



# PNSC Nutrition Guide for Wellbeing and Performance 2021-2022

**Disclaimer:**

**This guide is intended to provide general competitive swimming nutritional information. If you have any medical or dietary concerns regarding the contents of this guide, we strongly advise that you consult your healthcare professional or registered nutritionist.**

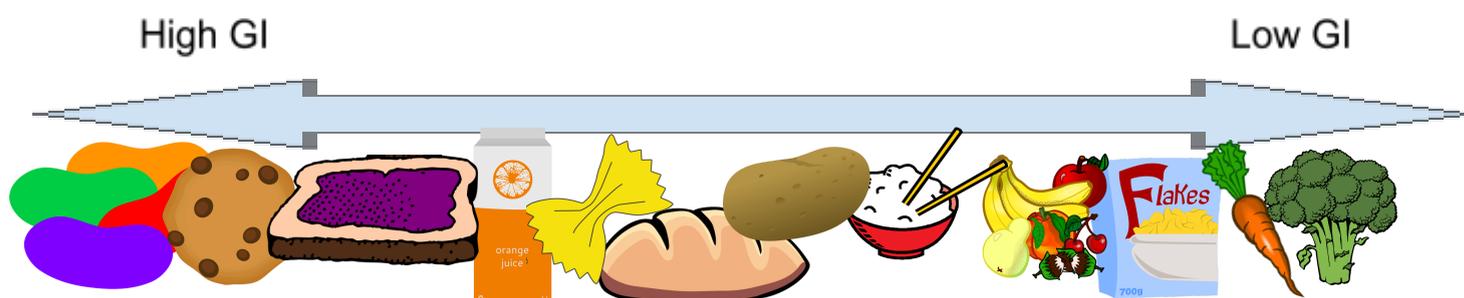
# Basics around...

## Carbohydrates

<b>What?</b>	Carbohydrates are one of the 3 main macronutrients in our diet (the other 2 being protein and fats). Carbohydrates is a broad term and not all carbohydrates are the same. Generally carbohydrates are split into 3 types; Sugar, Fibre and Starch.
<b>Why?</b>	Carbohydrates are the key source of energy in our diet. Critically they are used to supply the body with energy for high intensity exercise such as training and racing. On top of this, carbohydrates are incredibly important for fueling our brain for studying or race plans, and our immune system to keep ourselves healthy.
<b>How?</b>	We should eat carbohydrates from a large range of foods but mostly from starchy foods. Sugary foods can be helpful around exercise time but otherwise should be limited. Although Fibre cannot be digested for energy, it plays an important role in digestive health.

### Glycaemic Index

Different carbohydrate foods are digested at different rates. The Glycaemic Index (GI) is used as a way to figure out which are quickly broken down into glucose (High GI) and which are broken down slowly (Low GI).



Carbohydrate recommendations are based on grams per kg of Body Weight per day (g/kg/d) and will vary depending on training, activity and growth needs.

<b>Light Training</b>	<b>3-5g/kg/d</b> Eg. Single session, A1-A2 or skill based work
<b>Heavy Training</b>	<b>6-10g/kg/d</b> Eg. Multiple sessions per day. VO <sub>2</sub> , Tolerance or speed work or long duration sessions. Swimmers with increased energy demands due to growth.

# Basics around...

## Protein

<b>What?</b>	Proteins are fundamental structural and functional elements within every cell of our body - therefore they are essential for growth, repair and maintenance of good health. Proteins are long chains of amino acids, when we eat proteins we break these chains down into constituent amino acids and use them to build new proteins for our body.
<b>Why?</b>	Protein is the most abundant compound in the body (excluding water) and plays both structural and functional roles. For example, the proteins in our organs, hair and skin play an important structural role, whilst the proteins in our muscles allow them to contract and produce force.
<b>How?</b>	Our protein needs will change over the course of our lifetime but a growing and exercising body needs more protein for optimal growth and repair.

### Amino Acids and Protein Sources

There are 20 different amino acids of relevance to the human body. Of these 7 of them are considered essential as we must consume them in our diet. Protein from animal sources contain a full range of amino acids where-as plant based sources are often missing some or do not have them in sufficient amounts.

Some excellent sources of protein which promote repair and recovery are:



Dairy & Eggs



Beef, Poultry & Fish



Nuts & Seeds



Beans & Pulses

<b>Daily Intake</b>	<b>1.4-2.0g/kg/d</b> ie 105-150g per day for a 75kg swimmer. This is the same for a male or female swimmer.
<b>Around Training</b>	<b>~0.3g/kg</b> ie a meal or a snack containing 22g of protein (for a swimmer that weighs 75kg) is optimal to maximise muscle repair after training.

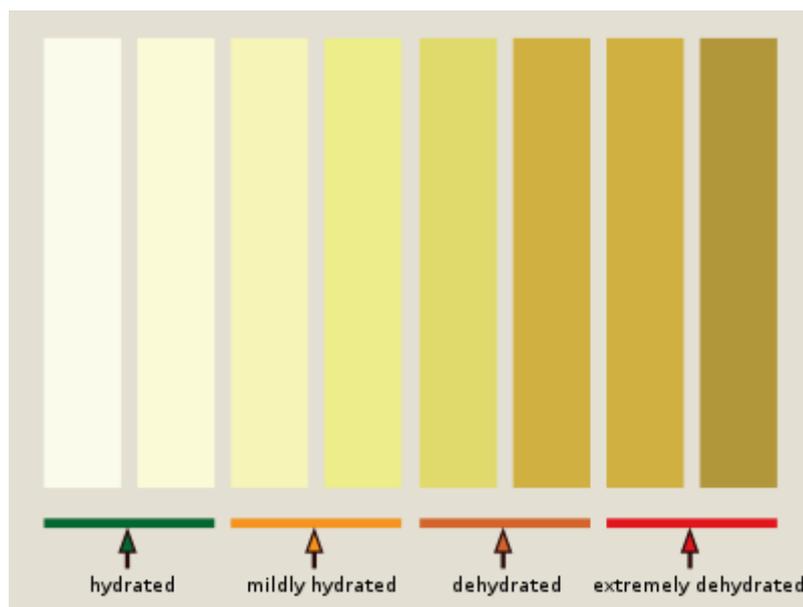
# Basics around...

## Hydration

<b>What?</b>	Our body weight is made up of 45-75% water; and this water is used in many different ways. In our blood, as lubricant for our joints, shock absorbers, as well as temperature regulation through sweating.
<b>Why?</b>	It is important to keep on top of your hydration status in training and during the day, as you can lose water through sweating and eating foods. Our bodies <b>depend on</b> this <b>water</b> in order to function properly. For example, a 2% loss of water weight can impair physiological responses (eg higher heart rate during easy exercise), exercise capacity (eg speed at which you swim at), and brain function (eg ability to understand training sets).
<b>How?</b>	Consuming enough water to keep your fluid balanced in one thing and intake for water needs are shown below. But consuming water alone is not enough. When we sweat we also lose salts and electrolytes which can be found in sports drinks.

### A good way to see how hydrated you are:

An easy way to check how hydrated you are is to look at the colour of your urine. If your urine is a pale yellow/almost clear then you have done a good job keeping yourself hydrated. If your urine is a really dark yellow/almost brown (it may even be strong in smell), it is an indication that you are really dehydrated.



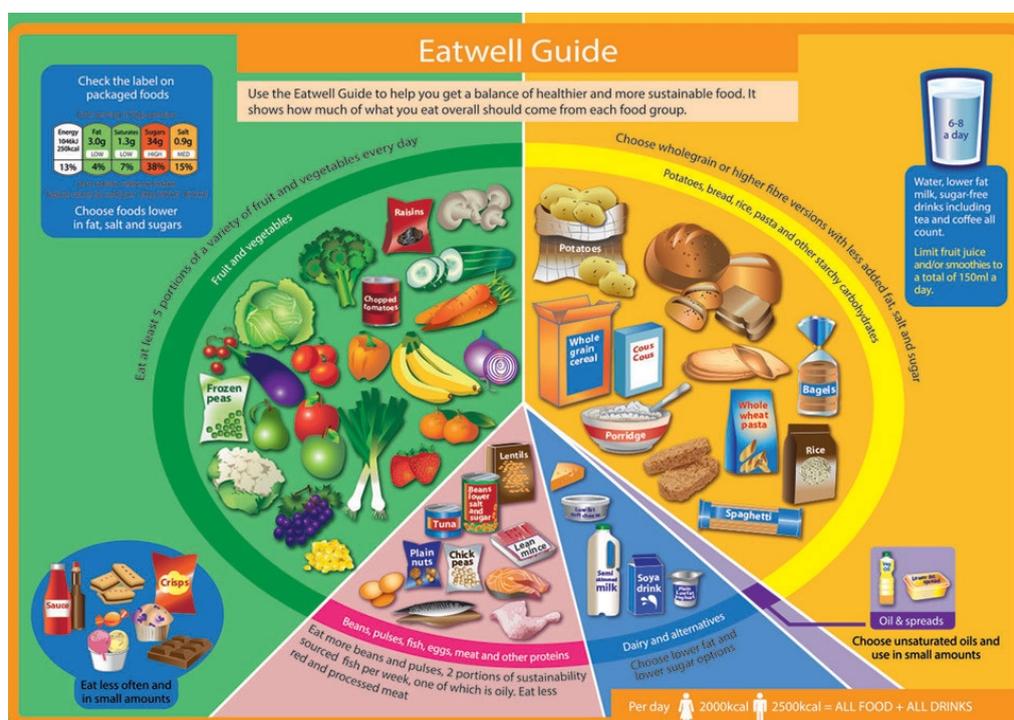
<b>Before Training</b>	Try to start training in a well hydrated state. Aim to drink ~500ml 30-60mins before the start of the session
<b>During Training</b>	Drink little but often. Exercises after taking on loads of fluid is uncomfortable. Try to drink little bits often through the session.
<b>Daily Aim</b>	Aim to consume 2-3L of fluid every day

# Main Meals

Now that we have a better understanding of the key nutrients, we can look at how and when to apply them. You could sit and weigh every portion of food out, but that can be very time consuming and much harder to do for an entire family than it is for an individual. So rather than throwing more numbers at you, a nice tool that can be used and is easy to refer back to is the Eatwell Guide.

The Eatwell guide was developed by Public Health England gives you a visual representation as to how much and the potential portion sizes of each type of food you and your swimmers should be eating relative to each other.

- ~ 60% of the plate should be carbohydrates
- ~ 15% of the plate should be protein such as meats
- ~ 25% of the plate should be dairy and fats.



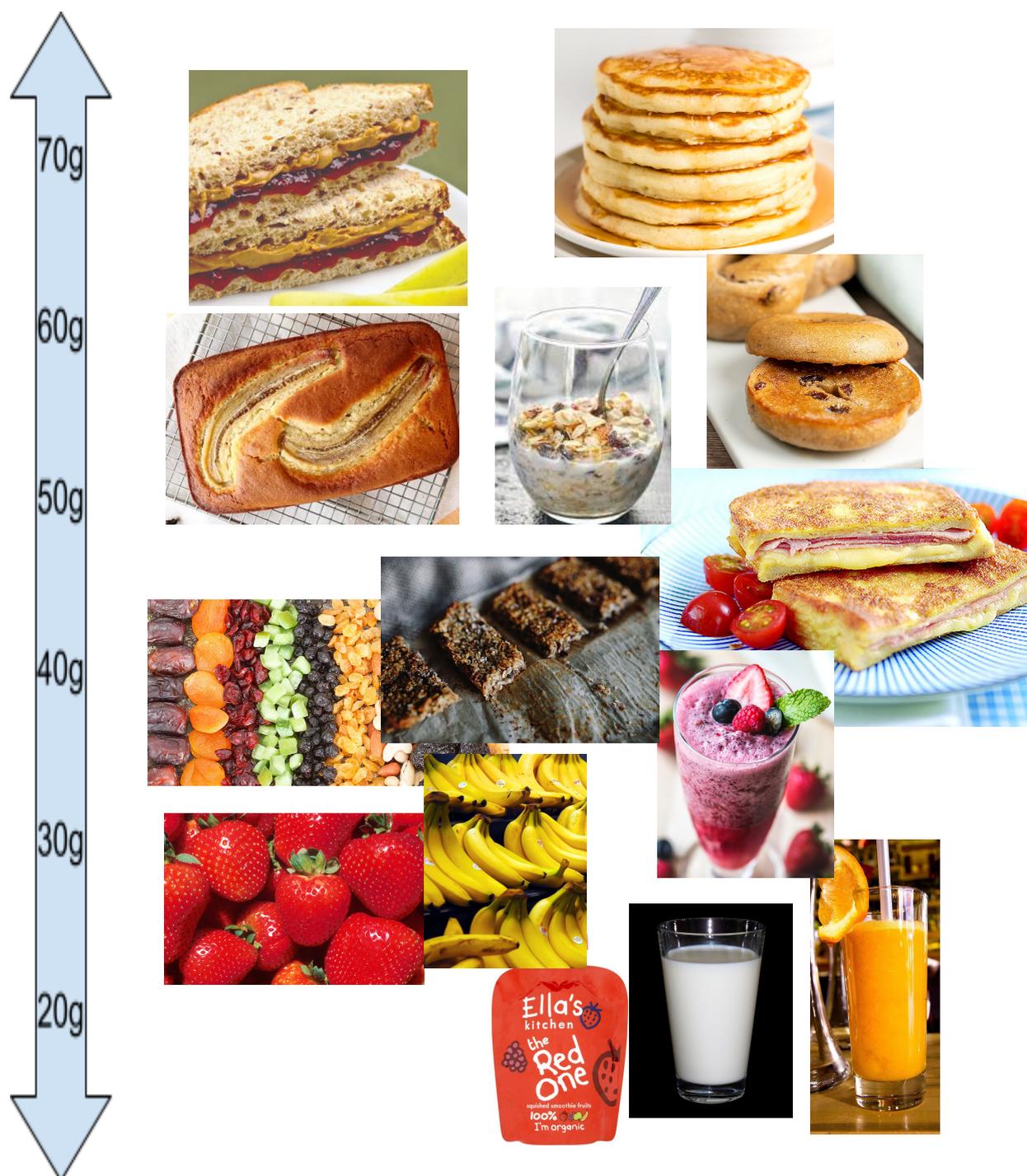
## Nutritional Foundations

- Eat a variety of foods from multiple food groups
- Eat colourful foods
- Eat often
- Drink often

# Snacks

Big main meals such as Breakfast, Lunch and Dinner should be had between 3 and 1.5hours before training or races. This is to maximise digestion time and allow the body to absorb all the goodness so your swimmer can have the energy stores ready to exercise. So what do you do when you/your swimmer is hungry or needs an energy boost, inside that 90minute window before training? Snack! You want to aim for 0.5-1g/kg of body weight of high GI carbohydrates.

Here are some practical ideas that you can either batch make and store or easily pick up at almost any store along with their approximate carbohydrate content:

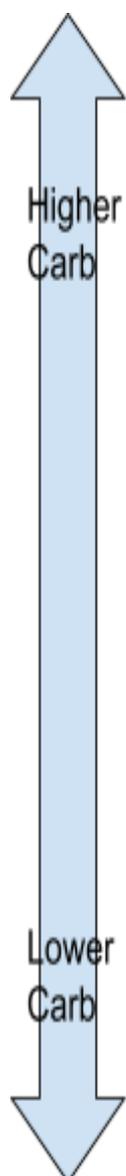


## Before Morning Training

Having a full breakfast before a 5am training session can be challenging. Often appetite is low, and digestion rate is slowed, so eating a whole meal can be uncomfortable and distract from training.

When we wake from our sleep, the carbohydrate reserves (glycogen) in our muscles may be at a moderate level to allow you to train, but your liver glycogen levels will be low. This is important because the liver produces glucose for our brain and to maintain blood glucose levels for training at higher intensities; which if compromised, will lead to a drop in performance. We also appreciate that for early morning training, you and your swimmer probably like to sleep to the last possible second before you need to leave.

Therefore, if high performance training is the goal, then a breakfast before early morning training might be critical but also convenient. Here are some ideas as to what they can have before training that is scaled depending on their appetite:



**Overnight oats** - easy to prep the night before

**Bananas and Oat Pancakes** - easy to make a big batch



**Fruit and Nut Mix** - High in fibre so just a big handful



**Fruit Smoothies** - Prep the night before. Blend and go



**Breakfast Muffins** - Great grab and go snack



**Fruit/Yogurt Pouches** - Quick and easy to digest



**Fruit Juice** - simple but effective

## Post training

Nutrition post training is a big part of your swimmers recovery and can set them up for success or failure for their next session. The best way to guide your post training snack is to follow the 3R's.

**Refuel** - Replacing the carbohydrates energy reserves that have been used up in the training session

**Repair** - Begin the process of repairing muscle tissue that was damaged during training

**Rehydrate** - Replace the fluids that were lost during the training session due to sweat.

On top of the previous snack options mentioned above, for post training, the following are the best examples of things you can get or make as a post training snack.

The king of post training drinks is:

### Chocolate milk



Contains around:

36.6g of carbohydrates to restore muscle glycogen

13.2g of protein for muscle repair and growth

Low in calories

Full of calcium for bone growth

Full of electrolytes to restore salts from sweating

Practical and affordable

Perfect for youth athletes

If you would rather have something to actually eat and chew then you could go out and buy things like protein/energy/refuel/cereal bars, but those things can get expensive. So here are some alternative recipes that you can make at home, without the use of protein powders, and store in the fridge/tupperware boxes for an easy on the go, post training snack.

**Oat Energy Balls** <https://blog.hellofresh.co.uk/homemade-vegan-energy-balls/>

**Homemade Protein Bars** <https://krollskorner.com/recipes/appetizers-snacks/homemade-protein-bars/>

**Protein Pancakes** <https://colleenchristensennutrition.com/protein-pancakes-without-protein-powder/>



Most of the ingredients are things that are easily accessible and cheap to get but also easily substituted. For example:

Blended oats instead of some of the flours

Mixed bag of nuts instead of individual bags

Sunflower or vegetable oils instead of coconut oils

## Example Timelines

### Training Day

Time	Event	Example meal
4am	Snack	Breakfast muffin + Orange Juice
5am	2hr Morning Training	1 bottle of water + 1 bottle of squash
7am	Breakfast	Overnight oats w/ Honey & Berries + Chocolate Milk
10am	Snack	Cereal bar/banana loaf slice
Noon	Lunch	Plenty of filled sandwiches or rolls + Mini Pancakes + Carrot sticks + Fruit Juice
3/4pm	Snack	Malt loaf + Yoghourt Pouch
5pm	2 Evening Training	1 bottle of water + 1 bottle of squash
7:30pm	Dinner	Fish Cake w/ Baby Potatoes, Carrots & Green Beans + water
9pm	Pre-Bed Snack	Banana + Yoghourt

### Race Day

Time	Type of meal	Example meal
3-1.5 hours before race	Meal containing slow release carbs with a glass of water to drink.	Porridge w/ Honey, Raisins and Banana + lots of water
90-20mins before race	Foods containing fast release carbohydrates.	Peanut butter and jam sandwich
Race	-	-
Post Race	Drink	Water
If more than 90 mins till next race	Carb centred meal, with some protein	Pasta w/ chicken chunks
If less than 90 mins till next race	Fast releasing carbohydrate based snack	Raisin bagels/Fruit
If end of meet	Protein centred meal	Chicken Fajitas w/ bell pepper, kidney beans