تغذیه برای سلامت ورزشکار

تغذیه و ریکاوری ورزشکار

Nutrition guidelines for quick recovery

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1.  Have carbohydrate 1.2 g/kg of carbohydrate as soon as possible after exercise cessation and every hour thereafter

2.  Avoid excessive dehydration and rehydrate with 150% of weight loss

3.  Experiment with antioxidants, tart cherry juice or protein. Be aware: this is likely less important in relation to performance and may interfere with long term benefits

4.  Add some protein with an eye on long term recovery and adaptation but this is NOT essential for the immediate post exercise recovery

quick recovery refers to 1-6h after exercise

Nutritional interventions to accelerate recovery from exercise-induced muscle damage

Reference : Bongiovanni et al. EJAP 2020

Designed by @YLMSportScience

F EVIDENCE

Good level of evidence

Tart cherries

Omega-3

Creatine

Lots of evidence but unclear beneficial effects

Vitamin D

Beetroot juice

Pomegrenate juice

Images provided by PresenterMedia

Modest evidence but requiring more research

L-Citrulline & watermelon juice

HMB

Protein & amino acids

Milk

L-Glutamine

L-Carnitine

Curcumin

Bromelain Proteases

Caffeine

Taurine

Ginger

Ginseng

Vitamin C Vitamin E

Alcohol and recovery

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Reduced muscle glycogen synthesis
Mainly because guidelines for rapid glycogen synthesis are not followed

Reduces cognitive function day after
which can decrease performance and increase risk of injury

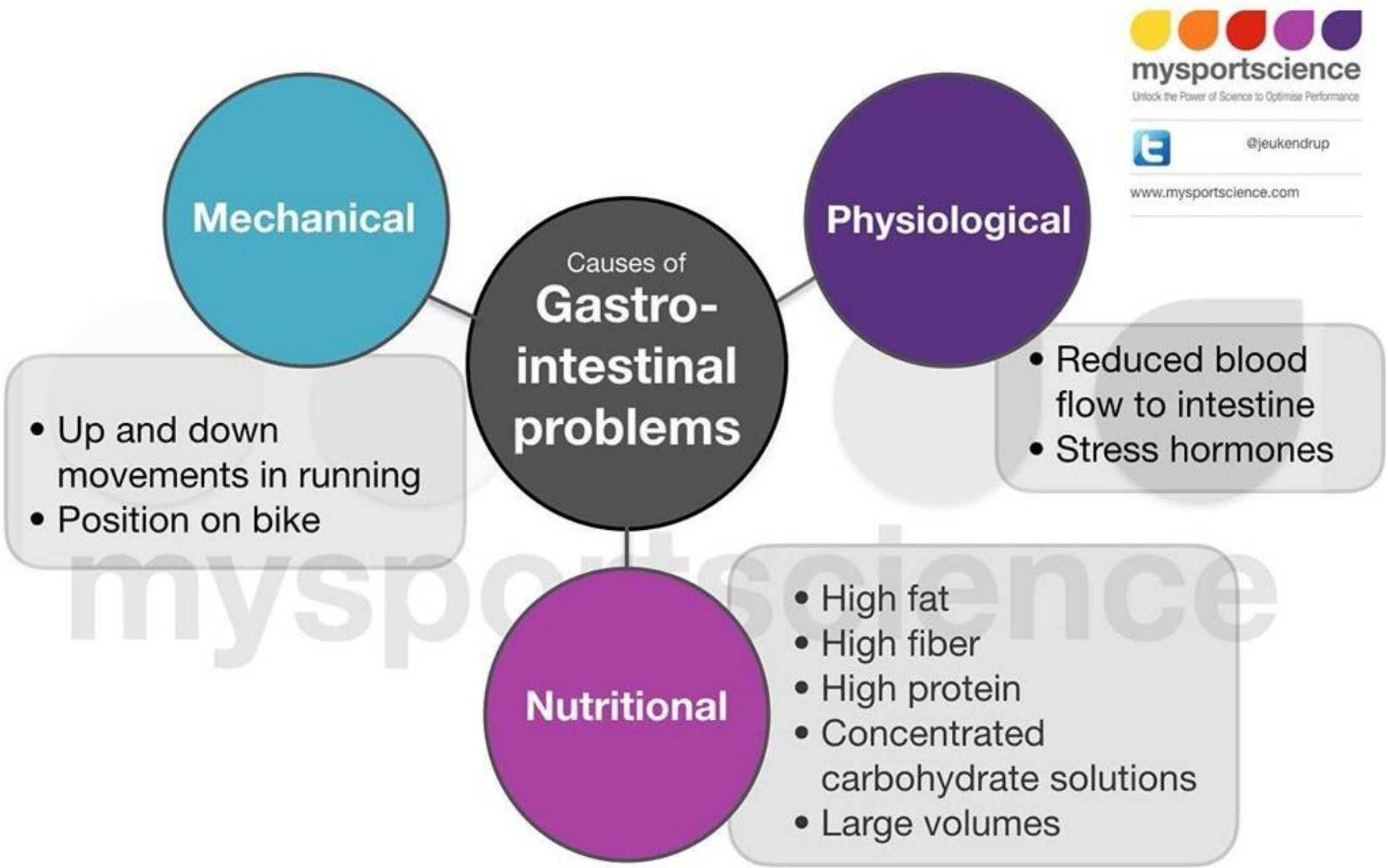
Sleep quality
may interfere with sleep quality

Reduces protein synthesis
Impaired muscle repair and adaptation

Reduces upper body power
as well as peak power

سیستم های آسیب پذیر در ورزش قهرمانی

- دستگاه گوارش (افزایش نفوذ پذیری روده)
- سیستم ایمنی (تضعیف ایمنی)
- عضلانی- اسکلتی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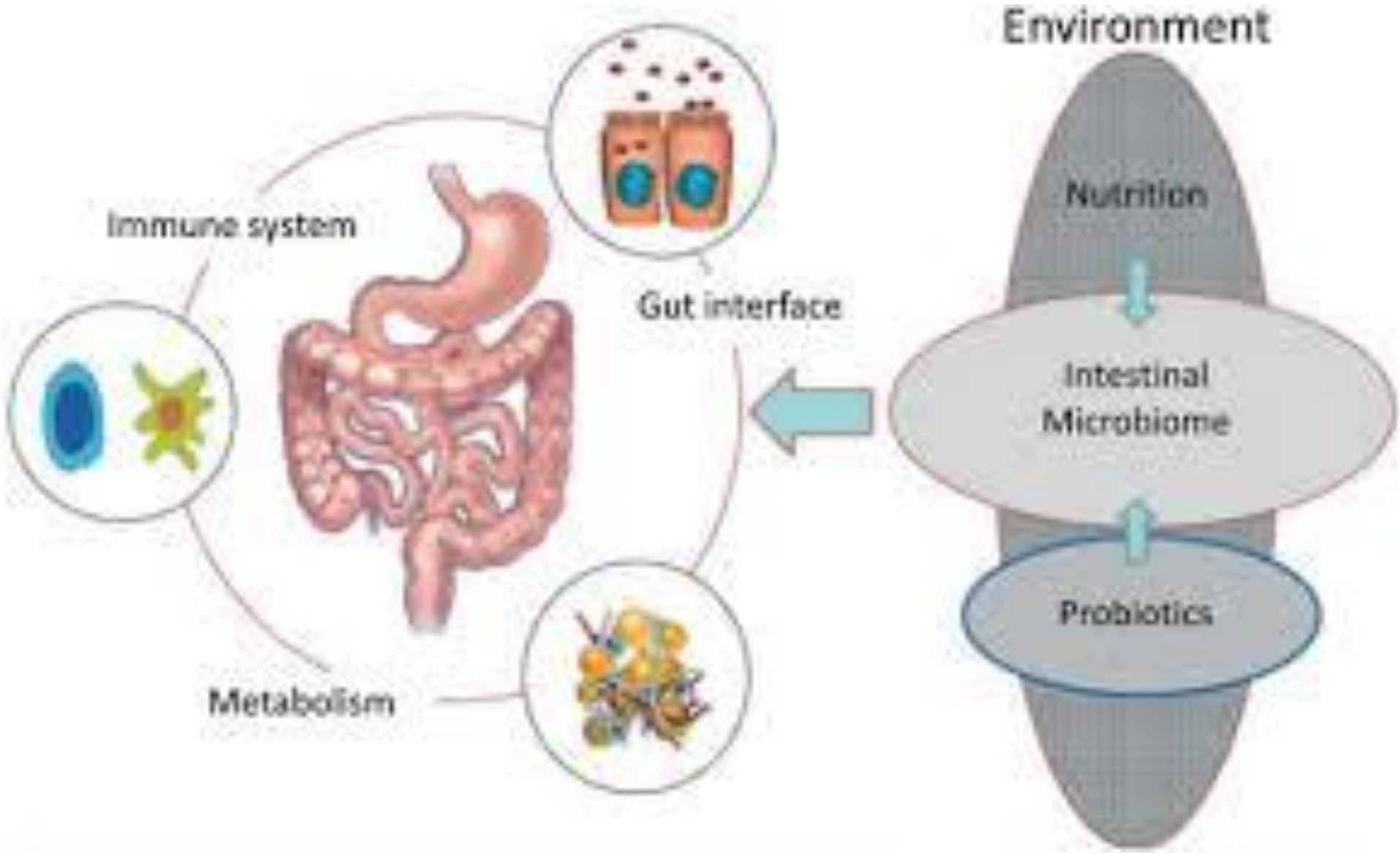
Causes of
Gastro-intestinal problems
Mechanical
• Up and down movements in running
• Position on bike
Physiological
• Reduced blood flow to intestine
• Stress hormones
Nutritional
• High fat
• High fiber
• High protein
• Concentrated carbohydrate solutions
• Large volumes


Environment
Nutrition
Intestinal Microbiome
Probiotics
Gut interface
Immune system
Metabolism

Fermentable **O**ligosaccharides, **D**isaccharides, **M**onosaccharides and **P**olyols (FODMAP)

- غذاهای فودمپ انواعی از کربوهیدرات ها هستند، از جمله قندها که روده باریک به صورت کم آنها را جذب می کنند.
- مطالعات نشان داده اند که رژیم غذایی کم فودمپ می تواند به بهبود علائم سندرم روده تحریک پذیر (IBS) کمک کند.
- ۱۱ درصد جمعیت جهان سندرم روده تحریک پذیر تأثیر می گذارد.

غذاهای فودمپ کم

سبزیجات: کاهو، پیازچه، خیار، رازیانه، بادمجان، کلم بروکلی و اسفناج
میوه ها: زغال اخته، تمشک، توت فرنگی، آناناس، انگور و کیوی.
گوشت: مرغ، گوشت گاو، بوقلمون، کالباس و بره.
ماهی: خرچنگ، لابستر، ماهی آزاد، ماهی تن و میگو.
چربی: روغن، دانه، کره، بادام زمینی و گردو.
نشاسته و غلات: سیب زمینی، نان بدون گلوتن، کوینو، برنج قهوه ای، چیپس تورتیلا و پاپ کورن.

غذاهای فودمپ بالا

سبزیجات: سیر، مارچوبه، پیاز، قارچ، لوبیا سیاه، گل صدف و گلابی.
میوه ها: خربزه، هندوانه، آلو، هلو، خرما و آووکادو.
گوشت: سوسیس، گوشت دودی، گوشت هایی در درون نان یا خمیر سرخ می شوند ، گوشتی که با سس بر پایه پیاز ویا سیر استفاده شود.
ماهی: ماهی که در درون نان یا خمیر سرخ می شوند ، ماهی که با سس پیاز و سیر خورده می شوند.
چربی: بادام، بادام هندی، پسته، آووکادو.
نشاسته، غلات و حبوبات: لوبیا، عدس، گندم و نان هایی بر پایه گلوتن، چاودار، کلوچه، شیرینی و پاستا.

High FODMAP foods

High fructose
Apples, cherries, watermelon

High fructans
Galacto-oligosaccharides (GOS)
Dates, honey, wheat based breads and bars

High lactose
Milk, yogurt, cheese

High polyols
Sorbitol

Low FODMAP alternatives

Low fructose
Blueberries, pineapple, honey dew melon

Low fructans
Galacto-oligosaccharides (GOS)
Dried kiwi, maple syrup, wheat free bars

Low lactose
lactose free milk, lactose free yogurt

Low polyols
Brown sugar, maple syrup, stevia

What is lactose intolerance?

Lactose intolerance is the body's inability to digest significant amounts of **lactose** (sugar found in milk and other dairy products) because of low or absent levels of the enzyme **lactase**.

Lactase is produced in the stomach and is necessary to break down lactose into two simple forms of sugar, glucose and **galactose**, which can then be absorbed into the bloodstream. Lactose intolerance is not a **food allergy**; it is a **food intolerance** in the digestive system. Lactose intolerance is not a reaction triggered by the **immune system**. Symptoms of undigested lactose include nausea, cramps, bloating, gas, and diarrhea. Symptoms can be mild to severe and usually begin within 30 minutes to 2 hours after ingestion of foods containing lactose. The severity of symptoms can be influenced by several factors that may include the amount of lactose a person can tolerate, speed of digestion, age, and ethnicity.

Particular individuals may be able to tolerate small amounts of dairy products without any side effects, whereas others may react to even the smallest amount. Those who are able to tolerate small amounts can usually control their symptoms through diet alone. Those who are unable to tolerate small amounts of lactose can purchase over-the-counter lactase enzymes (such as lactaid pills) or lactose-reduced or lactose-free food products.

Calcium intake is a nutrition concern for those unable to tolerate dairy products. Calcium is essential in building and repairing bone tissue and is required for muscle contraction and the maintenance of blood calcium levels; therefore, athletes with lactose intolerance who are unable to consume dairy products must eat other foods that contain calcium.

Some excellent sources of calcium include dark green leafy vegetables, salmon, sardines, yogurt, and calcium-fortified soy milk. Calcium supplements are recommended in some cases, although individuals should check with a healthcare provider before beginning any supplement.

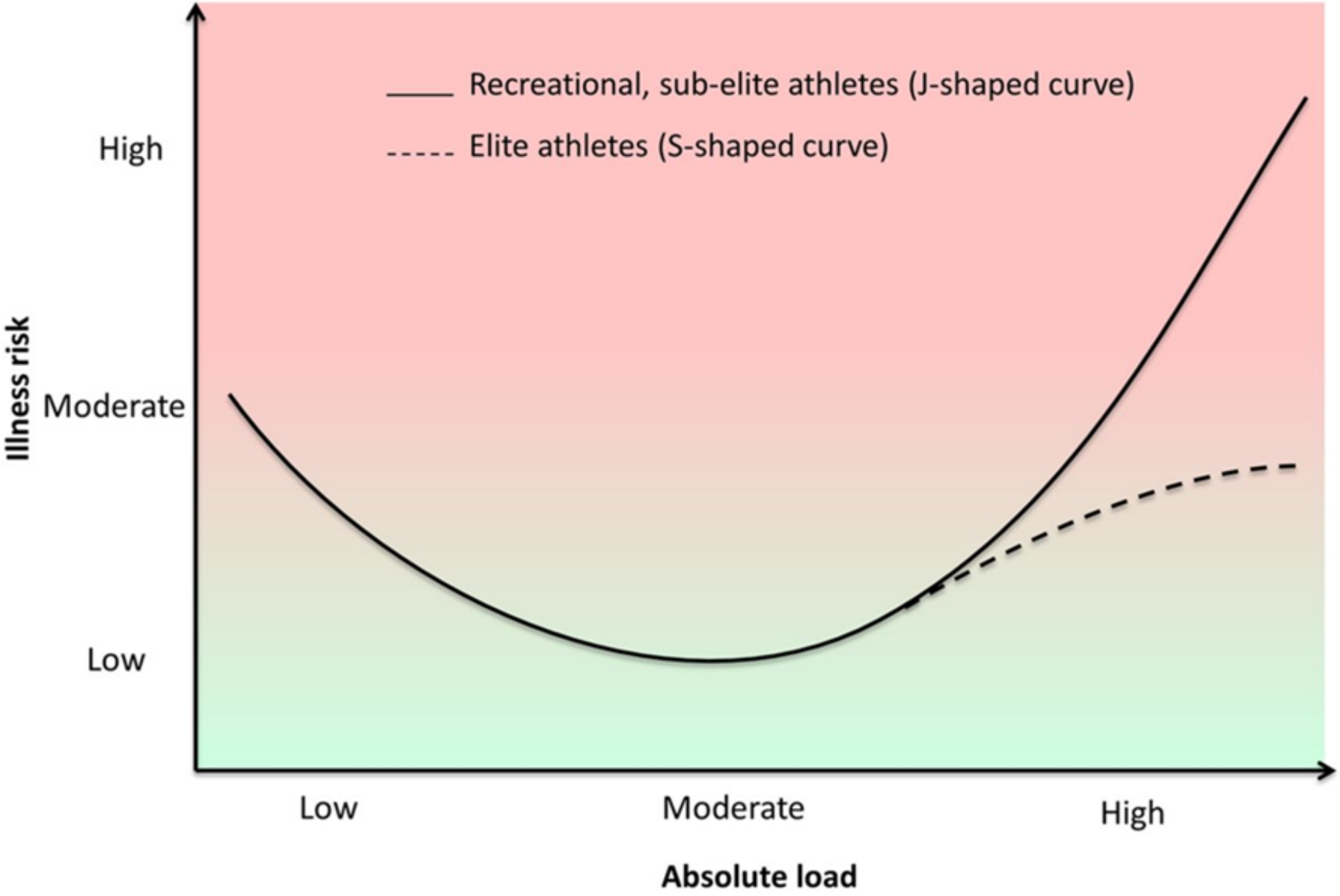
Gluten-free diet

بین نیم تا یک درصد مردم ایالات متحده بعلت ابتلا به بیماری سلیاک به گلوتن حساسیت دارند. بیماری سلیاک عبارت از نوعی واکنش ایمنی غیرطبیعی به گلیادین نسبتاً هضم شده می‌باشد. این بیماری به میزان مختلف در تمام مصرف کنندگان گندم در جهان رخ می‌دهد. مصرف و استنشاق گلوتن نیز موجب برخی واکنشهای آلرژیک و آسیبهای عصبی می‌گردد.

مواد غذایی حاوی گلوتن

- جو
- بلغور
- جو دوسر
- جو چاودار
- برنج
- مالت (آرد ذرت، شیر و آرد شیرینی پزی، عصاره مالت، شربت مالت، طعم مالت، سرکه مالت)
- سوپ مرغ
- برخی از سس های سالاد
- همبرگر
- سس سویا
- ادویه و ادویه مخلوط
- رشته فرنگی
- ادویه جات

ایمنی


Recreational, sub-elite athletes (J-shaped curve)
Elite athletes (S-shaped curve)
High
Moderate
Low
Illness risk
Low
Moderate
High
Absolute load

Potential causes of illness in athletes

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Increased exposure to pathogens

- Lung ventilation
- Skin abrasions
- Foreign travel
- Crowds
- Poor hygiene

Too much stress for the athlete

- Physiological stress
- Psychological stress
- Environmental stress
- Inadequate diet
- Poor sleep quality

Increased susceptibility to develop symptoms of infection

Depressed immune function

- Breathing cold air
- Breathing dry air
- Breathing polluted air

Allergy / inflammation

by Professor Mike Gleeson

از طرف دیگر موارد زیر احتمال ابتلای ورزشکار به بیماری های عفونی را افزایش می دهد.

- مسافرت
- استرس (موجب تضعیف سیستم ایمنی می شود)
- استفاده از وسایل ورزشی مشترک
- برخورد فیزیکی
- احتمال زخمی شدن

Key strategies to limit infection risk

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2 key strategies to limit infection risk

1 Prevent transmission of pathogens

- Avoid infected persons
- Avoid crowded areas
- Wash hands regularly with soap and water
- Avoid hand contact with eyes, nose and mouth
- Avoid sharing personal items
- Ensure cleanliness in living and eating areas
- Practice good food hygiene
- Limit contact with door knobs and other frequently handled items
- Limit contact with children if possible
- Use an antimicrobial hand gel or foam

2 Maintain robust immune function

- Avoid protein and micronutrient deficiencies
- Avoid crash dieting
- Consume a probiotic and fruits daily
- Take a vitamin D3 supplement (1000-4000IU)
- Get adequate good sleep quality
- Limit other sources of life stress
- Avoid binge drinking of alcohol

2a And if you are highly active:

- Ingest carbohydrate during training
- Manage your training load, don't overdo it
- Ensure adequate recovery
- Refuel and rehydrate after workouts

Reduce risk of infection

By Michael Gleeson

Probiotics

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Reduced risk of URTI infections

moderate level of evidence

Other potential benefits

Reduced risk of gastrointestinal discomfort symptoms?

low level of evidence

Reduced risk of reduced endotoxaemia during exercise in the heat

low level of evidence

Reduced incidence of gastrointestinal infections

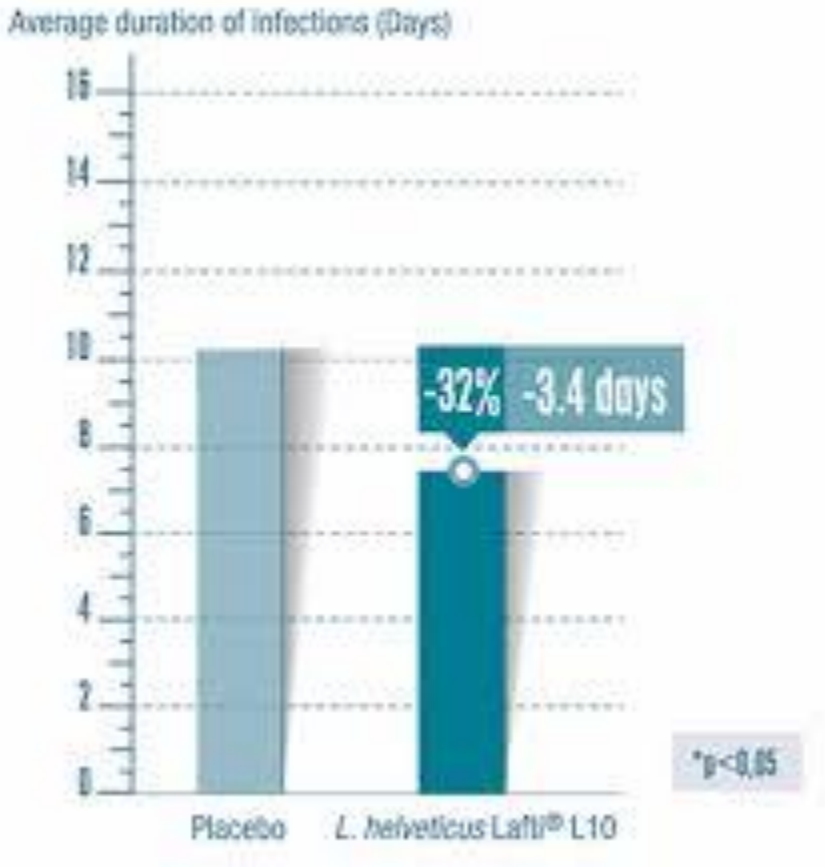
low level of evidence

پرو بیوتیک ها

- کاهش بیماری ها (به ویژه معده ای – روده ای)
- کاهش افسردگی
- کاهش التهاب
- کمک به حفاظت در مقابل اسهال های مسافرتی
- کاهش سرطان کولون
- کاهش کلسترول و فشار خون

در ورزشکاران

- تحقیقات نشان دادند موجب کاهش در بیماری های عفونی (بخش فوقانی سیستم تنفسی، سرماخوردگی و ...) به دلیل افزایش ایمنوگلوبین A می شود.
- این اثر در مردان بیشتر از زنان است.



آغوز (colostrum)

شکل 2: کلستروم حالت گذار از شیر استاندارد غنی تر است.

	واحد	کلستروم شیر					شیر خالص
		1	2	3	4	5	
ماده خشک	%	24.5	19.0	16.0	15.5	15.3	12.2
چربی	%	6.4	5.6	4.6	5.0	5.0	3.9
پروتئین	%	13.3	8.5	6.2	5.4	4.8	3.2
امینو اسیدهای ضروری	Mmol/L	390	230	190	140	115	ND
لاکتوفرین	g/L	1.84	0.86	0.46	0.36	ND	ND
انسولین	µg/L	65	35	16	8	7	1
هورمون رشد	µg/L	1.5	0.5	ND	ND	ND	ND
فاکتور رشد شبه انسولین۱	µg/L	310	195	105	62	49	ND

Source: Hammon et al 2000. ND = not detected.

آغوز (colostrum)

تحقیقاتی محدود در خصوص افزایش عملکرد وجود دارد.

موجب کاهش نفوذپذیری روده ای می شود.

علائم سرماخوردگی و سرفه را کاهش می دهد.

مقادیر بالایی IGF-1 دارد.

گلوتامین

- موجب کاهش نفوذپذیری روده ای می شود.
- اثر مستقیم بر عملکرد بر سیستم ایمنی تاثیر دارد.
- سوخت سیستم ایمنی است.

کربوهیدرات

از طریق:

- تامین قند خون برای سلول های ایمنی
- حفظ ذخایر گلیکوژنی

موجب کم شدن اثر منفی تمرین بر سیستم ایمنی می شود.

آنتی اکسیدان ها، ویتامین ها و مواد معدنی

- فنول ها موجب بهبود ریکاوری می شوند.
- ویتامین C و A نقش مهمی در عملکرد حفاظتی سیستم ایمنی دارند.
- آهن، روی و مس هم بر عملکرد سیستم ایمنی تاثیر دارند و کمبود آنها موجب تضعیف سیستم ایمنی می شود.

چربی ها

- امگا ۳ موجب انعطاف پذیری بیشتر گلبول های قرمز در هنگام عبور از مویرگها می شود.
- امگا ۳ موجب تضعیف پاسخ التهابی می شود.
- در هر دو مورد امگا ۶ اثر عکس دارد.

Is there an ideal ratio of omega-6 to omega-3 fatty acids?

- It has been speculated that the optimal omega-6:3 ratio is somewhere between 1:1 and 4:1 (Simopoulos, 2002). However, the ratio of omega-6: omega-3 in the current Western diet is roughly 15–20:1 (Simopoulos, 2008), which may have potentially profound health implications since omega-6 FA can activate inflammatory processes, while omega-3 FA are anti-inflammatory. However, there is no inherent threat of omega-6 intake, and food source must be considered when discussing dietary fat. For example, foods such as nuts and seeds are rich sources of omega-6, yet have consistently shown favourable health outcomes (de Souza et al., 2017) and higher omega-3 intakes are associated with lower metabolic syndrome risk (Jang & Park, 2020).

Nutrition for sport injuries

آسیب عضلانی– اسکلتی

انواع آسیب ورزشی

- آسیب عضلانی
- شکستگی استخوان
- آسیب تاندون، رباط و مفصل

Nutrition recommendations to minimise muscle loss when injured

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1. First and foremost, avoid nutrient deficiencies (including energy)
2. **Maintain energy balance**
3. Maintain a higher protein intake
4. Aim for 2.0-2.5 g protein/d/kg body mass
5. There is evidence for the efficacy of some nutraceuticals, e.g. omega-3 fatty acids

Energy balance plays an important role in the recovery process

Fiber

- Consuming fiber-rich foods while recovering from an injury can be an effective strategy to limit the gain of unwanted body fat.

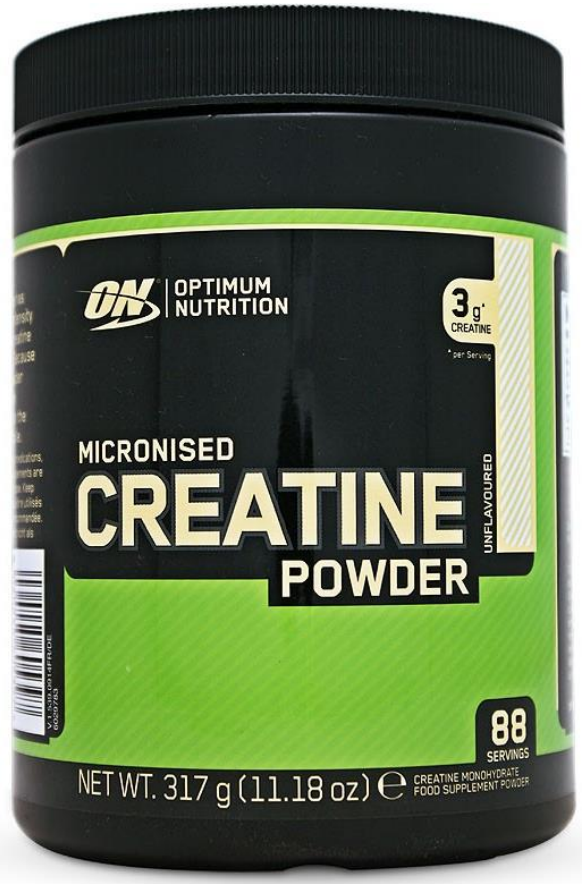
تغذیه برای آسیب عضلانی

Protein

- Eating protein-rich foods at every meal and snack may help prevent muscle loss following an injury.
- Protein-rich foods may also help you regain muscle mass faster once you return to training.

Creatine

- Creatine may boost your recovery by reducing how much muscle you lose immediately after your injury.
- It may also help you regain muscle more quickly once you go back to training.



Omega-3 Fatty Acids

- Foods rich in omega-3 fats may help speed up your recovery by limiting excessive or prolonged inflammation.
- Limiting your intake of omega-6 fats can also be helpful.

Zinc

Regularly consuming zinc-rich foods can help speed up wound healing and tissue repair and growth.

Nutrition for recovery from muscle injury

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Protein intake

20g of high quality protein (0.3 g/kg/meal) maximally stimulates muscle protein synthesis – aim for this at EVERY meal

Exercise the muscle as early as possible in the rehab process (pool-work and electrical stimulation of the muscle)

Energy balance

Avoid both negative as well as positive energy balance

Other nutrition

Creatine may help 10g/d for 3 weeks then 2 g/d beyond

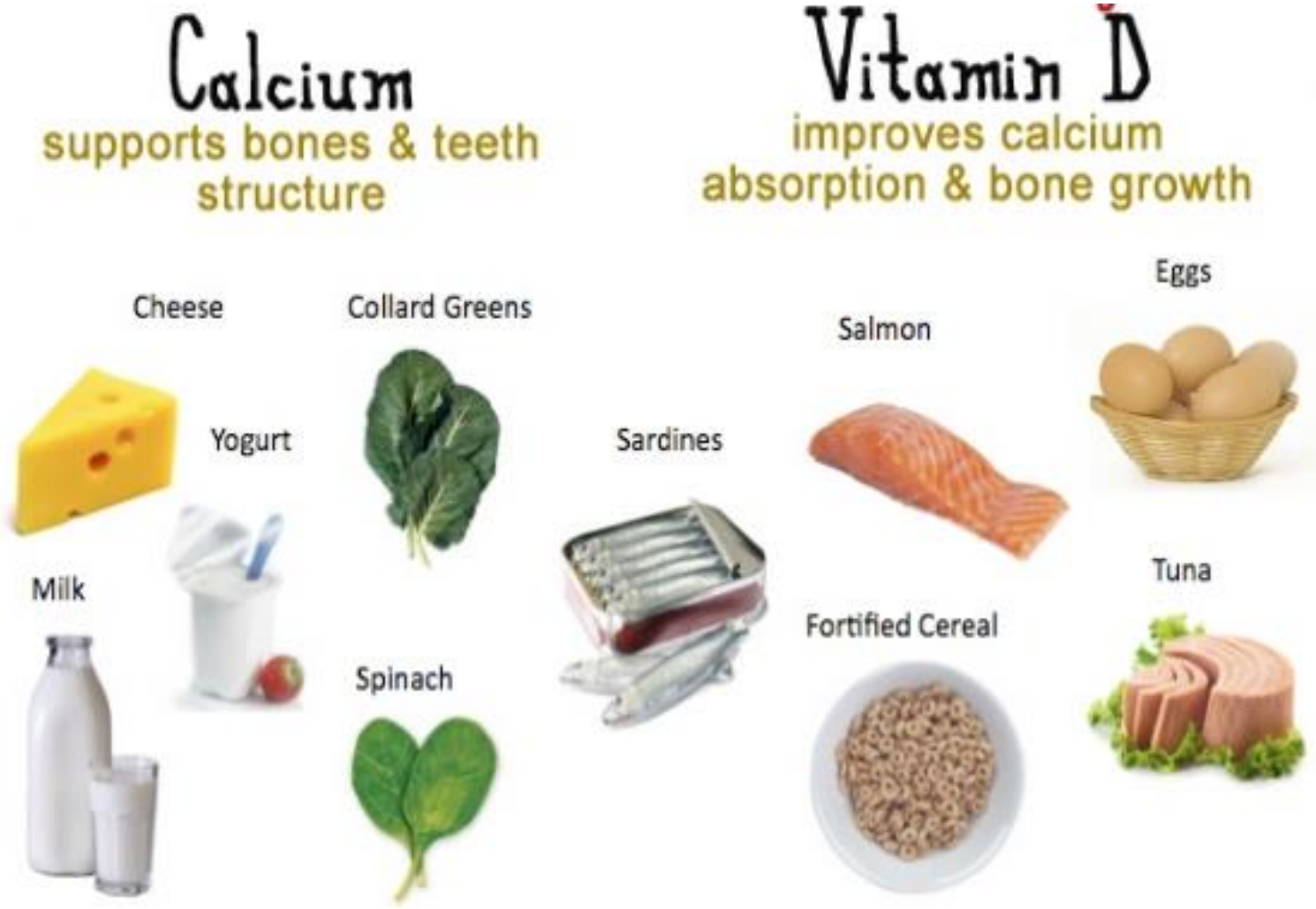
HMB?
Omega 3 fatty acids?

Based on presentations by
Kevin Tipton
Stuart Phillips
Keith Baar

تغذیه برای شکستگی استخوان

Vitamin D and Calcium

Eating enough calcium-rich foods is necessary for proper recovery from fractures. Getting enough vitamin D can also help.



Magnesium

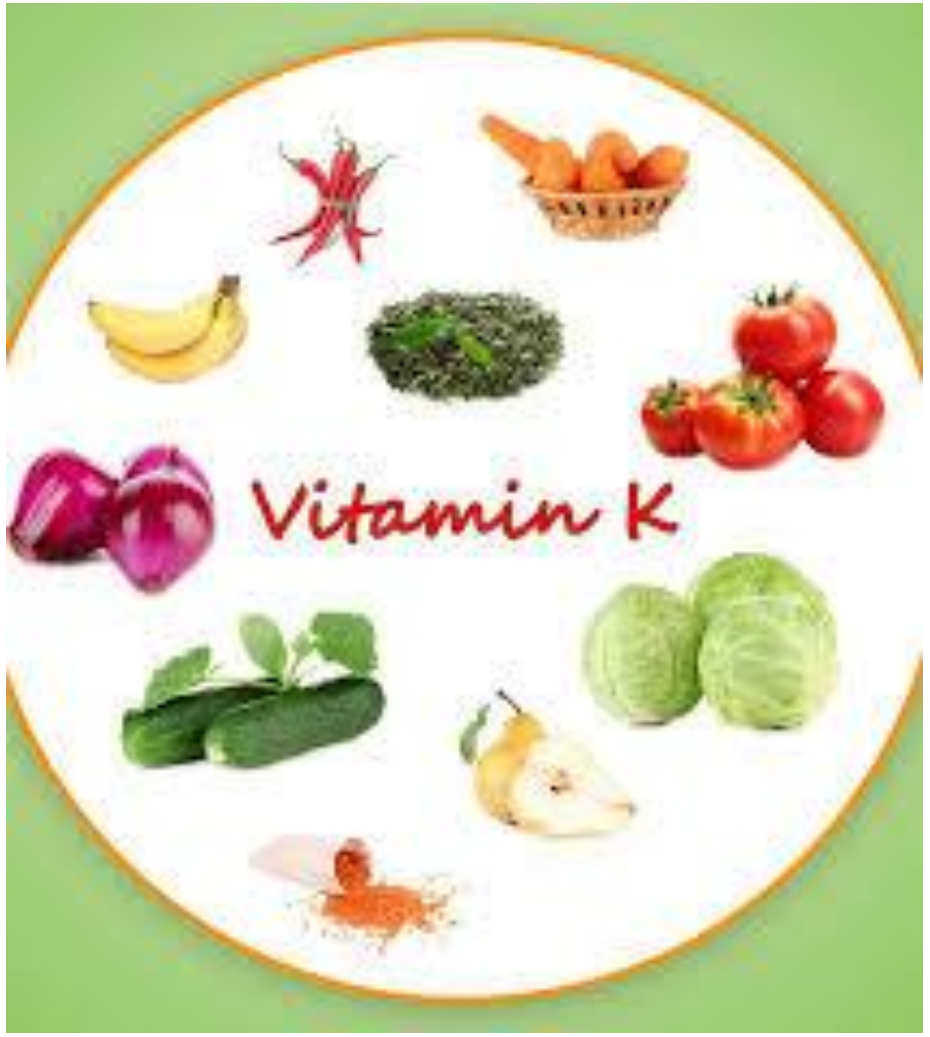
- Promotes bone strength and firmness.
- Found in almonds, cashews, peanuts, potato skins, brown rice, kidney beans, black-eyed peas, lentils and milk.

Silicon

- Plays an important role in the early stages of bone formation.
- Best sources include whole grains and cereals, carrots and green beans.

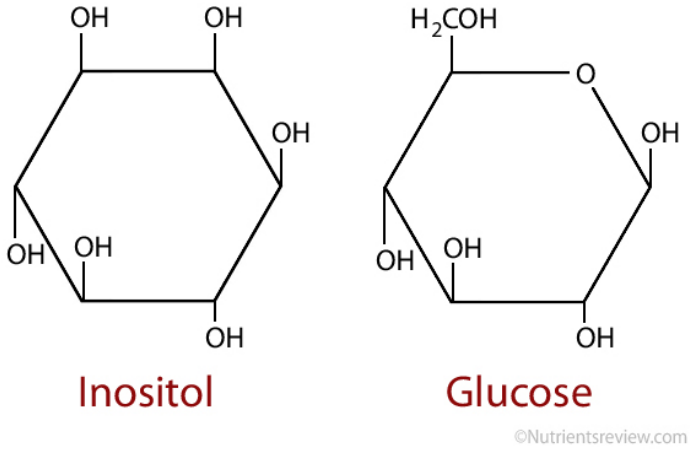
Vitamins K1 and K2

- Directs calcium toward bones and helps improve bone strength.
- Best sources include leafy greens, Brussels sprouts, prunes, sauerkraut, natto, miso, organ meats, egg yolks and dairy products from grass-fed cows.



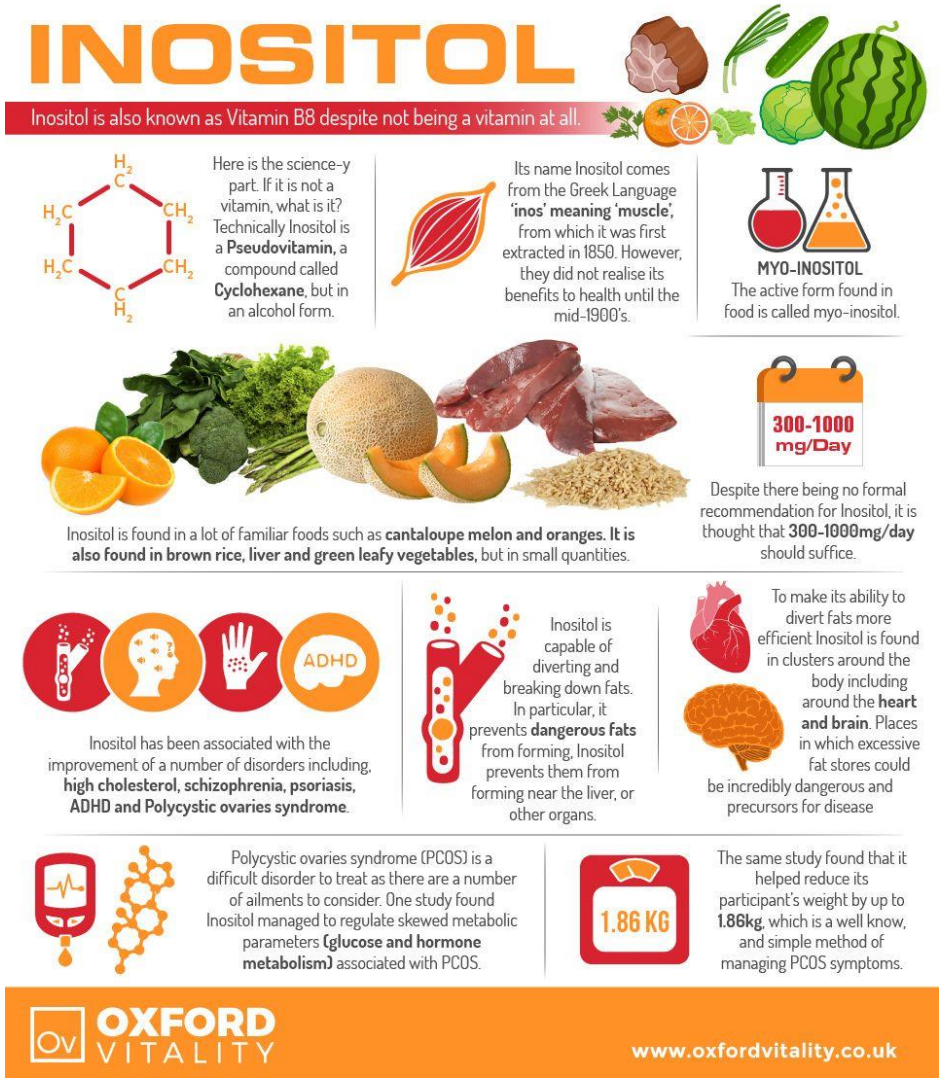
Boron

- Promotes bone health by increasing calcium and magnesium retention and enhancing vitamin D's effect. Prunes are the best dietary source.



Inositol

Helps improve calcium absorption in bones. Found in cantaloupe, grapefruit, oranges and prunes.

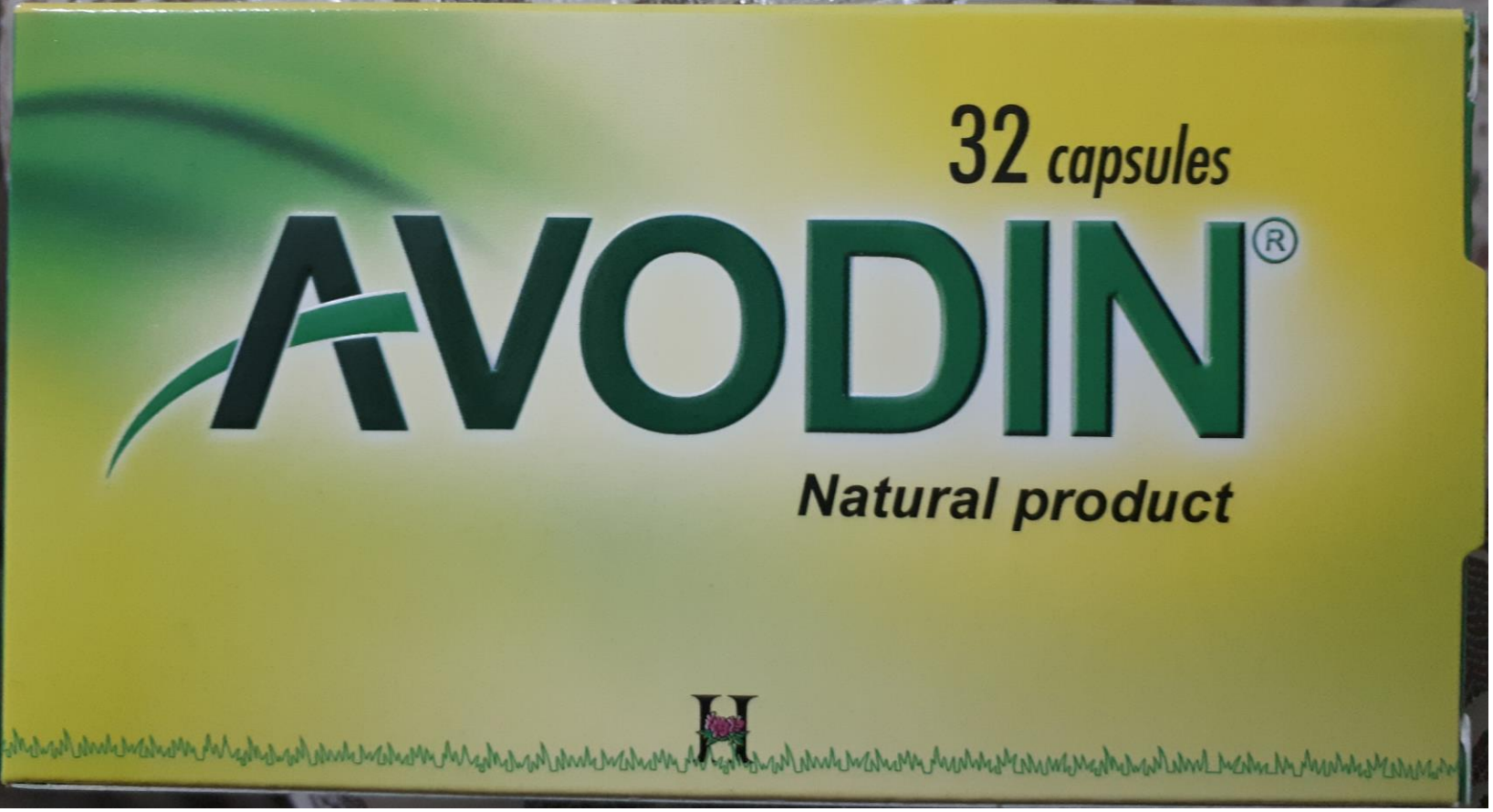


تغذیه برای آسیب تاندون، رباط و مفصل

- ویتامین دی
- کلسیم
- منیزیم
- روی

Glucosamine

- Glucosamine may help reduce pain and speed up recovery from fractures.
- However, more research is needed and some people shouldn't take it.



Natural product for:

- Decrease joint inflammation and pain.
- Help joints regeneration.
- Prevent the progressive destruction of cartilage.
- Help moving in affected joints.
- Decrease the need for analgesics.

Composition

Each capsule contains	
Total extract of Avocado-Soybean unsaponifiables	300 mg
Unsaponifiable Avocado	1 Part
Unsaponifiable Soya	2 Part
Ginger extract	100 mg
Natural Vit D_3 (Lanolin Free)	400 IU

نکته

- مجموع ویتامین دی های همه مکمل ها نباید از مقدار مورد نیاز بیشتر شود چون عوارض دارد.

Arginine

This amino acid is needed to produce nitric oxide, a compound necessary for fracture healing. Increased blood flow is important for tendon Restoration.

The best sources include meat, dairy, poultry, seafood, nuts and oatmeal.

Vitamin C

- Vitamin-C rich foods can help your body produce the collagen that's required to rebuild tissue after an injury.
- It can also help prevent excessive inflammation from slowing down your recovery.

مشکلات کلیوی (مصرف بیش از حد پروتئین و داروها)

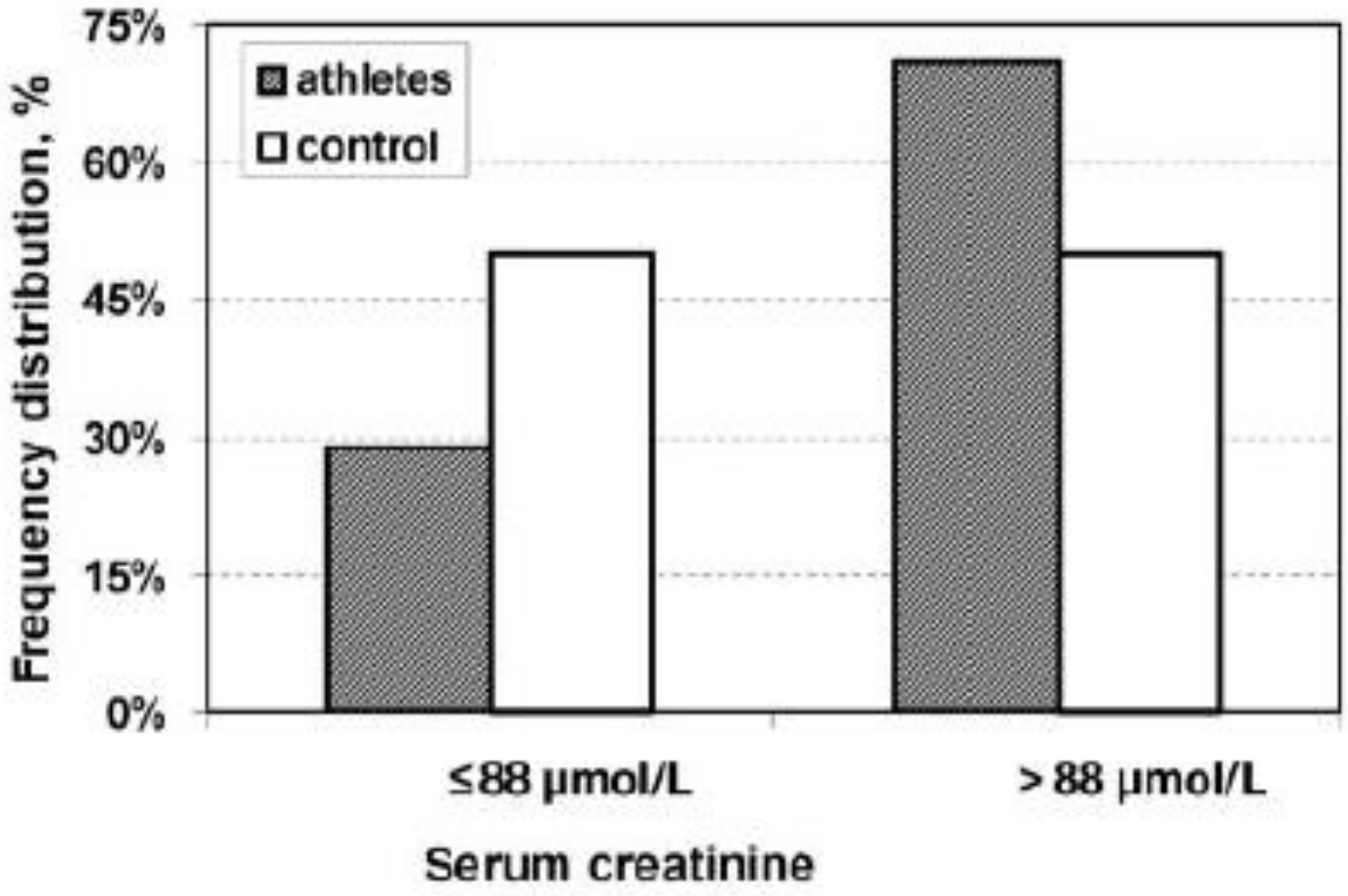


Fig. 1. Frequency distribution of serum creatinine concentrations in the 2 groups.

Data are divided considering as threshold the median value of the control group [88 µmol/L (1.0 mg/dL)].

- Reference: Serum Creatinine Values in Elite Athletes Competing in 8 Different Sports: Comparison with Sedentary People

Effects of mental fatigue on physical performance

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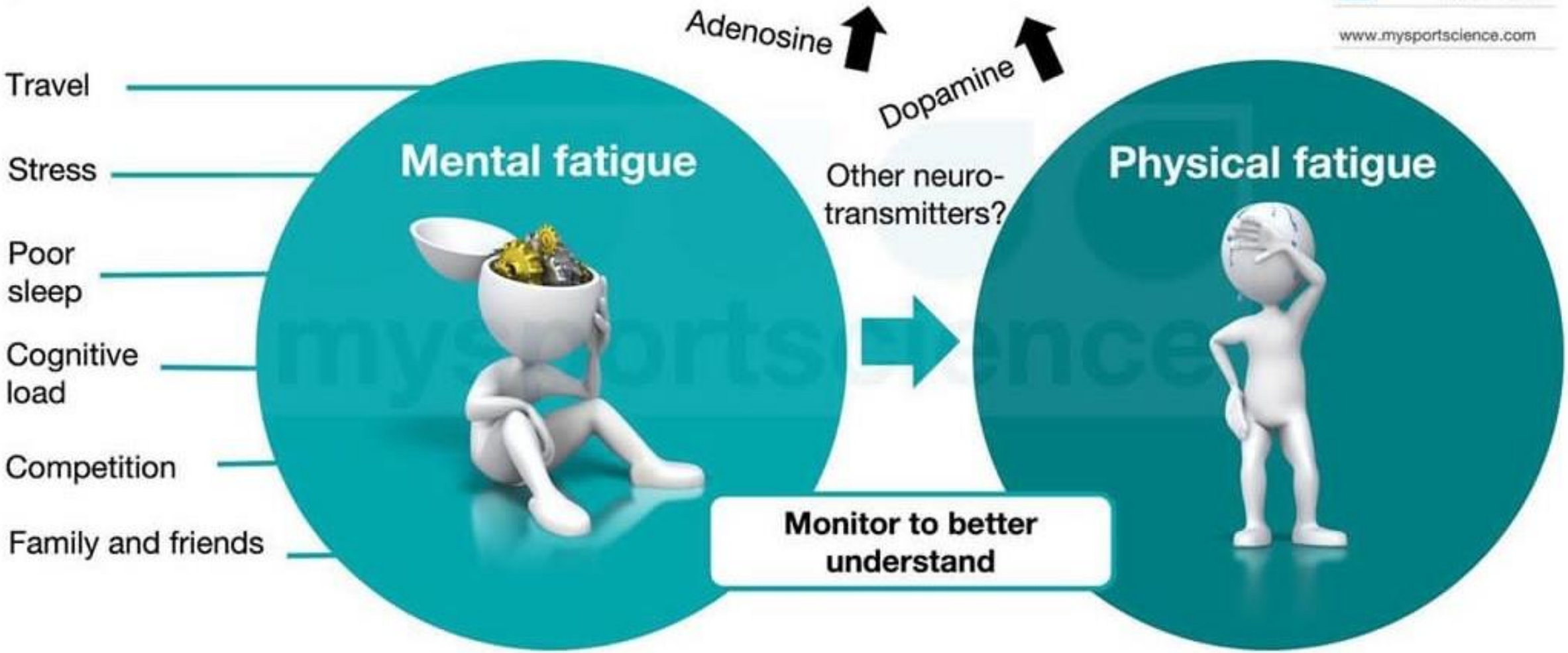

Nutrition and sleep

- High glycemic index foods (>1h before sleep)
- Diets high in carbohydrate (shorter sleep latencies)
- Diets high in protein improved sleep quality
- Small dose of trp (1g) may improve sleep quality
- Melatonin may decrease sleep onset time
- Fe, Zn, Mg ?

- Low energy intake
- High fat intake decreases total sleep time
- Cu, K, vitamin B12 ?

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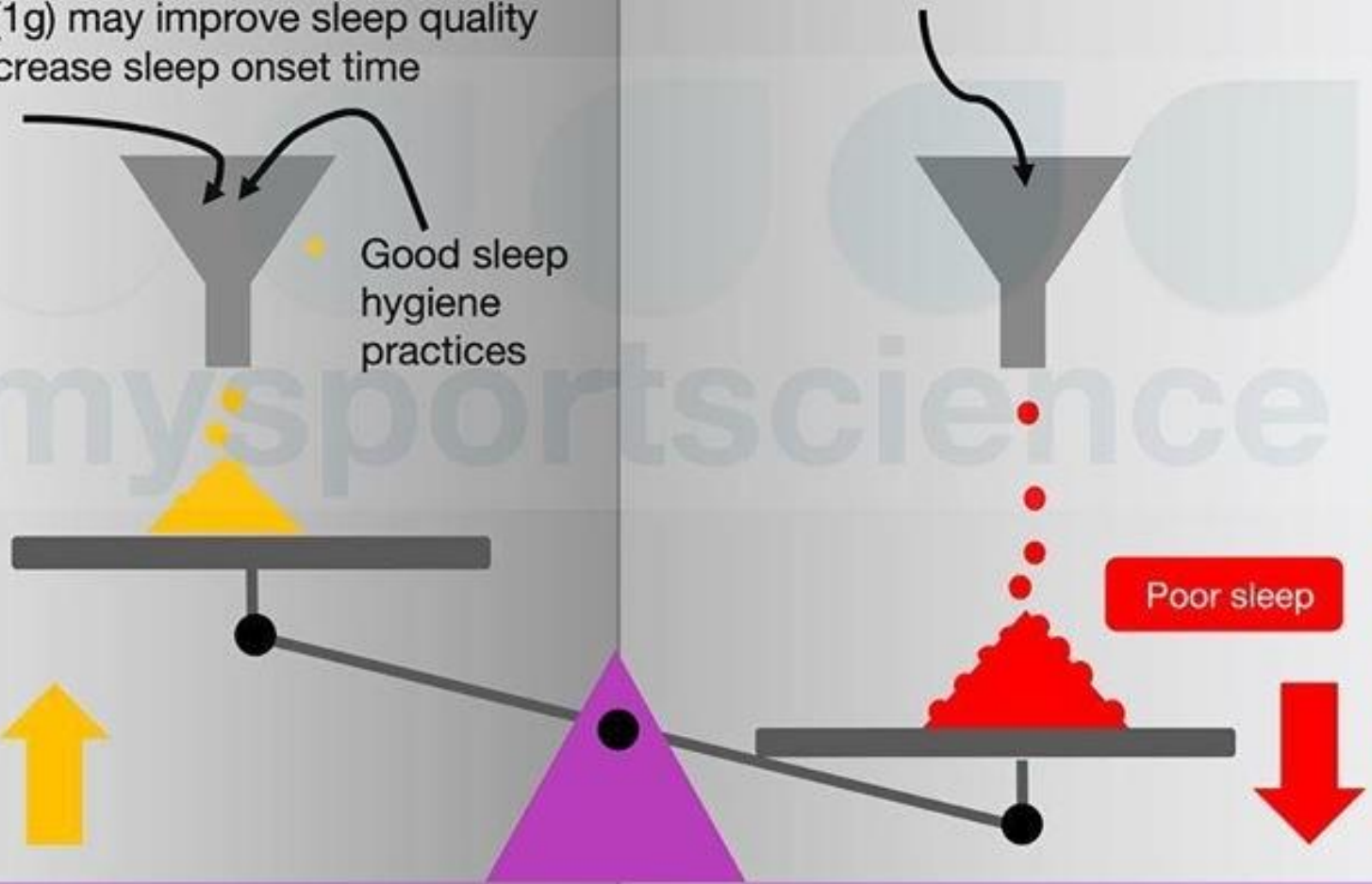

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- Mood
- Learning
- Memory
- Cognition
- Pain perception
- Immunity
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reference

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