

**SECTION 1**

**Carbohydrate, recovery and rest.**

The main source of energy during swimming training is carbohydrate (stored in the muscles and liver as glycogen). The depletion of the body's carbohydrate (glycogen) stores is one of the major causes of fatigue during swimming training. This is because the stores are relatively small and, particularly during periods of heavy training, they can fall to low levels. A swimmer who is glycogen depleted will feel tired, sluggish and heavy during training. This will lead to a reduction in the quantity and quality of work that they can do during training. They may also become more susceptible to illness and injury.

A swimmer must eat carbohydrate rich foods to maintain these glycogen stores during training. Levels must be topped up before, during and after sessions during heavy training.

**To enable you to train hard you MUST meet your goal for carbohydrate.  
(7-10g carbohydrate/kg/day)**

Check the table below to work out your personal goal.

Weight kg	(stones)	Carbohydrate (g/day)
60	9.4	420-600g
70	11.00	490-700g
80	12.5	560-800g
90	14.1	630-900g

This daily tally of carbohydrate should be divided evenly between swimmers' meals and snacks, so each one should be rich in carbohydrate. Even if training finishes late at night a high carbohydrate meal/snack is essential to set the swimmer up for the next day.

Rest days are refueling days. Do not neglect your nutrition plan on days off.

**Rest days are refueling days-don't miss the opportunity!**  
*(Checkout the attached graph -after Costill et al 1988)*

Scientific studies support the following recommendations (do not get too caught up in the detail-use these targets as a guide only).

Pre-training	1g carbohydrate/1 hour before
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Or	4g/kg 4 hours before
During training	1 hour or less-water
Or	25g-60g carbohydrate/hour for longer sessions
Post-training	1g/kg within 1 hour of training then a meal/snack (plus 15-25g protein)

Eating more carbohydrate than these recommendations will not speed up refueling.

### **Carbo-boosters-List 1**

*Each of the following contains approximately 50g of carbohydrate. Swimmers should choose the majority of their daily carbohydrate from the foods on this list.*

FOODS	50g CARBOHYDRATE FROM :
Bread/toast (preferably wholegrain)	X 2 thick slices/x 3 thin
Pitta bread/bagel/English muffins	X 1-2
Bread rolls (preferably wholegrain)	X 1-2
Currant buns/tea-cakes/scones	X 1.5-2
Crumpets/Scotch Pancakes/Malt loaf	X 3 pieces
<b>PASTA/RICE/POTATOES/NOODLES</b>	
Pasta/rice (cooked, preferably wholewheat)	X 3 serving spoons
Noodles (cooked)	X 1 sheet
Potatoes (boiled)	X 3 large
Potatoes (mashed)	X 2 serving spoons
Jacket potato	X 1 large
Couscous	X 4 serving spoons
Gnocchi	X 3 serving spoons
<b>BREAKFAST CEREALS (plus milk)</b>	
Porridge	X 1 large bowl
Weetabix/Shredded Wheat	X 2 bisks
Branflakes/Special K/Just Right	X 8 tablespoons
Muesli (sweetened)	X 2 tablespoons
<b>FRUIT/VEGETABLES/BEAN</b>	
Parsnips	X 4
Bananas	X 2 large
Mango	X 1
Apples	X 3
Grapes	Large bunch -300g
Dried fruit	X 1 handful
Baked beans/sweetcorn/other beans	X 3 tablespoons
Carrots	X 10

Other useful sources of carbohydrate include milk. 2 pints (1 litre) contains 50g of carbohydrate, as does 1 pint/0.5 litre of fresh fruit juice.

The foods on List One above are also a good source of a variety of other nutrients. They are described as 'nutrient rich' and should form the focus of a swimmer's carbohydrate intake in order to ensure that he/she is also consuming adequate quantities of protein, vitamins and minerals and 'fibre' as well. Wholegrain/whole-wheat foods are preferably and will contain a better nutrition package than the more refined alternatives.

### **Carbo-boosters -List 2**

The foods on this list are also good sources of carbohydrate but are not 'nutrient rich'. Whilst they can be used to top up a swimmer's carbohydrate tally they **SHOULD NOT** be a swimmer's main source of carbohydrate-this should be made up mainly from the foods in List 1. Age-group swimmers do not need to be consuming these foods in large amounts!

FOODS/DRINKS	50g CARBOHYDRATE FROM:
Digestive type biscuits	X 5
Chocolate coated biscuits (Penguins)	X 3
Fruit cake/sponge cake	X 1 big slice
Doughnuts	X 2
Crisps	X 3 packets
Chips	X 1 large plate
Ice-cream	X 2 scoops
Jelly	X half a block
Fruit crumble/pie	X 1 bowl
Chocolate bar	X 1.5 small bars
Mars Bar	X 1
Fruit gums/jelly babies	X 0.75 large bag
Liquorice Allsorts	X 0.75 large bag
Honey/jam/syrup	X 3 tablespoons
Cordial	X 1 litre

### **PRACTICAL TIPS**

- ✓ Choose most of your carbohydrate from the foods in List 1 to ensure that you are also consuming a variety of vitamins and minerals plus some protein and 'fibre' as well.
- ✓ Choose wholegrain, whole-wheat wherever possible.
- ✓ Limit your choices from List 2 to no more than x 1/day.
- ✓ Spread your carbohydrate intake out over the day to include breakfast, lunch, tea/supper plus snacks.

- ✓ Always refuel after training even if it is late at night.
- ✓ Always have some carbohydrate prior to a training session.
- ✓ During hard training in sessions over one hour swimmers may need to consume some carbohydrate in a drink as well.
- ✓ Do not eat more carbohydrate than is recommended-it will not help you to refuel more rapidly or effectively.

NOTES :