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GESCHLECHTSDIMORPHE LEISTUNGSUNTERSCHIEDE IM SENIORENALTER IN LEICHT- ATHLETISCHEN DISZIPLINEN

Literatur

- Åstrand, P. O. & Rodahl, K. (1986). *Textbook of Work Physiology*. McGraw-Hill: New York.
- Berbalk, A. (1997). Echokardiographische Studie zum Sporthler bei Ausdauerathleten. *Z. Angewandte Trainingswissenschaft*, 4, 6-36.
- Faulkner, J. A., Larkin, L. M., Clafin, D. R. & Brooks, S. V. (2007). Age-related changes in the structure and function of skeletal muscles. *Clin. Exp. Pharmacol. Physiol.*, 34 (11), 1091-1096.
- Finkelstein, J. F., Lee, H., Burnett-Bowie, S.-A. M., Pal-lais, J. C., Yu, E.W. et. al. (2013). Gonadal steroids and body compensation, strength, and sexual function in men. *N. Engl. J. Med.*, 369 (12), 1011-1022.
- Grimby, G. (1995). Muscle performance and structure in the elderly as studied cross-sectionally and longitudinally. *J. Gerontol. A Biol. Sci. Med. Sci.*, 50 (11), 17-22.
- Hamadeh, M. J., Devries, C. M., Mark, A. & Tarnopol-sky, M. A. (2005). Estrogen supplementation reduces whole body leucine and carbohydrate oxidation and increases lipid oxidation in men during endurance exercise. *J. Clin. Endocrinol. Metab.*, 90, 3592-3599.
- Hawkins, S. & Wiswell, R. (2003). Rate and mechanism of maximal oxygen consumption decline with aging: implications for exercise training. *Sports Med.*, 33 (12), 877-888.
- Hottenrott, K. (2015). Die sportliche Frau. Leistungs-physiologische Unterschiede zum Mann – Relevanz für die ärztliche Beratung. *Schweizer Zeitschrift für Gynäkologie*, 20 (3), 6-10.
- Hottenrott K. & Neumann G. (2012). Geschlechts-spezifische Formel für optimale Trainingsherzfrequenzen. *Schweizerische Zeitschrift für Sportmedizin und Sporttraumatologie*, 60 (3), 202-205.
- Labhard, A. (1986). *Clinical Endocrinology: Theory and Practice* (2nd ed.). Berlin: Springer.
- Laubach, L. L. (1976). Comparative muscular strength of men and women. A review of the literature. *Aviat. Space Environ. Med.*, 47, 534-542.
- Lexell, J. (1995). Human aging, muscle mass, and fibre type composition. *J. Gerontol. A Biol. Sci. Med. Sci.*, 50 (11), 6-11.
- Martyn-St James, M. & Carroll, S. (2008). Meta-analysis of walking for prevention of bone mineral density in postmenopausal women. *Bone*, 43 (3), 521-531.
- McArdle, W. D., Katch, F. I. & Katch, V. L. (2001). *Exercise Physiology* (5th ed.). Philadelphia: Lippincott Williams & Wilkins.
- McKenzie, S., Phillips, S. M., Carter, S. L., Lowter, S., Gibala, M. J. & Tarnopolsky, M. A. (2000). Endurance exercise training attenuates leucine oxidation and BCOASD activation during exercise humans. *Am. J. Physiol. Endocrinol. Metab.*, 278, 580-587.
- Miller, A. E., MacDougall, J. D., Tarnopolsky, M. A. & Sale, D. G. (1993). Gender differences in strength and muscle fiber characteristics. *Eur. J. Appl. Physiol. Occup. Physiol.*, 66, 254-262.
- Narici, M. V. & Maffulli, N. (2010). Sarcopenia: characteristics, mechanisms and functional significance. *Br. Med. Bull.*, 95, 139-159.
- Neumann, G. (2016). Sportliche Leistungsfähigkeit im Altersgang. In M. Engelhardt, K. Henschel, G. Neumann & A. Pfützner (Hrsg.), *Triathlonsymposium 2014 Niedernberg. Bd. 26* (S. 49-62). Hamburg: Feldhaus, Czwalina.
- Neumann, G. & Hottenrott, K. (2016). *Das große Buch vom Laufen* (3. Aufl.). Aachen: Meyer & Meyer.
- Neumann, G. (2017). Zur Abnahme der Laufgeschwindigkeit im Alterssport. In M. Engelhardt, K. Henschel, G. Neumann & A. Pfützner (Hrsg.), *Triathlonsymposium 2016 Leipzig. Bd. 28* (im Druck). Hamburg: Feldhaus, Czwalina.
- Neumann, G. & Buhl, H. (1981). Biologische Leistungsvoraussetzungen und trainingsphysiologische Aspekte bei trainierenden Frauen. *Med. Sport (Berlin)*, 21, 154-160.
- Nielsen, S., Guo, Z., Albu, J. B., Klein, S., O'Brien, P. C. O. & Jenssen, M. D. (2003). Energy expenditure, sex, and endogenous fuel availability in humans. *J. Clin. Invest.*, 111, 981-988.
- Pedersen, B. K. (2011). Exercise-induced myokines and their role in chronic diseases. *Brain Behav. Immun.*, 25 (5), 811-816.
- Pedersen, B. K. (2011a). Muscles and their myokines. *J. Exp. Biol.*, 214 (Pt. 2), 337-346.
- Pedersen, B. K. (2013). Muscle is a secretory organ. *Compr. Physiol.*, 3 (3), 1337-1362.
- Pedersen, B. K. & Febbraio, M. A. (2012). Muscles, exercise and obesity: skeletal muscle as a secretory organ. *Nat. Rev. Endocrinol.*, 25 (5), 811-816.
- Pollock, M. L., Mengelkoch, L. J., Graves, J., Lowenthal, D. T., Limacher, M. C. Forster, D. T. & Wilmore, J. H. (1997). Twenty years follow-up of aerobic power and body composition of older track athletes. *J. Appl. Physiol.*, 82, 1508-1516.
- Power, G. A., Dalton, B. H. & Rice, C. L. (2013). Human neuromuscular structure and function in old age: A brief review. *J. Sport Health Sci.*, 2 (4), 215-226.
- Prommer, N. & Schmidt, W. (2009). Hämoglobinnmenge und Sport. *Dtsch. Z. Sportmed.*, 60, 93-294.
- Rose, M. R., Burke, M. K., Shahrestani, P. & Mueller, L. D. (2008). Evolution of ageing since Darwin. *J. Genet.*, 87, 363-371.
- Rosenberg, I. H. (1997). Sarcopenia: origins and clinical relevance. *J. Nutr.*, 127, 990S-991S.
- Ryall, J. G. & Schertzer, J. D. & Lynch, G. S. (2008). Cellular and molecular mechanisms underlying age-related skeletal muscle wasting and weakness. *Biogerontology*, 9 (4), 213-228.
- Sparling, P. B., O'Donnell, E. M. & Snow, T. K. (1998). The gender difference in distance running performance has plateaued: an analysis of world rankings from 1980-1996. *Med. Sports Exerc.*, 30, 1725-1729.
- Steffensen, C. H., Roepstorff, C., Madsen, M. & Kiens, B. (2002). Myocellular triacylglycerol breakdown in females but not in males during exercise. *Am. J. Physiol. Endocrinol. Metab.*, 278, 634-642.
- Tanda, G. & Knechtle, B. (2015). Effects of training and anthropometric factors on marathon and 100 km ultramarathon race performance. *Dovepress*, (6), 129-136.
- Van Aaken, E. & Lennartz, K. (1987). *Das Laufbuch der Frau*. Aachen: Meyer & Meyer.
- Van Aaken, E. (1984). *Das van Aaken Lauflehrbuch* (1. Aufl.). Aachen: Meyer & Meyer.
- Venables, M. C., Achten, J. & Jeukendrup, A. E. (2004). Determinants of fat oxidation during exercise in healthy men and women: a cross-sectional study. *J. Appl. Physiol.*, 98, 160-167.
- Wilmore, J. H. (1979). The application of science to sport: physiological profiles of male and female athletes. *Can. J. Appl. Sport Sci.*, 4, 103-115.

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