

УДК 796.035.2-057.75

UDC 796.035.2-057.75

4.3.1. Технологии, машины и оборудование для агропромышленного комплекса (технические науки, сельскохозяйственные науки)

4.3.1. Technologies, machinery and equipment for the agro-industrial complex (technical sciences, agricultural sciences)

ОСОБЕННОСТИ ЗАНЯТИЯ СПОРТОМ РАБОТНИКОВ ЗРЕЛОГО И ПОЖИЛОГО ВОЗРАСТА В УСЛОВИЯХ ПРОИЗВОДСТВА

PECULIARITIES OF GOING IN FOR SPORTS OF WORKERS OF MATURE AND ELDERLY AGE UNDER PRODUCTION CONDITIONS

Липкович Игорь Эдуардович
доктор технических наук, доцент
РИНЦ: SPIN-код: 1176-1210
LipkovichIgor@mail.ru
*Азово-Черноморский инженерный институт
ФГБОУ ВО Донской ГАУ в г. Зернограде,
г.Зерноград, Ростовская область, Россия*

Lipkovich Igor Eduardovich
Doctor of Technical Sciences, assistant professor
RSCI SPIN-code: 1176-1210
LipkovichIgor@mail.ru
*The Azov-Black Sea Engineering Institute FSBE HE
Don State Agrarian University in Zernograd,
Zernograd, the Rostov region, Russia*

Пятикопов Сергей Михайлович
кандидат технических наук, доцент
РИНЦ: SPIN-код: 5409-2713
Pjatikopov@mail.ru
*Азово-Черноморский инженерный институт
ФГБОУ ВО Донской ГАУ в г. Зернограде,
г.Зерноград, Ростовская область, Россия*

Pyatikopov Sergey Mikhailovich
Candidate of Technical Sciences, assistant professor
RSCI SPIN-code: 5409-2713
Pjatikopov@mail.ru
*The Azov-Black Sea Engineering Institute FSBE HE
Don State Agrarian University in Zernograd,
Zernograd, the Rostov region, Russia*

Егорова Ирина Викторовна
кандидат технических наук
РИНЦ: SPIN-код: 1003-8910
OrishenkoIrina@mail.ru
*Азово-Черноморский инженерный институт
ФГБОУ ВО Донской ГАУ в г. Зернограде,
г.Зерноград, Ростовская область, Россия*

Egorova Irina Victorovna
Candidate of Technical Sciences
RSCI SPIN-code: 1003-8910
OrishenkoIrina@mail.ru
*The Azov-Black Sea Engineering Institute FSBE HE
Don State Agrarian University in Zernograd,
Zernograd, the Rostov region, Russia*

Ковалева Светлана Александровна
РИНЦ: SPIN-код: 7634-1454
ksazernograd@rambler.ru
*Азово-Черноморский инженерный институт
ФГБОУ ВО Донской ГАУ в г. Зернограде,
г.Зерноград, Ростовская область, Россия*

Kovaleva Svetlana Alexandrovna
RSCI SPIN-code: 7634-1454
ksazernograd@rambler.ru
*The Azov-Black Sea Engineering Institute FSBE HE
Don State Agrarian University in Zernograd,
Zernograd, the Rostov region, Russia*

Петренко Надежда Владимировна
кандидат технических наук, доцент
РИНЦ: SPIN-код: 5942-7170
*Азово-Черноморский инженерный институт
ФГБОУ ВО Донской ГАУ, в г. Зернограде,
г.Зерноград, Ростовская область, Россия*

Petrenko Nadezhda Vladimirovna
Candidate of Technical Sciences, assistant professor
RSCI SPIN-code: 5942-7170
*The Azov-Black Sea Engineering Institute FSBE HE
Don State Agrarian University in Zernograd, Zerno-
grad, the Rostov region, Russia*

Данная статья нацелена на создание у работодателя правильного мировоззрения в плане организации системы физической культуры в условиях предприятия для работников зрелого и пожилого возраста, с целью поддержания их здоровья и работоспособности на должном уровне. Правильное применение средств физической культуры помогает повысить производительность труда, снижает заболеваемость и профессиональный травматизм, учитывая возрастные особенности организма, влияющие на физические возможности, а следовательно,

This article is aimed at creating the correct worldview for the employer in terms of organizing a physical culture system under enterprise conditions for workers of mature and old age, in order to maintain their health and performance at the proper level. The correct use of physical culture tools helps to increase labor productivity, reduces morbidity and occupational injuries, taking into account the age-related characteristics of the body that affect physical capabilities, and therefore ensures the growth of labor productivity, high performance and good health of the employee. The article gives the procedure for the

обеспечивает рост производительности труда, высокой работоспособности и хорошего здоровья работника. В статье приведен порядок действия работодателя по организации физической культуры в условиях предприятия для данной категории лиц. Даны рекомендации к недельной двигательной активности, подобраны формы и средства физкультурно-оздоровительной работы в рамках трудового процесса, в после рабочее время и в дни отпуска. Подбор физических упражнений, режимов и объемов физической нагрузки следует проводить дифференцированно с учетом здоровья, возраста, образа жизни, наличия ограничений. Одной из наиболее доступной формой занятий физическими упражнениями для лиц зрелого и пожилого возраста является утренняя гимнастика, которая включает в себя комплекс упражнений для рук, ног, туловища. В режиме самого трудового процесса применяются основные эффективные формы физической культуры – производственная гимнастика (физкультпаузы и физкультминутки). Вне производства к наиболее важным для трудового процесса и работников отнесены комплексно-комбинированные занятия физическими упражнениями, упражнения на тренажерах, прогулки (пешие, велосипедные, туристические), плавание, скандинавская ходьба, рыболовство и охота, занятия по индивидуальным тренировочным программам. Подбор физических упражнений, их характер и интенсивность должны соответствовать физической подготовленности, возрасту, индивидуальным возможностям занимающихся

Ключевые слова: СПОРТИВНЫЕ ЗАНЯТИЯ, РАБОТНИКИ ЗРЕЛОГО И ПОЖИЛОГО ВОЗРАСТА, ПРОИЗВОДСТВО, ФИЗИЧЕСКАЯ КУЛЬТУРА, ДВИГАТЕЛЬНАЯ АКТИВНОСТЬ, СПОРТ, ГИМНАСТИКА, УПРАЖНЕНИЯ, ФИЗИЧЕСКАЯ АКТИВНОСТЬ

<http://dx.doi.org/10.21515/1990-4665-186-007>

employer to organize physical culture under conditions of the enterprise for this category of persons. Recommendations for weekly physical activity are presented, forms and tools of physical culture and health-improving work are selected within the framework of the labor process, after working hours and on vacation days. The selection of physical exercises, modes and volumes of physical activity should be carried out differentially, taking into account health, age, lifestyle, and the presence of restrictions. One of the most accessible forms of physical exercise for mature and elderly people is morning exercises, which include a set of exercises for the arms, legs, torso. In the mode of the labor process itself industrial gymnastics (physical education pauses and physical education minutes) as the main effective form of physical culture are used. Outside of production, the most important forms for the labor process and employees are complex-combined physical exercises, exercises on simulators, walks (hiking, cycling, and tourist walk), swimming, Nordic walking, fishing and hunting, classes according to individual training programs. The selection of physical exercises, their nature and intensity should correspond to the physical fitness, age, individual capabilities of trainees

Keywords: SPORTS ACTIVITIES, MATURE AND ELDERLY WORKERS, PRODUCTION, PHYSICAL CULTURE, PHYSICAL ACTIVITY, SPORTS, GYMNASTICS, EXERCISES, PHYSICAL ACTIVITY

The recent economic processes demand a decisive increase in the efficiency of labor and its productivity. In this regard, the interest of labor collectives in the optimal use of labor resources is increasing, which is primarily associated with the physical condition of the personnel and, as a result, with its performance [1, 2].

With the intensification of labor, the need for healthy people with high functional capabilities of the body increases sharply, and, consequently, for the means to achieve this.

<http://ej.kubagro.ru/2023/02/pdf/07.pdf>

So, one of the effective means to improve health and increase the functionality of the body is physical culture at work, differentiated by occupation and age period of life.

The main purpose and content of industrial physical culture is the development, achievement and sustainable provision of human readiness and the implementation of specific production and labor activities.

In modern conditions, especially in large enterprises, a large number of mature and elderly employees work, since the production process cannot do without their qualifications and experience. In turn, the management of the enterprise should provide an opportunity for these people to play sports at the enterprise in order to maintain their health and performance at the proper level (fig. 1) [3, 4].

The procedure for employees to organize sports activities with this category of employees is shown in figure 1.

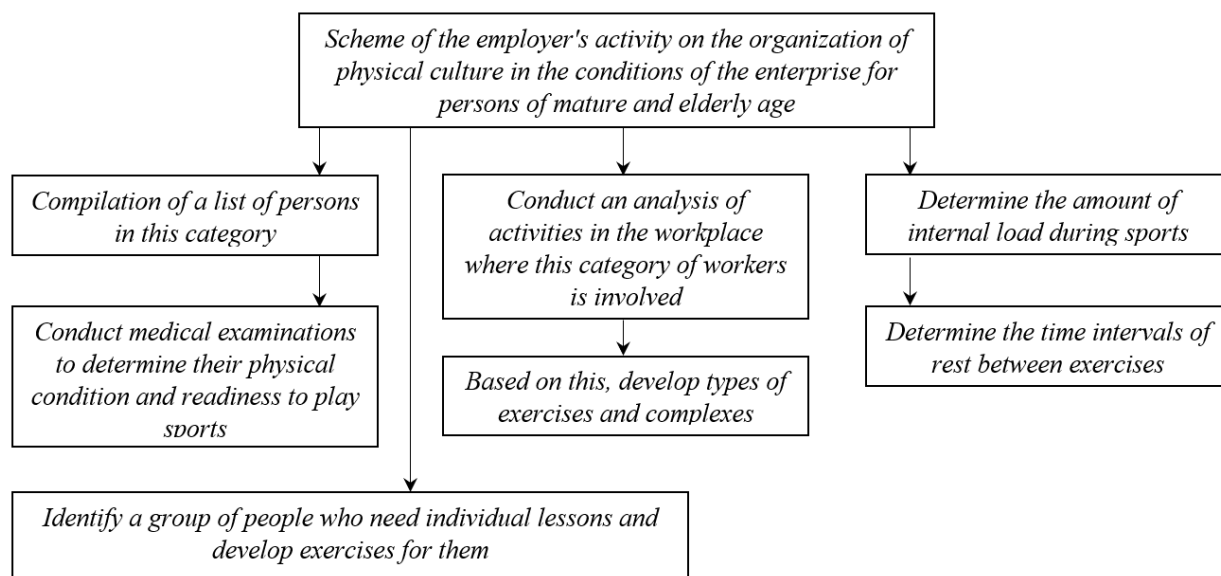


Figure 1 - Scheme of the employer's activities by organization physical culture at the enterprise for persons mature and old age

In this regard, in this article (research) we offer specific types of motor activity (table 1 and table 2) and develop physical exercises for them to achieve the goal.

Table 1 - Recommendations for weekly physical activity (50-59 years old)

№	Type of motor activity	Temporary volume per week not less than (min)
1	Morning exercises	100
2	Motor activity during the labor process	100
3	Motor activity at the end of the work shift	90
4	Independent physical education lessons	185
5	Leisure activities	120 (daily)

Table 2 - Recommendations for weekly physical activity (60-69 years old)

№	Type of motor activity	Temporary volume per week not less than (min)
1	Morning exercises	100
2	Motor activity during the labor process, in groups of health, general physical training, organized at the enterprise	190
3	Independent physical education lessons	180
4	Leisure activities	120 (daily)

The main tasks of physical culture of workers of mature and elderly age are [5]:

1. Promoting creative life, maintaining health in age-related changes.
2. To prevent the decline of motor skills and abilities, assistance in recovery in case of loss.
3. Expand knowledge for the independent use of physical culture.
4. Restoration of the working capacity of the body and a separate muscle group during and after the labor process in order to restore working capacity.

The choice of means for physical activity, modes and volumes of physical activity should be approached differently, taking into account health, age, lifestyle, and the presence of restrictions. It is necessary to take into account all the factors affecting the health of workers, their performance, professional and applied physical fitness, improving the culture of work and the growth of labor creativity. Competent use of physical culture means, in addition to the health-improving orientation, also has a special, professional-applied orientation, the forms and means of physical culture and health-improving work should be used

in direct connection with the labor process (in production) (table 3).

Table 3 - Means of physical culture and health work in the workplace

№	Forms of physical culture and health work	Means of physical activity	
1	morning exercises	Breathing exercises; tilts, head turns in different directions; rotation of the shoulders back and forth; circular movements of the shoulders back and forth; body turns in different directions, lateral tilts; rotation of the pelvis to the right and left, it is possible with a turn; half-squats, with the transition to full squats, walking, sipping.	
2	Physical activity of the labor process	Fizkultpauza	1. Stretching exercises; 2. Exercises for the muscles of the trunk, arms, legs (contraction, stretching, relaxation; turns, tilts with movements of the arms and legs); 3. Squats, running, turning into walking; 4. Exercises for coordination and accuracy
		Physical education minute	1. Sipping followed by relaxation of the muscles of the arms, legs and torso. 2. Tilts back, turns, circular movements of the body. 3. Exercises for the eyes. 4. Self-massage
3	Classes in health groups, general physical training	Complex-combined classes exercise equipment exercises	
4	Independent physical education lessons	Walks: hiking, cycling, tourist; swimming; Nordic walking, fishing and hunting	
5	Leisure activities	Physical exercises according to individual training programs	

One of the most accessible form of physical exercise for mature and elderly people is morning hygienic gymnastics. Morning exercises are done daily for 12-15 minutes. Each exercise is repeated 5-6 times at intervals of 5-15 seconds. It is advisable to start the complex with breathing exercises, exercises for the arms and shoulder girdle, torso, back and legs. In the middle and at the end of the session, walking exercises can be done on the spot and, if the room allows, in motion. The complex should be completed with exercises of a calming nature (breathing exercises, muscle relaxation). Exercises that affect individual muscle groups should be alternated with breathing exercises that help develop the skills of uniform, even breathing, perform at an arbitrary, convenient pace for working, and also give a task to associate breathing with counting and pronouncing words [5, 6].

The purpose of physical culture breaks and physical education minutes is to prevent fatigue and increase efficiency. The complex of physical training breaks consists of 7-8 specially selected physical exercises that help switch the load from the muscles involved in the work to others. It is recommended to

carry out one or two physical training breaks per day, the last one takes place 2 - 2.5 hours before the end of work. Physical education consists of two or three exercises (no more than 2-3 minutes) that help prevent the onset of initial signs of fatigue. They are performed 3-4 times during labor activity, at the workplace independently [7].

After working hours for workers of mature and elderly age, classes in health groups, general physical training are recommended. To achieve and maintain the proper level of physical condition, it is recommended to use complex-combined classes (Table 4).

The load in the classroom is regulated by the selection of physical exercises of various strength and complexity, the number of repetitions, the amplitude of movements, and the starting position. Methods are selected depending on the activity: when doing recreational walking, running - uniform; when alternating walking with running - variable; when exercising on simulators - circular training; sports games - gaming and competitive [2, 3].

Table 4 - Approximate structure and forms of complex-combined classes

Class structure	Orientation of exercises	Exercise content
Preparatory part of the classes 5-10 min.	Removal of psycho-emotional stress, preparation of the cardiovascular, respiratory system, musculo-skeletal system for the subsequent increased load in the main part	Stretching with deep breathing; varieties of walking with the transition to running; a set of general developmental exercises
Main part 20-25 min	Strengthening of the muscular system, development of joint mobility and elasticity of muscles and ligaments, development or improvement of physical qualities.	Exercises: gymnastic with and without objects, cyclic moderate intensity (in aerobic mode), on simulators (after 60 - mainly on cardio), with expanders; sports games according to simplified rules, with a decrease in the time of continuous play
Final part 5-10 min	Decreased overall physical activity	Breathing exercises, relaxation exercises, dance steps, calm walking.

For independent physical exercises after working hours and on vacation days, the following means of physical culture are offered: walks (hiking, cycling), hiking; swimming; Nordic walking, fishing and hunting, classes according to individual training programs. Studying the recommendations of many specialists in the field of physical culture, we proposed as one of the options for the training program "jogging" (table 5).

This program is designed for 12 weeks for beginner joggers who have a level of physical fitness below average and need to gradually increase their physical activity. This type of occupation is indicated for people with a lack of any motor activity, after an illness, whose weight exceeds 20% above normal. The running speed at the first stage is 100m in 55-60 seconds, 50m in 28-30 seconds. For 12 weeks, the distance increases to 2400m and the speed is 50m in 18-17 seconds, 100m in 37-34 seconds [8].

Table 5 - Approximate content of the "jogging" training microcycle

Day of the week	Training tasks	Number of repetitions
Monday	Jogging 50m, walking 50m; Jogging 100m, walking 100m; Jogging 50m, walking 50m; } 800m	4 times 1 time 2 times
Tuesday	Warm up; walking tour	10 minutes 10-15 minutes
Wednesday	Jogging 50m, walking 50m; Jogging 100m, walking 100m; Jogging 50m, walking 50m; } 800m	4 times 1 time 2 times
Thursday	Warm up; walking tour	10 minutes 10-15 minutes
Friday	Jogging 50m, walking 50m; Jogging 100m, walking 100m; Jogging 50m, walking 50m; } 800m	4 times 1 time 2 times
Saturday	Warm up; walking tour	10 minutes 10-15 minutes
Sunday	Warm up; walking tour	10 minutes 10-15 minutes

The volume of load in cyclic exercises is determined in units of length or time, in strength training - the number of repetitions and the mass of weights, sports games - the total time of physical activity. In everyday practice, load availability indicators can be indicators of fatigue, determined visually or by questioning, as well as from operational control data (table 6).

Table 6 - Indicators of fatigue after loads of different sizes

Indicators	Load		
	Medium	Big	excessive
Skin and its edema	redness on the skin	profuse redness	profuse redness, pallor, blue lips
Sweating	slight sweating	profuse sweating	profuse sweating all over the body
Execution of the movement	performed at a given pace	shows uncertainty	lack of coordination, manifestation of errors
Ability to focus	normal, full attention when explaining and demonstrating the exercise	inattention, when explaining, reduced responsiveness to instructions when correcting errors	severe distraction, attention, slow reaction, nervousness
General well-being of the worker	all tasks are completed, no complaints	decreased performance, difficulty breathing, weakness	the allowable heart rate limits are exceeded
Willingness to keep going	good mood for training	extreme fatigue, lack of exercise	Unwillingness to continue

Thus, it can be said with confidence that the organization of sports activities in the workplace with mature and elderly workers is a rather multi-stage process that requires a detailed analysis of the physical condition and organization of control over the well-being of those involved in sports.

In addition, given the age interval of workers, it is necessary to pay special attention to the amount of physical activity, which is determined by the duration of a single physical exercise, a series of exercises, as well as the total number of exercises in a certain part of the lesson or in the whole lesson.

References

1. Substantiation of the organization of work on physical culture at agricultural enterprises with the development of exercise complexes for the restoration of personnel working capacity: monograph / I.E. Lipkovich, S.M. Pyatikopov, M.M. Ukrainsev, I.V. Egorova, N.V. Petrenko, N.V. Nadezhina, S.A. Kovalev. - Zernograd: Azov-Chernomorsky Engineering Institute of FGBOU VO Donskoy GAU, 2021. - 262 p.

2. Organization of physical culture at agricultural enterprises and restoration of personnel working capacity: study guide / I.E. Lipkovich, S.M. Pyatikopov, I.V. Egorova, N.V. Petrenko, A.V. Pikalov, N.V. Nadezhina, T.D. Aliev, S.A. Kovaleva, N.N. Kravchenko, V.A. Petelin, N.N. Yakovenko - Zernograd: Azov-Chernomorsk Engineering Institute, Donskoy State Agrarian University, 2021. - 211 p.

3. Gorelov A.A. Theoretical foundations of physical culture: a textbook for universities / A.A. Gorelov, O.G. Rumba, V.L. Kondakov, E.N. Kopeikin: - 2nd ed., Rev. and additional - M.: Yurayt Publishing House, 2022. - 194.

4. I.E. Lipkovich. Fundamentals of designing systems for regulating environmental parameters in the premises of sports facilities of enterprises of the agro-industrial complex/ Lip-

kovich I.E., Pyatikopov S.M., Ukraintsev M.M., Egorova I.V., Petrenko N.V. //Polythematic network electronic scientific journal of the Kuban State Agrarian University. 2022.No. 178. With. 210-227.

5. Pyatikopov S.M. Organization of sports infrastructure facilities for agro-industrial enterprises/ Pyatikopov S.M., Lipkovich I.E., Matveikina Zh.V., Kovaleva S.A. //Physical culture: upbringing, education, training. 2022.No. 3. With. 76-79.

6. Shabanov N.I. Ergonomics and psychophysiological foundations of labor safety in the agroengineering sphere: monograph / N.I. Shabanov, I.E. Lipkovich, N.V. Petrenko, S.M. Pyatikopov, A.V. Pikalov, I.V. Egorova, A.S. Gaida, -Zernograd: Achia FGBOU VO Donskoy State Agrarian University in Zernograd, 2018. - 265 p.

7. Vinogradov, P. A. Physical culture and sport of workers: scientific, methodological, sociological and organizational aspects / P. A. Vinogradov, Yu. V. Okunkov. - Moscow: Soviet Sport, 2015. - 172 p.

8. Landa B.Kh. Methodology for a comprehensive assessment of physical development and physical fitness: study guide / B.Kh. Landa. - 5th ed., Rev. and additional - M.: Soviet sport, 2011. - 348 p.