



E-ISSN: 2706-8927
P-ISSN: 2706-8919
www.allstudyjournal.com
IJAAS 2022; 4(2): 37-39
Received: 22-02-2022
Accepted: 24-03-2022

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A study on the immediate effect of sucrose intake during various physical fitness activities

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Abstract

The purpose of the present study was to observe the effect of consumption of sucrose sugar (a form of simple Carbohydrate) on athletic performance of C.P.Ed students of Chaudhary Devi Lal University, Sirsa. Total 10 students were selected for this study. The age ranged from 18 to 24 years. There were five boys and five girls selected as subjects. In this study components of AAPHER youth fitness test were applied to check and observe the energy level and the effect on performance of athletes. Data was recorded Pre-test and after immediate consumption of Sucrose dose and after 4 hours to check the variation in performance of the subjects. Data was analyzed using statistical tool of ANOVA. It was concluded that Sucrose provides energy and boost performance but should be taken as the immediate source of energy. There was a decrease in the immediate performance of the subjects however after 4 hours there was an increase in the performance of Sucrose intake.

Keywords: AAPHER, ANOVA

Introductions

Sucrose, common name as table sugar or sugar. Sucrose is disaccharide (Glucose + Fructose). It is found in the stems of sugar cane and sugar beets. 'Sugar' is generalized term for sweet-flowered carbohydrates. There are many different types of sugars, depending on the molecular structure. Sugars can be simple mono saccharides such as glucose or fructose, through to disaccharides such as sucrose (table sugar) and lactose (milk sugar). Sugar is found naturally in many foods, particularly fruit and vegetables. Sugar has been available in the Human diet since ancient times. While the effect of sugar on sports performance is inconclusive, the effects of sugar on endurance performance are most certainly conclusive. However, when blood sugar is maintained, endurance performance improves. The simplest way to maintain blood sugar is by taking on board a simple sugar-based drink during exercise. Most of the research is based on the use of glucose, a simple monosaccharide. Most research would suggest a two to five percent impairment in performance lasting longer than one hour when you ingest simple sugars.

Simple sugars are a very good source of energy for both pre and post workouts. To find the effect of Sucrose sugar on immediate and after 4 hours on the sports performance this study was conducted.

Methodology

The purpose of the present study was to measure the effect of Sucrose (a form of simple carbohydrate) on physical fitness performance. The control group chosen for this study was not allowed to take part in rigorous training except warming up with mild exercises and some stretching. A short warm up period of 8 to 10 minutes was given to each variable for each test. Selected components of AAPHER Youth fitness test were chosen for this study.

Components	Tests
Strength endurance of arms and shoulder	Pull-ups
Agility	4x10 yards shuttle run
Explosive power	Standing broad jump
Speed	50-yard dash

Pre-Test was conducted before two day and Post Test was conducted after 4 hours on the same day. To measure the effect the subjects were given measured quantities of 100 gm of Sucrose dissolved into 250 ml drink and the test were conducted immediately and after 4 hours.

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Statistical Technique Used

The statistical techniques are the only source to analyze and interpret the data collected precisely. The statistical techniques used in the analysis of the data are given in the brief summary. In this study ANOVA test is used.

Data Analysis

Table 1: 50 M. Girls

Subject	Control	Sucrose	After four hours
A	9.13 a	10.65 a	10.17 a
B	9.98 c	11.92 c	11.09 c
C	9.16 b	10.99 b	10.70 b
D	9.17 b	10.95 b	10.65 b
E	9.13 a	10.62 a	10.14 a

Table 2: 50 M. Boys

Subject	Control	Sucrose	After four hours
A	8.21 a	9.89 a	8.70 a
B	8.35 b	9.97 a	9.80 c
C	8.98 c	9.39 a	9.10 b
D	9.07 d	10.12 b	9.89 c
E	8.30 ab	9.36 a	9.14 b

Means Followed by similar alphabet within the column do not differ significantly ($P<0.05$)

50m - The test was performed to measure the speed of the athletes with or without consumption of sucrose.

- The pre-test item was performed without consumption of any food and (control) readings were recorded 2 days prior to the Sucrose intake tests.
- The test was again performed after consumption of sucrose and the performance of athletes decreased and the readings were recorded.
- After 4 hours the reading was again recorded which showed the increasing effect of sucrose on performance of athletes.

Table 3: Broad Jump (Girls)

Subject	Control	Sucrose	After four hours
A	5.2 a	5.1 a	5.5 a
B	5.4 a	5.1 a	5.9 b
C	6.2 b	5.0 a	6.5 c
D	6.1 b	6.2 b	6.47 c
E	5.6 a	5 a	5.5 a

Table 4: Broad Jump (Boys)

Subject	Control	Sucrose	After four hours
A	7.8 b	7.2 bc	8.1 c
B	7.0 a	7.1 bc	7.9 c
C	7.2 a	6.9 b	7.5 b
D	7 a	6.3 a	7.1 a
E	7.1 a	7.3 c	7.6 b

Means Followed by similar alphabet within the column do not differ significantly ($P<0.05$)

Broad Jump- It is the test battery of AAPERED youth fitness test which measure the explosive strength of legs.

- The pre-test item was performed without consumption of any food and (control) readings were recorded 2 days prior to the Sucrose intake tests.
- After consumption of sucrose the readings of samples were again recorded which showed the decrease in performance of the athlete.

- After 4 hours the test was again performed by same samples. The performance of the samples varied. The leg strength of the athletes increased after 4 hours of intake of sucrose.

Table 5: Pull Ups (Girls)

Subject	Control	Sucrose	After four hours
A	1 a	3 a	4 a
B	1 a	2 a	3 a
C	4 b	7 b	10 b
D	1 a	3 a	5 a
E	2 ab	4 a	4 a

Table 6: Pull Ups (Boys)

Subject	Control	Sucrose	After four hours
A	7 b	10 a	11 ab
B	4 a	10 a	10 ab
C	7 b	13 b	17 c
D	10 c	10 a	8 a
E	7 b	10 a	12 b

Means Followed by similar alphabet within the column do not differ significantly ($P<0.05$)

Pull ups- It is the test item performed to measure the muscular endurance of the arms and shoulder girdle in pulling the body upward.

- The pre-test item was performed without consumption of any food and (control) readings were recorded 2 days prior to the Sucrose intake tests.
- Where the sucrose was given to the samples the readings were again recorded which showed the decrease in path of the athlete.
- The test item was again performed after 4 hours on the same subjects to observe the effect of sucrose on the athlete performance. It was found that the performance increased after 4 hours.

Table 7: Shuttle Run (Girls)

Subject	Control	Sucrose	After four hours
A	27 a	30.20 b	26.10 b
B	31.88 b	29.20 a	25.02 a
C	26.28 a	29.30 a	26.12 b
D	26.28 a	29.05 a	26.07 b
E	28 ab	30.20 b	26.10 b

Table 8: Shuttle Run (Boys)

Subject	Control	Sucrose	After four hours
A	21.23 a	22.72 a	21.90 a
B	22.28 b	24.52 b	21.93 a
C	25.88 d	24.09 b	22.90 b
D	24.47 c	25.09 c	21.99 a
E	25.05 d	22.92 a	21.90 a

Means Followed by similar alphabet within the column do not differ significantly ($P<0.05$)

Shuttle Run-The test battery of AAPERED test is performed to measure agility or change of direction.

- The pre-test item was performed without consumption of any food and (control) readings were recorded 2 days prior to the Sucrose intake tests.
- The test was performed with consumption of sucrose on the same subjects, and the performance of the athletes decreased.

- Again, the test was performed after 4 hours. The readings were recorded on same subjects who showed the increasing performance of athlete after 4 hours of consumption of sucrose.

Discussions and Findings

While the effect of sugar on sports performance inconclusive, the effects of sugar on endurance performance are most certainly conclusive. However, when blood sugar is maintained, endurance performance improves. The simplest way to maintain blood sugar is by taking on board a simple sugar-based drink during exercise. Most of the research is based on the use of glucose, a simple mono saccharide as a source of energy and improves performance. It was found that there was a significant difference or the performance of athletes after intake of sucrose. Consumption of sucrose resulted the decreasing immediate performance for various test conducted whereas when the test was again conducted after 4 hours that showed the increased performance of athletes. This research is aligned with the previous studies by R. Murray *et al.* Therefore, Sucrose sugars should not use as source of immediate energy for sports performances.

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