




## Nutrition and performance

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Manchester United believes that to be  
the **BEST** on the field their players  
require the best TRAINING  
the best PREPARATION  
the best NUTRITION  
and the best **KT**

**SPORTWOOL**   
Gives you the edge WOOL BLEND

Discover for yourself how it feels



## Overview

- ***Nutrients***
  - Carbohydrates
  - Protein
  - Fat
- ***Fluids***
- ***Eating for events***

## General Health

***Correct body weight and composition***



***Healthy diet***



***Exercise***



***Sleep and relax***



## Body Mass Index

$$BMI = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

<i>BMI</i>	
<b>&lt;18.5</b>	<b><i>Underweight</i></b>
<b>18.5-25</b>	<b><i>Normal</i></b>
<b>&gt;25-30</b>	<b><i>Over weight*</i></b>
<b>&gt;30-40</b>	<b><i>Obese</i></b>
<b>&gt;40</b>	<b><i>Extremely Obese</i></b>

\* If muscle we are not worried about it.

## Body Fat

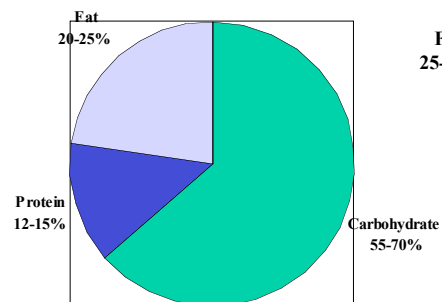
•Calipers

•BIA

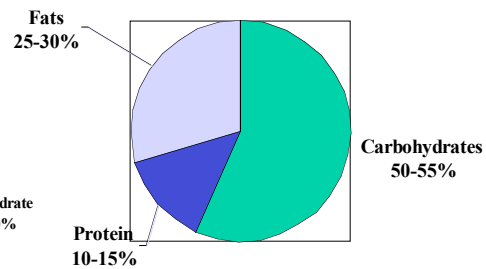
Normal Body Fat %	MALE	FEMALE
<30 years	12-18	20-26
31-40 years	13-19	21-27
41-50 years	14-20	22-28

## Percentage energy from different sources

### Sports Diet



### Normal Recommended Diet



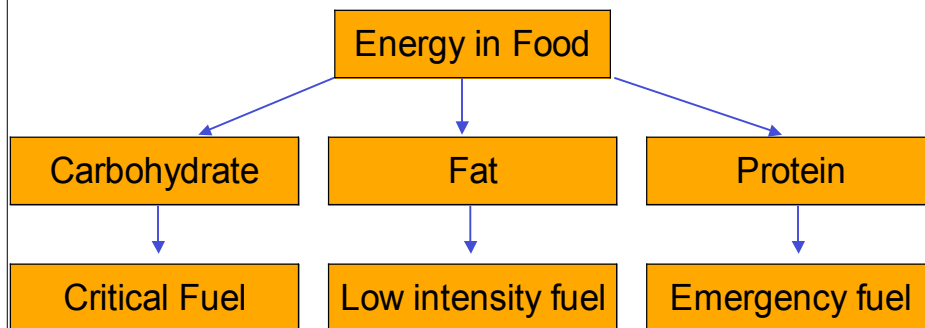
■ Carbohydrate ■ Protein ■ Fats

## Energy Balance

$$\text{Energy Intake} = \text{Energy Expenditure} + \text{Changes in Body Stores}$$



## Sources of energy in foods



## Calories (kcal)

**1g Carbohydrate = 4 kcal**

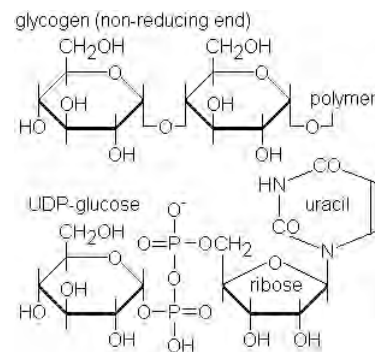
**1g Protein = 4 kcal**

**1g Fat = 9 kcal**

**1g Alcohol = 7 kcal**

## Carbohydrates

- **Glucose**
- **Sugar**
- **Starch**
- **Glycogen**



## High Carbohydrate Foods

***Breakfast cereals***

***Breads***

***Potatoes***

***Pasta & Noodles***

***Rice***

***Sugary Foods***



## Carbohydrate

- Necessary to maintain blood glucose levels during exercise
- Replace glycogen stores
- Requirements for athletes range from 6-10g/kg body weight per day
- Amount needed depends on level of physical activity
  - 1-2 hrs/day      6-7g/kg body weight/day
  - 2-4 hrs/day      7-8g/kg body weight/day
  - 4+ hrs/day      8-10g/kg body weight/day

***Women and men who do not train need 250-300g/day***

## Carbohydrate contd.....

### **Example of carbohydrate requirement;**

**80 kg (12 1/2 stone) man**

**2-4 hrs/day activity**

**7-8g carbohydrate/kg/day**

**= 560-640 g carbohydrate per day**



## Calculation of Carbohydrate

<b>Breakfast</b>	Weetabix	3 biscuits	50g
	Bread	2 thick slices	50g
<b>Snack</b>	Scones	2 average	50g
<b>Lunch</b>	Bread	4 slices	60g
	Yogurt	1 pot	25g
	Fruit	large	20g
	Mars Bar	bar	50g
<b>Snack</b>	Rice Krispie square	1 bar	25g
<b>Dinner</b>	Potatoes	3 large	150g
	Vegetables	2 portions	20g
	Fruit	Average	10g
	Muffin/cake	Slice	30g
<b>Supper</b>	Pitta bread	Large	50g

**Total Carbohydrate intake = 590g**



## Different types of carbohydrate

### *Starchy*

- Breakfast Cereals
- Bread
- Potatoes
- Rice
- Crispbreads, rice cakes, crackers
- Beans, Peas and Lentils
- Popcorn

### *Sugary*

- Sweetened breakfast cereals
- Cakes
- Biscuits
- Puddings
- Jam, marmalade, honey
- sweetened soft drinks
- Confectionary
- Sport products

## GI Index

- Glycaemix index is a rating for carbohydrate foods according to how fast they cause blood glucose to rise
- Scale of 0-100
- High GI foods will rapidly boost glucose levels (bread, sports drinks, breakfast bars, biscuits, jelly sweets)
- Low GI foods will take longer to peak (yoghurt, porridge, lentils, nuts)



## Event Day

**LOW GI**

- More sustained release during event
- Improve performance
- Effect if taking CHO during event
- Beneficial to athletes unable to consume adequate CHO during event

**Need high GI foods during and after competition**

## How to increase carbohydrate intake

- ✓ Base every meal around carbohydrate rich foods (bread, cereal, pasta, rice, potatoes)
- ✓ Consume high carbohydrate snacks between meals (wholemeal scone, dried fruit, cereal bars)
- ✓ Use thicker slices of bread
- ✓ Choose deep pan pizza
- ✓ Add fresh or dried fruit to breakfast and desserts



## Fat

- Small amounts of fat necessary
- Increased fat intake leads to increased weight gain
- Choose low fat versions of foods
- Limit intake of high fat foods (butter, mayonnaise, chocolate etc.)
- Don't fry
- Have foods with less than or equal to 30% energy from fat



## Protein

- Needed for growth and formation of new tissue
- To repair damaged tissue
- Athletes have a slightly higher requirement for protein
- Protein requirements are met by a balanced diet without the need for protein or amino acid supplements



## Protein

***Non athletes 0.8g/kg body weight/day***

***American College of Sports Medicine***

- Endurance athletes **1.2-1.4g/kg** body weight/day
- Resistance and strength athletes **1.6-1.7g/kg** body weight/day
- **>2 g/kg** does not enhance performance or increase muscle bulk
- 80kg Man endurance athlete 96-112g protein per day
- Average intake of protein in Irish diet =120-140g/day

## Protein Foods – High Biological Value

*Meat*

*Fish*

*Eggs*

*Dairy Products*

*Pulses, Nuts*

*Vegetarian- TVP, soya products*



## Protein Post Training

Heavy/strenuous training most athletes will benefit from a small amount of extra protein along with post training fluid and carbohydrate

Amount varies according to weight but approx 0.2g/kg body weight

e.g. 80kg man= 16g protein

## Protein Foods

- 1 Slice ham/turkey/chicken = 7g protein
- 1 natural yoghurt (125ml) = 6g protein
- 1 small tin of tuna (100g) = 19g protein
- 2 low fat fruit yoghurts = 11g protein
- 1 egg = 7g protein
- 25g skimmed milk powder = 9g protein
- 330mls low fat milk (1/2 pint) = 11g protein
- 40g peanuts = 10g protein
- 40g edam cheese = 10g protein
- 60g feta cheese = 10g protein



## Fluids in the body

- Humans contain 30 – 50 L water
- Excrete: sweat, urine , evaporated losses
- Water turn over varies 1-12 L per day from person to person
- Turnover increases during exercise & hot conditions



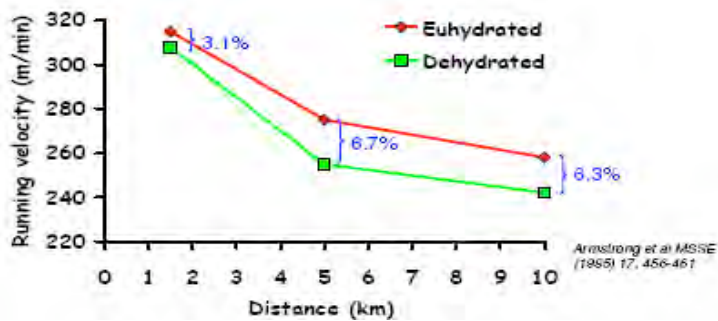
## Fluids in the body

- Exercise leads to loss of fluid due to sweat mechanism
- Excessive loss of fluids = dehydration
- Dehydration can-
  - *impair performance*
  - *nausea, vomiting and diarrhoea*
  - *dizziness*
  - *laboured breathing*
  - *weakness*
  - *confusion*



**Exercise performance can be impaired by 10-20% if dehydrated by as little as 2% of body weight**

## Studies



- Prior dehydration of 1.5-2% of body mass reduces running speed in track races at distances of 1500m, 5 km and 10 km



## Studies

### Cycling time to exhaustion

- No drink 70.2 min
- Water 76.2 min
- Glucose 79.0 min
- Fructose 65.6 min
- Dioralyte 90.8 min



Maughan et al (1989) Eur J Appl Physiol 58, 481-486

## Studies

Temp (°C)	RH (%)	n	Sweat loss (ml)	Fluid intake (ml)	Dehydration n (%)	Sweat Na (mmol/l)	Salt loss (g)
32	20	26	2193	972	1.59	30*	3.8*
27	55	24	2033	971	1.37	49	5.7
28	56	20	2221	1401	1.15	44	5.7
25	60	24	1827	834	1.22	44	4.7
5	81	16	1690	423	1.62	43	4.3

## Dehydration & Rehydration



## Categories of fluids

### *Hypotonic*

- Less concentrated than human blood

### *Isotonic*

- Same concentration as human blood

### *Hyertonic*

- More Concentrated than human Blood

## What should I drink?

- Isotonic drinks
- Water (next best alternative)
- Isotonic drinks contain - sugars, fluid and salt, which leads to faster absorption
- Isotonic drinks; Lucozade Sport  
Isotar, Gatorade  
Homemade Drinks: 800ml water,  
200mls of Miwadi, 1g salt  
or 50:50 Fruit juice:water 1g salt

## When Should I Drink?

*Before Exercise- 300-600ml of an isotonic drink 10-30 minutes*

*During exercise- 150-200mls of an isotonic drink every 15 minutes*

*After exercise- start hydration immediately after exercise*

*Remember to drink 1.5 litres of fluid for every 1 kg body weight lost during training/competition*

## What is a sports drink?

*Many drinks on the market referred to as sports drinks*

**Sports drink = Isotonic drink**

- » Contain Carbohydrate 6-8% (Ideal amt)
- » Contains Sodium (stimulates fluid absorption)
- » Sodium maintains desire to drink
- » Sodium & CHO enhance taste
- » Should not contain caffeine (= dehydration)
- » No carbonation (gas = wind = discomfort)

## How to read a sports drink label



Visit us at: [www.lucozade.com](http://www.lucozade.com)

LUCOZADE SPORT is a trademark of SmithKline Beecham.

**STILL ORANGE FLAVOUR ISOTONIC DRINK WITH ADDED ENERGY-RELEASING B VITAMINS - with sugars and sweeteners.**

**INGREDIENTS:** Water, Dextrose, Maltodextrin, Glucose Syrup, Citric Acid, Acidity Regulator (Sodium Citrate), Sweeteners (Aspartame, Acesulfame K), Preservative (Potassium Sorbate), Antioxidant (Ascorbic Acid), Flavouring, Stabiliser (Acacia Gum), Vitamins (Niacin, Pantothenic Acid, B6, B2, B12), Colour (Beta-carotene).

Contains a source of Phenylalanine.

**NUTRITION INFORMATION** (Typical Values per 100ml):  
Energy 118 kJ (28 kcal), Protein - Trace, Carbohydrate 6.4 g, Fat - Nil,  
Riboflavin (Vit B2) - 0.08 mg (5.2% RDA), Niacin - 0.93 mg (5.2% RDA),  
Vit B6 - 0.10 mg (5.2% RDA), Vit B12 - 0.05 µg (5.2% RDA),  
Pantothenic Acid - 0.31 mg (5.2% RDA).

Each 330 ml pouch provides 17% RDA of the named B vitamins.

Typical Mineral Values per 100 ml: Sodium - 50 mg, Potassium - 8.6 mg,  
Calcium - 3.0 mg, Magnesium - 0.6 mg.

Refrigerate once opened and consume within 4 days.

**BEST BEFORE END**

## Isotonic drinks in Ireland

<i>Per 100mls</i>	Lucozade sport	Gatorade	Club Energise	Powerade	Homemade Recipe
<i>CHO</i>	<b>6.4%</b>	<b>6.0%</b>	<b>6.2 %</b>	<b>6.0%</b>	
<i>Sodium</i>	<b>50mg</b>	<b>49mg</b>	<b>50mg</b>	<b>50mg</b>	<b>34mg</b>

## How can I monitor my hydration status

### *Daily Examination of urine*

- Use PEE chart as your guide

### *Hydration Monitoring using a Refractometer*

### *Weight before & after exercise (x 1.5)*



## Ask yourself daily

*Am I thirsty?*

*Is my morning urine dark yellow?*

*Is my body weight noticeably lower this morning than yesterday morning*

*Yes = most probably dehydrated*



Your target is to make sure that your pee is the same colour as numbers 1, 2 or 3. Colours 4 and 5 suggest dehydration and 6, 7 and 8 severe dehydration.



Dietitians in  
Sport & Exercise Nutrition  
PO Box 22360 London W13 9FL



Lucozade Sport for fast energy and  
fast fluid to help maximise performance.

## Tips on fluids

1. Thirst is a poor indicator of fluid needs
2. Remember to drink before, during and after exercise
3. Use training sessions to get used to taking fluids
4. If you are well hydrated your urine will be pale in colour
5. Alcohol and caffeine cause dehydration

## Alcohol

- Leads to increased urine losses = dehydration
- If muscle damage or injury occurs avoid alcohol for 24-36 hrs
- Once fluid and fuel needs have been met, alcohol can be consumed in moderation
- National Health Guidelines;
  - Men 21 units alcohol/week
  - Females 14 units alcohol/week



## Alcohol

### *National Health Guidelines;*

- Men 21 units alcohol/week
- Females 14 units alcohol/week
  - ◆ 1 unit is equivalent to 10g of alcohol

1 STANDARD DRINK CONTAINS 10G OF PURE ALCOHOL



- ◆ Alcohol also contains energy:
  - ◆ 1g Alcohol = 7 Calories

## Vitamin and mineral supplements

- Be careful of taking large doses of any one vitamin or mineral
- Always buy from reputable source (spiked)
- Ensure it is a permitted substance ([www.eirpharm.com](http://www.eirpharm.com))
- Read the label
- If it sounds too good to be true, then it probably is!
- Get personalised nutrition advice





## Competition and events

### Pre-competition meal

1. Carbohydrate based
2. Low in fat
3. Avoid excess fibre
4. Eaten 2 1/2 - 3 hours before a competition
5. High in carbohydrate

**Plenty of fluids!**



## Event Day (2-4hrs before)

### Morning – Lunchtime

- Porridge/cereal with low fat milk, fruit
- Pancakes with Syrup
- Toast, muffins, crumpet with honey/jam
- Low fat/muesli breakfast bar & banana

### Afternoon –Evening

- Pasta with tomato based sauce, vegetables, lean meat
- Toast with tinned spaghetti/beans
- Sandwich/roll with meat & salad
- Fruit salad & low fat yoghurt

## During the competition

- Remain well hydrated
- Use fluid as a vehicle for extra carbohydrate
- During tournaments bring plenty of carbohydrate snacks



## After competition

- Refueling should begin asap
- Have high carbohydrate meals for 24hrs post competition
- Avoid alcohol (delays glycogen resynthesis)

## Kit bag suggestions

- Sports Drink
- Cereal Bars
- Muffins/fruit cake
- Popcorn
- Dried Fruit
- Flavoured Milk
- Ham/Turkey/Tuna Sandwich

## Multiple events

### Carbohydrate

➤ *If next event*

<8h



*CHO within 30 mins of finishing last event*

## Multiple events

- Timing of events
- Facilities for
- Bring s
- How
- Opti
- mea
- Plan
- Know to
- Avoid f
- Supply of sports drinks/bars/gels



**Plan ahead & practice**

## Take home messages

- Nutrition is an important physical factor for general well being and sporting performance
- Need to implement advise during training
- Everyone is different biologically



The End!

