Supplementary S1 - Countermovement jump analysis

Recordings from the two individual force plates were summed to give an overall force-time curve. The first point deviating from baseline more than 10 standard deviations was determined. The start time of the CMJ was set 0.5 s earlier. Body weight was determined as the average of the vertical force across a 0.5-s second window before start time. CMJ takeoff was automatically identified. The start and takeoff identification for each jump were visually inspected, and if necessary (2 out of 549 jumps) modified. Net force (absolute force minus body weight) as well as the acceleration (net force divided by body mass), velocity and displacement (by integration over time) of the body's centre of mass were calculated between the start time and the moment of take-off. Based on the velocity data, the jumping motion was divided into a braking phase (from peak negative velocity to 0) and an upward movement phase (from 0 velocity to take off). The net force was integrated from the end of the braking phase to the end of the propulsive phase to obtain the net propulsive impulse ($N \cdot s$) and divided by body mass to calculate take-off velocity (ms⁻¹); the airborne displacement (m) was then calculated, and jump height was obtained by summing the airborne displacement and the displacement at take-off. Absolute peak power (absolute force multiplied by velocity, W) and force at the end of the braking phase (force at 0 velocity, kN) were calculated, and divided by body mass to obtain relative values (W kg⁻¹ and N kg⁻¹). The displacement of the upward movement phase, and the duration of the braking and upward movement phases were then determined.

For comparability with previous literature using field-based methods (Wade et al., 2020), jump height was also calculated using flight time in both groups (Linthorne, 2001). Regardless of group, in the Pre session, jump height calculated with the flight time method was 0.30 ± 0.04 m for males, and 0.20 ± 0.04 m for females. Results for the training and control group at Pre, Post + 0 and Post + 63 are reported in Table S3 below.

Measurement	Variable	Group	Pre	Post + 0	Post + 63
Counter Movement Jump Test	Flight time [ms]	t	444 ± 63	466 ± 72	460 ± 71
		С	451 ± 60	446 ± 58	443 ± 54
	Jump height [m]	t	0.25 ± 0.07	0.27 ± 0.08	0.27 ± 0.08
		С	0.25 ± 0.06	0.25 ± 0.06	0.24 ± 0.06

Table S1. Mean \pm SD values of flight time and jump height for the training and control groups across the three testing sessions.

Supplementary S2 - Hopping analysis

Recordings from the 2 individual force plates were summed to give an overall force-time curve. The peak force of each hop was automatically identified and only hops 4 to 8 were retained for further analysis. Takeoff and landing were determined as the first point below and above 10 N, with a negative and positive first derivative of force, respectively. Contact and flight times [s] were then calculated. The reactive strength index was determined as the ratio between flight time and contact time. Airborne displacement was calculated from flight time (Linthorne, 2001). Absolute [kN] and relative (to body mass) [N kg⁻¹] peak force was calculated. Each variable represented the average of the 5 considered hops for each trial.

Supplementary S3 - Training programming overview

Table S3. Overview of all programming variables per training session. Maximal repetitive CMJs referring to the HIT part of the training. Each column represents one training session. Warm-up parts were consistent and are shaded in grey. See Supplementary S4 for descriptions and video links of exercises.

		W	/eek	(1	W	eek	2	w	eek	: 3	W	eel	٤4	W	eek	: 5	W	eek	6	W	/eek	(7	w	eek	٤ ۵
Exercise		Т	rainir	ng	T	rainir	g	Т	rainir	ng	Т	rainir	۱g	T	rainir	ng	- T	rainir	ng	Т	rainir	ng	Т	rainir	ng
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
	Instructed intensity												mod	erate											
lumente a la ales	Duration [s]												3	0											
	Nr. of repetitions													1											
Jumping Jacks	Break after repetition [s]												3	0											
	Nr. of sets		1																						
	Break between sets [s]													-											
	Instructed intensity												mod	erate											
	Duration [s]		30																						
Ropotitivo CMIs	Nr. of repetitions		1																						
Repetitive Civits	Break after repetition [s]		30																						
	Nr. of sets													1											
	Break between sets [s]													-											
	Instructed intensity												mod	erate											
High-Knee Runs	Duration [s]		30																						
	Nr. of repetitions		1																						
	Break after repetition [s]												3	0											
	Nr. of sets													1											
	Break between sets [s]													-											
	Instructed intensity												max	imal											
	Duration [s]	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Hone	Nr. of repetitions	6	6	4	4	6	6	6	9	7	7	7	4	4	4	4	4	4	4	4	4	4	4	4	4
Hops	Break after repetition [s]	45	45	45	45	30	30	30	15	15	15	15	15	15	15	15	15	15	15	15	15	15	45	45	45
	Nr. of sets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Break between sets [s]	-2	1	1	a,	1	-	-		÷	4	-	ġ.	a.		ĵ.	3	-	3	3	3	12	\sim	- 242	-
	Instructed intensity												max	imal											
	Duration [s]	2	5	а	3	ы	4	2	ġ.	ų.	а.	2	3	2	$\tilde{\lambda}$	0	$\overline{\Omega}$		9	ų.	- 123	\sim	-	322	12
Single CMIs	Nr. of repetitions	8	8	8	9	9	8	8	8	8	10	10	10	12	12	6	6	6	6	6	121	6	8	8	8
Single Civits	Break after repetition [s]	40	40	40	30	30	30	25	25	25	20	20	15	15	15	15	15	15	15	15	222	15	40	40	40
	Nr. of sets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	ų.	1	1	1	1
	Break between sets [s]	2	3	5	3	а	3	-	4	1	э	2	2	2	2	8	3		ų.	2		\sim		-	
	Instructed intensity												max	imal											
	Duration [s]	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Ropotitivo CMIc	Nr. of repetitions	1	1	3	3	3	4	4	4	5	5	5	3	3	3	4	4	4	4	4	5	4	3	3	3
Repetitive Civits	Break after repetition [s]	-	8	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	Nr. of sets	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1
	Break between sets [s]	-	-	2		-		-		÷		÷	60	60	60	60	60	60	60	60	60	60	1.5	10.00	355

Supplementary S4 - Participants training schedule and training plan

Training schedule

Training schedule

On the following pages, you will find your personal training plan for the next eight weeks. A training session always consists of four components, which are explained below. The repetition and break times vary over the weeks. You will complete three training sessions per week. You should always take at least one day's break between training sessions. Remember to always record your training with your watch and chest strap.

Warm Up	The warm-up is important to prepare your body for exercise. The jumping jacks get your circulation going and activate your leg muscles. The relaxed counter- movement jumps help you prepare your coordination for the jumps during training. The high-knee runs really get you going again. Watch a video of the exercises. →	
Hoppings	When hopping, you jump repetitively on the balls of your feet, similar to jumping rope. Imagine the floor is a hot hob. Watch the video again to see the correct technique. \to	
CMJs	The aim of the counter-movement jumps during the training session is to jump as high as possible after a short lunge. Maybe you'll manage to touch the ceiling with your head. Watch the video again to see the correct technique. →	
ніт	The high-intensity final part of the workout is all about really pushing yourself to the limit. To do this, you repeatedly jump as high as possible in the air. Take another look at the correct technique in the video. →	

No. of	A trair	ning could look like this, for e	xample	
training 4	Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs Duration of	Break time 30s Break	
	Hoppings	4x15s Hoppings	45s Break	
Training progress	CMJs	9x Max. Counter Movement Jump	30s Break	Checkbox for after the
	ніт	3x30s repetitive jumping	30s Break	training Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	6x15s Hoppings	45s Break	
CMJs	8x Max. Counter Movement Jump	40s Break	
ніт	1x30s repetitive jumping	-	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	6x15s Hoppings	45s Break	
CMJs	8x Max. Counter Movement Jump	40s Break	
ніт	1x30s repetitive jumping	-	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	4x15s Hoppings	45s Break	
CMJs	8x Max. Counter Movement Jump	40s Break	
ніт	3x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	4x15s Hoppings	45s Break	
CMJs	9x Max. Counter Movement Jump	30s Break	
нп	3x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	6x15s Hoppings	30s Break	
CMJs	9x Max. Counter Movement Jump	30s Break	
HIT	3x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	6x15s Hoppings	30s Break	
CMJs	8x Max. Counter Movement Jump	30s Break	
ніт	4x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	6x15s Hoppings	30s Break	
 CMJs	8x Max. Counter Movement Jump	25s Break	
ніт	4x30s repetitive jumping	30s Break	Check

	Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
2 2	Hoppings	9x15s Hoppings	15s Break	
	CMJs	8x Max. Counter Movement Jump	25s Break	
	ніт	4x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	7x15s Hoppings	15s Break	
 CMJs	8x Max. Counter Movement Jump	25s Break	
ніт	5x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	7x15s Hoppings	15s Break	
CMJs	10x Max. Counter Movement Jump	20s Break	
HIT	5x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	7x15s Hoppings	15s Break	
CMJs	10x Max. Counter Movement Jump	20s Break	
ніт	5x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	4x15s Hoppings	15s Break	
CMJs	10x Max. Counter Movement Jump	15s Break	$\mathbf{\nabla}$
нг	3x30s repetitive jumping Imin Break	30s Break	Check
3x30s repetitive jumping	30s Break		

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	4x15s Hoppings	15s Break	
CMJs	12x Max. Counter Movement Jump	15s Break	
	3x30s repetitive jumping	30s Break	Cheek
HIT 1min Break 3x30s repetitive jumping	30s Break	CHECK	

14	Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
	Hoppings	4x15s Hoppings	15s Break	
	CMJs	12x Max. Counter Movement Jump	15s Break	
	LUT	3x30s repetitive jumping	30s Break	Chaole
	HIT 1min Break 3x30s repetitive jumping	30s Break	Check	

	Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
	Hoppings	4x15s Hoppings	15s Break	
	CMJs	6x Max. Counter Movement Jump	15s Break	
			-	
1 1	1.117	4x30s repetitive jumping	30s Break	Charalt
	HIT 1min Break 4x30s repetitive jumping	1min Break 4x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	4x15s Hoppings	15s Break	
CMJs	6x Max. Counter Movement Jump	15s Break	
	4x30s repetitive jumping	30s Break	Olarah
HII	4x30s repetitive jumping	30s Break	Check
Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	4x15s Hoppings	15s Break	
CM Is	6x Max, Counter Movement, lump	15s Break	

	ніт	4x30s repetitive jumping 1min Break 4x30s repetitive jumping	30s Break	Chock
			30s Break	CHECK

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
 Hoppings	4x15s Hoppings	15s Break	
CMJs	6x Max. Counter Movement Jump	15s Break	
ШТ	4x30s repetitive jumping	30s Break	Chock
nu	4x30s repetitive jumping	30s Break	CHECK

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	4x15s Hoppings	15s Break	
CMJs	6x Max. Counter Movement Jump	15s Break	
UIT	4x30s repetitive jumping	30s Break	Chack
	4x30s repetitive jumping	30s Break	CHECK
Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	4x15s Hoppings	15s Break	
CMJs	-	-	

	5x30s repetitive jumping	30s Break	Chask
- HIT	5x30s repetitive jumping	30s Break	Check

	Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
	Hoppings	4x15s Hoppings	15s Break	
	CMJs	6x Max. Counter Movement Jump	15s Break	
<u> </u>		4x30s repetitive jumping	30s Break	01 - 1
	HIT 1m 4x:	1min Break 4x30s repetitive jumping		Check
			30s Break	

	Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
	Hoppings	4x15s Hoppings	45s Break	
	CMJs	8x Max. Counter Movement Jump	40s Break	
	ніт	3x30s repetitive jumping	30s Break	Check
23	Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	

warm op	30s High-Knee Runs	SUS DI EAK	
Hoppings	4x15s Hoppings	45s Break	
CMJs	8x Max. Counter Movement Jump	40s Break	
ніт	3x30s repetitive jumping	30s Break	Check

Warm Up	30s Jumping Jacks 30s Counter Movement Jumps 30s High-Knee Runs	30s Break	
Hoppings	4x15s Hoppings	45s Break	
CMJs	8x Max. Counter Movement Jump	40s Break	
нт	3x30s repetitive jumping	30s Break	Check

Supplementary S5 - Functional principal component analysis of relative force-time curves of CMJs

For functional principal components analysis (Warmenhoven et al., 2021), only relative force of the braking and upward movement phases at Pre and at Post + 0 for both groups were considered. All jumps were interpolated to 401 data points. Piecewise linear length normalization aligned the start and end of the braking and upward movement phases. The braking phase duration across all participants and trials represented ~71% of the upward movement duration. Therefore, the braking and upward movement phases were interpolated with 167 and 234 data points, respectively. Each curve was estimated using a B-spline basis system (Ramsay et al., 2009). Using a combination of generalized cross-validation and visual confirmation, a roughness penalty (λ) was added for fitting relative force data. No varimax rotation was applied. The first 4 functional principal components (*f*PCs) and their corresponding scores were considered, retaining 97.6% of the variance of the data. To improve visual interpretation of the components, fPCs were added and subtracted from the mean function and rescaled to absolute units. Supplementary Figure S5 represents interpolated mean relative force–time traces with the fPCs, as well as changes between Pre and Post + 0 in *f*PC scores in both the training and control groups.



Figure S5. Functional principal component analysis of the relative force–time curves of the countermovement jumps at Pre and at Post + 0 in both training and control groups. The first 4 fPCs, explaining 97.6% of the variance of the data, and the associated individual functional principal component (fPC) scores were retained. The curves with + and – in plots show the combined interaction of relative force and time for positive and negative *f*PC scorers, respectively. In the right column, plots indicate changes in *f*PC scores in the training (magenta) and control (cyan) groups from Pre to Post + 0. Only for the training group, the scores of *f*PC1 and 3 decreased and increased (t-test; **P* < 0.05), respectively, indicating that in the training group the first peak of relative force was lower, while the second peak shifted to the right.