Clinical Research Program on Sports Nutraceutical Interventions

1. Background of the study

With the growth of China's national power and the advancement of social modernization, the nutritional problems of adults over 18 years of age have gradually shifted from eating enough to eating well, and from undernutrition to overnutrition and irrational dietary structure. The "China Health and Nutrition Survey" conducted by the Institute of Nutrition and Health of the Chinese Center for Disease Control and Prevention (CDC) and the University of North Carolina, USA, shows that from 1989 to 2018, the proportion of adults aged 18-35 whose dietary protein intake was lower than the average requirement increased from 17.8% to 34.8%, and the proportion of adults with a fat ratio of more than 30% increased from 35% to 35%, while the proportion of those with a fat ratio of more than 30% increased from 35% to 30%. The proportion of people whose dietary protein intake was higher than 30% increased from 35% to 34.8%, and the proportion of people whose fat energy ratio was higher than 30% increased from 35% to 69.1%; the dietary structure tended to be of high energy density type, the proportion of people whose intake of livestock and poultry meat exceeded the recommended value increased from 34. 10% in 1989 to 64.49% in 2015, the proportion of people whose intake of milk and dairy products was insufficient was always more than 99%, and the proportion of people whose intake of cereals and potatoes and vegetables was insufficient increased from 4. 10% and 42.30% in 1989 and 2015, respectively. 42.30% in 1989 to 19.20% and 67.00% in 2015. The prevalence of diseases related to nutritional imbalance, such as obesity and hyperlipidemia, has been increasing year by year. Compared with 2012, in 2015, the overweight rate of Chinese adults over 18 years old increased from 30.10% to 33.30%, and the obesity rate increased from 11.90% to 14.10%; serum TC, TG, LDL-C and HDL-C levels all showed an upward trend, and the prevalence rate of hypercholesterolemia was 58.00%, hypertriglyceridemia 15.00%, and high-LDL-Cemia 7.00%. The prevalence of hypercholesterolemia was 58.00%, hypertriglyceridemia was 15.00%, high LDL-C was 7.20%, and low HDL-C was 24.90%. Obesity and hyperlipidemia are risk factors for chronic diseases such as cardiovascular and cerebrovascular diseases, cancer, chronic respiratory diseases, diabetes, etc., and the burden caused by these chronic diseases accounts for more than 70% of the total disease burden in China, which has become an

important factor restricting the improvement of healthy life expectancy. As a result, the State Council promulgated the Healthy China Action (2019-2030) policy, which advocates reasonable diet, healthy weight, strong bones and muscles, as well as scientific exercise. In response to adult nutritional issues and the national strategy, Mengniu Biotechnology Research and Development Co., Ltd. has developed two sports nutrition products for weight control and muscle strengthening, and conducted clinical studies to demonstrate their efficacy.

2. research purpose

Evaluate the beneficial effects of two sports nutrition products on fat loss and body contouring and exercise recovery. Specifically, the efficacy of Product 1（a protein-enriched RTD drink that contains 15g of protein） was evaluated for fat loss and retention of lean body mass, while Product 2 (a protein-enriched RTD drink that contains 25g of protein) was evaluated for muscle building and post-exercise recovery.

3. Experimental design

3.1 Recruitment of the subject population

Healthy men and women were recruited to participate in the trial based on inclusion and exclusion criteria, basic information about the subjects was recorded, they were informed about the trial, their acceptability of the product was determined, and informed consent forms were signed. Randomization was performed according to the trial objectives for Product 1 and Product 2.

4.2 Intervention experiments

Product 1

The duration of the trial was 8 weeks and information was collected at baseline using questionnaires (Meal Log, Exercise Profile Questionnaire, Socio-demographic Questionnaire). Prior to the intervention period, 10 randomly selected individuals completed product preference and satiety tests. During the intervention period, the intervention group consumed the meal replacement product three times a week as a substitute for dinner, and the control group

consumed normal meals; a dietitian administered dietary management to both the control group and the test group, guiding dietary energy and nutrient intake on the same day; and the control group and the intervention group exercised three times a week, each time for approximately 40 min of aerobic exercise. Meal logs were collected at weeks 0 and 8, and general body parameters (height, weight, waist circumference, BMI, waist-to-hip ratio, etc.), blood metabolism-related parameters (lipids, blood pressure, blood glucose, oxidative inflammation parameters, liver function parameters, etc.), body composition and locomotor system function-related parameters (body composition analysis, bone metabolism biomarkers, etc.), as well as urinary metabolism parameters (urinary proteins, urinary creatine, etc.) were examined. Subjects in the intervention group were given samples for an additional 4 weeks after exiting the group, and subjects in both groups returned after 4 weeks if they wished to do so, and the trial staff recorded product use, exercise and dietary status, and performed body composition analyses if they wished to do so.

Product 2

The duration of the trial was 8 weeks and information was collected at baseline using questionnaires (dietary log, exercise questionnaire, socio-demographic questionnaire). During the intervention period, both groups exercised 3 times per week, each time for about 40 minutes of anaerobic exercise; after exercise, the intervention group took product 2 and the control group took water, and both groups maintained their habitual dietary intake in addition to the product; general body indices (height, weight, BMI, etc.), metabolism-related indices (blood lipids, blood pressure, blood glucose, liver function, etc.), body composition and locomotor system function-related indices (body composition analysis, muscle strength, muscle strength, muscle function, etc.) were examined in weeks 0 and 8, respectively.), indicators related to body composition and motor system function (body composition analysis, muscle strength, muscle endurance, muscle soreness scale, muscle injury indicators, bone metabolism biomarkers, etc.), and urinary metabolic indicators (urinary protein, urinary creatine, etc.). Subjects in the intervention group were given samples for an additional 4 weeks after exiting the group. Subjects in both groups who wished to

return after 4 weeks were documented by the trial staff in terms of product use, exercise and dietary status, and were analyzed for body composition if desired.

3.3 Statistical analysis

Data are analyzed using appropriate statistical methods depending on the type of data.

3.4 Data processing and reporting

Nankai will be responsible for the statistical analysis of the data, and will submit the raw data (in electronic form) to Mengniu at the mid-term and the end of the project respectively. Nankai will form a final report based on the data, and the content of the report must be approved by Mengniu.

4. Evaluation indicators

4.1 Pre-intervention baseline evaluation

A total of 70 healthy male and female subjects aged 18-35 who met the inclusion and exclusion criteria were recruited, and questionnaires (dietary log, exercise questionnaire), physical examination, and instrumental examination were used to collect the subjects' general body indexes (including height, weight, waist circumference, BMI index, and waist-hip ratio), blood metabolism indexes (lipid, blood pressure, blood glucose, liver function, and inflammation, etc.), urine metabolism indexes (urine routine), and indexes related to body composition and exercise system function (body composition analysis, muscle strength evaluation, muscle endurance evaluation, and bone metabolism biomarkers, etc.). metabolic indicators (urine routine), body composition and exercise system function-related indicators (body composition analysis, muscle strength evaluation, muscle endurance evaluation, bone metabolism biomarkers, etc.).

4.2 Post-intervention evaluation indicators

In week 0 of the intervention trial, 70 subjects were divided into 4 groups, Product 1 intervention group, Product 1 control group, Product 2 intervention group, Product 2 control group, for a total of 8 weeks, the subjects were asked to

follow the appropriate instructions to exercise, diet and/or consumption of the products, and at week 0 and 8, respectively, to test the general body indexes, blood metabolism-related indexes, body composition and motor system function-related indexes, and combined with the questionnaire data. Combined with the data from the questionnaire, the effects of combining Product 1 and Product 2 with exercise on fat loss and body contouring, exercise repair and muscle growth were comprehensively evaluated. At the same time, the main socio-demographic information of the subjects was collected for multifactorial analysis.

5. study population

5.1 Inclusion criteria

Product 1 was designed to recruit women aged 18-35 years with a healthy BMI of 24-28 kg/m^2 or body fat ≥25% or waist-to-hip ratio ≥0.8 (20 per group), and Product 2 was designed to recruit men aged 18-35 years with a healthy BMI of 18.5-23.9 kg/m^2 and no anaerobic exercise habits (15 per group).

5.2 Exclusion criteria

Exclude people who do not accept the flavor of the product, people who are not willing to cooperate with fat loss diet or exercise, people with inappropriate exercise-related diseases, such as cardiovascular disease, bone and joint disease, chronic pain disease, people with gastrointestinal diseases, people with abnormal thyroid function; people who are taking other sports supplements during the trial period; people with smoking, alcohol abuse and other habits; and other people who are not suitable for participating in the trial as deemed by the PI. The PI considers that the trial is not suitable for people who have an abnormal thyroid function.

5.3 sample size

A total of 70 target male and female subjects aged 18-35 years who were healthy and met the inclusion and exclusion criteria were recruited, with 20 enrolled in each group for the Product 1 trial and ≥15 enrolled in each group for

statistical analysis, and 15 enrolled in each group for the Product 2 trial and ≥12 enrolled in each group for statistical analysis.

6. Research Products

The two products used in the study were developed by a company owned by Mengniu. Product 1 and Product 2 are both sports protein drinks with 300 mL each. designed according to GB-24154 (Annex 1), Product 1 belongs to the category of partial meal replacement and Product 2 belongs to the category of protein supplementation. Both Product 1 and Product 2 use food ingredients that comply with national standards, are high in protein, high in calcium, and contain a variety of vitamins and minerals. Ingredients for Product 1 include water, milk protein concentrate, maltodextrin, starch, resistant dextrin, oligofructose, collagen peptides, sunflower oil, flavoring, minerals, vitamins and more. Product 2: Water, milk protein concentrate, oligofructose, starch, whey protein concentrate, collagen peptide, calcium caseinate, vitamins and minerals.

7. randomized grouping

Product 1 randomized the enrolled population based on the BMI of the enrolled population, and Product 2 randomized the enrolled population based on body fat percentage in the inbody test.

8. adverse event

Due to the need to consume high-protein sports nutrition products for 8 weeks, there is a very low risk of abdominal bloating, flatulence, nausea, vomiting, etc.; due to the need to maintain a certain level of intensity of exercise interventions, there is a very low risk of joint and muscle injuries caused by improper exercise.

Adverse reactions and product preference testing of subjects before the start of the formal trial, possible bloating, flatulence, nausea, vomiting and other adverse reactions to be observed, such as short-term can not be relieved on their own, manifested as persistent discomfort, referred to the clinician for treatment, and the serious ones to be withdrawn from the study; exercise intervention by a

professional trainer to design the program, movement guidance, before and after exercise is recommended to carry out a full warm-up and stretching, to prevent joint and muscle injuries. Exercise interventions are designed by professional coaches, and adequate warm-up and stretching are recommended before and after exercise to prevent joint and muscle injuries.

9. Data management and quality control

On the day that each questionnaire was completed, the investigator verified the completeness and quality of the questionnaire, and corrected and perfected any errors or omissions on the same day. All questionnaires, physical examinations and blood biochemistry data were entered into the database independently by two investigators, and the consistency of the data entered twice was verified to ensure the accuracy of data entry. SAS statistical software was used for data management and cleansing to ensure that all data processing was well documented.

10. statistical analysis

Mean ± standard deviation or frequency (percentage) were used to describe the baseline characteristics of quantitative and categorical data, respectively, and ANOVA or chi-square test was used to compare the baseline characteristics between the two groups. When analyzing the outcome indicators, two analysis strategies were used, following the study protocol analysis (Per-protocol, PP) and Intention-To-Treat (ITT). For univariate analysis, quantitative outcome indicators were analyzed using ANOVA, and categorical outcome indicators were analyzed using chi-square test. For multifactor analysis, quantitative or categorical outcome indicators were analyzed using multiple linear regression or logistic regression, respectively. The above statistical analyses were performed using SAS statistical software.

11. Appendix

Appendix 1

72-hour meal records

Detailed records were **collected for 72 hours (over a 3-day period) of all food and supplements** consumed, including but not limited to regular meals, snacks, water intake, and nutritional supplements.

Subject number:

Day 1 Month/Year Meal Record Sheet			
mealtime	Name of food	Raw material name	serving size
Examples:	meat bun	Zaoyang meat bun	1
	shredded pork with celery	celery (Apium graveolens)	1 bowl (based on commonly used small bowls)
		shredded pork	1/2 bowl
	multivitamin		1 grain
	cow's milk	Bright Full Fat	250mL
	cookies	soda (loanword)	4 pieces

breakfast			
Morning snack			
luncheon			
afternoon snack			

supper			
Evening Snacks			

Notes:

1. Meal times include: breakfast, morning snack, lunch, afternoon snack, dinner, and evening snack.

2. For nutritional supplements, please specify the name and brand.

3. Fruits, cookies snacks, etc. are also considered food and need to be written on the

Subject number:

Day 2 Month/Year Meal Record Sheet			
mealtime	Name of food	Raw material	serving size

		name	
breakfast			
Morning snack			
luncheon			
afternoon			

snack			
supper			
Evening Snacks			

Notes:

1. Meal times include: breakfast, morning snack, lunch, afternoon snack, dinner, and evening snack.

2. For nutritional supplements, please specify the name and brand.

3. Fruits, cookies snacks, etc. are also considered food and need to be written on the

Subject number:

Day 3 Month/Year Meal Record Sheet

mealtime	Name of food	Raw material name	serving size
breakfast			
Morning snack			
luncheon			

afternoon snack			
supper			
Evening Snacks			

Notes:

1. Meal times include: breakfast, morning snack, lunch, afternoon snack, dinner, and evening snack.

2. For nutritional supplements, please specify the name and brand.

3. Fruits, cookies snacks, etc. are also considered food and need to be written on the

Appendix 2

Satiety Rating

Subject number:

Honorable Subject:

We invite you to participate in the Satiety Evaluation Study. It is your voluntary decision whether or not to participate in this study, and your decision will not affect your rights. This test evaluates the degree of each indicator of satiety by visual analog scoring (VAS), which scores each indicator of satiety at different times before and after food intake, and can be used to evaluate and compare the effects of different foods on satiety.

1. Select the food number you are testing:

A. Food #1 B. Food #2 C. Food #3

2. your subject number:

3. Your gender:

A. Male B. Female

4. Your age group:

A.18-25 B.26-30 C.30-35

5. Your height: (example: 165cm, please fill in 1.65)

6. Your weight: (example: weight 60 kilograms, please enter 60)

- **Before starting to use the test food**

7. Please answer the following questions first:

Arrival time at test site.

Last meal time.

8. Did you exercise last night?

A. Yes B. No

9. Please fill in the type and duration of the campaign.

- **Before the test starts**

Complete the VAS scale below with a score of 0 and 100 on each end, with "0" meaning "not at all" and "100" meaning " very much."

10. Please mark your satiety status:

Very hungry(0) Very full(100)

11. How eager are you to eat this product now?

Not at all (0) Very (100)

12. How eager are you to eat now?

Not at all (0) Very (100)

13. What is your current estimate of the amount of food you would like to consume?

Not at all (0) A whole meal (100)

- **Testing begins**

14. Record the start time (cell phone time):

Record the end time (cell phone time): Please eat the test food according to the diet and finish all the food within 5-10 minutes, record the time to finish the food, e.g. 6 minutes, fill in 6

- **After eating your food, answer the following questions**

15. Do you like this food?

Dislike very much(0) Like very much(100)

16. Is your appetite satisfied?

My stomach is still empty(0) I can't eat any more(100)

17. Would you like to have some more of this food?

Not at all(0) Very much(100)

- **Please record your satiety status at 15 minutes:**

18. 15 minutes, satiety state

Very hungry(0) Very full(100)

19. At 15 minutes, would you like more of this product?

Not at all (0) Very (100)

20. At 15 minutes, how eager are you to eat?

Not at all (0) Very (100)

21. At 15 minutes, what is your estimate of the amount of food you would like to consume?

Not at all (0) A whole meal (100)

- **Please record your satiety status at 30 minutes:**

22. Satiety status at 30 minutes

Very hungry(0) Very full(100)

23. At 30 minutes, would you like more of this product?

Not at all (0) Very (100)

24. At 30 minutes, how eager are you to eat?

Not at all (0) Very (100)

25. At 30 minutes, what is your estimate of the amount of food you would like to consume?

Not at all (0) A whole meal (100)

- **Please record your satiety status at 45 minutes:**

26. Satiety status at 45 minutes

Very hungry(0) Very full(100)

27. At 45 minutes, would you like more of this product?

Not at all (0) Very (100)

28. At 45 minutes, how eager are you to eat?

Not at all (0) Very (100)

29. At 45 minutes, how much food do you predict you would like to consume?

Not at all (0) A whole meal (100)

- **Please record your satiety status at 60 minutes:**

30. Satiety status at 60 minutes

Very hungry(0) Very full(100)

31. At 60 minutes, would you like more of this product?

Not at all (0) Very (100)

32. At 60 minutes, how eager are you to eat?

Not at all (0) Very (100)

33. At 60 minutes, how much food do you predict you would like to consume?

Not at all (0) A whole meal (100)

- **Please record your satiety status at 90 minutes:**

34. Satiety status at 90 minutes

Very hungry(0) Very full(100)

35. At 90 minutes, would you like more of this product?

Not at all (0) Very (100)

36. At 90 minutes, how eager are you to eat?

Not at all (0) Very (100)

37. At 90 minutes, how much food do you predict you would like to consume?

Not at all (0) A whole meal (100)

- **Please record your satiety status at 120 minutes:**

38. Satiety status at 120 minutes

Very hungry(0) Very full(100)

39. At 120 minutes, would you like more of this product?

Not at all (0) Very (100)

40. At 120 minutes, how eager are you to eat?

Not at all (0) Very (100)

41. At 120 minutes, what is your estimate of the amount of food you would like to consume?

Not at all (0) A whole meal (100)

- **Please record your satiety status at 180 minutes:**

42. Satiety status at 180 minutes

Very hungry(0) Very full(100)

43. At 180 minutes, would you like more of this product?

Not at all (0) Very (100)

44. At 180 minutes, how eager are you to eat?

Not at all (0) Very (100)

45. At 180 minutes, what is your estimate of the amount of food you would like to consume?

Not at all (0) A whole meal (100)

- **Please record your satiety status at 240 minutes:**

46. Satiety status at 240 minutes

Very hungry(0) Very full(100)

47. At 240 minutes, would you like more of this product?

Not at all (0) Very (100)

48. At 240 minutes, how much do you crave to eat?

Not at all (0) Very (100)

49. At 240 minutes, what is your estimate of the amount of food you would like to consume?

Not at all (0) A whole meal (100)

Appendix 3

Product Preference Evaluation

Subject number: _____ Gender: _____

Date of filling in the form: Month and year

Height: _____ Weight: _____

Please rate the overall preference of the sampled product based on the following criteria:

preference	**give a mark**
Like Extremely	9 points
Like Very Much	8 points.
Compare Like Moderately	7 points.
Like Slightly	6 points
Neither Like Nor Dislike	5 points
Dislike Slightly	4 points
Dislike Moderately	3 points

Dislike Very Much	2 points
Dislike Extremely	1 point

Your overall preference for the products you tried was rated as follows

Appendix 4

Baseline questionnaire

Date of Completion: _____ Year ____ month ____ day

I. Personal information	
Subject ID: _____	Gender: _____
Contact: _____	Date of birth: _____ year ____ month ____ day
Ethnicity: Nation	
Current body circumference	Height: _____ centimeters (cm) Weight: _____ kilograms (kg) Bust: _____ centimeters (cm) Waist: _____ centimeters (cm) Hip circumference: _____ centimeters (cm) Big arm circumference: _____ centimeters (cm) Thigh circumference: _____ centimeters (cm) Calf circumference: _____ centimeters (cm)
Weight fluctuations in the last two months	_____ kilograms (kg) to _____ kilograms (kg)
Has there been any weight loss behavior (including dieting, heavy exercise,	

or taking medications that may cause weight changes), stressful or pathological weight loss in the last 30 days? □A Yes □B No

II. Disease history

1、Do you have a chronic disease or condition that has been diagnosed by a doctor?

□A No □B Yes, if yes, please select (√ on the disease):

a. Respiratory diseases	**b. Diseases of the cardiovascular system**	**c. Endocrine and gastrointestinal diseases**	**e. Other diseases**
□1. Allergic diseases	4. Coronary heart disease	13. Diabetes or hypoglycemia	□23. Sports injuries
□ 2. Bronchial asthma	□5. Cardiomyopathy	□14. Thyroid diseases	□ 24. Endocrine diseases
□3. Bronchitis	6. Congenital heart disease	□15. Peptic ulcer	□25. Gout
	□ 7. Cerebrovascular disease	16. Viral hepatitis	26. Osteoarthritis
	□8. Arrhythmia	17. Abnormal liver function	□27. History of surgery within the last 1 year
	□ 9. Hypertension/hypotension	□18. Nephritis	□28. Mental illness

	□ 10. High fluctuations in daily blood pressure	□ 19. Renal insufficiency	□29. Abnormal hormone levels
	□11. Panic	□20. Hyperlipidemia	□30. Chronic infections
	12. Chest tightness and chest pain	□ 21. History of gastrointestinal surgery	31. Serious trauma
		22. Food allergies	□ 32. Blood donation within one month
2. Whether they have recently suffered from	□1. fever □2. cold □3. cough □4. infection □5. inflammation □6. toothache		
3. History of drug use	11. Are you currently taking medications on a daily basis (e.g., antihypertensive and hypoglycemic medications, psychotropic medications, hormonal medications, antibiotics, allergy medications, etc.)? □A No □B Yes, if yes, please complete the following: Name of drug: , dosage and frequency of administration: . Name of drug: , dosage and frequency of administration: . Name of drug: , dosage and frequency of administration: . Name of drug: , dosage and frequency of administration: .		
4. Use of dietary supplements	□A vitamin-like supplement, Brand: , Frequency: _____ □B Calcium/Iron/Zinc Minerals, Brand: , Serving Frequency: _____ □C protein-based supplements, Brand: , Frequency: _____ □D Creatinine, Brand: , Dosing Frequency: _____		

	□E Nitrogen Pump, Brand: , Service Frequency: _____ □F L-Carnitine, Brand: , Serving Frequency: _____ □G Caffeinated, Brand: , Dosing Frequency: _____ □H Meal Replacement, Brand: , Frequency: _____

III. Lifestyle

1. Weight loss experience

1.1 Are you satisfied with your weight:

□A Satisfactory □B Fair □C Unsatisfactory

1.2 Are you satisfied with your weight:

□A Satisfactory □B Fair □C Unsatisfactory

1.3 Have you ever lost weight before:

□A yes □B no

2. Dietary habits

□A loves sweets □B prefers meat □C prefers vegetables□ D loves snacks □E fried food □G prefers spicy and salty food

3、Your favorite way to lose weight is:

□ A Exercise conditioning☐ B Diet control □ C Medication □ D Exercise + diet □ E Other medical modalities for weight loss	
4. Exercise habits	
4.1 Exercise habits are:	□A less than twice a week □B 3-4 times a week □C 5-6 times a week □D 7 or more times per week □E No exercise
4.2 Duration of exercise:	□A Less than 30 minutes per session □B 30 minutes to 1 hour per session □C More than one hour □D Irregular exercise
4.3 Preferred type of sport:	□A Aerobic exercise (e.g., running, brisk walking, jumping rope, aerobics) □B Anaerobic exercise □C Ball sports □D Irregular sports
5. Do you smoke?	□A Yes □B No □C Quit smoking
6. Do you drink alcohol (meaning you drink alcohol at least once a week or more for at least six months)?	
##A never ##	
□ B is now drinking:	Frequency: □ 1-2 times/week □ 3-4 times/week □ 5-6 times/week □ daily Type: □ beer □ liquor □ red wine □ spirits □ other alcoholic beverages

	Average per session: two
15. Do you drink coffee?	
□A very little	
□B is:	Type of coffee: , Frequency of consumption: ___ times/week, Volume of consumption: ml/time
Do you drink tea?	
□A very little	
□B is:	Type of tea: , Frequency of consumption: ____ times/week, Volume of consumption: ___ml/time

Appendix 5

Volunteer Recruitment Advertisement

南開大學 Nankai University | 公共卫生与健康研究院 Research Institute of Public Health

12. Sports Nutrition Products Intervention Study

Volunteer Recruitment

The Institute of Public Health and Wellness, Nankai University School of Medicine will conduct a sports nutraceuticals intervention study, and we cordially invite you to participate in this survey.

[Research content]

During the study period, you will be required to take the sports nutrition protein drink as required and to perform regular exercise and health checks as required by the study.

[Basic Requirements]

Item 1: Healthy **women** aged 18-35 years with BMI 24-28kg/m^2 or body fat ≥25% or waist-hip ratio ≥0.8 fulfilling any of the criteria met the inclusion criteria.

Item 2: Healthy **males** aged 18-35 years with a BMI of 18.5-23.9 kg/m^2 , without daily anaerobic training habits were considered to meet the inclusion criteria.

[Reward]

You will receive free diet and health counseling, free health screenings and body composition assessments. You will receive a free KEEP software membership for participating in Program 1 and 8 free fitness personal training sessions at the on-campus gym for participating in Program 2.

All volunteers receive an additional $1,800 before tax cash payment upon completion.

[Enrollment Method

1. Call or text "Name + Volunteer" to Ms. Liu, 18513043081
2. Please scan the QR code below, add friends and note "volunteer".

We sincerely look forward to your participation!

Appendix 6

Body Circumference, Muscle Strength Endurance and NRS Muscle Soreness Scale

Subject number: _____ Gender: _____ Date of Completion: ____ Year ____ Month ____ Day	
Current body circumference	Height: _____ centimeters (cm) Weight: _____ kilograms (kg) Bust: _____ centimeters (cm) Waist: _____ centimeters (cm) Hip circumference: _____ centimeters (cm) Big arm circumference: _____ centimeters (cm) Thigh circumference: _____ centimeters (cm) Calf circumference: _____ centimeters (cm)
This test is	□ Pre-entry test □ Pre-entry test

一、NRS Pain Numeric Rating Scale

	Inner thigh muscles	**Anterior Lateral Thigh Muscle**	**Lateral thigh muscles**	**Rear Lateral Thigh Muscle**	**gluteus maximus (anatomy)**
squat (without weight)					
	pectoralis major muscle (across the top of the chest)	**shoulder muscle**	**arm muscle**	**back muscle**	**abdominal muscle**

Chinese push-ups in the middle position					
Evaluation Criteria: 0: no pain; 1-3: mild pain; 4-6: moderate pain; 7-9: severe pain					

Note: The NRS pain assessment is to be performed prior to the 1RM. Muscle soreness requires the subject to perform an unweighted back squat, and with the test subject's thighs and planes in a parallel position, the experimenter will hold the NRS Pain Numeric Evaluation Scale (shown in Figure 1) to ask the subject about perceived muscle pain. For the upper extremity pain assessment, a mid-posture, mid-distance push-up (shoulder-width apart) position was used and held, and the subject was asked about his or her perceived pain at the 30th second after the start of the movement. For the Pain Numerical Analysis Rating Scale (PNARS), different values from 0 to 10 were included. When the test is conducted, these values represent different pain levels, with 0 representing the lowest level of pain and 10 representing the highest level of pain. The pain level is further defined and categorized according to the actual situation and needs, for example, when the value is in the range of 4 to 6, it represents moderate pain. Pain levels are defined and recorded according to the subject's perception. The NRS has been widely used in clinical settings, and is not only accurate, but also simple for the subject to use.

II. 1RM Muscle Strength Test

Movement 1: Smith Bench Press				
serial number	**Weight (Kg)**	**Number of times (not more than 10)**	**RPE (0-10)**	**Completed (Yes/No)**
1 (warm-up group)				
2				
3				
4				

5				
6				
7				
8				
9				
10				
Movement 2: Smith Squat				
serial number	**Weight (Kg)**	**Number of times (not more than 10)**	**RPE (0-10)**	**Completed (Yes/No)**
1 (warm-up group)				
2				
3				
4				
5				
6				

7				
8				
9				
10				

Notes:

- Initial weight selection is best chosen at 50-70% of the subject's predicted maximum weight; rest for 3-5 minutes after each completed attempt before proceeding to the next; weight can be increased by 5-10% (upper body) and 10-20% (lower body) per attempt. The serial number is the first attempt, usually the 6th-7th attempt can measure the result.
- RPE (0-10) scale:

  0 - Nothing at all; 0.5 - Just noticeable; 1 - Very light; 2 - Light; 3 - Moderate; 4 - Somewhat heavy

  5-6 Heavy; 7-9 Very heavy; 10 - Very, very heavy

1RM Final Results:

Smith bench press: _____

Smith Squat: _____

III. Relative Muscular Endurance Test Scale

Test Date	50% of 1-RM	ordinal number	RPE (0-10)
_____ year _____ month _____ day			

Note: Need to be tested 72 hours after doing the 1-RM test.

Appendix 7

Subject Data Record Sheet

Subject ID: _____

Date of entry into the group: _____ year ____ month ____ day

		Monday	Tuesday	Wednesdays	Thursdays	Fridays	Saturdays	Sunday
Week 1	caloric intake							
	Movement							
	Intervention							
Week 2	caloric intake							
	Movement							
	Intervention							
Week 3	caloric intake							
	Movement							
	Intervention							
Week 4	caloric intake							
	Movement							
	Intervention							

Week 5	caloric intake							
	Movement							
	Intervention							
Week 6	caloric intake							
	Movement							
	Intervention							
Week 7	caloric intake							
	Movement							
	Intervention							
Week 8	caloric intake							
	Movement							
	Intervention							