

Matt Lovell
Elite Sports Nutritionist



Sports Nutrition Essentials

Dietary Dogma and Commandments

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The Pillars of Nutrition

1. Hydration

Drink plenty of water throughout the day and during training sessions. Being well hydrated improves how you feel and perform. The average adult requires at least 2-3 litres of water a day. This requirement increases if you exercise. Thirst is a poor measure of dehydration. You become dehydrated long before you feel thirsty so drink water continuously throughout the day. Alternatively, choose fruit teas and herbal blends, and water flavoured with a little fresh fruit juice. Isotonic drinks should be consumed before - during and after training.

2. Preparation

This point mainly concerns preparation for competition. It's vital that your muscles are loaded with carbohydrate (CHO) if you want to perform to your maximum level, as CHO is the primary fuel for high intensity exercise. If you are training for fat loss then this is less important, as a lack of CHO will actually promote the utilisation of fat. Preparation also refers to your cooking; you should prepare your food yourself and be organised about planning your meals and menus. This way you know exactly what's going into your body and you can stick to eating at set times, getting into a routine to support good health!

If you are going to be out for the day then you may need to organise 4 or 5 meals and snacks to take with you. This attention to detail **MAKES THE DIFFERENCE!**

3. Regeneration

Post exercise recovery is paramount. You must be meticulous with your post workout intake - the quicker you recover the better you will perform week in week out. CHO rich foods with a High glycemic Index (GI) will aid recovery after exercise. If you are lean and body fat isn't such a concern, you can be more generous with carbohydrate intake. This is also a vital time to top up your body with the protein you'll need for repair and to support the immune system's response to exercise. Make sure you sleep adequately. You should wake up feeling refreshed and will be able to achieve more physical gains, performing better week in week out.

4. Quality

Deficiency & Toxicity will severely interfere with your ability to perform week-in week-out at the highest level. Organic, high grade produce is the best way to avoid these problems, with supplementation always an option if you don't think you can obtain all you need from a balanced diet.

If you're training hard then I would say it's pretty much a necessity.

5. Quantity

The most important thing is to stick to eating at set times and set portions. Be strict with yourself. You may have been given suggested serving sizes. For dried staples, such as rice and porridge they're easy to stick to if you use scales to make yourself familiar with a certain portion-weight, then use a specific scoop/spoon for subsequent portioning. For instance, a 40g portion of porridge oats (150Kcal) can be easily measured by filling a ½ pint beer-glass to the "bulge" about 2/3 of the way up. Increase or decrease the portion sizes depending on your goals.

6. Frequency

Eat around every 3 hours. Look at food as feeding opportunities, every time you consume food you can either gain or damage your health. Each meal should contain high quality protein, CHO and vegetables.

Explanation of macronutrients and implications for performance

Hydration must be your foremost priority. Each meal should consist of a portion of **protein, complex carbohydrate (CHO)** and **vegetables**. An effective strategy for fat loss has been revealed to be one of reducing fat in the diet by substituting it with protein. CHO should still be the major source of energy and, and consuming this with green vegetables, high in cellulose, has been shown to allow this energy to be released slowly, maintaining constant blood-sugar. This will mean your energy levels don't fluctuate too much.

Water

- The average adult requires at least 2-3 litres of water a day (2). This requirement increases if you exercise.
- Studies report performance losses after just 2% dehydration (about 1.5L of sweat).
- Salts increase water retention as well as thirst, encouraging rehydration. Added CHO has also shown an ability to improve fluid balance, as well as protein.
- Not only will dehydration affect your muscles' ability to function, but the loss of salts may eventually affect your nerve function, reactions and concentration.
- Thirst is a poor measure of dehydration. You become dehydrated long before you feel thirsty so drink water continuously throughout the day.
- The best measure of fluid balance is urine colour, this should be clear and pale at all times. Dark yellow urine is an indicator of dehydration, though some multivitamins may give the urine a bright yellow appearance.
- Rehydration drinks contain salts, and it's also advisable to drink water when you eat food. If making your own, use full-sugar squash for recovery, or diluted fruit juice or low sugar-squash at other times, adding a pinch of salt.

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- Start the day with a mug of freshly boiled water and a slice of lemon. In summer add a fresh sprig of mint and fresh lemon slices to a jug of cold water.
 - Drink from a bottle of water to measure daily intake until you are used to drinking enough.
 - Weigh yourself before and after exercise. For every kilogram lost, a litre of water is lost.

Carbohydrate (CHO)

- Carbohydrate (CHO) is the body's primary energy source, essential for short bursts of intense activity. It is stored in the form of glycogen in the muscles and the liver.
- You need to ensure an adequate supply for intense exercise and replenish afterwards.

Action Plan

- Replace some starchy carbs with fibrous carbs at each meal. This will increase fibre and help fill you
- Avoid large carbohydrate meals, as these will make you sleepy and excess calories will be converted into body fat.
- Always choose whole grain options. Brown rice, whole-wheat cereal and whole grain breads are always higher in nutrients and have a lower glycemic index.
- Starchy carbohydrates should be limited in the evening meal where fat loss is a goal, as the need for an energy source at night is limited.

After training...

- Insulin released in response to CHO prevents muscle-breakdown & promotes synthesis.
- In the “recovery period” immediately after training, we can take advantage of these properties.
- More “sugary” carbs (white bread/rice, “hypertonic” sports drinks etc) should be eaten to help “spike” insulin levels and to promote the uptake of sugars, protein and nutrients for repairing muscle.
- Replace brown with white bread/rice. Try and eat a good portion of carb and protein within 45 min of training.

However...

- Insulin acts as a signal to your body that you are fed, and so can promote the storage of fats and conversion of carbs to fat. Generally we don’t want too much simple/sugary carb for this reason.
- Eating complex carbs like brown rice and pasta when recovery isn’t the primary objective, will encourage your body to use this carb gradually for energy, instead of just storing it as fat.
- Eating complex carbs will also let your body burn fat more efficiently and prevent you feeling tired once all the CHO has been stored.
- Insulin also interacts with other hormones released from training.
- Growth Hormone, released after exercise, promotes muscle-building, and in a lower-CHO/insulin environment also causes your body to burn fat. If there is a lot of CHO and insulin, Growth hormone then has the opposite effect on fat metabolism, causing fat to be stored.

Suggestions for a small portion, providing around 150Kcal (adjust depending on your goals)

- Brown rice (40g serving)
- Brown pasta (40g serving)
- 1xSmall sweet-potato (80-100g cooked)
- 1xSmall potato (80-100g cooked)
- Wholemeal bread- 2 medium slices

Protein

- Protein is the main structural component of muscle tissue as well as providing a source of energy as an alternative to CHO during exercise and being the primary fuel for cells of the immune system.
- At least 20 - 25% of your daily energy intake should come from protein.
- Protein should be included at every meal, this will help control blood glucose levels support muscle and improve appetite control.
- Protein is required in higher amounts during weight loss in athlete. Replacing calories from fat and CHO with protein is an effective strategy for fat-loss.
- Using protein as a source of energy requires it's degradation, followed by inter-conversion of amino acids to glycolytic and ketogenic substrates, requiring the use of around 30% of the protein's calories.
- Protein intakes of around 1g per lb (2.2g per Kg) are effectively used by athletes wishing to maintain muscle mass, considering their body composition.
- Choose lean meat and poultry, avoiding prepared meals and processed meats (Preparation!). Fish is a superb source of protein, it is low in fat and oily fish like mackerel have the added advantage of being high in omega-3 fatty acids.

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- Grill, bake, steam or poach fish in preference to frying. Try to avoid farmed fish and choose wild and organic fish whenever possible. Avoid pork, as it is the most fatty of red meats.
 - Peas and beans (legumes) are excellent sources of protein and fibre, especially when combined with wholegrains. Most plant proteins do not contain all the essential amino acids (animal protein does); combining different sources of plant protein solves this problem.
 - Legumes should be eaten with wholegrains, e.g. brown rice and lentils, houmous with wholewheat pitta bread. Plant proteins are very low in fat and have a very low glycemic index (see later), this means that they cause a slow release of glucose into the blood. Baked beans have a low glycemic index, are cheap, convenient and easy to store. Serve as a filling for baked potatoes or on toast.
 - Nuts are also a useful protein source but they should be eaten in moderation as they have a high essential fat content.
 - Choose a mixture of almonds, pecans (The King of Omega-3!), walnuts, and Brazil nuts, hazelnuts, cashews, pumpkin, sunflower and sesame seeds. Add them to a salad or stirfry, or eat them as a snack. Avoid nuts that have been roasted in oil or are salted.
 - Tofu is a bland, tasteless food that can be prepared, flavoured and cooked in a multitude of ways so that it can take on the flavour and texture of any ingredients it is combined with.

Suggestions for a portion, providing around 30g of protein

- 1 Skinless chicken/turkey breast
- 2 White fish/cod fillets
- Mackerel
- 4 large eggs (have one full egg plus 3 whites in each portion)
- 1 can tuna

Fruit and Vegetables

Aim for six to seven servings of vegetables each day and one to two portions of fruit.

Explanation and advice

- The fibre in vegetables, when eaten with carbs, slows down the release of CHO into the body, reducing swings in blood sugar control. Fibre has been identified as having many beneficial effects including control of blood glucose, decreasing blood cholesterol, improving bowel health and even controlling appetite

Examples of high fiber foods:

- Oats
 - vegetables
 - wholewheat flour,
 - bran,
 - fruits with edible seeds
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- Getting your “5 a day” will give you a selection of vitamins and minerals to help all of the reactions in your body proceed.
 - Enzymes are machines in your body that are held in the correct shape by minerals like iron and magnesium. Vitamins are often involved in these reactions...they give them a kick-start (acting as “cofactors”).
 - Dark-green veg are often high in fat-soluble vitamins like vitamin E and contain some good fatty acids like omega-3. Eating these will put the correct fats into the “membrane” (like a skin) that surrounds every one of your cells, as well as protecting these fats from damage.
 - Balance your vegetable intake between the orange/red and green varieties. A good rule to follow is simply to try and get a good amount of “colour on your plate” for example, mixing up light green lettuce with the deep dark green of spinach or the bright orange of carrots. They can be eaten raw and cooking

most vegetables takes only a few minutes if you steam, stir-fry or microwave them.

- Choose fresh and organic vegetables wherever possible (Quality!).

Examples of green veg side dishes

- Stir-fry Kale in spray olive oil with garlic and ginger. Add Chinese 5-spice
- Fry Cabbage in spray-olive oil with onion, adding finely chopped apple after 3 mins, covering with stock and simmering till tender
- Add Spinach leaves/shredded raw cabbage to salad leaves
- Chop celery finely into “matchsticks” and add to finely chopped apple, carrot and lime-juice with 1 tsp honey
- Spinach can be easily cooked in 2-4 mins and drizzled in soy-sauce

Breakfast

Eating Breakfast increases your resting energy expenditure and will provide your immune system with the protein it needs for energetic substrates, as well as topping up glycogen levels. Breakfast is an essential part of an athlete's regimen.

Breakfast Food Choices

PROTEINS				CARBOHYDRATES				OILS/FATS/SPICES/BEVERAGES			
MEAT/FOWL	SEAFOOD	DIARY	LEGUMES	GRAIN	VEGETABLE	FRUIT	BEVERAGES	SPICES	OIL		
Bacon	Abalone	Cheddar	Dried Beans	Amaranth	Agar	Beet Green	Apple	Almond Milk	Basil	Almond Oil	
Beef	Anchovy	Cheese	Dried Peas	Barley	Artichoke	Broccoli	Avocado	Coffee	Bay Leaf	Blackcurrant Oil	
Beef Liver	Catfish	Cottage Cheese	Fava Beans	Brown Rice	Asparagus	Brussels Sprout	Banana	Green Tea	Cayenne	Borage Oil	
Chicken Breast	Caviar	Cream	Green Peas	Buckwheat	Bamboo Shoots	Cabbage	Berry	Herbal tea	Chilli Powder	Coconut Oil	
Chicken Liver	Clam	Eggs	Lentils	Corn	Beet	Chard	Cherry	Oat Milk	Cinnamon	Evening Primrose Oil	
Cornish Game Hen	Cod	Goat Cheese	Red Beans	Couscous	Carrot	Collard	Citrus	Red Wine	Coriander	Fish Oils	
Duck	Crab	Goat Milk	Soy Beans	Kamut	Cauliflower	Cucumber	Currants	Rice Milk	Cumin	Flax Oil	
Fowl	Crayfish	Kefir	Tempeh	Kasha	Celery	Garlic	Elderberries	Vegetable Juices	Curry Powder	Hemp Oil	
Goose	Flounder	Milk	Tofu	Millet	Corn	Kale	Figs	Water	Dill Weed	Hemp Oil	
Ham	Haddock	Mozzarella	White Beans	Oat	Dulse	Leafy Greens	Gooseberries	NUT/SEED	Fennel Seed	Olive Oil	
Kidney	Halibut	Parmesan		Quinoa	Eggplant	Okra	Grape	Almond	Ginger	Peanut Oil	
Lamb	Herring	Whey		Rye	Fresh beans	Onion	Grapefruit	Brazil	Honey	Sesame Oil	
Lean Pork	Lobster	Yoghurt		Spelt	Jicama	Parsley	Kiwifruit	Cashew	Horseradish	Sunflower Oil	
Pate	Mackerel			Triticale	Kelp	Parsnip	Loganberries	Chestnut	Mayonnaise	Walnut Oil	
Pheasant	Mussel			Wheat	Laver	Peppers	Mango	Coconut	Molasses	Wheat Germ Oil	
Pork Chop	Octopus				Mushroom	Radish	Melon	Filbert	Mustard	FAT	
Spare Rib	Oyster				Pea	Scallion	Nectarines	Hickory	Nutmeg	Butter	
Turkey	Perch				Potatoes	Spagetti squash	Olive	Macadamia	Oregano	Cream	
Turkey Breast	Salmon				Pumpkin	Sprouts	Peach	Peanut	Paprika	Ghee	
Veal	Sardine				Rutabaga	Summer Squash	Pear	Pecan	Pepper		
Venison	Scallop				Shallot	Tomato	Pineapple	Pine nuts	Peppermint		
Wild Game	Scrod				Spinach	Turnip	Plum	Pistachio	Sage		
	Shrimp				Squash, Winter	Watercress	Raisins	Pumpkin	Spearmint		
	Snail				Sweet Potato	Yellow Squash	Rasberries	Sesame	Tarragon		
	Sole				Yam	Zucchini	Rhubard	Sunflower	Thyme		
	Squid						Strawberries	Walnut	Tumeric		
	Trout						Tomato		Wasabi		
	Tuna, dark						Tropical				
	Turbot						Watermelon				
	White Tuna										

Carbohydrates

Eat freely

Low glycemic

Low energy

FIBROUS

Grow above the ground

Asparagus
Green Beans
Broccoli
Brussels sprouts
Cabbage
Courgettes
Cauliflower
Celery
Cucumbers
Aubergine
Lettuce
Mushrooms
Peppers
Spinach
Pumpkin family
Onion family

Portion control

GI varies

Energy dense

STARCHY

Roots and grains

Oatmeal
Rice
Wholemeal flour
Cooked carrots
Potatoes
Pasta
Sweet Potatoes
Corn
Barley
Popcorn
Parsnips
Swedes
Yam

Portion control

Low GI

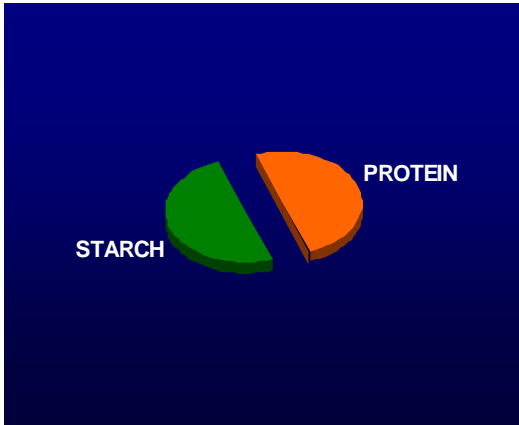
Medium energy

**STARCH + FIBRE
+ PROTEIN**

Beans and pulses

Lentils
Lima Beans
Black-eyed-beans
Peas
Soy beans
Broad beans
Chick peas
Kidney beans

How to Eat in order Not to Get Fat and Gain Muscle



Breakfast

'Never skip breakfast'

Recommended food groups

Protein + Starch

Suggested recipes

Grilled bacon or other lean meat, tomatoes and poached eggs on rye bread.
Porridge and nuts and seeds

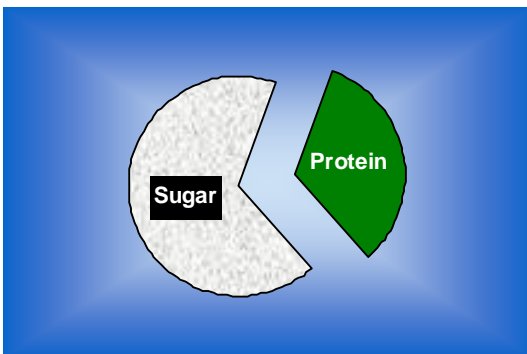
Eggs any style: scrambled with smoked salmon, Spanish omelette, poached, boiled etc on wholemeal toast. Sardines or baked beans on rye bread. Cereal and protein shake. Fresh vegetables and meats.

1 Breakfast - Recommended food groups

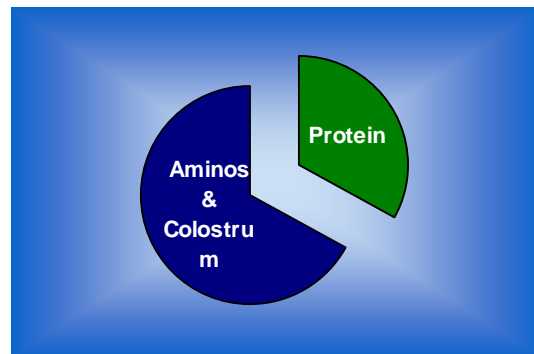
If you are carbohydrate sensitive then have veggies with protein for breakfast instead of bread and cereals

Postworkout Recovery (Drink) Protein +/- Sugars

The sugars should be as high GI as possible. This meal is best taken in liquid form. Aminos and protein mixtures can also work for recovery if carbohydrate tolerance is an issue



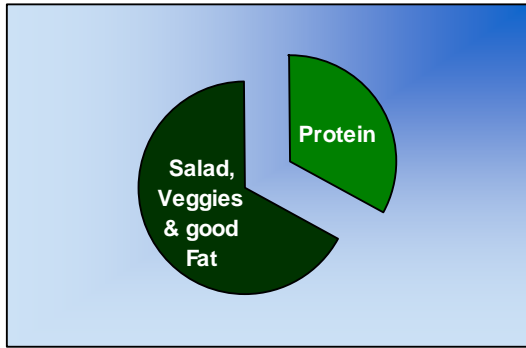
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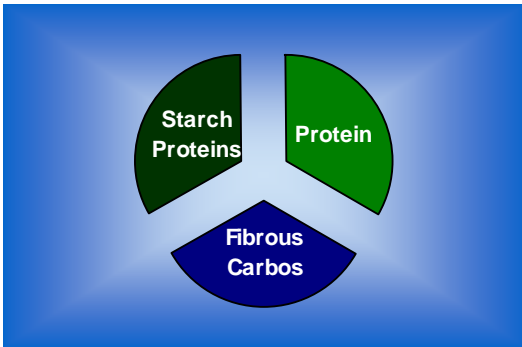
Post-Workout Recovery Meal Starch + Protein + Essential Fatty Acids EFAs

To fully replenish sugar reserves in the muscles and liver (glycogen). The next meal should be higher in starchy carbs and be consumed within two hours of finishing your training. Higher glycemic carbs may be consumed at this time. Yogurt and crunchy cereal is a good meal, as is white rice, baked potato or pasta with a good serving of whole protein. Baked potato, tuna and beans would also work at this time. Be careful of these types of carbohydrate if you are carbohydrate intolerant.

**Higher
GI Starchy
Carbohydrate**



Eat starchy carbos only if you've trained really hard. Otherwise stick to protein, salad, veggies and good fats.



Lunch

Include essential fats wherever possible.

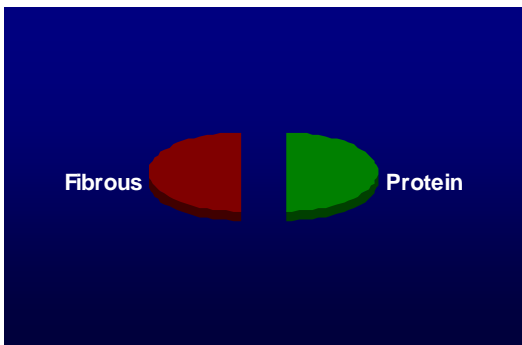
Good dressings include olive oil, balsamic, cider vinegar, mustard, herbs and garlic. Use chilli, soya and worchester sauce and other herbs and spices to flavour.

Protein + fibrous + starch/proteins

Suggested Recipes

Salad themes are good in this

Instance: salad Nicoise, Caesar salad or mixed bean and tuna salad, Greek salad with a good quality source of protein is good too. If you are having soup choose one made from beans or pulses and add some form of protein like chopped up chicken breast or extra prawns in tom yum soup.



Dinner

Additional Starch

Maybe required in the evening meal.

Only if you are very lean.

From starch/proteins or low GI Starches.

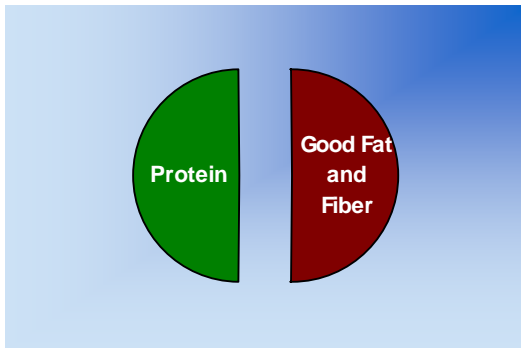
Include essential fats as well.

Protein + fibrous + EFAs

Suggested Recipes

Being creative with vegetables is essential to keeping interest up in your evening meal. Roasting, grilling, steaming and raw vegetables in salads are good ideas. Stir fries work very well, just minus the rice and the noodles. Always choose a good quality

protein source (or 2) and make this the focus of your meal. You can still have bolognaise but on a bed of red cabbage or broccoli instead of spaghetti.



Snacks

Protein + 'good fats' + Fibre

Suggested Recipes

A handful of nuts and seeds.

Low fat cottage cheese. Protein shakes are excellent snacks as are some protein bars, but check the carb content.

Bio – active unflavoured yoghurts, organic where possible – you can add your own berry fruits to flavour it up. Raw vegetables dipped into humus also work well and are good to nibble on before dinner to take the edge off appetite.

Meal replacements are an excellent choice for snacking as well. But try to get the majority of your snacks from real food if possible.

You can see as the day goes on that more of the foods you choose will be green choices, lean choices.

Acid-Alkaline Foods

Blood has a pH level of 7.4—slightly alkaline. This pH has to be kept almost constant, even minor variations would threaten the body's functions.

An overly acid load on the body has been associated with increased lactic acid levels, impaired recovery, low anabolic hormone production, bone demineralisation and a host of health problems.

The most common causes of an overly acidic condition are the over-consumption of fats, proteins, sugars, white flour products and milled white rice.

Eskimos consume a lot of animal foods and have been observed to exhibit a high acid load on the system as indicated by associated increases in excreted urinary acid. They also frequently suffer from bone demineralisation.

Generally, alkaline forming foods include: most fruits (not all), green vegetables, peas, beans, lentils, spices, herbs and seasonings, seeds, and nuts

Generally, acid forming foods include: meat, fish, poultry, eggs, grains, and legumes.

TRY TO EAT AS MUCH ALKALINE FOOD AS YOU EAT ACID BY WEIGHT

The body has an integrated number of buffering systems to maintain this pH within very narrow boundaries, but the foods we eat can have an impact on these systems. Sulphur-containing amino acids in proteins elevate sulphuric acid levels when broken down. As well as this, drinks containing phosphoric acid can increase the acid status of the body, imposing a Potential Renal Acid Load (PRAL). However, weaker organic acids can actually act as a base and when included in the diet also help buffer acid levels. Certain cations, in particular Potassium, can also help readdress the balance by sparing endogenous cations like sodium and associated bicarbonate. Therefore, the pH of the food consumed doesn't necessarily determine the acid load, as the ability of weaker acids to accept hydrogen ions as well as the influence of other minerals on the body's endogenous buffering systems can be the determining factor. Sodium

Bicarbonate is used by the body to buffer excess acid and is sacrificed from our bones, so balancing the relative intake of charged particles may impact on certain areas of health affected by this buffering process and bicarbonate pool. This has particular implications for bone health. (de Vries et al. 1986;Johnson & Rai 1990;New 2002)

Food Group and Food	PRAL Score
Meat and Meat Products Average	9.5
Lean Beef	7.8
Chicken	8.7
Canned, Corned Beef	13.2
Frankfurters	6.7
Liver Sausage	10.6
Lunch Meat	10.2
Lean Pork	7.9
Rump Steak	8.8
Salami	11.6
Turkey Meat	9.9
Veal Fillet	9.0
Fish Average	7.9
Cod Fillet	7.1
Haddock	6.8
Herring	7.0
Trout	10.8
Milk, Dairy, and Eggs	
Milk and non-cheese average	1.0
Low protein cheese average	8.0
High protein cheese average	23.6
Buttermilk	0.5
Low Fat Cheddar	26.4
Gouda Cheese	18.6
Cottage Cheese	8.7
Sour Cream	1.2
Whole Egg	8.2
Egg White	1.1
Egg Yolk	23.4
Hard Cheese	19.2
Ice Cream	0.6
Whole milk	1.1
Whole Milk Pasteurized	0.7
Parmesan Cheese	34.2
Processed Cheese	28.7

Whole Milk Yogurt w/Fruit	1.2
Whole Milk Yogurt Plain	1.5
Sugar and Sweets Average	4.3
Milk Chocolates	2.4
Honey	-0.3
Cake	3.7
Marmalade	-1.5
White Sugar	-0.1
Vegetables Average	-2.8
Asparagus	-0.4
Broccoli	-1.2
Carrots	-4.9
Cauliflower	-4.0
Celery	-5.2
Chicory	-2.0
Cucumber	-0.8
Eggplant	-3.4
Leeks	-1.8
Lettuce	-2.5
Mushrooms	-1.4
Onions	-1.5
Peppers	-1.4
Potatoes	-4.0
Radishes	-3.7
Spinach	-14.0
Tomato Juice	-2.8
Tomatoes	-3.1
Zucchini	-2.6
Fruits, Nuts, and Juices Average	-3.1
Apple Juice	-2.2
Apples	-2.2
Apricots	-4.8
Bananas	-5.5
Black Currants	-6.5
Cherries	-3.6
Grape Juice	-1.0
Hazelnuts	-2.8
Kiwi Fruit	-4.1
Lemon Juice	-2.5
Orange Juice	-2.9
Oranges	-2.7
Peaches	-2.4
Peanuts	8.3
Pears	-2.9
Pineapple	-2.7

Raisins	-21.0
Strawberries	-2.2
Walnuts	6.8
Watermelon	-1.9
Grain Products	
Bread average	3.5
Flour average	7.0
Noodles average	6.7
Mixed Grain Rye Bread	4.0
Rye Bread	4.1
Mixed Grain Wheat Bread	3.8
Wheat Bread	1.8
White Bread	3.7
Cornflakes	6.0
Rye Crackers	3.3
Egg Noodles	6.4
Oats	10.7
Brown Rice	12.5
White Rice	1.7
Rye Flour	5.9
White Spaghetti	6.5
Whole Grain Spaghetti	7.3
Wheat Flour	8.2
Legumes Average	1.2
Green Beans	-3.1
Lentils	3.5
Peas	1.2
Fats and Oils Average	0
Butter	0.6
Margarine	-0.5
Olive Oil	0.0
Sunflower Oil	0.0
Beverages	
Alkali rich average	-1.7
Alkali poor average	0
Draft Beer	-0.2
Pale Beer	0.9
Stout Beer	-0.1
Coca-Cola	0.4
Cocoa	-0.4
Coffee	-1.4

Mineral Water	-1.8
Red Wine	-2.4
Tea	-0.3
White Wine	-1.2

*This table is adapted from the Remer and Manz study discussed above (1) and each PRAL score is based on a 100g portion of food.

Potential renal acid load (PRAL) food index

PRAL predicts the net acid-alkaline load of food on the body. A chronically acidic environment causes net loss of muscle proteins and calcium, growth hormone resistance, mild down regulation of thyroid hormones and an increase in blood cortisol concentrations. To prevent such an environment/detrimental side effects aim to eat 9 moderately-highly alkaline forming foods per day at the designated time

PRAL index	Breakfast			Snack	Lunch & dinner			Post training	
	Fish & animal protein	Dairy & egg products	Breakfast cereals, fruit and juices	Fruit, nuts & seeds	Fish & animal protein	Fruit & vegetables	Other	Fruit	Grains
	Meat (9.5)	Milk (1.0)	Fruit, nuts & juices (-3.1)	Meat (9.5)	Vegetables (-2.8)	Legumes (1.2)	Bread (3.5)		
	Fish (7.5)	Soft cheeses (8.0)		Fish (7.5)		Fats & oils (0.0)			Flour (7.0)
Hard cheeses (23.6)		Noodles (6.7)							
Highly acid forming foods (10+)	Bacon (24.0)	Cooked whole egg (9.37)	Oat bran (16.9)		Corned beef (13.2)				Brown rice (12.5)
	Ham (11.7)		Oats (13.3)		Trout (10.8)				
	Smoked salmon (10.73)				Prawns (10.1)				
	Tuna (18.43)				Crab (10.9)				
	Smoked haddock (10.89)								
Moderately acid forming foods (1 to 10)	Cod (7.1)	Cottage cheese (8.33)		Cashew (8.9)	Lean beef (7.8)		Lentils (3.5)		White rice (1.7)
	Haddock (6.8)	Cooked egg white (2.09)		Peanuts (8.3)	Chicken (8.7)		Salad dressing (1.5)		Pasta (6.9)
		Whole milk yoghurt (1.5)		Brazilnuts (8.1)	Lean pork (7.9)				Noodles (6.7)
				Walnuts (6.8)	Rump steak (8.8)				Mixed grain bread (3.8)
				Almonds (2.3)	Cottage cheese (8.33)				
				Pistachio nuts (2.2)	Turkey (9.9)				
Slightly acid/neutral forming foods (0 to 1)		Low fat yoghurt (0.18)					Chickpeas (0.3)		
		Full fat milk (0.21)					Peas (1.2)		
							Mayonnaise (0.51)		
							Butter (0.63)		

								Nut oils (0.0)		
Slightly alkaline/neutral forming foods (0 to -1)		Skimmed milk (-0.01)	Blueberries (-0.75)	Hazelnuts (-1.94)				Tofu (-0.3)		Quinoa (-0.2)
			Blackberry (-2.8)	Macadamia (-1.38)				Margarine (-0.58)		
			Tea (0.3)					Olive oil (-0.03)		
Moderately alkaline forming foods (-1 to -10)			Banana (-6.93)	Apricots (-4.3)		Avocado (-8.2)	Kale (-8.3)	Green beans (-3.1)	Glutamine	
			Melons (-5.1)	Blueberries (-1.0)		Cabbage (-5.0)	Carrots (-5.7)		Bananas (-6.93)	
			Grapefruit (-2.5)			Radishes (-4.4)	Sweet potato (-5.6)		Kiwi fruit (-5.6)	
			Grapefruit juice (-2.95)			Tomatoes (-4.1)	Cauliflower (-4.4)		Mangos (-3.0)	
			Apple juice (-2.38)			Peppers (-3.4)	Squash (-4.1)		Pineapple (-2.7)	
			Mineral water (-1.8)			Lettuce (-3.1)	Broccoli (-4.0)		Blackberries (-2.8)	
						Cucumber (-2.4)	Leeks (-3.2)		Strawberries (-2.5)	
						Onions (-2.1)	Turnips (-3.2)		Raspberries (-2.4)	
Highly alkaline forming foods (-10+)				Dried figs (-14.1)		Spinach (-11.8)		White beans (-23.2)		
				Dates (-13.7)				Lima beans (-18.3)		
				Raisins (-12)				Pinto beans (-9.6)		
								Kidney beans (-8.4)		

Recovery and Meal Matrix Tables

MEAL MATRIX

Less Active			More Active	
Fat Loss			Performance	
PROTEIN	VEGGIES	EFA's	FRUIT	STARCH

So when you are less active, eat the food in the green zone.

When you are more active add the red zone foods, but keep fat intake lower the more red zone foods you eat.

COMPETITION MEAL MATRIX

More Active			Less Active	
Performance			Performance	
STARCH / SLOW RELEASE SUGARS	FRUITS	PROTEIN	EFA's	VEGGIES

Here you can see the emphasis has changed towards starchy carbohydrates and slow release sugars to maximise the available energy ready for you event.

It's very important not to eat fast release sugars until you have begun your warm up to help avoid rebound hypoglycaemia before you are due to compete.

Use the recovery matrix after each event or when you have a break in your event, e.g. at half time;

RECOVERY MATRIX;

TRAINING INTENSITY	Immediately	Within 1-2 hours	Within 3-4 hours
LOW	1 scoop of recovery powder in 300mls water		
MEDIUM	2 scoops of recovery powder in 350ml of water	A Medium sweet potato with lunch in addition to routinely consumed foods	
HIGH	3 Scoops of recovery powder in 400ml of water	A banana and bowlful of blueberries and yoghurt in addition to.....	A large slice of date and walnut cake with fruit smoothie

So the for light intensity sessions a single and small recovery drink is suggested

Recovery meals can be higher on the glycemic index and have a higher glycemic load to assist glycogen replenishment – higher GI choices are preferred if subsequent exercise is necessary within 24 hours, otherwise lower GI starchy sources and fruit may be better choices

After this drink has been consumed you can go back to your meal plan based on your goals

Medium intensity sessions require a slightly larger amount of carbohydrate immediately post workout and again within 2 hours.

The immediate recovery drink and then within 2 hours some form of starchy carbohydrate or fruit.

Finally for high intensity sessions or matches, you need 3 separate recovery hits over 4 hours; immediately, within 2 hours and again within 4 hours.

Aiming to consume 4 times your weight in kg in grams of carbohydrates is one easy way to ensure maximum recovery.

However this is an aggressive recovery formula and should only be adopted after aggressive intensive training of an appropriate intensity and duration.

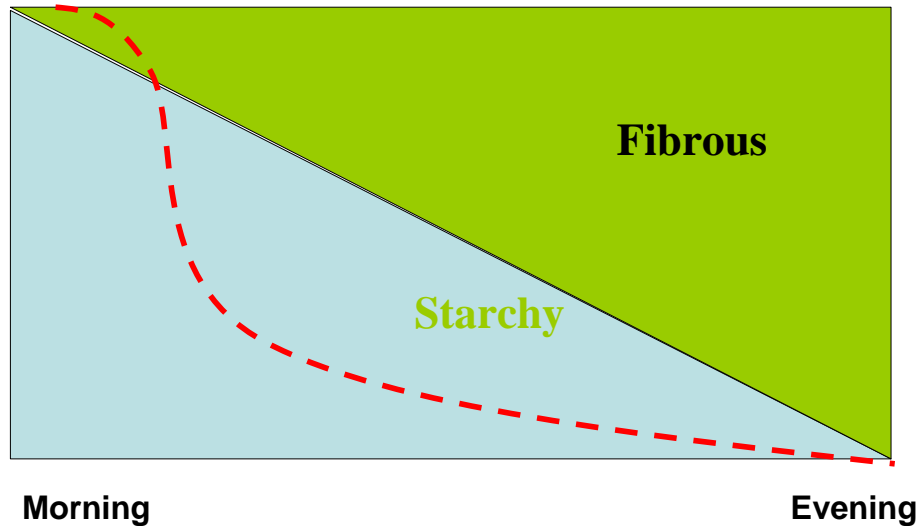
Remember that your first goal after training is to rehydrate to the tune of half the weight you've lost in kg in litres.

So if you've lost 3kg then drink 1.5 litres of hydration based fluids before recovery based powders.

3kg weight loss; divided by 2 = 1.5kg, convert this into litres = 1.5 litres of 6-8% solution before a higher concentration beverage is consumed.

This will avoid any potential to further dehydrate an athlete through consuming too high a concentrated formula.

CARBOHYDRATE CONSUMPTION



Hidden Problems

1. Sneaky Sugar

A pint of diluted fruit squash contains the same amount 9 teaspoons of sugar!, while a pot of fruit yoghurt may contain as much as six teaspoons of sugar. Blend fresh fruit into live natural yoghurt for a much healthier alternative (PREPARATION!!!)

2. Probiotic drinks and yoghurts can contain more sugar 'weight for weight' than coca cola.

3. Pre packed bread contains fats and sugars, as well as the simple CHO from wheat (QUALITY!). You may not realise that some varieties will give you a teaspoon of sugar and half a teaspoon of oil in a 2-slice serving. That's before you've buttered and filled your sandwich!

4. Fizzy drinks get their fizz from a substance called phosphoric acid. The body uses calcium to neutralize this acid so that it doesn't damage us. However, this calcium comes from our bones.

Advice on Supplementation

Basic Supplement Support Package

Multivitamin

- A quality multivitamin is needed by everyone today because there has been a decrease in vitamin and mineral quality in our modern food supply.
- Modern farming and pesticide methods have reduced vitamin levels in foods – for example some crops lose between 20 (Vitamin E) and 300% (ALA) of vital nutrients. Food preparation and storage methods can decrease some nutrients by as much as 30%.

Fish Oil

- Western diets can be lazy and full of the wrong kind of fats, i.e. trans fats. Therefore, we are not giving our bodies the correct balance of fatty acids.
- Lipids comprise 50-60% of the brain's dry weight
- 35% are long chain polyunsaturated fatty acids, predominantly the Omega-3 DHA, and the Omega-6, AA.
- Dietary intake seen to heavily affect the relative proportions of Brain-LCPUFA
- Eicosapentaenoic acid (EPA) is a functional fatty acid that acts as a precursor for chemical signals associated with good cognitive function and anti-inflammatory effects.
- Fish oils, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) may help to prevent heart disease, depression, and cancer.

Probiotic

- Probiotics play a key role in human nutrition and health in balancing the intestinal microflora naturally, that represent the first line of defence in our innate immune system.
- Probiotics have been used therapeutically to enhance immunity, improve digestive processes, lower cholesterol, Crohn's disease, ulcerative colitis, IBS, diarrhoea, and constipation.

Greens Drinks

- Strengthening of one's immune system
- Increase in energy level
- Reduction of and sometimes complete recovery from food-related and seasonal allergies
- Also, many contain an additional top of essential fatty acids

Magnesium Complex

- Magnesium is responsible for muscular contraction. Symptoms of deficiency of Magnesium in the body may include muscle dysfunction such as cramps and spasms. Muscular twitches and tremors may also occur.
- Magnesium supplementation is used to treat symptoms of deficiency, including diabetes (from inadequate magnesium in enzymes involved in carbohydrate metabolism), as well as osteoporosis.

Take your Fish Oils. Do I need to spell it out!?

Cognition.

Of particular importance to an athlete, Fish oil supplementation has been seen to enhance the transmission of electrical signals along the nerves, while elevating mood and increasing focus and attention (Fontani et al. 2005a; Fontani et al. 2005b). Working memory, the ability to manipulate data, often used as a measure of IQ, has also been attributed to fish-oil supplementation along with increased attention in children (Helland et al. 2008, Sinn et al 2007).

Oncology.

Cell signalling responsible for switching on genes can malfunction, leading to **cancer**. As every cell in the body is surrounded with a fatty acid membrane, the impacts of fatty acids extend to mediating such signalling pathways, explaining their proposed anti-carcinogenic properties (Siddiqui, et al 2007; Siddiqui, et al, 2008). Consumption of fish-oil has also been associated with a reduced the risk of developing prostate cancer (Norrish, A, et al. 1999).

Degradation.

The balance between muscle synthesis and degradation can become disrupted by the inflammatory response to intense exercise and overtraining, leading to muscle wasting. The balance of fatty acids that, in turn, provide precursors for inflammatory signals is essential to mediate these responses. Fish oil supplementation has been observed to yield anticatabolic effects in cancer patients, those suffering from Alzheimer's and athletes (Mickleborough & Gotshall 2003;.

Fat metabolism.

Fish oils decrease circulating levels of triglycerides in the blood, as well as increasing insulin sensitivity and enhancing fat-loss and decreasing inflammation in those undergoing weight loss. News.(Dasgupta & Bhattacharyya 2007;Krebs et al. 2006;Tremoli et al. 1994). This has far reaching consequences for the effectiveness of nutrition in recover and in terms of health and performance.

Inflammation. Inflammation is the body's natural defence to infection and injury, but when dysregulated can become a self perpetuating cause of illness, impacting many biological systems. The balance of fatty acids that, in turn, provide precursors for inflammatory chemicals is essential to mediate these responses. Inflammatory diseases such as asthma and exercise induced broncho-constriction, (particularly relevant to athletes) have been treated with some success with fish-oils (Mickleborough & Gotshall 2003;Mickleborough et al. 2003Calder 2006;Heneka & O'Banion 2007;Pacht et al. 2003). Research has also shown that supplementation with fish oils results in a significant reduction in pain reported by rheumatoid arthritis patients (Dry J & Vincent D, 1991).,

Serotonin.

Fish oils, as well as existing levels of EPA and DHA have been associated with augmented serotonin neurotransmission. This is the neurotransmitter associated particularly with feelings of love and feelings of well being (Stroll 1999). Fish oil

supplementation has also shown efficacy in treating major depressive disorder. Maes et al. 1996; Nemets et al. 2006

Heart disease and hypertension.

Supplementing with fish oils can reduce the risk of sudden cardiac death by as much as 50%. (Tavazzi et al. 2008) as well as successfully treating the symptoms of hypertension.(Hammamieh et al. 2007; (Bigger &Tarek 2001, Connor 1995)

Extra Virgin Coconut Oil

Proposed Benefits: The Facts on Fats

Coconut Oil contains Medium Chain Triglycerides (MCTs) which stimulates the body to use fats for energy rather than storing them (Mendis, Samarajeewa, & Thattil 2001).

Extra Virgin Coconut Oil is a stable, healthy saturated fat that does NOT elevate bad (LDL) cholesterol (Mendis, Samarajeewa, & Thattil 2001), actually decreasing the LDL to HDL ratio, enhancing the body's regulation of fat/cholesterol transport and removal.

Coconut oil has been shown to reduce the symptoms of digestive disorders (Gracey and Anderson, 1969).

Extra Virgin Coconut Oil has tremendous antiviral properties (Isaacs et al. 1990). Lauric Acid makes up 50 to 55 percent of the medium-chain fatty acids in Extra Virgin Coconut Oil. In the body lauric acid converts into monolaurin, a compound which is adept at fighting viral pathogens, and is also present in large quantities in breast milk, where it protects infants from viral, bacterial and parasitic infections. Evidence exists suggesting efficacy in preventing bacterial, viral and fungal infections (Gracey and Anderson, 1970).

As long as your cholesterol is maintained, coconut oil won't further arthersclerotic progression (Mangiapane et al. 1999) Extra Virgin Coconut Oil is a stable, healthy

saturated fat that actually increases HDL (good) cholesterol (Mendis, Samarajeewa, & Thattil 2001).

MCTs improve insulin secretion and utilization of blood glucose, improving CHO metabolism and the regulation between fat and CHO utilization (Dulloo AG Et Al, 1995).

You'd be NUTS to be missing out

Smoothie Recipes

Berry explosion

Vanilla protein powder 1 scoop

Mixed berries - handful

Honey – teaspoon

Spirulina - teaspoon

Lecithin granules – dessert spoon

Water OR skimmed milk – 250-300ml

Combine ingredients together and blend

Use more liquid for thinner shake, less for a thicker shake

Coconuts

Chocolate protein powder 1 scoop

Milk – 250-300ml

Lecithin granules – dessert spoon

Linseeds – tablespoon

Coconut oil - teaspoon

Peanut butter – dessert spoon

Cocoa powder – teaspoon

Combine ingredients together and blend

Use more liquid for thinner shake, less for a thicker shake

Strawberry cheesecake

Strawberry protein powder – 1 scoop

Milk – 250-300ml

Cottage Cheese – tablespoon

Strawberries – handful

Low fat sour cream – teaspoon

Lemon zest - pinch

Combine ingredients together and blend

Use more liquid for thinner shake, less for a thicker shake

Marathon

2-3 scoops of Chocolate MRP

20 oz (2 1/2 cups) of skim milk

1/2 cup of low fat or fat-free cottage cheese

2 tablespoons of natural peanut butter

1 tablespoon of linseeds ½ table spoon of lecithin granules

Apple Strudel

2 -3 scoops vanilla MRP

1 container (3.9 oz) natural unsweetened apple sauce

Cinnamon as desired

Cold water (Add more or less based on the consistency you want.)

1 tablespoon of linseeds ½ table spoon of lecithin granules

Seedy Slickster

2-3 scoops chocolate Low-Carb MRP or Whey Protein

1 serving of natural peanut butter

Cold water

1 tablespoon of linseeds ½ table spoon of lecithin granules

1 tablespoon of linseeds ½ table spoon of lecithin granules

Farmhouse Smoothie

1/2 to 1 cup of oatmeal (not flavored)

1 or 2 servings of either vanilla MRP or Whey Protein

1/2 to 1 serving of cottage cheese

Cold water

1 tablespoon of linseeds ½ table spoon of lecithin granules

Rice Pudding

2 scoops MRP

2-3 Tbsp. of sugar-free instant pudding (rice pudding)

Five ice cubes

Cold water

1 tablespoon of linseeds ½ table spoon of lecithin granules

Banana Split Shake

2-3 scoops Vanilla MRP

Banana, pineapple, fresh or frozen strawberries

Cold water or skim milk

1 tablespoon of linseeds ½ table spoon of lecithin granules

Bar-Blitz-vah

1 scoop of MRP or Whey Protein shake

1/2 to 1 cup fat free or low fat cottage cheese

1 food bar like the new Grow! bars

Cold water or skim milk

1 tablespoon of linseeds ½ table spoon of lecithin granules

Key Lime

2 scoops Vanilla MRP

Cold water or skim milk

2 Tbsp. frozen lime juice

1 Digestive biscuit

3 ice cubes

1 tablespoon of linseeds ½ table spoon of lecithin granules

Carrot Cake

1 scoop vanilla MRP

2 Tbsp. almond butter

carrots, sliced

apples, sliced

1 tablespoon of linseeds ½ table spoon of lecithin granules

Cheat Day

1-2 scoops chocolate MRP

1/2 to 1 cup low fat cream

1 crushed digestive biscuit

1 sliced frozen banana

1 tablespoon of linseeds ½ table spoon of lecithin granules