

Nutrition For Young Athletes

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ASSOCIATION FOR NUTRITION

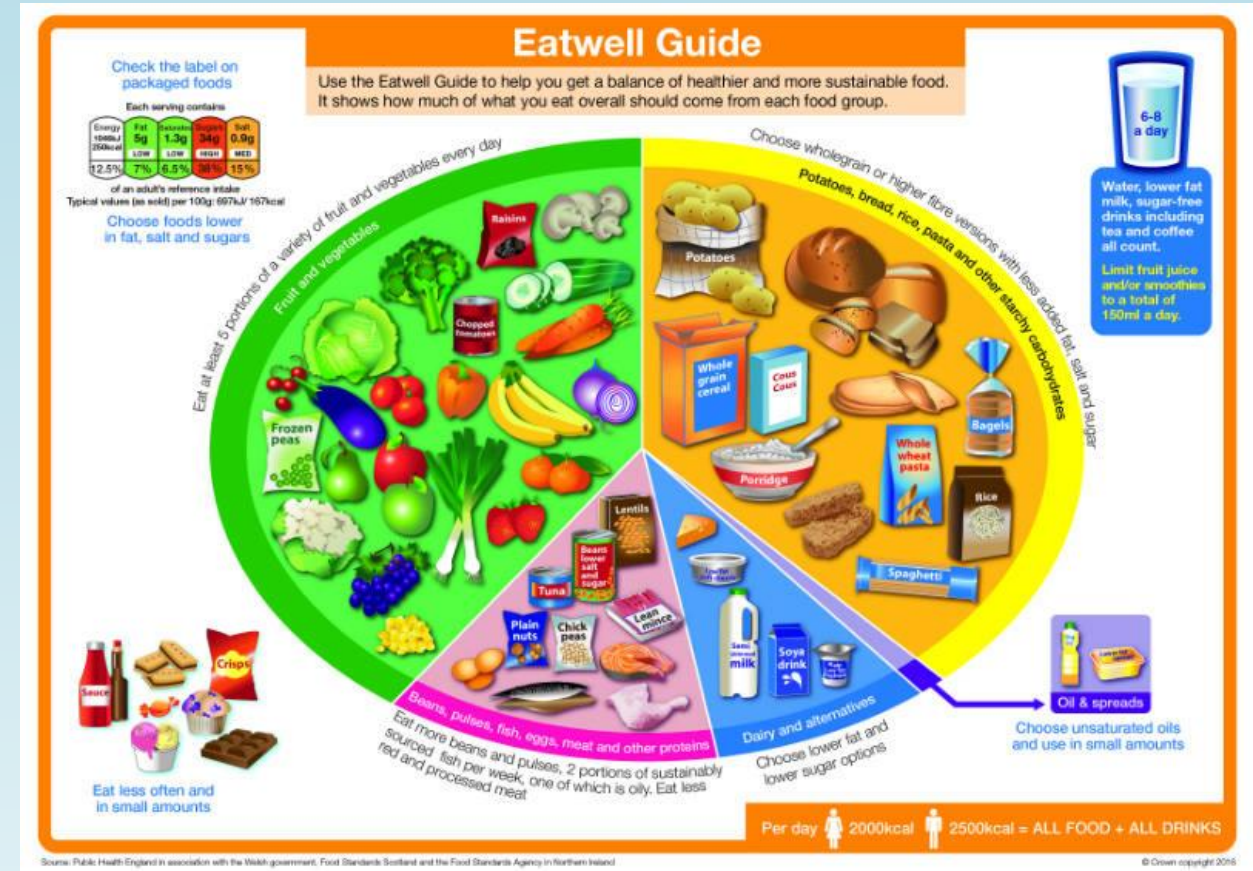


Overview

- Foundation Principles of Nutrition
 - Micro and Macronutrients
- Nutrition in Sport
 - Energy Balance and Exercise
 - Pre and post training
 - Race Day
 - Recovery
 - Consequences of Poor Nutrition
- Examples Meal Preps
- Questions

Nutrition and Health

- Population Guidelines
 - Per Day: Females: 2000kcal. Males 2500kcal
 - Energy base: Protein, Carbohydrates, Fat
 - Mineral base (essential nutrients):
 - Calcium
 - Vitamin A, B, C, D, E, K
 - Magnesium
 - Iron



What are Macronutrients?

- Proteins
 - Builds, Maintains, Repairs
 - Made up of amino acid building blocks
- Fats
 - Temperature regulation
 - Mineral absorption
- Carbohydrates
 - Bodies preferred source of energy
 - Source of minerals, vitamins and dietary fibre.



Macronutrients - Protein

- Proteins

Main Function

Average recommended daily intakes

Deficiency and excess intakes

Sources

Macronutrients

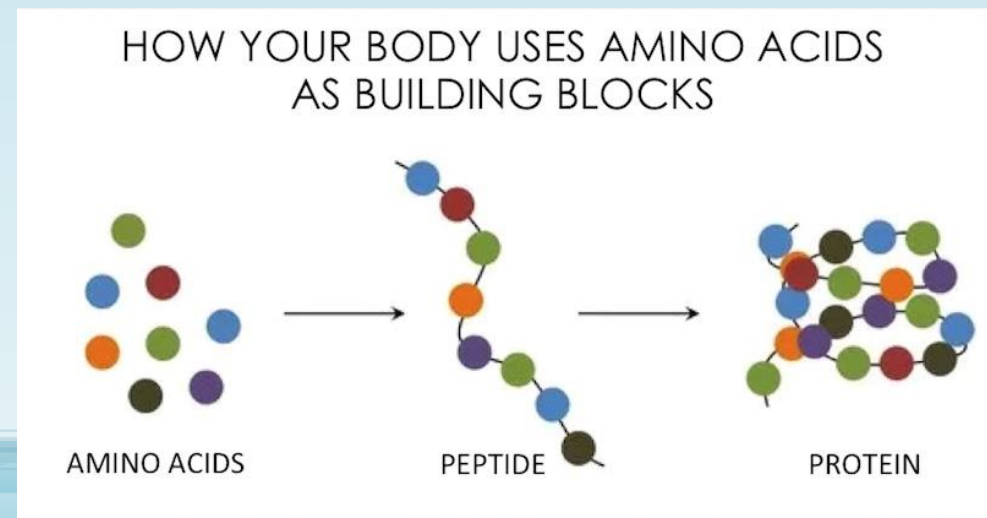
- Proteins

Main Function

To build and repair damaged muscle tissues, cells

Roles including manufacture of hormones and enzyme control

Made up from 20 amino acids. 9 of which considered “essential” (*i.e. required in the diet*)



Macronutrients

- Proteins

Average recommended daily intakes

0.8 grams per kg/body weight. (Public Health England)

On average, 56 grams average male/46 grams average female (Sedentary)

Equates to: 10-15% of total calorie intake

Macronutrients

- Proteins

Deficiency

Low energy

Blood sugar highs and lows, further tiredness and mood swings

Protein stores low – joint and muscle pain

Increased recovery time/poor muscle regeneration

Weakness in muscles, faster to fatigue

Macronutrients

- Proteins

Excess intakes

Excess intakes converted to storage (fat build up)

Increased removal from nitrogen excretion (stress on kidneys)

Leading to dehydration

Macronutrients

- Proteins

Sources

Meat Products

Vegetables sources; Beans, pulses, legumes

Nuts (almonds, walnuts, pecans)

Macronutrients

- Proteins (Daily intake $0.8\text{g} \times \text{kg}/\text{bodyweight}$)

Sources (per 100g)

Meat Products – **Chicken breast (31g), Egg (14g), Milk (3.4g)**

Vegetables sources; Pulses – **Lentils (9g), Chickpeas (19g), Kidney Beans (24g)**

Nuts (**almonds (21g), walnuts (15g), pecans (9g)**)

Macronutrients - Carbohydrates

- Carbohydrates

Main Function

Average recommended daily intakes

Deficiency and excess intakes

Sources

Macronutrients

- Carbohydrates

Main Function

Providing energy and regulation of blood glucose (Glycogen)

Dietary Fibre (Lowering cholesterol, control blood sugar spikes)

Complex vs Simple Sugars

Maintain Digestive health

Macronutrients

- Carbohydrates

Average recommended daily intakes

4 grams per kg/body weight. (Institute of Medical Health)

On average, 300 to 400g average male/225 to 325g average female (Sedentary)

Equates to: 45-65% of total calorie intake

Macronutrients

- Carbohydrates

Deficiency

Low blood sugar levels

Low energy and lack of ability to exercise

Reduced concentration

Fat breakdown and ketosis

Macronutrients

- Carbohydrates

Excess Intakes

Chronic excess in simple sugar intakes – Increased insulin release ->insulin resistance pathway

Increase in blood sugar levels and stored glycogen.

If under utilized -> possible weight gain in form of fat storage.

Macronutrients

- Carbohydrates

Sources

Almost all foods contain carbohydrates

Complex Carbohydrates – Wholemeal Pastas, Rice, Lentils

Simple Sugars – Table sugar, fruit juices, confectionary.

Macronutrients

- Carbohydrates

Sources (per 100g)

Almost all foods contain carbohydrates

Complex Carbohydrates – **Whole meal Pastas (31g), Rice (28g), Lentils (20g), Sweet Potato (20g), Banana (28g)**

Simple Sugars – Table sugar, **fruit juices (10g)**, confectionary.

Key Micronutrients

- Iron
 - Most common nutrient deficiency
 - Vital role in oxygen transport
 - Cognitive development
- Calcium
 - Period of increased bone growth
 - Extra strain through high impact exercise
 - Development and maintenance of skeleton
- Vitamin D
 - Commonly deficient
 - Enhances calcium absorption

Nutrition and Sport

- IAAF Statement –
- “All athletes can benefit from making good food choices that will support consistent training, maximise performance in competition and help maintain good health”

Lamine Diack

Former IAAF President

Nutrition for Sport and Exercise

- What are the goals of good nutrition when relating to sport and exercise?
- Benefits of a well chosen diet for all athletes
 - Optimal gains from training
 - Enhance and promote recovery between workouts
 - Maintaining ideal body weight
 - Reduced risk of illness and optimise good health

Main aims in young athletes

- Natural growth and development stage
- Sufficient energy intake
- Key micronutrient intakes
 - Calcium
 - Iron
 - Vitamin D

Nutrition for Sport and Exercise

Physiological Effects of Exercise

Nutrition for Sport and Exercise

Physiological Effects of Exercise

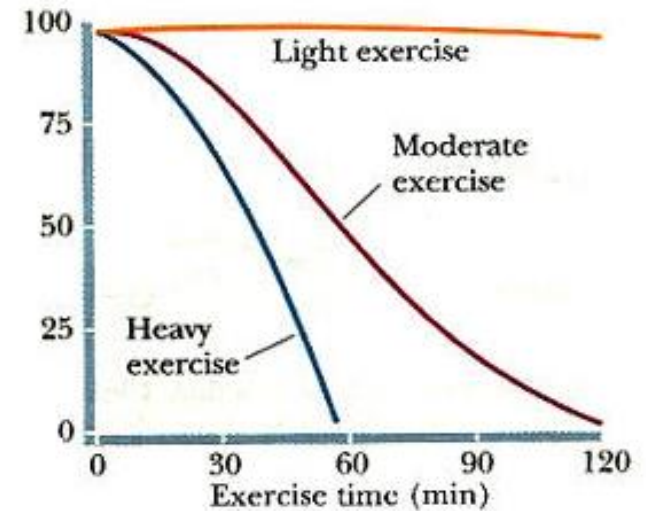
1. Increased energy expenditure → Low muscle glycogen
2. Muscle “damage” → Increased demand for repair/rebuild

Nutrition for Sport and Exercise

Physiological Effects of Exercise

1. Increased energy expenditure → Low muscle glycogen

Glycogen Utilization in Working Muscle

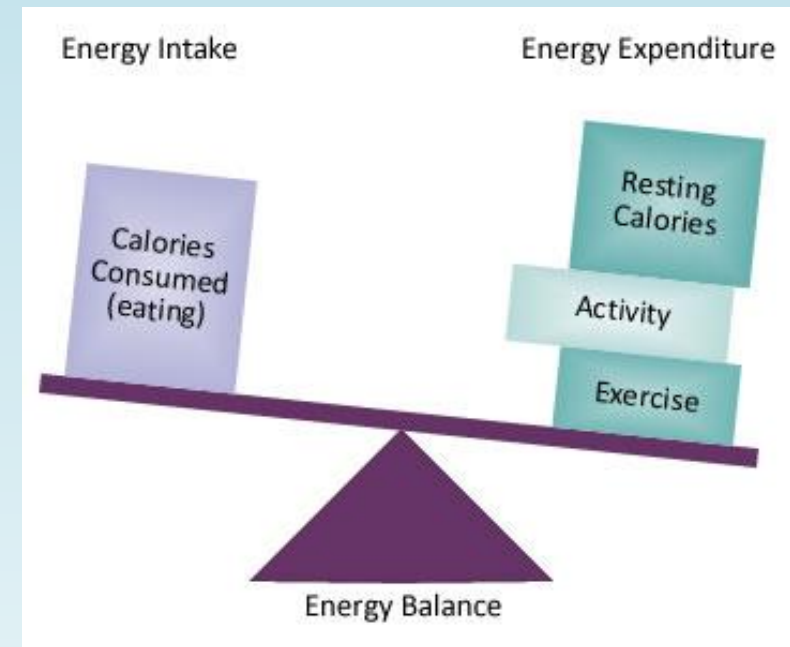


Nutrition for Sport and Exercise

Energy Balance and Exercise

1. Increased energy expenditure → Low muscle glycogen

= CARBOHYDRATES



Nutrition for Sport and Exercise

2. Muscle “damage” → Increased demand for repair/rebuild

Muscle Repair and Recovery

During Exercise → Catabolism (breakdown)

After Exercise → Anabolism (build up)

= PROTEIN

Nutrition and Sport

Pre and post training

- Glycogen stores topped up
 - Carbohydrate rich foods
- Avoid greasy or high fat diets
 - Can cause digestive problems
- 2 to 3 hours prior

Nutrition and Sport

Pre and **post** training

- Mix of Carbohydrates and Protein
 - Depleted muscle glycogen
 - Protein synthesis for repair and recovery
 - Carbohydrate based snack followed by protein/carbohydrate intake.

Nutrition and Sport

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Examples of nutrient-rich carbohydrate foods and meal combination

Breakfast cereal with milk

Fruit with flavoured yoghurt

Fruit smoothie or liquid meal supplement

Sandwich with meat and salad filling

Stir-fry with rice or noodles

Nutrition and Sport

Race Day

- Tried and tested foods
- Simple Meals for energy/glycogen stores
- Plan food depending on time of race
- Last meal 2/3 hours before
- Light Snack 1 hour before (Banana, Fruit)

Nutrition and Sport

Recovery Phase

- Mix of protein and carbohydrate foods
- Beneficial effect achieved with as little as 10g of protein
- Maximal effect with 20-25g protein consumption
- Suggested intakes of 1.2-1.7g per kg/bodyweight for athletes
- Guidelines suggest within 4 hours (sooner the better)

Nutrition and Sport

Recovery Phase

Activity of timing	Recommended Intake	Example
Immediate Recovery (0 to 4hr)	1.2g of Carbs per kg BW	60kg athlete to consume 72g of carbohydrates immediately after exercise. Total of 246g within four hours.
Daily Recovery	5g of Carbs per kg BW	60kg athlete to consume 300g carbohydrate throughout the day (1200 calories)

Nutrition and Sport

Recovery Phase

Protein rich foods – 10 g protein is provided by any of the following

2 small eggs	2 cups cooked pasta or 3 cups rice
300 ml cow's milk	400 ml soy milk
20 g skim milk powder	60 g nuts or seeds
30 g cheese	120 g tofu or soy meat
200 g yoghurt	150 g legumes or lentils
35-50 g meat, fish or chicken	200 g baked beans
4 slices bread	150 ml fruit smoothie or liquid meal supplement
90 g breakfast cereal	

Consequences Of Poor Nutrition

Signs and Symptoms

- Prolonged muscle soreness
- Unexplained fatigue
- Joint and ankle pains
- Stress fractures
- Frequent cold or flu symptoms
- Weight fluctuation
- Built up over weeks or months can lead to injury stress and reduced performance

Example Meals

- Middle distance Runner – Laura Muir
- Morning – Porridge w/ peanut butter
- Lunch – Chicken or Fish Salad + yoghurt
- Dinner – Casseroles, lasagne, Salmon w/veggies
- Post session Snack – Banana
- Pre Race - Porridge
- *quantities tailored towards individual needs



Example Meals

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- Pre Race – Porridge



Example Meals

- 200/400m Runner – Zoey Clark
- Morning – Porridge or Weetabix w/ fruit
- Lunch – Soup w/sandwich, Eggs on Toast.
- Dinner – Casseroles, Chicken or Beef with veg.
Sweet Potato as main Carb Source
- Post session Snack – Pick form Fruit, Yoghurt, Nuts, Toast w/ Peanut Butter.
Protein Shake when short on time.
- Race Day – Porridge (portion size dependent on race time),
Yoghurt and Toast
- *quantities tailored towards individual needs



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Summary

- Energy and nutrient intakes vital for early years development
- Carbohydrate Intakes: 5-7g per kg body weight
- Protein Intakes: 1.2-1.7g per kg body weight
- Timing is important for refueling and repairing the body (within 4 hours)
- Signs of possible nutritional deficiencies
 - Tiredness, soreness, fatigue, weight change, illness
- Treat your nutrition with as much dedication as your training

Additional Sources

- Eatwell Guide. Public Health England
- Nutrition for Athletics: The 2007 IAAF Consensus Statement

Thanks for listening!

Any Questions?

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