# 54 - EVALUATION OF MACRONUTRIENTS CONSUMPTION AMONG BODY-BUILDERS IN A FITNESS CENTER IN SANTA MARIA - RS

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## INTRODUCTION

Currently, the infinity of benefits that the physical activities can bring to people are already known: weight reduction and fat percentage reduction; physical and muscles strengthen increase; muscle tonus; flexibility, bones and joints strength (BOUCHARD, 2003).

Resistance exercises, that mean, exercises with weight are the most efficient to modify the body composition in a better way, therefore the exercises contribute to the muscle mass increase, body mass increase and body fat weight reduction. During resistance exercises, our organism deviate big part of the blood volume to the working area, increasing the vascular factors and local oxygenation (BARCELOS e ROGATTO, 2006).

People who have started or regularly carry through body-building in fitness center use to associate the mass gain to proteins extra consumption. The body-builders' nutritional needing is a little different from other life styles, as sedentary people and the ones who have specific characteristics.

When the macronutrients role were understood, mainly the proteins ones, and how people process them, it will be possible to select the best food choices, aiming a specific objective that is the muscle hypertrophy. Beyond the proper proteins ingestion, people should ingest carbohydrates, lipids, micronutrients and vitamins properly, and lots of water.

This theme has motivated the necessity and interest in evaluate the body-building practitioners' macronutrients consumption. Therefore the objective of this paper was to verify the body-builders' macronutrients consumption in a fitness center in Santa Maria-RS.

## MATERIALS AND METHODS

This study is characterized as a transversal exploratory study into the sportive nutritional research.

The research selection criteria were: the body-worker has to be male, be between 18 and 25 years-old and work out in a fitness center from four to six days a week, and the intensity of training has to be from moderate to intense; and the excluded criteria were: the practitioner should not have any disease that could not let him doing any physical activity properly.

The chosen group was taken in a random way. In a first moment an informal contact to the body-builders was made, to verify the interest in being part of this research. After that, a more detailed explanation was made to the ones who were interested in the project. In this second moment, the 24h recall was applied to them and some doubts were solved. Throught the 24h recall the macronutrients consumption was verified and then compared to the RDA and DRI.

The DietWin Profissional software version 2.0 was used to calculate the consumed macronutrients. To the moderate activity factor was used 1,75 and to intense activity factor was used 2,10. The practitioners' weight and height were used a physical evaluation form and after that the IMC was calculated using the formula below:

$$IMC = \frac{P}{(A)^2}$$

Where: P= weight, A=height

After the ending of the study, the data's average and standard deviation were compared to the literature ones and presented in a table-format.

## RESULTS AND DISCUSSION

Even the proper exercises and the good food habits can provide benefits to the health, but the total reduce of risk factors in chronic diseases is maximized when both nutrition and proper exercises are part of a healthy way of life.

Table 1 - Individual Features

| | Average | Standard deviation |
|---|---|---|
| Weight (Kg) | 76,05 | 7,51 |
| Height (m) | 1,74 | 0,06 |
| Age (years-old) | 21,8 | 1,3 |

Analyzing Table 1 it can be seen that the average age was 21,8 years ±1,3 years, the average height was 1,74 metros ± 0,06 m and the average weight was 76,05 Kg ± 7,51 Kg.

Table 2 - Body Mass Index.

| Malnutrition | N (%) |
|---|---|
| Eutrophy | 09 (45%) |
| Over weight | 11 (55%) |
| Obesity Grade I | - |
| Obesity Grade II | - |
| Obesity Grade III | - |
| Total | 20 (100%) |

According to what can be seen in Table 2, 45% of the individuals were eutrophyc and 55% were classified as over weight that shows IMC is not a good parameter to evaluate the individuals' physical composition, like Williams (2002) and Costa & Böhme (2005) suggest.

Table 3 - Carbohidrate Consumption in grams per kilo of the individuals body weight.

| CHO g/Kg/weight | N (%) |
|---|---|
| ? 5 | 02 (10%) |
| 5 - 8 | 11 (55%) |
| ? 8 | 07 (35%) |
| Total | 20 (100%) |

Analyzing the Table 3 data, we can see that 10% of the evaluated people are ingesting a low quantity of carbohydrate according to what Tales (2003) and Coelho *et al.,* (2004) recommend that is from 5 to 8g/Kg/weight. This low macronutrient consumption can reflect in a significant way in their performance during the training, and a fatigue can occur in a faster way because of the low muscle and liver supply of carbohydrate, as Soares (2001), Coelho *et al.,* (2004) and Bernadot (2005) suggest.

On the other hand, 55% of the studied group consumes the proper quantity of carbohydrate. It is reflected in their training and they can make the exercises with correct interval and repetitions, it means that, they can make from 8 to 12 series with 45 to 60 seconds of intervals in each series, when the muscle hypertrophy occurs (BOMPA; CORNACCHIA, 2000).

This table also shows that 45% of the sample are not ingesting the recommended carbohydrate consumption, that way, the muscle and liver supplies are above or below to the ones that are good for them. It can cause either a glucose raise or hypoglycemia or even na exercise time reduction and a precocious fatigue, as it is said by Coelho *et al.*, (2004).

Table 4 - Percentage of lipidium consumption.

| Lipidium (%) | N (%) |
|---|---|
| ? 20 | 18 (90%) |
| 20 - 25 | 2 (10%) |
| ? 25 | - |
| Total | 20 (100%) |

Analyzing the Table 4 data, we can see that 90% of the group consume less than the minimum recommendation of this macronutrient, it means that this percentage of people won't suffer the consequences of a high total fat diet, that are: high incidence of chronic diseases and a significant supplies of intramuscular triglycerides, what can bring many damages to the performance, as can be seen in Biesek & Corte (1997) and Leser (2005).

Table 5 - Consumption of saturated, mono-unsaturated, poly-unsaturated fatty acids and the cholesterol.

| Lipdium | RDA | N (%) |
|---|---|---|
| A.G. Saturated | ? 10% | - |
| A.G. Mono-unsaturated | ? 10% | 20 (100%) |
| A.G. Poly-unsaturated | ? ou = 10% | 17 (85%) |
| Cholesterol | 300 mg | 16 (80%) |

Analyzing the Table 5 data, we can see that 100% of the group consumes what is recommended by the literature to the consumption of mono-unsaturated fatty acid and 85% consume what is recommended to the consumption of poly-unsaturated fatty acid. In relation to the cholesterol ingestion, 80% consume what is recommended according to Leser, 2005.

This table shows that the evaluated individuals are ingesting the lipidium from a mono-unsaturated and poly-unsaturated fatty acid diet and they can use the benefits they bring as the reduction of LDL cholesterol and the raising of HDL cholesterol.

Table 6 - Consumption of proteins in grams per kilo of weight.

| PTN g/Kg/weight | N (%) |
|---|---|
| ? 1 | - |
| 1 - 1,8 | 8 (40%) |
| ? 1,8 | 12 (60%) |
| Total | 20 (100%) |

Observing the data of the Table 6, it can be verified that 60% of the evaluated individuals are ingesting more proteins than it is recommended by Sizer & Whitney (2003) and Tales (2003). It shows that a muscle hypertrophy can occur to these people because the protein synthesis in the muscles exceeds the degradation tax, what a positive protein balance in the muscle can occur, but this degradation can also transform itself into fat and then it can provoke damage in the kidneys. This protein exceed does not bring any other benefit than gaining muscle mass according to Lemon (1991), Guedes & Guedes (1998), Garcia Júnior (1999) and Tales (2003). It can also be observed that 40% of the studied group consume the established quantity of proteins to body-building and they will certainly have a muscle mass gain and they won't have any problems to the proteins exceed. In this case, if these individuals were consuming the proper quantity of carbohydrates they will have the waited result with the hypertrophy training, as Bompa & Cornacchia (2000) said.

There is no consensus in the literature or in substantial stories that a protein quantity above 2g/Kg/weight has any better benefit in relation to muscle mass gain to the ones who have a protein quantity below 1,8g/Kg/weight.

Table 7 - Incorrect food intake.

| Macronutrients | ? recomended | ? recomended |
|---|---|---|
| Protein | - | 12 (60%) |
| Carbohydrate | 02 (10%) | 07 (35%) |
| Lipidium | 18 (90%) | - |

According to the Table 7, it can be noticed that 60% of the individuals are intaking a wrong quantity of proteins. Among these individuals, 45% are ingesting a quantity of carbohidrates different from the ones recommended by the literature and 90% are intaking lipidium less than they should as it can be seen in the literature. All these alterations can damage the individual performance in their muscle hypertrophy training, such as: fatigue raising and in a quickly way, quantity of series and repetitions reduction, discouragement, and muscle damages raising.

**CONCLUSION**

After evaluating and comparing the present study data, it can be concluded that:

- An important part of the studied group was ingesting a not proper quantity of carbohydrates to practice body-building;
- Most of the evaluated practitioners were having more proteins than it is recommended for those who practice muscle hypertrophy;
- Most of the evaluated practitioners were having a quantity of lipidium below than what it is recommended for them;
- There were no people who have consumed saturated fatty acid as it is recommended by the literature. The entire

individual was having the recommended quantity of mono-unsaturated fatty acid, and an important part of them was also having the recommended quantity according to the literature of poly-unsaturated fatty acids.

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**EVALUATION OF MACRONUTRIENTS CONSUMPTION AMONG BODY-BUILDERS IN A FITNESS CENTER IN SANTA MARIA - RS**

**ABSTRACT**

Nowadays body-building is one of the ways to prevent chronic degenerative disease and keep a healthy life. Resistance exercises help to make the body composition better and to provide an increase to muscle mass with a good quantity of proteins. The objective of this paper is to verify the body-builder's macronutrients consumption in a fitness center in Santa Maria-RS. This a transversal exploratory study which uses the sportive nutrition research line with 18 to 25 year-old body-builders. A 24h recall was used to verify the macronutrients ingestion and after that DietWin Professional software version 2.0 was used to calculate the number of calories ingested and macronutrients consumed. The FAO/OMS/85 formula and the participant's current weight were used to determine the energy necessity. Among the evaluated people 55% of the sample was overweight and 45% were eutrophic. In relation to the proteins ingestion 60% of them was ingesting more than the literature recommended and 40% was ingesting the ideal quantity. The body-builders who were not eating the proper quantity of macronutrients can have their performance harmed in the fitness centers and they will not get the waited result: the muscle hypertrophy.

KEY-WORDS: food consumption, body-building, fitness center.

**EVALUATION DE LA CONSOMMATION DES MACRO ELEMENTS NUTRITIFS PAR CEUX QUI PRATIQUENT DE LA GYMNASTIQUE DANS UNE SALLE DE SANTA MARIA - RS**

**RESUMÉE**

La gymnastique est aujourd'hui un des moyens pour empêcher des maladies dégénératives et mantenir une vie en activité. Des exercices de résistance aindent à modifier de façon favorable la composition du corps et offre l'augmantation de la masse musculaire avec l'idéal apporte de proteínes. On a eu comme cible de cette recherche la vérification des macro éléments nutritifs de ceux qui pratiquent de la gymnastique à Santa Maria - RS. Il s'agit d'une étude d'exploitation transversel dans la voie de recherche de nutrition sportive chez les praticant de gymnastique entre 18 et 25 ans. Pour vérifier l'ingéstion des macro éléments nutritifs il a été utilisé le bilan alimentaire 24 heures et ensuite il a été utilisé le programme DietWin Profissional version 2.0 pour le calcul des calories et des macro éléments nutritifs consommés. Pour la détérmination de la necessité énergétique il a été utilisée la formule de la AO/OMS/85 avec le poid actuel du praticant. Parmis les individus évalués 55% de l' échantillon en condition de surpoids et 45% en condition de eutrofie. Par rapport à l'ingéstion des protéines 60% de l' échantillon avait consommé plus de ce qui a été suggéré par la littérature et 40% avait fait l'igéstion idéal. Les praticants qui n'avaient pas fait l'ingéstion de façon idéal des macro éléments nutritifs pourrons avoir leurs performances à la gymnastique endommagée et n'ont pas réussi le résultat envisagé de l'hipertrophie musculaire.

MOTS CLES: Consommation alimentaire, Gymnastique, Salle de Gymn

**EVALUACIÓN DEL CONSUMO DE MACRO NUTRIENTES DE PRACTICANTES DE MUSCULACIÓN EN UNA ACADEMIA DE SANTA MARIA - RS**

**RESUMEN**

La musculación es, hoy día, uno de los medios de prevención de enfermedades crónico-degenerativas y mantenimiento de una vida activa. Ejercicios de resistencia ayudan a modificar favorablemente la composición corporal y proporcionar el aumento de la masa muscular con el aporte ideal de proteínas. Se ha objetivado en este trabajo verificar el consumo de los macro nutrientes de practicantes de academia de Santa Maria-RS. Se trata de un estudio exploratorio transversal dentro de la línea de investigación de nutrición deportiva con practicantes de academia entre 18 y 25 años. Para verificar la ingestión de los macro nutrientes fue usado el recordatorio alimentar 24 horas y después fue usado el programa DietWin Profissional versión 2.0 para el cálculo de las calorías ingeridas y de los macro nutrientes consumidos. Para determinación de la necesidad energética fue utilizada la fórmula de la FAO/OMS/85 con el peso actual del participante. Entre los individuos evaluados 55% de la muestra con sobrepeso y 45% con eutrofia. En relación a la ingestión de proteínas 60% de la muestra estaba ingiriendo arriba del recomendado por la literatura y 40% estaba con la ingestión ideal. Los practicantes que estaban con ingestión incorrecta de macro nutrientes podrán tener su desempeño en la academia perjudicado y no conseguirán el resultado esperado que sería la hipertrofia muscular.

PALABRAS-LLAVE: Consumo alimentar, Musculación, Academia.

**AVALIAÇÃO DO CONSUMO DE MACRONUTRIENTES DE PRATICANTES DE MUSCULAÇÃO EM UMA ACADEMIA DE SANTA MARIA - RS**

**RESUMO**

A musculação é hoje em dia um dos meios de prevenir doenças crônico-degenerativas e manter uma vida ativa. Exercícios de resistência ajudam a modificar favoravelmente a composição corporal e proporcionar o aumento da massa muscular com o aporte ideal de proteínas. Objetivou-se neste trabalho verificar o consumo dos macronutrientes de praticantes de academia de Santa Maria-RS. Trata-se de um estudo exploratório transversal dentro da linha de pesquisa de nutrição esportiva com praticantes de academia entre 18 e 25 anos. Para verificar a ingestão dos macronutrientes foi usado o recordatório alimentar 24 horas e após foi usado o programa DietWin Profissional versão 2.0 para o cálculo das calorias ingeridas e dos macronutrientes consumidos. Para determinação da necessidade energética foi utilizada a fórmula da FAO/OMS/85 com o peso atual do participante. Dentre os indivíduos avaliados 55% da amostra com sobrepeso e 45% com eutrofia. Em relação à ingestão de proteínas 60% da amostra estava ingerindo acima do recomendado pela literatura e 40% estava com a ingestão ideal. Os praticantes que estavam com ingestão incorreta de macronutrientes poderão ter seu desempenho na academia prejudicado e não conseguiram o resultado esperado que seria a hipertrofia muscular.

PALAVRAS-CHAVE: Consumo alimentar, Musculação, Academia.