



The extent of dietary supplements use by male rugby players in Kenya

Mse, E.^{1*}, Kimiywe, J.². and Simiyu N.W.W³.

¹Department of Sports and Games and ² Nutrition and Dietetics Department, Kenyatta University, P.O. Box 43844- 00100 Nairobi, Kenya; ³ Department of Physical Education, Wiley College, Texas, USA.

*Corresponding author email: ewals57@yahoo.com; Other authors: ² jokimiywe@yahoo.com: ³ njororai@yahoo.com

Published online at www.biosciences.elewa.org on October 7, 2009

ABSTRACT

Objective: Dietary or nutritional supplements are substances which act either nutritionally to reverse or prevent deficiency or pharmacologically, to alter some physiological processes. The purpose of the present study was to determine the extent of knowledge, consumption levels and identify factors or reasons that influenced the utilization of dietary supplements by male rugby players in Kenya.

Methodology and results: The study adopted the descriptive survey design. The target population was 210 players from seven teams that participated in the Kenya Cup League. Simple random sampling was used to select 140 (67%) respondents out of the target population of 210. Percentages were used to describe the players' knowledge levels. Generally, rugby players had moderate knowledge about the dietary supplements. This was rated at 44.9% for creatine monohydrate, antioxidants - 11.3%, multivitamins – 44.2%, glutamine – 14%, whey protein – 37.3% and Zinc Magnesium Aspartate (ZMA) -8.6%. The consumption levels (15.1% took and 53.8% never took) were low. Hypothesis testing confirmed that there was significant difference ($p < 0.005$) between the variables (age, academic qualification, occupation, experience and club affiliation) and the reasons for taking dietary supplements as well as the consumption patterns by the male rugby players

Conclusion and application of findings: There were definitely low levels of use of dietary supplements among rugby players. The Kenya Rugby Football Union should organize clinics, courses and seminars for rugby coaches and teachers regarding dietary supplementation and its role in enhancing the nutritional status of the players. Further research should be conducted on the use of other dietary supplements and their effect on performance.

Key words: Dietary supplements, ergogenic aids, enhanced performance, knowledge level.

INTRODUCTION

Rugby football started in 1823 AD and was attributed to an English man known as William Webb. He introduced a new dimension into the game of football (Myles & Thomas, 1894; Kiganjo *et al.*, 2003). It is believed that he disregarded the

rules of football (soccer) as played in his time by taking the ball in his arms and running with it. In rugby, basically the ball is both handled and kicked. The main objective is to place a ball on the ground across the goal line in order to make a try.



A team usually strives to gain possession of the ball through contests such as line outs, mauls, and scrums, kick off and open play situations (Biscombe, 1998). All these activities require strength, endurance, power and speed. Currently, rugby has become a multi million dollar sport that places extreme physical demands on the players. Today, rugby players compete for fame and glory in the rugby union or rugby league where players smash and tackle opponents to stop them from getting a try. Therefore, to perform well one has to be rough, rugged and determined. This is partly possible through eating a balanced diet and use of commercially available supplements (Steven, 2002).

Nutritional or dietary supplements are ergogenic aids aimed at enhancing performance above expectation, either by affecting energy metabolism or the central nervous system. The supplements also function by increasing lean body mass or muscle mass, by stimulation of protein

MATERIALS AND METHODS

Descriptive survey design was used to investigate the extent of dietary supplements use by rugby players in the Kenya Cup League of 2006. Simple random sampling was used to select 20 players from each of the seven identified teams (Kenya Commercial Bank, Nondescripts, Harlequins, Impala, Mwamba, Mean Machine, and the United States International University); giving a total of 140 players. Data was collected between April and August 26, 2009, which is usually the Kenya Cup season. The researcher and the coaches identified suitable dates on which questionnaires were to be administered. The questionnaires were distributed by the researcher and

RESULTS AND DISCUSSION

Creatine monohydrate: The results in table 1 show that majority (55%) of the respondents had no knowledge about creatine monohydrate while 44.9% indicated that they were aware. Creatine monohydrate is the most popular (49.9%) supplement used by rugby players (Wagner, 2005). In a study of 300 elite sports people, Poortmans and Francaux (2000) found that 100% of rugby players used creatine monohydrate. A study by Ahmum *et al.* (2002) revealed that in highly

synthesis or by reducing body fat content. According to Laurie (1999), dietary supplements are any substance which acts either nutritionally to reverse or prevent deficiencies (e.g. multivitamins). They are the most recognized form of ergogenic aids (Burke *et al.*, 2000). A survey in 1998 by the independent British National newspaper on 360 elite athletes showed that 44% were using supplements regularly, which included 100% of rugby league players and 100% of the weight lifters (Poortmans & Francaux, 2002).

Whey protein, antioxidants, creatine monohydrate, glutamine and ZMA are the supplements mostly used by rugby players (Adams, 2005). As yet, it is not known whether Kenyan rugby players take dietary supplements. Therefore, the objectives of this study were to determine the extent of knowledge and the consumption levels, and to identify factors or reasons that influence the utilization of dietary supplements by rugby players in Kenya.

the players asked to fill and return as soon as possible but not later than 24 hours.

The statistical package for social sciences (SPSS) was used for data analysis. Descriptive statistics were used to analyze data, which generated frequencies, percentages, means and standard deviations. Chi-square (χ^2) test computed at $p=0.05$ level of significance was used to determine presence of significant associations in the extent of dietary supplements use with age, level of education, occupation, experience and club affiliation of the players.

trained rugby players, a dose of 20g per day for 5 days of creatine monohydrate improved sprint performance.

The number of rugby players in Kenya who were aware of this supplement was generally low probably because of lack of adequate information about the supplement. In addition, this supplement is expensive and may be unaffordable to most of the rugby players, who were students at the time of the study.



Table 1: Knowledge of dietary supplements by Kenyan rugby players (F= frequency).

Supplements	Yes		No	
	F	%	F	%
Creatine Monohydrate	53	44.9	65	55.1
Antioxidants	11	11.3	86	88.7
Multi-Vitamins	46	44.2	58	55.8
Glutamine	13	14.1	79	85.9
Whey protein	35	33.3	70	66.7
ZMA (Zinc Magnesium Aspartate)	8	8.6	85	91.4

Antioxidants: Only 11.1% of the respondents admitted awareness of the existence of antioxidants, while 88.7% were not aware. Research carried out by Rousseau *et. al.*, (2004) on 118 well trained athletes indicated that antioxidants played a protective role against illnesses among athletes. Yet, it is surprising that Kenyan rugby players have scanty information about antioxidants. Perhaps nutrition knowledge could be taught more in schools and also to the general public in order to enhance the awareness on the value of dietary supplements. These findings indicate that there is a gap in the curriculum, which should be addressed.

Multivitamins: From the responses, 44.2% of the respondents indicated they were aware of multivitamins supplements. However, the players are more likely to go for the cheaper food supplements, which may have selected vitamins. Adams (2005) recommends use of multivitamins for enhanced endurance and aerobic capacity rather than single nutrient supplements.

Glutamine: The responses showed that 14.1% of the respondents had some knowledge about glutamine, while majority (85.9%) had absolutely no knowledge. Glutamine is a valuable energy source for cells lining the intestines. Evidence shows that it is the largest fuel amino-acid for athletes and people under stress. Since it is abundant (protein building blood) in the body, it is involved in more metabolic processes than any other amino acid. It is usually converted to glucose for instant energy. Without the supplement, cells lining the intestine waste away (Dale, 2001; Adams 2005). Clearly, there is need to raise the level of awareness regarding glutamine among rugby players in Kenya.

Whey protein: Whey protein was determined to be a common dietary supplement as it was used by 33.3% of the respondents. It is the best protein source because it is absorbed quickly for provision of energy and to initiate repair of worn out tissues. Persistent

consumption of a protein supplement immediately after exercise promotes muscle mass and increases strength (Tipton *et. al.*, 2001).

Zinc Magnesium Aspartate (ZMA): A massive 90.4% of the respondents indicated that they had no idea about the ZMA supplement, with only 8.6% being aware of it. Yet, Brilla and Conte (1999) reported that supplementation of ZMA boosts the levels of testosterone (a growth hormone), which is usually suppressed by hard physical training. ZMA is widely used by endurance athletes such as runners, cyclists, wrestlers as well as strength training athletes like footballers, body builders and rugby players

Reasons for taking dietary supplements

The study sought to establish the reasons as to why the Kenya Cup rugby players took dietary supplements. Results (table 2) showed that 41.6% of the respondents indicated that they often excelled due to supplement intake, 13.5% rarely took the dietary supplements while a higher proportion (44.9%) of the respondents expressed that their performance was not due to dietary supplement intake. On average, the results indicate that rarely (2.06%) did the intake of dietary supplements contribute to the Kenya Cup Rugby players' excellence in sports. This means that there are other factors besides the dietary supplements that enable these players to excel in the game of rugby.

When asked whether the supplements were worthwhile and necessary for their performance, majority (52.5%) of the respondents indicated that it was necessary to use them quite often. On the other hand, 26.7% of the respondents indicated that the supplements were not necessary. Although the dietary supplements were said to be worthwhile and necessary by some, most of the players could not afford to purchase them.

On the question of whether it was enjoyable to take the dietary supplements, the study established that a majority of the respondents (60.7%) did not enjoy taking the supplements; 22.6% seldom enjoyed, while a few (16.7%) enjoyed taking the supplements. This is consistent with the expectation since most of the respondents had little knowledge of the supplements and how they should be used. From the researcher's interaction with a few of the players (who preferred anonymity) they were not sure whether the supplements were drugs (illegal substances) or nutrients. This caused apprehension and some feelings of insecurity.

With regard to whether the supplements were important for daily life, 43.2% indicated that they were not necessary, 37% were of the opinion that they were a little bit important, while the least proportion (19.8%) stated that the supplements were necessary and

important for life. Majority of the respondents (80.3%) indicated they did not consume dietary supplements because they could not afford a balanced diet. A balanced diet consists of energy (carbohydrates) giving foods, fuel (fats), bodybuilding and repair (proteins) foods, protective foods (vitamins) and minerals and of course water. These can be obtained from locally available foods as compared to supplements which are manufactured and to a large extent imported.

Minority (7.4%), however, consumed the dietary supplements quite often because they could afford them. From the mean score analysis, it is clear that even though the respondents consumed the dietary supplements, it was not as a result of a balanced diet being expensive, rather they were able to afford it or they had some knowledge on the importance of the dietary supplements

Table 2: Reasons expressed by male rugby players in Kenya for taking dietary supplements.

Reason	Frequency	Often%	Seldom%	Never%	Mean	SD
-I excel in my sport when I take dietary supplements	89	41.6	13.5	44.9	2.06	.98
-Dietary supplements are worthwhile and necessary	99	52.5	21.2	26.7	1.76	.90
-Dietary supplements are not enjoyable and stimulating	84	16.7	22.6	60.7	2.44	.77
-Dietary supplements are not important to every life	81	19.8	37.0	43.2	2.23	.76
-I take dietary supplements because I cannot afford a balanced diet	81	7.4	12.3	80.3	2.80	.70
-I take dietary supplements with my friends	73	6.8	17.8	75.3	2.74	.71

The study investigated rugby players' reasons or factors that influenced the utilization of dietary supplements. Based on the chi-square analysis (Table 3) there was a significant difference between the reasons for taking dietary supplements and age, level of education, occupation, experience and club affiliation of rugby players. Although the ages of players varied,

there was a general awareness of dietary supplements and their importance to sports across the range of ages. Biscombe (1999) and Burke and Minehan (2000) reported that dietary supplements prevent deficiency and thus help the players to resist illness and stay healthy so as to excel.

Table 3: Chi-square analysis of reasons for taking dietary supplements based on the age, level of education, experience and club affiliation of rugby players in Kenya.

Age, level of education, experience and Club Affiliation,	Chi-Square χ^2	df	<0.05 (Sig)
I excel in my sport when I take dietary supplements	38.023	4	.000
Dietary supplements are worthwhile and necessary	18.531	4	.001
Dietary supplements are not enjoyable and stimulating	89.333	4	.000
Dietary are not important to every life	44.750	4	.000
I take dietary supplements because I cannot afford a balanced diet	169.291	4	.000

The level of education of the respondents is relevant because they are able to gain awareness and comprehend the dietary supplements offered on the market. A study by Frank *et al.* (2000) supports the idea that many years of education will enhance awareness on the role of nutrition in good health. Hence, there is a substantial relationship between the respondents' level of education and reasons for taking dietary supplements.

The occupation of the respondents definitely dictates the lifestyles of the players (Janet *et al.*, 2002) and those who have well paying careers have the capacity to improve their performance by supplementing their diet, while the students may have little option, except to play to the best of their abilities. It has been proved from several studies that elite players often use dietary supplements (Thomas, 1998; Steven, 2002; Rousseau *et al.*, 2004; Myles & Wagner, 2005).

Further, respondents with long experience in the game of rugby are more likely to be using dietary supplements since they have to perform and excel in the sport consistently in order to be retained in the team/club. Apart from physical conditioning and thorough practice of the skill, the trend is towards supplementing a balanced diet with dietary supplements (Brilla & Conte, 1999). Our study also found evidence of a relationship between the reasons for using dietary supplements and the player's club affiliation.

Consumption patterns of the dietary supplements

The study sought to establish the consumption patterns of dietary supplements among the Kenyan rugby players. It is evident (table 3) that majority (53.8%) of the respondents never took the dietary supplements, 31.1% rarely took the supplements and only a minority (15.11%) confirmed that they often took the dietary supplements.

On whether they enjoyed taking the dietary supplements, majority (51%) of the respondents never wanted to take dietary supplements. The players would seldom wish to take the dietary supplements as the indicated by the low mean score (2.25).

More (60.6%) of the respondents had a perception that a balanced diet was more essential than dietary supplements and therefore they tended to take it more often as indicated by a mean of 1.55. Some (23.9%) of the respondents indicated it to be essential. The overall observation is that a balanced diet is more preferred to dietary supplements.

The study also established that 31.5% were often motivated to take the supplements, 20.2% were seldom motivated while 48.3% were not motivated to take the dietary supplements.

Besides lack of motivation to take the supplements and as well lack of resources to buy them, the limited knowledge of the players on the available dietary supplements could also impact negatively on their consumption since as noted above (Table 1), majority did not have knowledge of the dietary supplements.

Table 4: Consumption patterns of dietary supplements by rugby players in Kenya. (Values are %).

Statement depicting the consumption	Frequency	Often	Seldom	Never	Mean	Std. Dev
I take dietary supplements	106	15.1	31.1	53.8	2.41	.78
I usually enjoy taking dietary supplements	101	21.8	19.8	58.4	2.45	.92
I do not want to take dietary supplements	92	28.3	20.7	51.0	2.25	.91
A balanced diet is more essential than supplements	109	60.6	23.9	15.6	1.55	.75
I do not like dietary supplements	86	21.0	31.4	47.6	2.31	.88
I am not motivated to take dietary supplements	89	31.5	20.2	48.3	2.17	.88

The study investigated consumption patterns of dietary supplement based on age, level of education, occupation, experience and club affiliation. The findings indicated that there was a significant relationship between the demographic characteristics and the consumption patterns. This is supported by US Food and Nutrition board (1989) and Food and Agriculture Organization (1985) who noted that both young and old people who engaged in hard vigorous training use

dietary supplements. The general impression is that a majority (78%) of the respondents were below 25 years and had little knowledge about the supplements. This implies that they are likely not to consume dietary supplements.

The level of education of the players was also a significant factor. A study by Nayge and Reed (1999) revealed that there is greater use of dietary supplements among adults of high socio-economic

status. A study by Janet *et al.* (2002) showed that athletes leading healthier lifestyles tend to use dietary supplements.

For rugby players to be regarded as elite, they should have played the game of rugby for a long time in order for them to qualify to be professionals. The implication of this finding is that the trend of athletes in general and rugby players in particular is in the direction of utilization of dietary supplements. The findings are likely to change if rugby as a sport is made professional in Kenya.

Based on the findings, a majority of the Kenyan rugby players who participated in the 2006 season of the league had relatively low knowledge levels of dietary supplements. Although a small group indicated that supplements were worthwhile and

necessary, more players preferred a balanced diet. Creatine monohydrate was more familiar to the players, followed by multivitamins, whey protein, antioxidants and ZMA. The study recommends that the Kenya Rugby Football Union should organize clinics, seminars and courses to sensitize coaches on the essence of nutrition and the role of dietary supplements in nutrition.

ACKNOWLEDGEMENTS: The contribution of coaches of the rugby teams (Kenya Commercial Bank, Nondescripts, Harlequins, Mwamba, Impala, Mean machine and United States International University) who ensured high returns of the questionnaires as well as the players for their invaluable support and willingness to respond to the research instruments.

REFERENCES

- Adams N, 2005. The Five Habits of Health Transformation. The Health Rayer.
- Ahmun RP, Tong RJ, Grimshaw PN, 2002. The effects of acute creatine supplementation on multiple sprint cycling and running performance in rugby players. *Journal of Strength and Conditioning Research* 19: 92-97.
- Biscombe T. and Duetz P, 1998. Rugby: Steps to Success, Human Kinetics .U.S.A.
- Brilla LR. and Conte W, 1999. A novel zinc and magnesium formulation increases hormones and strength in athletes. *Medicine in Sports and Exercise* 31: 483.
- Burke L. and Deshrow BM, 2000. Dietary supplements and nutritional ergogenic aids. In: *Clinical Sports Nutrition* (2nd ed.) edited by L. Burke and W. Deskin, Sydney McGraw Hill pg. 455 – 526.
- Dale MA, 2001. Ergogenic Aids. *Counseling the Athlete, America Family Physician.* 639: 13-22
- Frank E, Bendich A, Denison W, 2002. Use of vitamin – mineral supplements by female physicians in the United States. *Am. J. Chin. Nutrition* 72: 969-75.
- Janet AF, Suzaanne PM, Lynne RW, Jean HH, Brian EH, Lawrence NK, 2002. Use facts associated with dietary supplement among University of Hawaii, Honolulu, HI. University of Southern California, Los Angeles, C.A.
- Kiganjo G, Mwathi L, Kamenju J, 2003. Physical Education; A Teachers' Guide for Form Three, Jomo Kenyatta Foundation, Nairobi, Kenya.
- Laurie WC, 1999. Question Marks on Supplements: *Soccer Journal* Volume 4 (1) : 44-45.
- Myles RCD. and Thomas KFT, 1994. *Injuries and Rugby*, London, Blackwell Scientific Publication.
- Nayge RM. and Reed DB, 1999. Factors Associated with the Intake of Dietary Supplements. *Fan. Econ. Nutrition Rev.* 12:43-48.
- Poortmans JR. and Francaux M, 2000. Adverse Effects of Creatine Supplementation. *Fact of Fiction. Sports Medicine* 30(3) 155 – 170.
- Saris WM, Van Esphart MA, Browns E, Westerberg KB, Hoor M, 1989. A study on Food Intake and Energy Expenditure during Extreme Sustained Exercise. *Tour de France International Journal of Sport Media* 10: 526-531.
- Rousseau AS, Hinigner I, Pakaxetti S, Fauvem H, Rousei A-M, Margentis I, 2004. Antioxidant Vitamin Status in High Exposure to Oxidative Stress in Competitive Athletes, *British Journal of Nutrition*, 92(3): 461-468.
- Steven S, 2002. The Nutritionist, the Runners World Magazine pg. 52.
- Tipton KD, Rasmussen BB, Miller SI, Wolfe SE, Owens Stovall SK, Petrini BH, Wolfe RR, 2001. Timing of Amino Acids – Carbohydrates Ingestion Ulcers Anabolic Response of Muscle to Resistance Exercise. *American Journal of Physiology* 281 E. 197 – E206.
- Wagner P, 2005. *Nutritional tips for Rugby Players: Body Building, Com 305, Steel Head Way* Boise, I. D. 83704.

