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WORK SAFETY ON FARMS IN POLAND – LEGAL, SOCIAL AND TECHNOLOGICAL CONDITIONS

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Abstract. *Agriculture is an economic sector with a high accident rate. Working on a farm requires acquiring knowledge, skills and experience in various fields. The specificity of this industry leads to many health and life hazards and a high risk of accidents. Farmers work in different positions, depending on what is produced on the farm. They operate machinery and equipment, as well as perform maintenance and repairs, participate in transport and storage processes, take care of farm animals, perform agricultural technical and chemical treatments and other non-agricultural activities. The simultaneous occurrence of many production and logistics processes increases the risk of accidents and makes work in agriculture more difficult. Transport and storage processes are common on farms. They are defined as a carefully organized system of interconnected logistics processes, the purpose of which is to produce agricultural products using land, labor, capital, management decisions (farmers) and the forces of nature. Statistics show that the most dangerous events can be considered those that occur during transport work and those related to the operation of tractors and agricultural machinery.*

Keywords: work safety, accident at work, farming, accident prevention.

1. INTRODUCTION

The working environment of farmers is very specific compared to other professions. The variety of work that farmers have to perform exposes them to many dangerous and harmful elements. Working hours are also irregular, often exceeding eight hours a day. Stress and rush have also contributed to the increase in agricultural accidents. The number of accidents has been high for many years and is not characterized by a decreasing trend. It is not possible to talk about only one cause, although inspectors investigating accidents usually point to one - the main cause. However, accidents occur for many overlapping reasons. Generally, the causes of serious accidents in agriculture should be sought in very complex agricultural work environments, where due to the work performed and the number of machines, tools, buildings used, contact with animals and variable conditions. Of the many threats, the greatest seems to be the lack of awareness among farmers. There are also historical reasons for this lack of awareness. For many years, farmers did not have any system of labor protection. As a result, they do not have the opportunity to

participate in training, the aim of which is, among others, to building awareness of hazards and creating a safe work culture (Bińczycka-Majewska, 1993). It should be remembered that a farm is not only a place of work. It is also a living quarters for entire peasant families – often multi-generational – from working children to middle-aged and young people who simply play, as well as older people who feel the need to work among them, because they should not waste their energy. Another cause of agricultural accidents is the technical condition of equipment and buildings. The lack of possibilities to improve the situation due to the low level of farmers' income is another reason for the threat to the work environment in agriculture. About 70-80% of accidents are caused by human errors caused by the mentality of farmers, inappropriate behaviour at work or improper performance, passed down from generation to generation (Jaworska-Spicak, 2001).

2. MATERIALS AND METHODS

The aim of the work was to present Polish legal regulations concerning work in agriculture and the structure of accidents. This aim was achieved based on a query of national literature and analysis of existing data. It presents definitions of agriculture and accidents in agriculture. The importance and role of the Agricultural Social Insurance Fund is presented. In addition, the hazards occurring during agricultural work are discussed. Mechanical, chemical, biological and physical hazards are illustrated. The work also discusses the subject of accidents and the nature of occupational diseases in agriculture. The directions and forms of KRUS preventive actions at national and local level are discussed in the further part.

3. LEGAL REGULATIONS ON OCCUPATIONAL HEALTH AND SAFETY IN AGRICULTURE

Detailed legal regulations regarding occupational health and safety in agriculture are regulated in Poland by several acts and departmental regulations. These are:

- Act of 27 April 2001 - Environmental Protection Law. Announcement of the Speaker of the Sejm of the Republic of Poland of 23 January 2008 on the announcement of the uniform text of the act - Environmental Protection Law (Journal of Laws 2008, No. 25, item 150, as amended),
- Act of 13 April 2007 on the State Labour Inspectorate (Journal of Laws 2007, No. 89, item 589, as amended),
- Act of 25 August 2006 on food and nutrition safety (Journal of Laws 2006, No. 171, item 1225, as amended),
- Act of 14 March 1985 on the State Sanitary Inspectorate. Announcement of the Minister of Health of 4 May 2006 on the announcement of the uniform text of the act on the State Sanitary Inspectorate (Journal of Laws 2006 No. 122, item 851, as amended),
- Act of 26 June 1974 - the Labor Code (Journal of Laws 1998, No. 21, item 94, as amended),
- Act of 24 August 1991 on fire protection. Announcement of the Marshal of the Sejm of the Republic of Poland of 15 October 2009 on the announcement of the uniform text of the act on fire protection (Journal of Laws 2009, No. 178, item 138),
- Act of 11 January 2001 on chemical substances and preparations Announcement of the Marshal of the Sejm of the Republic of Poland of 27 August 2009 on the announcement of the uniform text of the act on chemical substances and preparations (Journal of Laws 2009, No. 152, item 122),
- Act of 20 December 1990 on social insurance for farmers. Announcement of the Marshal of the Sejm of the Republic of Poland of 10 March 2008 on the announcement of the uniform text of the act on social insurance for farmers (Journal of Laws 2008, No. 50, item 291, as amended),
- Act of 27 April 2001 - Environmental Protection Law. Announcement of the Marshal of the Sejm of the Republic of Poland of 23 January 2008 on the announcement of the uniform text of the act - Environmental Protection Law (Journal of Laws 2008, No. 25, item 150, as amended),

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- Act of 13 April 2007 on the State Labour Inspectorate (Journal of Laws 2007, No. 89, item 589, as amended),
- Act of 25 August 2006 on food and nutrition safety (Journal of Laws 2006, No. 171, item 1225, as amended)

Direct enforcement is based on ministerial regulations, such as:

- Regulation of the Minister of Labour and Social Policy of 26 September 1997 on general occupational health and safety regulations (Journal of Laws 2003, No. 169, item 1650, as amended),
- Regulation of the Minister of Health of 30 December 2004 on occupational health and safety related to the presence of chemical factors in the workplace (Journal of Laws 2005, No. 11, item 86, as amended),
- Regulation of the Minister of Agriculture and Rural Development of 9 September 2004 on the qualifications of persons authorized to perform professional slaughter and the conditions and methods of slaughter and killing animals (Journal of Laws 2004, No. 205, item 2102, as amended),
- Regulation of the Minister of Social Policy of 28 April 2005 on the method and procedure for reporting an accident at agricultural work and determining its circumstances and causes (Journal of Laws 2005, No. 76, item 669),
- Regulation of the Minister of Health of 22 April 2005 on biological factors harmful to health in the work environment and the protection of the health of employees professionally exposed to these factors (Journal of Laws 2005, No. 81, item 716, as amended).

In Poland, the Agricultural Social Insurance Fund has been legally obliged to promote safe work of farmers, by the Act on social insurance of farmers of 20 December 1990 (Journal of Laws No. 7, 1998, item 25, as amended). Basically, in agricultural practice, due to the nature of work, it is impossible to completely eliminate harmful and burdensome factors, which is why society should be made aware of their existence in agriculture and their negative impact on the human body should be indicated (Pac, 2006).

An important educational element is broad activity promoting appropriate solutions and work methods. Popularization of occupational health and safety issues is of particular importance for raising the level of work culture. This is a long-term task with difficult to measure effects, but necessary for improving the state of occupational safety in agriculture. When speaking about work protection, we should take into account, to the extent available, all legal norms and observations, both our own and research, in the field of biological and technical processes occurring in agriculture, aimed at protecting the rights of an individual producer, employee, protecting their life, health and securing them against dangerous, harmful and burdensome factors for the body occurring in a given work environment (Pac, 2018). The definition of work protection also includes the concept of physical safety and biological hazards at work. In general, work safety should therefore be considered as activities aimed at protecting an employee, producer, farmer, breeder against accident hazards, i.e. those that ultimately contribute to the occurrence of an injury caused by an external factor, including biological, physical or chemical factors occurring in the work process. The essence of occupational health and safety is, above all, safe work organization while observing safe and rational human behavior in a given environment (Pac, 2023; Pac 2022; Wyka, 2001).

The labor protection system in Poland should primarily take into account:

- state supervision over working conditions,
- social supervision over health and safety conditions,
- liability for violation of labor protection regulations by employers and employees,
- rational and safe undertakings for the protection of labor on family farms (Miłkowski et al. 2014).

The main postulate of employees has always been, is and will be the systematic reduction or elimination of hazards occurring in the work process, and this requires knowledge of specific principles, health and safety regulations, sufficient knowledge and practical skills, and an active and responsible attitude of employees. For this purpose, actions are taken to popularize labor protection issues through dissemination, promotion and teaching, enabling the acquisition of knowledge, skills and adaptation to appropriate habits among wide circles of society, which should be implemented and included in the basic principles of health and life protection on a farm (Cież, 2013; Pac, 2025).

4. ACCIDENTS AT WORK IN AGRICULTURE

Despite the changes taking place in agriculture, the causes of accidents at work in agriculture have not changed over the years. The lack of ability to predict the effects of hazards by farmers plays a significant role here. The source of many accidents is carelessness, disregard for danger, haste, failure to use protective clothing and work footwear, poor technical condition of machines and devices used in agricultural production, ignorance of the principles of their safe operation. Among the listed causes of accidents, failure to comply with the principles of safe work still takes the leading place (Puślecki 2004; Pac, 2024a; Pac, 2024b). The concept of an accident is defined in the literature as "an unfortunate event, misfortune, catastrophe, a violent and unexpected phenomenon". An unfortunate event that happens to a farmer during work is sometimes colloquially called an accident. It is worth emphasizing, however, that the occurrence of such an event does not yet determine that it is an accident at work. Therefore, it should be referred to as an accidental event (Budzinowski, 2003).

In order for an accidental event to be considered an accident at agricultural work, it is necessary for it to meet all the conditions specified in the Act. These include the suddenness of the event, the external cause causing it and the connection of the activity performed with the agricultural activity conducted. The concept of "agricultural work" has not yet been defined by the legislator. In everyday language and in technical sciences, the term "work" appears wherever there is an action of force to overcome resistance. In this approach, we can therefore speak of the work not only of people, but also of animals (e.g. horses) and machines. Work in the economic sense is a conscious and purposeful activity of man directed at the natural environment in order to adapt it to his own needs. In this sense, work includes both physical effort (muscular work) and intellectual effort (mental work). Agricultural work - in a broader sense - will therefore be a conscious undertaking of man directed at the natural environment in order to conduct agricultural activity (Witoszko, 2005). It should be noted that the Polish legislator does not always define "agricultural activity", and the legal definitions in various legal acts are not identical. In the Insurance Act, "agricultural activity" should be understood as activity in the field of plant or animal production, including horticultural, fruit-growing, bee-keeping and fish production. In order to be able to talk about agricultural activity, it is therefore necessary to have appropriately organized instruments (an agricultural farm) and an entity that conducts this activity (an agricultural producer). The effect of this activity is primarily agricultural products. Activities related to this activity should include all activities that are aimed at producing a given product (e.g. ploughing, sowing, harvesting). However, the production process consists of various phases: from pre-production (preparatory) activities to post-production (including processing and sale of manufactured products). It is only on the market that the social and economic meaning of the activity of an entity conducting agricultural activity is realized. It should be noted, however, that this statement does not apply to social – self-sufficiency farms (Kobielski 2005).

Farm work is associated with a high risk of accidents and occupational diseases. The highest risk of accidents occurs on farms where production has a mixed profile.

The most common hazards occurring on farms include:

- mechanical hazards,
- chemical and dust hazards,

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- unfavourable weather conditions,
- biological hazards,
- electrical hazards,
- noise hazards,
- falls from heights,
- welding hazards
- animal husbandry hazards (Kobielski, 2005; Salwa 2003).

The working conditions of a farmer depend to a large extent on weather conditions, but work safety depends primarily on the farmer himself, his knowledge of the hazards occurring during work performed on the farm.

5. HAZARDS OCCURRING DURING FARM WORK

*Mechanical hazards***.** These are hazards caused by mechanical elements, i.e. impacts of machines, tools, objects, animals and the ground on people, which may result in injury or death. Mechanical hazards may be caused by:

- moving machines and transported objects,
- moving working elements of machines and installations (many accidents are caused by self-designed machines, equipment and tools without appropriate guards that have been removed),
- sharp, protruding elements: buildings, structures, agricultural machinery structures, agricultural machinery and equipment tools, workshop tools,
- falling objects, materials, tools,
- during renovation of farm buildings, loading and reloading work,
- pressurized fluid, e.g. oil in the engine or hydraulic system of a lift,
- wet, uneven surfaces are a direct cause of falls. Particularly at risk are surfaces of barns and pigsties that are wet and dirty, yard surfaces in poor condition,
- muddy, slippery, poor drainage of rainwater, lack of care for the proper condition of communication routes, e.g. winter, ice, earth. A high threshold at the entrance also creates a risk of falls. Another risk of falls results from the lack of adequate lighting,
- confined spaces, i.e. in livestock buildings, especially in barns for cows and pigs, there is always a risk of injury to the operator. Similarly, where limited access to machinery or equipment creates a risk, such as crushing, it is also important to ensure adequate access,
- live animals, e.g. during work related to the breeding of bulls, boars, sows or stallions,
- various, i.e. dangerous sewage channels, cesspools, holes in the roof, improper work in the attic at height (Maszyny i inne urządzenia techniczne..., 2002).

Ignoring mechanical hazards, which appear at almost every step during agricultural work, can have very serious consequences. Mechanical injuries are most often crushing or amputations, e.g. of fingers or hands, bruises, stabbing or pricking, abrasions, cuts, fractures, dislocations. The direct causes of these accidents are improper gripping of tools, improper securing of machines or devices during downtime, and removing covers and guards from machines and devices (Pawłowska, 2008). It is worth remembering that the cause of mechanical hazards can be both the normal course of the work process and the action of force majeure, as well as disruptions or failures of agricultural machines. Even the correct use of machines and devices cannot always protect against hazards related to their use. The rule is that all work on agricultural equipment should be performed in accordance with the operating instructions, and access to combines and other self-propelled machines should be granted to people with appropriate qualifications and training required to operate these machines (Regulation of the Minister of Economy of 30 October 2002

on minimum requirements for occupational health and safety in the use of machinery by employees during work, 2002).

Machines must be maintained in proper technical condition, which means checking their technical condition, occasional repairs and maintenance, and cleaning parts or components of agricultural equipment, always after stopping the engine and switching off all driven elements. A farmer is more exposed than a person working in another industry to falling from a height or falling into various types of depressions. The risk of an accident is increased by the presence of agricultural machinery and other equipment, as well as dangerous sharp tools, which constitute barriers that a falling person can hit. In agricultural work, there are many situations in which falls from a height can occur, these include: renovation and construction work, stacking bulk materials during finishing, renovation, cleaning and washing work, e.g. greenhouses, trailers, agricultural machinery.

In turn, falls related to work in ditches can occur during: construction or cleaning of cesspools, deepening wells, work on silos, excavations for building foundations. In the above works, there is a high risk of mechanical injuries as a result of a fall, as well as the risk of covering people with loose material or drowning and fainting. Identification of machine hazards and the resulting dangerous situations is developed based on the analysis of activities in the work system and the way they are performed (Regulation of the Minister of Economy of 21 October 2008 on essential requirements for machines and safety elements, 2008). This analysis takes into account the time spent by work equipment in the hazard zone during normal operation (defined by the designer and/or manufacturer) under specific conditions of use, as well as the possibility of contact with factors causing mechanical hazards, such as the possibility of interference with its function and the potential consequences of such situations.

In particular, the analysis covers:

- general information describing the characteristics of the workstation, such as its location, equipment and arrangement, etc.,
- types of operations and work activities performed by operators and the manner and time of their performance,
- environmental influences on the occurrence of the examined workstation,
- other conditions in which a dangerous situation occurs (PN-EN ISO 12100).

As a result of this analysis, potential sources of injuries or other deterioration of health and dangerous situations that may lead to these effects are identified. Analysis of environmental conditions that affect the occurrence of dangerous situations at the workstation or increase the occupational risk associated with existing hazards related to machines include improper lighting (especially stroboscopic phenomena), insufficient visibility, dust, disorganized elements, spilled liquids, e.g. due to unpacked installation (PN-EN ISO 13850:2008).

*Chemical hazards***.** Chemicals are a wide range of chemical compounds with simple or complex structures that translate into their different chemical and physical properties. Of all the substances that exist, whether obtained from natural sources or by chemical synthesis, thousands are listed as hazardous chemicals. This is an open list and new entries may appear (Regulation of the Minister of Health of 30 December 2004 on occupational health and safety related to the presence of chemical factors in the workplace, 2004).

Council Directive 67/548/EEC of 27 June 1967 on the proximity of dangerous substances in laws, regulations and administrative provisions relating to classification, packaging and labelling and Directive of the European Parliament and of the Council of 31 May 1999 Council Directive 1999/ 45/EC concerning the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations, dangerous substances and mixtures are substances and mixtures that belong to at least one of the following classes:

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- explosive substances and mixtures,
- oxidising substances and mixtures,
- extremely flammable substances and mixtures,
- highly flammable substances and mixtures,
- flammable substances and mixtures,
- alternative highly toxic substances and mixtures,
- toxic substances and mixtures,
- dangerous substances and mixtures,
- substances and mixtures corrosive,
- irritating substances and mixtures and mixtures,
- sensitizing substances and mixtures,
- carcinogenic substances and mixtures,
- mutagenic substances and mixtures and mixtures toxic to reproduction,
- substances and mixtures harmful to the environment.

They are most often found in plant protection products, fertilizers, fuel, used oils and greases and other hazardous substances used on farms, e.g. for cleaning residential premises. Plant protection products, called insecticides, destroy weeds, fungi and pests, but can also have a harmful effect on human health if they are not used and stored properly. They are among the most harmful compounds to which farmers are exposed. The high toxicity of plant protection products and their increasing use on farms mean that they pose the greatest threat to the health and even life of exposed (Regulation of the Minister of Labor and Social Policy of 29 November 2002 on the maximum permissible concentrations and intensities of harmful health factors in the work environment, 2011).

The activities that most affect farmers are: preparing solutions, such as spraying or dressing seeds, watering plants with plant protection products, cleaning and repairing sprayers. Packaging should be thrown away after work and work clothes should be washed. To reduce the risk of direct exposure to pesticides, protective clothing, gloves, appropriate footwear, goggles and respiratory protection should be worn (Regulation (EC) No. 1907/2006).

Research by the Central Institute for Labor Protection - National Research Institute (CIOP-PIB) has shown that plant protection products have a harmful effect on all important parts of the human body. According to CIOP-PIB, the level of risk posed by a pesticide is influenced by, among other things, the type of product used and its toxicity class - the most harmful are pesticides with toxicity classes I and II. However, it should be remembered that most poisonings are associated with the use of class III compounds (Council Directive 98/24/EC). Working with pesticides becomes more dangerous at elevated temperatures and humidity, especially in greenhouses – the way substances enter the body – often through absorption through the skin and respiratory system. The most exposed to pesticides were the hands, thighs, calves, forearms, eyes, face, torso and feet. These toxins can enter the body through the skin, respiratory system and digestive system. They can cause acute poisoning – when large doses are absorbed in a single dose, chronic poisoning – due to the accumulation and long-term accumulation of the drug in small doses in the body, distant poisoning – symptoms can be delayed and difficult to recognize. On the other hand, poisoning with plant protection products in small doses includes:

- poor health, general weakness,
- headache and dizziness,
- nausea, vomiting,
- abdominal pain, diarrhea,
- anxiety, agitation,
- salivation, tearing,
- sweating.

Since the symptoms are the same as food poisoning, poisoning rarely requires a doctor's visit. The most common causes of pesticide poisoning are improper use, improper storage and easy access by unauthorized persons. Good practices in the use and storage of plant protection products:

- prevent the spread of weeds, pests and pathogens through appropriate agricultural techniques,
- use integrated pest management,
- read the labels on the packaging before using plant protection products,
- properly prepare a technically efficient sprayer for work,
- properly prepare the working fluid,
- properly clean the sprayer,
- plant protection products should be stored in separate buildings or in specialist warehouses, clearly marked (with the inscription: "Plant protection products") and closed and secured against access by unauthorized persons (Regulation (EC) No. 1272/2008 of the European Parliament and of the Council).

*Dust hazards***.** The PN-ISO 4225:1999 standard defines dust as solid particles of various sizes and origins suspended in a gas for a certain period of time. The following terms can also be found in regulations and legal standards:

- total dust - a set of all particles surrounded by air in a specified volume (PN-EN 481:1998),
- fine dust - small particles of a solid; usually assumed to be particles with a diameter below 75 μm, which settle under the influence of weight, but can remain suspended for some time (PN-ISO 4225:1999),
- coarse dust - solid particles in the atmosphere or exhaust gases are harmful to humans (PN-ISO 4225:1999).
- Dust can be divided into the following groups based on the hazard:
- irritating (particles of coal, iron, glass, aluminum, barium compounds),
- fibrillating (particles of asbestos, cristobalite, tridymite, talc, iron ore and coal),
- carcinogenic substances (asbestos, special purpose refractory ceramic fibers, deciduous tree dust (beech, oak),
- allergens (dusts of plant and animal origin, pharmaceuticals, arsenic, copper, zinc, chromium dust).

The most harmful dust is produced during sharpening, grinding or polishing. Substances whose dust is considered particularly hazardous to health include primarily:

- asbestos, which is carcinogenic due to the long-term retention of fibers in the human body,
- artificial mineral fibers are often used as a substitute for asbestos,
- wood, especially oak and beech, due to its hardness,
- crystalline silica dust is considered very harmful in Poland,
- amorphous silica dust (diatomaceous earth and silica).

In agriculture, many processes produce dust, solid particles, which, after being separated from a solid body, remain suspended in the air for some time. They are the most common hazards. They are created, for example, during crushing, harrowing, threshing, cutting wood, sowing, ploughing, fertilizing, and feeding animals. The most common disease is pneumoconiosis. From the point of view of composition, the most dangerous are dusts containing silicon compounds, found mainly in asbestos, cement, hard and brown coal, talc, mineral wool and soil. The effects of exposure usually appear after many years, manifesting themselves in inflammation of the respiratory tract and cancer.

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Biological hazards. According to the Regulation, harmful biological factors that can cause infection, allergy or poisoning are:

- ✓ cellular microorganisms, including genetically modified microorganisms,
- ✓ non-cellular entities capable of replicating or transferring genetic material, including genetically modified microorganisms,
- ✓ cell cultures,
- ✓ internal parasites.

The basis for the classification of biological pest factors is their impact on the health of employees. Biological factors are divided into 4 categories of hazards based on their infectivity. The criteria for classifying factors into individual groups are:

- ✓ the ability to cause disease in humans and the severity of its course,
- ✓ the probability of the disease spreading in the population,
- ✓ the probability of using effective prevention and treatment (Directive 2000/54/EC).

The condition for the occurrence of a health hazard is the entry of biological factors into the body. Biological factors can enter the body through three main routes of exposure:

- ✓ inhalation (air) - by inhaling air containing biological factors (e.g. tuberculosis, influenza, Legionnaires' disease, infectious mononucleosis, measles),
- ✓ dermal - through the skin and mucous membranes (nose, eyes) exposure to biological factors (e.g. viral hepatitis B and C),
- ✓ ingestion - by eating and/or drinking products containing biological factors (e.g. infection with the Salmonella hepatitis virus) (Dutkiewicz et al. 2007).

Biological hazards are very common in agriculture. Biological hazard factors are microorganisms and macroscopic organisms and the substances they produce, which have a harmful effect on the human body and can cause occupational diseases, especially respiratory and skin diseases. Biological hazard factors are divided into three groups:

- ✓ allergens, toxins produced by plants, such as celery, rue, etc.,
- ✓ allergens and toxins produced by bacteria, actinomycetes, fungi and animals and plants,
- ✓ infectious agents of animal origin, such as viruses, fungi and protozoa (Regulation of the Minister of Health of 28 November 2005 on the list of work positions and protective vaccinations recommended for employees taking up work or employed in these positions).

Biological factors are present in organic dust and are released in large quantities into the air inhaled by farmers. All of them have a negative impact on human health, showing toxic, irritating, sensitizing and even carcinogenic effects.

Physical hazards. Agricultural work is mainly carried out outdoors, in changeable weather. In autumn and winter, farmers are exposed to variable low temperatures and humidity, and in summer to hot conditions. High sunlight and high temperatures can significantly worsen working conditions, leading to overheating, fainting and skin lesions. Alternating work inside and outside the building is dangerous due to large fluctuations in temperature and humidity (PN-N-18002:2000).

Farmers use many electrical devices while working on the farm, and improper use can lead to accidents and illnesses. Using electrical devices can cause electric shock and burns, as well as a fire hazard (PN-N-01256-01). The premises in which farmers work are often cramped and damp, with damp and conductive floors, which further increases the risk of accidents. On the other hand, people staying for a long time near devices generating high voltage are exposed to the harmful effects of strong electric and electromagnetic fields (PN-EN ISO 14738).

On farms, there may also be hazards during the welding process. First of all, the danger of intense light radiation, thermal radiation, sparks and molten metal spatter. Depending on the type of radiation band and its wavelength, we can suffer various bodily injuries. In particular, the following may occur: inflammation of the cornea, visual impairment, retinal burns, skin burns. On the farm, we most often meet

gas welders and electric welders. To prevent the harmful effects of optical radiation, eye and face protection should be used.

Noise hazard. Noise is any unwanted sound that may be bothersome or harmful to health or increase the risk of accidents at work. Noise is the most common harmful factor in the work environment. The negative impact of noise on the human body mainly concerns the hearing organ, which is the ear. Noise is also accompanied by other types of mechanical wave vibrations that may adversely affect humans. Infrasound - low-frequency vibrations (0-16 Hz), inaudible or barely audible, but strongly affecting internal organs. Ultrasound - very high-frequency waves (above 20,000 Hz), which are barely audible, but affect people, and vibrations - vibrations transmitted through solid bodies and affecting those who come into contact with them (Koradecka, 2008).

One of the most important harmful environmental factors in agriculture is noise. Farmers use machinery to work - tractors are used with complete agricultural machinery, self-propelled agricultural machinery, stationary agricultural machinery, and workshop and construction machinery. Being with animals in animal production also exposes farmers to noise. The main source of noise in agricultural environments are tractors. The Central Institute for Labor Protection - National Research Institute informs that studies of noise emitted during the operation of various machines used in agriculture have shown that agricultural tractors pose the greatest threat to the hearing organ, with the average 1-hour exposure time to noise (EA,1h) ranging from 0.05 to 4.80 (Pa2*h) depending on the type, technical condition, and manufacturer of the tractor (Engel et al. 2005; Lipowczan, 1987).

To date, studies by the Institute of Rural Medicine have only allowed determining the level of noise emitted during agricultural, transport, and workshop work. However, there have been no studies on how long farmers spend in this noise range and we do not know the true level of risk that this factor poses to farmers' health. Hearing protectors should be used at the tractor operator's position and during all other work that produces noise above the permissible level or is considered burdensome. For comparison, according to Polish law, the maximum permissible level in the A-weighted sound environment is 115 decibels, and the peak C-weighted sound level is 135 decibels. Employers must take action when noise exposure reaches 85 decibels during an eight-hour 24-hour work period - informed the National Labor Inspectorate. The tractor noise level in the cabin is about 80 decibels. Excessive and prolonged noise directly leads to fatigue, poor performance, poor concentration, disorientation, irritability, increased blood pressure, headaches and dizziness, and in the long term may lead to temporary or permanent hearing damage (Morzyński & Puto, 2005).

6. OCCUPATIONAL SAFETY IN ANIMAL PRODUCTION

There are many hazards related to accidents and diseases, both mechanical and biological, when breeding animals on a farm. The risk of mechanical accidents occurs during activities related to animals, such as milking, feeding, and sanitary procedures. Slippery floors in livestock buildings also increase the likelihood of falls. According to statistical data, in 2022, 11.2% of all agricultural accidents resulted from being hit, crushed, and bitten by animals, while 4.9% of accidents resulting from improper handling of animals, including failure to exercise special caution when handling dangerous animals, were caused by violence and aggression of animals not resulting from their biological causes (e.g. fever, first lactation, childbirth, mastitis, etc.) - 4.8% (Majchrzycka & Pościk, 2007). The data also show that in Poland about 2,000 people per year suffer injuries while working with animals, and some of them die. A particular threat to people working with animals is the risk of zoonoses. Zoonoses are infectious and parasitic diseases that people can get from sick animals or carriers of viruses, bacteria and fungi. The most common include: salmonellosis (consumption of food contaminated with feces of infected animals, especially eggs and poultry), rabies, Lyme disease and tick-borne encephalitis, tetanus, toxoplasmosis, zoonotic fungal diseases (Koradecka, 1997).

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7. THE IMPORTANCE OF THE AGRICULTURAL SOCIAL INSURANCE FUND IN SHAPING SAFE WORK IN AGRICULTURE

The Agricultural Social Insurance Fund is a state institution responsible for social insurance for farmers. This system is supervised by the Minister of Agriculture and Rural Development. The Agricultural Social Insurance Fund (KRUS) is an institution that provides services to farmers in matters concerning:

- ✓ covering them with social insurance,
- ✓ paying contributions for this insurance,
- ✓ granting and paying cash benefits from insurance: retirement and disability insurance, accident insurance, sickness insurance and maternity insurance (Act of 20 December 1990 on social insurance for farmers, 2008).

Additionally, KRUS conducts preventive activities to promote the principles of work safety on farms and eliminate hazards in the workplace. The Agricultural Social Insurance Fund also conducts voluntary, free medical rehabilitation for persons entitled to benefits, at risk of incapacity for work or permanently or temporarily incapacitated to work on a farm. KRUS also performs many additional tasks assigned by the state, including:

1) pays:

- ✓ national structural pensions,
- ✓ family allowances,
- ✓ care allowances,
- ✓ veterans' benefits for war invalids,

2) manages the health insurance of farmers, their household members, retirees and pensioners, members of their pensioner and pensioner families, while also acting as a payer of contributions for this insurance on behalf of the National Health Fund (Puślecki, D. 2006).

In the social insurance of farmers, two types of insurance operate on separate financial principles:

- ✓ pension and disability insurance, financed mainly from a budget subsidy, supplemented by income from contributions from insured farmers,
- ✓ accident, sickness and maternity insurance, the implementation of benefits from this insurance is guaranteed only by contributions from farmers, collected in the Contribution Fund of the Social Insurance of Farmers. This fund is a legal person, the functions of the management board are performed ex officio by the President of KRUS, under the supervision of the Farmers' Council.

The organizational structure of KRUS consists of:

- ✓ Headquarters
- ✓ 16 regional branches,
- ✓ 256 local branches.

The Agricultural Social Insurance Fund is managed by the President as the central public administration body subordinate to the minister responsible for agriculture. The President of the Fund is appointed and dismissed by the Prime Minister, upon an application submitted after seeking the opinion of the Council of Farmers. Under Article 76 of the Act on Social Insurance for Farmers, the President of KRUS performs ex officio, under the supervision of the Council of Farmers, the functions of the board of the Contribution Fund of the Social Insurance for Farmers (Jędrasik-Jankowska, 2002). The monthly amount of the contribution to retirement and disability insurance is 10 percent of the basic pension. The amount of the basic pension is announced by the President of ZUS in the Official Journal of the Republic of Poland "Monitor Polski" (Salwa, 2003).

The basis for financing all statutory tasks of KRUS are three state earmarked funds: the Pension and Disability Fund, the Prevention and Rehabilitation Fund, the Administrative Fund, and also the extra-budgetary Contribution Fund of the Social Insurance for Farmers.

8. ACCIDENT RATE AND PREVENTIVE MEASURES

The basic machine used in agricultural work is the tractor. Used with machines cooperating during field work and for transport work, it facilitates work, increases efficiency and allows for cost reduction, but it is also a machine that poses the greatest threat to the health and life of farmers operating it. The operation of machinery and safety depend largely on its skillful operation. Every year, over 20,000 accidents occur on individual farms, resulting in dozens of deaths (Solecki, 2008). According to KRUS data, the structure of accidents has not changed significantly in recent years, and the causes of most injuries are: "falls", "being caught or hit by moving parts of machines and devices" and "being hit, crushed" or bitten by animals. A large number of accidents occurred during the use of agricultural machines in the logistics and production process. The largest share of machines in accidents were agricultural tractors, trailers, combines and means of transport (Puślecki, 2011).

There are many causes of agricultural accidents and they are related to the specificity of farmers' work, characterized by a lack of time frames, variable working conditions, multitasking, the presence of children and animals in the work environment. The work is characterized by excessive physical and mental consumption, the use of many generally outdated machines and technical devices (Jaworski, 2007). The most common accidents during agricultural work include falls, dropped objects, being caught and hit by moving parts of machines, crushing, biting and other events involving animals (kick, hit, knocked over by an animal) and the forces of nature (extreme temperatures, storms, cyclones, etc.) (Puślecki, 2010). According to the Institute of Rural Medicine, the most common forms of this are: broken bones, cuts, bruises, sprains, burns, crushing (amputation), etc. Therefore, in agriculture, farmers are exposed to a very high occupational risk in the form of agricultural accidents and agricultural occupational diseases. KRUS data do not reflect the actual number of agricultural accidents in Poland, because some farmers do not apply for insurance. The current law includes two types of insurance:

- ✓ full (against the consequences of accidents on the farm),
- ✓ limited (against the consequences of accidents outside the farm, which covers only accidents occurring during normal activities related to agricultural activity or in connection with conducting such activity) (Puślecki, 2011).

The interpretation of the concept of accidents at agricultural work was initially difficult due to the lack of statutory definition of agricultural work and the introduction of broader concepts (Kobielski, 2005). The concept of agricultural activity falls within the definition of an accident, which is too narrow in agricultural law, because it excludes preparatory and organizational activities and activities in the post-production phase. Only when three elements are met simultaneously: suddenness of the event, externality of the cause and connection with work, can we speak of the existence of accidents at work in the legal sense. In order for an event to be considered sudden, the factors that caused it must affect the victim within a short time (Rodak, 2012). However, the concept of transience is not clearly defined as time, the decisive criterion here is not so much the short duration of the event, but the lack of time for the victim's consciousness to register the state of danger, for the victim to be able to take precautions and prevent it. If the accident occurred at home or on a farm, any such accident can be considered an accident at agricultural work if it is related to activities related to conducting agricultural activity or performing such activities. In addition, there must be a temporal and functional connection with agricultural work, but we are not dealing here with a classic, fully causal form of relationship. The combination of "local" and "functional" relationships is characteristic here. Accidents are sudden events caused by external causes, occurring outside the farm and home and its premises, while performing "everyday activities related to agricultural activity" (Jędrasik-Jankowska, 2003). This also applies to farmers who have accidents while picking fruit from trees and, as a farmer, have accidents on neighboring farms as part of neighborly help. The problem of many accidents at work that are not recognized as accidents on farms results from the fact that the definition of "accident" is imperfect. The correct construction of the legal concept of "agricultural accident" is of fundamental importance for the protection of victims of accidents (Szymanek & Zarychta, 2004).

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The specificity of agricultural work is characteristic enough to justify special protection of farmers and members of their families against accidents and diseases related to agricultural work. Social insurance for farmers should therefore provide adequate and broad protection for people working in agriculture (Puślecki, 2006). The main goal of preventive measures implemented by KRUS local units is to disseminate the "Principles of health and life protection on a farm", which are recommendations regarding the equipment of a farm, protection of people working on it and the method of performing activities related to agricultural activity (Accidents at work and occupational diseases of farmers and preventive measures of KRUS in 2020, 2021). The content of the document was first published in 1995 and then amended in 2008 and 2020, in accordance with the arrangements of the President of the Fund in agreement with the Council of Farmers and ministers responsible for health, social protection and rural development. The need for updating results from the need to adapt individual regulations to the statutory and regulatory provisions and good agricultural practices in force in EU countries (Szewczyk, 2005). The latest edition contains advice on work organization, environmental protection, fire protection, handling hazardous substances (such as plant protection products, fuels and fertilizers), as well as on the psychophysiological state of farmers and their health. The dissemination of these principles is the main goal of preventive activities of KRUS units. The Act on the Social Insurance of Farmers indicates that claims can be made from suppliers of agricultural products and services whose defects are the only or main cause of accidents at work in agriculture or occupational diseases, for monetary compensation from insurance paid to injured farmers (Szewczyk, 2006).,

Based on the analysis of the causes and circumstances of accidents and occupational diseases reported to KRUS in 2020, the President of the Fund determined the following directions of KRUS preventive actions:

a) dissemination of the updated "Principles of health and life protection on a farm" and the "List of particularly dangerous activities related to running a farm, which must not be entrusted to children under 16 years of age" among farmers, their families and children of people associated with the rural environment,

b) influence the elimination of hazards and prevent the most common accidents from the following groups: falling people, being caught and hit by moving parts of machines and devices, being hit, crushed and bitten by animals, falling objects and other accidents. This is done by popularizing:

- ✓ improving the surface of yards and communication routes on the farm
- ✓ using work safety measures
- ✓ using platforms and ladders to prevent tipping and sliding during work at heights,
- ✓ eliminating thresholds and failures in buildings and communication routes,
- ✓ the correct method of getting on and off agricultural machinery,
- ✓ ensuring that machinery is equipped with guards and that its moving parts are secured,
- ✓ properly securing machinery and tools when stationary and in motion,
- ✓ applying the principle of safe timber harvesting for the needs of the farm,
- ✓ taking care of the farmer's appropriate mental state (healthy lifestyle, diagnostics),

c) influencing the proper production and distribution of agricultural products and protective measures by:

- ✓ informing farmers about products marked with the KRUS Safety Mark and the distinction awarded by the President of KRUS entitled A product that increases work safety on a farm and encourages its purchase and use,
- ✓ a preventive and recourse program aimed at eliminating from the market products with structural defects that may cause accidents or pose a threat to users,
- ✓ informing farmers about ways to prevent occupational diseases - mainly about preventing tick bites and the rules of conduct in the event of a bite,

- ✓ familiarizing farmers with the basic rules of conduct and methods of providing first aid in the event of an accident (Accidents at work and occupational diseases of farmers and preventive activities of KRUS in 2021, 2022).

The President of the Fund instructs the heads of local branches to supervise the proper determination of the cause and circumstances of the accident and to conduct preventive measures in accordance with the Act on Social Insurance for Farmers (Jędrasik-Jankowska, 2013).

9. CONCLUSION

In order to provide people with the best possible living conditions, Poland spares no effort to create the most favorable working conditions possible. This aspiration is reflected in the Constitution of the Republic of Poland. In addition, a number of legal acts oblige employers to organize production processes in such a way that they do not threaten the health and life of employees.

The state's activity in this area is based on specific organisational principles. The employees themselves and their social organisations, state and local government administration and scientific institutions take an active part in creating safe and harmless working conditions.

A new organisational system for labour protection has been created in Poland, which consists of three main divisions: executive, supervision (inspection) and scientific and research. Each of them has its own specific tasks, and the harmonised activity within these three divisions ensures the implementation of a common goal, which is to create safe and harmless working conditions. A characteristic feature of this system is the close connection between the executive division, which is in the hands of the state administration, and the supervision division, the core of which are employees.

In Poland, the obligation to comply with occupational health and safety regulations and to apply safe work principles has been imposed on all employees. The management body of the workplace, appointed to perform specific occupational health and safety tasks and at the same time having the right to control compliance with occupational health and safety regulations, is the workplace administrative occupational health and safety service. This is particularly important in the field of agriculture, where various types of accidents and unfortunate events very often occur during the performance of various types of work.

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