



Survey on the Use of Supplements among College Athletes



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1. Overview

1.1 Survey Objectives

Since the establishment of the World Anti-Doping Agency (hereafter referred to as "WADA" in 1999), anti-doping activities have been globally extended. Meanwhile, the Japan Anti-Doping Agency (hereinafter referred to as "JADA"), established in 2001, has been implementing the international activities along with the Government of Japan representing Asia in the WADA Executive Committee, as well as promoting anti-doping activities in Japan.

The World Anti-Doping Code provides guidelines for anti-doping education and research. JADA conducted surveys and research in FY 2009, 2010 and 2011 to promote anti-doping education, in which relationships among athlete's understanding, awareness and behavior related to anti-doping were elucidated and the importance, etc. of raising awareness of anti-doping from ordinary sport activities, was shown. Moreover, the FY 2013 survey and research conducted a survey on public awareness, which revealed that ethics and fair play among elite athletes constituted key elements reflecting public expectation in sports.

Given the increasing number of domestic and overseas cases involving inadvertent infringements of anti-doping rules due to ingesting prohibited substances contained in supplements, the survey and research in this fiscal year was to be implemented with the aim to contribute to effective anti-doping education and awareness raising activities for athlete by ascertains the actual status of supplement use and awareness of using supplements, etc.

1.2 Survey Contents

1.2.1 Questionnaire survey on the actual status of supplement use by college athlete

(1) Contents

Many of the recent cases of anti-doping rule violation derive from careless ingestion of prohibited substances contained in supplements and pharmaceutical products. Such cases arising from using supplements have been observed more in senior athlete than junior athlete. Given the circumstances, it is an urgent necessity to grasp the actual state of how senior-level athlete is aware of using supplements.

For the purpose of this research, it deems necessary to proceed to grasp the actual status of college athlete who are in the transition from junior-level to senior-level athlete. Becoming adult in terms of their age, university students are more or less independent compared to their high school life. Making their choice in daily life and training management more freely and subjectively is also one of the features of university student. This implies that they will also be able to purchase supplements subjectively and may use in more wide-range and frequent manner. Therefore, university students' awareness and actual status of supplement use is considered to have an influence on their awareness and actual use in their subsequent athlete life. Clarification of the actual status of senior athlete including top-level athlete based on the research on university students will also help to grasp their comprehensive trends, thereby carrying out more effective education and awareness raising activities as well

as obtaining information for establishing effective message.

Based on the above, the actual status of college athlete's use of supplements is surveyed in this research.

(2) Survey Method

1) Survey on universities at a higher level of competition

A questionnaire survey was conducted targeting college athlete who belong to an athletic club of a university at a higher level of competition. It also includes those clubs where their athlete participates to international-level competitions as well as their team players or teams participate to top-level domestic competitions.

2) Survey on universities at the general level of competition

A questionnaire survey was conducted by using web monitors targeting athlete belongs to athletic clubs of their university as well as university students belong to athletic circles of their university. The total number of athletic clubs and circles shall be more or less the same level as those "targeting universities at a higher level of competition." To collect a number of samples, they shall be collected as many as possible during the survey period.

(3) Key survey items

Key survey items are as follows:

- Basic attribution (sex, age, and sporting event).
- Living environment.
- Status of the consumption of supplements (experience, frequency, etc. of use).
- Purpose of consuming supplements.
- Reasons for consuming supplements.
- How to obtain supplements, etc.

1.3 Survey period and results of sample collection

(1) Survey period

The period of the survey is as follows:

1) Survey on universities at a higher level of competition

From Early to mid-March, 2013

2) Survey on universities at the general level of competition

From late in February to early March, 2013

(2) Collection result

The results of sample collection are as follows:

1) Survey on universities at a higher level of competition

Distribution: 3,243 sheets to 8 universities

Valid responses: 2,064 from 7 universities (response ratio: 63.6%)

2) Survey on universities at the general level of competition

Responses were collected from 721 students who belong to athletic club and 721 students who belong to athletic circles.

2. Overview the survey results

2.1 Living environment and dietary life of college athlete

o Among college athlete surveyed, around a half of the males live in dormitory while a half of the live in their own lodging; hence, the proportion of living with their family is low. In addition, many of them have breakfast but eat out dinner.

- Among athlete belong to a university athletic club at a higher level of competition, (hereinafter referred to as "athletic club (strong university team)"), 45.1% of males live in dormitory of their university or team while 18.6% and 33.9% of them live with their family and in their own lodging, respectively.
- On the other hand, 48.0% of females belong to "athletic club (strong university team)" live in their own lodging while 28.9% of them live in their parent's house. The proportion of those females living in dormitory of their university or team was 15.9%.
- Comparing to those athlete belong to a university athletic club at the general level of competition and sport lovers (hereinafter, respectively referred to as "athletic club (web monitoring)" and "athletic circles (web monitoring)"), 66.7% of them have breakfast every day, which shows a high ratio, while 4.3% of them do not have breakfast at all.
- In terms of the frequency of eating out dinner, 12.5% of college athlete of "athletic club (strong university team)" were almost every day, 20.7% of them were around 3 to 5 days per week, and 38.9% were around 1 to 2 days per week. This frequency was almost on the same level as that of "athletic club (web monitoring)" and "athletic circles (web monitoring)."

o About 60% of athlete used supplements over the last one year. Around 30% of them consumed supplements more than 3 days in a week. Males showed a higher rate of use as well as frequency of supplements consumption.

- Among those college athlete belong to "athletic club (strong university team)," 14.6% of them consumed supplements almost every day, 15.3% did around 3 to 5 days per week, and 10.3% did around 1 to 2 days per week. 38.9% of them were not supplement users.
- 16.1% of male athlete belongs to "athletic club (strong university team)" consumed "almost every day" (the ratio in the same response from "athletic club (web monitoring)" athlete and those belong to "athletic circle" were 8.6% and 6.9%, respectively) and 17.0% were "around 3 to 5 days per week" (8.5% of "athletic club (web monitoring)" athlete and 7.1% of those in "athletic circle"). This showed relatively higher figures than other targets while 36.0% of them "did not consume" which was lower than others (54.1% of "athletic club (web monitoring)" athlete 55.9% of those "athletic club"). Meanwhile, 8.8% of female athlete belong to "athletic club (strong university team)" consumed supplements "almost every day," 8.6% were "around 3 to 5 days per week," and 49.3% did not consume supplements.
- The status of using supplements by female athlete in "athletic club (strong university team)" showed almost at the same level as those belong to "athletic

club (web monitoring)" and "athletic circles (web monitoring)."

2.2 The status of using supplements

○ Major incentives of using supplements were "to increase muscle amount and body weight" (particularly incentives of males), "for fatigue recovery" (particularly incentives of female), and "to replenish insufficient nutrition."

- The most incentives of college athlete belong to "athletic club (strong university team)" to consume supplements were "To increase muscle amount and body weight" (60.0%), followed by "for fatigue recovery" (44.0%) and "to replenish insufficient nutrition" (34.0%).
 - "To increase muscle amount and body weight" was the most incentive of male respondent in particular (65.5%) while "for fatigue recovery" was the most reason of female respondents (59.3%). Around 30% of males and 40% of females responded "to replenish insufficient nutrition" for their incentive.
 - Moreover, "to enhance performance ability" accounts for 33.5% which showed a higher percentage compared to the same responses from those in "athletic club (web monitoring)" (16.0%) and "athletic circles (web monitoring)" (6.9%).
- * The question items were prepared with reference to "the status of using supplement by Japanese top-level athlete" published by Japan Institute of Sport Science. (<http://jpnssport.go.jp/jiss/supplement/tabid/346/Default.aspx>)

○ Those supplements mostly consumed were "protein supplements" (particularly by males), followed by "amino acid supplements" (particularly by females) and "multi-vitamin pills." Females ingested various supplements.

- Those supplements mostly consumed by college athlete in "athletic club (strong university team)" were "protein supplements" (68.0%), followed by "amino acid supplements" (29.4%) and "multi-vitamin pills" (19.6%).
 - "Protein supplements" were mostly consumed by males in particular (72.7%), and more females (35.8%) consumed "amino acid supplements" than males (27.9%).
 - The proportion of females who consumed almost all types of supplements except protein supplements was higher than males, which implies a trend that females ingested supplements of various types.
 - Regarding "multi-vitamin pills," "multi-mineral pills," "multi-vitamin/multi-mineral pills," "simple vitamin pills," "simple mineral pills," "energy jelly, bar and drink," and "herbs," their consumption level of college athlete belong to "athletic club (strong university team)" was lower than those belong to "athletic club (web monitoring)" and "athletic circles (web monitoring)."
- * The question items were prepared with reference to "the status of supplement consumption by Japanese top-level athlete" published by Japan Institute of Sport Science. (<http://jpnssport.go.jp/jiss/supplement/tabid/346/Default.aspx>)

○ A half of males and 40% of females believed necessary to use supplements of their own accord. Females tended to be influenced by their coach and family members compared to males. Meanwhile, 15.1% of males and 10.8% of females consumed

supplements for some reason without thinking carefully.

- The major reasons of college athlete belong to "athletic club (strong university team)" for consuming supplements were as follows: "I thought they are necessary for myself and I consumed them of my own accord" (49.6%), "I was recommended by my coach" (19.8%), "I was advised by my colleague athlete" (19.2%), and "I consumed them for some reason without thinking carefully" (14.3%).
- Most males (51.6%), in particular, chose the reason "I thought they are necessary for myself and I consumed them of my own accord" for their consumption and 39.7% of females chose the same.
- The proportions of female college athlete belong to "athletic club (strong university team)" in responding "suggested by your family member" (females: 24.0%; males 8.2%) and "I was recommended by my coach" (females: 25.5%; males: 18.5%) were than higher males of the same belonging.
- 14.3% of college athlete belong to "athletic club (strong university team)" (15.1% of males and 10.8% of females) responded "I consumed them for some reason without thinking carefully" for their reason of consumption, which showed a lower level compared to those belong to "athletic club (web monitoring)" (25.1%) and "athletic circles (web monitoring)" (36.5%).

○ About 60% of respondents purchased supplements at pharmacies and drug stores, followed by purchasing via internet and from given by their coach.

- The most way that college athlete belong to "athletic club (strong university team)" obtained supplements was "purchased at a store such as pharmacy and drug store" (56.1%), followed by "purchased via internet (from a domestic agency)" (19.8%) and "given by your coach" (11.4%).
- 62.3% of females responded "purchased at a store such as pharmacy and drug store," which was higher than male respondents (54.6%) whereas 20.7% of males responded "purchased via internet (from a domestic agency)," which showed a higher percentage than females (15.2%).

○ 34.0% of respondents "did not know that supplements may contain prohibited substance."

- 34.0% of college athlete belong to "athletic club (strong university team)" responded "did not know that supplements may contain prohibited substance." This was particularly higher in male responses accounts for 35.2% (the proportion of female respondents was 27.9%).
- 11% of college athlete belong to "athletic club (strong university team)" responded "also knew about the name of specific prohibited substance" while 51.2% of them "knew that some prohibited substance may contain a prohibited substance but did not know about its specific name."
- The results more or less showed the same level as the responses of college athlete belong to "athletic club (web monitoring),"

○ University lectures and seminars, workshop and training course or their coach are

the main information source of college athlete. Only a few athlete obtained information from physician and pharmacist or searched information by themselves.

- Major information sources for learning the fact that supplement may contain prohibited substance were “learned from a lecture or seminar at university” (40.2%), “learned from my coach” (35.0%), and “learned at a workshop and training” (31.6%).
- Very few college athlete learned from physician (5.4%) or pharmacist (1.2%), and the number of those who studied by themselves from internet (8.9%) or textbook, handbook, etc. (14.3%) remains to be small.

2.3 Analysis on supplement use by college athlete at a higher level of competition

* The college athlete mentioned in the following items of this section refers to those belong to “athletic club (strong university team).”

○ Compared to top-level athlete in general, the proportion of college athlete ingesting “protein supplements” to “increase their muscle amount and body weight” was very high. On the other hand, the proportions of their use for the purposes of “replenishing insufficient nutrition,” “fatigue recovery,” and “enhancing performance ability” were lower whereby their use meant to be concentrated in “protein supplements.”

- According to “the status of supplement consumption by Japanese top-level athlete” published by Japan Institute of Sport Science, the incentives of top-level athlete to consume supplements were: “for fatigue recovery” (under 20 years old: 64.3%; over 20: 68.5%) as the first place, followed by “to replenish insufficient nutrition” (under 20 years old: 48.6%; over 20 years old: 50.6%) and “to enhance performance ability” (under 20 years old: 38.6%; over 20 years old 46.5%). 21.4% of under the age of 20 years old and 26.0% of over 20 years old consumed supplements “to increase muscle amount and body weight.”
- Compared to top-level athlete, the proportion of college athlete consumed supplements “to increase muscle amount and body weight” (60.0%), “for fatigue recovery” (44.0%), “to replenish insufficient nutrition” (34.0%), or “to enhance performance ability” (33.5%). Their response of “to increase muscle amount and body weight” was especially higher than that of top-level athlete while their proportion in responding “for fatigue recovery,” “to replenish insufficient nutrition,” and “to enhance performance ability” were lower.
- Regarding almost all supplements except protein supplements, the proportion of college athlete using them was lower than that of top-level athlete in general, which implies a trend that their use was concentrated in protein supplements.

○ Incentives of using supplements were not related to living environment and dietary habit, which indicated that the incentives may be driven by sport-related factors.

- Comparison was made between three groups: a group of having breakfast every day and less eating out (Group A), a group of not or never having breakfast and eating out many times (Group C), and an intermediate group the respondents of which does not belong to either group (Group B).
- In case of Group A, 35.3% of college athlete live in dormitory of their university or

team and 22.8% of them live with their family at their parent's house. Besides, 9.3% of them live in their own lodging. Those college athlete living in dormitory and their parent's house are considered to have better dietary habit than living in their lodging.

- There were no differences in terms of sex among those who live in dormitory and their parent's house. With regard to college athlete living in their lodging, the proportion of females of Group A tended to be higher while those of Groups C was lower compared to males, so that their better dietary habit can be observed.
- Meanwhile, comparison of the three groups' status of using supplements showed that their rate, frequency, and incentive of using supplements were more or less the same.
- This results indicate that the incentives for consuming supplements are relatively independent from living environment and dietary habit and may be induced by aforementioned reasons: "to increase muscle amount and body weight" (particularly an incentive of male), "for fatigue recovery" (particularly an incentive of female), "to enhance performance ability," etc.

o Those attributions and situations highly likely to use supplements "without knowing that supplements contain prohibited substance" were: males (sex), lower grade (grade), infrequent use (frequency), to increase muscle amount and body weight (incentive), protein supplements and multi-vitamin pills (supplement types), consumed for some reason (reason), and passively obtained from their coach and family members (how to obtain).

- 35.2% of males and 27.9% of females responded "I did not know that supplements may contain prohibited substance." In terms of their grade, 35.8% of them were the first- and second-year students while 30.9% were the third and last-year students.
- In terms of the frequency of using supplement by those who did not know that prohibited substance may be contained in the supplements, college athlete who consumed supplements "almost every day" was 22.9% while those who consumed "around 3 to 5 days per week" was 30.8%, "around 1 to 2 days per week" was 31.5%, and "a few times in a month" was 36.5%. It shows that those users at a lower frequency did not know that prohibited substance may be contained.
- The incentive of using supplements "to increase muscle amount and body weight" was highest in those who consumed without knowing that prohibited substance may be contained (30.4%), followed by "for fatigue recovery" (26.0%), "to replenish insufficient nutrition," (25.6%), and "to enhance performance ability" (23.2%).
- In case of those who did not know that prohibited substance may be contained, the major reasons for using supplements were "I consumed them for some reason without thinking carefully" (35.8%) and "I though they are necessary for myself and I consumed them of my own accord" (27.6%).
- In case of those who did not know that prohibited substance may be contained, the major types of supplements consumed were "protein supplements" (29.5%),

- “multi-vitamin pills” (28.2%), and “energy jelly, bar and drink” (28.0%).
- In case of those who did not know that prohibited substance may be contained, the major ways to obtain supplements were “given by your coach,” (32.9%), “given by my family member” (29.7%) and “purchased at a store such as pharmacy and drug store” (29.2%).

o Those attributions and situations highly likely to use supplements “for some reason without thinking carefully” were: male (sex), infrequent consumption: a few times in a year (frequency), multi-vitamin pills (supplement type) and purchased at stores (how to obtain).

- 15.1% of males and 10.8% of females responded that “I consumed them for some reason without thinking carefully.” In terms of their grade, 14.5% were the first- and second-year students and 14.1% were the third- and last-year students.
- In terms of frequency of using supplement in case of those who consumed for some reason, “almost every day” was 9.6%, “around 3 to 5 days per week” was 9.5%, “around 1 to 2 days per week” was 14.1%, “a few times in a month” was 17.8%, and “a few times in a year” was 24.9%. It shows that those users at a lower frequency tended to consume supplements for some reason without thinking carefully.
- In case of those who consumed for some reason without thinking carefully, the major types of supplements they consumed were: “multi-vitamin pills” (21.2%) and “energy jelly, bar and drink” (16.6%).
- 16.0% of those who “purchased at a store such as pharmacy and drug store” consumed supplements for some reason without thinking carefully.

o Those attributions and situations highly likely to use supplements to increase performance ability were: higher grade (grade), high frequency (frequency), influenced by training and workshop (reason), amino acid supplements and energy jelly, bar and drink (supplement type), and purchased via internet (how to obtain).

- 33.7% of males and 31.9% of females responded “to enhance performance ability.” In terms of their grade, 32.3% of them were the first- and second-year students and 35.4% were the third- and last-year students.
- Among those who used supplements to increase their performance ability, their frequency of using supplements were: “almost every day” (49.8%), “around 3 to 5 days per week” (40.0%), “around 1 to 2 days per week” (29.6%), “a few times in a month” (20.2%), and “a few times in a year” (17.8%). It shows that more frequent supplement users tended to consume supplements to increase their performance ability.
- In case of those who used supplements to increase performance ability, the major reasons for using supplements were “became interested in supplements after participating to a training or workshop” (53.7%) and “I was recommended by my coach” (46.6%).
- In case of those who used supplements to increase performance ability, major types of supplements they consumed were “amino acid supplements” (51.0%) and “energy jelly, bar and drink” (47.8%).

- 53.8% of those who used supplements to increase performance ability purchased the supplements "via internet (from a domestic agency)" while 38.5% of them were "given by your coach."