ANALYTICAL STUDY OF ENERGY INTAKE AND EXPENDITURE OF ARCHERY PLAYERS AND LONG DISTANCE RUNNERS

KULJINDER SINGH

Department of Physical Education, Government Senior Secondary School Chherhatta, Amritsar, Punjab, India
E-mail id- rajumalhi78@gmail.com

Abstract- Knowledge of food and nutrition has a direct bearing on the maintenance of sound health of an individual. The energy balance requires the understanding of facets of energy expenditure and energy intake. The knowledge of caloric intake just like caloric expenditure is very important. Research is conducted to find out the dietary intake and Expenditure and to evaluate the difference of dietary intake of Archery Players and Long Distance Runners. It is found that the energy intake was more in Long Distance Runners as compared to Archery Players and the energy expenditure was more in Long Distance Runners as compared to Archery Players.

I. INTRODUCTION

To keep our body cells running properly, they must be supplied with correct amount food having required chemicals in ratio of the food. The chemicals in food which our body needs are called nutrients. The nutrients include proteins, carbohydrates, fats, vitamins and minerals. These nutrients are chemical substances which are present in the food we eat daily.
Nutrition is the science that deals with food and its uses by the body. The science of nutrition has a great value for its ultimate goal, the development and maintenance of strong, study bodies. It is the science of foods and their relation to health. It has an immediate objective for the determination of what components of foods are needed for health and how much of each dietary essentials are required for infants, children, adolescents and athletes.
The energy needs and diet schedule for an athlete also varies because of difference in the factors like age, sex, body size, duration and severity of training, climatic conditions, types of sports\games, occupation and physical activity patterns. In sportsmen this factor is more important as there are wide variations in the energy needs between individuals of different sports activities. Athletic performance improves with wise nutrition and crumbles with nutritive deficiency. Knowledge of food and nutrition has a direct bearing on the maintenance of sound health of an individual. The energy balance requires the understanding of facets of energy expenditure and energy intake. The knowledge of caloric intake just like caloric expenditure is very important. An athlete or coach must be familiar with the planning of diet from the view point of nutrient requirement of his body.
For every Kg of body weight 1.3 calories of energy is required every hour. (An athlete weighting 50 Kg would require 1.3 x 24 hours x 50 Kg = 1560 calories/day). For each hour of training you require 8.5 calories of energy for each Kg of body weight. (For a two hour training session our 50 Kg athlete would require 8.5 x 2hrs x 50 Kg = 850 calories). An athlete weighting 50Kg who trains for two hours would require an intake of approx 2410 calories (1560 + 850).
Compared with the general population, endurance athletes and those involved in strength or speed events, such as weight lifters or sprinters, have increased protein requirements. It has been estimated that non-athletes require 0.75g protein/kg body weight/day, whereas endurance athletes need 1.2g to 1.4g/kg/day and strength and speed athletes 1.2 to 1.7g/kg/day. However, these intakes can easily be achieved through a normal balanced diet that meets an athlete's energy requirements and protein or amino acids supplements are not necessary. Indeed, extra protein intake above requirements has no advantage for either performance or muscle size.
The present study is the Analytical study of energy intake and expenditure of Archery Players and Long Distance Runners.

II. OBJECTIVES OF THE STUDY

- To find out the dietary intake and expenditure of archery players and long distance runners.
- To evaluate the difference of dietary intake of archery players and long distance runners.

III. HYPOTHESES

There will be significant difference in energy intake and energy expenditure of long distance runners and archery players.

IV. DELIMITATIONS

- The study is delimited to archery players and long distance runners those who have at least participated at the inter-university level competition.
- The study is delimited to male groups only.

- The subjects taken for the study are only 20 in number.
- The study is delimited to age ranging between 17 to 25 years.

V. SIGNIFICANCE OF THE STUDY

- The study will provide the nutritional guidelines for archery players and long distance runners.
- The study would lay down the guidelines for the coaches and physical education teachers and sports administration for searching the diet given to the players.
- The study would help them to find out balance diet for the athletes according to their game to raise the standard of the players and the sports performance.
- It would help to prepare dietary schedule for long time training which will help to get best results.

Candice and Christie (2008) conducted a study to compare the energy demands of manual harvesting tasks with the associated energy intake of the workers'. The data indicated that the tasks placed 'moderate-to-heavy' demands on the workers resulting in a significant imbalance between the energy demands of the tasks and the associated energy intake of the workers. M.NHassapidou and A. Manstrantoni (2008) conducted a study on dietary intakes and the energy balance of elite female athletes of four different sports. It is concluded that Energy intakes varied between sports and between athletes of the same sport. Calculated energy expenditure was higher from the reported energy intake for most athletes. Athletes with the lowest energy intakes reported menstrual abnormalities.

Louise Martin et. al. (2006) conducted a study to establish the nutritional practices and activity patterns of elite female soccer players. It is concluded, to encourage consumption of carbohydrate-electrolyte beverages to enhance carbohydrate intake and increase fluid intake, and ensure sufficient iron rich foods are included in the diet to meet the DRI. S. Vogt et. al. (2005) made a research to quantify the nutritional status of eleven cyclists of a professional. The analysis of the food diary showed that these experienced riders composed a carbohydrate-rich and low-fat diet by themselves as recommended for high-performance endurance athletes. When compared to nutritional guidelines, the composition of the diet in the present study can be considered as adequate. Hill and Davies (2002) made a research to determine the energy expenditure (EE) and hence energy requirements of lightweight male rowers Due to the underreporting of EI, diet recording may not be an appropriate way of assessing energy requirements in lightweight male rowers. A benefit of accurately determining energy requirements, as with DLW, is that male lightweight rowers will be able to successfully manipulate their EI and achieve the set weight cut-off for participation without compromising their health or performance.

The players selected for sample were provided Performa of daily energy intake and energy expenditure chart. For determining the caloric intake, a record of everything eaten and drink along with the specific amount has recorded. A food database had been prepared of different Indian foods about 50 commonly used recipes and for determining the caloric expenditure every activity done by the player in the whole day e.g. walking, running, exercising etc. has recorded.

For determining the total daily caloric/energy intake and expenditure for 7 days was recorded and thus total caloric intake and expenditure in Kcal/day had been found.

As per the nature of the study the investigator used ANOVA and t-test to find out the nutritional status of Archery Players and Long Distance Runners.

VI. ANALYSIS AND DISCUSSION

Data has been analyzed to test the mean as well as comparison of energy intake and expenditure of Judokas, Yoga Practitioners, Archery Players and Long Distance Runners. Comparative analysis of the selected variables have statistically analyzed by applying ANOVA and t-test.

Table 1
Mean, S.D. and‘t’ ratio for Calories Intake of Long Distance Runners and Archery Players

Group	Total No. of observations	Mean	S.D.	t-ratio
Long Distance Runners	70	5118.1	94.58	84.16**
Archery Players	70	3732.8	100.09	

** Significant at 0.01 and 0.05 level

No of observations = No. of days x No. of subjects

In Table 1, the mean scores show that the energy intake of Long Distance Runners and Archery Players (5118.1 and 3732.8) respectively. Thus the result indicates that the energy intake was more in Long Distance Runners as compared to Archery Players. When‘t’ value was calculated (t = 84.16, significant at both the levels of significance i.e. 0.05 and 0.01 respectively), it gives significant difference in the caloric intake between Long Distance Runners and Archery Players.

Table 2
Mean, S.D. and‘t’ ratio for Calories Expenditure of Long Distance Runners and Archery Players

Group	Total No. of observations	Mean	S.D.	t-ratio
Long Distance Runners	70	5462.6	96.97	112.9**
Archery Players	70	3390.6	118.99	

** Significant at 0.01 and 0.05 level

No of observations = No. of days x No. of subjects

In Table 2, the mean scores show that the energy expenditure of Long Distance Runners and Archery Players (5462.6 and 3390.6) respectively. Thus the result indicates that the energy expenditure was more in Long Distance Runners as compared to Archery Players. When 't' value was calculated (t = 112.9, significant at both the levels of significance i.e. 0.05 and 0.01 respectively), it gives significant difference in the caloric expenditure between Long Distance Runners and Archery Players.

The statistical analysis of data shows that the calories intake and also expenditure of long distance runners is more than other groups of Athletes or players. Energy intake depends upon the duration of activity and intensity of exercise. Long duration exercise needs high intake of energy. Long distance runners perform activities for long period of time. They burn more calories as so their intake and expenditure is high. Cathy et. al. (1992) conducted a study on daily energy expenditure and nutrient intake of male athletes who run more than 70 km/wk and find that their energy intake is less than energy expenditure. His results are relevant to this study because this study also shows that the energy intake of Long Distance Runners was less than energy expenditure.

Results also show that the calories intake and expenditure of Archery Players is low in comparison to Long Distance Runners. Energy intake depends upon the duration of activity and intensity of exercise. Short duration exercise needs less intake of energy. They consume less energy due to low intensity of exercise because they don't need high energy in their specific work. They also need less no. of calories because they do not need high strength and Aerobic capacity in comparison to long distance runners.

When 't' value of the caloric intake between Long Distance Runners and Archery Players was calculated (t = 84.16, significant at both the levels of significance i.e. 0.05 and 0.01 respectively), it gives significant difference in the caloric intake between Long Distance Runners and Archery Players. Calculated 't' value of the caloric expenditure between Long Distance Runners and Archery Players was 112.9 and it gives significant difference in the caloric expenditure between Long Distance Runners and Archery Players. So our last hypothesis of the study that there will be significant difference in energy intake and energy expenditure of Long Distance Runners and Archery Players is accepted.

CONCLUSIONS

- The energy intake was more in Long Distance Runners as compared to Archery Players.
- The energy expenditure was more in Long Distance Runners as compared to Archery Players.

REFERENCES

[1] Baneijee B &Saha N (1970) Energy cost of some common daily activity of active tropical male and female subjects, Journal of Applied Physiology 29: pp200-203.

[2] Burke, Cummings, Desbrow (2001)Guidelines for Daily Carbohydrate Intake: Do Athletes Achieve Them? Sports Medicine, Volume 31, No. 4, pp 267-299(33)

[3] Candice Jo and Anne Christie(2008) Relationship between energy intake and expenditure during harvesting tasks, Journal of Occupational Ergonomics, Vol. 8, Number 1, pp 1-10

[4] Cathy Ludbrook and Dallas Clark (1992) Energy expenditure and nutrient intake in long-distance runners, journal of Nutrition Research, Vol. 12, Issue 6, pp 689-699

[5] Devadas, P.R., Sakthivelmani, A. and Kaveri, R. (1979) Nutritional profile of selected adolescent and adult women athletes, Indian Journal of Nutritional Diet, 16: pp 435-439.

[6] Ekelund U, Franks and Sharp S (2007) Increase in physical activity energy expenditure is associated with reduced metabolic risk independent of change in fatness and fitness, Diabetes Care 30(8): pp 2101-2106,

[7] Hill, and S. W. Davies (2002) Energy intake and energy expenditure in elite lightweight male rowers, Med. Sci. Sports Exerc., Vol. 34, No. 11, pp. 1823-1829,.

[8] Hiilloskorpi, Fogelholm, Laukkanen, Pasanen, Oja P.(1998) Validation of gender-specific equations for predicting energy expenditure during exercise, Med Sci Sports Exerc, Suppl, 30(5), 1998 pp 139-144

[9] Ismail M.N. (1988) Nutrition and sports performance, Seminar on Sports Science, Johore, pp 23-35

[10] Júlia and Teresa Da Costa (2005) Nutritional status of endurance athletes: what is the available information? ArtículosGenerales, Vol. 55 - Numero 1

[11] Louise Martin, AnnelieseLambeth and Dawn Scott (2006) Nutritional Practices of national female soccer players: analysis and recommendations, Journal of Sports Science and Medicine, Vol. 5, pp 130 – 137

[12] M. N. Hassapidou& A. Manstrantoni (2008) Dietary intakes of elite female athletes in Greece, Journal of Human Nutrition and Dietetics, Vol. 14, Issue 5 , pp 391 – 396

[13] Weiss E., Racette S., Villareal D. (2006) Improvement in glucose tolerance, and insulin action induced by increasing energy expenditure or decreasing energy intakes,: A randomized controlled trial, American Journal of Clinical Nutrition 84(5): pp1033-1042.

★★★