

Michael Angermann/Hans Hoppeler/Christoph Däpp/Matthias Wittwer/Michael Vogt

Effekte eines intermittierenden Höhentrainings auf die langlaufspezifische Oberkörperleistungsfähigkeit bei Nordischen Kombinierern

Literatur

- Angermann, M. et al. (2003). Oberkörperergometrie: Spezifische Leistungsdiagnostik für Langläufer und Nordisch Kombinierer. *Schweizer Zeitschrift für Sportmedizin*, 51 (4), Seiten 168-173.
- Bailey, D. et al. (2000). Training in hypoxia: modulation of metabolic and cardiovascular risk factors in men. *Med. Sci. Sports Exerc.*, 32 (6), 1058-1066.
- Bailey, D. & Davies, B. (1997). Physiological implications of altitude training for endurance performance at sea level: a review. *Br. J. Sports Med.*, 31, 183-190.
- Bilodeau, B. et al. (1995). Upper-body testing of cross country skiers. *Med. Sci. Sports Exerc.*, 27 (11), 1557-1562.
- Clanton, T. & Klawitter, P. (2001). Invited Review: Adaptive responses of skeletal muscle to intermittent hypoxia: the known and the unknown. *J. Appl. Physiol.*, 90, 2476-2487.
- Desplanches, D. et al. (1993). Effects of training in normoxia and normobaric hypoxia on human muscle ultra-structure. *Pflügers Arch.*, 425, 263-267.
- Emonson, D. et al. (1997). Training-induced increase in sea level $\dot{V}O_{2max}$ and endurance are not enhanced by acute hypobaric exposure. *Eur. J. Appl. Physiol.*, 76, 8-12.
- Gaskell, S. et al. (1993). Physiological changes during one year of training for national level cross country skiers. *Med. Sci. Sports Exerc.*, Volume 23, p. 132 (Abstract 732).
- Geiser, J. et al. (2001). Training high – living low: Changes of aerobic performance and muscle structure with training at simulated altitude. *Int. J. Sports Med.*, 22, 579-585.
- Green, H. et al. (1999). Downregulation of Na^+K^+ -ATPase pumps in skeletal muscle with training in normobaric hypoxia. *J. Appl. Physiol.*, 86 (5), 1745-1748.
- Hendriksen, I. & Meeuwse, T. (2003). The effect of intermittent training in hypobaric hypoxia on sea-level exercise: a cross-over study in humans. *Eur. J. Appl. Physiol.*, 88, 396-403.
- Levine, B.D. (2002). Intermittent hypoxic training: Fact and fancy. *High Alt. Med. Biol.*, 3, 177-193.
- Levine, B.D. & Stray-Gundersen, J. (1997). "Living high – training low": effect of moderate-altitude acclimatization with low-altitude training on performance. *J. Appl. Physiol.*, 83, 102-112.
- Maassen, N. & Busse, M.W. (1989). The relationship between lactic acid and work load: a measure for endurance capacity or an indicator for carbohydrate deficiency? *Eur. J. Appl. Physiol. Occup. Physiol.*, 58 (7), 728-737.
- Mahood, N.V. et al. (2001). Physiological determinants of cross-country ski racing performance. *Med. Sci. Sports Exerc.*, 33, 1379-1384.
- Melissa, L. et al. (1997). Skeletal muscle adaptations to training under normobaric hypoxic versus normoxic conditions. *Med. Sci. Sports Exerc.*, 29 (2), 238-243.
- Mizuno, M. (1990). Limb skeletal muscle adaption in athletes after training at altitude. *J. Appl. Physiol.*, 68 (2), 496-502.
- Mygind, E. et al. (1991). Evaluation of a specific test in cross-country skiing. *J. Sport Science*, 9, 249-257.
- Powell, F. & Garcia, N. (2000). Physiological effects of intermittent hypoxia. *High Alt. Med. Biol.*, 1, 125-136.
- Roskamm, H. et al. (1969). Effects of a standardized ergometer training program at three different altitudes. *J. Appl. Physiol.*, 27 (6), 840-847.
- Rundell, K.W. & Bacharach D.W. (1995). Physiological characteristics and performance of top U.S. biathletes. *Med. Sci. Sports Exerc.*, 27 (9), 1302-1310.
- Smith, G.A. et al. (1989). Analysis of V1 skating technique of olympic cross-country skiers. *Int. J. Sports Biomech.*, 5, 185-207.
- Staib, J.L. et al. (2000). Cross-country ski racing performance predicted by aerobic and anaerobic double poling power. *J. Strength Cond. Res.*, 14 (3), 282-288.
- Terrados, N. et al. (1988). Effects of training at simulated altitude on performance and muscle metabolic capacity in competitive road cyclists. *Eur. J. Appl. Physiol.*, 57, 203-209.
- Terrados, N. et al. (1990). Is hypoxia a stimulus for synthesis of oxidative enzymes and myoglobin? *J. Appl. Physiol.*, 68 (6), 2369-2372.
- Truijens, M. et al. (2003). Effect of high-intensity hypoxic training on sea-level swimming performances. *J. Appl. Physiol.*, 94, 733-743.
- Turner, D.L. et al. (1997). Effects of endurance training on oxidative capacity and structural composition of human arm and leg muscles. *Acta Physiol. Scand.*, 161, 459-464.
- Ventura, N. et al. (2003). The response of trained athletes to six weeks of endurance training in hypoxia or normoxia. *Int. J. Sports Med.*, 24, 166-172.
- Vogt, M. et al. (2001). Molecular adaptations in human skeletal muscle to endurance training under simulated hypoxic conditions. *J. Appl. Physiol.*, 91, 173-182.
- Warren, G. & Cureton, K. (1989). Modeling the effect of alterations in hemoglobin concentration on $\dot{V}O_{2max}$. *Med. Sci. Sports Exerc.*, 21 (5), 526-531.
- Wenger, R.H. & Gassmann, M. (1997). Oxygen(es) and the hypoxia-inducible factor-1. *Biol. Chem.*, 378 (7), 609-616.
- Wisloff, U. & Helgerud, J. (1998). Evaluation of a new upper body ergometer for cross country skiers. *Med. Sci. Sports Exerc.*, 30 (8), 1314-1320.
- Wisloff, U. & Helgerud, J. (1998). Methods for evaluating peak oxygen uptake and anaerobic threshold in upper body of cross country skiers. *Med. Sci. Sports Exerc.*, 30 (6), 963-970.