



NUTRITIONAL BASICS



TABLE OF CONTENTS

What you can expect in this brochure

2	Introduction	7	Macro tracking
3	Nutrition in sports	8	Nutrition without tracking
4	Macronutrients	9	Nutrition & Training
5	Calorie intake	10	Literature
6	Goal-oriented nutrition		

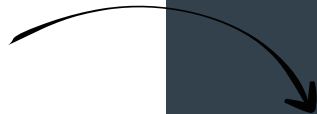


NUTRITION FOR ATHLETES

Find out everything you need to know

Fancy taking a more laid-back approach to nutrition, too? Then this "Nutrition Basics" handbook is for you!

It seems as though there's a new 'perfect diet' every month. To help you keep track of them and set the right priorities, we've compiled scientifically based recommendations in this guide.



NUTRITION IN SPORTS

This is what you should pay attention to in your diet

NUTRIENT SUPPLY

- ✓ macronutrients as energy-providing main components: carbohydrates, proteins and fats
- ✓ micronutrients (minerals and vitamins) are essential for the proper functioning of the body
- ✓ Hydrate! A good indicator of this is light yellow urine 🟡🟡🟡🟡

[1-4]

NUTRITIONAL PRIORITIES



[5]





MACRONUTRIENTS IN DETAIL

These building blocks should not be missing from your diet



CARBOHYDRATES & FIBER

- ✓ relevant for athletic and cognitive performance, muscle building, regeneration as well as immune and digestive functions
- ✓ distinction between simple and complex carbohydrates
- ✓ depending on activity level
3-12 g/bw*/day

[6-15]

PROTEINS

- ✓ important building material that is therefore relevant for muscle building and maintenance, regeneration, performance, and immune and digestive functions.
- ✓ depending on training goal and activity level between 1.2-2.5 g/bw*/day
 - ⇒ distributed as evenly as possible over different meals

[16-18]

FATS

- ✓ rather minor relevance for athletic performance, but more important for nutrient absorption and as a building material
- ✓ distinction between unsaturated, saturated and trans fatty acids
- ✓ 30% (min. 20%) of calorie intake (mostly from unsaturated fatty acids)

[19-22]

DAILY CALORIE INTAKE

This is how much energy your body needs



energy requirements depend on: weight, height, age, body composition, activity level & genetics



How to determine your TDEE

- Calculation with formula
- "Trial and Error"
 1. Eating as usual
 2. Track macronutrients for 2-3 weeks
 3. Monitor weight, performance and energy levels
 4. Calculate the average value
 5. Adjustments according to weight changes

COMPOSITION OF DAILY ENERGY REQUIREMENTS (TDEE):

EAT

Exercise activity thermogenesis
calories burned from training

NEAT

Non-exercise activity thermogenesis
calories burned from leisure activities

TEF

Thermic effect of food
calories burned from digestion

BMR

Basal metabolic rate
calorie expenditure involved in all the organism's life-sustaining processes

TARGETED NUTRITION

How to eat according to your goals



MUSCLE BUILDING

- ✓ calorie surplus
 - moderate surplus: 5-10% of TDEEs
 - weight gain: 0.1-0.25% of bw/week
 - Protein: 1,6-2,75 g/kg per day
 - Carbohydrates: 3-12g/kg bw per day;
 - around training
 - the greater the training volume, the more carbohydrates are needed
 - Fat: min. 0.5-0.6 g/kg bw per day
- ✓ studies show that an excess of more than 15% does not result in a higher hypertrophy rate

PERFORMANCE/HEALTH FOCUSED

- ✓ maintenance calorie intake
 - macronutrient distribution according to well-being and individual preferences
 - Protein: 1,6-2,75 g/kg per day
 - Carbohydrates: 3-12g/kg bw per day; around training the higher the training workload, the more carbohydrates
 - Fat: min. 0.5-0.6g/kg bw per day
- ✓ to increase performance (e.g. strength gain) a calorie surplus can be helpful

FAT LOSS



calorie deficit

- moderate deficit: 10-20% of TDEEs
- Weight loss: 0.25-1% of bw/week
- Protein: 1,6-2,75 g/kg per day
- Carbohydrates:
 - around training
 - the higher the training volume, the more carbohydrates
- Fat: min. 0.5-0.6g/kg bw per day



The lower the body fat percentage, the smaller the deficit should be!



A larger deficit leads to greater muscle loss!



risks if the calorie deficit is too high

- rapid decline in physical and cognitive performance
- loss of muscle instead of body fat
- binge eating
- excessive focus on food



CALORIE COUNTING AND MACRO TRACKING

You should consider these points when making your decision

ADVANTAGES

- ✓ precise control over nutrient intake and energy supply
- ✓ insightful information about food
- ✓ feeling for portion sizes
- ✓ more controlled progress

DISADVANTAGES

- ✓ can promote an unhealthy relationship with food and nutrition
- ✓ less flexibility
- ✓ loss of intuition
- ✓ micronutrients can get neglected

$$152 + 89$$



CALORIE DEFICIT

- ✓ increased reliance on less energy-dense foods

- high in fiber
- low in fat and sugar
- proteinreich

- ✓ mindful eating & increased daily activity



- ✓ signs of insufficient calorie intake

concentration problems, irritability, loss of performance and energy, reduced sleep quality, etc.

NUTRITION WITHOUT TRACKING

How to stay fit and healthy in the long term

EATING FOR MAINTAINANCE

- ✓ listen to your hunger and satiety cues

- ✓ observe energy level, well-being & performance

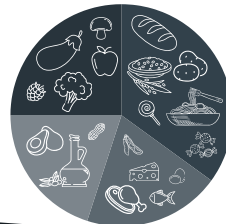


CALORIE SURPLUS

- ✓ increased reliance on foods with high energy density

- higher fat
- less fiber

- ✓ increased intake of liquid foods



NUTRITION & TRAINING

How to eat for athletic performance



intake of carbohydrates, proteins and water (+electrolytes) around training

- < 1 hour before training: simple carbohydrates
- 2-3 hours before training: complex carbohydrates
- 0.5-4 hours after training: carbohydrate and protein-rich meal



consumption of simple carbohydrates, water & electrolytes can be useful during training

- particularly beneficial for high training intensity
- particularly relevant from 1-1.5 hours of continuous exercise

[1,4,16]

mmm



LITERATURE (1/5)

- [1] Pietrowsky, R. (2019). Ernährung und Gesundheit. In R. Haring (Hrsg.), Gesundheitswissenschaften (S. 323-332). Berlin, Heidelberg: Springer Berlin Heidelberg.
- [2] Parr, M. K., Schmidtsdorff, S., & Kollmeier, A. S. (2017). Nahrungsergänzungsmittel im Sport – Sinn, Unsinn oder Gefahr? Bundesgesundheitsblatt – Gesundheitsforschung – Gesundheitsschutz, 60(3), 314–322. <https://doi.org/10.1007/s00103-016-2498-10>
- [3] Carlsohn, A., Braun, H., Großhauser, M., König, D., Lampen, A., Mosler, S., Nieß, A., Oberitter, H., Schäbenthal, K., Schek, A., Stehle, P., Virmani, K., Ziegenhagen, R., & Hesecker, H. (2019). Mineralstoffe und Vitamine im Sport: Position der Arbeitsgruppe Sporternährung der Deutschen Gesellschaft für Ernährung e. V. (DGE). Ernährungs-Umschau, 12(12), M712-M719. <https://doi.org/10.4455/eu.2019.050>, <https://doi.org/10.4455/eu.2019.050>
- [4] Mosler, S. C., Braun, H., Carlsohn, A., Großhauser, M., König, D., Lampen, A., Nieß, A., Oberitter, H., Schäbenthal, K., Schek, A., Stehle, P., Virmani, K., Ziegenhagen, R., & Hesecker, H. (2019). Flüssigkeitsmanagement im Sport: Position der Arbeitsgruppe Sporternährung der Deutschen Gesellschaft für Ernährung e.V. (DGE). Ernährungs-Umschau, 66(3), 52-59. <https://doi.org/10.4455/eu.2019.011>
- [5] Gjokaj, T. (2020). The Ultimate Nutritional Priorities Guide Abgerufen am 10.April 2023 von <https://livereforged.com/blogs/news/the-nutritional-priorities-guide>

LITERATURE (2/5)

- [6] König, D., Braun, H., Carlsohn, A., Großhauser, M., Lampen, A., Mosler, S. C., Nieß, A., Oberritter, H., Schäbenthal, K., Schek, A., Stehle, P., Virmani, K., Ziegenhagen, R., & Hesecker, H. (2019). Carbohydrates in Sports Nutrition Position of the Working Group Sports Nutrition of the German Nutrition Society e. V. (DGE): Position der Arbeitsgruppe Sporternährung der Deutschen Gesellschaft für Ernährung e. V. (DGE). *Ernährungs-Umschau*, 66(11), M660-M667.
- [7] Elia, M., Folmer, P., Schlatmann, A., Goren, A., & Austin, S. (1988). Carbohydrate, fat, and protein metabolism in muscle and in the whole body after mixed meal ingestion. *Metabolism: clinical and experimental*, 37(6), 542–551. [https://doi.org/10.1016/0026-0495\(88\)90169-2](https://doi.org/10.1016/0026-0495(88)90169-2)
- [8] von der Saal, K. (2020). Kohlenhydrate. In *Biochemie* (S. 45-56). Berlin, Heidelberg: Springer Berlin Heidelberg.
- [9] Westenhöfer, J. (2006). Kohlenhydrate und kognitive Leistungsfähigkeit. *Aktuelle Ernährungsmedizin*, 31(S 1), 96-102.
- [10] Suares, N. C., & Ford, A. C. (2011). Systematic review: the effects of fibre in the management of chronic idiopathic constipation. *Alimentary pharmacology & therapeutics*, 33(8), 895–901. <https://doi.org/10.1111/j.1365-2036.2011.04602.x>
- [11] Murray, B., & Rosenbloom, C. (2018). Fundamentals of glycogen metabolism for coaches and athletes. *Nutrition reviews*, 76(4), 243–259. <https://doi.org/10.1093/nutrit/nuy001>
- [12] Lennerz, B., & Lennerz, J. K. (2018). Food Addiction, High-Glycemic-Index Carbohydrates, and Obesity. *Clin Chem*, 64(1), 64-71. [doi:10.1373/clinchem.2017.273532](https://doi.org/10.1373/clinchem.2017.273532)

LITERATURE (3/5)

- [13] Stanhope, K. L. (2016). Sugar consumption, metabolic disease and obesity: The state of the controversy. *Crit Rev Clin Lab Sci*, 53(1), 52-67. doi:10.3109/10408363.2015.1084990
- [14] Brown, L., Rosner, B., Willett, W. W., & Sacks, F. M. (1999). Cholesterol-lowering effects of dietary fiber: a meta-analysis. *The American journal of clinical nutrition*, 69(1), 30-42. <https://doi.org/10.1093/ajcn/69.1.30>
- [15] Weickert, M. O., & Pfeiffer, A. F. (2008). Metabolic effects of dietary fiber consumption and prevention of diabetes. *The Journal of nutrition*, 138(3), 439-442. <https://doi.org/10.1093/jn/138.3.439>
- [16] Ferrauti, A. (2020). *Trainingswissenschaft für die Sportpraxis: Lehrbuch für Studium, Ausbildung und Unterricht im Sport*. Berlin: Springer Spektrum.
- [17] Toigo, M. (2019). *MuskelRevolution*. Berlin: Springer Nature.
- [18] König, D., Carlsohn, A., Braun, H., Großhauser, M., Lampen, A., Mosler, S., Nieß, A., Schäbenthal, K., Schek, A., Virmani, K., Ziegenhagen, R., & Hesecker, H. (2020). Proteinzufuhr im Sport: Position der Arbeitsgruppe Sporternährung der Deutschen Gesellschaft für Ernährung e. V. (DGE). *Ernährungs-Umschau*, 67(7), M406-M413. Lennerz, B., & Lennerz, J. K. (2018). Food Addiction, High-Glycemic-Index Carbohydrates, and Obesity. *Clin Chem*, 64(1), 64-71. doi:10.1373/clinchem.2017.273532

LITERATURE (4/5)

[19] Wolfram, G., Bechthold, A., Boeing, H., Ellinger, S., Hauner, H., Kroke, A., Leschik-Bonnet, E., Linseisen, J., Lorkowski, S., Schulze, M., Stehle, P., Dinter, J., & German Nutrition Society (2015). Evidence-Based Guideline of the German Nutrition Society: Fat Intake and Prevention of Selected Nutrition-Related Diseases. *Annals of nutrition & metabolism*, 67(3), 141–204.
<https://doi.org/10.1159/000437243>

[20] Schek, A., Braun, H., Carlsohn, A., Großhauser, M., König, D., Lampen, A., Schäbenthal, K. (2019). Fette in der Sporternährung. *Ernährungs Umschau*, 66(9).

[21] de Souza, R. J., Mente, A., Maroleanu, A., Cozma, A. I., Ha, V., Kishibe, T., . . . Anand, S. S. (2015). Intake of saturated and trans unsaturated fatty acids and risk of all cause mortality, cardiovascular disease, and type 2 diabetes: systematic review and meta-analysis of observational studies. *Bmj*, 351, h3978. doi:10.1136/bmj.h3978

[22] Hooper L, Martin N, Abdelhamid A, Davey Smith G. (2020). Reduction in saturated fat intake for cardiovascular disease. *Cochrane Database of Systematic Reviews* 2015, Issue 6. Art. No.: CD011737. DOI: 10.1002/14651858.CD011737. Accessed 07 April 2023.

[23] Braun, H., Carlsohn, A., Großhauser, M., König, D., Lampen, A., Mosler, S. C., Nieß, A., Oberritter, H., Schäbenthal, K., Schek, A., Stehle, P., Virmani, K., Ziegenhagen, R., & Heseke, H. (2019). Energiebedarf im Sport: Position der Arbeitsgruppe Sporternährung der Deutschen Gesellschaft für Ernährung e. V. (DGE). *Ernährungs-Umschau*, 66(8), 146-153

LITERATURE (5/5)

- [24] Hall K. D. (2008). What is the required energy deficit per unit weight loss?. *International journal of obesity* (2005), 32(3), 573–576. <https://doi.org/10.1038/sj.ijo.0803720>
- [25] Helms, E. R., Aragon, A. A., & Fitschen, P. J. (2014). Evidence-based recommendations for natural bodybuilding contest preparation: nutrition and supplementation. *Journal of the International Society of Sports Nutrition*, 11, 20. <https://doi.org/10.1186/1550-2783-11-20>
- [26] Alpert S. S. (2005). A limit on the energy transfer rate from the human fat store in hypophagia. *Journal of theoretical biology*, 233(1), 1–13. <https://doi.org/10.1016/j.jtbi.2004.08.029>
- [27] Garthe, I., Raastad, T., Refsnes, P. E., & Sundgot-Borgen, J. (2013). Effect of nutritional intervention on body composition and performance in elite athletes. *European journal of sport science*, 13(3), 295–303. <https://doi.org/10.1080/17461391.2011.643923>
- [28] Ingels, J. S., Misra, R., Stewart, J., Lucke-Wold, B., & Shawley-Brzoska, S. (2017). The Effect of Adherence to Dietary Tracking on Weight Loss: Using HLM to Model Weight Loss over Time. *Journal of diabetes research*, 2017, 6951495. <https://doi.org/10.1155/2017/6951495>
- [29] Simpson, C. C., & Mazzeo, S. E. (2017). Calorie counting and fitness tracking technology: Associations with eating disorder symptomatology. *Eating behaviors*, 26, 89–92. <https://doi.org/10.1016/j.eatbeh.2017.02.002>
- [30] Levinson, C. A., Fewell, L., & Brosof, L. C. (2017). My Fitness Pal calorie tracker usage in the eating disorders. *Eating behaviors*, 27, 14–16. <https://doi.org/10.1016/j.eatbeh.2017.08.003>