

THE INFLUENCE OF NUTRITION AS A PART OF ERGONOMIC RECOMMENDATIONS ON WORK PRODUCTIVITY EMPLOYEES

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ABSTRACT

This study aims to examine the effect of nutrition as an ergonomic method in terms of high room temperature on employee work productivity in a bakpia factory roasting room. Researchers gave treatment in the form of water containing salt with mineral water. Subjects in this study were 2 workers in the roasting. This study has nutrition-free variables as an ergonomic method and variables depending on employee productivity. By using the t-test score, it can be seen that there is a difference in productivity before treatment with treatment, this is indicated by a score of $p = 0.025$; $p < 0.05$. While the comparison between the treatment of water containing salt and mineral water showed insignificant results, this can be seen from the score of $p = 0.72$; $p > 0.05$.

Keywords: Productivity, Ergonomics, Nutrition.

PRELIMINARY

HR is the most important control holder, because if the HR in an industry is working well and optimally, the industry will experience a significant increase. Likewise, when an industry has human resources who work less optimally, the industry will not develop optimally. Seeing the importance of the existence of human resources, Ergonomics is the science, art and application of technology to harmonize or balance all facilities used both in activities, as well as rest, with human capabilities and limitations both physically and mentally so that the overall quality of life becomes better (Tarwaka, Bakri & Sudiajeng, 2004).

Work nutrition is a form of ergonomic method that is not less important than some other ergonomic methods. Good food can increase one's emotional stability, endurance, stamina and enthusiasm in carrying out all activities.

Article 23 of Law No. 23 of 1992 concerning Occupational Health, states that occupational health is organized to achieve optimal work productivity. Occupational health includes occupational health services, prevention of occupational diseases and occupational health requirements.

Bakpia Pathuk 25 factory is an industry engaged in food production. The type of food produced is bakpia which is a typical Yogyakarta food and is most in demand by newcomers or foreign tourists who are on vacation enjoying the city which is one of the most favorite tourist destinations in demand by Indonesians. For some tourists, this Bakpia 25 Factory is one of their tourist destinations, because besides being able to get bakpia prices which are quite affordable compared to prices that are sold freely on the market, tourists are allowed to tour inside the factory, see how the bakpia process starts from the start of the process. making bakpia skin, making bakpia contents, until the end of the production is the bakpia packing process.

Therefore, Bakpia 25 Factory is always crowded with visitors, both buyers, foreign tourists, and distributors, making this factory one of the factories with the busiest schedule at all times.

In terms of ergonomics, researchers tried to focus on the baking room. There are 2 bakpia roasting rooms, 1 room is intended for roasting bakpia which has green bean flavor, while the second roasting room is used for baking bakpia that has flavors other than green beans, such as chocolate, cheese and pineapple.

The workers who work in the roasting section are tasked with putting the bakpia-bakpia that have been arranged in an aluminum container into a large roaster. Then the worker brings out the bakpia that has been baked again, then turns it over, so that the other side of the bakpia can be roasted evenly.

The sweat content in the body consists of water and body ions. When the sweat in the body comes out in large quantities, a person will become dehydrated. Dehydration in the body, if experienced every day, will have an effect on decreasing kidney and brain function. The body needs fluids for work, activity, and thinking. In this case, workers in the Bakpia Pathuk 25 factory roasting room really need adequate fluid intake every day.

As already explained that ergonomics greatly affects employee productivity. Employees will feel pleasant, supportive, trigger potential in themselves, or even become pressure in employees. The facilities provided by the company will support the health and safety of employees. If the ergonomic facilities provided by the company are suitable for their work, then this will affect the employee's comfort, so that employees will try to achieve self-actualization in working for their company. Every company has the expectation of a conducive and pleasant work environment for employees so that employees always love their work every day.

PRODUCTIVITY

Productivity is a ratio between output (output) and input (input) per unit time (ILO, 1969). Productivity according to Sudomo (1993) has various meanings, among others the most important are as follows:

1. Productivity.
2. The Indonesian National Productivity Council formulates productivity as follows:
 - a. Productivity involves the integrated use of human resources and skills in capital goods, technology, management, information, energy and other resources.
 - b. Productivity is the driving force to realize the quality of life, economic growth and social progress, which are essentially the goals of national development.

Manuaba (1992) suggests that increasing productivity can be achieved by reducing input and utilizing available resources, as well as increasing output as much as possible. The theory given by David Bain (1982) is one of the theories commonly used in explaining productivity, where productivity is defined as the ratio or comparison between several outputs with several inputs.

Productivity = Output / Input

Productivity is not a measure for a production or the amount of output made. Productivity is a measure of how well all available resources are combined and used to achieve certain desired results (Awibowo, 1992).

Productivity = Output / Input = Acquisition Achieved / Resources Consumed

There are three variables that determine the size of the productivity, namely:

1. Labor
2. Capital
3. Management

According to Heizer (2005) management factors provide the largest contribution in increasing productivity because management is responsible for ensuring labor and capital are used effectively to increase productivity.

Productivity Aspects

Productivity will increase when:

1. *Output has increased while input is constant.*
2. *Output is constant while input has decreased.*
3. *Output has increased while input has decreased.*
4. *Output has increased twofold while input has decreased.*
5. *Output has decreased while input has decreased 2 times.*
6. *Output has increased 2 times while input has increased 2 times (Widianty, 2001).*

Factors Affecting Productivity

Kumar (2006) states that there are various factors that affect human labor productivity, namely:

1. *Human Factors;*
2. *Technological factors ;,*
3. *Managerial Factors;*
4. *Natural Factors;*
5. *Sociological Factors;*
6. *Political Factors;*
7. *Economic Factors.*

Bambang (in Widianty, 2001) argues that the factors that can affect productivity are:

1. Humans;
2. Capital;
3. Production factors;
4. Environmental factors;
5. State environmental factors;
6. International environmental factors;
7. Feedback.

Wexley and Yukl (1977) stated that the work productivity of employees of an organization plays a very important role.

Theory Motivation

One of the most well-known motivation theories is the theory of hierarchy of needs which was initiated by Abraham Maslow (in Stone, 2005) which states that every human being has five stages to achieve existence and self-actualization, namely:

1. **Physiological:** includes the needs to overcome hunger, thirst, sex, shelter such as housing and other physical needs.
2. **Security:** including security services and protection against physical and emotional violence.
3. **Social:** includes affection, self-acceptance, Friendship.
4. **Esteem:** including self-respect, appreciation, Attention.

5. Self-actualization: inner development, self-fulfillment or self fulfillment (Robbins, 2005).

Maslow's theory is a warning to managers about the dangers of need that dominate employee attention and can affect employee work attitudes. On the other hand, providing satisfaction to employees does not mean the only way to influence employee work attitudes in a company (Robbins, 2005).

Ahyari (1983) states that attention to the work environment of employees is one of the most important elements in increasing productivity.

Ergonomics

The term ergonomics comes from Greek which comes from two words, namely "ergon" which means work and "nomos" which means rules or laws (Bridger, 1995). Human Factors Engineering or Human Factors, or in Scandinavian countries using the term Biotechnology (Sanders & McCormick, 1993). The definition of ergonomics is the science, art and application of technology to harmonize or balance all the facilities used for activities and breaks with human abilities and limitations both physically and mentally so that the overall quality of life becomes better, the personal development of these workers (Tarwaka, Bakrie, & Solichul, 2004).

Ergonomic Goals

In general, the objectives of implementing ergonomics are: (Bridger, 1995).

- a. Improve physical and mental wellbeing through efforts to prevent work-related injuries and diseases, reduce physical and mental workloads, promote promotion and job satisfaction.
- b. Increasing social welfare through improving the quality of social contacts, managing and coordinating work appropriately and increasing social security both during the productive age period after being unproductive.
- c. Creating a rational balance between various aspects, namely technical, economic, anthropological and cultural aspects of each work system carried out so as to create a high quality of work and quality of life (Tarwaka, Bakrie, & Solichul, 2004).

Ergonomic Aspects

In subsequent developments, ergonomics are grouped into four aspects, according to Satalaksana (1979) in his book describing these four aspects, namely:

- a. Display or display: a display is a device that provides information about the environment, and applications to humans are in the form of signs, numbers, symbols and others.
- b. Human physical factors: this aspect focuses on human activities at work, then learns about measuring these activities.
- c. Office Space Dimensions: this aspect aims to get a workplace design that is in accordance with the size (dimensions) of the human body.
- d. Work Environment: This includes the physical environment of the workplace and the factors that cause heat exchange between the body and the surrounding environment are conduction heat, convection heat, radiant heat, and evaporation heat (Bernard, 1996).

Exposure to heat stress also causes weight loss. Priatna (1990) stated the results of his research that workers who worked for 8 hours / day consecutively for 6 weeks, in a room with a Wet and Ball Temperature Index (ISBB) between 32.02-33.01 ° C caused weight loss of 4, 23%.

Nutrition

Setiadi (2009) argues that there are at least 12 things that encourage individual productivity, namely mental attitudes in the form of work motivation, work discipline and work ethics; education; Skills; managerial skills; the application of industrial relations between employees in order to foster active participation in efforts to increase productivity; income level; social security provided by the company to employees; a conducive working environment and climate; production facilities; technology; achievement opportunities; as well as work nutrition and employee health.

A healthy person certainly has the power of thought and the power of daily physical activities which is quite high (Marsetyo and Kartasapoetra, 1991).

Kinds of Nutrition

In work, the work nutrition needed by humans is at least 3 kinds of important nutrients, namely:

1. Various kinds of nutrients obtained from food (sugar, protein, fat) as a source of energy.
2. Protection material (vitamins, mineral salts, iodine, iron).
3. Fluid for freshness.

Manuaba (1998) states that human capabilities and limitations are determined by various factors, namely:

1. Age

A person's age is directly proportional to physical capacity to some extent and reaches a peak at age 25. At the age of 50-60 years, muscle strength decreases by 25%, sensory-motor ability decreases by 60%. (Astrand & Rodahl, 1977; Grandjean, 1993; Genaidy, 1996 and Konz, 1996).

2. Gender

In general, women have physical strength about 2/3 of the physical ability or muscle strength of men, but in certain cases women are shown to be able to complete work more thoroughly than men (Tarwaka, Solichul, Bakrie & Sudiajeng, 2004). Priatna (1990), that a woman is more resistant to cold and hot temperatures.

3. Anthropometry

Anthropometry is a collection of numerical data relating to the physical characteristics of the human body.

(Stevenson, in Wisanggeni, 2010). Pulat (1992) suggests that anthropometric data can be used to design clothes, workplaces, work environments, machines, work tools and facilities as well as products for consumers.

4. Health and Nutrition Status

Health and nutrition status are closely related and affect work productivity.

5. Physical Freshness

Hairy (1989) and Hopkins (2002) state that physical fitness is the ability or ability of the human body to make adjustments or adaptations to the physical load faced without causing significant fatigue and still have spare capacity to carry out subsequent activities.

6. Ability to work physically

- a. Muscle strength;
- b. Muscle endurance;
- c. Cardiovascular endurance.

In ergonomics, nutrition is one of the methods that helps improve the human body system from within, because nutrition can be used proactively and reactively proactive means by getting

good nutrition, the body will become stronger and ready to face various diseases from outside the body (Davis, 2007).

Work Nutrition

The benefits that are expected from fulfilling work nutrition for employees are to maintain and increase body endurance and balance nutritional and calorie needs against the demands of work tasks (Tarwaka, Bakrie & Solichul, 2004). Silverman (2011) suggests that if someone does something related to improper ergonomics, it will show an imbalance in the body.

Factors in the work environment show clear effects on labor nutrition. Excessive workload and hot work can lead to weight loss (Priatna, 1990).

Heat Pressure: In hot work and heavy work, at least 2.8 liters of drinking water is required for the workforce, while 1.9 liters for light work is recommended. The salt content should not be too high but about 0.2% (Grantham, 1992). Other drinks that do not contain alcohol (soft drinks) and are good for body refreshing are given.

1. Chemicals: Other effects may be digestive tract disorders resulting in decreased function of the digestive tract of food in the body.
2. Psychological factors: Stress as a result of emotional mismatch, human relations at work are not good, the relationship between workers and the work environment is not good, will cause a decrease in one's appetite, it will result in weight loss, cause disease and decrease employee productivity at work (Tarwaka, Bakrie & Solichul, 2004).

Inter-Variable Dynamics: Nutrition as One of the Ergonomic Recommendations for Employee Work Productivity

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Ergonomics is a science, art, and technology to harmonize or balance all the facilities used for activities and breaks with human abilities and limitations both physically and mentally so that the overall quality of life becomes better.

Kroemer and Grandjean (2000) suggest that humans need food to remain productive, as follows:

1. Food ingredients (sugar, protein, fat, carbohydrates) as a source of energy,
2. Supplements (vitamins, mineral salts, iodine, acids) so that they can work properly and maintain a healthy body,
3. Fluid.

Kroemer and Grandjean (2000) suggest that the various needs and processes experienced by car engines are compared to the needs and processes experienced by humans.

Humans not only need food for energy, but also need fluids. The need for drinking can be felt from feelings of thirst, which can arise at any time (Kroemer & Grandjean, 2000).

Hypothesis

There are differences in productivity levels before and after the implementation of nutrition as one of the ergonomic recommendations for employees who work in high room temperatures. The productivity of employees who have been given nutritional treatment in the form of

mineral fluids and fluids containing minerals and salt in high room temperatures will increase more than when employees who worked before being given nutrition treatment.

CLOSING

Conclusion

The conclusion of this research is that nutrition as a method to provide balance in the body in an ergonomic atmosphere in the work room has been proven to increase employee productivity, but other factors also play an important role in increasing productivity.

Suggestion

The researcher is fully aware that there are still some shortcomings in this study, so for further research, you should pay attention to the following:

1. Pay attention to the time spent researching, whether the company is in the stage of increasing production or not.
2. Pay more attention to the work environment of employees related to ergonomic problems, especially room temperature and employee work nutrition.

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