

Sports Nutrition Development Model

Ratna Dewi¹, Ahmad Al Munawar²

Lecture of Sport and Health College Bina Guna

Abstract: *The formation of nutrition is one of the techniques to achieve sportsman achievements in North Sumatra. The research conducted is to review the sportsman nutrition models in sports that have achievements at the National Sports Week. The research method used was a qualitative survey method. The subject of the research in this research is the North Sumatra sport branch that competed in the 2016 National Sports Week of West Java, namely the most gold medalist including Wushu, Karate, and Pencak Silat. Data collection techniques for interviews, documentation, and group discussion forums. Test the validity of the data that is with credibility, transferability, dependability, and confirmability. The results obtained that the sports nutrition development model is done by providing nutritional needs, namely carbohydrates, proteins, fats, vitamins, minerals, and water. A review of the coaching model is applied based on the athlete's calorie needs. Athletes' calories are measured based on the athlete's needs and calorie sources are provided with the right food ingredients such as fruits, vegetables, fish, eggs, meat, milk, beans, and drinking enough water. The athlete's nutritional model can play a role in the athlete's appearance during a match and obtain an athlete's achievements.*

Keywords: Sport, Nutrition, Model

1. Introduction

Balanced nutrition for sports or often known as sportsman nutrition needs to be known and implemented by every athlete. Sportsman nutrition is one of the keys in supporting the achievement of an athlete, this is seen from the form of physical work done daily by athletes. Proper nutrition is not only important for growth, maintenance, and replacement of body tissues, but also for providing energy. Physical efficacy in an athlete is not much influenced by the amount of energy produced by the muscles of the body, but is more determined by the body's ability to use the energy produced by the muscles of the body to make the necessary movements.

One important aspect to achieve good performance for an athlete is to maintain a healthy body. One of the determining factors in achieving sports achievements is the fulfillment of physical components, which consist of strength, speed, agility and coordination, energy, muscular endurance, work power of the heart and lungs, flexibility, balance, accuracy, and health of exercise (M. Sajoto, 1995). Based on the description above it can be concluded that one of the factors to get athletes who excel is by maintaining a healthy body, namely by maintaining a balanced nutrition in accordance with the portion of the needs of each athlete based on the activities undertaken.

Nutrition is a process of organism using food that is consumed normally through the process of digestion, absorption, transportation, storage, metabolism and release of substances that are not used to maintain life, growth and normal function of organs, and produce energy. Based on this it can be said that nutrition is a tool in meeting the body's needs for activities, besides that nutrition can produce a balance between the energy that comes out with the energy that enters, so that the fulfillment of nutrition in the body is one of the roles in balancing the needs and uses or in other words balanced nutrition.

Nutritional status assessment is an effort to interpret all information obtained through anthropometric, food consumption, biochemical, and clinical assessment

(Almatsier, Soetardjo, & Soekarti, 2011). From this statement it can be concluded that for each individual having a different level of nutritional needs, this is seen from an assessment of the nutritional status possessed by someone, so that nutritional needs can be classified into several groups according to the state of the body (anthropometry) which is owned such as pregnant women, breastfeeding mothers, children, infants, teenagers, adults, elderly, and athlete.

Balanced nutrition for athletes has an important role in achieving an athlete's achievement goals. By paying attention to the process of activity and precise measurement so as to obtain the appropriate level of athlete's needs. According to (Almatsier et al., 2011) "The most important requirement for an athlete is the adequacy of energy which depends on body size, body composition, age, gender, and type of exercise performed. In addition, the intensity of the length of exercise and the efficiency of body movements also affect how much energy an athlete needs. From this statement it can be said that each athlete has a different level of nutritional needs, so that it will require a proportion of nutritional needs for each athlete that will support the avoidance of excess or malnutrition in the body.

Proportion of Balanced Nutrition Needs for athletes or athletes according to (FAO / WHO / UNU Expert Consultation, 2001) "Energy needs are energy consumption derived from food that is needed to cover a person's energy expenditure if he has the size and composition of the body with the level of activity in accordance with health. long-term, and which allows the maintenance of physical activities that are needed socially and economically. "From this it can be stated that each person has a different level of activity, so that it will lead to different levels of needs in meeting those needs. Nutritional requirements for athletes are different when compared to the nutritional needs of non-athletes, because the activities and activities carried out are different, and there are certain conditions when athletes must be supported with proper nutrition. An athlete can need energy up to 6000 calories per day and this is a need in a large capacity for non-athletes.

According to the Institute of Occupational Medicine (in Almsier et al., 2011) states that "Lack of nutritional intake will cause a nutritional deficiency, while excess will cause the opposite. In extreme conditions a deficiency or excess nutrition can cause illness and even death ". From this it can be concluded that, nutrition has a role in maintaining a healthy body if it is fulfilled in accordance with the needs and balance, so that the body will easily perform its role in carrying out activities.

Simply stated, food is everything that an athlete eats and drinks everyday. Food substances are the basic ingredients that make up food ingredients. Food substances or nutrients that are: carbohydrates, proteins, fats, vitamins and minerals. The food that athletes put into their bodies should be well organized to follow the flow of the needs of the sportsman's activities. With another understanding, if the food is well organized, of course it will support the athlete's achievement achievement, and vice versa if the athlete's food is not organized will be a big problem in achieving achievement. Organizing a sportsman's food naturally refers to the interests of the sportsman who is occupied.

2. Research Methods

The method used in this research is descriptive survey. According to (Notoatmodjo, 2010) states that "In general, descriptive surveys are used to make an assessment of the conditions and implementation of a program in the present, then the results are used to prepare plans for improving the program". From this, it can be stated that the method used is appropriate, that is, in accordance with the background of the research conducted. Therefore this study has a research method as a way to obtain information about certain circumstances, so that the research is conducted in accordance with the aims and objectives of the study.

Data acquisition techniques are using questionnaires, interviews, documentation, and group discussion forums (FGD). Test the validity of the data that is with credibility, transferability, dependability, and confirmability. Based on this, the researcher collected them using the following techniques and instruments:

- 1) Descriptive field notes: this is the longest part and describes all efforts of researchers to record details that occur in the field (Emzir, 2012: 67). Descriptive field notes conducted by researchers is to record all the events that occur and are available.
- 2) Reflective field notes: in addition to descriptive material, field notes contain sentences and paragraphs that reflect a more subjective understanding of research (Emzir, 2012). Reflective field notes conducted by researchers is to record the developments obtained by researchers.

3. Results and Discussion

3.1 Research result

The research was carried out on top sports in North Sumatra which received the most gold medals at the 2016 National Sports Week . The sports branches studied were: 1) Wushu, 2) Karate, and 3) Pencak Silat. Data acquisition is described as follows:

- 1) Wushu: winning the most medals with 14 athletes. The nutritional status of the athlete is carried out by implementing the following food consumption patterns:
 - a) Exercise: rice (500gr), eggs (2 grains), meat (150gr), syrup (25gr), sugar (40gr), vegetables (200gr), and vegetables (200gr).
 - b) Before the game: mixed vegetable dishes (150gr), nonfat milk (200cc), fruit juice (150cc), and cakes (50gr).
- 2) The highest number of medal winners is Karate with 10 athletes. The nutritional status of the athlete is carried out by implementing the following food consumption patterns:
 - a) Exercise: Rice (500gr), bread (50gr), sugar (40gr), butter (25gr), eggs (2 grains), meat (150gr), milk (25gr), vegetables (200gr), and fruits (200gr) .
 - b) Before the game: fish (100gr), mixed vegetable dishes (150gr), milk (200cc), fruit juice (150cc), and fruits (200gr).
- 3) Pencak Silat is the most medalist with 15 athletes. The nutritional status of the athlete is carried out by implementing the following food consumption patterns:
 - a) Exercise: rice (500gr), bread (50gr), biscuits (75gr), jam (25gr), syrup (50cc), sugar (40gr), butter (25gr), meat (150gr), and fruits (200gr).
 - b) Before the match: potatoes (150gr), meat (100gr), milk (200cc) and cakes (50gr).

The food consumed must be varied to avoid athlete's boredom or psychological disturbance during the competition preparation process. The need for nutritional status is done to make athletes avoid problems related to body conditions such as fatigue, loss of concentration, and accuracy of the use of proper energy in every movement.

3.2. Discussion

The nutritional needs of each individual have different portions, the calculation is based on age, body weight, sex, physical activity, environmental conditions (temperature), certain circumstances (sick, pregnant or breastfeeding) (Daryanto, 2015). Energy needs needed by an athlete are needed for: (1) basal metabolism (Base Metabolism Rate (AMB) / Resting needs) (Karmiathi, 2016); (2) physical activity, and (3) food or the influence of specific dynamic natural resources (specific dynamic action) and in general the greatest energy needs are needed for basal metabolism (Almsier, Soetardjo, & Soekarti, 2011: 136). Based on the guidelines for balanced nutrition, it is explained that the level of need for athletes can be measured with applicable regulations, making it easier for athletes to meet nutrients according to the recommended rules. Calculation of nutritional needs can be calculated based on physical work factors as multiplied by BMR as follows:

Table 8: Physical Work Factors (Multiplication with BMR)

Activity Level	Male	Female
Rest in bed	1,2	1,2
Very Light Work	1,4	1,4
Light Work	1,5	1,5
Light-Medium Work	1,7	1,6
Medium work	1,8	1,7
Work hard	2,1	1,8
Very hard work	2,3	2,0

Sources: (Tahron & Usman, 2014)

Calculation of the number of calories needed per day for athletes can be done by calculating BMI (Body Mass Index) with the formula $\text{weight (kg)} / \text{Height}^2$, BMR (basal metabolic rate) contained in the table, SDA (specific dynamic action) of 10% BMR, physical activity energy in the table, and exercise energy based on the table. The need for energy for a person depends on the body's metabolism and physical activity and the food consumed is then measured with a standardized count.

As an athlete, it is necessary to have sufficient nutrients before the match, this serves to facilitate athletes in running the match. One that must be met before competing is the energy supply. Energy reserves are stored in the muscles and liver as glycogen, if a little energy supply will result in fatigue due to exhaustion.

Glycogen reserves in the body can be enlarged through the technique of "carbo-loading" which provides as much carbohydrate input as possible into the athlete's body so that it will encourage the formation of glycogen reserves in large enough quantities. Energy supply can be done by carbo-loading process by providing high carbohydrate intake to athletes (Moehji, 2009).

The production of adenosine triphosphate (ATP) in muscle action depends on the availability of muscle glycogen and blood glucose. Muscle tissue is the main glycogen deposit (400g or 6.7MJ), then the liver (70g or 1.2MJ) and blood glucose (2.5g or 342kJ). This amount can vary and depends on factors such as intake or food intake. Although carbohydrates are not the only source of energy, carbohydrates are more needed as a source of muscle energy for high physical activity (Latief & et al, 2000).

Adenosine triphosphate (ATP) production during intensive muscle work depends on the availability of muscle glycogen and blood glucose. Mild physical activity can be produced with low carbohydrate sources. Conversely, high activity will require a large source of energy. Muscle tissue is the main glycogen savings (400 g: 6.7 MJ), later (70gr: 1.2 MJ) and blood glucose (2.5 g: 342 kJ). The amount of energy supply capacity varies between individuals according to intake (food intake). The muscle glycogen content of endurance athletes trained on a mixed diet has a muscle glycogen content of 130-230 mmol / kg muscle weight (Daryanto, 2015).

In the type of endurance sports with high intensity such as marathons, triathlons, self-defense and cross-country, it requires high glycogen deposits. Because endurance sports (activities > 90 minutes) and ultra endurance (activities > 4 hours) if you have normal glycogen deposits, energy requirements will not be fulfilled, causing a decrease in sports performance. To overcome this can be done with "Carbohydrate Loading (carbo-loading)" which serves to increase glycogen savings of 200-300% in overcoming fatigue and the appearance of athletes can be improved.

4. Conclusion

Calorie needs of athletes as an effort to improve the achievements of North Sumatra athletes are done through the measurement of Basal Metabolic Rate (BMR) and

calorie sources are provided with food ingredients that are sweaty or not burdensome to the digestive aspects of vegetables, fruit, fish / eggs (occasionally meat), milk (for morning / night), nuts, and drink enough water. Reviewing the athlete's nutrition model can provide an important role in obtaining an athlete's achievements.

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