Overview

Triathlon is a combination of three sports – swimming, cycling and running. The order of the event is swimming, cycling and running. Duathlon (running, cycling and running) and aquathon (swimming and running) are two other popular multisport events. Triathlons are completed over various distances ranging from 20 minutes to over half day races. The table below outlines the various distances over which triathlons are completed.

Triathlon	Swimming (m)	Cycling (km)	Running (km)
Super sprint	200-400	10	2-3
Sprint	750	20	5
Olympic Distance	1500	40	10
Half Ironman	1900	90	21.1
Long Course	3000	120	30
Ironman	3800	180	42.2

Training

Local triathletes participate in either full-time or part-time training so the time spent in training varies considerably. Since there are three sports in triathlon, most of the full-time triathletes train at least 2 times daily to make sure they master all three sports. Triathletes regularly combine two or three disciplines into the one session to ensure their bodies are well adapted for the stresses of competition.

Physical characteristics

Triathlon is an endurance sport. Low body fat and balanced muscle development are advantageous to sport performance.

Common Nutrition Issues

Energy and Nutrients Recovery

Routine training loads for full-time triathletes increase daily energy, carbohydrate and protein requirements. Triathletes should ensure their meals and snacks have adequate carbohydrate and other nutrients to meet daily energy and nutrient demands. Adequate intake of daily energy and nutrients can prevent fatigue, illness, unwanted weight loss and can promote better recovery.

Since most triathletes are required to train 2 sessions each day, recovery between sessions is crucial to maximize training gains.[1] Triathletes need to plan their training and eating schedules. It is important to have nutritious carbohydrate snacks within 30 minutes after training and exercise. A carbohydrate-rich meal should be consumed within 2 hours post-exercise or post-training since many researches showed that it could optimize muscle glycogen recovery. The following snacks are examples of carbohydrate-rich snacks that should be consumed as soon as possible after training and competition.

Male Athlete (target 60-80g carbohydrate)

- 150g yogurt + 1 jam sandwich
- 150g yogurt + 1 cereal bar + 250ml fruit juice
- 250ml milk + 1 cereal bar + 1 banana
- 1 Energy bar + 500ml Sports Drink
- 750-1000ml of Sports Drink

Female Athlete (target 40-50g carbohydrate)

- 150g yogurt + 1 cereal bar
- 150g yogurt + 1 banana
- 1 Energy bar
- 250ml Milk + 1 cereal bar
- 750ml of Sports Drink
- 1 Jam sandwich + 250ml fruit juice

Carbohydrate Loading

Many triathletes use carbohydrate loading to maximize energy store for competition. Carbohydrate loading is slightly increasing the amount of food consumed 3 days before competition and certainly does not mean gorging yourself with food for the entire week before competition. As training decreases leading to competition, the daily energy and carbohydrate requirements also decrease. During a light training week prior to competition, it is important to taper the food intake to avoid unwanted weight gain. To maximize muscle glycogen for competition, dietary intake of carbohydrate should reach 9-10 grams per kilogram body weight daily 3 days before competition. The total amount of carbohydrate consumed by a triathlete depends on the distance and time needed to complete competition. For Olympic distance races, triathletes decrease training load before competition in conjunction with an intake of 9-10 grams of carbohydrate per kilogram body weight daily 2 days before competition in order to maximize muscle glycogen stores. For example, a 60kg Olympic distance athlete should aim to consume 540-600 grams of carbohydrate daily 2 days before competition. However, athletes competing in half ironman, long course and ironman races should aim to consume 10-12 grams of carbohydrate per kilogram body weight daily 3 days before competition. This will help to allow maximizing muscle glycogen loading before race so that it will help to delay fatigue during competition. For example, a 60kg long course athlete should aim to consume 600-720 grams of carbohydrate daily three days before competition.

Example of carbohydrate loading diet (suitable for triathlete who weighs 60kg and preparing for an Olympic distance race to be consumed 2 days before the race)

Breakfast	- skimmed milk	1 cup
	- corn flakes	1 cup
	- banana	1 piece
	- bread	2 slices
	- fruit jam	2 teaspoons
Lunch	- rice	2 bowls
	- chicken thigh	1 piece
	- green vegetable	4 ounces
	- lemon tea	1 cup
Snack	- orange juice	1 cup
	- bread	2 slices
	- fruit jam	2 teaspoons
Dinner	- rice	2 bowls
	- Chinese meat loaf	3 ounces
	- green vegetable	4 ounces
Late snack	- apple juice	1 cup
	- chiffon cake	1 piece

Energy: 3400 kcal

Carbohydrate: 567g(66%)

Protein: 100g (12%)

Fat: 83g (22%)

Pre-race Eating

The majority of triathlon races start in the early morning, some athletes may decide to skip breakfast before competition. Breakfast and pre-competition diet are important to maintain blood glucose level and top up liver glycogen stores. A pre-race meal providing 2 grams of carbohydrate kilogram body weight should be consumed 2 hours before competition. The meal should contain familiar carbohydrate-rich foods and drinks, with moderate protein, and low in fat and fiber. For example, a sandwich (with fruit jam), an egg and 750ml sports drinks (providing about 600kcal, 125g of carbohydrate, 14g of protein, 2g of fat and 2g of fiber.) Foods like banana, energy bar and fruit juice are also suitable pre-race food choices.

Eating During Training and Competition

During Olympic distance competitions, it is not necessary to eat foods during the race if the athlete has sufficient glycogen storage and an adequate breakfast. Athletes can rely on sports drinks to supply fluid, energy and electrolytes to meet the demands of the race. Athletes can also use carbohydrate gels if necessary. However, in half ironman and ironman competitions, athletes should regularly consume foods and drinks to supply energy and to replace fluid and electrolytes losses. Athletes should consume 1 gram of carbohydrate per kilogram body weight for each hour exercise. This is roughly 60-70 grams of carbohydrate each hour for most athletes. For half ironman and ironman triathletes, the cycling part is the best time to consume solid foods. For example, many athletes consume energy bar, banana, dried fruits and carbohydrate gels in the cycling part of the race. During running, athletes are encouraged to consume sports drinks in order to meet fluid, electrolytes and carbohydrate needs. Athletes can also use carbohydrate gels if necessary. In long course and ironman competitions, athletes can use defizzed soft drinks and carbohydrate gels to meet energy requirement since these kinds of foods are more practical and gastric tolerable than other solid foods.

Fluid and Electrolytes Requirements During Training and Competition

Most triathletes train 2 times daily, sweat losses tend to be high especially when training in hot environments. Athletes should consciously remind themselves to consume adequate fluid to prevent dehydration. Having access to a drink bottle during training and competition and carrying a drink bottle during a day is a key in ensuring athletes to replenish daily fluid losses. During competition, in cycling race for instance, athletes should aim to consume 750-1000ml of fluid for each hour exercise under hot weather to prevent dehydration. Athletes are encouraged to replace fluid losses during cycling in order to prevent dehydration during running which may lead to problems such as muscle cramping, dizziness and failure to finish the race.

The above information is provided by the Sport Nutrition Unit of the Athlete & Scientific Services Division. All information is for reference only.

For enquiry, please contact:
Sports Science Department. Tel: 2681 6277.

HONG KONG SPORTS INSTITUTE 香港體育學院

25 Yuen Wo Road, Sha Tin, N.T., Hong Kong
Tel: (852) 2681 6888 Fax: (852) 2681 6330
Website: http://www.hksi.org.hk

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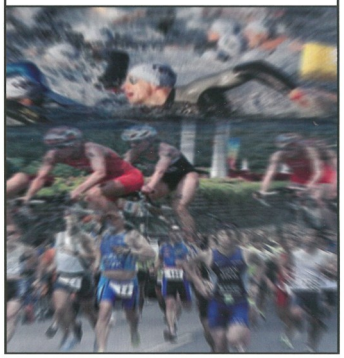
SPORT NUTRITION EDUCATION SERIES XIII

鐵人三項賽
TRIATHLON



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簡介

鐵人三項是由三種運動項目組成-游泳、單車和跑步。這項目的程序通常是先游泳，然後賽單車，最後是跑步。兩項鐵人賽(跑步-單車-跑步)和水陸鐵人賽(游泳和跑步)亦是時下流行的組合。鐵人三項賽的賽程，完成時間由二十分鐘至大半天不等，以下是項目的賽程表。

鐵人三項賽	游泳(米)	單車(公里)	跑步(公里)
缤紛賽程	200-400	10	2-3
半奧運賽程	750	20	5
奧運標準賽程	1500	40	10
半程鐵人耐力賽程	1900	90	21.1
長途賽程	3000	120	30
鐵人耐力賽程	3800	180	42.2

訓練

本地鐵人三項賽的運動員，分為全職訓練和業餘訓練，他們的訓練時間有所不同。許多全職訓練的運動員每日也要訓練至少兩次才能練好這三項運動。而且，他們需定期作三項或兩項合併的訓練，讓身體適應比賽模式。

體質特點

鐵人三項屬耐力項目，所以運動員的體脂較低，肌肉發展平均有助運動表現。

常見的營養問題

能量及營養的恢復:

鐵人運動員的日常運動量使他們需較多的能量、碳水化合物和蛋白質。他們的正餐及小食，都需要有充足的碳水化合物及其他營養素以供應日常的能量和營養需要，以免出現疲憊、生病和體重下降的情況，充足的營養也有助體力的恢復。

大部分鐵人三項運動員需接受每日兩節訓練，訓練與訓練之間的恢復有助確保訓練的質素。運動員需好好編排訓練與進食的時間表。在每節訓練後及比賽後的30分鐘內進食碳水化合物豐富的小食，然後應在運動後的兩小時內吃一份正餐，因有研究指出，這樣做可有效的恢復肌醣量。以下是碳水化合物豐富的小食，應在訓練後及比賽後盡快補充。

男運動員(目標60-80克 碳水化合物)

- 150克乳酪+1份果醬三文治
- 150克乳酪+麥條+250毫升果汁
- 250毫升牛奶+1條麥條+1隻香蕉
- 1條能量棒+500毫升運動飲品
- 750-1000毫升運動飲品

女運動員(目標40-50克 碳水化合物)

- 150克乳酪+1條麥條
- 150克乳酪+1隻香蕉
- 1條能量棒
- 250毫升牛奶+麥條
- 750毫升運動飲品
- 1份果醬三文治+250毫升果汁

醣原負荷法:

許多鐵人三項選手都會在比賽之前使用醣原負荷法來增加能量儲存。醣原負荷法是指在比賽前的三天起略為增添食量，但並不等於在賽前任意的大量進食。因為當運動員在準備比賽之前會調節或減低運動量，所以他們的熱量和碳水化合物的需求都會下降。在比賽前的一星期運動員會漸漸調校訓練量，也即是減低訓練量，因此也需要調節進食量，而避免比賽前體重增加。若想充分地使肌肉中的醣份達到理想的水平去迎接賽事，那麼鐵人三項運動員應在賽前的三天起每天進食以體重計每公斤9-10克的碳水化合物。每個運動員須進食多少碳水化合物視乎比賽的距離和需要完成賽事的時間。參與奧林匹克距離的賽事，運動員在調整訓練量的同時，在比賽前的兩天每天按體重計每公斤進食9-10克的碳水化合物，這足以提升肌醣的儲備。例如一個60公斤重的運動員進行奧林匹克距離比賽，他就要在比賽前兩天每天進食540-600克的碳水化合物。

但若運動員需要進行一個半程、長途或鐵人耐力賽事，最好在比賽前三天以每公斤體重計每天進食10-12克的碳水化合物。這方法可令他們的肌肉盛滿肌醣而避免或延遲比賽時有疲憊的情況出現，例如一個60公斤重的運動員進行長途賽，他就要在比賽前三天每天進食600-720克的碳水化合物。

醣原負荷法示例：(適合60公斤重的運動員於奧林匹克距離的賽事前兩天起使用)

早餐:	- 脫脂奶1杯	
	- 粟米片1杯	
	- 香蕉1隻	
	- 方包2片	
	- 果醬2茶匙	
午餐:	- 白飯2碗	
	- 雞脾1隻	
	- 菜心4安士	
	- 檸檬茶1杯	
下午茶:	- 橙汁1杯	
	- 方包2片	
	- 果醬2茶匙	
晚餐:	- 白飯2碗	
	- 蒸肉餅3安士	
	- 西蘭花4安士	
宵夜:	- 蘋果汁1杯	
	- 雪芳蛋糕1件	
總熱量: 3400千卡		
碳水化合物: 567克(66%)		
蛋白質: 100克 (12%)		
脂肪: 83克 (22%)		

賽前的飲食

鐵人三項的賽事通常在一清早舉行，有些運動員會因為來不及吃早餐的原故而空肚作賽。早餐和作賽前的飲食對於血糖平衡和肝醣的儲存是非常之重要。賽前飲食是需要在比賽前兩小時以每公斤體重計進食2克的碳水化合物，這些食物應是平日習慣食用的碳水化合物和飲品，最好是含適量蛋白質、低脂肪及低纖維素。例如是吃三文治(塗果醬)、一隻雞蛋及750毫升的運動飲品（大概提供600千卡、125克碳水化合物、2克脂肪、14克蛋白質及2克纖維素）。另外香蕉、能量棒、果汁等都適合賽前食用。

訓練和比賽時的飲食編排:

運動員有充足的肌醣儲備及一份足夠的早餐，進行短途或奧林匹克距離比賽中是不需進食任何的食物。在比賽中可依賴運動飲品來滿足能量、水份及電解質的需要，有需要時也可使用糖漿。若運動員是進行半程鐵人或鐵人耐力賽事的時候就需要定時或計劃每隔一段時間進食些食物來滿足能量、水份、電解質的需要。參與這些賽事的運動員，大概每小時的運動需要按每公斤體重進食1克的碳水化合物，也正等於每個小時要進食大概60-70克的碳水化合物。對於半程鐵人或鐵人耐力賽的運動員來說，在單車賽事期間是較容易進食固體食物。例如許多參加這賽事的運動員都在單車部份中進食能量棒、香蕉、乾果及糖漿等。在跑步路段，運動員可盡量飲用運動飲品，來滿足水份、電解質和碳水化合物的需求，有需要時也可使用糖漿。若參加長途鐵人賽或鐵人耐力賽的時候，運動員可飲用放了氣的汽水或糖漿去滿足能量的需要，這類食物比其他固體的食物宜用和容易受腸胃適應。

訓練和比賽期間對水份及電解質的需求

大部分鐵人三項運動員都需每日進行兩次的訓練，汗液的流失也是非常之高，特別在炎熱的天氣下訓練，因此鐵人三項運動員要不斷提醒自己要飲足夠的水份來避免脫水。鐵人三項的運動員除了可在比賽期間帶備水壺去補充水份外，非訓練期間也應督促自己補充足夠的水份。在熱環境下作賽，以單車路段為例，運動員每小時要飲用750-1000毫升的水份來預防脫水。運動員應盡量在單車路段補充汗液所流失的水份，預防在跑步期間脫水而出現問題如：抽筋、頭暈及不能完成賽事。

以上資料由運動員及科研事務科轄下的運動營養組提供，只供參考。

如有查詢，請致電26816277
與運動科學部聯絡。

HONG KONG SPORTS INSTITUTE 香港體育學院

新界沙田源禾路25號
電話: (852)2681 6888 傳真: (852)2681 6330
網址: http://www.hksi.org.hk

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