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## Nutrition and Exercise

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#### Abstract

This study of Nutrition and Health aims to focus on the health and nutrition required by body. It also put light on the various physical exercises and it's benefits. Balanced diet and the quality and quantity of food required during various physical activities is showcased in the report. It concentrates on the nutrients and healthfulness that foods bring without following the latest fads. If we are what we eat, then we should probably know something about how to eat! This module will talk about the field of nutrition, the basics of nutrition and health. It also seeks to raise awareness of the interrelationship between nutrition, physical activity and life-style for improving health through life-course, and to demonstrate how healthcare outcomes and policies can be improved with the adoption of a more nutrition-oriented approach. In this way it aspires to provide an invaluable resource to nutrition.

**Keywords:** Health, Nutrition, Diet, Exercises

#### Introduction

The health benefits of exercise have been widely reported amongst different age groups, genders and cultures. However, adhering to and exercise program within an active lifestyle may require the increased consumption of some nutrients to cope with exercise-induced losses (see section 2 and 3 above). Indeed, the overall exercise experience and performance will be partly determined by the foods and beverages consumed before, during and after exercise.

The type and amount of foods and beverages consumed around exercise will support three main elements of exercise performance.

- Supply of rapid carbohydrate energy to the exercising muscles
- Maintenance of blood glucose levels during exercise, which will reduce fatigue
- Promotion of effective recovery and exercise adaptation during the rest period

#### Eating and Drinking before Exercise

Besides providing support in controlling hunger, the foods and beverages consumed before exercise serve two main functions: i) they can either contribute towards helping replenishment of the muscle carbohydrate stress, if there is sufficient time; or ii) they can support the maintenance of blood glucose levels during the initial stages of exercise.

Research studies have shown that consuming a carbohydrate rich meal 3 to 4 hours before exercise can help to fill up the muscle carbohydrate stores, especially if the overall diet is not providing sufficient carbohydrate to meet exercise demands. In the context of a meal, carbohydrate sources should have a moderate to high glycaemic index, and provide a variety of food groups that also contribute in providing other important nutrients that will generally be absorbed and assimilated prior to the onset of exercise. If a particular exercise session does not cause substantial carbohydrate depletion (e.g. a session generally lasting under 1 hour), the pre-exercise meal does not need to be predominantly carbohydrates. However, if performing strenuous exercise lasting longer than 1 hour, it is advised to select carbohydrate rich foods. It is also important to ensure exercise is commenced in a fully hydrated state (see section 8).

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The glycaemic index or GI is a measure of the effects of carbohydrates in food on blood sugar levels. It estimates how much each gram of available carbohydrate in a food raises a person's blood glucose level following consumption of the food, relative to consumption of glucose.

Examples of carbohydrate foods with a moderate to high Glycaemic Index

- Most breakfast cereals
- Potatoes
- Most forms of rice
- White or brown bread
- Sugar, jam, honey
- Sports drinks and soft drinks
- Tropical fruits and juices

You can find more information, and a list of the GI of various foods at:

### Examples of foods and beverages for consumption 3 to 4 hours before exercise

#### Morning session

- Large bowl of breakfast cereal with skimmed milk and 200g of low fat fruit flavoured yoghurt
- 3 to 4 slices of toast with honey or jam and a large fruit smoothie
- Large bowl of oatmeal made with skimmed milk and with an added handful of dried fruits

#### Afternoon session

- Medium plate of boiled/steamed rice with low fat topping of choice (e.g. low fat chilli con carne)
- 2 sandwiches with filling of choice (e.g. lean unprocessed meats, tuna or salmon) with at least two types of raw vegetables (e.g. sliced lettuce, cucumber, tomato, or shredded carrot)
- Large bowl of pasta salad which includes some lean meat (e.g. grilled chicken breast), at least two types of different cooked vegetables (peas, carrots, broccoli, or cauliflower), and a low fat dressing

Not that can you use oat, soya, or rice products in place of dairy products and meat alternatives, such as quorn, in place of meat products of you wish.

A carbohydrate rich snack may be useful to support the maintenance of blood sugar levels during the initial stages of exercise. These foods/beverages ideally should be of a moderate to high glycaemic index (see text box).

### Examples of Foods and beverages for consumption up to 1 hour before exercise:

- Fruit smoothies
- Medium bowl breakfast cereal, with skimmed milk, and large banana\*
- Large bread roll with thick spread honey or jam, and large glass of fruit juice
- 2 to 3 slices of sweet breads (e.g. raisin bread, fruit loaf, or malt loaf) or 1 sweet bun (e.g. current bun, hot cross bun, or low fat fruit scone) with jam or honey
- 1 low fat cereal bar (check labelling) with fruit juice or smoothie
- 3 pieces of fresh fruit or 2 handfuls of dried fruits

\*Note: use oat, soya or rice drink in place of dairy milk if required.

Consuming these foods and beverages in the pre-exercise period will allow sufficient time for gastric emptying and intestinal absorption, lowering the probability of gastrointestinal distress that may occur with the onset of exercise. However, individual tolerance will determine which foods and beverages are chosen.

#### Pre-exercise nutrition

Consuming a carbohydrate rich meal 3 to 4 hours before exercise, which may contain a variety of food groups, is recommended.

Consuming a carbohydrate rich snack up to 1 hour before exercise, which is low in fat, is recommended.

### Eating and Drinking during Exercise

Carbohydrate is the body's main fuel during exercise, becoming more important as exercise intensity increases, and will determine exercise effort and onset of fatigue. The body's carbohydrate stores are limited, and can sustain strenuous exercise for no more than about 90-120 minutes. For an exercise session lasting up to 1 hour, carbohydrate reserves in the muscle before exercise will provide sufficient fuel to complete the exercise load provided these stores are well-filled at the start of exercise. However, additional intake of carbohydrate is essential during more prolonged exercise to help prevent significant declines in blood glucose levels and to maintain exercise performance.

The consumption of at least 20-60g of carbohydrate per hour of exercise, in a form that is rapidly converted to blood glucose, is generally recommended. This is particularly important if carbohydrate stores are not full prior to the start of exercise (e.g. insufficient carbohydrate has been consumed during the preceding hours and days.) sipping carbohydrate-electrolyte sports drinks (~6% carbohydrate) little and often at 15 to 20 minute intervals throughout exercise is generally effective in providing fluids, carbohydrates, and electrolytes (especially sodium) to the exercise body. However, individual tolerances will dictate which foods and/or beverages are chosen.

### Examples of foods and/or beverages that contain about 60g of carbohydrates

- 500 ml isotonic sports drink
- 300 ml fruit juice or soft drink
- 2 handfuls of sweets (e.g. jelly beans, jelly babies) or dried fruit
- 2 cereal bars (make sure they are generally low in fat and fibre)
- 2 large pieces of fresh fruit
- 2 slices of white bread with honey or jam

Note: if consuming solid food sources, be aware these need to be supplemented with water intake. The body is limited in how much carbohydrate it can absorb and utilise as energy during exercise. Therefore, it is important to fill up muscle carbohydrate stores before exercise, and then provide carbohydrate during the exercise bout as tolerated. Note that excessive food and fluid consumed during exercise may cause uncomfortable symptoms (e.g. bloating, nausea, vomiting, and/or abdominal pain) lowering exercise performance. Additionally, exercising in different environmental conditions (cold or hot) can also affect food and beverage tolerance

during exercise. Therefore, each individual should be aware of their own tolerance levels and adjust recommendations to suit their needs.

How to maintain hydration levels and avoid dehydration during exercise is described in section 8.

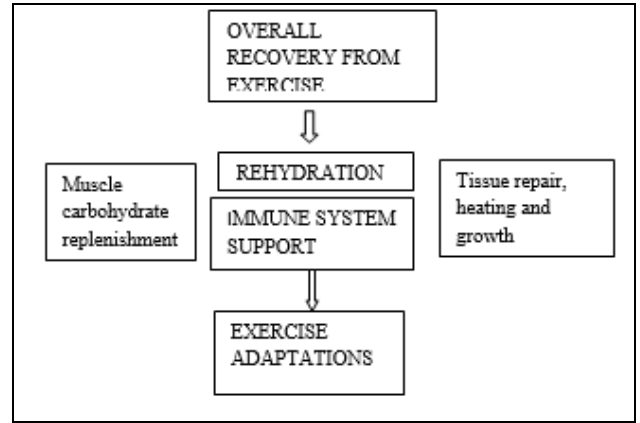
**Pre-exercise nutrition**

Consuming a carbohydrate rich meal 3 to 4 hours before exercise, which may contain a variety of food groups, is recommended.

Consuming a carbohydrate rich snack up to 1 hour before exercise, which is low in fat, is recommended.

**Eating and drinking after Exercise**

After an exercise session it is likely that muscle carbohydrate stores are depleted, some normal exercise-induced tissue damage has occurred, hydration levels are below their starting levels, and the immune system may be functioning a little under the norm, potentially increasing the risk of illness and infection. Nutrition in this immediate post-exercise period is essential to assist the recovery process and re-establish normal levels (Figure 2).



Immediately after exercise, and before the appearance of suppressed appetite, consumption of carbohydrate rich foods and/or beverages of moderate to high glycaemic index (GL) will promote the replenishment of muscle carbohydrate stores. Selecting recovery foods/beverages that also contain about 20-25 grams of protein can aid tissue repair and can stimulate the changes in the muscle that occur in response to the training stimulus.

**20 grams of protein is provided by:**

- 600 ml skimmed milk
- 40 g skimmed milk powder
- 60 g cheese
- 400 g yoghurt
- 70-100 g meat, fish or chicken
- 8 slices bread
- 180 g breakfast cereal
- 4 cups cooked pasta or 6 or cups rice
- 800 ml soy drink
- 120 g nuts or seeds
- 240 g tofu or soy mince
- 300 g legumes or lentils
- 4 small eggs
- 400 g baked beans
- 300 ml fruit smoothie or liquid meal supplement

**Examples of foods and beverages which combine adequate amounts of carbohydrate and protein (and also contain electrolytes)**

- 500 to 750 ml low fat milkshake\*
- 500 to 750 ml fruit smoothie made with low fat milk or yogurt\*
- Large bowl of breakfast cereal with enriched skimmed milk (by adding skimmed milk powder)\*
- 500 ml of a soft drink with a sandwich, pitta bread, or bagel filled with tuna, ham, or chicken#
- Cooked potatoes (jacket, roasted boiled) with cottage cheese, tuna, or beans\*#
- 3 to 4 slices of toast or 1-2 bagels with reduced fat peanut butter and 2 pieces of fruit
- 500 ml of fruit juice with two low fat cereal bars
- Large bowl of fruit salad with 200g low fat yogurt

How to rehydrate after exercise is described in Section 8.

\*use oat, soya, or rice products in place of dairy products if required.

#use meat alternatives, such as quorn, in place of meat products.

If not exercising on a daily basis, for longer term recovery (e.g. over 24 hours between exercise sessions), normal daily dietary habits (regular routine of meals and snacks) are sufficient to promote adequate recovery nutrition. Ensuring the consumption of a diet that includes items from all food groups, contains healthy fats, and provides sufficient micronutrient to meet requirements, Will assist exercise recovery and adaptations.

**First meal after training for longer term recovery**

**Carbohydrate sources**

Pasta, rice, noodle, potatoes, couscous, bulgur wheat, and/or breads

**Protein sources**

Fish, lean meats, low fat dairy, eggs, and/or vegetarian alternatives

**Accompanied by**

Vegetables in main meal (at least 2 different types, cooked or as a raw vegetable salad) and fruit (fresh, dried, or tinned in natural juice) in selected dessert

**Conclusion**

Eating a balanced diet is vital for good health and wellbeing. Food provides our bodies with the energy, protein, essential fats, vitamins and minerals to live, grow and function properly. We need a wide variety of different foods to provide the right amounts of nutrients for good health. A poor diet may cause health problems, causing deficiency diseases such as blindness, anemia, scurvy, preterm birth, stillbirth and cretinism health-threatening conditions like obesity and metabolic syndrome and such common chronic systemic diseases as cardiovascular disease and diabetes. Regular exercise is necessary for physical fitness and good health. It reduces the risk of heart disease, cancer, high blood pressure, diabetes and other diseases. It can improve your appearance and delay the aging process. Good Health is important because a man of health can enjoy great happiness during his life time. Without health we cannot do anything in this world. A man suffering from fever remains confined to bed. He cannot get out of doors.

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