ASSESSMENT OF NUTRITIONAL STATUS AND PERFORMANCE: IN THE CASE OF LEGA TAFO LEGA DADI ATHLETICS CLUB, OROMIA REGIONAL STATE, ETHIOPIA

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ARFASE ELIYAS

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Assessment of Nutritional Status and Performance: In The Case of Lega Tafo Lega Dadi Athletics Club, Oromia Regional State, Ethiopia

A Thesis submitted to the Department of Sport Science,
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In partial fulfillment of requirements for the Degree master of Sport Science in Sport Nutrition

ARFASE ELIYAS

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HARAMAYA UNIVERSITY, HARAMAYA

STATEMENT OF THE AUTHOR

I the undersigned declare that this thesis is my original work and has not been presented for any degree in any university and all the resource of materials used for this thesis have been dually acknowledged.

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Name of the author: Arfase Eliyas Signature _____

Place: Haramaya University, Haramaya

Date of Submission: December, 2020

ACCRONYMS AND ABBREVATIONS

BMI: Body Mass Index

BMR: Basal Metabolic Rate

KCAL: Kilo Calory

SDA: Specific Dynamic action

BIOGRAPHICAL SKETCH OF THE AUTHOR

The author was born in Ambo town which is found in Oromiya Regional State in June 1988 G.C. She completed her BSc degree in Sport Science from Addis Ababa University in 2008. Since then, she was worked as Sport Science expert in Oromiya Regional State Sport Commission for a year. Then she joined the School of Graduate Studies of Haramaya University in 2017 to pursue MSc degree in Sport nutrition.

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HARAMAYA UNIVERSITY

I hereby certify that I read and evaluated this Thesis entitled (Assessment of Nutritional Status and Performance: In The Case of Lega Tafo Lega Dadi Athletics Club, Oromiya Regional State, Ethiopia) prepared under my guidance (Arfase Eliyas). I recommended that it be submitted as fulfilling the thesis requirement.

1. Abinet Ayalew (PhD) _____ _____

Major Advisor Signature Date

2. Negussie Bussa (B.Pharm, PhD) _____ _____

Co- Advisor Signature Date

As a member of the Board of Examiners of the (MSc.) Thesis Open Defense Examination, I certify that I have read and evaluated the Thesis prepared by Arfase Eliyas and examined the candidate. I recommend that the thesis be accepted as fulfilling the Thesis requirements for the degree of Master of Science in Sport Nutrition.

_____ _____ _____

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Abstract

Sport nutrition has a great impact on human's growth, sustain life and athletes performance. To this end, the purpose of this study was to assess the nutritional Status and Performance of Lega Tafo Lega Dadi athletics club, Oromia Regional State, Ethiopia. Cross-sectional research design and descriptive survey method was used purposely to collect data, Data were collected using questionnaires, document analysis, interviews and observations. Data analysis was performed using SPSS 23 software in order to analyze Knowledge of nutrition and athletes food consumption. Simple regression was used to assess the effect of meal pattern on athletes' performance in Lega Tafo Lega Dadi Athletics club. Qualitative analysis was used to supplement the quantitative analysis. The result of this study indicates that athlete's meal pattern did not affect on athletes' performance $p > 0.05$. The study concluded that Athletes of Lega Tafo Laga Dadi athletics club did not have sufficient knowledge of sport nutrition and athletics club athletes had sport nutrition food consumption sometimes. Lega Tafo Lega Dadi athletics club athletes should allocate better sport nutrition expense to their athletes.

Keywords: athletes, nutrition knowledge, food consumption

1. INTRODUCTION

1.1 Background of study

Most people know and understand the importance of eating correctly. Nutrition lacking in the essential elements to cover the basal metabolic rate- the energy required to keep body function, for growth and for exercise may lead to physiological and psychological consequences such as shortness of breath, little energy, general tiredness, muscle cramps, lack of concentration and inability of the body to respond for the specific training program which leads to be juried. Therefore, adequate nutrition is a key component of sports performance. The greater the demand for increased performance both in training and competition, the higher the nutritional value must be (Mcardle *et al.*, 1991).

Proper nutrition is an important consideration for athletes, who seek to maximize their performance (McGinty *et al.,* 1991). So, daily training will create special nutritional needs for an athlete, particularly the elite athlete whose training commitment is almost a full-time job (Burke, 1998).

Many coaches make dietary recommendations based on their own "feeling" and past experiences rather than rely on available research evidence. This problem is compounded because athletes often have either inadequate or incorrect information concerning prudent dietary practices or the role of specific nutrients in the diet. Although research in this area is far from complete, the general consensus that active people and athletes do not require additional nutrients beyond those obtained in a balanced diet (Mcardle *et al.,* 1991) .

Physical activity, athletic performance, and recovery from exercise are enhanced by optimal nutrition. In addition to this idea it is expected from athletes to consume Carbohydrates, protein, fat, fluids and manage their body weight in a recommended manner to the demands of their specific training program and sport activity. So all ideas expressed above need emphasis also with Ethiopian athletes and coaches in order to compete and reach the peak performance more than what have been done. The fundamental difference between an athlete diet and that of the

general populations are that athletes require additional fluid to covers sweat loss and additional energy to fuel physical activity (Rodligue *et al.,* 2009). Furthermore, in today's competitive sport environment athletes need to be physically & mentally fit to perform at their best. Research clearly shows that nutrition can play an important role in improving exercise performance, decreasing recovery time form strenuous exercise, preventing exercise-associated strenuous injuries due to fatigue, providing the fuel required during time of high intensity training, and controlling weight (Driskell *et al.,* 2008).

In general nutritional assessment should be taken in order to know the athletes current status and predict the future performance which is the main emphasis of this study. Moreover, among the selected Athletic Club of Lega Tafo Lega Dadi athletics club is stronger contributor for the developments of athletics in Oromiya which has been established in 2002 E.C and playing great role in producing competent athletes starting from the establishment and to the current. Therefore, the investigation was focused on the assessment of nutritional assessment and performance of Lega Tafo Lega Dadi athletics club.

1.2 Statements of the Problem

Proper nutrition is essential for growth, development, health, performance and one's well-being. Nutritional Programs facilitate the development of a child in all its dimensions and have considerable long-lasting effects on the child's life (Beryl, 2000).

Previous studies have reported the dietary practices and habits of elite soccer players (Bangsbo, *et al.,* 1992), but limited information is available about the developing soccer player, young players or schools of soccer and professional football players (Bar-Or *et al.,* 1994; Boisseau *et al.,* 2002).

From the few available studies, it would appear that the total energy intake of athletes is often insufficient, ranging from 2352+454 to 3395+396 kcal, compared with the recommended range of 3819 – 5185 kcal (Leblanc *et al.,* 2002). Furthermore, other studies showed that athletes' diets were unbalanced, with too great an emphasis upon fatty foods (29.1+2.8 to 34.1+3.1% versus the recommended 20%), to the detriment of carbohydrates (48.5+4.3 to 56.6+3.1% TEI vs the recommended 55 – 60%) (Ibid, 2002).

Lega Tafo Lega Dadi athletics club is one of the athletics club in Oromia in providing camp services for the athletes including dietary and dormitory which is conducive for the study on the assessment of athlete's nutritional status. Based on the above issues the researcher was raise a question what are the major types and amount of diets for this club? Hence, this study attempted to answer the following basic research questions.

1. Do Lega Tafo Lega Dadi Athletics Club athletes have sufficient knowledge of sport nutrition?
2. To what extent athletes consume food frequently in Lega Tafo Lega Dadi Athletics club?
3. How is the effect of meal pattern on athletes' performance of Lega Tafo Lega Dadi Athletics club?

1.3 Scope of the Study

The researcher was delimited on assessment of Nutritional Status and Performance of Athletic Club of Lega Tafo Lega Dadi Town Athletics Club. It was delimited to variables such as athletes' nutritional knowledge, athletes consume food frequently and the effect of meal pattern on Athletes' performance of Lega Tafo Lega Dadi Athletics club, 2019/2020.

1.4 Significance of the Study

The use of recommended diet in enhancing athletic performance is one of the most important issues for once country result in national, continental and international competitions in their events. However, some problems hinder to achieve. As a result, conducting on the current nutritional status will have the following significance.

1. Create awareness for athletes, coaches and concerned body about their knowledge of nutrition.
2. It initiates athletes, coaches and concerned body to look in to the possibilities of improving patterns of nutrition
3. Contribute the clubs coaching staff to include information that can be used in the development of training program.
4. It adds knowledge for the researcher about nutrition and performance.

5. The results of the study will be used as a spring board for other researchers who want to conduct in-depth study on the same or related issue.

1.5 Objective of the study

1.5.1 General objective

The main objective of the study was to assessment of Nutritional Status and Performance of Athletic Club of Lega Tafo Lega Dadi Town Athletics Club

1.5.2 Specific Objectives

1. To assess the athletes' sport nutritional knowledge in Lega Tafo Lega Dadi Athletics club
2. To assess the extent to how athletes consume food frequently in Lega Tafo Lega Dadi Athletics club
3. To examine the effect of meal pattern on Athletes' performance of Lega Tafo Lega Dadi Athletics club

2. LITERATURE REVIEW

2.1 Nutrition

According to Thompson (1991), nutrition means all the food a person eats and drinks. The whole human body is made from this food, and all energy comes from food. The food acts in the body as a fuel, providing energy and chemicals for movement, growth and to keep the body healthy. What the athlete need nutritionally is affected by age, sex, body build, level of physical activity and state of health.

The carbohydrate, lipid and protein nutrients provide the necessary energy to maintain body function of rest and during various forms of physical activity. Aside from their role as biologic fuel, these nutrients, called macronutrients, play important roles in maintaining the structural and functional integrity as the organism (Mcardle *et al.,* 1996).

2.2 Methods of assessing food intake

The ability of the sports nutritionist to determine an athlete's dietary intake and to consequently analyze his or her nutrient status is important. Reliable and accurate ways to assess food intake using food diaries (diet records), 24 hour dietary recalls, and food frequency questionnaires serve to assess food and nutrient intake in various ways. The use of a specific method can be determined by the purpose of the assessment and other factor such as time and ability of the athlete record or recall specific intake (Driskell *et al.,* 2011).

2.2.1 Diet records (food diaries)

A diet record consists of the all the food and beverages a person consumes in certain amount of time. Three day diet records are most often used (individual's daily food and beverage consumption. Seven day food dairies are more time consuming but may afford a more complete picture of the diet. It should be noted that diet records lasting an extended amount of time are not always as accurate as more concise diet records. This is due to the fact that individuals may absent mindedly forget to write down the information daily or may find the task tedious and redundant. The seven day diet record is one of the most common approaches when assessing an individual's diet. In general, the more information collected and the more details provided, the

more accurate the conclusions. Diet records, also called food diaries, are recorded on a form with one line for each food consumed and columns for portion size (Driskell *et al.,* 2011).

2.2.2. Twenty – four hour's unstructured interview

Twenty – four hour dietary recalls are often used as a quick nutrition assessment and many times can be used on an important basis to determine an individuals' daily intake. A dietitian will ask an athlete to list the foods that he/she has consumed with in the past 24 hours. When doing so, it can be advantageous to first review with the athlete the past day's events which then can be used to help recall specifies about dietary consumption(Driskell *et al.,* 2002).

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The 24 hour dietary recall can be performed by two different methods. The first is when the dietitian asks the individual to start from the beginning of the previous day and provide in detail all of the food and beverage consumed from the beginning of the day before. The second method starts with the current day and works backward. Both qualities is activities as a way to assist in recalling his/her dietary intake. For example, the individual would be questioned on what he/she ate prior to this visit and then work back over the past 24 hours. Both methods allow the dietitian to use the individual and food preparation play a major role when performing a 24 hour dietary recall because most of the time it is difficult for athletes to quantify the amount of food and beverage she/he consume during the past 24 hours, so athletes recalling ability play great role (Ibid *et al.,* 2002).

2.2.3 Food frequency questionnaires

Food frequency questionnaires can assist in determining, on average, the amount of a specific macro or micronutrient an individual consumes. It too is highly dependent up on the individual's memory and ability to estimate the quantity of a particular food or food group. A list of food is given to the individual and he/she is asked to determine how often each food was consumed during a specific period, usually ranging from one day to several months (Driskell *et al.,* 2002).

2. 3. Evaluation of Nutrient adequacy of athlete's diets

Adequate and proper nutrition is important for active individuals to meet their overall energy, nutrient, and fluid needs. Thus, many athletes are interested in learning how to improve their

dietary and fluids for health and performance. One of the first steps in determining how to best improve an athlete's diet is to assess his/her food, fluid and supplement intakes within the context of their weight goals, sport training routine, and completion schedule knowing when an athlete eats in relationship to exercise training may be as important as knowing what he/she eats (Driskell, 2007).

Regular assessment of an athlete's diet will help identify potential nutrition problems related to time of year, changes in training routine, health issues that arise such as injuries or illness, and/or lifestyle changes. So these parts of literature reviews the methods used to assess an athlete's diet and the guidelines used to determine the adequacy of these diets, including the dietary reference intakes, approaches for assessing dietary adequacy, and specific macro and micronutrient recommendations for active individuals and athletes (Driskell and Wolinshy, 2008).

2.4. Optimal nutrition for exercise

An optimal diet is one in which the supply of required nutrients is adequate for tissue maintenance, repair, and growth without excess energy intake. It is now possible to make reasonable estimates of nutritional needs for men and women that account for normal variation in daily energy expenditure. Dietary recommendations for athletes, however, must also consider the specific energy requirements of a particular sport as well as by the athlete's dietary preferences. Although there is no one diet for optimal exercise performance, careful planning and evaluation of food intake should follow sound nutritional guidelines (Mcardle *et al.,* 1991).

2.4.1. Nutrients Requirements

Many coaches make dietary recommendations based on their own "feelings" and past experiences rather than on available evidence. This problem is compounded because athletes often have either inadequate or incorrect information concerning prudent dietary practices. Although research in the area of sport nutrition is far from complete, the general consensus is that physically active people do not require additional nutrients beyond those obtained in a balanced diet. This is important because a large number of adults exercise regularly to keep fit (Mcardle *et al.,* 1991).

2.4.2. Nutrients

Food is made up of many different things. Those things which are essential for the body to function well are called nutrients. Nutrients have different jobs, though they may work together or need the presence of others to work properly. The different types of nutrients are Protein, Carbohydrate, Fat, Vitamins, Minerals and Water (Thompson, 1991).

2.4.2.1. Proteins

Proteins, from the Greek word meaning of "prime important" are found in all living matter and function primary in the growth and repair of body tissue. Proteins are similar to carbohydrates and lipids in that each molecule contains atoms of carbon, oxygen, and hydrogen. The major difference is that protein contains nitrogen, sulfur, phosphors, and iron (Mcardle *et al.,* 1991).

Protein is an essential part of the diet and plays many roles in the body. Protein's roles are primarily structural, but it is also scarified by the body for energy during intensive exercise or when nutrition is inadequate. In these situations, to meet its metabolic needs, the body breaks down precious muscle tissues, which is a setback for an athlete who has been training hard to make gains. In addition, athletes need to eat just the right amount of protein to minimize the formation of metabolic waste products. When too much protein is consumed, the body converts the excess to fat and increase the blood levels of ammonia and nitric acid. Ammonia and uric acid are toxic metabolic waste products. The athlete's goal therefore is to maintain proper protein intake (Burke *et al.,* 1999).

According to Thompson (1991), until the age of about 18 the body makes new cell in order to grow. Also, throughout life, cells wear out and are replaced. Some types of cell only last a few weeks before being replaced. Others last much longer. All the material for new cells comes from food. Proteins are the main body building nutrient. As they are needed to build new body tissue during growth, and are also used to repair any damaged tissue, there is a constant need for a regular protein intake.

Eight amino acid cannot be synthesized by the body and therefore must be provided preformed in foods. These are called essential amino acid. However, the amino acids that can be manufactured in the body are formed as non-essential. This does not mean that they are

unimportant, but simply that they can be synthesized from compounds ordinarily available in the body and a rate that meets the demands for normal growth. Furthermore, foods that contain all of the essential amino acids in the quality and correct ratio to maintain nitrogen balance and allow for tissue growth and repair such as eggs, milk, meat and fish are known as complete proteins, or high quality proteins. An incomplete protein, or lower quality protein, lacks one or more essential amino acid (Mcardle *et al.,* 1996).

As Thompson (1991) stated, proteins are made up of building blocks called amino acids. There are 21 types of amino acid which combine in different ways to make different proteins. Inside the digestive system proteins are broken down in to their amino acids. Of the 21 amino acids all but eight can be made inside the human body. The eight that must come from food are called essential amino acids. “Protein quality” relates to how many of the eight essential amino acids a food supplies. High quality proteins are generally animal proteins such as egg, milk, fish and meat. Lower quality protein is found in plants such as nuts, lentil and beans. For a person who does not eat meat or animal products a wide variety of plant protein must be eaten to obtain all the necessary amino acids for health. The athlete in training needs extra protein to create muscle tissue. There is also an increased need for extra calories in this situation and enough extra protein will usually be obtained simply by eating more food. If too much protein is eaten, any amount over what the body actually needs will be converted for use as an energy source or stored as body fat.

2.4.2.1.1 Protein and Energy

In addition to the functions of protein discussed above, protein the same as fat and carbohydrates can also be used for energy. Under conditions of both outright and training induced starvation, the body releases amino acids from muscle tissue for use as energy or in energy cycles. This catabolism (breakdown) of protein occurs during exercise especially during intensive workouts, in particular power exercises and prolonged endurance activities-or when the body runs out of carbohydrates from the diet or glycogen from its muscle and liver stores. Even though the body can depend on the fat that it has stored, it still uses muscle protein, unless it is fed protein as food. When dietary circumstances cause the body to use amino acids as a source of energy, it cannot also use these amino acids for building muscle tissue or for performing their other

metabolic functions. This is why a proper protein intake is essential every hour of the day (Burke and Gastelu, 1999).

2.4.2.2 Fat

The same as carbohydrates, they are composed of carbon, hydrogen, and oxygen. Fat is a major nutrient and it has several functions. Oils and fats are concentrated sources of energy. Each gram of fat supplies nine (9) calories. So it play many essential functions in the body (Mudambi and Rajagopal, 2006). Their main functions are:-

- Besides providing energy, oils and fats have several functions in the body. Foods fats are a source of two groups of essential nutrients-essential fatty acids and fat soluble vitamins A, D, E and K. Food fats also aid the transport and absorption of fat-soluble vitamins.
- Cholesterol is an essential lipid synthesized in the liver. Some important hormones and bile acids are formed from cholesterol. Fat forms the fatty centre of cell walls, helping to carry nutrient materials across cell membranes.
- Fats are used to synthesis phospholipids sides, which are found in all cells
- Fat stored in various parts of the body is known as adipose tissue. The vital organs in the body are supported and protected by a web-like padding of this tissue. Fat act as a Cashion for certain vital organs. Nerve fibers are protected by the fat covering and it aids relay of nerve impulses.
- Since fat is a poor conductor of heat, a layer of fat beneath the skin helps to conserve body heat and regulate body temperature.

According to Thompson (1991), fats are a very concentrated source of energy, weight for weight, they provide twice as much energy as carbohydrates but fat is not as good on energy source as carbohydrate because it is digested very slowly and uses more oxygen to produce this energy. In addition, fat is stored under skin and inside the muscles. It is a reserve energy source and is essential to carry the fat soluble vitamins around the body. Diets that contain large amounts of fat can lead to obesity, heart diseases and cancer. A person need only a small amount of fat in the food they eat and drink to be healthy.

2.4.2.2.1 Physical exercise and lipid utilization

Physical exercise has a profound effect on the metabolism of lipid during exercise. Improvement in the aerobic production of ATP from lipids with aerobic training may aid in maintaining cellular integrity and a high level of function that would contribute to enhanced endurance independent of glycogen reserves (Mcardle *et al.,* 1996).

2.4.2.3 Carbohydrates

Carbohydrates, as the name implies, are composed of carbon and water. The body gets the major part of its energy requirements from carbohydrates. They break down quickly and easily in the digestive system to form the basic fuel of glucose. The natural or complex carbohydrates enter the blood more slowly and insulin levels are steady. This increases the amount of energy available from the carbohydrate and reduces the amount stored as fat (Thompson, 1991).
According to Mcardle *et al.,* (1996), excessive carbohydrate in the diet is a main cause of tooth decay. The precise role, if any, that excessive dietary sugar plays in disease such as diabetes, obesity, and coronary heart diseases has been not established.

2.4.2.3.1 Role of Carbohydrate in the Body

As MCardle *et al.,* (1996) stated that, carbohydrates serve four important functions related to energy metabolism and exercise performances which are energy source, protein sparing, metabolic primer and fuel for the central nervous systems.

1. **Energy source**

The main function of carbohydrates is to serve as an energy fuel, particularly during exercise the energy derived from the breakdown of blood born glucose and liver and muscle glycogen is ultimately used to power the contractile elements of muscles as well as other forms of biologic work. Daily carbohydrate intake must be adequate to maintain the body's relatively limited glycogen stores. On the other hand, once the capacity of the cell for glycogen storage is reached, excess sugars are converted to and stored as lipid. This action helps to explain how the body's fat content can increase when excess carbohydrates are consumed, even if the diet is low in lipid.

2. Protein sparing

Adequate carbohydrate intake helps o preserve tissue proteins. Normally, protein serves a vital role in tissue maintains, repair, and growth and to a considerably lesser degree, as a nutrient source of energy. Glycogen reserves, however, can readily calorie and /or carbohydrate content and through strenuous exercise. The effect of reduced energy intake (40-hour fast) and total food deprivation (7-day starvation) on levels of plasma glucose and lipid breakdown components takes place. After almost 2 days of fasting, blood glucose becomes reduced by 35% but does not decrease to a lower level during a further prolonged abstinence from food. At the same time, circulating fatty acid and ketones (byproducts of incomplete lipid breakdown) levels increase rapidly, with plasma ketenes rising dramatically after 7 days of starvation (Burke *et al.*, 2011).

When glycogen reserves are reduced and plasma glucose level falls, metabolic pathways exist for the synthesis of glucose from both protein and the glycerol portion of the lipid molecule. This process of gluconeogenesis provides a metabolic option for augmenting carbohydrate availability (and maintaining plasma glucose levels) in the face of depleted glycogen stores, as occurs in dietary restriction or prolonged exercise. The price paid, however, is a temporary reduction in the body's protein "stores" particularly muscle protein. In extreme conditions, this causes a significant reduction in the lean tissue mass and an accompanying solute load on the kidneys, which must increase their workload to excrete the nitrogen-containing byproducts of protein breakdown (Karlson and Saltin, 2001).

3. Metabolic Primer

Carbohydrates serve as a "primer" for lipid metabolism. Certain products from carbohydrate breakdown must be available to facilitate the metabolism of lipid. If carbohydrate metabolism is insufficient-either through limitation in the transport of glucose into the cell, as occurs in diabetes or through depletion of glycogen through improper diet or prolonged exercise-the body will mobilize a greater amount of lipid than it can metabolize. The result is incomplete lipid breakdown and the accumulation of acetone-like byproducts (chiefly acetoacetate and hydroxyl-butyrate) called ketone bodies." This situation may lead to a harm full increase in the acidity of body fluids, a condition called acidosis or more especially with regard to lipid breakdown, ketosis (Mudambi and Rajagopal, 2006).

4. Fuel for the Central Nervous System

Carbohydrate is essential for the proper functioning of the central nervous system. Under normal conditions and in short-term starvation, the brain uses blood glucose almost exclusively as it's full and essentially has no stored supply of this nutrient. In poorly regulated diabetes however, or during starvation or with a low carbohydrate intake, metabolic adaptations occur so that after about 8 days the brain uses relatively large amounts of lipid in the form of acetoacetate for its fuel requirement. There is even indication that adaptations take place in skeleton muscle that increases its ability to burn lipids for energy during exercise and concurrently spare muscle glycogen (Karlson and Saltin, 2001).

At rest and during exercise, liver glycogenolysis is the primary means for maintaining normal blood glucose levels. With the depletion of liver glycogen and a continued large use of blood glucose by active muscle, blood glucose eventually falls below normal levels. The symptoms of a modest reduction in blood glucose (hypoglycemia) include feelings of weakness, hunger, and dizziness. The condition impairs exercise performance and may partially explain the "central" fatigue associated with prolonged exercise. Sustained and profound low blood sugar can cause loss of consciousness and irreversible brain damage. Because of the important role of glucose in nerve tissue metabolism, blood sugar is usually regulated within narrow limits (Mudambi and Rajagopal, 2006).

2.4.2.3.2 Carbohydrate balance in Exercise

According to Mcardle *et al.,* (1996), the fuel mixture in exercise depends on the intensity and duration of effort, as well as the fitness and nutritional status of the exercise.

1. Intense Exercise

With strenuous exercise, neural-humeral factors increase the hormonal output of epinephrine, nor epinephrine, and glucagon, and decrease insulin release. These actions have a stimulating effect on the enzyme glycogen phosphorylase that facilitates glycogenolysis in the liver and active muscle. Because of its ability to provide energy without oxygen, stored muscle glycogen is the prime contributor of energy in the early minutes of exercise when oxygen utilization does not meet the metabolic demands. As exercise progresses, blood-borne glucose increases its contribution as a metabolic fuel. Blood glucose, for example, may supply 30% of the total energy

required by vigorously active muscles, with the remaining majority of carbohydrate energy supplied by muscle glycogen (Mcardle *et al.,* 1996),

An hour of high-intensity exercise can decrease liver glycogen by about 55%; a 2-hour strenuous workout can just about deplete the glycogen in the liver and specifically exercised muscles. The uptake of circulating blood glucose by the 40th minute of exercise, glucose uptake has risen to between 7 and 20 times the uptake at rest, depending on the exercise intensity. The increased contribution of carbohydrate in intense anaerobic exercise occurs because it is only macronutrient to provide energy rapidly when the oxygen supply and/or utilization do not meet a muscle's oxygen needs. During heavy, fatiguing aerobic exercise, the advantage of a selective dependence on carbohydrate metabolism lies in its rapidity for energy transfer compared to lipids (about twice as fast) and proteins. Also, the energy generated per unit oxygen consumed is about 6% greater for carbohydrate hand for lipid (Burke *et al.,* 2011)..

2. Moderate and Prolonged Exercise

As exercise continues and glycogen stores become reduced, blood glucose becomes the major source of carbohydrate energy, and an increasingly greater percentage of the total energy is supplied through lipid breakdown. Eventually glucose output by the liver fails to keep pace with its use by muscle and plasma glucose concentration decrease. The level of circulating blood glucose may actually falls to hypoglycemic levels (less than 45 mg glucose per 100 ml blood) during 90 minutes of strenuous exercise (Karlson and Saltin, 2001).

During prolonged exercise in both the glycogen-depleted and the glycogen-loaded state, as sub maximal exercises in the glycogen-depleted state, blood glucose levels fall and the level of circulating lipid increases dramatically compared to exercise in the glycogen-loaded state. Concurrently, there is an increased contribution of protein to the energy pool. Under such conditions of carbohydrate depletion, work capacity (expressed as a percentage of maximum) progressively decreases so that at 2 hours, only about 50% of maximum capacity can be sustained due to the relatively slow rate of aerobic energy release from lipid breakdown (Corbin *et al.,* 2007**)**.

3. Effect of Diet on Muscle Glycogen Stores and Endurance

The endurance capacity of subjects who were fed the high-carbohydrate diet was more than three times greater than when the same subjects consumed the high-fat diet. In all instances, the point of fatigue was associated with the same low level of muscle glycogen. These results clearly demonstrate the importance of muscle glycogen for high intensity exercise lasting more than an hour. Such data also emphasize the important role nutrition can have in establishing the appropriate energy reserves for both long-term exercise and strenuous training (Fallowfield and Wilkinson, 1999).

A diet deficient in carbohydrates rapidly depletes muscle and liver glycogen and subsequently affects performance in intense short-term exercise as well as in prolonged sub-maximal endurance activities. These observations are important for athletes and physically active individuals who have modified their diet by reducing the recommended percentage of carbohydrate intake (Haff, 2008):.

2.4.3 Planning the Training Program

One of the most important responsibilities of the coach is planning the athlete's training program. Planning is a long term process since elite athletes may not reach their full performance until 24 years of age or older .In this long term planning the coach usually looks at what the athlete wants to achieve for a particular year and divides this year in to a number of periods. For younger, inexperienced athletes performance targets may need to occur at more frequent intervals such as the immediate season a head. This is because young athletes are often unable to work toward objectives that athletes think of as being too distant (Thompson, 1991).

2.4.4 Nutrition and Endurance athletes

Distance runners compete over a variety of race lengths most commonly, 10km, 15km, half marathon (21.1km), and the marathon (42.195km). To be successful in their respective events, endurance athletes require muscular endurance and cardiovascular endurance. Endurance is one of the basic components of physical fitness. As a result, most athletes have to possess some

degree of muscular and cardio respiratory endurance to perform in their respective sports (Burke, 1998).

Obviously, endurance is important to almost all athletes, even those involved in sport requiring, short intermittent bursts of intense anaerobic activity that are repeated over the course of an hour or more (Karlson and Saltin, 1971).

Previous literature indicates that study endurance athletes are those who are engaged in continuous activity lasting between 30 minutes to 4 hours. Because of the duration and continuous nature of their sports, endurance athletes expend a tremendous number of calories not only during competition, but also in their preparatory training. This puts a tremendous demand on energy reserves that must be replenished after daily training about, making diet a key factor not only athletic success, but also for overall health. Therefore, it is critical for endurance athletes to consume sufficient calories on a daily basis to supply the energy for daily training, to ensure the delivery of nutrients needed for complete recovery from work outs, and stay health and injury free. Failure to maintain adequate dietary intake of nutrients can quickly result in chronic fatigue dehydration, increased risk for illness and injuries, as well as muscle wasting (Burke, 1998).

Furthermore, Burke and Gastelu (1999) revealed that one of the main concerns for endurance athletes is matching energy consumption with energy expenditure. Long distance strenuous exercise requires a large number of calories. Elite athletes can potentially burn more than two to three times the number of calories as their untrained. If these calories are not replaced daily, energy for training and the ability to perform during training will decline.

2.5. The Energy Balance

A person should eat and drink the number of calories to supply the energy their body requires. The average person has basic energy requirements to maintain the body through normal daily activities like sleeping and breathing. The athlete has these basic energy requirements plus the energy needed to train and compete. A typical growing adolescent needs 2500 calories of energy per day for basic energy requirements whereas athletes need more energy than sedentary

individuals. The performance of an athlete who does not take in sufficient calories will be reduced. When the calories supply is constantly low the athlete will lose weight as he/she uses up the energy stored in the body. A person who takes too many calories will store any amount more than the body requires as fatty tissues. This non-essential fat will reduce performance (Thompson, 1991).

Furthermore, Whitney and Rady (2008) revealed that, to achieve energy balance, the body must meet its needs without taking in too much or too title energy. Somehow the body decides how much and how often to eat when to start eating and when to stop. People expend energy continuously and eat periodically to refuel. Ideally, their energy intakes cover their energy expenditure without too much excess. Excess energy is stored as fat, and stored fat is used for energy between meals. The amount of body fat a person deposits in, or with draw from, "storage" on any given day depends on the energy balance for that body the amount consumed (energy in) versus the amount expended (energy out). When a person is maintaining weight, energy in equals energy out whereas when the balance shifts, weight changes.

2.5.1 Energy Intake and Expenditure

According to Whitney and Rady, (2008), the energy released from carbohydrates, fats, and proteins can be measured in calories which is tiny units of energy so small that a single apple provides tens of thousands of them. To ease calculation energy is expressed in 1000-caloric metric units known as kilocalories (shortened to kcal, but commonly called calories). When it is read in popular books or magazines that an apple provides 100 calories, it actually means 100 kcalories.

The energy the body gets from food is measured in calories. Different foods provide different amounts of energy, and so have different values in calories. The amount of calories a person needs depends on how big and active they are and how efficiently their body uses foods. Some people eat a lot and never get fat. They use up food for energy more quickly than those who put on weight easily. The rate at which a person converts food to energy is known as the metabolic rate .People have different metabolic rates, but every one's metabolic rate can increase during exercise. The amount of calories a person needs also depends on his/her age. Athletes probably

need more basic energy between the ages of 12 and 17 than at any other time in their life. Growing uses up a lot of energy and young athletes will find it hard to train and complete if their diet lacks energy (Thompson, 1991).

2.5.2 Exercise and food intake

As Mcardle, *et al.,* (1996) stated, for individuals who engage regularly in moderate to intense physical activity, it is relatively easy to match food intake with the daily level of energy expenditure. Distance runners who train upwards of 100miles per week (6 minutes per mile at approximately 15 kcal per minute) probably do not expend more than 800 to 1300"Extra" calories each day above their normal energy requirement. For these endurance athletes, the daily food intake should supply approximately 4000kcal to balance the increased energy expenditure. For men, the daily energy intake ranged between 2900 and 5900 kcal, whereas the intake of female athlete ranged between 1600 and 3200kcal. With the exception of the high energy intake of athletes of extremes of performance and training, daily caloric intake generally did not exceed 4000kcal for the men and 3000kcal for the women.

2.5.3 Energy intake recommendation

Recommendation to meet high – energy demands in sports depends on many factors, namely the sport itself and the changes in volume and intensity throughout training and competition. Simple strategies to meet high – energy demands during intense training are summarized as follow:

Area of focus Strategies

Frequency of eating: Athletes should be advised to eat three to four meals and two to three snacks per day. Snacks are predominately consumed before, during, and after exercise, between meals, and after dinner.

Meal size: Athletes should add calories to meal, which can be accomplished by adding fruit juice, sport drink, or milk as energy – containing fluids, by including an appetizer

Fueling before, during: Athletes should skilled in selecting and after exercise food and fluids before, during, and after exercise to (1) optimize performance during and maximize recovery after exercise and (2) to meet the energy demands of intense training/competition and

environmental extremes. Most athletes consume a significant amount of calories during the actual training or competition period.

I**llness** – Athletes should use strategies to meet energy demands when ill or injured (increase or decrease energy intake).

Indeed, proportion of caloric consumption as follows: of the total calories consumed, the recommended balance for most athletes: carbohydrate (55%- 60%), fat (15% - 30%) and protein (10% - 15%) (Driskell and Wolinsky, 2002),

2.5.4. Energy intake measurement

As Mudambi and Rajagopal (2006) pointed out, the main source of energy for all the body activities is food, along with the energy store in body tissues as reserve. Human body needs fuel to carry out its work on a continual basis. This need starts at birth and continues as long as one lives. Furthermore, energy is the primary need of the body and takes precedence over all other needs. The metabolic products formed by digestion of carbohydrate, fats and protein which are simple sugars, glycerol and fatty acid, and amino acid; provide most of the energy need of the body. Food energy intake can be calculated by keeping on accurate record of a day's actual food consumption. The energy values of foods eaten can be calculated by referring to food consumption table standard to know the caloric value of a meal which can be done by identifying the composition and weight of a food and then determining at water factors.

Food composition in Ethiopian context

In Ethiopia there is no adequate texts on the standards of all food composition therefore, the food composition table for use in Ethiopia part III (1997) and IV(1998) which were prepared by Ethiopia health and nutrition research institute and food and agriculture organization of the united nation were used as standard. The summery of some food composition was depicted in the following table.

Table 2. 1 Comparison of food commonly used in Ethiopia

Food item	Composition in terms of 100 gram		
	Protein in gram	Fat in gram	Carbohydrate in gram
Porridge	3.3	4.7	21.3
Bread	6.8	0.8	46.9
Tea	5.6	1.7	20.5
Pasta	12.3	1.5	71.8
Rice	2.1	0.1	24.5
Beef (Siga wet yebere)	30.1	5.4	2.1
Egg	11.6	10.9	2.1
Injera	4.9	1	36.3
Mutton (Siga wet yebeg)	24	6.1	0.4
Potato	1.1	0.1	21.1
Peas (Ater wet)	2.8	5.8	9.3
Butter	1.3	81.2	0.1
Oil		99.6	00
Garlic (Nech shenkurt)	4.1	0.3	29.8
Shallot (Keyi shenkurt)	1.06	0.1	16
Pepper (Berbere)	2	2.5	15.7
Tomato	1	0.1	3.9
Leek(Baro shenkurt)	1.2	0.6	12.1
Source: Food composition table for use in Ethiopia part III and IV (1997 and 1998)			

Remind that one from of carbohydrate and one from of protein contain 4kcal whereas one gram of fat contains 9kcal (Whitney and Rady, 2008).

1g carbohydrate = 4kcal

1g protein = 4kcal

1g fat = 9kcal

2.5.5 Factors that affect energy expenditure

Important factors that affect a person's total daily energy expenditure include physical activity, dietary induced thermogenesis, and climate (Mcardle *et al.,* 1996)

2.5.5.1 Physical activity

Physical activity has by far the most profound effect on human energy expenditure. Under normal circumstances, physical activity accounts for between 15 and 30% of a person's total daily energy expenditure.

2.5.5.2 Dietary Induced Thermo genesis

For most people, the ingestion of food stimulates energy metabolism. This dietary-induced thermogenesis consists of two components. One component, called obligatory thermo genesis (formerly called specific dynamic action, or SDA), is a result of the energy-requiring processes of digesting, absorbing, and assimilating food nutrients. The second component is called facultative thermogenesis. This increase in metabolism with food ingestion related to the activation of the sympathetic nervous system and its stimulating effect on metabolism (Mudambi and Rajagopal, 2006**).**

In general, the thermic effect of food reaches a maximum within one hour after a meal. While considerable variability exists between individuals, the magnitude of dietary induced thermo genesis can vary between 10 and 35% of the ingested food energy in normal individuals depending on both the quantity and type of food eaten. A meal of pure protein, for example, elicits a thermic effect that is nearly 25% of the meal's total calories. The large thermic effect is due mainly to digestive processes as well as the extra energy required by the liver to assimilate and synthesize protein or dominate certain amino acids and convert them to glucose (Rodliguez *et al.,* 2009).

The calorigenic effect of protein ingestion has been used by some people to advocate a high protein diet for weight reduction. They maintain that because of protein's relatively high thermic effect, fewer calories are ultimately available to the body compared to a meal of similar caloric value but consisting mainly of lipid or carbohydrate. Although this point has some validity, many other factors must be considered in formulating a sound program for weight loss; not least of

these the potentially harmful strain on kidney and liver functions that could result from excessive protein intake. The important point is that or a physically active person, dietary-induced thermogenesis represents only a small portion of the total daily energy expenditure compared to the energy expended through regular physical activity (Mudambi and Rajagopal, 2006).

2.5.5.3 Climate

Environmental factors can influence resting metabolic rate. For example, the resting metabolisms of people living in tropical climates are generally 5 to 20% higher than those of their counterparts living in more temperate areas. Exercise performed in the head also imposes a small additional metabolic load, causing an oxygen uptake increase of about 5% compared to the same work performed in a thermoneura environment. This is probably a result of the thermo genic effect an elevated core temperature as well as the additional energy required for sweat-gland activity and altered circulatory dynamics during work in the heat (Rodliguez *et al.*, 2009).

Cold environments can have a significant effect on energy metabolism both at rest and during exercise, the extent of which depends largely on a person's body fat content and the effectiveness of clothing worn. During extreme cold stress at rest, metabolic rate can double or triple as shivering commences and the body generates heat in an attempt to maintain a stable core temperature. The effects of cold stress during exercise are most evident in cold water because it is quite difficult to maintain a stable core temperature in such an environment (Whitney and Rady, 2008).

2.5.6 Components of Energy Expenditure

The total daily energy expenditure can be estimated by the total sum of energy daily need for basal metabolic processes, which are involuntary. The basal energy expenditure is the minimal amount of energy necessary to sustain life. The energy needed to keep the heart beating, respiration going, and maintain cell metabolism, nerve transmission, body temperature, and so forth. The basal metabolic rate requires that the person have no additional physical logic or psychological stimulation such as digestion, excess temperature regulation, psychological tension, or any physical activities or movement. So it is the energy expenditure required to maintain normal body function at rest (Driskell and Wolinsky, 2011).

2.5.7. Estimating Energy Requirements

In estimating energy requirements the DRI committees developed questions that consider how the following factors influence energy expenditure. Women have a lower BMR than men in large part because men typically have lean body mass. BMR is high in people who are growing. BMR declines during adulthood as lean body mass diminish. This change in body composition occurs in part because some harmony that influence appétit. Body weight and metabolism become more, or less active with age. Physical activities tend to decline as well. The decline in the BMR that occurs when a person becomes less active reflects the loss of lean body mass and may be minimized with ongoing physical activities. Because age influence energy expenditure. It is also factored in to the energy equations (Williams and Devlin, 1991).

2.5.8 Energy expenditure measurement

According to Burke (1998), energy expenditure of an athlete can be calculated as follows and also used as reference for this study. Step one: find the basal metabolic rate (BMR) of an athlete, which is calculated by using body weight, sex and age of an athlete.

Table 2. 2 Average activity levels expressed as multiple of BMR

Activity level	Males	Females
Bead rest	1.2	1.2
Very sedentary	1.3	1.3
Bed rest and light walking	1.45	1.4
Light	1.5	1.5
Light moderate	1.7	1.6
Moderate	1.8	1.7
Heavy	2.1	1.8
Very heavy	2.3	2
Source: Burke(1998),The complete South Africa Guide to Sport Nutrition		

Step three: multiplying basal metabolic rate by the activity level factor

Step four: estimating the energy cost of training competition multiplying the frequency of exercise per week with duration of the activity and multiplying the calculated result (frequency with duration) with estimated energy cost of activity (Kg/minute) of special task or exercise. Then divide the weekly total calculated result by 7 to get a daily average.

Table 2. 3 Estimated energy cost of activity (Kilojoules/minute)

Activity	Body weight				
	50 kg	60 kg	70 kg	80 kg	90 kg
Aerobic beginners	22	26	30	34	39
Aerobic advanced	28	33	40	45	51
Badminton	20	24	28	33	37
Ballroom dancing	11	13	15	17	19
Basketball	29	35	40	46	52
Boxing sparring	46	56	65	74	84
Boxing sparring in ring	29	35	40	46	52
Canoeing leisure	9	11	13	15	17
Racing	22	26	30	34	39
Circuit training	22	26	30	35	40
Cricket batting	17	21	24	28	32
Bowling	19	22	26	30	34
Cycling 9km/hr	13	16	18	21	24
Cycling 15km/hr	21	24	28	33	38
Racing	35	42	49	56	63
Football	28	33	39	44	50
Golf	18	21	25	28	32
Gymnastics	14	16	19	22	25
Hockey	18	20	24	29	33
Judo	41	49	57	65	73
Running 5.5 min per km	40	49	57	65	73
Running 5 min per km	44	52	61	70	78

Running 4.5 min per km	48	55	65	75	83
Running 4 min per km	54	65	76	87	98
Source: Burke(1998),The complete South Africa Guide to Sport Nutrition					

Step five: add step three result on step four

Step six: converting kilojoules per day in to kilocalorie by diving to 4.2

2.5.9. Effects of insufficient energy supply

Insufficiency of energy supply in occurs due to missed meals, poor schedules, neglect or poor health practices .The effects of insufficient energy supply vary with the age group affected and the extent of insufficiency. In adults, it may affect their capacity for work; in children it affects their growth and activity. Through this process body tissues are wasted in order to meet the physical demand of an individual (Mudambi and Rajagopal 2006).

3. MATERIALS AND METHODS

3.1. Description of the study area

Lega Tafo and Lega Dadi town is located in Oromia regional state, along the avenue to Dessie-Mekele at a distance of 21 km from Addis Ababa, the capital of Ethiopia. Geographically it is between 9°01'29" N - 9°06'0" N latitude and between 38°53'42" E - 38°55'30" E Longitude. The study area was conducted in Oromia Regional state clubs particularly Lega Tafo Lega Dadi Athletics clubs in Lega Tafo Lega Dadi town. Lega Tafo Lega Dadi town is found in Oromia special zone surrounding Finfinne, Ethiopia (Mengistu Asefa, 2017).

3.2. Research design

The researcher formulates a research problems, the next step is to put in place the research design (Zikmund *et al.*, 2013). A research design simply refers to a plan of procedures and methods a researcher follow to collect data for the study (Zikmund *et al.*, 2013). In this study, the researcher used a cross sectional survey design. The most popular form of survey design is a cross-sectional survey design. In a cross-sectional survey design, the researcher collects data at one point in time (Cresswell, 2012).

The decision to arrive at an appropriate research design was influenced by the objectives of the study, sources of information, techniques and sampling methodology (Zikmund et al, 2013). The research was undertaken at a point in time. Cross sectional design therefore was not only best fit in this circumstance (Bryman, 2011). The primary objective of this research was to assess the current nutritional status and predict the future performance of athletes.

3.3. Population of the study

Based on the data obtained from Lega Tafo Lega Dadi athletics club in 2019/20 shows that the club had 70 different disciplines including coaches and club managers. It includes throwing event 7 (10.6%), Sprinting event 17 (25.8%), middle distance running event 21 (31.8%) and long distance running 21 (31.8%)

3.4. Sample size and sampling techniques

The club athletes were purposely selected for this study because of the duration and continue nature of their sport that they expend a tremendous number of calories not only during competition, but also in their preparatory training. As mentioned above, athletes were 66 in number of which 33 were male & 33 were female athletes. The athletics club coaches (n = 3) and club manager (n = 1). Totally there were seventy population of the study.

3.5. Source of data

Primary and source of data were collected from Lega Tafo Lega Dadi athletics club athletes, coaches and club Manager. Moreover, primary source includes questionnaire, interviews and observation whereas document analysis was secondary source.

3.6. Data gathering tools

As sources of data Lega Tafo Lega Dadi athletics club athletes, coaches and club Manager were selected for the interviewee and administration of questionnaire. The data were obtained from primary sources of data which includes questionnaire, document analysis, interviews and observation. The primary information gathered from different sources have clear picture of about the study on the assessments of nutritional status athletes. Hence the tools were as discussed below.

3.5.1. Questionnaire

A set of questionnaires' were prepared to gather information regarding the background information, athlete's knowledge and athlete's food consumption frequency. The questionnaire both open ended and close ended questions. Initially, the questionnaires were ~~was~~ prepared in English language and later on translated into Afan Oromo version in order to clarify ideas in the question and gather pertinent data.

3.5.2. Interviews

The researchers use unstructured interview to gather information from coach on training load and athletes' dietary intake or balancing of caloric intake & expenditure. This is because this approach to data collection is extremely useful in situations where either in depth information is needed or little is known about the area (Kumar, 1996). In this regard, the researcher carry out face-to-face interview with coacher.

3.5.3. Observations

Observation is one way to collect primary data. As to Kumar (1996), there are many situations in which observation is the most appropriate method of data collection, for example when the researcher want to learn about the interaction in a group, study dietary patterns of a population & ascertain the functions performed by worker (Kumar, 1996).Hence, the researcher used participatory observation for ten meals to see the amount served and composition roughly. Beside their non-participatory observation was used to see the training session (Macro cycle) and the appropriateness of feeding center. Finally, the sum in KJ is divided by 4.2 to gat kilo Calorie (Kcal).

3.6. Pilot test

The pilot test provides an advance opportunity for the investigator to check the questionnaires and to minimize errors due to improper design of instruments, such as problem of wording or sequence (Adams *et al.,* 2007). The first pilot questionnaire was distributed to athletes on Monday morning and second round questionnaire was distributed exactly after one week at the same time. Then after, both returned questionnaires test retest reliability were calculated and explained as below.

Table 3. 1 Pilot test result of Gelan Athletics club athletes

S.n	**Variable**	**α-level**
1.	Athletes' nutritional knowledge of questionnaire	0.83
2.	Athletes' food frequency questionnaire	0.86

Table.3. 2, indicates that the Athletes' nutritional knowledge of questionnaire (α = 0.83) and Athletes' food frequency questionnaire (α = 0.86). The results of cronbatch alpha level indicate that the questionnaire was good with the major modification of grammars, spelling and general instructions of the questionnaire.

3.5. Data analysis

Analysis was performed using SPSS 23 software. Frequency and percentage were calculated to summarize demographic characteristics of athletes and coaches, knowledge of nutrition and athletes consume food frequently. Simple regression was used to assess the effect of meal pattern on athlete's performance in Lega Tafo Lega Dadi Athletics club. Qualitative analysis was used to supplement the quantitative analysis

3.6. Ethical Consideration

As ethical permission was obtained from the University; a formal letter was submitted to all concerned bodies to obtain their cooperation. Accordingly, signed ethical clearance was obtained from Haramaya University. Lega Tafo Lega Dadi Athletics club permitted to the researcher to collect the data based on the letter obtained from Haramaya University. After was, all participant of the study were willing to participate in filling the questionnaire and interview. Finally, the study respondents were confidentiality were kept; that no one had opportunity to seen the responses except the researcher and the information provided would not be used for anything other than research purpose.

4. RESULTS AND DISCUSSIONS

4.1.1. Demographic characteristics of athletes

Table 4. 1 Demographic characteristics of Lega Tafo Lega Dadi Athletics club

S.n	Variables	alternatives	Frequency	Percentages
1.	Sex	Male	33	50.0
		Female	33	50.0
		Total	66	100.0
2.	Age	<20	54	81.8
		20-30	12	18.2
		Total	66	100.0
3.	Educational level	< Grade 10	48	72.7
		10+2	6	9.1
		Diploma	9	13.6
		First degree	3	4.5
		Total	66	100.0
4.	Training age	1-2 year	25	37.9
		3-5 year	35	53.0
		6-10years	6	9.1
		Total	66	100.0
5.	Training per week	7-9hr	20	30.3
		>10hr	46	69.7
		Total	66	100.0
6.	Athletics event	Throwing	7	10.6
		Sprint	17	25.8
		Middle Distance Running	21	31.8
		Long Distance Running	21	31.8
		Total	66	100.0

The above result indicates the sex of male 33 (50 %) and female athletes 33 (50 %) respectively. Athletes age who was under 20 years 54 (81.8%) and 20-30 years 12 (18.2%). Athlete's educational background reveals that less than grade 10 students 48 (72.7%), grade 10+2 was 6 (9.1%), diploma holder 9 (13.6%) and first degree holder 3 (4.5%) respectively. Athletes have the training age of 1-2 years 25 (37.9%), 3-5 years 35 (53%) and 6-10years 6 (9.1%) respectively. Training per week of an athlete's were 7-9hr 20 (30.3%) and greater than 10hr 46(69.7%) y. Lega Tafo Lega Dadi athletics have throwing 7 (10.6%), Sprint 17 (25.8%), middle Distance Running 21 (31.8%) and long Distance Running 21 (31.8%) respectively.

The above analysis one can interpret that Lega Tafo Lega Dadi athletics club had equal percentage male and female athletes. Majority of athlete's age were under 20 years which shows that they found on performance stage to be trained in the campus. Most of athletes educational background reveals that athletes were under grade 10 this indicate that athletes did not understand the essentiality of athlete's nutrition and their nutrients. Large number of athletes had less than 5 years of training experience. Most of the athletes trained greater than 10hr per week. Lega Tafo Lega Dadi athletics club had given more focus equally to middle Distance running and long Distance Running then to Sprint and throwing event consecutively.

4.1.2. Demographic characteristics of Coaches

Table 4. 2 Demographic characteristics of coaches

S.n	Variables	alternatives	Frequency	Percentages
1.	Sex	Male	4	100.0
2.	Age	30-40 Years	1	25
		>40 years	3	75
		Total	4	100.0
3.	Educational level	Diploma	2	50
		First degree	2	50
		Total	4	100.0
4.	Experience of coaching	0-9	-	-
		10-20years	4	100.0
		20-30	-	-
		30-40	-	-
		Total	4	100.0
5.	Training per week	7-9hr	-	-
		>10hr	4	100.0
		Total	4	100.0
6.	Athletics event per coach	Throwing and jumping	1	25
		800-3000m	1	25
		5000-Marathon	1	25
		Team leader	1	25
		Total	4	100.0

The result above indicates the sex of coaches were male 4(100 %); coaches age ranges from 30-40 Years 1(25%) and greater than 40 years 3(75%); Coaches were diploma 2(50%) and first degree 2(50%) holders; coaches experience of coaching athletics were greater than 10years 4(100%); Coaches offering training per week than 10hr 4(100%) as well as coaches involved in

throwing and jumping 1(25%), 800-3000m(25%), 5000-Marathon(25%) and team leader1(25%) respectively.

This implies that all of a coaches found in Lega Tafo Lega Dadi Athletics club was male; majority of coaches age were greater than 40 years; coaches had equal percentage of diploma and first degree holders; coaches experience of coaching athletics were greater than 10years; coaches offering training than 10hr per week as well as coaches were equally involved in throwing and jumping, 800-3000m, 5000-Marathon and team leader.

4.2. Athlete's knowledge about nutrition

Table 4. 3 Athletes nutritional knowledge

S.n	Items	SD		D		N		A		SA	
		F	%	F	%	F	%	F	%	F	%
1.	You are effectively attend your meal times like (breakfast, lunch, snack and dinner) throughout the week	1	1.5	3	4.5	4	6.1	56	87.9		
2.	You concerned about your food intake (during training, before the competition, 24 hours prior to competition and during recovery)	3	4.5	8	12.1	55	83.3				
3.	You have specific meal plan as training, time, before the competition, 24 hours prior to competition and during recovery?	2	3	57	86.4	5	7.6	2	3		
4.	The main reason why your meal/food item designed by your club in specified times is	4	6.1	4	6.1	6	9.1	52	78.8		
5.	to provide energy, to carbon-load, to provide protein, to provides the meal/food item	2	3	56	84.8	2	3	6	9.1		
6.	You are concerned to control your fluid intake/hydration almost always	2	3	59	89.4	3	4.5				
7.	The most important reason for your fluid intake during the specified times like before, during and after training and competition is following the pre-determined fluid intake for athletes	6	9.1	56	84.8	2	3	2	3		
8.	Fluid replace, provide energy and regulation of body temperature is the main reason for you are drinking a particular drink/fluid before, during and after training and competition.	8	12.1	54	81.8	2	3	2	3		
9.	Your usual total fluid intake during training is 30ml per 15 minutes	4	6.1	58	87.9	2	3	2	3		
10.	Your usual total fluid intake during competition is 30ml per 15 minutes	2	3	56	84.8	2	3	6	9.1		
11.	Your daily meal patterns contain at least one glass of milk or soy milk or yogurt.	2	3	60	90.9	2	3	2	3		
12.	Your intake of supplements like Vitamin C, Vitamin E, Energy Drink, Protein Supplement, Recovery drink example: Juice is regular in meal pattern.	5	7.6	57	86.4	2	3	2	3		
13.	Practice of athletes food consumption	4	6.1	58	87.9	2	3	2	3		
14.	How often do you eat breakfast in the morning?	7	10.6	55	83.3	2	3	2	3		
Aggregate result		**3**	**6**	**45**	**69**	**7**	**10**	**10**	**15**		

The result above shows that Lega Tafo Lega Dadi athletics club effectively attended your meal including breakfast, lunch, snack and dinner throughout the week respondent replied that strongly disagree 1 (1.5%), disagree (1.5%), 3(4.5%), Neutral 4(6.1%) and agree 56(87.9%) respectively. Athletes were about your food intake (during training, before the competition as well as 24 hours prior to competition and during recovery) replied strongly disagree 3(4.5%), disagree 8 (12.1%) and neutral 55(83.3%).

Athletes had specific meal plan as training, time, before the competition, 24 hours prior to competition and during recovery responded that strongly disagree 2(3%),disagree 57(86.4%),neutral 5 (7.6%) and agree2(3%) respectively. Athletes meal was designed for specific time responded strongly disagree 4(6.1%), disagree 4(6.1%), neutral 6(9.1%) and agree 52(78.8%) respectively. The club provide energy food like carbohydrate and protein strongly disagree 2(3%), disagree 56(84.8%), neutral 2 (3%) and **A**gree 6(9.1%) respectively. Always Athletes control your fluid intake/hydration strongly disagree 2(3%) , disagree 59 8(9.4%) and neutral 3(4.5%) respectively. The most important reason for your fluid intake during the specified times like before, during and after training and competition is following the pre-determined fluid intake for athletes response was strongly disagree (6 9.1%), disagree 56(84.8%), neutral 2(3%) and agree 2(3%).

In the same scenario, fluid replace, provide energy and regulation of body temperature is the main reason for you are drinking a particular drink/fluid before, during and after training and competition responded strongly disagree 8 (12.1%), disagree54 (81.8%) , neutral 2(3%) and agree 2 (3%) respectively. Athletes usual total fluid intake during training is 30ml per 15 minutes answered strongly disagree 4(6.1%), disagree58 (87.9%), neutral 2(3%) and agree 2(3%) respectively.

Athlete's total fluid intake during competition is 30ml per 15 minutes answered strongly disagree 2(3%), disagree 56(84.8%), neutral 2(3%) and agree 6(9.1%) respectively. Athlete's daily meal patterns contain at least one glass of milk or soy milk or yogurt replied strongly disagree 2(3%), disagree 60(90.9%), neutral 2(3%) and agree 2(3%) respectively. Athlete's intake of supplements like Vitamin C, Vitamin E, Energy Drink, Protein Supplement, Recovery drink for example: Juice is regular in meal pattern replied strongly disagree 5(7.6%), disagree 57(86.4%), neutral

2(3%) and agree 2(3%) respectively. The club regularly practice of athletes food consumption answered strongly disagree4 (6.1%), disagree58 (87.9%) ,neutral2(3%) and agree 2(3%) respectively. Athletes frequently eat breakfast in the morning responded strongly disagree 7(10.6%), disagree 55(83.3%), neutral 2(3%) and neutral 2(3%) respectively. Athlete's knowledge of nutrition showsstrongly disagree3 (6%), disagree45 (69%), neutral7 (10%) and agree 10 (15%) respectively.

From the above result one can understand that Lega Tafo Lega Dadi Athletics clubs agreed that athletes effectively attended your meal including breakfast, lunch, snack and dinner throughout the week. Athletes were agreed about their food intake (during training, before the competition as well as 24 hours prior to competition and during recovery). Athletes had not specific meal plan as training, time, before the competition, 24 hours prior to competition and during recovery. Athlete's meal had designed for specific time. The club did not provide energy food like carbohydrate and protein. Always Athletes did not control your fluid intake/hydration. The most important reason was not for your fluid intake during the specified times like before, during and after training and competition is following the pre-determined fluid intake for athletes.

Correspondingly, fluid replace, provide energy and regulation of body temperature was not the main reason for you are drinking a particular drink/fluid before, during and after training and competition. Athletes were not took usual total fluid intake during training is 30ml per 15 minutes. Athlete's total fluid intake during competition was not 30ml per 15 minutes. Athlete's daily meal patterns were not contained at least one glass of milk or soy milk or yogurt. Athletes were not taking intake of supplements like Vitamin C, Vitamin E, Energy Drink, Protein Supplement, Recovery drink for example: Juice is regular in meal pattern. The club does not regularly practice of athlete's food consumption. Athletes did not frequently eat breakfast in the morning. Athlete's Lega Tafo Lega Dadi athletics club did not have sufficient knowledge of sport nutrition.

Strengthening the above idea, the cost of athlete's nutrition during training was 100 per day which cover their breakfast, lunch and dinner. In the year 2019/20 100birr was not sufficient enough to cover the ever increase expense of nutrition overnight. Additionally, during competition 200birr was allocated to athletes which includes their breakfast, lunch, dinner and

accommodation cost. Because of this low allocation athletes did not have enough sport nutrition during training and competition.

However, most of the club athletes were international athletes who were trained and paid-up by their managers. Some of their expenses were cover by managers and also athletes were know how of sport nutrition so that from their money they used sport drinks such as juice, honey, sugarcane, orange, supplements and others. One of their coaches was African coach of the year 2018/19; from his demography athletes have been getting experience and education with respect to sport nutrition. Beside this, Lega Tafo Lega Dadi athletics club track and environment were most suitable and attractive to athletes for athletes that most of Addis Ababa clubs and individuals used their tracks for rent.

In agreement with this finding Azizi *et al.,* (2010) reported that the nutritional knowledge of Ethiopian athlete was poor, especially in the area of nutrient functions as indicated by their poor food choices and dietary practices. Although the energy contribution from macronutrients (carbohydrate, protein and fat) has been reported to be within the recommended intakes for Acceptable Macronutrient Distribution Ranges (AMDR), yet overall lower mean daily energy intakes were observed in various athletics club (Burke *et al.,* 2006: Martin *et al.,* 2006).

4.3. Frequency of athletes food consumption

Table 4. 4 Frequency of athletes food consumption

S.n	Items	Never		Sometimes		Often		Always	
		F	%	F	%	F	%	F	%
1.	Based on three meals per day, how often do you skip at	48	72.7	8	12.1	5	7.6	1	1.5
2.	least one meal per day	2	3.0	60	90.9	2	3	2	3
3.	How often do you take vitamin supplements?	2	3	56	84.8	6	9.1	2	3
4.	How often do you take mineral supplements?	2	3	56	84.8	2	3	6	9.1
5.	How often do you eat at least three meals per day	3	4.5	11	16.7	50	75.8	2	3
6.	How often do you record what you eat?	53	80.3	6	9.1	7	10.6		
7.	How often do you drink water?	2	3	55	83.3	7	10.6	2	3
8.	How often do beverages? You drink sweetened	2	3	55	83.3	7	10.6	2	3
9.	How often are you on a “diet”?	2	3	52	78.8	2	3	10	15.2
10.	How often do pasta, potatoes, you eat breads, cereals, or rice?	1	1.5	5	7.6	9	13.6	51	77.3
11.	How often do apples, bananas, you eat fruits, such as or oranges?	49	74.2	10	15.2	7	10.6		
12.	How often do you eat vegetables, such as broccoli, tomatoes, carrots, or salad?	2	3	53	80.3	9	13.6	2	3
13.	How often you do eat complete sources of protein such as beef, chicken, turkey, eggs, and fish?	6	9.1	8	12.1	52	78.8		
14.	How often do you eat berry jams, cookies, candies, or other sweets?	49	74.2	10	15.2	7	10.6		
Aggregate result		12	19	30	43	12	19	12	19

The above result indicates athlete's food consumption practice of Lega Tafo Lega Dadi athletics club ate three meals per day, how often do you skip at reported never 48 (72.7%), sometimes 8(12.1%), and often 5(7.6%) and always 1(1.5%) respectively. Athletes were responded that athletes had at least one meal per day never 2(3.0%), sometimes 60 (90.9%), often 2(3%) and always 2(3%) respectively. Frequency of athletes vitamin supplements intake response shows never 2(3%), sometimes 56 (84.8%), often 6(9.1%) and always 2 (3%) respectively. Frequency of athletes mineral supplements intake response indicates never 2 (3%), sometimes 56(84.8%), often 2(3%) and always 6 (9.1%) respectively.

Athletes ate at least three meals per day response indicates never 3(4.5%), sometimes 11(16.7%), often 50(75.8%) and always 2(3%) respectively. Frequency of athlete's nutrition record shows never 53(80.3%), sometimes 6(9.1%) and often 7(10.6%) respectively. Frequency of athlete's drinking water reported as never 2(3%), sometimes 55(83.3%), often 7(10.6%) and always2(3%) respectively.

With this connection frequency of athlete's sweet beverage intake response reveals never 2(3%), sometimes 55 83.3%), often 7 (10.6%) and always 2(3%) respectively. frequency of athlete's nutrition intake shows never 2(3%), sometimes 52 (78.8%),often 2(3%) and always 10(15.2%) respectively. Frequency of athlete's How often do pasta, potatoes, you eat breads, cereals, or rice intake shows never 1(1.5%), sometimes 5 (7.6%), often9 (13.6%) and always 51(77.3%) respectively. Frequency of athlete's apples, bananas, you eat fruits, such as or oranges intake response indicates never 49(74.2%), sometimes 10(15.2%) and often 7(10.6%) respectively.

Frequency of athlete's broccoli, tomatoes, carrots and salad intake response implies never 2(3%), sometimes 53 (80.3%), often 9(13.6%) and always 2(3%) respectively. Frequency of athlete's complete sources of protein such as beef, chicken, turkey, eggs, and fish intake shows never 6(9.1%), sometimes 8 (12.1%) and often 52(78.8%) respectively. Frequency of athlete's berry jams, cookies, candies, or other sweets intake shows never 49(74.2%), sometimes 10(15.2%) and often 7 (10.6%) respectively. Frequency of athletes food consumption aggregate result shows never 12(19%), sometimes 30(43%), often 12(19%) and always 12(19%) respectively.

The above analysis implies that majority of Laga Tafo Laga Dadhi athletics club athletes did not skipped ate three meals per day. Athletes had at least one meal per day never. Athletes took vitamin supplement sometimes. Almost all of athletes had mineral supplements sometimes. Athletes ate at least three meals per day often. Majority of athlete's drunken water sometimes. Athletes took sweet beverage sometimes. Athletes took sport nutrition sometimes. Athlete's pasta, potatoes, you eat breads, cereals, or rice intake always. Athletes never took apples, bananas and oranges. Athletes took broccoli, tomatoes, carrots and salad sometimes. Athletes ate complete sources of protein such as beef, chicken, turkey, eggs and fish often. Athletes never ate berry jams, cookies, candies, or other sweets. Laga Tafo Laga Dadhi athletics clubs athletes had sport nutrition food consumption sometimes.

Observational analysis depicts that athlete's daily nutrition requirement and training (completion) energy intake was the same but dietary intake was different during competition because competition was held in different Ethiopian place and across the globe. More importantly, the daily athlete's dietary intake depends on your age, height, weight, and sport or activity level. In general, athletes need to replace the number of calories they burn each day. Calories measure the energy athletes get from food. Most people need between 1,500 and 2,000 calories a day. The recommended daily carbohydrate intake for athletes ranges from 6-10 g/kg body weight and endurance athletes are advised to ingest between 1.2-1.4 grams of protein per kilogram of body weight each day. This was far from what Laga Tafo athletes were practicing because running, jumping and throwing athletes shares the same menu.

In this study, the researcher observation shows that athletes dietary intake before, during and after training below the recommended guideline. As a result the researcher suggests that it is better if athletes take 1-1.2 grams of carbohydrates per kilogram of body weight per hour for the first four hours after exercise. Refueling may be enhanced by consuming small amounts of carbohydrate more frequently (every 15-30 minutes) for up to four hours.

The fat, protein and fluid drink content found Laga Tafo Laga Dadhi Athletics menu was below the standard. Although healthy fats are an important part of our overall diet, eating high fat meals or snacks before exercising can compromise your workout. If the pre-workout meal has not been digested, it will not provide 'fuel' for the session. It's recommended that you consume 0.14–0.23 grams of protein per pound of body weight (0.3–0.5 grams/kg) very soon after a

workout. Studies have shown that ingesting 20–40 grams of protein seems to maximize the body's ability to recover after exercise. Drink 0. 5l to 0. 6l of water 2 to 3 hours before you start exercising. Drink 8 ounces of water 20 to 30 minutes before you start exercising or during your warm-up. Drink 0.2l to 0.3l of water every 10 to 20 minutes during exercise. Drink 0.25l of water no more than 30 minutes after you exercise.

Thus Lega Tafo Lega Dadi Athletics clubs have to provide high glycemic index foods during or after exercise (such as glucose, potatoes, bagels, raisins, oatmeal, sugar) and stick with low to moderate index foods before exercise (pasta without sauce, chocolate milk, Powebar, green beans, yogurt, apples, less ripe bananas), especially if you are eating within 60-90 minutes of the event.

Documents were reviewed especially athlete's menu, coaches were interviewed and observation was closely made in order to qualitatively analyze the finding of the study. Data were accordingly interpreted as below. On Monday breakfast, lunch and dinner athletes ate egg, roasted meat (tibsi) and rice. Tuesday breakfast, lunch and dinner athletes ate Meat (Dullat), Pasta and Boiled Meat (qiqil). Wednesday breakfast, lunch and dinner athletes ate Forage, Vegetable dish and Rice. Thursday breakfast, lunch and dinner athletes ate Meat (Dullat), Pasta and Boiled Meat (qiqil). Friday breakfast, lunch and dinner athletes ate Forage, Vegetable dish and Rice. Saturday breakfast, lunch and dinner athletes ate Egg, Roasted Meat (Tibsi) and Boiled Meat (qiqil). Sunday breakfast, lunch and dinner athletes ate Forage, Roasted Meat (Tibsi) and Rice. The club team leader supervises their nutrition intake sometimes when there were complaints.

In agreement with this study insufficient dietary intake can result in delayed growth, disturbed muscle development, alter the normal pattern of pubertal development and can affect the overall athlete's athletic performance (Rankinen *et al.,* 1995; ADA/DC/ACSM, 2009; Maughan and Shirreffs, 2013).

The other similar research output depicts that the energy intake of female soccer players from UK was found to be lower than the recommended intakes (Martin et al., 2006). Similarly the mean daily intake of energy in female synchronized skaters from 2002 US National Synchronized Skating Teams was found to be less than the recommended intake for 11-18 years

of female athletes exercising for 10-20 h/week (Ziegler and Jonnalagadda, 2006). Low daily energy intakes might result in weight loss, disruption of endocrine function, loss of strength and endurance, compromised immune system, menstrual dysfunction, failure to gain bone density and may increase the risk of fatigue, injury and illness (Burke *et al.*, 2006; ADA/DC/ACSM, 2009).

4.4. The effect of meal pattern on athletes' performance of Lega Tafo Lega Dadi Athletics club

Table 4. 5. Simple regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.034[a]	.001	-.014	0:00:00
a. Predictors: (Constant), meal pattern				

The standard approach for describing the relationships in this problem is linear regression. The most common measure of how well a regression model fits the data is R^2. This statistic represents how much of the variance in the response is explained by the weighted of predictors. The closer R^2 is to 1, the better the model fits. Regressing Preference on the meal pattern results in an R^2 of .001, indicating that approximately 1% of the variance in the athletes' performance is explained by the meal pattern in the linear regression. The remaining 99% of variation athletes' performance explained by excluded variables.

Table 4. 1 The effect of meal pattern on athletes' performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.341	.720		4.640	.000
Meal pattern	.006	.022	.034	.272	.787
Dependent Variable: performance					

The standardized coefficients are shown in the table. The sign of the coefficient indicates whether the predicted response increases or decreases when the predictor increases, all other predictors being constant.

The value of the coefficient reflects the amount of change in the predicted preference ranking. Using standardized coefficients, interpretations are based on the standard deviations of the variables. Each coefficient indicates the number of standard deviations that the predicted response changes for a one standard deviation change in a predictor, all other predictors remaining constant. In this case, since alpha value is greater than the level of significance p = .787. The null hypothesis was accepted that the regression model is insignificant. Since the model is inadequate that the regression model is useless for inferential purpose.

In disagreement with this finding, nutrition knowledge and attitudes have an effect on eating habits and inadequate nutritional knowledge may contribute to poor dietary behavior (Sakamaki *et al.,* 2005; Heaney et al., 2011; Sedek and Yih, 2014). Sakamaki *et al.,* (2005) observed that 85.6% of students were aware of the concept of nutritionally balanced food, but only 7% applied it when selecting foods from the menu. Very limited information is available from Arabian Gulf region, in particular from Oman regarding the nutritional knowledge, dietary habits and type of physical training of athletes (Waly *et al.,* 2013).

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary of major findings

The purpose of this study was to nutritional Status and Performance of Lega Tafo Lega Dadi athletics club, Oromia regional state, Ethiopia. This attempted to answer the following research questions such as:

- Do athletes have sufficient knowledge of nutrition in Lega Tafo Lega Dadi Athletics club?
- To what extent athletes consume food frequently in Lega Tafo Lega Dadi Athletics club?
- Do demographic characteristics of athletes affect their food consumption in Lega Tafo Lega Dadi Athletics club?

In order to answer the above research questions descriptive survey method was used, all the club athletes were purposely selected, and data collection instrument such as questionnaire, document analysis, interviews and observation were used. Analysis was performed using SPSS 23.0 (SPSS Inc., Chicago, IL) software. Frequency and percentage were calculated to summarize demographic characteristics of athletes and coaches, knowledge of nutrition and athletes consume food frequently. Simple regression was used to assess The effect of meal pattern on athletes' performance in Lega Tafo Lega Dadi Athletics clubs. Qualitative analysis was used to supplement the quantitative analysis

Majority of athletes (69%) did not have sufficient athlete's knowledge of nutrition while less number of athletes had sufficient knowledge of athletics. Additionally, large numbers of athletes (43%) athletes' food consumption frequency were reported sometimes.

The null hypothesis was accepted that the regression model is insignificant. Since the model is inadequate that the regression model is useless for inferential purpose.

5.2. Conclusions

Athletes who had international experience have sufficient nutritional knowledge experience what to eat, how and when to eat sport nutrition during training and competition. This enables them enhance their athletic performance. However, beginner athletes, those who lacks international experience and not under supervision of athletic manager did not have sufficient nutrition knowledge.

Lega Tafo Lega Dadi Athletics club provides three daily nutritional requirement menu's per day, which was poor in its' nutritional content. Experienced athletes get nutritional supplement by themselves while other did not.

The study confirmed that athlete's meal pattern did not affect the performance Lega Tafo Lega Dadi athletics club athletes, because most the athletes were experienced. While, few them were affected by due to lack of knowledge, budget and experience.

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5.3. Recommendation

Based on the finding of the study the following recommendations were drawn. This includes:

- Lega Tafo Lega Dadi athletics club per-dium allocation was very low too covering athlete's breakfast, lunch, dinner and accommodation. Thus, Lega Tafo Lega Dadi athletics club management body allocates sport nutrition expense to their athletes.
- Lega Tafo Lega Dadi athletics club athlete's nutritional cost allocation per day was low during training cover their breakfast, lunch and dinner. Hence, Lega Tafo Lega Dadi athletics club management body allocates sport nutrition expense to their athletes
- There was mass nutrition system in which runner, throwers and jumpers share the same menu. So that the researcher recommends that Lega Tafo Lega Dadi athletics club has to identify and feed different type of nutrition across athletics events,
- The athletes of Lega Tafo Lega Dadi athletics club recommended to take extra meal in addition to nutrition provided by the athletics club.

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Appendix - A

A Survey Questionnaire for the Athletes

Dear Respondents!

You are selected as a sample respondent. I believe that you can provide valuable information that contributes immensely to the research concerned. Please take a few moments to complete this questionnaire. It is for the purpose of conducting a research on the Assessment of Nutritional Status and Performance of Lega Tafo Lega Dadi Town Athletics Club. So I kindly request you to fill this questionnaire and give your genuine response, because it gives a great benefit for the success of the research.

Thank you in advance for your Cooperation.

N.B: No need to mention your name and any of your personal information.

Part I General Information

Instruction: Put check mark (√) on one of your choice for the information listed below.

1. Sex: Female ☐ Male ☐
2. Age: A. ≤ 20 ☐ B. b/n 20 and 30 C. ≥30 ☐
3. Educational Background
   - A. Grade 10 & below ☐
   - B. 10+2 ☐
   - C. Diploma ☐
   - D. B.A/BSc and above ☐
4. Duration of the respondent in Lega Tafo Lega Dadi town Athletics club
   - A. 1-2year ☐
   - B. 3-5 year ☐
   - C. 6-8 year ☐
   - D. 9 year and above ☐
5. Training sessions per a week
   - A. 2-3 sessions ☐
   - B. 4-6 sessions ☐
   - C.7- 9 sessions ☐
   - D. above 10 sessions ☐

6. In which athletics discipline your taking part_____

7. What is your best personal best in time (meter)_____

PART II. **Answer the questions below based on their sense**.

No	**Athletes' nutritional knowledge**	**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
1	You are effectively attend your meal times like (breakfast, lunch, snack and dinner) throughout the week					
2	You concerned about your food intake (during training, before the competition, 24 hours prior to competition and during recovery)					
3	You have specific meal plan as training, time, before the competition, 24 hours prior to competition and during recovery?					
4	The main reason why your meal/food item designed by your club in specified times is to provide energy, to carbon-load, to provide protein, to provides the meal/food item					
5	You are concerned to control your fluid intake/hydration almost always					
6	The most important reason for your fluid intake during the specified times like before, during and after training and competition is following the pre-determined fluid intake for athletes					
7	Fluid replace, provide energy and regulation of body temperature is the main reason for you are drinking a particular drink/fluid before, during and after training and competition.					
8	Your usual total fluid intake during training is 30ml per 15 minutes					
9	Your usual total fluid intake during competition is 30ml per 15 minutes					
10	Your daily meal pattern contain at least one glass of milk or soy milk or yogurt.					
	Your intake of supplements like Vitamin C, Vitamin E, Energy Drink, Protein					

11	Supplement, Recovery drink example: Juice is regular in meal pattern.					
	Practice of athletes food consumption	1. Never: Does not occur at all 2. Sometimes: 1-2 days per week 3. Often: 3-4 days per week 4. Always: 5-7 days per week				
		1	2	3	4	
1	How often do you eat breakfast in the morning?					
2	Based on three meals per day, how often do you skip at least one meal per day					
3	3. How often do you take vitamin supplements?					
4	How often do you take mineral supplements?					
5	How often do you eat at least three meals per day					
6	How often do you record what you eat?					
7	. How often do you drink water?					
8	How often do beverages? You drink sweetened					
9	How often are you on a “diet”?					
10	How often do pasta, potatoes, you eat breads, cereals, or rice?					
11	How often do apples, bananas, you eat fruits, such as or oranges?					
12	How often do you eat vegetables, such as broccoli, tomatoes, carrots, or salad?					
13	How often you do eat complete sources of protein such as beef, chicken, turkey, eggs, and fish?					
14	How often do you eat berry jams, cookies, candies, or other sweets?					

APPENDIX - B

Interview for a survey study to the Coaches and Club Manager

Dear Respondents!

You are selected as a sample respondent this interview. So that I kindly request you to respond this interview, because it mandatory for the success of the study.

1. How much you effectively attend your athletes' meal times and its pattern like (breakfast, lunch, snack and dinner) throughout the week?
2. What do you think that the fluid intake of your athletes' during the specified times like before, during and after training and competition is following the pre-determined fluid intake for athletes?
   2.1 How much their usual total fluid intake during training?
   2.2 How much their usual total fluid intake during competition?
3. What do you advice for your athletes' the intake of supplements like Vitamin C, Vitamin E, Energy Drink, Protein Supplement, Recovery drink example: Juice is regular in meal pattern.

Appendix-C
Athlete's nutrition menu

S.n	Time of the day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1.	Breakfast	Egg	Meat (Dullat)	Forage	Meat (Dullat)	Forage	Egg	Forage
2.	Lunch	Roasted Meat (Tibsi)	Pasta	Vegetable dish	Pasta	Vegetable dish	Roasted Meat (Tibsi)	Roasted Meat (Tibsi)
3.	Dinner	Rice	Boiled Meat (qiqil)	Rice	Boiled Meat (qiqil)	Rice	Boiled Meat (qiqil)	Rice

Appendix – D

Check list for Observation of Nutritional Status

_____ _____ _____ _____

Date Month Year Meal Time

Situation	Recommendations		Actual Practice	Practical Consideration
Daily Requirement	CHO: 5-10g/kg/day			
	Protein: 1.2-2g/kg/day			
	Fat: 20% of total energy intake			
	Hydration	BT: Sufficient fluid		
		DT: Sufficient fluid		
		AT: Sufficient fluid		
Pre-Training	CHO: 1-4g/kg/day			
	Protein: 0.25-0.4g/kg/day			
	Fat: 20% of total energy intake			
	Hydration ~ 5-7ml/4hrs before exercise task			
After Training	CHO: 1.0-1.2g/kg/day			
	Protein: 0.25-0.4g/kg/day			
	Fat: 20% of total energy intake			
	Hydration: ingest 125-150% of fluid lost			
During Competition	CHO: 30-60g/kg/hr			
	Hydration: ingest adequate fluid			
After Competition	CHO: 1.0-1.2g/kg/hr			
	Protein: 0.25-0.4g/kg/day			
	Fat: 20% of total energy intake			
	Hydration: ingest adequate			

Appendix – E

Information sheet and Consent to participate voluntarily in this research study

If there is any questions or enquires any time about the study or the procedures, please contact the investigator.

Researcher's Name: Arfase Eliyas Ayana

Supervisor's Name :

Major Advisor Abinet Ayalew (PhD)

Co – Advisor Negussie Bussa (PhD)

This title: Assessment of Nutritional Status and Performance: In the Case of Lega Tafo Lega Dadi Athletics Club, Oromia Regional State, Ethiopia.

Purpose of the Study

The purpose of this study is to assess Nutritional Status and Performance: In the Case of Lega Tafo Lega Dadi Athletics Club, Oromia Regional State, Ethiopia

Procedure and Duration.

The researcher will be interviewing you using a questionnaire to provide me with pertinent data that is helpful for the study. In this study Assessment of Nutritional Status and Performance: In the Case of Lega Tafo Lega Dadi Athletics Club, Oromia Regional State, Ethiopia will be conducted before during as well as the end of training and competition program. Participation in the study will for 3 days per week observing.

Risk and Benefits

The risk of being participating in this study is very minimal, Assessment of Nutritional Status and Performance of Athlets, in Lega Tafo Lega Dadi Athletics, is not any direct payment for participating in this study and again you will not pay for your participation. But the findings from this research may reveal important information for the investigator.

Confidentiality:

The information and data obtained from you will be kept confidential. However, you are free to disclose it to your own physician. The information will be used only for the sake of the research and it will not be personalized. The data will be reported and presented without reference to the individual identify.

Rights:

Your participation in this research study is voluntary. If your administration decide not to participate, your athletes and coaches have the right to withdraw from the study at any time and this will not label your athletes and coaches for any loss of benefits which they otherwise are entitled but it is not advisable.

Contacts address

If there is any questions or inquires any time about the study or the procedures, please contact:

Arfase Eliyas _____+251912015535)

E-mail: _____arfaseeliyas@gmail.com

Abenet Ayalew (PhD) _____ (+251911827322)

E-mail: _____amenab2012@yahoo.com

Negussie Bussa (PhD) _____ (+251910275526)

Appendix – F

Description of the study area.

Map of Laga Tafo Laga Dadhi, Oromia, Ethiopia

As illustrated on the above figure, Lega Tafo Lega Dadi athletics club is found in Lega Tafo Lega Dadi Woreda, Oromia special zone surrounding Addis Ababa, Ethiopia.