3. EXPERIMENT MATERIALS AND METHODS

3.1. Object of Study

Green beans, physiological saline and mice.

3.2. Methods

60 mice are as subjects. They were randomly divided into four groups (low dose group, middle dose group, high dose group and physiological saline group). Each time they were respectively feed 10g 20g/L, 40g/L, 80 g/L green beans sports drinks and 15ml/(kg.d).

3.3. Administration Method

Green beans of each group and saline are paired with corresponding concentration; based on body weight accurately calculate the amount fed; gavage once daily; continuous administration 30 days.

3.4. Loading Swimming Test Method

Every 30min after given the test sample, set mouse swimming in the swimming tank; Water depth is not less than 20cm, and water temperature is 25±2. Rat tail is loaded with 5% of body weight lead sheet, record the time from the mice began to swim to death as swimming time.

3.5. Blood Urea Test Method

Every 30min after given the test sample, set mouse swimming in the swimming tank without load for 30min; After 30min rest, collect blood, and measure blood urea content.

3.6. Data Processing Method: Variance

In probability theory and statistics, variance measures how far a set of numbers is spread out. A variance of zero indicates that all the values are identical.

The variance of a random variable X is its second central moment, the expected value of the squared deviation from the mean $\mu = E[X]$:

$$Var(X) = E[(X - \mu)^2] \quad (2)$$

This definition encompasses random variables that are discrete, continuous, neither, or mixed. The variance can also be thought of as the covariance of a random variable with itself:

$$Var(X) = Cov(X, X) \quad (3)$$

The variance is also equivalent to the second cumulant of the probability distribution for X. The variance is typically designated as Var(X), σ_X^2, or simply σ2 (pronounced "sigma squared"). The expression for the variance can be expanded:

$$\begin{aligned} Var(X) &= E[(X - E(X)^2] \\ &= E[X^2 - 2X \cdot E[X] + E[X]^2] \\ &= E[X^2] - 2E[X] \cdot E[X] + (E[X])^2 \\ &= E[X^2] - (E[X])^2 \end{aligned} \quad (4)$$

4. EXPERIMENT RESULTS AND ANALYSIS

4.1. The Impact of Green Beans Sports Drinks on Weight of Mice

The impact of green beans sports drinks on weight of mice is as shown in Table **1**. We can see that the weight of mice of each group has slightly increased, but with no statistical differences Fig. (**1**).

Table 1. The GI values of some food (glucose GI=100).

GI level	Food	GI value
High GI (GI>=70)	Maltose	105
	Glucose	100
	Cornflakes	81
	Watermelon	72
	White bread	70
Medium GI (55<=GI<70)	Sucrose	68
	Muffin	62
	Ice cream	61
	Rice	59
	Pineapple	59
	Coca-Cola	59
Low GI (GI<55)	Honey	55
	Banana	52
	Apple	38
	Peanuts	14

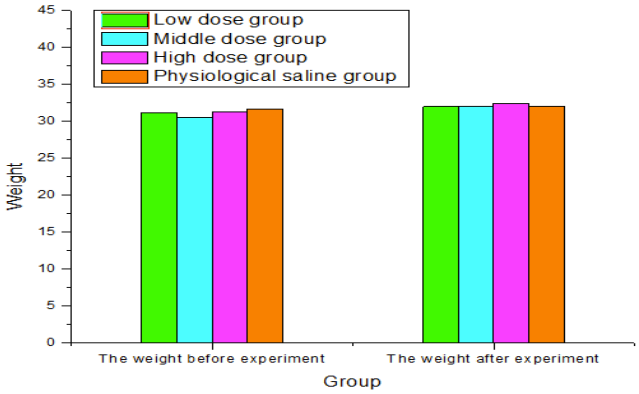

Fig. (1). The impact of green beans sports drinks on weight of mice.

4.2. The Impact of Green Beans Sports Drinks on Swimming Time

For low dose group, middle dose group and giht dose group, the swimming time of mice was prolonged, and with the saline control group there is significantly different. Also the higher the concentration of green beans sports drinks, the longer the average swimming time Table **2**. This shows that green beans sports drinks have some alleviate physical fatigue function Fig. (**2**).

Table 2. The impact of green beans sports drinks on weight of mice.

The group	Dose (g/L)	The weight before experiment	The weight after experiment
Low dose group	20	31.15±1.29	31.94±1.88
Middle dose group	40	30.45±2.01	32.04±1.46
High dose group	80	31.22±1.78	32.45±2.05
Physiological saline group	15ml/(kg.d)	31.61±1.62	31.98±1.76

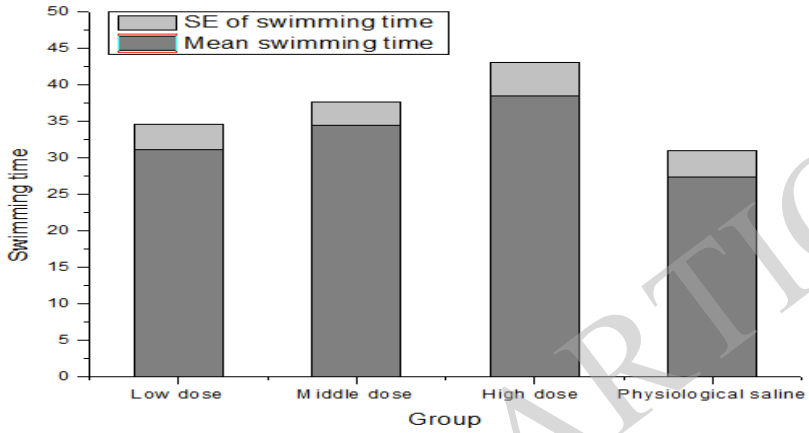

Fig. (2). The impact of green beans sports drinks on swimming time.

Table 3. The impact of green beans sports drinks on swimming time.

The group	Dose (g/L)	Mouse number	Swimming time (mmol/L)
Low dose group	20	15	31.15±3.48
Middle dose group	40	15	34.48±3.14
High dose group	80	15	38.50±4.55
Physiological saline group	15ml/(kg.d)	15	27.36±3.60

Table 4. The impact of green beans sports drinks on blood urea nitrogen.

The group	Dose (g/L)	Mouse number	BUN (mmol/L)
Low dose group	20	15	12.55±1.05
Middle dose group	40	15	10.58±0.88
High dose group	80	15	8.26±1.15
Physiological saline group	15ml/(kg.d)	15	15.46±1.10

4.3. The Impact of Green Beans Sports Drinks on Blood Urea Nitrogen (BUN)

The content of serum urea nitrogen nitrogenous can reflect the substances' metabolism status in the body, also is a more sensitive indicator for evaluationg the body under special conditions of physical work load carrying capacity. Table **4**. The lower serum urea nitrogen, the less the decomposition of nitrogenous substance in the body, the stronger the body's adapting load Fig. (**3**).

The serum urea nitrogen of each group after free swimming is shown in Table **3**. After strenuous activity, increased endurance can improve the adaptability to severe load of body, which appears to reduce urea nitrogen [9, 10].

Experimental group compared with the control group, BUN significantly decreased, indicating hat supplying green beans can reduce the extent of using protein of the body. The serum urea nitrogen values of three experimental groups and control group are compared; there is no significant difference

(p> 0.05). Blood urea nitrogen is a protein metabolites. When the general movement is no more than 30min, less protein is involved in for energy, blood urea nitrogen does not change significantly.

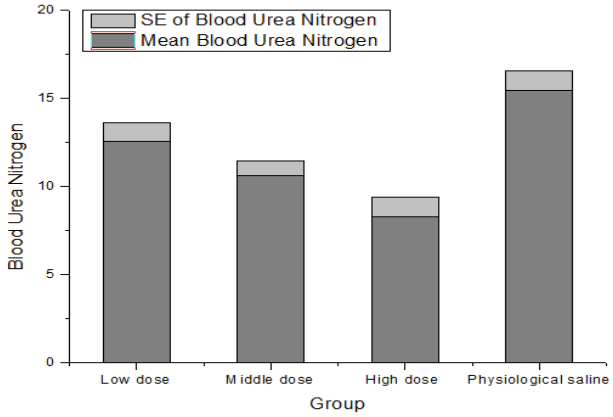

Fig. (3). The impact of green beans sports drinks on blood urea nitrogen.

CONCLUSION

Sports or work, the body is in a high-intensity stress state. All parts of physical or physiological response positivly in order to maintain or balance "movement" needs. In movement, physiological changes are mainly manifested in energy consumption of materials, water loss, electrolyte loss, accumulation of lactic acid, free radical damage and internal environment disorder, etc. Anti-fatigue functional sports drink products are based on the following rationales: delay muscle glycogen depletion rate, clear energy metabolism of lactic acid and maintain the body's normal metabolic process in motion.

Green beans have these funcitons (detoxification, relieving summer heat and other health effects). Mung bean is a kind of grain used as food and medicine, with heat, summer heat, detoxification, liver and reduces blood fat, cholesterol, soften blood vessels and other effects. Green beans are rich in protein and amino acid variety. Wherein the essential amino acid lysine content is up to 6.9%, and the content of essential amino acids is higher than the FAO/WHO recommended value (Kubota Yoshimi, *et al.,* 2011). Mung bean is also rich in dietary fiber, carbohydrates, vitamins and trace elements, and tannin, coumarin, alkaloids, saponins and flavonoids and other bioactive substances. Some studies have reported that Soybean peptides drinks have a good effect for athletes muscle mobilization and anti-fatigue. Animal tests show that sports drinks green beans significantly prolong swimming time, its effect may be better than commercially available sports drinks. Green beans sports drinks can have good affect on biochemical parameters associated with fatigue, so has the performance of the delay physical fatigue.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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