

157 - ANTHROPOMETRIC AND NUTRITIONAL PROFILE OF JUNIOR SOCCER ATHLETES

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INTRODUCTION

The set of information about the nutritional status of athletes is important to understand the link between nutrition, health and sports performance. The nutritional assessment is a key factor for the development and adhesion to the diet. A careful dietary anamnesis is a tool that allows strategies and diet changes to be defined and implemented. In order to identify the factors that limit food intake of the athlete, it is necessary to understand the pattern of training and his or her lifestyle. The correct intake of macronutrients is important because the appropriate consumption of carbohydrates is essential to optimize the stocks, maintain and replenish muscle glycogen. The consumption of protein food helps in muscle repair and growth and contributes in the energy metabolism. Lipids provide energy to working muscles; they synthesize hormones and modulate the inflammatory response. Based on this and considering the issue that players who do not have nutritional monitoring might have inadequate body composition, the purpose of this study was to evaluate the soccer junior athletes, regarding their body composition, and draw their feed profile. The methodology for the research is characterized as applied, quantitative, descriptive, bibliographical and of survey, making use of deductive scientific method.

THEORETICAL REFERENCE

According to Fonseca and others (2007), the study of body composition and nutritional assessment are important to trace the nutritional profile of the athlete. Anthropometry is a method widely used to describe their morphological characteristics.

By means of the nutritional assessment, athletes or physically active people can be educated about the importance of diet education for the promotion of health and performance. The nutritional demand of the athlete is directly related to factors collected during their nutritional assessment. Even so, nutritionists must be careful to analyze each piece of obtained information (DUARTE, 2007). The assessment and determination of anthropometric characteristics (height, body mass and body composition) is essential to make a team not only successful during a game but during a whole season, since such information can and should be used by the coach to change player function, or even change the shape of the entire tactical team, in order to maximize performance, considering that each position has unique characteristics. The weight and height are variables that are shown as the best tool for evaluating nutritional status, for its convenience and low cost. The use of skin fold thickness measurements is one of the most practical methods for calculations of total and regional adiposity, since portable instruments are used, providing a quick assessment. Bio-impedance analysis (or bioelectrical impedance) is a rapid, noninvasive, and relatively cheap to assess body composition in clinical and field situations.

Another simple and inexpensive method that does not require a high degree of skill and training from the volunteer is the ratio of weight to height squared, in other words, the Body Mass Index (BMI) (ARAÚJO and others, 2007).

A study by Prado and others, (2006) states that goalkeepers and defenders were taller and had higher body mass than the other athletes. Regarding the percentage of fat it was not significant, but the goalkeepers had more fat mass than the midfielders and the wingers. Lean mass was greater in the defenders, followed by the goalkeepers.

When it comes to the evaluation performed in adolescent athletes, it must be more careful and take into account the stage of development that the athlete is. Boys, during puberty, gain more muscle mass, because they have higher concentrations of testosterone. Jonnalagada, and others, (2001) while researching the eating habits of soccer players showed that 55% of players had a habit of attending fast food restaurants; 42% consumed supplements, mostly creatinine. Pascoal, and others, (2002) assessed the eating habits of soccer players and can conclude that the diet consisted of 44% carbohydrate, 37.5% lipid, 15% protein and 3.5% alcohol. These studies show that a diet of soccer players is inadequate in all kinds of nutrients, which consequently prevents the adequacy of micronutrients as well. Prado and others, (2006), state that there are variations with regard to food profile according to the position the player takes in the field.

MATERIAL AND METHODS

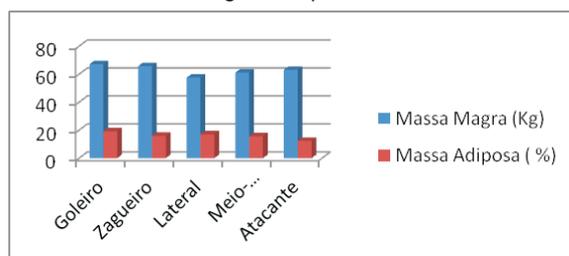
The survey was conducted by means of anthropometric measurements of 25 soccer players, aged between 16 and 20 years, belonging to the Railway Workers' Sports Club of Ponta Grossa – Pr. The anthropometric assessment was performed on a digital scale, through which we obtained data on body composition of athletes, and their height was measured by a stadiometer. Nutritional Consultations were also held, based on the anamnesis food chart adapted for athletes and the anthropometric assessment. In order to set parameters for intake and feed frequency, a feed frequency questionnaire was applied. The obtained data were expressed in average \pm standard deviation, and those which require comparison, the appropriate statistical treatment was applied. The study was submitted to the Ethics Committee and Research - CESCAGE and approved on 31 July, 2009 under Protocol number 225/09.

RESULTS AND DISCUSSION

25 athletes in the junior team were evaluated; from the 25 players, 3 were goalkeepers, 6 defenders, 5 wingers, 6 midfielders and five strikers. The average age of athletes was 18.38 ± 1.39 years. For FIFA, soccer's governing body, the average ages for players of that rating range from 16 to 20 years, therefore, the studied subjects are within the existing standards. According to the anthropometric measurements the average height was 1.80 ± 0.064 m. In a study by Araujo et al, 2007, the authors obtained data on the height of 1.66 ± 8.43 m, but the players analyzed in this study had a mean age of 15 years. So, with a higher average age, players have passed through the phase of growth spurt, presenting thus, a higher average height.

Figure 1 shows the body composition in relation to lean mass and fat mass of athletes, considering the field position.

Figure 1: Lean body mass and fat mass according to field position



Analyzing the graph, one can see that the percentage of body fat mass of the goalkeepers is higher ($19.16 \pm 0.66\%$). The wingers, the midfielders and strikers, had lower concentrations of fat mass, with respective results of $16.98 \pm 2.36\%$, $15.58 \pm 1.37\%$ and $12.32 \pm 2.37\%$. Regarding the lean body mass, the wingers showed the lowest concentration of lean mass (57.54 ± 5.6 kg). Followed by midfielders (61.08 ± 3.86 kg) and strikers (63.02 ± 6.46 kg). The goalkeepers and defenders presented more lean mass, with 67.13 ± 5.35 kg and 65.74 ± 6.34 kg, respectively.

Analyzing the players according to their position, the obtained results are consistent with other studies on the subject. For the best performance of their roles it is essential that goalkeepers and defenders are taller and have a greater lean mass. The goalkeepers also tend to have a percentage above the recommended fat mass. This is explained by the fact that this position does not need to use the athlete's speed for a long time, making only small sprints to the defenses. But the defenders need more speed and more participation in sprints during the match, so they have a lower percentage of body fat than the goalkeepers.

The wingers have lower values of fat mass and lean body mass, due to a higher metabolic burden caused by a higher speed and more active participation in the game. The midfielders and strikers did not show large anthropometric differences among themselves and other positions. The body composition is important to determine the fitness level of players, given that excess fat can substantially reduce the human performance. According to literature, the ideal fat percentage for a soccer player ranges between 6 and 12% depending on the position in which he or she operates, it was lower for the wingers and strikers, and higher for the defensive players and goalkeepers.

The dietary record has been widely used in studies of food intake. The accuracy of the information obtained from dietary records can be compromised by difficulties in quantifying food and inhibitions associated with self-image. The omission of food consumed (sub-report) has been identified as a major limitation in dietary studies of athletes, although there are references of sub reports (PANZA et al, 2007).

After evaluation of diet habits the form of frequency of food intake detected daily intake mainly of the following food: meat, fruit, sugar, white bread and artificial juices, as shown in Table 1.

Table 1: Main food consumed daily by the athletes.

Food	Percentage of athletes who consume daily	Number of athletes who consume daily
Meat	96%	24
Fruit	92%	23
Sugar	84%	21
White Bread	80%	20
Artificial juice	80%	20

While assessing the record of food frequency of the athletes it was possible to observe that for the group of cereals, rice and pasta the consumption was adequate in 72% (18 athletes) of the sample. The adequacy of this group is important for the proper performance of the athlete, since they are the main sources of carbohydrate, macronutrient responsible for providing the muscle glycogen that helps reduce fatigue.

The adequate amount of the group of meat, milk, dairy and eggs eaten by athletes was positive for 48% (12 athletes) of the sample. This finding is interesting and it is worrying, given that the protein that helps muscle recovery after competition and helps in physical fitness is not being adequately consumed by most athletes. The amount of lipid intake was found below the recommended to 28% (7 players), while the rest of the sample above the recommended dietary intake for the concerned population.

Prado, et al, (2006), in a study with professional soccer players concluded that the diet of these players is hypoglycemic and normolipidemic and hyperproteic, besides having a high alcohol consumption. These data are contrary to those obtained in the survey, because these are teenagers, with less healthy eating habits.

After data analysis and physical assessment of food intake modifications were suggested relating the diet of athletes. The guidelines have been exposed to athletes in the form of individual consultation where the researchers explained the nutritional objectives to be achieved. The guidelines were reinforced to the technical staff and a menu based on this information was proposed.

CONCLUSIONS

The nutritional status of most athletes was classified as eutrophic according to BMI, however, with percentage of fat above the recommended level for this population. The feed of the studied population is inadequate in most food groups studied. This indicates that the insertion of the Nutritionist in meal planning for soccer athletes is of great importance to improve performance during the match and enhance muscle recovery after the game.

The athletes who do not have the nutritional follow up usually have their body composition and eating habits outside the normal standard for the group in question. The study achieved its objectives to evaluate and establish a profile of food intake and body composition of the team in question. However, the second phase of work is in progress and the results of implementing it will be described in future research. It is necessary to monitor the proposals of the researchers to describe the results after the intervention.

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REFERENCES

- DUARTE, ACG **NUTRITIONAL EVALUATION: Clinical and Laboratory Aspects.** ed. Atheneu Publisher. São Paulo, 2007.
- PANZA, VP, et al. Food intake: reflections on nutritional recommendations, food habits and methods for assessing energy expenditure and energy intake. **Journal of Nutrition.** Campinas. 20 (6). 681-692. 2007. Available at: www.scielo.com. Accessed: 14/02/10.
- ARAÚJO, JS, et al. Anthropometry and body composition of adolescent athletes of 15 years old male of a soccer team in the state of Rio de Janeiro. **Brazilian Journal of Sports Nutrition.** São Paulo. 1 (3). 61-67. 2007. Available at: www.ibpex.com.br. Accessed: 19/02/10.
- PRADO, WL et al. Anthropometric profile and macronutrient intake in professional Brazilian soccer players according to their positions. Vol 12. São Paulo. **Brazilian Journal of Sports Medicine,** 2006. Available at: www.scielo.com. Accessed: 24/02/10.
- PASCHOAL, V.; NAVES, A.; SOUZA, DM Nutritional Behavior in Collective Sports. **Nutrition, Health and Performance.** 2002. p. 9-12. São Paulo.
- JONNALAGADA, SS, Rosenbloom, CA, SKINNER, R. **Dietary practices, attitudes and physiological profile of children soccer players.** Journal Strength Cond. 15 (4): 507-513, 2001.
- GUERRA, I., Soares, EA; Burini, RC Nutritional Aspects of Football Competition. **Brazilian Journal of Sport Medicine.** 6 (7). p. 200-207. 2001. Available at: www.scielo.com. Accessed: 15/02/10.

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ANTHROPOMETRIC AND NUTRITIONAL PROFILE OF JUNIOR SOCCER ATHLETES**ABSTRACT:**

The nutritional assessment and the study of body composition are important to trace the nutritional profile of the athlete. The anthropometric and nutritional assessment of the soccer player should consider the fact that according to the positions taken in the field, the athletes will have a specific energy demand and a certain anthropometric standard. This research was classified as applied, quantitative with a deductive method. The research objective was to perform the anthropometric assessment and establish the feed profile of junior soccer players. The anthropometric assessment of 25 players with a mean age of 18.38 ± 1.39 years and mean height of 1.80 ± 0.064 m was performed. The goalkeepers and defenders presented more lean mass and higher percentage of fat mass. The wingers showed the lowest values for the analyzed data. When evaluating the feed rates of the players, it was observed that 72% (18 athletes) consume adequate amounts of carbohydrates, 48% (12 athletes) consumed the protein requirements and 28% (7 players) ingested quantities below the recommended for lipids, while the remainder exceeded these values. It was concluded that athletes who do not have the nutritional follow up usually have their body composition and eating habits outside the normal standard for the group in question.

KEYWORDS: Nutritional assessment, soccer, sports nutrition

RÉSUMÉ:

L'évaluation nutritionnelle et l'étude de la composition corporelle représentent des éléments importants pour tracer le profil nutritionnel du sportif. L'évaluation anthropométrique et nutritionnelle du footballeur doit considérer le fait que selon la position occupée sur le terrain, le sportif aura une demande énergétique spécifique et un standard anthropométrique déterminé. Cette recherche a été classée comme quantitative, appliquée avec une méthode deductive. Le but essentiel de cette recherche consiste à réaliser l'évaluation anthropométrique et tracer le profil alimentaire des footballeurs juniors. L'évaluation anthropométrique de 25 joueurs âgés de $18,38 \pm 1,39$ ans en moyenne et une taille moyenne de $1,80 \pm 0,064$ m, a été réalisée. Les gardiens (de but) et défenseurs ont présenté plus de masse maigre et un grand pourcentage de masse adipeuse. Les latéraux ont présenté les valeurs les plus basses par rapport aux données analysées. En évaluant la fréquence alimentaire des joueurs, on a pu observé que 72% (18 sportifs) consommaient des quantités adéquates de glucides, 48% (12 sportifs) ingéraient les protéines recommandées et 28% (7 sportifs) ingéraient des lipides en quantités inférieures aux indiquées, tandis que le reste dépassait ces valeurs. Cela permet alors de conclure que les sportifs qui n'ont pas d'accompagnement nutritionnel, ont généralement leur composition corporelle et leurs coutumes alimentaires hors des modèles adéquats pour le groupe en question.

MOSTS CLÉS: L'évaluation nutritionnelle, Football, la nutrition sportive

RESUMEN:

La evaluación nutricional y el estudio de la composición corporal representan elementos importantes para trazar el perfil nutricional del deportista. La evaluación antropométrica y nutricional del futbolista debe observar hacia el hecho de que, según la posición ocupada en campo, el atleta tendrá una demanda de energía específica y determinadas normas antropométricas. Esta investigación fue clasificada como cuantitativa, aplicada en el cual se aplicó el método deductivo. El objetivo de la investigación fue realizar las evaluaciones antropométricas y trazar el perfil de alimentación para los jugadores Junior de fútbol. Fue realizada la evaluación antropométrica de 25 jugadores con una edad media de $18,38 \pm 1,39$ años y con la altura media de $1,80 \pm 0,064$ m. Los arqueros y los defensores fueron los que más presentaron una mayor cantidad de masa flaca y mayor porcentaje de masa adiposa. Los laterales presentaron valores más bajos de los datos analizados. Al evaluar las tasas de alimentación de los jugadores, se observó que el 72% (18 atletas) consumían cantidades adecuadas de carbohidratos, 48% (12 atletas) ingerían las recomendaciones de proteínas y 28% (7 atletas) ingerían cantidades abajo de los lípidos recomendados, mientras que el resto habían superado estos valores. Fue posible concluir que los atletas que no tienen un acompañamiento nutricional, por lo general tienen su composición corporal y sus hábitos alimentarios fuera de lo normal y adecuada para el grupo en cuestión.

PALABRA CLAVE: La evaluación nutricional, Fútbol, Nutrición deportiva

PERFIL ANTROPOMÉTRICO E NUTRICIONAL DE ATLETAS DE FUTEBOL JUNIORES**RESUMO:**

A avaliação nutricional e o estudo da composição corporal representam elementos importantes para traçar o perfil nutricional do atleta. A avaliação antropométrica e nutricional do jogador de futebol deve atentar para o fato que de acordo com a posição ocupada em campo, o atleta terá uma demanda energética específica e um padrão antropométrico determinado. A presente pesquisa foi classificada como quantitativa, aplicada e com método dedutivo. O objetivo da pesquisa foi realizar a avaliação antropométrica e traçar o perfil alimentar de jogadores juniores de futebol. Foi realizada a avaliação antropométrica de 25 jogadores com idade média de $18,38 \pm 1,39$ anos e estatura média de $1,80 \pm 0,064$ m. Os goleiros e zagueiros apresentaram maior quantidade de massa magra e maior porcentagem de massa adiposa. Os laterais apresentaram os menores valores para os dados analisados. Ao avaliar a frequência alimentar dos jogadores, observou-se que 72% (18 atletas) consumiam quantidades adequadas de carboidratos, 48% (12 atletas) ingeriam as recomendações de proteínas e 28% (7 atletas) ingeriam quantidades abaixo do recomendado de lipídeos, enquanto que o restante tinha esses valores ultrapassados. Foi possível concluir que os atletas que não têm o acompanhamento nutricional geralmente têm sua composição corporal e seus hábitos alimentares fora dos padrões adequados para o grupo em questão.

PALAVRAS CHAVE: Avaliação nutricional, futebol, nutrição esportiva