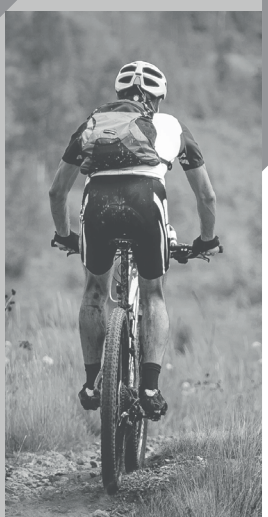
torq®

PERFORMANCE NUTRITION



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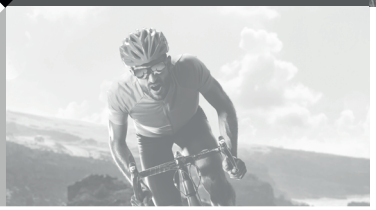


THE MACRONUTRIENTS

FAT

CARBOHYDRATE

PROTEIN

The foods we eat are comprised of carbohydrates, fats & protein. These are called the macronutrient food groups. In order to survive and function the human body requires a well-balanced composition of each. During times of exercise load, there is also a need to increase the quantities of certain macrocontinents in order to perform and recover.

KCAL PER GRAM

1g CARBS = 4KCAL

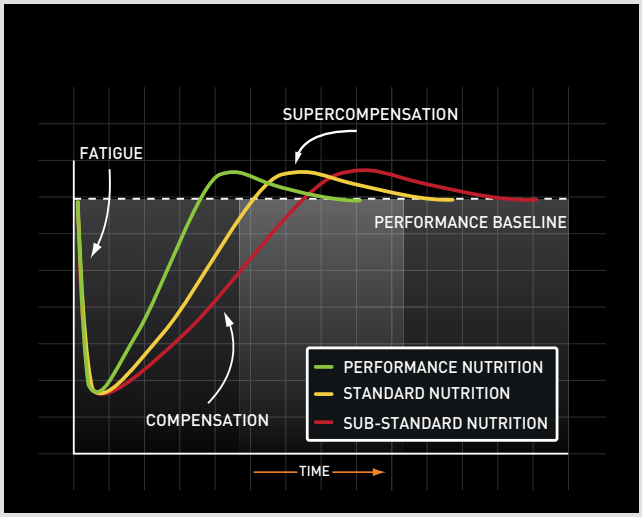
1g PROTEIN = 4KCAL

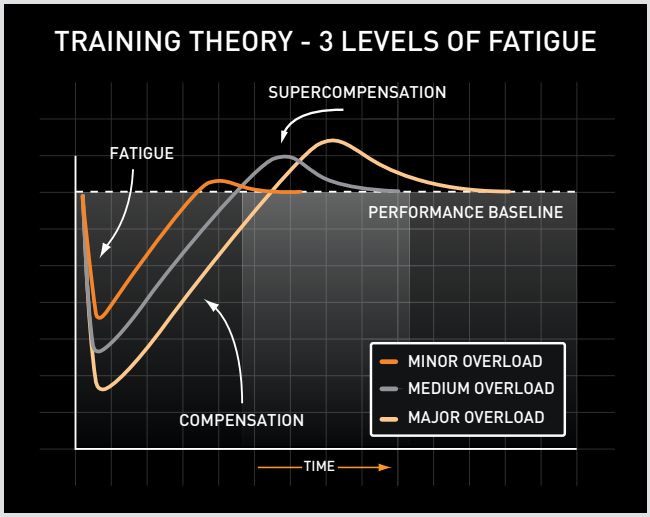
1g FAT = 9KCAL

1g ALCOHOL = 7KCAL

Each of the 3 macronutrients, are allocated a calorific value based upon their chemical structure. Alcohol also has a calorific value, and like fat is exceptionally calorie dense.

CARBOHYDRATE & TRAINING THEORY



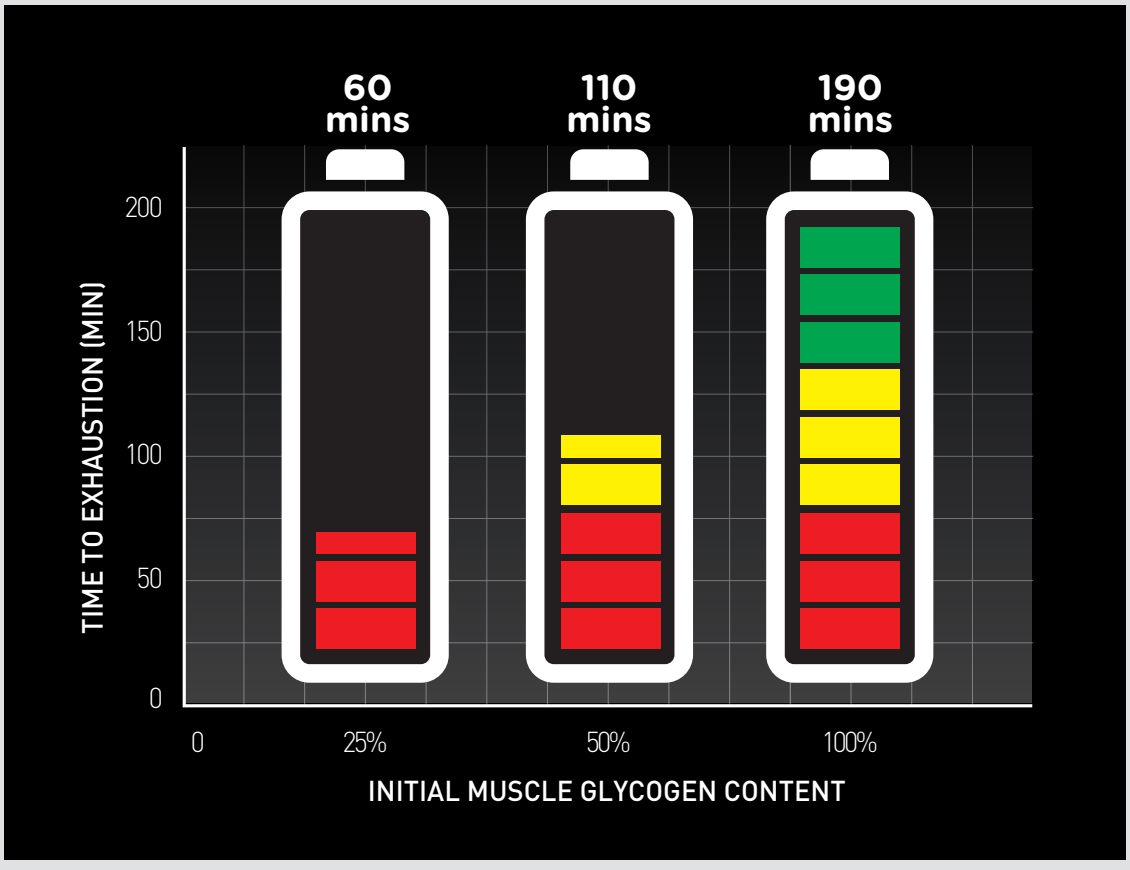


Carbohydrate is an important nutrient for fuelling and refuelling the human body during, but also after exercise.

Carbohydrate is stored within the muscle and liver at a maximal capacity of 500g. If carbohydrate is not replenished post exercise, and training volume/ intensity continues, it is likely an athlete will start to experience chronic fatigue and delayed recovery. The quantity of carbohydrate consumed within the diet should be based upon the volume and intensity of the current training programme. Fuelling a training session with carbohydrate will allow an athlete to work harder during that session, allowing for a greater training overload and a better training outcome. Re-fuelling with carbohydrates post exercise will ensure carbohydrate is stored in the muscle and the liver ready for the next training session. Re-fuelling will allow for more training sessions within a training week as recovery time is quicker.

MUSCLE GLYCOGEN CONTENT & TIME TO EXHAUSTION

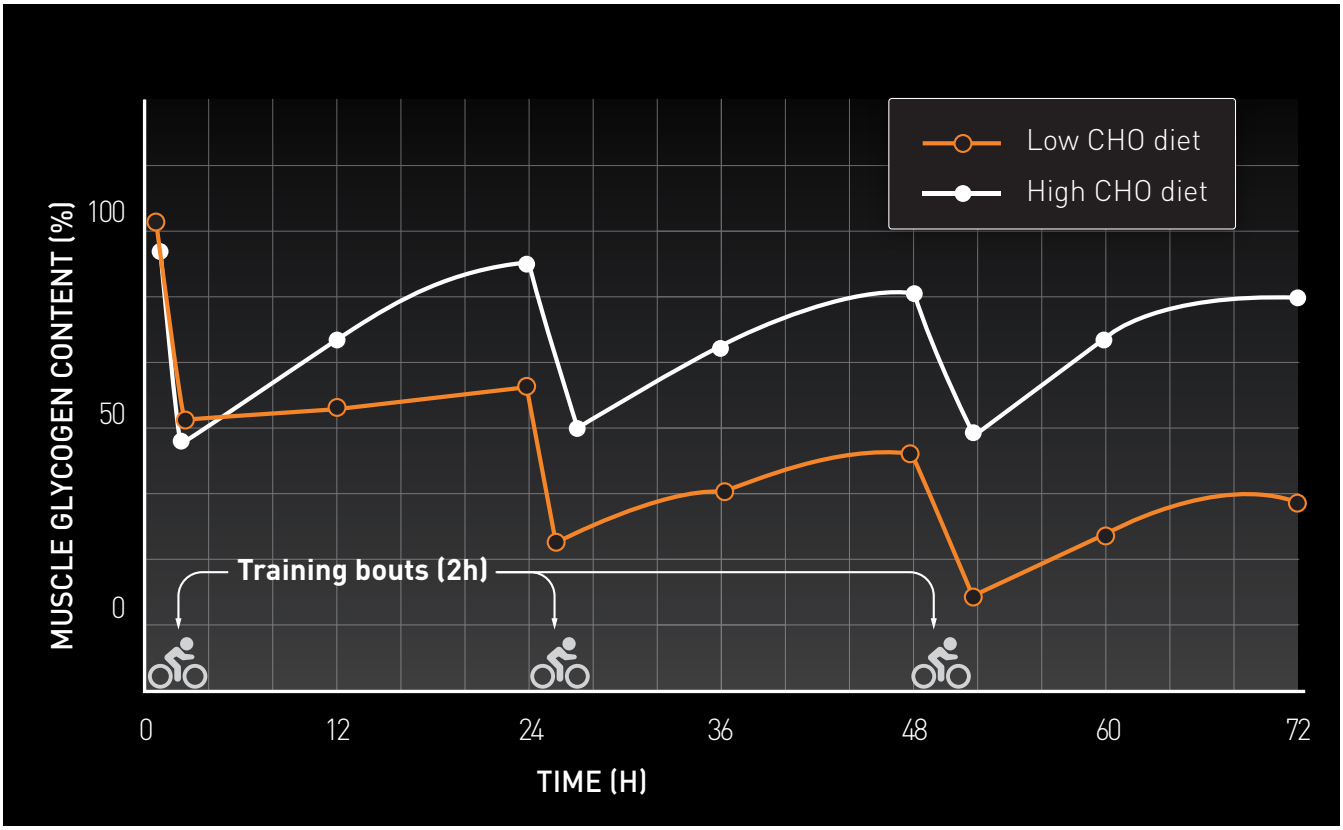
Glycogen is simply carbohydrate in its stored form. When stored to full capacity at 500g, it is likely that an athlete will be able to work at a high intensity for 190 mins. Once this store of carbohydrate is depleted, the required fuel source (carbohydrate) is no longer available and the athlete will "bonk" or "hit the wall".



Bonking and hitting the wall are terms given to an athlete that's completely running out of carbohydrate and having to reply on fat break down to get them home. As fat can only be broken down at low intensities, the rider has no choice but to reduce their power output.

If an athlete starts their training session with only 25% of stored glycogen, the end result is the same, but it occurs much sooner at only 60 minutes.

HIGH & LOW CARBOHYDRATE DIETS



As previously discussed, the difference between high and low carb diets is the ability to perform during and recover from exercise. It is also important to note that the generation of fatigue with high carb diets can be higher as an athlete can work at higher intensities. Session upon session will deplete resting stores of carbohydrate and therefore, calories in the form of carbohydrate must be consumed to replenished those lost through exercise. Neglecting carbohydrate can lead to over training and significantly reduced performance.

GLYCAEMIC INDEX CHART (GI)

Carbohydrates are commonly categorised by sugars or starches based upon their Glycaemic Index (GI). GI is a value 112 – 23 that describes how quickly a carbohydrate is digested from food to glucose found within the bloodstream.

The lower the value, the slower the release of carbohydrate. Generally, the slower the release, the longer the carbohydrate molecule is.

HIGH GI CHO		MEDIUM GI CHO		LOW GI CHO	
MALTODEXTRIN	112	ORANGE JUICE	57	APPLE	36
GLUCOSE	100	BOILED POTATO	56	PEAR	36
CORN FLAKES	84	BROWN RICE	55	CHOCOLATE MILK	34
HONEY	73	BAKED BEANS	48	GREEN BEANS	30
MARS BAR	68	ORANGE	43	WHOLE MILK	27
ICE CREAM	61	LENTIL SOUP	42	FRUCTOSE	23

SIMPLE & COMPLEX CARBOHYDRATES

SIMPLE CARBOHYDRATES (SUGARS) (HIGH GI)	COMPLEX CARBOHYDRATES (STARCHES) (MED-LOW GI)
SUCROSE (SUGAR)	PASTA
HONEY	RICE
SYRUP	BREAD
BOILED SWEETS	POTATOES
WINE GUMS	NOODLES
NON-DIET SOFT DRINK	CEREALS

Simple sugars are often considered as very short chains. The long chains are considered as complex carbohydrates. Short chain or "simple" carbohydrates should be consumed during and immediately post exercise and medium to long chain or "complex" carbohydrates should be consumed anytime surrounding exercise.

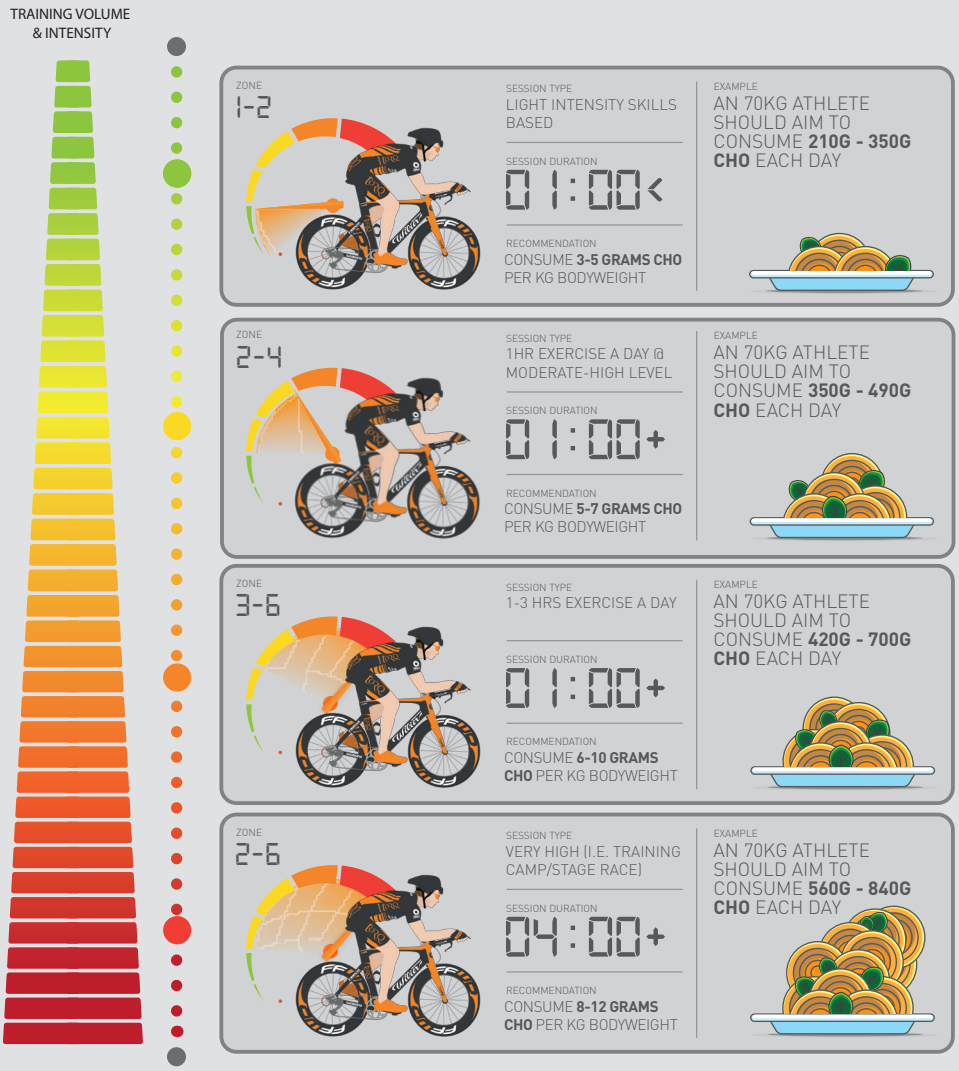
CHOOSING HIGH CARBOHYDRATE SNACKS

HIGH CARB SNACKS	FAT PER 100g	FAT PER SNACK
BANANA	0.3	<0.3
McVITIES GO AHEAD "FRUIT-INS"	4.6	0.8
MULLER CORNER "BLUEBERRY"	3.9	5.8
OAT SO SIMPLE "APPLE"	6.2	2.2
McVITIES "JAFFA CAKES"	8.1	1.0
McVITIES "CHOCOLATE DIGESTIVES"	23.9	4.1

When choosing high carbohydrate snacks to perform and recover from exercise, it is important to notice the fat quantity per 100g. Fat can limit the absorption of carbohydrate from the intestine, causing gastrointestinal stress such as cramps. A general rule of thumb is to aim for less than 10% fat per 100 (10/100g). Above is a list of high carbohydrate foods of varying fat quantities.

FUEL FOR THE WORK REQUIRED

In recent years, research has aimed to conclude the quantity of carbohydrate required to complete certain tasks. Due to science, we are now able to isolate the quantity of carbohydrate burned during different exercise types. In order to maintain weight, by "periodising carbohydrate", athletes can examine their weekly training load and volume and "fuel for the work required".

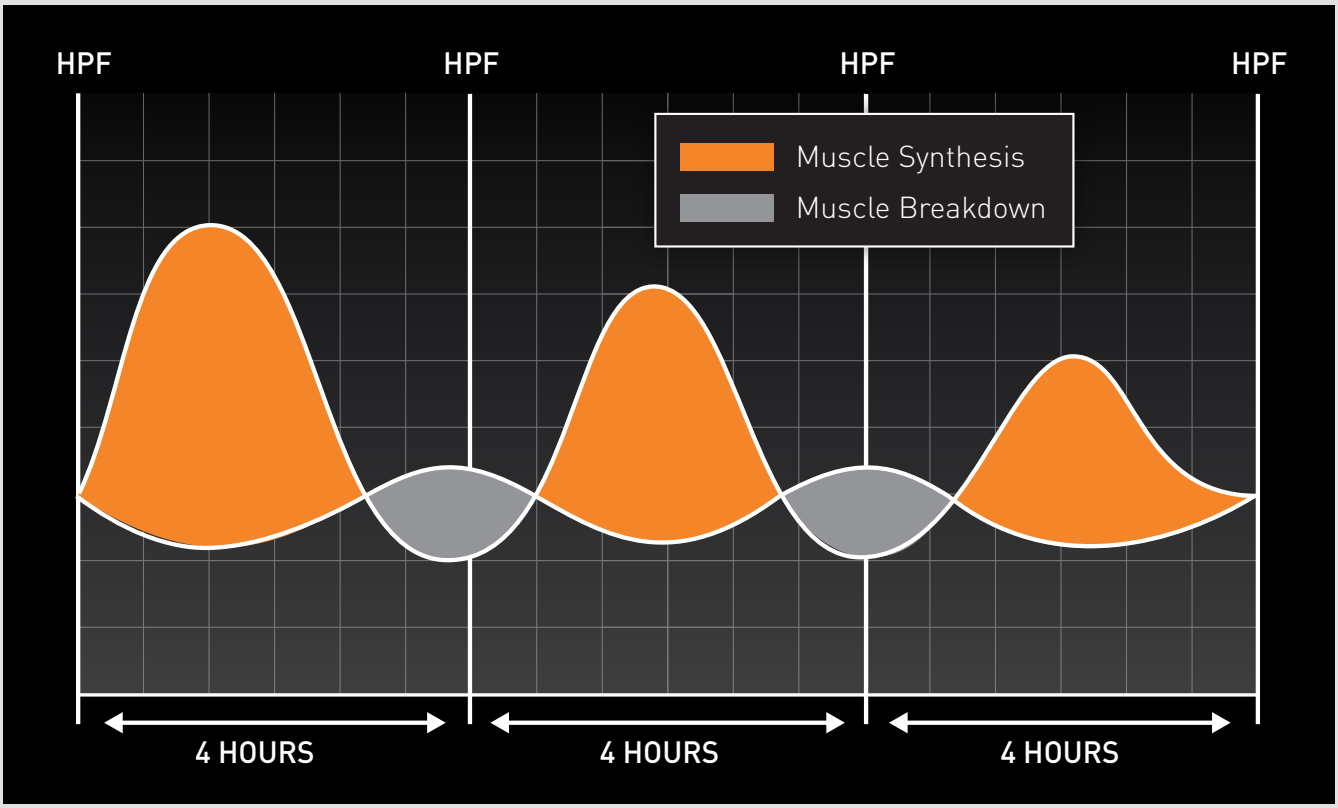


For example, if an athlete is competing many high intensity training sessions within a 1-week period, then there must be a reliance on carbohydrate to perform and recover from that week. However, if training volume and intensity is light, then the athlete may wish to reduce the carbohydrate consumed within the diet to regulate energy intake/output.

CARB LOADING EXAMPLE

Above is an example diet that an athlete weighing 70kg can consume to achieve a very high carbohydrate diet of 9g/kg. Breaking the meal serves down in to smaller more frequent meals can combat the sensation of feeling full and increase the desire to eat.

PROTEIN REQUIREMENTS



The human body is made up of millions of different proteins that make up who we are. From skin, hair, tendons and muscle tissue, to the enzymes that breakdown our food, and the hormones that control our body, each one has a specific function. Exercise stimulates muscle specific protein building but also breakdown. If protein is lacking within the diet, the body will find it very difficult to repair and reconstruct the proteins that are damaged during exercise. Consuming 25g of protein every 3-4 hours is simply enough to ensure that the rate of muscle protein production exceeds the rate of breakdown, leading to the athlete getting fitter, stronger and more capable.

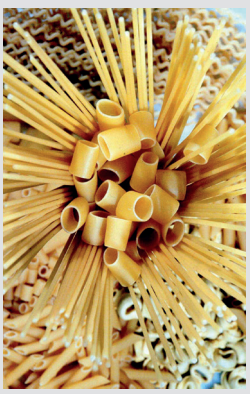
SOURCES OF ESSENTIAL AMINO ACIDS

In order to build proteins, the body requires the building materials. If proteins are a considered as the "house" the "bricks" would be the amino acids. Amino acids are single molecules that join together to create a functional protein. The body requires different amino acids to produce different types of proteins. In total there are 21 amino acids, 10 of which are essential and 11 of which are non-essential. If an amino acid is essential, we must get it from our food. Above is a list of foods you can add to your diet to ensure you ingest quality protein sources.

MEAT AND FISH	BEANS AND PULSES	GRAIN
BEEF	BAKED BEANS	WHEAT
CHICKEN	HARICOT BEANS	OATS
TURKEY	KIDNEY BEANS	MAIZE
TUNA	GARDEN BEANS	CORN
SALMON	CHICKPEAS	PASTA
EGG	LENTILS	RICE

RICH SOURCES OF PROTEIN

FOOD OPTION (100g)	AMOUNT OF PROTEIN PER (100g)
BEEF	30g
CHICKEN	26g
CHEESE	28g
TOFU	7-15g
NUTS	26g
PASTA	3.5g



This table represents different food groups that can be consumed to achieve regular 25g protein serves every 3 – 4 hours.

PROTEIN FEED TIMETABLE

A timeline example of how and when an athlete may wish to consume 20 – 25g of protein every 3-4 hours throughout the day to ensure muscle protein production is remains elevated.

PRE, DURING & POST EXERCISE NUTRITIONAL INFOGRAPHIC

2- 3 Days Before
8-10/kg/day

1 - 3 Hours Before
Low - Medium (GI)

During Exercise
60 - 90 CHO/Hr

Post Exercise
CHO & PRO Rich Food Choices

The info-graphic above provides an insight of how much, and what type of carbohydrate should be consumed, pre, during and post exercise. Carb loading should be considered during high training load (i.e training camps, races or "A" rated focused events).

HYDRATION

Although official ACSM guidelines are in place to support the hydration requirements of athletes, it is important to note that each of the factors above can play a fundamental role in the regulation of hydration and core body temperature.

Therefore, as water loss through exercise is dependent upon the individual, specific requirements must be adjusted based on an individual formulation and experimented with during training.

GENETICS
Some people sweat more than others

FITNESS
Ability to thermo-regulate improves with fitness

ENVIRONMENT
Sweat loss is higher in hot, humid conditions

INTENSITY
The higher the exercise intensity, the more you will sweat