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Research Article

RESULTS OF DAILY ENERGY CONSUMPTION OF WORKERS OF TOBACCO PRODUCTION ENTERPRISE

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ABSTRACT

This study reviewed common methods used to measure energy expenditure and body composition. The study also discusses genetic and hormonal factors that regulate energy balance, the concept of a healthy weight, and appetite and body composition.

KEYWORDS

A social exchange speed, energy consumption, chronogram.

INTRODUCTION

Energy is constantly used by every cell in the body. Therefore, a person should regularly eat food to meet his energy needs. When dietary energy intake corresponds to energy expenditure, body composition and healthy weight are interrelated concepts that play a critical role in maintaining overall health and well-being. A person who consumes more energy than they need is in positive energy balance and converts unused energy into triacylglycerols for storage as body fat. How the body automatically adapts to daily

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discrepancies in energy intake and energy expenditure by redistributing fuel molecules between tissues. However, long-term whole-body energy balance is largely under external control, depending on how much we eat and how much we exercise. These controllable factors inevitably form the basis of recommendations and interventions aimed at reducing the prevalence of obesity in different countries [Gropper SS, Smith JL 2013].

Energy expenditure refers to the number of calories a person burns or expends in a given period of time. Our body requires energy for various activities , including a social exchange speed (AAT), physical activity and digestion . Total energy consumption (UES) is the sum of these components. Basal metabolic rate (AAT) represents the energy needed to maintain basic body functions such as respiration, blood circulation, and maintaining body temperature . It accounts for the majority of our energy expenditure (about 60-75%) and is influenced by factors such as age, gender, body size and genetics. Physical activity includes both planned exercise and non-exercise activities such as walking, housework, or occupational activities. It contributes to energy expenditure and is common among people. The energy required to digest, absorb and store nutrients from the food we eat is known as the thermic effect of food. This is a small percentage (about 5-10%) of the total energy consumption. [Silver, Nathaniel V. 2015, Shaikhova GI, Ermatov NJ Azizova FL 2023].

Body composition is the composition of various components of the body, primarily fat and indicates the relative proportions of lean mass (muscles, bones, organs, fluids) [Rustamov MM, Khamrakulova MA, Ermatov NJ 2018] . Mostly body fat expressed as a share. Body fat percentage represents the percentage of total body weight that is made up of fat. This is an important indicator of health because excess body fat increases the risk of various chronic diseases, including cardiovascular disease, diabetes, and certain cancers. Fat-free mass includes all the fat-free components of the body, such as muscle, bone, organs, and fluids. It plays a crucial role in metabolism, physical performance and overall health. A healthy weight is a weight range associated with optimal health outcomes and reduced risk of chronic disease. This is influenced by a variety of factors, including genetics, body composition, lifestyle choices, and individual health goals. Body mass index (BMI) is a commonly used measure to assess weight status. However, this has limitations, especially in people with higher muscle mass or different body composition. [Disse E. et al. 2018. Shaikhova GI, Ermatov NJ Azizova FL 2023].

To achieve and maintain a healthy weight, it's important to consider the following:

To maintain weight, energy intake (calories consumed) must balance energy expenditure. If energy intake exceeds expenditure, weight gain occurs, and a deficit leads to weight loss.

Regular physical activity can help increase energy expenditure, improve body composition, and support overall health. A combination of aerobic exercise, strength training and flexibility training is beneficial.

A balanced diet rich in nutrient-dense foods (fruits, vegetables, whole grains, lean proteins, healthy fats) and moderate calorie intake supports healthy weight management and body composition.

Each person's energy expenditure and body composition vary depending on genetics, age, gender, muscle mass, and other factors. It's important to focus on personalized approaches and consult with health professionals or registered dietitians for personalized guidance.

AAT represents the amount of energy required to maintain basic life processes such as respiration, heartbeat, kidney function , brain and nerve activity, blood circulation, active transport, synthesis of proteins and other complex molecules. AAT accounts for the majority of energy expenditure in the human body. Most of the energy used at rest goes to the liver (27%), brain (19%), kidneys (10%), heart (7%), and skeletal muscles (18%), which require significant amounts even at rest. energy for protein synthesis and normal cell function [Gropper SS, Smith JL 2017].

AAT can be affected by several factors, including body composition , age and sex, pregnancy and lactation, environmental temperature, and dietary energy restriction. Many of these factors are fat may be related to the amount and proportion of lean body mass with higher metabolic activity than lean tissue. AAT is higher in overweight people due to increased lean body mass. Fat in aging mass increases at the expense of lean mass, which leads to a decrease in AAT. Women typically have a higher percentage of body fat relative to lean mass and therefore have lower AAT than men of the same age, height, and total body weight. Taller, leaner individuals have a larger work area relative to volume, which is associated with greater heat loss and higher AAT. A cold environment can increase BMR due to shivering which creates internal heat in the body. Surprisingly, a hot environment can also increase AAT due to increased blood circulation and sweat gland activity. AAT increases during pregnancy and lactation. AAT decreases during fasting due to loss of lean body mass. AAT also decreases with aging due to reduced mass and function of certain organs.

AAT is estimated indirectly by measuring oxygen consumption under carefully controlled conditions that eliminate any contribution of energy expenditure due to physical activity, the thermic effect of food, or heat production in a cold environment. AAT is measured upon awakening and in the postabsorptive state 12 to 18 hours after a meal, preferably after waking up in the morning. A person should lie down in a thermoneutral environment for at least 30 minutes,

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completely relaxed. Any factors that can affect the inner workings of a person are minimized as much as possible. Oxygen consumption (recorded as ml per minute) is then measured for at least 10 minutes. Next step, carbohydrate, fat and is to convert the rate of oxygen consumption into energy expenditure based on the principle that protein oxidation yields about 5 kcal of energy per liter of oxygen consumed. AAT is often expressed as daily energy expenditure (kcal/day) and is accordingly called basal metabolic rate.

Several equations have been developed that accurately estimate AAT based on body weight, height, age, and sex. These equations do not require special equipment or the expertise needed to make calorimetric measurements. Many equations have been developed over the past century, but only a few are in common use today. In general, predictive equations are convenient and provide reasonably accurate estimates of AAT in different populations. However, predictive equations are more variable in older adults and tend to overestimate AAT in individuals with body fat. Below are some commonly used equations for adult men and women based on body weight in kilograms (W), height in centimeters (B), and age in years (Y).

Mifflin-St. Geor's equations were published in 1990 by Mifflin-St. To improve the accuracy of AAT measurements in individuals with excess body fat, Jeor equations were developed using indirect calorimetry in normal weight, overweight, obese, and severely obese individuals. [Mifflin MD, St George ST 1990]. Mifflin-St. Jeor equations are commonly used in clinical settings and can accurately predict AAT to within 10% of that measured by indirect calorimetry in non-obese and obese adults [Fullmer S. 2015]. As with the Harris-Benedict calculations, the Mifflin-St. Jeor's equations apply to men and women and require body weight, height, and age as inputs:

Skeletal muscles require a large amount of energy during physical activity. A muscle also participates in a major training state while awake, which requires energy in less obvious ways. The energy expenditure of physical activity is highly variable depending on the level of human activity. Physical activity typically accounts for about 15-30% of total energy expenditure, but it can be significantly less in a truly sedentary person or much more in a very active person. During physical activity involving large muscles, energy expenditure can significantly exceed aat, at least briefly. Such high rates of energy use cannot be sustained, so the average daily energy expenditure from physical activity is usually below the RMR in most people. Physical activity includes all exercise and non-exercise related activities of daily living.

Quantifying the energy expenditure of physical activity requires measuring AAT and total energy expenditure and then calculating the difference. This can be achieved in a clinical setting by measuring gas

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exchange (consumed oxygen and carbon dioxide) or using predictive equations. Alternatively, practitioners can simply estimate the contribution of physical activity to total energy expenditure by multiplying AAT by a factor that estimates additional skeletal muscle energy expenditure [Trumbo PR 2021].

An additional component of energy expenditure of particular importance is thermoregulation, also known as adaptive, nonshivering, facultative, or regulatory thermogenesis. Thermoregulation refers to changes in metabolism necessary to maintain a core body temperature of approximately 36.7–37 C. Most people adjust their clothing and environment to maintain comfort and thermoneutrality, but due to hormonal changes controlled by the hypothalamus, the body can adjust metabolic heat production as needed. AAT measurements are performed under thermoneutral conditions so that the contribution of thermoregulation can be excluded from energy expenditure calculations.

The third component of energy expenditure is the thermic effect of food. It represents the metabolic response to food and is also called diet-induced thermogenesis, specific dynamic action, or the specific effect of food [Shaikhova GI, Ermatov NJ Azizova FL 2023] . Thermic effect of food refers to the increase in energy expenditure associated with food processing by the body, including digestion, absorption, transport, metabolism and storage of food energy. The percentage increase in energy expenditure above BMR caused by the thermic effect of food is usually about 10%.

Proteins in food have the greatest thermic effect, increasing energy expenditure by 20-30%. Carbohydrates have an intermediate effect, increasing energy expenditure by 5-10% and fats increasing energy expenditure by 0-5%. The most commonly used value for the thermic effect of food is 10% of the 24-hour average caloric value of a mixed diet [Trumbo PR 2021]. Because of its relatively small contribution, the thermic effect of food is usually not included in total energy expenditure calculations.

As a precaution, muscle activity can generate significant heat and cause a rapid rise in core body temperature beyond the body's ability to thermoregulate, especially in hot environments. Heat stress is a concern for high school athletes, particularly football players, who have the highest incidence of heat-related deaths [Kerr ZY 2013]. Coaches, parents and athletes should take steps to ensure proper performance and avoid conditions that increase the risk of heat stress.

The purpose of the study: Hygienic assessment of the nutritional status of the workers of the tobacco production enterprise to determine daily energy consumption.

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Research object: workers of a tobacco production enterprise. The total number of employees was 367, of which 324 were men and 43 were women. To calculate daily energy, workers were conditionally divided into control and research groups. Administration, security and medical staff were included in the control group. The research team included tobacco, cigar, engineer and other workers.

Mifflin - St . Jeor's equations and number 0250-08 sanitary norms, rules and hygiene regulations were evaluated according to the indicated method.

$$AAK_{men} = 10 \text{ x } TV \text{ (kg)} + 6.25 \text{ x } B \text{ (cm)} – 5 \text{ x } Yo \text{ (year)} + 5;$$

$$AAK_{women} = 10 \text{ x } TV \text{ (kg)} + 6.25 \text{ x } B \text{ (cm)} – 5 \text{ x } Yo \text{ (year)} – 161 .$$

here TV body vani, kg; B-length, cm; Yo-yosh, in years.

Statistical calculations were carried out in the Microsoft Windows environment using Microsoft OfficeExcel-20 20 and SPSS version 22 software packages. The obtained data were displayed in the form of M±m, where M is the mean sign of the variation series, m is the standard error of the mean sign. The reliability of the differences between independent samples was determined by the Manna-Whitney and Student methods, and the Wilson criterion was used to evaluate the dynamics of pairwise rows.

Correlation (r) between independent samples was determined using Spearman's formula:

$$r = 1 - \frac{6 - \sum(r_1 - r_2)^2}{n(n^2 - 1)}$$

Here : S (r 1 - r 2) 2 is the sum of squared differences in the corresponding colors , n is the number of pairs .

The relationship between characters was evaluated by the correlation value : if it was higher than 0.7 , then the relationship was considered strong, if r = 0.3 it was considered weak .

Student's t - test was calculated using the following formula :

$$t = \frac{M_1 - M_2}{\sqrt{{m_1}^2 + {m_2}^2}}$$

Here : M is the mean , m is the standard error of the mean .

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The obtained magnitude was compared with Student's table and the criterion of reliability was obtained. R<0.05 was accepted as the reliability of differences between averages.

The results obtained in the research: the actual energy consumption of a person during the day is an important criterion in developing the body's need for energy and basic nutrients.

Energy value (energy equivalent) for all stages and types of activities during the day is necessary to calculate the daily energy expenditure of a person.

It is the main determining indicator of the daily energy consumption of workers, and it is a temporary and qualitative description of their individual activities. In connection with this, a complete analysis of timing during the day and different types of energy equivalent received in different types of activity are particularly noteworthy.

Table 1

No	Anthropometric indicators	Control (n=144)		Study (n=223)	
		Male (n=125)	Female (n=19)	Male (n=199)	Female (n=24)
1	Body weight, kg	74.68 ±9.9	67.07 ±7.36 **	73.43 ±10.74 *	62.9 ±9.59 **
2	Height, cm	173.54 ± 5.6	164.43 ±5.7 *	175 ±5.08 **	167.66 ±5.77 *
3	Age, in years	42.29 ±7.27	42.52 ±8.08 *	42.53 ±6.72 *	42.04 ±8.2

the tobacco production enterprise were divided into two groups. The control group consisted of 144 workers. Among them, 125 men and 19 women. The research group has a total of 223 workers. Of these, 199 are men and 24 are women. The average value of body weight, height and youth of workers was determined. According to the results, the body weight of men in the control group was 74.68 ± 9.9 kg, the average height was 173.54 ± 5.6 , and the average age was 42.29 ± 7.27 . Women showed average values of 67.07 ±7.36 , 164.43 ±5.7 and 42.52 ±8.08 , respectively . In the study group, men were 73.43 ±10.74 , 175 ±5.08 and 42.53 ±6.72 . The average age of women was 62.9 ±9.59 , 167.66 ±5.77 and 42.04 ±8.2 years.

After that, according to the results obtained above, a social exchange of workers pointer Mifflin-St. Jeor is found through the equations of predictions and the hourly value is determined.

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Table 2

No	Pointer	Control (n=144)		Study (n=223)	
		Male (n=125)	Female (n=19)	Male (n=199)	Female (n=24)
1	Basic exchange indicator, kcal	2047.87	1749.98	2045.7	1726.07
2	Main exchange 1 hour indicator, kcal	85.32	72.92	85.23	71.92

According to the table, it was found that in the control group, the basic metabolic rate of men was 2047.87 kcal, and the hourly basic metabolic rate was 85.32 kcal/hour. In women, it was 1749.98 kcal, and the hourly basal metabolic rate was 72.92 kcal/hour. In the research group, it was found that men's basal metabolic rate was 2045.7 kcal, and one-hour basal metabolic rate was 85.23 kcal/hour. In women , it was 1726.07 kcal, and the hourly basal metabolic rate was 71.92 kcal/hour.

Table 3

Daily timing and average daily energy expenditure of male workers in the summer season

Type of activity		Duration, in hours		AA pointers		JFK		kcal	
		A	B	A	B	A	B	A	B
1.	Wake up	0.5	0.5	85.32	85.23	1.2	1.2	51.19	51.1 3
2.	Morning exercise, toilet	0.2	0.2	85.32	85.23	1.8	1.8	30,71	30.68
3.	Walking in the fresh air	0.5	0.5	85.32	85.23	2.5	2.5	106.65	106.53
4.	Breakfast	0.5	0.5	85.32	85.23	1.5	1.5	63.99	63.92
5	Going to work:	0	0	85.32	85.23			0	0
	- waiting for transport	0.2	0.2	85.32	85.23	1.4	1.4	23.88	23.86
	- walking in transport	0.5	0.5	85.32	85.23	1.7	1.7	72.52	72.44
6.	Production works:	0	0	85.32	85.23			0	0
	-Preparation in the main work, checking the readiness of tools, equipment	0.4	0.5	85.32	85.23	1.8	4.6	61.43	196.0 2
	- The main work in the first half of the working day	4	4	85.32	85.23	2	3.2	682.56	1090.94

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	- lunch	1	1	85.32	85.23	1.5	1.5	127.98	127.84
	- rest	0.6	0.2	85.32	85.23	1.4	1.4	71.66	23.86
	- The main work in the second half of the working day	2	2	85.32	85.23	2	3.2	341.28	545.47
	Cleaning the workplace, cleaning the equipment	0.1	0.3	85.32	85.23	3.3	4.4	28.15	112.50
7 .	Tolmachoy	0.5	0.5	85.32	85.23	1.5	1.5	63.99	63.92
8.	Dinner	1	1	85.32	85.23	1.5	1.5	127.98	127.84
9.	Shower, toilet, dressing	0.5	0.5	85.32	85.23	1.8	1.8	76,78	76.70
10.	Going home:	0	0	85.32	85.23			0	0
.	- waiting for transport	0.1	0.2	85.32	85.23	1.4	1.4	11.94	23.86
	- walking in transport	0.53	0.5	85.32	85.23	1.7	1.7	76,87	72.44
11.	Housework:	0	0	85.32	85.23			0	0
	- cooking, looking after the child	1.06	1.15	85.32	85.23	2.2	2.2	198.96	215.6
	- recreation (television, radio, computer, literature)	1.66	1.58	85.32	85.23	1.2	1.2	169.95	161.59
12.	Getting ready for bed	0.83	0.86	85.32	85.23	1.2	1.2	84.97	87.95
13.	Sleep	7.3	7.3	85.32	85.23	1	1	622.83	622.17
	Total:	**24**	**24**					3096.34	3897.39

Note: A-Control; B-study.

Table 4

Daily timing and average daily energy consumption of female workers in the summer season

Type of activity		Duration, in hours		AA pointers		JFK		kcal	
		A	B	A	B	A	B	A	B
1.	Wake up	0.5	0.5	72.92	71.92	1.2	1.2	43.75	43.15
2.	Morning exercise, toilet	0.2	0.2	72.92	71.92	1.8	1.8	26,25	25.89
3.	Walking in the fresh air	0.5	0.5	72.92	71.92	2.5	2.5	91.15	89.9
4.	Breakfast	0.5	0.5	72.92	71.92	1.5	1.5	54.69	53.94
5	Going to work:	0	0	72.92	71.92			0	0

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	- waiting for transport	0.2	0.2	72.92	71.92	1.4	1.4	20,41	20.13
	- walking in transport	0.5	0.5	72.92	71.92	1.7	1.7	61.98	61.13
6.	Production works:	0	0	72.92	71.92			0	0
	-Preparation in the main work, checking the readiness of tools, equipment	0.4	0.5	72.92	71.92	1.8	4.6	52.50	165.41
	- The main work in the first half of the working day	4	4	72.92	71.92	2	3.2	583.36	920.57
	- lunch	1	1	72.92	71.92	1.5	1.5	109.38	107.88
	- rest	0.6	0.2	72.92	71.92	1.4	1.4	61.25	20.13
	- The main work in the second half of the working day	2	2	72.92	71.92	2	3.2	291.68	460.28
	Cleaning the workplace, cleaning the equipment	0.1	0.3	72.92	71.92	3.3	4.4	24.06	94.93
7 .	Tolmachoy	0.5	0.5	72.92	71.92	1.5	1.5	54.69	53.94
8.	Dinner	1	1	72.92	71.92	1.5	1.5	109.38	107.88
9.	Shower, toilet, dressing	0.5	0.5	72.92	71.92	1.8	1.8	65,62	64.72
10.	Going home:	0	0	72.92	71.92			0	0
.	- waiting for transport	0.1	0.2	72.92	71.92	1.4	1.4	10,20	20.13
	- walking in transport	0.53	0.5	72.92	71.92	1.7	1.7	65.70	61.13
11.	Housework:	0	0	72.92	71.92			0	0
	- cooking, looking after the child	1.06	1.15	72.92	71.92	2.2	2.2	170.04	181.95
	- recreation (television, radio, computer, literature)	1.66	1.58	72.92	71.92	1.2	1.2	145.25	136.36
12.	Getting ready for bed	0.83	0.86	72.92	71.92	1.2	1.2	72.62	74.22
13.	Sleep	7.3	7.3	72.92	71.92	1	1	532.31	525.01
	Total:	**24**	**24**					2646.34	3288.75

Note: A-Control; B-study.

Table 5

Daily timing and average daily energy expenditure of male workers in the winter season

Type of activity	Duration, in hours		AA pointers		JFK		kcal	
	A	B	A	B	A	B	A	B

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1.	Wake up	0.3	0.4	85.32	85.23	1.2	1.2	30,71	40.91
2.	Morning exercise, toilet	0.2	0.2	85.32	85.23	1.8	1.8	30,71	30.68
3.	Walking in the fresh air	0.4	0.4	85.32	85.23	2.5	2.5	85.32	85.23
4.	Breakfast	0.55	0.6	85.32	85.23	1.5	1.5	70.38	76.70
5	Going to work:	0	0	85.32	85.23			0	0
	- waiting for transport	0.25	0.2	85.32	85.23	1.4	1.4	29,862	23.86
	- walking in transport	0.52	0.5	85.32	85.23	1.7	1.7	75.42	72.4 4
6.	Production works:	0	0	85.32	85.23			0	0
	-Preparation in the main work, checking the readiness of tools, equipment	0.2	0.3	85.32	85.23	1.8	4.6	30,71	117.61
	- The main work in the first half of the working day	4.3	4.2	85.32	85.23	2	3.2	733.75	1145.49
	- lunch	1	1	85.32	85.23	1.5	1.5	127.98	127.84
	- rest	0.5	0.3	85.32	85.23	1.4	1.4	59.72	35.79
	- The main work in the second half of the working day	2	2	85.32	85.23	2	3.2	341.28	545,472
	Cleaning the workplace, cleaning the equipment	0.1	0.3	85.32	85.23	3.3	4.4	28.15	112.50
7 .	Tolmachoy	0.5	0.6	85.32	85.23	1.5	1.5	63.99	76.70
8.	Dinner	1	1	85.32	85.23	1.5	1.5	127.98	127.84
9.	Shower, toilet, dressing	0.4	0.3	85.32	85.23	1.8	1.8	61.43	46.02
10.	Going home:			85.32	85.23			0	0
.	- waiting for transport	0.3	0.2	85.32	85.23	1.4	1.4	35.83	23.86
	- walking in transport	0.53	0.4	85.32	85.23	1.7	1.7	76,87	57.9 5
11.	Housework:	0	0	85.32	85.23			0	0
	- cooking, looking after the child	1.62	1.26	85.32	85.23	2.2	2.2	304.08	236.25
	- recreation (television, radio, computer, literature)	1	1.58	85.32	85.23	1.2	1.2	102.38	161.59
12.	Getting ready for bed	0.83	0.86	85.32	85.23	1.2	1.2	84.97	87.95
13.	Sleep	7.5	7.4	85.32	85.23	1	1	639.9	630.70
	Total:	**24**	**24**					3141.48	38 63 , 47

Note: A-Control; B-study.

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Table 6

Daily timing and average daily energy consumption of female workers in the winter season

Type of activity		Duration, in hours		AA pointers		JFK		kcal	
		A	B	A	B	A	B	A	B
1.	Wake up	0.3	0.4	72.92	71.92	1.2	1.2	26,25	34.52
2.	Morning exercise, toilet	0.2	0.2	72.92	71.92	1.8	1.8	26,25	25.89
3.	Walking in the fresh air	0.4	0.4	72.92	71.92	2.5	2.5	72.92	71.92
4.	Breakfast	0.55	0.6	72.92	71.92	1.5	1.5	60.15	64.72
5	Going to work:	0	0	72.92	71.92			0	0
	- waiting for transport	0.25	0.2	72.92	71.92	1.4	1.4	25.52	20.13
	- walking in transport	0.52	0.5	72.92	71.92	1.7	1.7	64.46	61.13
6.	Production works:	0	0	72.92	71.92			0	0
	-Preparation in the main work, checking the readiness of tools, equipment	0.2	0.3	72.92	71.92	1.8	4.6	26,25	99.24
	- The main work in the first half of the working day	4.3	4.2	72.92	71.92	2	3.2	627.11	966.6
	- lunch	1	1	72.92	71.92	1.5	1.5	109.38	107.88
	- rest	0.5	0.3	72.92	71.92	1.4	1.4	51,044	30.2
	- The main work in the second half of the working day	2	2	72.92	71.92	2	3.2	291.68	460.28
	Cleaning the workplace, cleaning the equipment	0.1	0.3	72.92	71.92	3.3	4.4	24.06	94.93
7 .	Tolmachoy	0.5	0.6	72.92	71.92	1.5	1.5	54.69	64.72
8.	Dinner	1	1	72.92	71.92	1.5	1.5	109.38	107.88
9.	Shower, toilet, dressing	0.4	0.3	72.92	71.92	1.8	1.8	52.5	38.83
10.	Going home:			72.92	71.92			0	0
.	- waiting for transport	0.3	0.2	72.92	71.92	1.4	1.4	30.62	20.13
	- walking in transport	0.53	0.4	72.92	71.92	1.7	1.7	65.7	48.9
11.	Housework:	0	0	72.92	71.92			0	0
	- cooking, looking after the child	1.62	1.26	72.92	71.92	2.2	2.2	259.88	199.36

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	- recreation (television, radio, computer, literature)	1	1.58	72.92	71.92	1.2	1.2	87.5	136.36
12.	Getting ready for bed	0.83	0.86	72.92	71.92	1.2	1.2	72.62	74.22
13.	Sleep	7.5	7.4	72.92	71.92	1	1	546.9	532.2
	Total:	**24**	**24**					2684.91	3260.13

Note: A-Control; B-study.

Workers of the tobacco production enterprise average daily energy consumption No. 0250-08 sanitary standards, rules and hygiene regulations were evaluated based on the indicated method. During the winter and summer seasons, the workers' time expenditure was recorded for their 24-hour work and home activities from morning to evening. According to the obtained results, it was found that the number of timings of the men's team in the summer season was 3096.34 kcal in the control group, and 3897.39 kcal in the research group. In the winter season, it was seen that the timing indicators of the men's team were 3141.48 kcal in the control group, and 3863.47 kcal in the research group.

3288.75 kcal in the research group . In the winter season, it was found that the timing indicators of the men's team were 2684.91 kcal in the control group, and 3260.13 kcal in the research group.

CONCLUSION

Total energy expenditure in male workers in the summer season 3096.34 -3897.39 kcal, 3141.48-3863.47 kcal energy consumption in the winter season was determined. In female workers in the summer season Energy expenditure of 2646.34 - 3288.75 kcal, 2684.91 - 3260.13 kcal in winter season was determined. In comparison, the study group used more energy during production than the control group. It was found that male workers expend more energy than female workers.

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