



BUENOS AIRES 2018



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The Teen Athlete's Nutrition Priorities for Performance

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Are you the same person you were yesterday?





Athletes come in different ages, shapes and sizes



Just like everyday people



Track & Field varies widely in Body Composition



Adam Setliff Discus 6' 4" 270 lbs.

Dawn Elle Hammer Th 6' 2" 240 Breaux Green Javelin 6' 2" 225 lbs.

Connie Price-Smith Shot Put 6' 3" 210 lbs. Adam Nelson Shot Put 6' 0° 255 lbs.







What are the challenges you are facing?





The Adolescent athlete

Active adolescent athlete

 12-18 years: Applies foundational movement skills in a sports specific context, and may be associated with a commitment to training, skill development and/ or formal engagement in competition

Competitive Adolescent athlete

 12-18 years who demonstrates physical, physiological and movement talents which may indicate future potential in HP sport, and are engaged in sustained practice through high training volumes

Elite Adolescent athlete

- 12-18 years competing against adults in international competition
- Para Sports often enter elite competition at a young age



Adolescence - A time of change

- Period of significant growth and physical development
 - $\circ~$ Altered body composition
 - $\circ~$ Metabolic and hormonal fluctuations
 - $\circ~$ Maturation of organ systems
 - o Bone maturation
 - Establishment of nutrient deposits
 - Changes in metabolic fuel preferences
 - Improve sweat response
- Social, emotional and sexual development



Important time in establishing life-long relationship with food



Changes in metabolic rate





Benefits early maturity

Taller

Heavier

Stronger

More muscle mass (males)

Co-ordination adjustments earlier

Challenges early maturity

Higher expectation skill set based on size Fatigue earlier

Early onset menstruation

Hormonal influences (skin, body hair, emotions) Increased energy demands (growth spurt)





Benefits late maturity

Smaller size – self select sports and activities Usually maturing at slower rate than peers Rely on skills for success than strength

Challenges late maturity

Body image

Delayed growth spurt and bone maturation Inadequate energy can be a contributor





Key Nutrients for Young Athletes

Energy – fuel, growth and hormonal health

Protein – growth, muscle, blood supply, bone

Calcium – growth, bone, blood clotting, muscle contraction

Iron – blood supply, energy production

Iodine – metabolic rate (use iodised salt, seaweed sushi)

Vitamin D – bone, immunity (sun exposure and food)

Challenges with changing body image







How does the body use energy from food?



Resting energy

Growing energy

Repairing energy

Breathing energy

Muscle energy

Sweating energy

Digestion energy









Energy Availability

This is not Energy. Caffeine is a stimulant







Energy: RDI 8-18 year old

		MALE			FEMALE	
Age (years)	8–11	12–15	16–18	8–11	12–15	16–18
Nutrient						
Energy (MJ)	8.7–9.1	9.2–11.8	11.7–13.5	7.7–8.2	8.1–9.8	8.8-10.0
Protein (g)	27–38	42-60	64–70	27–39	44–55	57
Iron (mg)	6–8	10-13	10–13	6–8	10–13	10–13
Calcium (mg)	800	1,200	1,000	900	1,000	800

Actual intake varies based on genetics and level of activity – body size, body composition, stage of development/puberty, training maturity

https://www.nrv.gov.au/nutrients-energy-calculation/nutrients-energy-calc-result-1523579067



Examples

http://www.globalrph.com/harris-benedict-equation.htm

Female:	15yrs
Height	140cm
Weight	48kg
RMR	1315 kcal
Energy	2235 kcal
Male:	16yrs
Male: Height	16yrs 165cm
Male: Height Weight	16yrs 165cm 61kg
Male: Height Weight RMR	16yrs 165cm 61kg 1620 kcal
Male: Height Weight RMR Energy	16yrs 165cm 61kg 1620 kcal 2760 kcal

16yrs 153cm 54kg 1390 kcal 2365 kcal

17 yrs 172cm 68kg 1750 kcal 3000 kcal 18yrs 166cm 62kg 1954 kcal 3325 kcal

18yrs 178cm 69kg 1780 kcal 3335 kcal







ENERGY AVAILABILTY

A new concept that is being promoted is that of energy availability—that is, the **energy that is left for body functions once the energy cost of training is taken into account**





Causes of low energy intake (LEA)

Increased energy expenditure

*increased volume training,
*increased intensity
*Increased duration
*Addition another sport
*clinical – fever, injury



Decreased nutrition

*Unintentional (fatigue, timing, finances not eating between sessions

*Intentional (missing meals and snacks, attempts to change body composition or body mass

*Poor practices - lack planning and preparation

*orthorexia, fad diets, fasting

*Clinical – disordered eating



When things go wrong

Fatigue Poor concentration Distracted at training Reduced ability to learn and adapt Nutrient deficiency e.g. iron Bone stress Undesirable hormone profiles Undesirable loss lean mass Orthorexia Fad diets **Disordered** eating REDS



When to eat?

Around training – before and after

Regular meals and snacks

What about sports drinks?

What about late night eating?

Is it OK to eat Carbs after 6pm?

Body changes: Explain weight increase – check height with weight with development stage of puberty – young athletes

should get taller and heavier!







Nutrition to support activity and health in Teens

- Young people are inactive although a **portion are overactive and over committed and too busy** – this influences messages athletes and parents here in the media
- Parents are the gate keepers of the pantry and fridge and what is available for young people to eat young people can't eat what is not there!
- A portion of parents and carers are excellent and aware providing variety of food, quality and appropriate flexible quantity
- A portion of parents and carers lack resources and knowledge
- A portion of parents are over involved, influenced by the latest trends, fads, myths, to the point where the application of these beliefs adversely affects the food available to young people:



COMMON POOR NUTRITION PRACTICES

- Not arriving at training hydrated and with well fueled muscles
- Not consumed a snack 1-2 hours prior to a long, highly intense or technique session
- Weighing self either before or after sessions – morning weight 1-2x week
- No fluids at training
- No recovery snacks or long gaps before a main meal if eaten after training
- Eating the same food lack variety limited nutrient intake
- Cutting out major food groups
- Focus on rapid weight loss







Calcium and Bone Health

TABLE 1 Factors Associated With Stress Fractures^{1,2,6,13}

Low bone mineral density

Menstrual irregularities in women

Low dietary calcium intake

Low levels of serum 25(OH)D

Lower body weight

Lower body fat level

History of stress fractures

Disordered eating

Low fitness level This is not a concern in Athletics

Calcium has many roles in the body:

- Bone growth and mass
- Muscle contraction relaxation
- Nerve transmissions
- Regulating heart functioning
- Blood clotting
- Teeth
- Enzyme functioning





Nutrients for Bone Growth and Health

- Energy
- Protein
- Calcium
- Phosphorous
- Vitamin D
- Vitamin K
- Vitamin A
- Potassium
- Magnesium
- Manganese
- Copper
- Boron
- Fluoride

	Nutrient	Food Sources		
	Protein	Eggs Lean meat Poultry Nuts Low-fat milk (dairy or fortified soy or rice milk) Low-fat yogurt Low-fat cheese		
	Calcium	Low-fat milk (dairy or fortified soy, rice, or almond milk) Calcium-fortified orange juice Hard cheese such as Parmesan cheese Cabbage Broccoli Canned salmon Calcium-set tofu		
	Vitamin D	Wild salmon Egg yolks Fortified milk, margarine, and cereal		
	Potassium	Bananas Low-fat milk White and lima beans Spinach Lentils		
	Vitamin K	Cooked greens (kale, spinach, collards) Broccoli Asparagus		
	Magnesium	Whole grains Almonds Cashews Spinach Raisin bran Legumes (dried beans and peas)		
	Boron	Fruit-based beverages Avocado Legumes Peanut butter Peanuts		



Milk contains:

Water + Carbohydrate (Lactose) +



MILK: THE NEW SPORTS DRINK?

By BD Roy, J Int Soc Sports Nut, 2008

Designed by @YLMSportScience

OVERVIEW

There has been growing interest in the potential use of bovine milk as an exercise beverage, especially during recovery from resistance training and endurance sports

MUSCLE RECOVERY

Milk appears to be an effective postresistance exercise beverage that results in favourable acute alterations in protein metabolism



MUSCLE GAIN When postexercise milk consumption is combined with resistance training, greater increases in muscle hypertrophy and lean mass have been observed



Milk represents a more nutrient dense beverage choice for individuals who partake in strength and endurance activities, compared to traditional sports drinks

CONCLUSION

Bovine low-fat fluid milk is a safe and effective post exercise beverage for most individuals, except for those who are lactose intolerant



REHYDRATION

Low-fat milk has been shown to be as effective, if not more effective, than commercially available sports drinks as a rehydration beverage





Ways to add more calcium

Add more milk to cereal Make porridge with milk Glass of milk with lunch Eat canned salmon with bone Add cheese to salads Add almonds to salads & snacks Eat more dark green vegetables Eat yoghurt as snack Add cheese to soups Drink a glass of milk before bed

Am I getting enough CALCIUM?

	FOOD	Portion Size	Points	Calcium (mg)
	Milk – calcium fortified, trim	1 cup	10	510
	Yoghurt – Greek style	1 cup	9	460
300	Liquid breakfast, e.g. Up & Go, Fast Start	1 cup	9	450
¥	Sardines – canned, drained	100g	11	550
	Milk – reduced fat	1 cup	7	330
	Milk – standard	1 cup	6	310
	Soy milk – regular	1 cup	6	290
	Milk – flavoured	1 cup	5	251
100+	Yoghurt – low fat, flavoured	1 pottle	3	130
	Baked beans in tomato sauce	1 cup	2	100
	Cheese – cheddar, edam, colby	1 slice	3	160
	Silverbeet – boiled	1 cup	2	110
	Tofu – firm	100g	2	110
	Ice-cream – vanilla, standard	1 cup	4	196
	Dried figs	3 figs	1½	80
ഗ	Chickpeas	1 cup	2	90
	Red salmon, canned in water	100g	2	93
	Bread – multigrain	2 slices	2	82
o	Natural muesli – Sanitarium fruit & 5- grain	1 cup	1½	72
	Bok Choy	1 cup	1	59
	Boiled egg	2 eggs	1	56
	Broccoli	1 cup	1	52
	Dried apricots	6 apricots	1/2	32
	Almonds – skin on	10 almonds	1/2	30
ω	Orange	1 orange	1	37
Ò	Muesli bar – Mother Earth, nut bar	1 bar	1/2	24
+	Carrot	1 carrot	1/2	24
	Kumara - boiled	1 medium	1	33
	Cheese – cottage cheese	5 Tablespoons	1	45

*Values have been sourced from The Concise New Zealand Food Composition Tables, 10th Edition.

1 cup = 250ml, unless stated otherwise

1 point = ± 50mg





Essential Iron

- To carry oxygen around the body from the lungs to the rest of the body.
- Ensure a healthy immune system - the cells that fight infection depend on adequate stores of iron. Low iron = more prone to infections.
- Produce energy iron is essential for the chemical reactions producing energy from food. Low iron = the body may not be able to use all the energy available.



The body absorbs haem iron more easily, with about a quarter being used. Only about 5% of non-haem iron is absorbed.



Effect low iron & deficiency:

- Fatigue & reduced tolerance to work (feels harder)
 Developmental delay & learning difficulties (poor
- concentration)
- Reduced resistance to the cold
 Impaired immunity (increased infections)
- Reduced appetite
- •Deterioration in athletic performance due to decreased aerobic capacity
- Iron deficiency anaemia

Seafood high in iron: shrimps (8), oysters (6), mussels, octopus, clams



http://www.beeflambnz.co.nz/index.pl?page=iron_facts&m=105



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Fad Diets: An area of concern for coaches

- Flexitarian vegan who eat meat or meat eater who eats vegetarian two or more times a week
- Plant based eating
- Orthorexia Overly healthy eater to the point of being un-healthy
- Gluten free by choice
- Dairy free by choice
- Following family eating patterns medical



Diet Diet

The Mostly Vegetarian Way to Lose Weight, Be Healthier, Prevent Disease, and Add Years to Your Life



Flexitarian Name came about Combining two words:

Flexible and vegetarian.

LOW CARB DIET LIQUID CRAPEFRUIT DIET DIET DETOX DIET DETOX DIET JUICE DIET CABBAGE SOUP MACROBIOTIC DIET



Orthorexia: When healthy eating becomes unhealthy and dangerous Orthorexia is the term for a condition that incl



Orthorexia is the term for a condition that includes symptoms of obsessive behavior in pursuit of a healthy diet. **Orthorexia** sufferers often display signs and symptoms of anxiety disorders that frequently co-occur with anorexia nervosa or other eating disorders

1 Large Celery Sta	lk - Can	ieat it?	yes or No
Calories 10 Calories fr % Dai	om Fat 1 Iy Value	al I. III.	2
Total Fat 0g	210 5	it neather	
Saturated Fat 0g	0%		and the second s
Trans Fat			
Cholesterol Omg	0%		and the
Sodium 51mg	2%		
Total Carbohydrate 2g	1%		1-1-2.11
Dietary Fibre 1g	4%		
Sugars 1g	5 this	high	
Protein 0g		Fat St	ugar Salt Sat Fat

"Clean Eating"

At its simplest, **clean eating** is about **eating** whole foods, or "real" foods — those that are un- or minimally processed, refined, and handled, making them as close to their natural form as possible.





If Exercise is King, Nutrition is Queen

- Teenagers are not elite athletes but talented young individuals who need to train and develop skill sets
- For athletes with a young training age supplements are not needed as more benefits to performance will come from training and good coaching (skill, technique), practice, sleep & recovery
- Supplements are not a shortcut to training – their impact is only very small
 - "Eat Sleep Train Repeat"



doing the hard yards





Supplements

The supplement programme is designed to

 minimize the risks of an adverse analytical finding,

provide education to athletes,

(3) support the training environment and athlete performance, and

(4) provide a duty of care which includes:

(a) clinical nutritional support e.g. (nutrient deficiencies e.g. iron),

(b) avoiding adverse reactions (e.g. food allergies) and

(c) undesirable practices (e.g. inappropriate doses)

which could negatively impact health and performance

https://hpsnz.org.nz/journalentries/choosing-dietary-supplements/

Why athletes should choose dietary 📠 supplements carefully

WHAT IS A DIETARY SUPPLEMENT?

B

OPEN ACCESS

Although dietary supplements are regulated in most countries, there is usually no pre-approval (unlike a medicine) required before being sold. This means some products enter the market without being adequately tested by the manufacturer for safety, purity and if it actually does what it claims to do. Harmful ingredients, incorrectly labelled, and contaminated products are often only discovered after the product has been ingested by athletes and consumers

Consensus statement

IOC consensus statement: dietary supplements and the high-performance athlete

Ronald J Maughan, 1 Louise M Burke, 2,3 Jiri Dvorak, 4 D Enette Larson-Meyer, 5 Peter Peeling, ^{6,7} Stuart M Phillips,⁸ Eric S Rawson,⁹ Neil P Walsh,¹⁰ Ina Garthe,¹¹ Hans Geyer,¹² Romain Meeusen, ¹³ Lucas J C van Loon,^{3,14} Susan M Shirreffs,¹ Lawrence L Spriet,¹⁵ Mark Stuart,¹⁶ Alan Vernec,¹⁷ Kevin Currell,¹⁸ Vidya M Ali,¹⁹ Richard GM Budgett, 20 Arne Ljungqvist, 21 Margo Mountjoy, 22,23 Yannis P Pitsiladis, 19 Torbjørn Soligard, 20 Ugur Erdener, 19 Lars Engebretsen 20

http://bjsm.bmj.com/content/bjsports/52/7/439.full.pdf



SPORT BENEFITS OF DRINKING WATER

Good for general health, free and always available

Supports training – be hydrated prior to starting training

Replacing sweat losses

Assists thirst and promotes recovery after exercise

5 Assists concentration and judgement (good for study/school)







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Finding Help and Support

Dietitians.org.nz – find a local dietitian with sports experience

Sports Medicine New Zealand

NZ Nutrition Foundation

NZ Heart Foundation

HPSNZ hpsnz.co.nz go to Journal – Choosing safe Supplements

Performance Nutritionist or Sports Nutritionist

ACSM American College of Sports Medicine

Sportsdietitians.com.au

AIS sports nutrition – Australia Institute of Sport

Drug Free Sport NZ











HIGH PERFORMANCE SPORT NEW ZEALAND

Questions