

## Nutrition: Understanding fuel for training

### Farah Fadzali, September 2020

To perform at their best, dancers need to be adequately fuelled for their dance activities. Sufficient amount of nutrition is intricately tied to every aspect of physiology and health<sup>11,15</sup> and physical strain increases the demands made on the metabolism. Intense training leads to micro-injuries of the tissue, releasing toxic substances and radicals. When damaged tissue is repaired, toxins are neutralised and discharged from the body through complex biochemical processes. This is only possible with the help from the food we eat that supplies us with the necessary building materials, nutrients and energy.

In this article, we will be discussing the importance of nutrition in the dancers' everyday lives. It is also important for us to understand that every dancer is unique and individualised approach to nutritional goals and diet must be taken into consideration.



## Food and dietary recommendations for dancers

In general, the energy in a dancer's diet should composed of about 55% - 60% carbohydrates (CHO), 12% - 15% proteins (P) and 20% - 30% fats (F) as seen in Table  $1^{3,4,10,15,16}$ .



Table 1. IADMS Nutrition Resource Paper 2016

Here are some benefits of Carbohydrates (CHO), proteins (P) and fats (F)<sup>4,10,16</sup>:

### Carbohydrates (CHO)

- CHO are the most important energy source for strenuous activities of relatively short duration such as dance.
- The body able to store CHO in the form of glycogen. However, the amount of glycogen stored is sufficient for about 90 minutes of dance.
- Never start training when you are hungry! CHO with a low glycaemic index are slowly metabolised and therefore the ideal source for physical activity.
- By eating high-fibre, complex carbohydrates such as pasta, rice or potatoes, as well as fruits and vegetables, you can level out your blood sugar throughout the whole day
- Eating a chocolate bar shortly before training or during rehearsals leads to a rapid rise in blood sugar level.

### Proteins (P)

- Proteins act as building materials for the body and therefore of great importance for
- Proteins are particularly important after intense training.
- In contrast to CHO, proteins cannot be stored in the body for a long term, making a daily supply even more important
- The body cannot make use of too much protein in one go. Therefore, it is advised to eat small quantities several times a day. (Eg. Yoghurt with fruit, poultry/fish, cheese, etc.)
- Drink plenty of water so that the waste product of the protein metabolism can be flushed out thoroughly.

### Fats (F)

- Fat is the most energy-rich food of all food. Without fat, the body's energy metabolism grinds to a halt.
- When the body works over a long period of time at a lower intensity level, fat is used as the principal source of energy.
- Overtime, the body will learned to increase their fat metabolism thus preserving their glycogen reserves. This allows to remain fit and concentrated even throughout long periods of physical exercise.
- Wherever possible, avoid saturated fats (instant noodles, soups, sauces, etc.) and increase your intake of unsaturated fats. (Eg. Vegetable fats as they are low in unsaturated fatty acids).
- Only with sufficient body fat can good bone stability and resilience be achieved

These three components are necessary to the human body in order for it to maintain normal physiological function. By consuming the right amount and types of food and fluid, it will provide the body with the 'high performance fuel' needed to achieve optimal training benefits and peak performance. As much as it is important to monitor what dancers eat, the amount of food consumed also needs to be critically evaluated. A specialist should be consulted for a personalised nutrition prescription.

#### Vitamins and minerals: micronutrients

Vitamins and minerals (both containing micronutrients) are important in maintaining the body's system and organs. The micronutrients plays important roles such as formation of the red blood cell, bone maintenance and formation and act as antioxidants to prevent celldamage<sup>7,11,16</sup>. An example would be fruits, vegetables, vitamins A, and C, potassium, folate and fibre. Additionally, these excellent source of vitamins and minerals provide phytonutrients



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(natural plant chemicals) that are increasingly known to be essential for health, performance and prevention of illness<sup>7,10,14,15,16</sup>.

### Fluid, hydration, and sweat

During a dance activity or exercise, heat is generated by muscles and raises our core temperature. An approximate of 0.5 - 1.5 litres is lost during moderate exercise over a one hour period, though this may vary by person<sup>3,11</sup>. Pre-professional / professional dancers tend to attend back to back classes, which may cause the dancers to lose a considerable amount of water through their sweat resulting in dehydration.

### **Replenishing fluid**

Fluid intake is essential during pre-exercise, exercise and post-exercise regime. Drinking 5 – 15 minutes before class is recommended during both dance activity and recovery. Research shows that each kilogram of weight loss in a dancer immediately after class is equivalent to approximately 1.2 - 1.5 litres of fluid<sup>10,11,15,16</sup>. In order to estimate total fluid loss during dance

sessions, dancers must take into account any fluid consumed during this period. It is also important to note that fluid requirements differ according to each individual. Hydration status too depends on the available opportunities for drinking during class, rehearsal or performance<sup>14</sup>. Table 2 below shows the requirement of water intake per exercise time and intensity<sup>7,14</sup>.

Exercise Time & Intensity	Fluid Requirements
Less than 30 minutes	Water
Low to moderate intensity, less than 1hour	Water
Moderate to high intensity, less than 1 hour	Water or hypotonic drink
High intensity, more than 1 hour	Hypotonic or isotonic drink

Table 2. OneDanceUK Fluid for Dancers Info Sheet 2017

Below are the different types of fluid and its benefits<sup>3,7,10,16</sup>:

#### Hypotonic

- •Contains carbohydrates and electrolytes at a lower concentration than the body
- •Specifically designed to replace fluid lost through sweating
- •Best consumed after exercise
- •Useful for dancers who require fluid without a boost of carbohydrate

#### Isotonic

- •Contains similar concentrations of carbohydrate and salt as the body
- •Designed to replace fluid in addition to provide energy in form of sugar

#### Protein shakes

- •May contain high amount of fats and added sugars
- •For a better alternative (less sugar), opt for shakes with low fat milk/ milk substitues and add fruits

#### Coffees & Teas

- •Caffeine is a stimulant
- •Best consumed in moderation (may cause jitterness when consumed in excess)

It is noted that changes in food intake (fasting, limiting calories, etc.) will impact on water and electrolyte balance in a dancer. This may lead to an arbitrary fluctuation of thirst, body weight and water retention<sup>3,16,15</sup>. As such, it is important for dancers to develop a performance eating plan to navigate challenges and optimise their condition in order for their body and mind to function at a high level. When the body is able to function at a high level, the need for restrictive eating is minimised. To help facilitate this, dancers should seek nutritional advice from a qualified nutritional professional (such as a sports dietitian).

### **Eating behaviours**

Eating behaviour is driven by complex neuro-hormonal mechanisms which regulate appetite, satiety, cravings, and physiological responses to food. Dancers, like the general population, are hard-wired for sweet, salty and high fat foods, yet there is limited room for these foods in a dancer's diet. Dancers often believe that if one type of food, vitamin or exercise is good for them, they would then excessively consume or perform it<sup>5,6,14,15</sup>. This approach may result in nutritional imbalance and is not sustainable. In



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order to meet the demands required for their dance activity, dancers require sufficient amount of caloric intake from the major food groups in order to fuel the body as well as preserve metabolic function, growth and hormonal regulation.

For example, body size is frequently defined relative to body mass index  $(BMI)^{3,4,15}$ . BMI is a ratio of height to weight and the normal BMI range for adults is between  $20 - 25 \text{ kg/m}^2$ . This range was derived from a large scale population health data suggesting that adults within this range carry a lower risk of chronic and debilitating diseases (such as cardiovascular disease, diabetes, cancer, etc.)<sup>8,11</sup>. However, the measurement of BMI does not reflect an individual's body composition, especially for dancers who has proportionally more muscle to fat. Since BMI are calculated differently for adults and children, dancers should consult medical professional (e.g. nutritionist) who can make accurate assessment of growth and body size.

#### Dieting vs. healthy body weight

Weight management is a common term that is heard across multiple dance genres and this may end up dominating the dancer's mindset in an unhelpful manner. Being clinically underweight or overweight may trigger emotional issues, metabolic, bone, and hormonal abnormalities<sup>1,10,16</sup>. There are intrinsic (from within an individual) and extrinsic (environmental, cultural or related lifestyle) variables in maintaining a



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healthy body weight. Body composition and body type is primarily determined by one's genetic profile. As such, dancers are encouraged to look at the frame sizes of close family members to identify the body type and work with it, rather than against it. Health management and maintaining the ability to function well is critical for dancers and this can be regulated by matching their food intake and energy expenditure<sup>9,11</sup>. It is important to note that any changes to body composition will require weeks to months and not within a few days.

Besides understanding the amount of food intake required, sleep is also an important component of appetite regulation. Hence, getting an adequate amount of rest and uninterrupted sleep is essential for dancers (click <u>here</u> for injury prevention and rest article).

Unfortunately, eating disorders are common in dancers<sup>1,2,5,13,14,19</sup>. Eating disorder can be described as any type of food-related behaviours that impact negatively on an individual's health or wellbeing.

Some examples of eating disorders are<sup>18</sup>:

- Going for long periods of time without eating or deliberately skipping meals
- Counting calories or grams of food in a way that is unhelpful or stressful
- Feeling guilty, anxious or shameful around the context of food or eating
- Binge eat
- Cutting out an increasing number of food groups (all sugars, carbs, dairy, meat, protein)

Some symptoms of eating disorders:

- Mood swings
- Extreme concern with body shape and size
- Withdrawal from usual friends and/or activities
- Feeling cold all the time
- Fainting/syncope
- Sleep problems
- Difficulties concentrating
- Stomach cramps or other non-specific gastrointestinal complaints

### Female Athlete Triad and Relative Energy Deficiency in Sport<sup>2,17,13,19</sup>

A syndrome comprising three interrelated components, namely disordered eating, amenorrhea (an abnormal absence of menstruation), and osteoporosis, has been termed as the Female Athlete Triad (The Triad)<sup>13,17,19</sup>. The Triad is a medical condition seen in physically active girls and women characterised by low energy availability with or without eating disorder, menstrual dysfunction and low bone mineral density. Another disorder is called the Relative Energy Deficiency in Sport (RED-S). RED-S refers to impaired physiological function

that is caused by the imbalances between dietary intake and energy expenditure<sup>12,13,14,15,17,19</sup>. These syndromes are of great concern in sports but also are important topics for both dancers and dance educators as there is a common misconception regarding the dancers physique leading to eating disorder. Factors involved in both are build up upon each other with serious consequences which should be monitored quickly. Scientific evidences show that there are impacts on several body systems, in addition to the reproductive and musculoskeletal systems, and that both men and women are equally at risk<sup>2,3,6,12</sup>. Hence, when one or more of the Triad components is detected, early intervention is essential to prevent its progression.

#### End



An MSc in Dance Science graduate from Trinity Laban Conservatoire of Music and Dance, Farah has multiple experience in teaching movement therapy in various organisations in Singapore.

Farah is now a dance science researcher studying injury prevention and performer's health and safety practices. Together with her achievements and qualifications, Farah hopes to work towards the development of dance science research in Singapore.

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