

## Nutritional status of sport persons

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The diet and nutrition in relation to specific athletic activity and performance, energy intake and its relation to energy expenditure for specific activity and the like is not available. Though a few reports are available on the diet and nutrition of Sport persons, for Indian sport persons more information need to be unearthed along these lines, for drawing any definite conclusions on their diet and nutritional requirements and optimum performance. This paucity of data on sport persons nutrition enthused the investigators to pursue the present study. Thirty state and national level male sport persons from Kolhapur city of Maharashtra State, ten sport persons from each sports discipline namely athletics, basket ball, holly ball were chosen for the entire study. The heights and weights of the subjects were measured using a stadiometer and beam balance scale, respectively and their body mass index (BMI) was calculated. The skin fold thickness at specific sites of the body viz., triceps, scapula and abdomen were measured using a Harpenden skin fold calipers. The fat content was determined by body density technique (BD) using formula predicted by Katch and Mc Ardle. The lean body mass (LBM) was calculated by subtracting the per cent fat from the body weight. All the sports persons had normal BMI (20-25) except the athletes persons and basketball events who had low weight normal BMI (18.5-20). None were found to be obese (BMI > 25). Majority (18 out of 20) of athletics and basket ball persons had acceptable body fat per cent (7-15%) whereas majority (7 out of 10) of the holly ball were lean (*i.e.*<7% body fat). Except the athletics persons the energy requirement of basket ball and holly ball did not meet the RDA. Maximum energy was expended for the sports practice by the athletes.

**Key Words :** Sport persons, Body mass index, Lean body mass and RDA

**How to cite this article :** Khogare, D.T. and Kolgane, B.T. (2012). Nutritional status of sport persons. *Food Sci. Res. J.*, 3(2): 202-204.

### INTRODUCTION

Sport persons and sports are receiving increasing global attention today. Top class sport persons are more or less equal in still but during competition, success is achieved by the one who possesses better physical fitness for which nutrition plays an important role.

The science of nutrition in relation to sports performance has progressed from empirical studies investigating the effects of dietary manipulations, such as restriction and supplementation, to the direct investigation of the physiological basis of the specific nutritional demands of hard physical exercise (Chandrasekhar, 1987). Throughout the years, athletes in training for competition have constantly been searching for the ultimate ingredient which would increase

their physical performance capacity and may give them that extra winning edge over their opponents. Physical fitness is one's richest possession. It cannot be purchased, but has to be earned through daily routine of physical exercise. Nutritional and medical support is essential for the realization of the athletes natural capacity for optimal performance (Johnson and Nelson, 1982).

Sharma and Costill (1984) shows that sport persons the right diet for sports is a well balanced diet. The athlete needs a balanced diet to keep in good health, to grow, to exploit his potential to the full and to obtain the best results. There are no "miracle" diets or foods guaranteed to give "super performance". However, in translation of recommended nutrient allowance into diets for sportsmen and women, the same basic principles as in planning the diets for normal individuals need to be considered. An athlete derives his energy requirement from his food and expends his energy through physical activities.

There is a general agreement on the relative nutrient demands of the sport persons concerning the percentage of energy to be derived from proteins, fats and carbohydrates,

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but conclusive evidence related to nutrition and sports performance is not available. Also, the diet and nutrition in relation to specific athletic activity and performance, energy intake and its relation to energy expenditure for specific activity and the like is not available. Though a few reports are available on the diet and nutrition of sport persons, for Indian sport persons more information need to be unearthed along these lines, for drawing any definite conclusion on their diet and nutritional requirements and optimum performance. This paucity of data on sport persons nutrition enthused the investigators to pursue the present study.

Information regarding nutrition, energy intake and energy expenditure in relation to specific events is not available. Hence, the present study was undertaken to assess the nutritional status of selected sport persons of Kolhapur city of Maharashtra State during the year 2009-2010.

## METHODOLOGY

Thirty state and national level male sport persons from Kolhapur city of Maharashtra state, ten sport persons from each sports discipline namely athletics, basket ball, holly ball were chosen for the entire study. A larger group of 50 sport persons belonging to the various sports discipline were assessed for anthropometric measurements and hemoglobin estimation.

The heights and weights of the subjects were measured using a stadiometer and beam balance scale respectively and their body mass index (BMI) was calculated. The skin fold thickness at specific sites of the body *viz.*, triceps, scapula and abdomen were measured using a Harpenden skin fold calipers. The fat content was determined by body density technique (BD) using formula predicted by Katch and Mc Ardle (1973). The lean body mass (LBM) was calculated by subtracting the per cent fat from the body weight.

$$\text{Body density (BD)} = 1.09665 - 0.00103 \times X_1 - 0.00056 \times X_2 - 0.00054 \times X_3$$

where

$$X_1 = \text{Triceps skin fold}$$

$$X_2 = \text{Scapula skin fold}$$

$$X_3 = \text{Abdominal skin fold}$$

$$\text{Body fat percentage} = \left[ \frac{4.57}{\text{B.D.}} - 4.142 \right] \times 100$$

$$\text{Lean body mass (LBM)} = \text{B.W.} - \left\{ \frac{\text{Body fat percentage}}{100} \times \text{Body weight} \right\}$$

The hemoglobin level of the sport persons was estimated by cyanmet-hemoglobin method.

The dietary intake of the athletes was recorded for a period of three consecutive days by weightment method. The raw equivalents of the cooked food consumed were computed and nutrient content determined by using the food composition tables (NIN, 1983).

For determining the energy expenditure, the athletes were asked to maintain a time and activity diary wherein they were asked to record the time each athlete spent on different activities for 24 hours. The energy expenditure activities was computed using values given by Mc Ardle and Katch (1973).

## OBSERVATIONS AND ASSESSMENT

The result of the present study have been discussed and presented under the following heads:

### Nutritional profiles of the selected sport persons:

The anthropometric measurements, height and weight were assessed and their corresponding body mass index (BMI) determined (Table 1).

The body mass index of all the sports persons were classified according to Garrow's classification. All the sports persons had normal BMI (20-25) except the athletes persons and basketball events who had low weight normal BMI (18.5-20). None were found to be obese (BMI > 25).

Based on the skinfold measurements the body fat per cent and lean body mass (LBM) were computed (Table 2). It was seen that the holly ball persons had lower fat per cent end

**Table 1.** Height, weight measurements and BMI of the sport persons

Sports discipline	Height (m)	Weight (Kg)	Body mass index wt. (kg./ht.(m <sup>2</sup> ))
Athletics (N = 10)	1.71 ± 0.04	63.5 ± 4.45	21.54 ± 2.42
Basket ball (N = 10)	1.83 ± 0.06	67.1 ± 2.98	19.8 ± 0.91
Holly ball (N = 10)	1.72 ± 0.04	63.3 ± 4.74	21.48 ± 1.0

**Table 2.** Different Indices of adiposity sports persons

Sports discipline	BMI	% Fat	Lean body mass
Athletics	19.77 ± 1.73	9.05 ± 1.14	52.48 ± 6.17
Basket ball	20.39 ± 1.03	8.4 ± 1.93	55.12 ± 2.5
Holly ball	20.59 ± 1.1	6.9 ± 0.52	59.04 ± 4.65

**Table 3.** Comparison of the energy intake of the athletes with RDA and ration provided

Sports	Energy intake kcal/day	RDA kcal	Ration kcal
Athletics	4793	4616	4800
Basket ball	4732	4832	4800
Holly ball	4791	5080	4800

**Table 4.** Per cent distribution of energy among nutrients in comparison to the RDA

Sports discipline	Carbohydrate	Percentage distribution of energy				
		RDA	Fat	RDA	Protein	RDA
Athletics	60	55-64	27	22-31	13	12-15
Basket ball	53	55-64	31	22-31	16	12-15
Holly ball	55	55-64	30	22-31	15	12-15

hence a higher lean body mass compared to the other groups.

The sports persons were classified for their body fat per cent based on classification by Strauss. Majority (18 out of 20) of athletics and basket ball persons had acceptable body fat per cent (7-15%) whereas majority (7 out of 10) of the holly ball were lean (*i.e.* < 7% body fat).

The energy intake of the sports persons were computed and compared with their recommended dietary allowances (RDA). Endurance sports persons require 80 Kcal per kilogram of body weight and their requirements according to their respective body weights were determined. Except the athletics persons the energy requirement of basket ball and holly ball did not meet the RDA (Table 3). The same quantity of ration was supplied to all the sports persons irrespective of their individual requirements according to their body weights.

The percentage distribution of energy among the nutrients namely carbohydrate, fat and protein varied among the selected groups but were comparable to the RDA (Table 4).

### Conclusions:

In this study thirty sport persons belonging to different sport discipline were chosen to study their nutritional profile in terms of anthropometry, dietary and hemoglobin estimation. A positive correlation existed between energy intake, LBM and hemoglobin level. Thus, it is evident that nutritional status

of the sport persons has a direct influence on their physical fitness and thus performance. The importance of nutritional adequacy is stressed to bring out their full potential. There is tremendous scope for future research directed towards improvement of performance through suitable training regimens and adequate nutritional care in order to excel in the international scenario.

### LITERATURE CITED

- Chandrasekhar, U.** (1987). Guidelines on the planning of balanced diets to translate the recommended nutrient allowance. Background paper for the workshop on sports Nutrition 4.5<sup>th</sup> August, 1987, NIN, Hyderabad (A.P.) INDIA.
- Johnson, B.L. and Nelson, J.K.** (1982). *Practical measurements for evaluation in Physical Education*. 3<sup>rd</sup> Ed. Subject Publication, pp. 154-160.
- Katch, F.I. and Mc Ardle, W.D.** (1973). Prediction of body density from simple anthropometric measurements in college men and women. *Human Biol.*, **45**: 445-454.
- NIN** (1983). *NIN manual* – Hyderabad, pp. 112-115.
- Sharma, W.M. and Costill, D.** (1984) The marathon: Dietary manipulation to optimize performance. *American J. Sports Med.*, **12**:J15.

Received : 27.06.2012; Revised: 15.07.2012; Accepted : 25.08.2012