HUMAN POTENTIAL

PERFORMANCE NUTRITION HANDBOOK

THE HYROX ENGINE

What the research says about the physiological demands of Hyrox, how it measures up against professional rugby and football, and how to fuel an engine that works this hard.

~92%
of max heart rate, averaged across a whole race

79.5%
of race time in the 90 to 100% max heart rate zone

8.5
mmol/L peak blood lactate, hit at the wall balls

0
stoppages, scrums, throw ins or half time

human-potential.co.uk / Sources numbered throughout, full list in section 10

INSIDE

TEN SECTIONS. ONE ENGINE.

A recreational Hyrox racer works harder, for longer, than a professional rugby player or footballer does across a match. This handbook shows the numbers, then shows you how to fuel for them.

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01 · THE RACE

EIGHT KILOMETRES. EIGHT STATIONS. NO HIDING.

A Hyrox race is eight 1 km runs, each followed by a functional station: SkiErg, sled push, sled pull, burpee broad jumps, rowing, farmers carry, sandbag lunges and 100 wall balls.[2]

Every race uses the same format worldwide, which is why the sport can build one of the largest performance datasets in fitness. And it is growing fast. More than 1.5 million athletes raced in the 2025/26 season, and Hyrox expects more than 2 million in 2026/27.[3] At the sharp end, Alexander Rončević broke the 52 minute barrier in April 2026 with a men's Elite 15 world record of 51:59,[4] and Joanna Wietrzyk set the women's Pro world record of 54:25 at the same Warsaw Major.[5]

TYPICAL FINISHER

86.5 min

Median time for recreational athletes in the first peer reviewed Hyrox study.[1]

RUNNING SHARE

51.2 min

Time spent running in that study: about 60% of the race. The stations took 32.8 min.[1]

WORLD RECORD

51:59

The first finish under 52 minutes in Hyrox history, 43 seconds faster than the previous record.[4]

HEART RATE: LIVING IN THE RED ZONE

02 · HEART RATE

In March 2025, researchers at the University of the Bundeswehr Munich published the first peer reviewed study of Hyrox physiology. Eleven recreational athletes completed a full simulated race to Individual Open standards while heart rate, blood lactate and perceived exertion were recorded at every run and station.[1]

The headline: these were not elite athletes, yet their median heart rate across the whole race was 171 bpm against a laboratory maximum of 186 bpm. That is roughly **92% of max for 86 minutes.** Their race peak (185 bpm) matched what they hit in a maximal lab test.[1]

THE FIVE HEART RATE ZONES

ZONE	RANGE	WHAT IT FEELS LIKE
Zone 1	50 to 60% HRmax	Very easy. Warm ups, cool downs, recovery.
Zone 2	60 to 70% HRmax	Easy aerobic. Conversational pace, base building.
Zone 3	70 to 80% HRmax	Steady. Comfortably hard, short sentences only.
Zone 4	80 to 90% HRmax	Threshold. Hard, sustainable for limited periods.
Zone 5	90 to 100% HRmax	Maximal. The hardest zone, usually reserved for short intervals in training. **Hyrox racers spent about four fifths of the race here.**

A common five zone model. The Hyrox study reported time as "hard" (70 to 90% HRmax) and "very hard" (90 to 100% HRmax).[1]

WHERE A HYROX RACE IS SPENT



Median values, n = 11 recreational athletes, simulated Individual Open race. Brandt et al. 2025.[1]

STATIONS BEAT RUNS

Heart rate averaged 174 bpm on the stations versus 169 bpm on the runs, and lactate and exertion were also significantly higher on the stations.[1]

THE WALL BALL FINALE

The last station delivered the highest lactate (8.5 mmol/L) and the highest heart rate and exertion of the race, with exertion peaking at 18 on the 6 to 20 Borg scale, between "very hard" and "extremely hard".[1]

THE ONE THING

Hyrox is not a run with some gym work in the middle. The stations are where your heart rate, lactate and effort peak.

HYROX VS THE PROFESSIONALS

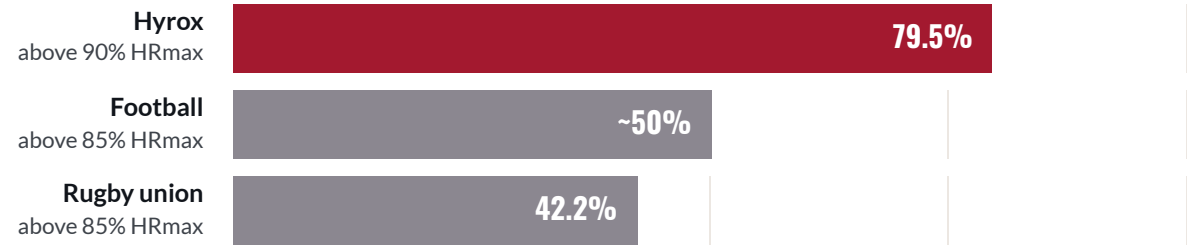
Here is how a recreational Hyrox race compares with match data from professional rugby union and football. On sustained cardiovascular intensity, Hyrox comes out on top.

AVERAGE HEART RATE (% OF MAX)



Hyrox: Brandt 2025 (median race HR divided by median lab max).[1] Football: Bangsbo 2014 review.[6] Rugby union: Dubois 2017, five European Challenge Cup matches.[7]

SHARE OF TIME IN THE TOP ZONE



The bar for Hyrox is set higher (90%) than for the team sports (85%), so the true gap is, if anything, larger. Sources 1, 7, 8.

03 · HEAD TO HEAD

MEASURE	HYROX	PRO RUGBY UNION	PRO FOOTBALL
Average heart rate	**~92% HRmax** *Brandt 2025*[1]	80.6% HRmax (Top 14); ~88% HRmax (n = 2 case study) *Dubois 2017;*[7] *Cunniffe 2009*[9]	~85% HRmax *Bangsbo 2014*[6]
Time in top zone	**79.5% above 90% HRmax**	42.2% above 85% HRmax	~50% above 85% HRmax *Literature summary*[8]
Blood lactate	**6.3 average, 8.5 peak (mmol/L)**	4.7 to 7.2 mmol/L (elite U19) *Deutsch 1998*[10]	3 to 9 mmol/L after matches, sometimes over 10 *Bangsbo 1994*[11]
Continuous work	**The full 52 to 90+ min. The clock never stops.**	Ball in play roughly 34 to 39 min of 80 *2017 Rugby Championship and Six Nations*[12]	Ball in play roughly 55 to 58 min per Premier League match *Opta Analyst*[13]
Aerobic engine (VO2max)	**51 ml/kg/min median (recreational); ~72 (world champion Rončević)** *Sources 1, 14*	46.8 ml/kg/min average (15 professional players) *Colosio 2018*[15]	~62 to 64 ml/kg/min meets the demands of the professional game *Tønnessen 2013*[16]
Substitutes and breaks	**None**	Up to 8 replacements, half time, frequent stoppages	Up to 5 substitutes, half time

THE TAKEAWAY

A recreational Hyrox racer averages a higher percentage of max heart rate than a professional rugby player or footballer does across a match, spends far more of the race in the top zone (79.5% above 90% HRmax, against 42% to 50% above the lower 85% mark in rugby and football), produces lactate in the same range, and does it **without a single break in play.**

The recreational racers in the Hyrox study also had a higher average VO2max (51) than a group of professional rugby players tested in Italy (46.8).

THE CALORIE BILL

No study has yet measured Hyrox energy expenditure directly, so the figures below are Human Potential estimates.

They assume an average oxygen uptake of 70 to 85% of VO2max (consistent with ~92% HRmax) for an athlete with the study's median VO2max of 51 ml/kg/min, at about 5 kcal per litre of oxygen, over a 90 minute race.

BODY MASS	ESTIMATED RACE BURN	PER MINUTE
60 kg	~960 to 1,170 kcal	~11 to 13 kcal
70 kg	~1,120 to 1,370 kcal	~12 to 15 kcal
80 kg	~1,290 to 1,560 kcal	~14 to 17 kcal
90 kg	~1,450 to 1,760 kcal	~16 to 20 kcal
100 kg	~1,610 to 1,950 kcal	~18 to 22 kcal

PRO FOOTBALL

~1,360 kcal

Estimated for a 75 kg player with a VO2max of 60 over a 90 minute match.[11] A 75 kg Hyrox racer finishing in 90 minutes lands in the same range.

PRO RUGBY UNION

~1,650 to 1,960

kcal, estimated from heart rate for a back and a forward over an 83 minute game.[9] Rugby players carry far more body mass, and collisions add an energy cost of their own.[17]

ELITE HYROX

~20 kcal/min

Our estimate for a 75 kg athlete with a VO2max of 72 working at 75% of it: about 1,050 kcal in a 52 minute race.

WHY THIS MATTERS FOR NUTRITION

A single race costs as much energy as a professional football match. Add the training it takes to get there and Hyrox athletes need to **fuel like the athletes they are, not like someone on a diet.**

EAT LIKE A PRO ATHLETE

At around 92% of max heart rate the body runs mainly on carbohydrate, and the stations pile on lactate. Your nutrition has three jobs: fill the tank, protect the engine and rebuild it.

Figures are per kilogram of body mass (g/kg) and come from international position stands.

EVERY DAY

TRAINING FUEL

- Carbohydrate: 5 to 7 g/kg on moderate days (about an hour of training); 6 to 10 g/kg on big days of 1 to 3 hours.[18]
- Protein: 1.2 to 2.0 g/kg a day,[18] spread as doses of 20 to 40 g roughly every 3 hours.[19]
- Whole foods, colour and hydration first. Supplements fill gaps, they do not replace meals.

24 TO 48 HOURS BEFORE

FILL THE TANK

- An hour long race does not need a full carbohydrate load. Football's expert consensus recommends 6 to 8 g/kg of carbohydrate the day before a 90 minute match,[56] a sensible target for Hyrox too.
- Finishing in over 90 minutes? Full carbohydrate loading (10 to 12 g/kg for 36 to 48 hours) becomes relevant.[20]
- Lower fibre and fat the day before to keep your stomach settled.

RACE MORNING

TOP UP

- 1 to 4 g/kg of carbohydrate, 1 to 4 hours before your wave.[18]
- 5 to 7 ml/kg of fluid about 4 hours before; another 3 to 5 ml/kg 2 hours before if your urine is dark.[21]
- Caffeine: 3 to 6 mg/kg about 60 minutes before. Trial it in training first.[22]

DURING THE RACE

HOLD THE LINE

- Racing for about an hour: a carbohydrate mouth rinse or a few sips of sports drink is enough to get the benefit.[24]
- 75 to 90 minutes: small amounts, up to about 30 g per hour (one gel), taken in the Roxzone.[24]
- Over 90 minutes: 30 to 60 g per hour.[18]

HYDRATION

BEAT THE ARENA HEAT

- Losing more than about 2% of body mass as fluid impairs performance.[21]
- Find your sweat rate with a simple weigh in, weigh out test. Full method in section 06.
- Use a drink with sodium so the fluid stays in.[32]

AFTER THE RACE

REBUILD

- Racing again within 24 hours (doubles, relays)? 1.0 to 1.2 g/kg of carbohydrate per hour for the first 4 hours.[20]
- 20 to 40 g of protein as soon as practical.[19]
- Rehydrate with 1.2 to 1.5 litres for every kilogram lost, with sodium.[21]

DOES CARBOHYDRATE HELP IN AN HOUR OF ZONE FIVE?

Yes, and in an hour long race the reason may surprise you. No study has tested carbohydrate in a Hyrox race yet, so the evidence comes from high intensity endurance and team sport research.

Over about an hour, your muscles are unlikely to run out of glycogen if you started the race well fuelled. Even so, most studies of high intensity exercise (above 75% of VO2max) lasting 30 to 60 minutes find that taking carbohydrate improves performance.[25] A systematic review concluded that over efforts of about an hour, the benefit comes mainly from the brain: carbohydrate receptors in the mouth stimulate the brain's reward centres, which supports motor drive. It does not depend on fuel reaching the muscle.[26]

The proof is the mouth rinse. In a classic study, cyclists who simply swilled a carbohydrate drink round their mouth and spat it out rode a one hour time trial about 3% faster, which matched the benefit from drinking it.[25] When glucose was infused straight into the blood instead, performance did not improve.[25] Across the rinse studies, improvements ranged from 1.5% to 11.6% in efforts of about an hour.[27]

Team sports point the same way. Carbohydrate consistently improves the capacity for repeated high intensity work, with the biggest effect late in the game when fatigue sets in.[28] That is exactly where Hyrox bites: the wall balls come after 8 km of running and seven stations.

EFFORT LENGTH	CARBOHYDRATE DURING EXERCISE
Under 30 min	Not needed.
30 to 75 min	Small amounts or a carbohydrate mouth rinse. This covers elite and fast Hyrox finishers.
1 to 2 hours	Small amounts, up to about 30 g per hour. This covers most age group finishers.
2 to 3 hours	Up to 60 g per hour.
Over 2.5 hours	Up to 90 g per hour, using glucose and fructose blends.

Carbohydrate guidance by duration, Jeukendrup 2014.[24] Highlighted rows cover Hyrox finish times.

THE CATCH: EAT BREAKFAST FIRST

The mouth rinse effect is strongest when the tank is low. When athletes rinsed two hours after a carbohydrate rich meal, one study found no performance benefit.[29] Rinsing and sipping during the race add to a good breakfast. They do not replace it.

Practical rule: fuel properly 2 to 4 hours before your wave, then take a gel or a few mouthfuls of sports drink in the Roxzone around run 4 or 5. Swill it round your mouth for a few seconds before you swallow. Practise it in training so your gut is ready on race day.

EXAMPLE: RACE DAY FOR A 75 KG ATHLETE

WHEN	TARGET	LOOKS LIKE
Day before	450 to 600 g carbohydrate	Breakfast: 80 g oats with honey and a banana (~90 g). Lunch: 300 g cooked rice (~85 g). Dinner: 125 g dried pasta and a bread roll (~115 g). Snacks: two bagels with jam (~120 g) and 500 ml orange juice (~45 g). About 455 g in total; add rice cakes or extra rice to reach your number.
3 hours out	~150 g carbohydrate (2 g/kg), 375 to 525 ml fluid	Two plain bagels (~95 g) with 2 tbsp jam (~25 g) and a medium banana (~25 g), about 145 g in total, plus a large glass of electrolyte drink
60 minutes out	225 to 450 mg caffeine (if tolerated)	Coffee or a caffeine product you have used in training
15 to 30 minutes out	~25 to 30 g carbohydrate	A gel or a small handful of sweets
Within an hour after	20 to 40 g protein, 75 to 90 g carbohydrate, fluid with sodium	A protein shake and a bagel, then a proper meal; keep drinking until you are back to starting weight

THE ONE THING

Breakfast does the heavy lifting. The gel in the Roxzone is the top up, not the plan.

WEIGH IN. WEIGH OUT.

No two athletes sweat the same. Athletes typically lose between 0.5 and 2.0 litres of sweat per hour, and sweat sodium ranges from about 10 to 90 mmol/L.[30]

In one dataset of 506 athletes, sweat rates ran from 0.26 to 5.73 L per hour.[31] A generic "drink 500 ml" plan can leave one racer badly dehydrated and give another more than they need.

Hyrox makes this matter more. You race indoors in warm, crowded arenas at over 90% of max heart rate, and drinking is limited to the Roxzone. The aim is to keep fluid loss below about 2% of body mass, the point where performance starts to suffer.[21] You can only manage that if you know your numbers.

THE WEIGH IN, WEIGH OUT TEST

Do this in a real Hyrox session or simulation, ideally in conditions like race day. Repeat it a few times, in different temperatures, to see your range.

1. **Empty your bladder**, then weigh yourself in minimal clothing on a digital scale. Note it to 0.1 kg.[30]
2. **Train as normal.** Weigh your bottles before and after, so you know exactly how much you drank. If you go to the toilet, note it.
3. **Towel dry** straight after, then weigh again on the same scale in the same clothing. Sweat trapped in clothing can hide 8 to 10% of your loss.[30]
4. **Do the maths** using the formula below.

SWEAT RATE (L/H) = (WEIGHT BEFORE − WEIGHT AFTER + FLUID DRUNK − URINE) ÷ HOURS TRAINED

1 kg of body mass lost is about 1 litre of sweat.[30]

WORKED EXAMPLE: 75 KG ATHLETE, 60 MINUTE SIMULATION	RESULT
Weight before	75.0 kg
Weight after	73.9 kg (1.1 kg lost)
Fluid drunk	0.5 L
Sweat rate	**1.6 L per hour** (1.1 + 0.5)
Body mass lost	**1.5%**: under the 2% line, but only because they drank
To drink afterwards (150%)	**about 1.65 L** with sodium, over the next few hours

WHY 150%?

YOU KEEP LOSING FLUID AFTER YOU STOP

You keep producing urine while you rehydrate. In the landmark study, athletes who drank 50% or 100% of their sweat losses stayed dehydrated. Drinking 150% or 200% restored fluid balance, but only when the drink contained enough sodium. Without it, the extra fluid went straight out as urine.[32]

WHY SODIUM?

SODIUM KEEPS THE FLUID IN

Sodium is the electrolyte you lose most in sweat and has the biggest effect on hydration.[30] It helps your body hold on to what you drink. Human Potential's Hydration Drink gives 384 mg of sodium per scoop.

TAKE IT FURTHER: SWEAT COMPOSITION TESTING

The scales tell you how much you sweat, not how salty your sweat is. A sweat patch test measures the sodium concentration of your sweat. Multiply it by your sweat rate and you get your sodium loss per hour. For example, 1.6 L per hour at 1,000 mg/L is about 1,600 mg of sodium per hour, more than four scoops of Hydration Drink.

Two athletes with the same sweat rate can lose very different amounts of sodium, so a sweat test turns a generic plan into an informed one. Results need careful collection and interpretation to be accurate,[33] so have your test done by a qualified practitioner.

A note on overdrinking: if you weigh more after training than before, you drank more than you sweated. Overdrinking is not a safe fix, so drink to your plan, not more.[21]

THE ONE THING

Weigh yourself before and after your next simulation. One number changes your whole race plan.

WHAT THE RESEARCH SAYS

No supplement has yet been tested in a Hyrox race. Food comes first; supplements fill the gaps.

The first studies of Hyrox athletes' diets and supplement use are only now under way,[55] so the evidence below comes from sports with similar demands: endurance running, team sports with repeated sprints, and strength training. The International Olympic Committee's position is that only a few supplements have strong evidence of directly boosting performance, while others support health, recovery and training.[39]

MULTIVITAMIN

EVIDENCE: SITUATIONAL

Every Hyrox session runs on micronutrients behind the scenes. B vitamins turn carbohydrate and fat into usable energy, iron carries oxygen to working muscle, and vitamins and minerals support muscle function, repair and immunity. A deficiency impairs both health and performance, and athletes who restrict their energy intake or eat a narrow range of foods are the most likely to fall short.[40] The research is also clear on the limits: there is no evidence that vitamins and minerals improve performance unless a deficiency already exists.[40]

WHY IT MATTERS FOR HYROX

That risk profile describes a lot of Hyrox racers: training once or twice a day, trying to lean out before race day and fitting meals around a full time job. A multivitamin will not make a well fed athlete faster, and reviews conclude that supplementing athletes who already eat well does not enhance performance.[41] Its value is as an insurance policy through heavy training blocks, travel and busy race weeks, sitting alongside a varied diet rather than replacing one.

VITAMIN D

EVIDENCE: STRONG IN UK WINTER

In a study of UK based professional athletes tested in winter, 62% had inadequate vitamin D levels (below 50 nmol/L).[42] When athletes took vitamin D3 for eight weeks, their 10 m sprint times and vertical jump improved, while the placebo group showed no change.[42] A decade of research confirms that deficiency is especially common in indoor athletes and during winter, and that supplementing improves musculoskeletal health and may reduce injury risk.[43]

WHY IT MATTERS FOR HYROX

Hyrox is an indoor sport, most of its training happens in gyms, and its season runs straight through the UK winter. From October to late March there is not enough sunlight for the skin to make vitamin D, so UK guidance is that everyone should consider a daily 10 µg (400 IU) supplement.[44] Vitamin D contributes to the maintenance of normal bones and normal muscle function, which matters when they absorb thousands of running strides, lunges and wall ball squats every week. Anyone wanting a higher dose should base it on a blood test.

OMEGA 3

EVIDENCE: MODERATE, FOR RECOVERY

The omega 3 fats EPA and DHA, found mainly in oily fish, are built into muscle cell membranes and help regulate inflammation. In a controlled trial, four weeks of omega 3 significantly reduced muscle soreness 24 hours after damaging eccentric exercise compared with placebo.[45] A 2026 meta-analysis found omega 3 moderately reduced inflammatory markers, with the strongest effects after at least six weeks of use and in recreational rather than elite athletes.[46] The effects on performance itself are small, so omega 3 is a recovery tool rather than a race day booster.[45]

WHY IT MATTERS FOR HYROX

Hyrox is loaded with eccentric work that drives soreness: 100 m of sandbag lunges, 100 wall ball squats, burpee broad jump landings and 8 km of running on tired legs. The researchers pointed out that less soreness matters because sore athletes skip or water down their next sessions.[45] Consistent training is what builds a faster Hyrox, so for athletes who do not eat oily fish regularly, a daily omega 3 started at least six weeks before a race block is a sensible addition.

CREATINE

EVIDENCE: STRONG

The International Olympic Committee lists creatine as one of only a handful of supplements with good evidence of a performance benefit.[39] It tops up phosphocreatine in muscle, the fuel for short, maximal efforts, and there is robust evidence that it enhances short term, high intensity exercise in athletes.[47] For pure endurance it does very little: a 2023 meta-analysis found no meaningful change in endurance performance in trained athletes.[47]

WHY IT MATTERS FOR HYROX

That split is exactly why it suits Hyrox. A 2026 review concluded that creatine is most relevant in mixed sports involving repeated high intensity efforts, sprint finishes and power endurance demands.[48] Hyrox is eight of those efforts stitched together with running, and races are often won or lost on the sled push, sled pull and wall balls. The biggest pay off comes in training, letting you push heavier sleds and complete more quality reps week after week. The standard approach is 3 to 5 g a day; some athletes gain a little body water when they start, which most racers find is worth the extra power.[49]

WHEY PROTEIN

EVIDENCE: STRONG

A meta-analysis of 49 trials and 1,863 people found that protein supplements significantly increased gains in strength and fat free mass during resistance training.[50] The benefit was greater in people who already trained with weights, and gains levelled off at a total protein intake of around 1.6 g/kg a day.[50] Whey is fast digesting and rich in leucine, which makes it the most convenient way to hit a high quality protein dose straight after a session.

WHY IT MATTERS FOR HYROX

Hyrox athletes are hybrid athletes. They need the strength to move a heavy sled and carry kettlebells for 200 m, and the engine to run 8 km at the same time, and that combination of strength and endurance training increases protein needs. The research supports spreading protein across the day in doses of 20 to 40 g roughly every 3 hours,[19] and a whey shake makes the post training dose easy, especially after an evening session when appetite is low and time is short.

PROTEIN AND CARBOHYDRATE SHAKE

EVIDENCE: MODERATE, SITUATIONAL

Carbohydrate is the most important factor in refuelling muscle glycogen after exercise.[51] When carbohydrate intake is below the optimum, adding a little protein increases insulin and refuels muscle as quickly as a much larger carbohydrate dose: 0.8 g/kg per hour of carbohydrate plus 0.2 to 0.4 g/kg of protein matched 1.2 g/kg of carbohydrate alone.[51] When carbohydrate intake is already high, the protein does not speed refuelling any further,[52] but it still delivers the amino acids needed for muscle repair at the same time.

WHY IT MATTERS FOR HYROX

That makes a combined shake the ideal tool when recovery time is short: training twice in a day, racing a doubles or relay heat after an individual race, or a hard session followed by an early start the next morning. After a near maximal effort many athletes cannot face a full meal, and one shake covers refuelling and repair together. On easy days with plenty of time before the next session, normal meals do the job just as well.

ELECTROLYTE AND HYDRATION DRINK

EVIDENCE: STRONG FOR HEAVY SWEATERS

Athletes typically sweat 0.5 to 2.0 litres an hour, with sweat sodium ranging from about 10 to 90 mmol/L, so individual losses vary hugely.[30] Losing more than about 2% of body mass as fluid impairs performance,[21] and research on rehydration shows that sodium is what makes fluid stay in the body: without enough sodium, the extra fluid is simply lost as urine.[32]

WHY IT MATTERS FOR HYROX

Hyrox is raced in warm, crowded indoor arenas at over 90% of max heart rate, with drinking limited to the Roxzone. Most athletes also train hard several times a week, so starting each session well hydrated matters as much as race day itself. A sodium based drink before and after training, and in the hours before a race, helps you start topped up and recover faster. Human Potential's Hydration Drink provides 384 mg of sodium per scoop.

A NOTE ON L-GLUTAMINE

Our Hydration Drink also contains L-Glutamine. Glutamine is the main fuel for the cells lining the small intestine, and gut studies show it helps drive sodium and water absorption, especially alongside glucose.[23] In people, single doses of 0.25 to 0.9 g/kg of fat free mass (roughly 15 to 60 g) taken two hours before an hour of running in the heat reduced markers of a leaky gut, and the bigger doses worked best.[57] Not every study agrees: 0.3 g/kg taken an hour before a harder, hotter run to exhaustion made gut permeability slightly worse.[58] A systematic review of 47 studies also found no effect of glutamine on athletes' immune function or aerobic performance.[59]

So we make no performance, immune or gut health claim for it. Even the full amino acid content of a scoop (about 6 g) is well below the doses used in the heat studies.

CARBOHYDRATE AND ELECTROLYTE DRINK

EVIDENCE: STRONG

Most studies of high intensity exercise lasting 30 to 60 minutes find that taking carbohydrate during the effort improves performance, mainly through the brain rather than the muscles.[25] In team sports, carbohydrate consistently improves the ability to repeat high intensity efforts, with the biggest effect late in the game when fatigue sets in.[28] Current guidance is up to about 30 g of carbohydrate an hour for efforts of one to two hours.[24]

WHY IT MATTERS FOR HYROX

A combined drink solves three Hyrox problems with one bottle: fluid, sodium and fuel. In the Roxzone, a few mouthfuls swilled round the mouth deliver the carbohydrate signal for the final stations. In long training sessions and race simulations it keeps quality high through the last intervals, which is where most athletes lose the most time on race day.

COLLAGEN

EVIDENCE: EMERGING

Tendons and ligaments adapt more slowly than muscle, and researchers have looked at whether nutrition can help. In a controlled trial, taking 15 g of vitamin C enriched gelatin one hour before six minutes of skipping doubled a blood marker of collagen synthesis.[53] A follow up study found hydrolysed collagen may work in the same way when taken an hour before exercise, although results varied widely between people.[54] These are small studies measuring markers, not injury rates, so the evidence is promising rather than proven.

WHY IT MATTERS FOR HYROX

Hyrox puts serious load through connective tissue: the Achilles tendon on every running stride, the knees on lunges and wall balls, and the whole lower limb on burpee broad jump landings. Athletes moving up in training volume or returning from a niggle are the most likely to benefit. The protocol from the research is 15 g of collagen or gelatin with vitamin C, taken 30 to 60 minutes before a short session of jumping, skipping or tendon loading.[53]

THE ONE THING

Supplements are the last 5%. Get the food, the fluid and the sleep right first, then fill the gaps.

08 · CLEAN SPORT

KNOW WHAT IS IN YOUR TUB

Hyrox now drug tests its elite racers.

Its drug testing code for the Elite Division is based on the World Anti-Doping Code and Germany's national code,[34] and since the 2025/26 season testing has covered every Elite 15 singles and doubles race at Majors, Regional Championships and the World Championships.[35]

Under that code, any amount of a prohibited substance found in an athlete's sample is a violation, however it got there.[34] This is called **strict liability**, and supplements are where most athletes get caught out. UK Anti-Doping warns that many athletes fail tests because of the supplements they use, and that no supplement can be guaranteed free of prohibited substances.[36] WADA and UKAD do not approve any supplement, so a label claiming they do means nothing.[37]

BEFORE YOU BUY

FOUR CHECKS

- Food first. Only add a supplement when it fills a real gap.
- Independent laboratory testing against the WADA Prohibited List.
- Current batches tested, not one sample from years ago.
- Match the batch number on your tub to the published certificate.

HUMAN POTENTIAL

CHECK YOUR BATCH

Our products are tested by independent laboratories, including ISO/IEC 17025 accredited labs, and certified by PURE-ELITE. 480+ banned substances on every batch we sell. Every certificate we publish is public, so you can check the batch in your own tub.[38]

PURE-ELITE and Human Potential share a founder. The laboratories that do the testing are independent of both.

CHECK YOUR BATCH

Testing minimises the risk but cannot remove it completely. Athletes remain responsible for everything they take.

09 · FAIR PLAY: READING THE NUMBERS HONESTLY

Hyrox is a young sport and the science is catching up. To keep this handbook credible:

- The core Hyrox data comes from one study of 11 recreational athletes in a simulated race rather than an official event. Race day crowds and competition could push values higher.
- Heart rate in Hyrox is lifted by heavy station work and warm indoor venues, so % of max heart rate slightly overstates oxygen demand compared with running sport.
- The team sport studies use different methods, years and sample sizes. They are the best published comparators, not a matched trial.
- Rugby and football ask for things Hyrox does not: collisions, repeated sprints, decisions under pressure. This handbook compares cardiovascular and metabolic load, not the sports overall.
- Hyrox calorie figures are estimates. No one has measured them directly yet.

THE EVIDENCE

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