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Is recovery optimized by using a cycle ergometer between ski-mountaineering sprints ?

Frédéric Luisier & Raphaël Faiss, REDs - Recherche & Expertise dans les sciences antidopage, Institut des sciences du sport, ISSUL, Université de Lausanne

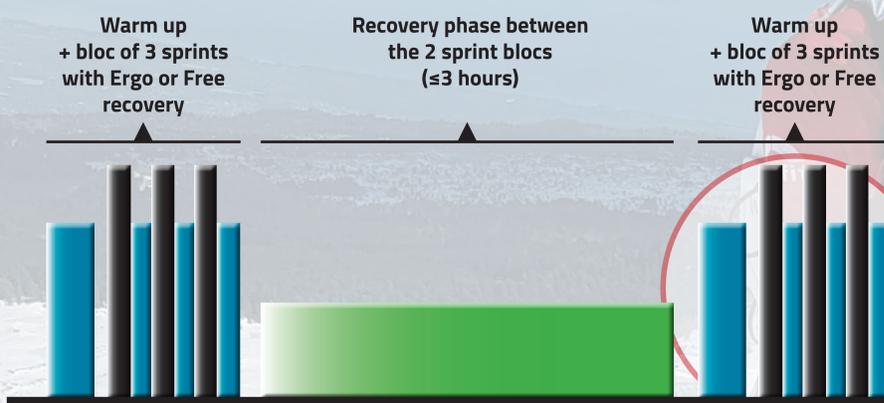
1. INTRODUCTION & GOAL



This study tested if ski-mountaineering performance during sprint races can be improved when athletes follow a recovery protocol on a cycling ergometer compared to an individually freely chosen recovery strategy.



2. MATERIALS & METHODS

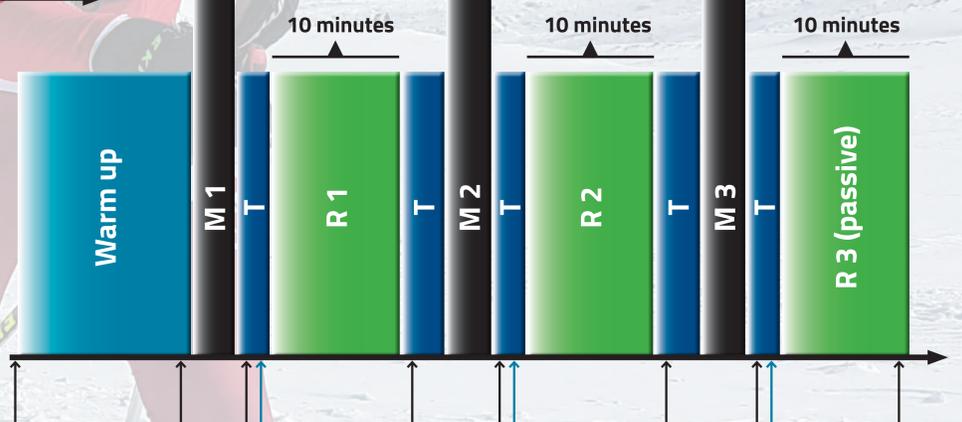


- Sprint performance (time)
- Lactate concentration [La]
- Heart Rate (HR_{mean} and HR_{max})
- Rate of perceived exertion (RPE)

- 13 elite ski-mountaineering athletes
- 2 times 3 sprints with different recovery strategies

1st recovery: 10 minutes at 70% of HR_{max} on a cycle ergometer
2nd recovery: 10 minutes with a freely chosen intensity on skies with poles

Passive recovery after heat 3 for both protocols



3. MAIN RESULTS

SPRINTS RESULTS	Ergo	Free
Temps M (s)	177 ± 24 (NS)	176 ± 23
HR _{mean} (% of HR _{max})	92 ± 3 (NS)	91 ± 6
HR _{max} (% HR _{max})	96 ± 3 (NS)	96 ± 3
RPE (Borg)	16.7 ± 1.5 (NS)	16.8 ± 1.5

NS, no significance
 Ergo, recovery on ergometer

RECOVERY RESULTS	Ergo		Free	
	R1 & R2	R3	R1 & R2	R3
Δ [La] (mmol·L ⁻¹)	-3.0 ± 1.7	-1.1 ± 1.5*	-2.8 ± 1.8	-1.0 ± 1.7*
HR _{mean} (% of HR _{max})	70 ± 3	99 ± 13*	71 ± 5	100 ± 11*

* p < 0.05 for difference with R1 & R2
 R1, R2, R3, recovery phases 1, 2 and 3 respectively

4. CONCLUSION

- Using a cycle ergometer does not seem to provide additional benefits for recovery between ski-mountaineering sprints when compared to a freely chosen recovery strategy
- Both recovery strategy may improve lactate removal
- Our results highlight similar intensities adopted for both active recovery types with a clear effect compared to passive recovery for lactate removal
- Further research may focus on more intense whole-body exercise recovery protocols to help athletes adopt the most adequate recovery strategy
- On the basis of lactate concentration and HR, both aerobic and anaerobic energy system are requested in a such sprint competition