

Food consumption pattern and nutritional status in venezuelan vegetarian athletes

Abstract

Practicing sport offers healthy people and good quality of life, but it needs to be accompanied by top quality alimentary habits. Under these considerations, some athletes have adopted as part of their lifestyle the vegetarian feeding; Although, its benefits and disadvantages, have been poorly described in the third world countries. This descriptive and cross-sectional study has been done to characterize the alimentary consumptions pattern. Anthropometric and biochemical status in vegetarian athletes belongs to a Venezuelan Sports Complex. For this study, were taken all vegetarian athletes (in number of 08) with ages between 18 and 32 years. Data was collected by survey using a validated form designed for the purpose. Then, it was emptied into a database designed in the statistical package SPSS version 20.0. The information was organized in tables and graphs. For statistical analyzes were employed central tendency's statistics (average, standard deviation and trend). The results indicated positive nutritional status and balanced diet in lacto-ovo-vegetarian athletes. Their diet provides an energy contribution higher than the requirements for their age and for their physical activity. The results obtained in the competitions held in the last quarter of the year.

Keywords: pattern of alimentary consumption, anthropometric nutritional status, blood biochemistry and vegetarian sports people

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Introduction

The transculturation and globalization have exerted great influence on the kind of diets adopted by population groups. At the beginning of this century, people preferred more natural diets, less processed and with greater nutritional value. Nowadays, people prefer quick preparation, foreign foods, obviating their nutritional contribution.¹

It exists unlimited sorts of diets and it may cause confusion among people. In this sense, first, few patterns of food consumption have been studied in detail, especially, those developed from western countries defined as "western diet"; second, vegetarian eating habits and third, semi-vegetarian diets known as "prudent diet". These diets are characterized by the predominance of plant's products and while animal products were not considered. Finally, "Mediterranean diet" has been assumed by 3 to 9 percent of the European and North American population.¹

This preoccupation for studying what we eat, suggest that people are worried about acquiring a balanced and healthier diet. A good diet attends people's particularities such as sex, age, health condition and nutritional requirements. In the athletes' case, the diet must provide balanced quantity of macro nutrients (energy, protein, lipids and carbohydrates) and micro nutrients (vitamins and minerals) without omitting water requirements. Also, it can't affect their health or their sports performance. It has been reported that independently of athlete's choice, diet must be varied; however, many of them prefer vegetarian diet. This term includes the consumption of vegetables and exclusion of animal products.²

The vegetarian diet has been embraced by many people around the world. A study done in North America showed in 2006 that 2.3% of adults (4.9 million of people) adopted this class of feeding excluding of their diets meats, fish or poultry. Also it reports that 3% of children and teenagers with ages between 8 and 18 were vegetarian; of them 1% were vegans.³

In this research has been demonstrated that the vegetarian teenagers whom do sport have higher nutritional requirements in comparison with teenagers who have other feeding practices. The vegetarian teenagers merits nutritional particularities in order to replace and provide the necessary nutrients for the sports practice; only in this way, it could be carried out fully.

When the alimentary consumption pattern of the athlete is not controlled, it represents a problem, because the decreasing in the consumption of animal products can be used for losing weight or for achieving the lean body composition. One aspect that should be highlighted is the importance of the inclusion of adequate nutritional alternatives for allowing to the vegetarian athletes to substitute the consumption of animal-based foods in their daily meals. As they do not perform a suitable amino acid supplementation, their diet will be insufficient to maintain their health, as well as the demands of daily training.⁴

This behavior explains the lack of energy seen in some vegetarian athletes. Some authors point to calculating the energetic expenditure of the athlete considering several components and factors such as: *individualized analysis of the athletes*, which involves information about their caloric expenditure, food habits and hydration. In order to

design a feeding plan according to their specific needs; once adopted *the evaluation of the performance*, the food plan, it would create awareness by providing knowledge and information on relevant nutrition to the case.⁵

The Venezuelan case requires special attention due to the current country's nutritional conditions. Nowadays, this nation affords a dual reality; by one side, it exists a group, with enough economical resources, in order to feed themselves but consuming fat, sugar, refined flours, fast food with a tendency to overweight. In contrast, another part of population does not count with the economical resources to feed themselves showing under nutrition. This scene also extends to who practice sports in our country.

Besides this situation, in Venezuela there is scarce information about the vegetarian athletes. The purpose of this research is to characterize the dietary consumption pattern and the anthropometric and biochemical nutritional status in vegetarian athletes. This information will instruct on the studied athletes, the adoption of a diet that satisfies their nutritional demands and allow them to reach their maximum sports potential.

Material and methods

This is a no experimental, descriptive and cross-sectional study.

Subjects in study

The population was all the vegetarian athletes who assisted to a Venezuelan Sports Complex following a non-statistical sampling, according to these criteria.

Inclusion criteria

- Vegetarian athletes (lacto-ovo vegetarian, lacto vegetarian, ovo vegetarian and vegans)
- Athletes in training, at the moment of the study, from May to August 2017.

Exclusion criteria: Non-vegetarian athletes with intermittent training, at the moment of study. Once applied the criteria were included eight (8) both genders vegetarian athletes with ages ranged between 18 and 32 years old.

Instruments

The instrument used was a questionnaire format titled "Global nutritional status of the vegetarian athlete", consisting of 48 items with closed and open questions. In the first section, the dietary consumption's pattern of vegetarian athletes was characterized by the intake of energy's amount through carbohydrates, fat, proteins and iron.

In the second section, the nutritional status of the vegetarian athletes was analyzed with some biochemical tests determined with automated equipment (Architec), the method used was RIA inmulate (chemiluminescence), taking 10cc of blood samples, whose results were emptied according to a standard scale Likert with high, normal and low values.

After, the evaluation of the anthropometric component was done using the direct observation, performed in an anthropometric laboratory using Omron bioimpedance balance. It defines the total body weight and corporal composition. The corporal composition was ratified through the use of the Holtain plicometer, for measuring the

thickness of the adipose tissue. For the body height measure, athletes must adopt the Frankfort anatomic using the Seca 202 Stadiometer. Finally, the data was processed constructing measures and nutritional indicators that were contrasted with International Athletes Patterns.⁶

Results

In the Table 1, it presents the statistical results of the studied sample. It observes that the major part of the vegetarian athletes were young with ages near to 22 years old. The mean of weight was approximately 65 kg and the average height was 172cm.

In the Table 2, it describes the sports disciplines practiced by the studied vegetarian athletes. 50% percent of them do ornamental jumps, followed by front tennis 25%, while cycling and swimming represented 12.5% each one, respectively. The frequency of the practiced disciplines for all the athletes was of 5 times a week.

In the Table 3, it shows the nutritional state of the studied vegetarian athletes according to their gender. 75% were eutrophic. The male used to present low nutritional state (25%). None of them has overweight. In the Table 4, it points out that the athletes' anthropometric parameters correspond to the sports disciplines practiced, except for the body fat area, because its values is in average of 18,25%.

In the Table 5, it indicates biochemical characteristics of the vegetarian athletes. In their totality presents normal values for all the parameters. Perhaps, it could be justified as the organic response to the relationship food- exercise. However, it results convenient to do other type of studies such as hemoglobin, folic acid and B₁₂ vitamin among others advocated to know the real biochemical state of the athletes.

In the Table 6, it specifies according to 24 hours recording method the kilocalories and macronutrients ingested by the vegetarian athletes. In average, kilocalories consumption was of 4209.46Kcal/day with variability among the subjects in study of 1208.6kcal per day. The distribution of macronutrients is pointed out in the Graphic 1.

In the Figure 1, it represents the distribution of the macronutrients (proteins, lipids and carbohydrates) ingested by the athletes. The proteins' intake was of 14%, fat 27% and carbohydrates 59%. These findings reveal that exist an adequate proportion among the macronutrients in the studied athletes. It could explain the normal values showed by the studied subjects in the biochemical and anthropometric parameters.

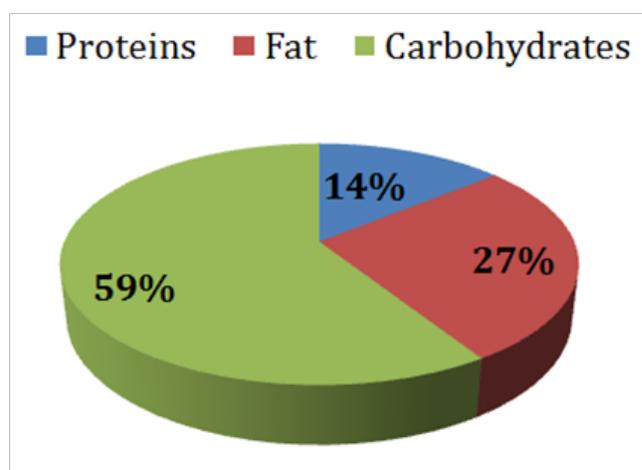


Figure 1 Distribution of macronutrients intake in vegetarian athletes.

Table 1 Descriptive Statistics of the sample

Parameters	Mean and typical deviation
N (subjects in study)	8
Age (in years)	22.88±5.6
Weight (in kilograms)	64.78±13
Height (in centimeters)	172.75±8.6

Note: Vegetarian Athletes' Nutritional State Survey, 2017.

Table 2 Sports disciplines practiced by the vegetarian athletes

Sports discipline	Number	Percent
Cycling	1	12.5
Front tennis	2	25
Swimming	1	12.5
Ornamental Jumps	4	50
Total	8	100

Note: Vegetarian Athletes' Nutritional State Survey, 2017

Table 3 Nutritional Anthropometric state in vegetarian athletes by gender

Nutritional Anthropometric State	Gender				Total %
	Male		Female		
	Number	Percent	Number	Percent	
Under nutrition	2	25			25
Eutrophic	3	37.5	3	37.5	75
Total	5	62.5	3	37.5	100

Note: Vegetarian Athletes' Nutritional State Survey, 2017

Table 4 Anthropometric characteristics of vegetarian athletes

Anthropometric characteristics	Mean and typical deviation
Fat area (%)	18.25±5.1
Muscle area (%)	41.34±11.6
Body mass index (kg/m ²)	21.50±2.5

Note: Vegetarian Athletes' Nutritional State Survey, 2017

Table 5 Biochemical parameters in the vegetarian athletes

Biochemical parameters	Mean and typical deviation
Serum Glycemia (mg/dl)	94.13±11.1
Serum Urea (mg/dl)	23.25±6.8
Serum creatinine (mg/dl)	0.79±0.2
Uric Acid (mg/dl)	2.88±0.5
Total proteins (g/dl)	6.66±0.2
Serum albumin (g/dl)	3.80±0.1
Serum Globulins (mg/dl)	2.86±0.1
Total Cholesterol (mg/dl)	169.88±35.7
HDL Cholesterol (mg/dl)	41.13±1.6
LDL Cholesterol (mg/dl)	109.45±39.1
VLDL Cholesterol (mg/dl)	11.55±2.2
Triglycerides (mg/dl)	57.75±11.1

Note: Vegetarian Athletes' Nutritional State Survey, 2017

Table 6 Descriptive statistics of food intake in vegetarian athletes

Parameters	Mean and typical deviation
Kilocalories (kcal/day)	4209.46±1208.6
Proteins (g/day)	152.02±44.2
Fat (g/day)	126.62±36.9
Carbohydrates (g/day)	615.45±182.3
(mg/day)	44.85±16.88

Note: Vegetarian Athletes' Nutritional State Survey, 2017

Discussion

In this research, the studied subjects were mainly young people. These results are similar to the reported by Martínez and Sánchez⁷ whom studied 21 members of a soccer team belonging to the third division in the Faculty of Physical Activity and Sports Sciences, at the University of León, Spain. They determined that the majority of the subjects had ages between 18 to 35 years old as was observed in this study. Respect to these authors, we found differences in the choice of the sports discipline; because in this studied case, the athletes preferred to do other kind of sports different to soccer, while, the Spanish athletes whom were vegetarians showed inclination for traditional sports such as football.

In this study the vegetarian's athletes mainly present nutritional state "eutrophic or normal". These findings are related to those manifested by Vilallonga and Lofrano,⁸ who affirm that vegetarian athletes tend to have a normal nutritional status and good athletic performance.

In this research the vegetarian athletes had good body composition except for body fat percentage, because it was lightly incremented. These results are contrary to reported by Gonzales,⁹ who found in his study that the vegetarian athletes tend to have percentages of body fat below 12%. The studied athletes present higher values (18%), this situation could be attributed to their incremented energy intake because their principal source were foods with elevate content of refined carbohydrates and lipids. It explains the high fat percentage of our athletes.

Respect to the consumption pattern of the vegetarian athletes resulted to be in concordance to the reported by Vilallonga and Lofrano⁸ and Gonzalez⁹ whom studied a group of vegetarian athletes, planning their vegetarian diet before the sport meets. They did their nutritional plan with an energetic intake between 2000 and 5000Kcal per day depending on the duration, frequency, type and intensity of physical activity, body composition, and sex. This way, it allows the

maintenance of a weight and an optimal composition, and therefore, a good sports performance. The caloric intake of this investigation is similar to the reported by Vilallonga and Lofrano. By other hand, it must add that the dietetic formula goes according to the Venezuelan references. Nevertheless, it results necessary to do new researches directed to establish a specific dietetic formula for Venezuelan vegetarian athletes.

Conclusion

In this study, the results obtained, may suggest that ovo-lacto-vegetarian diets are appropriated for athletes who practice ornamental jumps, cycling, front tennis and swimming disciplines; However, it could be interesting to compare these parameters with athletes of these sports disciplines who have other kind of diets (omnivore, Mediterranean, among others). On the other hand, the case of vegetarian athletes seems to carry out a very varied healthy and totally lacto- ovo-vegetarian diet. Likewise, the diet would provide to them an energy contribution superior to the requirements for their age and their physical activity.

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None.

Conflicts of interest

The author declares that there is no conflicts of interest.

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