersson, I-M., Lindahl, C., 2020, Med stallet som arbetsplats: om attraktivt arbete i hästnäringen, Arbetsmarknad & Arbetsliv, 26, 1, 53-69. |
| | Lindahl, C., Bergman Bruhn, Å., Andersson, I., 2022, Occupational Safety Climate in the Swedish Equine Sector, Animals, 12, 4, 438. (https://doi.org/10.3390/ani12040438) |
| | Bergman Bruhn, Å. 2022, The Double-Sided Nature of Meaningful Work: Promoting and Challenging Factors within the Swedish Equine Sector. Challenges, 13, 13. (https://doi.org/10.3390/challe13010013) |
| | |
| **Scientific publications, *submitted*** | Bergman Bruhn, Å., Lindahl, C., Andersson, I., Rosén, G., Motivational factors for work environment improvements: a mixed-methods study within the Swedish equine sector. |
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| **Scientific publications, *manuscript*** | |
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| **Conference publications/ presentations** | Bergman Bruhn, Å., Rydell, A., Andersson, I-M., Lindahl, C., 2019, Med stallet som arbetsplats - en studie om upplevelsen av attraktivt arbete på ridskolor, Forum för arbetslivsforskning (FALF)-konferensen, Norrköping, 10-12 June. |
| | Bergman Bruhn, Å., 2020, Attractive and sustainable work in the equine sector – an explorative study in riding schools and trotting stables in Sweden, Nordic Working Life Conference, Aalborg, Denmark, 10-12 June. |
| | Lindahl, C., Bergman Bruhn, Å., Andersson, I-M., Bendroth, M., 2021, Improving work environment and safety within the Swedish equine sector through novel methods and tools, Equine Cultures in Transition Conference, digital 22-24 June. |
| | Bergman Bruhn, Å., Lindahl, C., Andersson, I-M., 2021, Safety climate assessment in the equine sector – a study of Swedish riding schools and trotting stables, International Occupational Hygiene Association (IOHA) Conference, digital 11-15 September. |
| | |
| **Other publications, *media etc.*** | Forskare vill förbättra hästnäringens arbetsmiljö: "Mer mekanisering behövs", 4 July 2019, Hippson (https://www.hippson.se/artikelarkivet/ridsportens-innovationer/forskare-vill-forbattra-hastnaringens-arbetsmiljo.htm?__refresh=1) |
| | Hårt men attraktivt att jobba med hästar, 7 November 2019, ATL (https://www.atl.nu/hart-men-attraktivt-att-jobba-med-hastar) |
| | Dröm att jobba med hästar – trots bristande arbetsmiljö, 8 July 2020, Forskning&Framsteg (https://fof.se/artikel/drom-att-jobba-med-hastar- |

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| | trots-bristande-arbetsmiljo/?fbclid=IwAR3t0WTYg6YnkWtTLBFRcvDpHsJ6NpI30VRTZJl6O8q9eA3xjwLkXeVeRN8) |
| | Attraktivt jobb trots brister i arbetsmiljön, 17 July 2020, Hippson (https://www.hippson.se/artikelarkivet/hippsonnews/attraktivt-jobb-trots-brister-i-arbetsmiljon.htm) |
| | Attraktivt arbete i stallet, 2020, popular science information folder (http://du.diva-portal.org/smash/get/diva2:1452738/FULLTEXT01.pdf) |
| | Hon slår larm – akut brist på hästskötare, 15 November 2021, Travronden |
| | |
| **Oral communication, *to horse sector, students etc.*** | Oral presentation on Branschdagar Hållbar Hästnäring, 22-23 March 2019, approx. 50 participants from the horse sector. |
| | Oral presentation for representatives from Equestrian Federation and the Sports Federation in Dalarna, 13 February 2019. |
| | Oral presentation at a doctoral seminar at University of Karlstad, 11 April 2019, PhD students and researchers. |
| | Oral presentation at the Working Life Conference in Karlstad, 29-30 April 2019. 30 researchers. |
| | Oral presentation at the NIVA-course Designing, implementing and evaluating organizational interventions, 13 May 2019, Copenhagen. |
| | Oral presentation for CeTLeR–network (Centre for Tourism and Leisure Research), spring 2019, about 15 researchers and practitioners. CeTLeR is financed jointly by Dalarna University, Region Dalarna and the EU. |
| | Oral presentation for about 30 high school students at Researchers' Night (Forskarfredag), 27 September 2019. The last Friday of September, European Researchers' Night is celebrated in more than 370 cities in 27 countries across Europe. 22,000 researchers show how exciting, fun and relevant day-to-day living research actually is. |
| | Oral presentation at HYN (Hästnäringens yrkesnämnd) annual meeting, 30 March 2021 |
| | Oral presentation for Equine Sports Young Leaders (Hästsportens Unga Ledare, HUL), 22 April 2022. A group of approx. 10-12 young leaders in the horse sector. |
| | Reference group meetings once a year (five occasions), 2018-2022, the group included representatives from the Swedish Equestrian Federation, the Swedish Municipal Workers' Union, the Swedish Horse Industry Foundation (HNS), the Federation of Swedish Farmers' horse section, the Swedish Work Environment Authority and TM Grandin Construction and Trading AB. |
| | End seminar and workshop, 31 May 2022, 22 participants from the Swedish horse sector. The results and conclusions from the studies were presented and discussed and we also arranged group discussions on how to use these results and also how to continue the process of improving the work environment and where future research efforts should be focused. We received confirmative response to the presented results and conclusions. |
| **Student theses** | Results from the project will be presented in a PhD thesis by Åsa Bergman Bruhn, Högskolan Dalarna, planned for defense and publication 2023 |
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| **Other** | The project is presented on RISE's website (https://www.ri.se/sv/vad-vi-gor/projekt/forbattrad-arbetsmiljo-inom-hastnaringen-genom-nya-metoder-och-verktyg) |
| | The project is presented on Högskolan Dalarna's website (https://www.du.se/sv/forskning/forskningsprojekt/?code=HDA2018-00014) |
| | The project and results are presented in a few short films, which will be free to access from Youtube. |
| | Continuation of study: AFA Insurance is founding a project with similar aims as the current project (grant number 190229), which has given us the opportunity to increase the number of participating riding schools and trotting stables. This means that data on e.g. questionnaires, interviews and observations is sufficient for more thorough analysis, which is expected to generate more reliable results during 2022 and 2023. |

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