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### BREAKFAST FOR TABLE TENNIS CHAMPIONS

#### Abstract

*If energy intake and expenditure are equal over a given period of time, a state of energy balance exists, and no variation of body weight will take place. However, when energy intake exceeds output there is a surplus of Kilocalories, and the body stores this extra energy in the form of fat tissue. In order to use the fatty reserves, the body needs to spend more energy than what is absorbed. Conversely, when energy expenditure is greater than input, the body compensates for this deficit by using the reserves. Therefore, meals should be carefully planned. In this presentation I will try to explain how we plan an ideal breakfast meal for table tennis athletes.*

**Key words:** table, tennis, nutrition, carbohydrates, glycemic index

During a table tennis match, muscles rely primarily on fuel stored from meals consumed in the preceding days. Food eaten in the morning of the table tennis competition mainly fuels the brain. If the matches are long or intermittent, the liver is another contributor since topped-up liver glycogen stores help to prevent hypoglycemia throughout the competition.

Signs of inadequate energy can be immediate such as the symptoms of low blood sugar (hypoglycemia) or they can be longer term.

The main symptoms of hypoglycemia are:

- Light headedness, headache, dizziness
- Fatigue and lethargy
- Inconsistent performance
- Inability to focus or concentrate on the game plan
- Demonstrating slow recovery
- Mood swings and irritability

Long term signs of inadequate energy are:

- Weight loss
- Loss of muscle mass
- Reduced strength
- Persistent injury

Eating disorders can also manifest themselves in many ways showing some of the above symptoms, and it is important for the coach to recognize them. The treatment for eating disorders can be multi-disciplinary to include medical, psychological and nutritional intervention from sport scientists. Athletes with such disorders need a supportive environment and time to modify their behavior. Insults, bribery, manipulation and threatening statements will exacerbate rather than assist the situation. Table Tennis coaches should take care of the nutritional needs of the athletes long before competition.

The objectives of the breakfast meal for table tennis players are to:

- Prevent hunger before and during the match
- Top-up liver glycogen stores
- Ensure adequate blood sugar levels
- Facilitate quick and easy digestion
- Maximize fluid levels to prevent dehydration

- Promote the perception that the selected foods will facilitate a performance advantage, with physical comfort and mental alertness.

The size and items in this meal varies according to the particular needs of each table tennis athlete. Generally, the pre-competition meal should be mainly carbohydrates with fewer amounts of protein and fat. Coaches must take into account that athletes digest their food more slowly when they are nervous, before a table tennis match. Also, high calorie meals take longer to leave the stomach than light snacks.

- 3-4 hours for a large meal to digest
- 2-3 hours for a smaller meal
- 1-2 hours for a snack or blender/liquid meal, or whatever the athlete's own tolerance indicates.

Table Tennis players cover a wide range of height, weight, body mass index, athleticism and cultural background from the 204 members Associations of the I.T.T.F. Therefore, nutritional needs vary accordingly.

Carbohydrate is the most important fuel for table tennis players, both in training and competition. It is also the only source of energy for the brain and the nervous system. During a table tennis match, the anaerobic lactic system uses only carbohydrate as a fuel. This makes it even more important for coaches to understand why carbohydrates should make up between 60% - 70% of the calorie intake at breakfast, before the match.

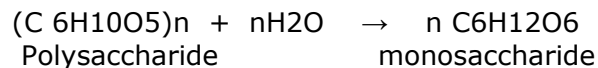
There are two main categories for carbohydrates:

- Simple carbohydrates (sugars)
- Complex carbohydrates (starch, fibre, cellulose)

Simple carbohydrates are characterized by a simple chemical structure, and this enables the body to absorb them easily. Mono saccharides and Disaccharides are simple carbohydrates.

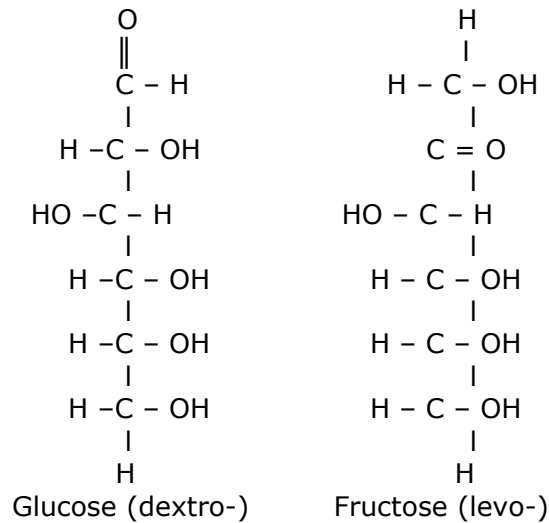
Mono - triose (C<sub>3</sub>H<sub>6</sub>O<sub>3</sub>) , tetrose (C<sub>4</sub>H<sub>8</sub>O<sub>4</sub>) , ... glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>)  
 Di - C<sub>12</sub>H<sub>22</sub>O<sub>11</sub> + H<sub>2</sub>O → C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> + C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>  
                   (sucrose)                    (glucose)   (fructose)

Complex carbohydrates (Polysaccharides) are composed of long chains of glucose molecules. Before being absorbed by the body, they must be broken down into simple carbohydrates through digestion.



These can be found mainly in bread, cereals, legumes, potatoes, bananas, corn, rice, pasta, flour, and seeds, bran, fruits, nuts and peel.

There are many kinds of sugars, but the chief physiological sugar is glucose, Glucose is a monosaccharide, a hexose and an aldose.



Another interesting feature of sugars is the degree of sweetness.

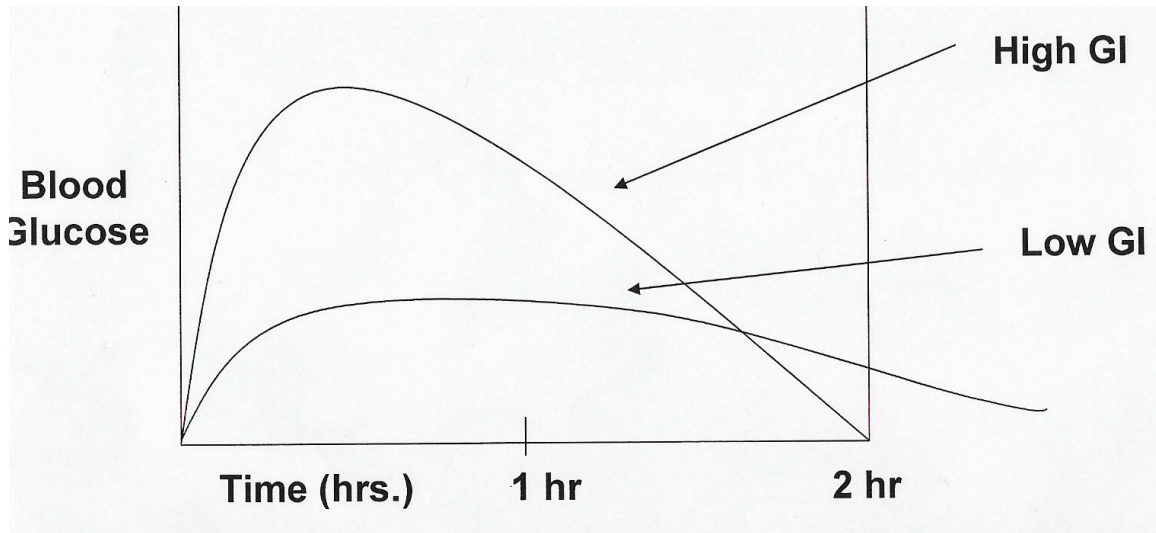
Sugar	Numerical Rating (sucrose = 100)	Units of weight sugar to one unit of sucrose
Lactose	16.0	6.3
Raffinose	22.6	4.4
Galactose	32.1	3.1
Rhamnose	32.5	3.1
Maltose	32.5	3.1
Xylose	40.0	2.5
Glucose	74.3	1.3
Sucrose	100.0	1.0
Invert Sugar	130.0	0.8
Fructose	173.3	0.6

### ***The Glycemic Index***

Recent studies have indicated that several factors are involved in the effect that carbohydrates have on blood glucose and insulin levels. In order to assist nutritionists to devise charts and select foods, a glycemic index table was developed.

The glycemic index is a measure of the effect of a food on blood glucose. It measures the area under the glycemic response curve during the two hour period after 50g of carbohydrate, from a test food, has been consumed.

The GI can be considered to be a physiological response to the chemical properties of the food.



Blood glucose level tends to increase quickly after consumption of foods with high glycemic indices. When a food with lower glycemic index is eaten, the blood glucose level has a lower peak and a smaller area under the curve for the two-hour period.

The GI for some foods compared to glucose = 100:

Grains	Veggies	Fruit	Milk products	Legumes
Instant rice 91	Potatoes 85	Watermelon 72	Ice cream 61	Baked beans 48
Corn flakes 84	Carrot 72	Pineapple 66	Yogurt 33	Channa 33
Bagel 72	Sweet potato 54	Orange juice 57	Skim milk 32	Lentils 29
100% wheat bread	Green peas 48	Banana 53	Homo-milk 27	Kidney beans 27
Corn meal 68		Grapes 43		Soy beans 48
Oat meal 65		Orange 43		Peanuts 14
Bran Muffin 60		Pear 36		
White rice 56		Apple 36		
Brown rice 55				
Spaghetti 41				

Some table tennis matches last over an hour while others can end within twenty minutes. Therefore, the coach must plan accordingly. During the match a "fuel blend" made of carbohydrates, lipids and proteins is utilized. The shorter the duration and/or the greater the intensity, the more the "fuel blend" will be high in carbohydrates and lower in fatty acids.

Therefore, the coach must select the breakfast menu with the glycemic index as a focus.

Best choices for breakfast, before competition, can be selected from:

Cereal – with low fat or skim milk

Yogurt – low, plain or with fruit

Fruit

French toast } With no added butter or margarine

Pancakes }

Egg dishes – not fried

Lean ham or steak – not fried

Potatoes – not fried

Rice – steamed or boiled  
Roti, chapatti or naan  
Noodles, pasta, dahl, congee  
Toast – limited butter or margarine  
Muffins – can add jam or jelly, not butter  
Fluid = beverages, bottled water  
Fruit juice – fresh, canned carton  
Skim milk or chocolate milk (low fat)

Before competition Avoid:

Cookies, crackers, granola bars, cream soups, stir-fry, fried-meat, fish, poultry, potatoes, foods that are buttered in fried sautéed, creamed or souffléed, pâté, sausages, processed meats, liverwurst and paratha.

Suggested examples for a medium breakfast for Table Tennis champions are:

- Cereal with milk + fruit, 1 poached or boiled egg + 2 slices of toast + orange juice
- Pancakes, French toast or waffles, ham, fresh fruit cocktail, milk
- Congee, noodles, pau, tea or juice
- Light ghee, roti, milk and/or juice, tea
- Cream of wheat or oatmeal, eggs, turkey, toast, juice, milk, fruit.

Remember, the main goals of breakfast are to help the table tennis player to feel comfortable and mentally alert.

There is no doubt that what an athlete eats and drinks can affect health, body weight, body composition, substrate ability during the table tennis match, recovery time after the match and, ultimately, a position on the podium.