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Sector-Specific Occupational Safety Risk Factors Evaluation in Livestock Farms

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Abstract: ***The risk factors control and protection methods for employee health is a very new subject for livestock enterprises. In the workplaces in the less dangerous class, if the number of employees is 50 or more it is obligatory to assign an occupational physician and occupational safety specialist, but less than 50. In this context, adaptation studies to the process gain importance in livestock enterprises. The main objective of current research to present some important issues to the benefit of users by evaluating the general situation in livestock enterprises in terms of occupational safety rules to be applied in workplaces.***

Keywords: livestock, occupational safety, industry-specific risks, personal protective equipment

1. Introduction

Technical knowledge in animal husbandry is directly related to yields and production economy. Sustainable production can't be achieved without using technical knowledge and profitability is interrupted. Expected production efficiency can be achieved with the most appropriate care and management of animals, which are production materials. At this point, the employee factor has a privileged position in animal husbandry. Because interactions between animals and workers play an important role in farm animal and worker welfare. A safe and comfortable approach with animals is also important in minimizing risks. However, the shortage of qualified personnel in the livestock sector is one of the main problems (Göncü et al.2010). There are difficulties in finding and employing minimum-educated caregivers, shepherds and butlers, especially in providing social security and other personal rights (Göncü et al.2021). It has become difficult for large farms to find trained personnel and the sector has sought to obtain its workforce from foreign resources. Along with communication problems, the issue of employing foreign workers has also started to have its own problems. The use of technology is increasing (Delibaş et al.2016). In addition, the fact that the experienced personnel in the sector facilitates the achievement of the targeted success also highlights the quality of the employees (O'Brien et al.2018). Occupational health: To maximize the physical, mental and social well-being of workers and to maintain them at this level, to prevent their health from deteriorating due to working conditions, to protect them from factors contrary to their health during their employment, to employ each worker in a job suitable for their physiological and psychological conditions, to ensure compliance. It is very important to examine the relations between the health of the employees due to possible risks in livestock enterprises, to control risk factors and to protect employee health. The Labor Law No.4857 in 2003 and the Occupational Health and Safety Law No.6331 enacted in 2012 are very important for occupational health and safety in Turkey. With this law, it has made it compulsory to apply occupational safety expertise; The obligation to employ both an occupational physician and an occupational safety specialist has been extended to include workplaces employing less than 50 workers (Anonymous, 2022). Special programs and strategic action plans aimed at preventing occupational risks for livestock workers should be put into practice. However, the necessary sensitivities about occupational health and safety in livestock have not been formed yet. In the field of occupational safety, each sector is divided into hazard classes according to its activities. The definition of hazard class is essentially about how harmful studies are carried out in the working area of an enterprise.

With this research, it is to evaluate the general situation in livestock enterprises in terms of the occupational safety rules to be applied in the workplaces on 31 December 2023 if not postponedand to present some issues to the benefit of the users with the results.

2. Material and Methods

The study was carried out using observation and survey methods in livestock enterprises located in Adana Province and its districts. Adana province is the sixth most populous city in Turkey. According to 2019 data, it has a population of 2, 258, 718. The area of the province is 13, 844 km2. According to 01.02.2018 TUIK (TUIK, 2022) data, it has a total of 15 districts and municipalities, 5 of which are central districts (Seyhan, Yüreğir, Çukurova, Sarıçam, Karaisalı). Adana has a typical Mediterranean climate. The winters are warm and rainy, and the summers are hot and dry. Adana Province is located between latitudes 35-38 and longitudes 34-46 east, in the Mediterranean Region. For Adana growers, high temperature and humidity affect the production and production style in some months.

Although Adana is one of the first industrialized cities, with the construction of the Seyhan Dam and the developments in agricultural techniques, great developments were experienced in agricultural productivity in the 1950s. Along with agriculture, animal husbandry also contributes to Adana's economy above the average of the country's economy, thanks to the geographical conditions. In Adana province, 265, 500 of the total number of 1.080.000 animals in 29.500 livestock enterprises are cattle. The animal population in Adana varies according to the geographical situation, climatic conditions and agricultural character of the province. Since all areas are reserved for cultivation in the plains, more barn animal husbandry is carried out. Livestock and poultry are used in places close to the city center, and sheep and goats are kept in mountainous and forested areas.

In determining the main population of the research, first of all, the number of enterprises engaged in intensive dairy cattle breeding in Adana Province and its districts was determined. For this purpose, the data of Adana Provincial and District Directorates of the Ministry of Agriculture and Forestry and Adana cattle breeders' association data were used. Afterwards, interviews were conducted with 60 of the enterprises with 40 heads of cattle, which were determined based on secondary data, but 10 enterprises agreed to participate in the survey. The prepared questionnaires were determined through on-site and face-to-face interviews. It has been understood that businesses generally abstain from participating in a survey on occupational safety. In the interviews, literature review and sample business visits and "designed questionnaires" were prepared and applied by the researchers. The research questionnaires were formed from the questions in the sub-headings of sector-specific risks and training and information, personal protective equipment (PPE), ergonomics, manual handling, transportation, emergencies and chemicals, which were prepared to meet the research objectives. The prepared questions were first applied in one enterprise, and the clarity of the questions was determined, and after the necessary corrections were made, they were applied in other enterprises. The survey application was carried out in the form of face-to-face interviews.

In the evaluation of the survey results, cross tables were created using SPSS (for Windows 6.01) statistical program and MS Excel program according to research purposes. Then, using the answers given to the survey questions and the results of the wound observation results determined as a result of the observation, the numbers and frequencies were made using the Excel program formula function. The survey was conducted between March 2021 and November 2021.

3. Results and Discussion

Livestock businesses differ in location, structure, shelter features, the conditions created by each structure, and the machinery and equipment used. In addition, the main thing in animal breeding is to provide conditions suitable for animal nature. For this reason, conditions that are not very comfortable for people can occur. Generally, unobtrusive walking and working floors, openings in floors, handrails, railings, stairs and protective cages can be ignored. Experience, experience and knowledge are very important in livestock workers, and the emphasis is on experience rather than diploma in recruitment. In this regard, the references of the employees can be recruited.

Considering the education level of livestock workers, the rate of literate workers is 13.7%; It is understood that 52.8% of the employees are primary school-secondary school graduates. The rate of high school graduates was 28.3% and the rate of university graduates was 5.2%. On the other hand, 34.17% of the employees with less than 5 years of experience, while the number of employees with more than 15 years of experience is 10.1%. However, it was understood during the survey that the experience gained by working in different farms, not in the same workplace. Employees who are dissatisfied with their jobs often change their jobs, and what's worse is that they continue to do so. As it is known, there may be a significant economic burden due to various legal processes during the start and departure of each employee. For this reason, changing personnel frequently creates a problem, but the main problem is the damage to production in the business context. This harm includes many processes from recognizing the animal to learning the job to be done, learning the conditions in the workplace in terms of using techniques and tools. In general, 25% of livestock workers report that they switch between businesses and that working conditions vary significantly from farm to farm (Buffington and Reaves 1968). In general, the education level of the employees in livestock enterprises is determined by Tugay and Bakır, (2004) primary school (54%), 19.3% without education, Soyak et al. (2007) reported it as primary school (59%). Sarı (1998) reports that 92.6% of business employees have primary and high school education, while the remaining part do not have any educational background. In addition, it has been determined that foreign workers can also work temporarily in enterprises from time to time. It is understood that the average age of the workers in livestock enterprises is 35.56% between the ages of 32-37. Yıldırım, (2000), between 15-49, Şahin et al., (2001) 48.4 and Koyubenbe, (2005) 46.83. It has been determined that 39.77% of the employees' animal husbandry experiences are concentrated between 5-10 years.

Sector-Specific Risks

Today, the number of animals bred to meet the need has increased, and an intensive production model has been adopted by switching from natural conditions to controlled conditions. In order to meet the high demand, some sector-specific risks have been brought to the agenda in the controlled production conditions. Possible risks in livestock enterprises differ from other sectors depending on working with livestock (GöncüKarakök, 2004). Diseases in livestock are always a big problem. In particular, infectious diseases cause the closure of businesses and thus great economic losses. It is absolutely necessary to have information about the diseases and to take precautions at all times in order to prevent the enterprises from being harmed and to ensure healthy and reliable animal production. Zoonoses are an occupational disease in professions dealing with animals. From butchery to veterinary professions, the place of people engaged in animal husbandry is important. Livestock workers may be at higher risk for zoonotic disease because they are often in an environment contaminated with animal

feces or by-products. In addition, other members of the farmhouse may be at increased risk from direct and indirect contact with animals, even if they do not work on the farm. Important zoonotic diseases are: Rabies, Echinococcosis (Echinococcus granulosus), Tuberculosis, Brucellosis, Listeriosis, Leptospirosis, Bovine spongiform brain disease (BSE), Anthrax (Anthrax), Taenia saginata-cysticercusbovis, Salmonellosis, Leichmaniasis, Toxoplasmosis (ar, 2016). Livestock enterprises were evaluated with a total of 15 questions on sector-specific risks, and the differences in the answers given to these questions between provinces and between enterprises are shown in Table 1.

There are differences between the identification and control of risk factors and the practices of protecting employee health. In the enterprises, there is one-to-one contact with the animal in the stages of feeding, transportation, loading, hoof care, numbering, dehorning, vaccine-drug-treatment. These activities carry various risks for both the animal and the worker. Stress increases and yields decrease due to the wounds that occur during the treatment in animals. In addition, bruises that occur during animal treatment also cause increased losses as a source of infection. In order to avoid all these injuries, livestock farms choose the least possible way of contact with animals (Göncü and Anitaş, 2021). Issues such as human-animal contacts in livestock enterprises and the tools and equipment used in animal management are not suitable for animal nature, leading to increased losses (Göncü and Anitaş, 2021). In case of emergency, human escape doors with a width of 30 cm should be planned in the animal passage corridors and sections of the shelters. In addition, warning signs should be used about the presence of animals working in the barn and visitors, such as bulls, that may be aggressive. In addition, a single person should not be allowed to work with animals, and care should be taken to have a companion and helper.

Education and Information

A job description should be made by taking into account the working conditions of the people working in the enterprises. The job description is all of the information that includes the responsibility of the employee in each position, the duties and responsibilities within the business, the instructions on how to do the work, and the importance and effect of the work in production. Job descriptions require a systematic and conscious presentation of the information obtained through job analysis for each sector. Animal-related risks Educating workers in proper animal handling and how to position themselves safely when working with animals will significantly reduce the risk of injury. Giving this information to the person who will work in livestock enterprises with a short-term training and providing the necessary infrastructure for working is very important in preventing occupational safety risk factors (Göncü, et al.2010). Livestock enterprises were evaluated with a total of 10 questions on training and information issues, and the differences were identified statistically important between the answers and enterprises.

The job description in livestock enterprises should be created by competent, experienced, expert and correct people. In addition, the contributions of other employees doing similar work are also helpful. In addition, it should be emphasized that each job has a target to be specified in the job description and that it is measurable in the determined targets. Job descriptions support job analysis processes and complete many steps such as identifying future employee needs and needs, eliminating unfavorable working conditions, and creating criteria for recruitment. Obtaining information beforehand about potentially dangerous situations will prevent many accidents (Grandin, 2002). For example, cows that have just given birth or are in heat may behave differently and be more aggressive compared to their normal periods. Being aware of the risks and knowing the techniques to deal with them will prevent many accidents.

Personal Protective Equipment

Livestock enterprises were evaluated with a total of 4 questions on personal protective equipment, and the differences in the answers given to these questions between provinces and between enterprises are shown in and Table 2.

Personal protective equipment is extremely important for the health and safety of employees in this sector. Foot injuries are common in all livestock businesses. Therefore, protective shoes or boots should be worn. The soles of the shoes or boots used should also be selected to help you walk safely on slippery floors. Gloves that will prevent hand wear and irritation while working with animals will prevent most of the wounds, bruises and bruises that may occur. In addition, disposable gloves should be worn in short-term applications. Local adequate ventilation systems, adequate hygiene and the provision of dust masks in confined spaces will significantly reduce risks. In general, protective equipment is used against dust and harmful gases in the environment. However, it is necessary to use dust masks suitable for the dust in the environment. In areas with high microbiological density, air filtering masks should be used instead of dust filter masks. According to studies conducted in developed countries, 25% of those working in the livestock sector suffer from some form of respiratory disease. The most important source of diseases is agricultural organic dust containing microbes. Bronchitis and asthma are the most common ailments. Asthma is mostly caused by chronic inflammation of the respiratory tract (DemirhanAlapala et al.2016). Along with large-scale animal production, the problem of manure and polluted shelter air in the barns comes to the fore. These wastes contain pollutants such as gases and particulate matter that cause adverse effects on the environment, animal and employee health in the shelter area. There are general and regional legal regulations and regulations on the identification of pollutants originating from animal shelters, revealing their potential effects, choosing the appropriate prevention strategy to reduce pollutant concentrations, and on this subject. In these regulations, limit values for emissions specific to sectors specific to pollutants are specified and sanctions to be applied in case of exceeding the limit are explained. Thus, it applies appropriate production techniques and mitigation measures to keep gas and particulate matter emissions from shelters at minimum levels. Thus, the pressure of animal shelters on the environment can be reduced and a healthier environment can be created for the worker and the animal (Chianese and Lester 2010)

Ergonomics

When planning livestock enterprises, the enterprise should be planned by considering the employee factor. Because the ergonomic work environment, which will facilitate and relax the employee's work, is very effective on work effectiveness (Spector, 1996; Bumin, 1989). Ergonomics is to provide the environment for making the best use of the employee's abilities, taking into account the natural limits of the employee. Providing an ergonomic environment aims to provide the necessary conditions for the job to the human and the human to the job by researching the people who fit the definition of it, taking into account the employee's characteristics and abilities. Arranging these conditions appropriately will not only lead the employees to work more willingly, but will also facilitate their integration with the business. Creating more suitable working conditions should not only be considered as an economic necessity, but also as a social and humane necessity within the understanding of contemporary management (Sabuncuoğlu, 1997). In environments such as the milking parlor, where movements such as bending, getting up or lying down are frequently experienced, the issue of ergonomics comes to the fore. There are 6 questions in the ergonomics section of the questionnaire. The differences in the answers given to these questions between provinces and between enterprises are shown in Table 3.

In order to reveal the real value and weight of the works, it is necessary to determine the working environment and conditions very well (Gürgen, 1995). Since there is a very close relationship between the physical improvement of working conditions and the productivity of the employees; Working conditions that cover physical conditions such as heat, noise, lighting and work-related hazards should be regulated. In many livestock enterprises established in our country, the lack of projects for the social facilities required for the personnel in the first investment project is among the main reasons for employee dissatisfaction, with the idea that later additions will be made. Employees working in areas protected against hot, cold wind or adverse environmental conditions increase work efficiency. However, this convenience should be arranged not only in the work area, but also in a way to provide the necessary rest breaks by taking into account the needs of the employees to rest, drink and socialize. Ergonomic disorders seen in the workplace are largely musculoskeletal disorders such as repetitive work-related disorders, repetitive strain injuries, trauma diseases, overuse injuries and overuse syndromes. It has effects on increasing productivity and quality by including ergonomic designs in the workplace, ensuring occupational health and safety, reducing fatigue and work stress, preventing work force losses, trying to minimize work accidents and occupational risks.

Carry by Hand

Manual lifting includes lifting, holding, pulling, pushing, sliding and lowering. The minimum requirements to ensure the protection of employees from health and safety risks, especially back and waist injuries, that may arise from manual handling in workplaces are determined in the regulation numbered 25370 of February 11, 2004. There are 4 questions in the manual handling part of the questionnaire. The differences in the answers given to these questions between provinces and between enterprises are shown in Table 4.

In the regulation, workplaces are obliged to take the necessary measures to organize work and to ensure that the load is carried by appropriate methods, especially by using mechanical systems, so that there is no need to carry the loads manually. In addition, in cases where manual handling of the load is unavoidable, it is reported that necessary arrangements should be made for the use of appropriate methods and aids to reduce the risk arising from manual handling.

Transportation

Many jobs that must be done on a daily basis in animal husbandry involve risks. Procedures such as numbering of newborn calves, feeding, dehorning, hoof trimming, milking and transporting animals from one place to another are risky practices (Breuer et al.2000; Lindsay et al.2004; Wiggins et al.1989). In addition, Lindahl et al (2016) reported that the relationships between employee, animal and facility characteristics are important. In livestock enterprises, livestock enterprises were evaluated with a total of 5 questions on Transport within the barn, and the differences in the answers given to these questions between provinces and between enterprises are shown in Table 5.

Livestock workers generally use hitting, forcing, shouting using sticks, and electric shocks to guide animals from one compartment to another, or from one compartment to another in the barn. Although electric shocks give violent action at first, they cause an increase in difficulty in later processes with permanent learning in animals. However, electric stimulants are a useful aid only if used correctly. The electrical stimulus should never be used on an animal that has nowhere to go or is already moving in the right direction in the herd. Instead of these, aids such as plastic or newspaper, flag sticks can be used. Holding a stick in front of a cattle will cause it to stop or turn. However, using the stick to hit the animal is unnecessary and ineffective in moving the animals in the right direction. It is dangerous to poke an animal that is already moving in the right direction, as it will cause the cattle to kick (Göncü, 2019). In general, the construction of barns and corridors providing passage between barn compartments should be designed to provide or take into account the natural behavior of cattle (Huhnke and Harp 1998; Smith, 2002). A key element of facility design is to ensure correct animal flow. In the corridors used for animal movement in the barns, the use of movement warning flags, especially at the points where the animal flow is stopped, can make the cattle flow more easily. In addition to distracting the outside of the corridors and paddocks, signals to guide the animals can be used (Göncü, 2019).

Emergencies

In workplaces, the procedures and principles regarding the preparation of emergency plans, what to do, safe management and appointment of officers are defined in the regulation prepared based on the 11th, 12th and 30th articles of the Occupational Health and Safety Law No.6331 dated 20/6/2012. It includes the determination of a safe place at a distance or shelter where the employees will not be affected by the negative consequences of emergencies, with the plans

that include the work and actions to be implemented in case of risks that may occur in the enterprise or in case of natural disasters. The most common hazards in animal husbandry are due to approaching mistakes during working with animals (Göncü, 2019). The animal itself is a danger. Workers may face physical attack, kicking, biting, crushing and being pushed if the animal gets out of control during handling. There are 7 questions in the emergency section of the questionnaire. The differences in the answers given to these questions between provinces and between enterprises are shown in Table 6.

There is a possibility of some emergencies in every sector. Even if occupational health and safety precautions and investments and conditions to protect employees are met, emergencies may occur. It is absolutely necessary to plan ahead of time about what to do in case of an emergency caused by a fire that started in the environment, spreading to the workplace or natural disasters. The most important point is that there should be a plan on who will undertake what tasks in an emergency, what tools and equipment will be used, how to do protection, first aid and evacuation. In addition, appropriate lighting should be provided in animal shelters and the trauma risks that may occur due to this should be reduced as much as possible. Falls, fractures, soft tissue traumas, head traumas, etc. that may occur during the cleaning, maintenance, and animal transport of the barns. First aid training should be given to employees against the risks of physical trauma. Precautions should be taken, ranging from the equipment that the employees will use, to the arrangement of the working environment and to the anticipation of the hazards.

Chemicals

Chemicals such as detergents, disinfectants, drugs and health protection products are used regularly and continuously in livestock enterprises. However, these chemicals pose a risk if not used safely. However, the harmful potential of chemicals also depends on a number of other factors. There are 14 questions in the chemicals section of the questionnaire. The differences in the answers given to these questions between provinces and between enterprises are shown in Table 7.

There are 14 questions in the chemicals section of the questionnaire. The differences between the enterprises of the answers given to 11 of these questions were found to be insignificant ($P \leq 0.05$). Are non-hazardous chemicals provided instead of hazardous? Is unauthorized access to chemicals prevented? Are the storage conditions of chemical substances followed? The differences in the answers given to the questions between the enterprises were found to be significant ($P \leq 0.05$).

Chemical hazards can be listed as foot baths, pacifier dipping or applications, cleaning materials or medications. In their use, they must comply with the directives and be knowledgeable about the risks of employees. Chemicals should be kept locked and out of reach of only responsible personnel in a separate place that is not easily accessible. Empty chemical containers used should be disposed of in a safe manner. In addition, everyone working on the farm should be aware of the meaning of the hazard pictograms used to warn people of the danger. During the survey, it was a remarkable finding that there were no occupational safety warning signs in the enterprises.

4. Conclusion

In the interviews held during this study, it is understood that there are reservations about regulating the duties, authorities, responsibilities, rights and obligations of employers and employees in order to ensure occupational health and safety in livestock enterprises and to improve current health and safety conditions. There is a possibility of emergencies in every sector. It is absolutely necessary to plan ahead of time about what to do in case of an emergency caused by out-of-control reasons such as a fire that started in the surrounding area or natural disasters. The most important point is who will undertake what tasks in an emergency, what tools and equipment will be used, how to provide protection, first aid and evacuation. Falls, fractures, soft tissue traumas, head traumas, etc. that may occur during the cleaning, maintenance, and animal transport of the barns. Emergency first aid training should be given to employees against the risks of physical trauma. Many risk factors can be overcome with measures ranging from the equipment to be used by the employees to the arrangement of the working environment and the anticipation of the hazards. During the survey, it was a remarkable finding that there were no occupational safety warning signs in the enterprises. Another important finding is that breeders need exemplary practices in this regard.

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Table 1: Inter-enterprise comparison results of sector-specific risks questions

Question	Answers	Enterprises										χ^2
		1	2	3	4	5	6	7	8	9	10	
Unauthorized entrance	Blocked	3	6	4	4	2	3	2	1	2	0	0.315
	Not Blocked	1	0	1	1	2	0	0	1	0	1	
Exit with at least two ways when working with animals	Exists	1	6	4	4	2	3	2	1	2	1	0.181
	Not Exists	3	0	1	1	2	0	0	1	0	0	
Precaution for those working against pests and insects	Receiving	3	4	3	3	2	3	2	0	2	1	0.442
	Not Received	1	2	2	2	2	0	0	2	0	0	
Companion intervene in case of possible accidents with animals	Exists	2	4	4	4	2	3	1	1	1	1	0.867
	Not Exists	2	2	1	1	2	0	1	1	1	0	
Treatment of sick animals by authorized persons	Being Done	3	6	5	5	2	3	2	2	2	1	0.200
	Not Done	1	0	0	0	2	0	0	0	0	0	
Animal vaccination and quarantine application	Exists	3	6	5	5	3	2	2	2	2	0	0.157
	Not Exists	1	0	0	0	1	1	0	0	0	1	
Necessary measures in the culling of sick animals	Received	3	6	5	5	3	2	2	1	2	1	0.503
	Not Received	1	0	0	0	1	1	0	1	0	0	
Personal hygiene after working with animals	Being Done	3	6	4	5	4	2	1	2	2	0	0.195
	Not Done	1	0	1	0	0	1	1	0	0	1	
Shelter, gate, loading ramp and fences	Good	2	6	5	5	3	2	2	1	2	0	0.125
	Not Good	2	0	0	0	1	1	0	1	0	1	
The loading areas surrounded by guardrails to prevent falling.	Yes	2	5	4	4	2	2	1	1	1	1	0.921
	No	2	1	1	1	2	1	1	1	1	0	
Prevention of employeesgetting stuck behind large vehicles	Yes	2	5	3	4	3	3	1	1	1	1	0.860
	No	2	1	2	1	1	0	1	1	1	0	
Working area is at sufficient distance to high voltage lines	Yes	4	6	4	5	2	3	2	2	2	0	0.054
	No	0	0	1	0	2	0	0	0	0	1	

Table 2: Cross-enterprise comparison of personal protective equipment questions

Question	Answers	Enterprises										χ^2
		1	2	3	4	5	6	7	8	9	10	
Suitable clothing for the job and working conditions provided for employees?	Yes	3	4	3	3	1	3	1	1	2	0	0.574
	No	1	2	2	2	3	0	1	1	0	1	
Are suitable and non-slip shoes provided to employees?	Yes	1	4	3	4	2	2	1	1	2	0	0.727
	No	3	2	2	1	2	1	1	1	0	1	
Dust mask supply	Exists	1	2	4	4	2	1	1	3	1	0	0.427
	Not Exists	3	2	0	0	2	0	1	1	1	1	

Table 3: Business-to-business comparison of ergonomics questions

Question	Answers	Enterprises										χ^2
		1	2	3	4	5	6	7	8	9	10	
Precautions for heavy and demanding load	Yes	1	5	4	4	2	3	1	1	1	0	0.427
	No	3	1	1	1	2	0	1	1	1	1	
Precautions for reaching very long distances	Yes	2	4	5	4	2	3	1	1	1	0	0.508
	No	2	2	0	1	2	0	1	1	1	1	
Supply of desks, chairs, support equipment appropriate for the work they do?	Yes	3	4	3	4	2	3	1	1	1	0	0.513
	No	1	2	2	1	2	0	1	1	1	1	
Supply for Benches, chairs, stools, etc., in sitting work.	Yes	3	5	3	4	3	3	1	1	2	1	0.886
	No	1	1	2	1	1	0	1	1	0	0	
Precautions to prevent repetitive movements that force the musculoskeletal system?	Yes	1	5	3	4	3	2	1	1	1	0	0.691
	No	3	1	2	1	1	1	1	1	1	1	
Are the hand tools used ergonomic?	Yes	1	4	3	3	2	3	1	1	1	0	0.772
	No	3	2	2	2	2	0	1	1	1	1	

Table 4: Business-to-business comparison of manual handling questions

Question	Answers	Enterprises										χ^2
		1	2	3	4	5	6	7	8	9	10	
Information about the measures taken to protect health and safety	Yes	1	5	4	4	3	3	1	1	0	0	0.192
	No	3	1	1	1	1	0	1	1	2	1	
Information about transport the loads correctly and the risks of incorrect transport.	Yes	2	1	4	3	2	3	3	1	1	1	0.669
	No	4	3	2	2	3	1	0	1	1	1	
Precaution to prevent heavy loads from being lifted by workers	Yes	1	5	4	4	2	2	1	1	1	0	0.626
	No	3	1	1	1	2	1	1	1	1	1	
Suitable means of transport to push or pull loads that may pose a risk of back and waist injury	Yes	1	4	3	3	2	2	1	1	1	0	0.952
	No	3	2	2	2	2	1	1	1	1	1	

Table 5: Business-to-business comparison of shipping questions

Question	Answers	Enterprises										χ^2
		1	2	3	4	5	6	7	8	9	10	
Animal traffic corridors	Exists	1	4	3	3	2	2	1	1	1	0	0.952
	No	3	2	2	2	2	1	1	1	1	1	
General traffic and pedestrian road separated from each other	Yes	1	3	2	3	0	2	2	1	2	0	0.300
	No	3	3	3	2	4	1	0	1	0	1	
Organization on the safe movement of vehicles on the farm site	Exists	1	5	3	3	1	2	1	1	1	1	0.739
	No	3	1	2	2	1	1	1	1	1	0	
Old tractor cabins are equipped with a safety cage (roll-bar)	Yes	1	4	3	2	2	2	0	1	2	1	0.605
	No	3	2	2	3	2	1	2	1	0	0	
Vehicles lighting system and indicators are working properly	Yes	4	6	4	3	1	2	2	2	2	1	0.158
	No	0	0	1	2	3	1	0	0	0	0	
Compliance with indoor and outdoor speed limits in the working area	Yes	4	5	4	5	3	3	2	2	1	1	0.717
	No	0	1	1	0	1	0	0	0	1	0	

Table 6: Business-to-business comparison of emergency questions

Question	Answers	Enterprises										χ^2
		1	2	3	4	5	6	7	8	9	10	
In the workplace, an emergency plan has been prepared.	Yes	1	4	2	1	1	1	0	1	1	0	0.785
	No	3	2	3	4	3	2	2	1	1	1	
Sufficient amount of fire extinguishers and their routine checks	Yes	2	4	3	4	2	2	1	1	1	0	0.963
	No	2	2	2	1	2	1	1	1	1	1	
The emergency exit doors to the fire escape are not locked and are designed to open outwards.	Yes	1	4	3	2	1	0	0	1	0	0	0.447
	No	3	2	2	3	3	3	2	1	2	1	
Availability of safe fire escape stairs and safe emergency exit doors and their intended use	Yes	1	4	2	3	0	0	0	1	1	0	0.351
	No	3	2	3	2	4	3	2	1	1	1	
The phone numbers of emergency (fire, gas leak, earthquake,	Yes	1	4	3	2	2	3	1	1	0	0	0.527

etc.) posted in a visible place (s)	No	3	2	2	3	2	0	1	1	2	1	
It is ensured that the fire warning system (audible and light warning) is operational.	Yes	1	4	2	1	1	2	0	1	0	1	0.476
	No	3	2	3	4	3	1	2	1	2	0	
Is a first aid kit available and its contents are appropriate?	Yes	4	4	3	3	1	3	1	0	2	0	0.167
	No	0	2	2	2	3	0	1	2	0	1	

Table 7: Comparison of answers given to questions about chemicals according to businesses

Question	Answers	Enterprises										$\chi 2$
		1	2	3	4	5	6	7	8	9	10	
Use of non-dangerous or less dangerous chemicals are used instead of dangerous chemicals.	Yes	1	6	4	4	1	2	2	2	2	1	0.032
	No	3	0	1	1	3	1	0	0	0	0	
Unauthorized access to chemicals is prevented	Yes	4	6	4	4	2	3	2	2	2	0	0.151
	No	0	0	1	1	2	0	0	0	0	1	
Chemical wastes are disposed of properly	Yes	2	4	4	4	2	3	1	2	1	1	0.796
	No	2	2	1	1	2	0	1	0	1	0	
Chemicals are stored under appropriate conditions	Yes	3	6	4	4	4	3	2	1	2	1	0.684
	No	1	0	1	1	0	0	0	1	0	0	
Chemical Safety Data Sheets (SDS) available	Yes	1	4	1	2	1	2	0	1	2	0	0.416
	No	3	2	4	3	3	1	2	1	0	1	
Direct exposure of workers to chemicals is prevented	Yes	1	5	3	4	2	3	1	1	1	0	0.510
	No	3	1	2	1	2	0	1	1	1	1	
Information about not to use dangerous chemicals that don't have an instruction manual or not yet prepared.	Yes	1	4	4	3	2	3	1	1	0	1	0.448
	No	3	2	1	2	2	0	1	1	2	0	
Appropriate and adequate ventilation is available in closed working areas treated with chemicals.	Yes	1	5	4	4	4	3	2	1	2	0	0.140
	No	3	1	1	1	0	0	0	1	0	1	
The spread of chemicals to the environment (water, sewage, air, soil) is prevented	Yes	1	5	3	4	2	3	1	1	1	1	0.599
	No	3	1	2	1	2	0	1	1	1	0	
Chemicals (especially flammable) are complied with and kept in appropriate storage conditions	Yes	4	5	4	4	3	3	2	0	2	0	0.105
	No	0	1	1	1	1	0	0	2	0	1	
Chemicals that can react with each other and create dangerous releases are stored in separate places.	Yes	3	5	3	4	2	2	1	1	1	0	0.880
	No	1	1	2	1	2	1	1	1	1	1	
Skin, eye or respiratory contact is prevented during the use of chemicals to prevent allergy and irritation	Yes	1	4	4	3	2	3	1	1	1	0	0.656
	No	3	2	1	2	2	0	1	1	1	1	