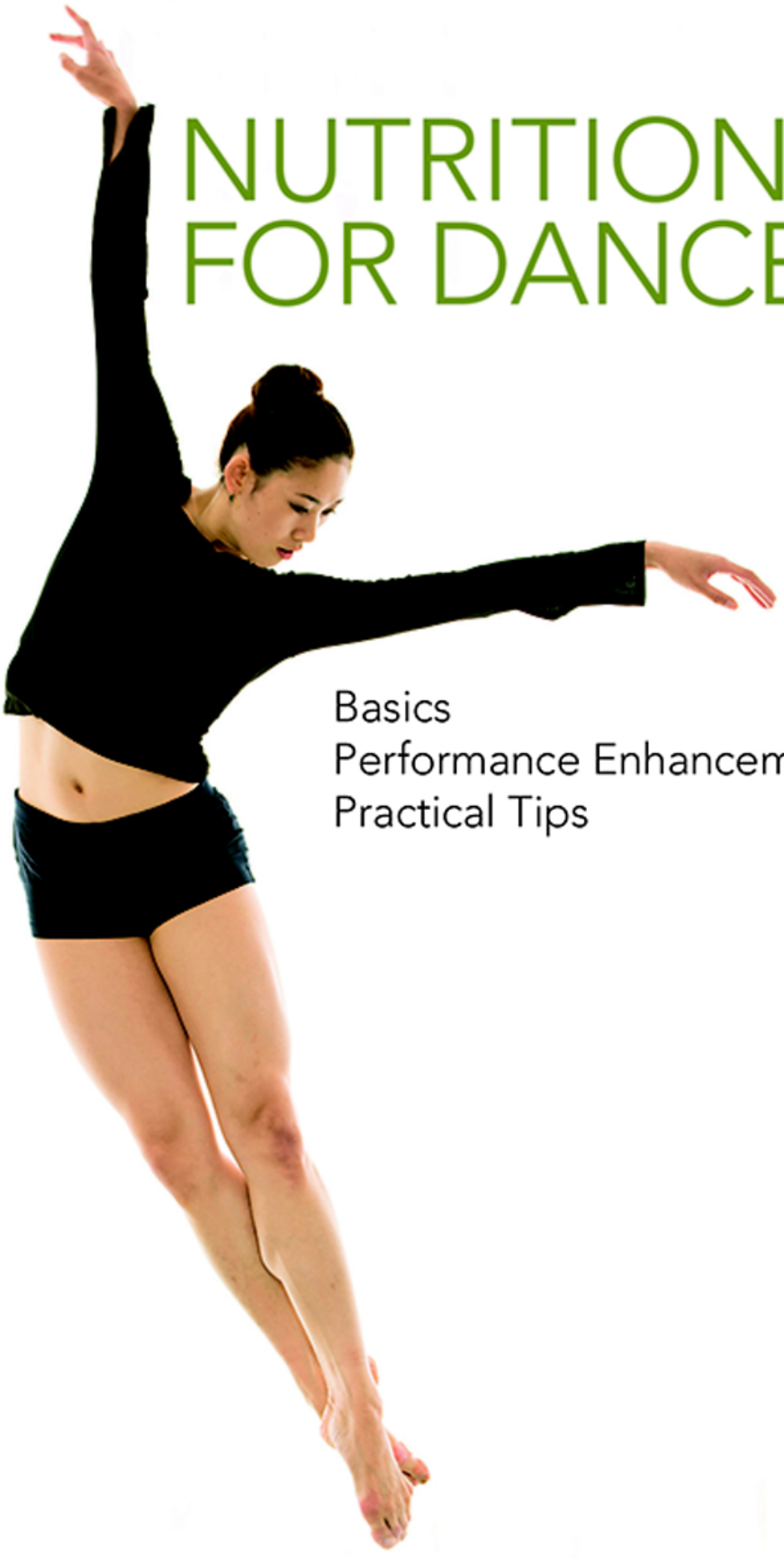
NUTRITION FOR DANCERS



Basics
Performance Enhancement
Practical Tips

LIANE SIMMEL AND EVA-MARIA KRAFT
Translated by Richard Gilmore and Liane Simmel

ROUTLEDGE

Nutrition for Dancers

Dancers are top performance athletes on stage – to keep fit and healthy proper nutrition is an integral part of an optimal dance training. *Nutrition for Dancers* provides the principles of nutrition for dancers of all genres. Authors Liane Simmel and Eva-Maria Kraft clarify widespread nutritional mistakes and give advice on how a healthy diet can be incorporated into the everyday life of dancers.

Liane Simmel, MD, runs an institute for dance medicine, *Fit for Dance*. The former dancer is now a doctor of dance medicine and was the president of the German Dance Medicine Association for many years.

Eva-Maria Kraft is a certified nutritional expert with the specialization in dance, but also a dance teacher and freelance dancer. She gives nutritional courses and seminars in professional training centres for dance, acting, and musical performance.

Nutrition
for Dancers

Basics

Performance Enhancement

Practical Tips

Liane Simmel and Eva-Maria Kraft
Translated by Richard Gilmore and Liane Simmel

With illustrations by Anna Holter

Routledge
Taylor & Francis Group
NEW YORK AND LONDON

First published in English 2018
by Routledge
711 Third Avenue, New York, NY 10017

and by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an Informa business

Translated by Richard Gilmore and Liane Simmel

Ernährung für Tänzer. Grundlagen, Leistungsförderung, Praxistipps
Published in German by Seemann Verlag in der Seemann Henschel GmbH Si Co. KG, 2016

Library of Congress Cataloging-in-Publication Data
A catalog record for this title has been requested

ISBN: 978-1-138-04114-1 (hbk)
ISBN: 978-1-138-04115-8 (pbk)
ISBN: 978-1-315-10039-5 (ebk)

Typeset in MaximaEF-Light
by Out of House Publishing

Information: This book is the result of thorough research. All recommendations are in line with the guidelines of the German, Austrian and Swiss Nutritional Authorities (DGE, ÖGE, SGE). Any differences that occur are based on the specific needs of dancers. Despite all best intentions, it may be that statements made here could be found untrue in years to come. Therefore, all content is given without accepting responsibility. Neither the authors nor the publishers accept responsibility for any disadvantages or damage that may occur as a result of information given in this book.

Professional dancing is an immense challenge: it requires not only excellent technique, but also a healthy balance between body, mind, and soul. A balanced diet therefore affords dancers the necessary freedom for their stage presence. I am very pleased that a well-researched book is now being published on this topic.

John Neumeier

This book is aimed at all dancers who …

… want to use food and nutrition as an important aid of health and wellbeing, which will enhance their ability to perform.

… want to plan healthy meals in spite of contradictory dieting tips and misleading advertising.

… want to avoid a strict dietary plan and instead use simple principles to develop their own individual nutritional strategies, without having to count calories.

Contents

Getting Started

A book on nutrition for dancers, while the stores are full of advice on healthy nutrition for athletes, dietary tips for the perfect figure, and guides to eat your way to health – is this necessary? The answer is a clear 'Yes!' A guidebook on nutrition for dancers is long overdue. Although the positive effects of a healthy and balanced diet have long been known, there is significant misinformation about a healthy diet throughout the dance world. Meanwhile, unhealthy eating habits and inadequate fluid intake hinder dancers from performing to their full potential – a bit like dancing with the handbrake on. Peak physical performance is impossible if the body is missing important energy sources and building materials.

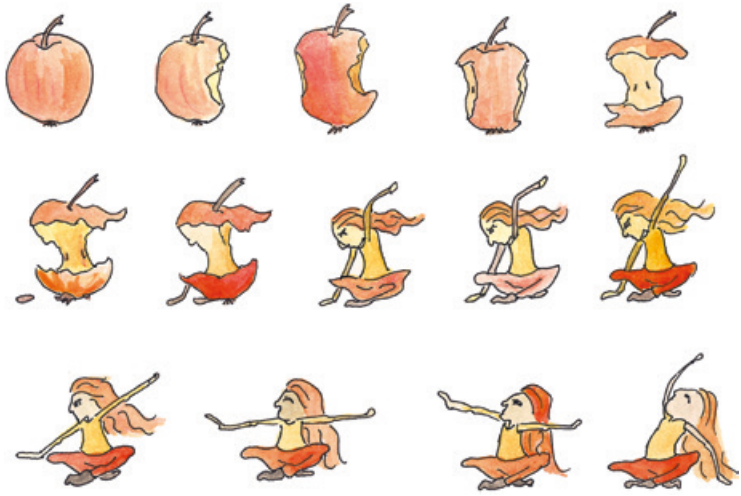
In order to be fit as a dancer, a healthy diet and optimal fluid intake are just as important as regular training.

Yet the world of dance does not always make it easy to have a healthy relationship with food. The image of the super slim dancer, the idea of perfection and absolute mastery of the body, seems to make it more difficult to allow room for enjoyable and intuitive eating. Today, on the other hand, the modern world makes it easier than ever before to find variety in your food, provided

that you have the tools to navigate through the overwhelmingly vast choices of products. It is easy to fall prey to the seductive advertisements and to choose products which do not live up to their promises. Nutrition misinformation is common, changing with current trends. Diet fads may offer very little for those who are searching for their optimal personal diet. Thus, many dancers feel left alone with questions about what, when, and how to eat, in order to stay fit for the strenuous profession of dance.

Similar to dance, nutrition also follows varying styles: everyone has their own preferences; from vegetarian to vegan; from Mediterranean to Asian. Just as in the world of dance, the more diversity one is familiar with, the easier it becomes to choose what one feels comfortable with.

This book guides through the basics of nutrition in dance, gives assistance and tips for applying these practically in your own life, and it trains you to observe your own dietary habits. With this knowledge, you can approach nutrition with the same enthusiasm many audiences have when watching dance – as something colourful in its variety and presented in different combinations according to one's taste and needs.



1

The Basics – an Overview

Why do we eat? Science offers a clear answer to this question. Every second there are around 10^{30} chemical reactions going on in our bodies. Every day, around 600 thousand million cells die and just as many new ones are formed, seamlessly becoming part of the body's systems. Dancing places even more demands on this system. Physical activity leads to micro-injuries in the tissues and raises the amount of waste products. Through complex biochemical processes, injured tissues are rebuilt, while the products of metabolism are removed and eliminated from the body. This can only happen with outside help. Through the food we eat, we give our bodies the necessary nutrients, provide it with sufficient energy and building blocks to build up and restructure tissue. But who is thinking of the metabolic process when biting into a juicy apple? For most people, it is the emotional satisfaction which dominates their choice of what, when, and how much they eat. In our society, many people tend to eat to be sociable or out of boredom, as a reward or to reduce stress, but rarely based on the basic human instinct of hunger.

Nutritional science casts light on the complexity of human nutrition. Foods are classified into different groups for simplicity's sake, but nature's diversity is not so easily represented by such straightforward compartmentalization. As in our body, different nutrients do not just affect us by way of their unique

components, but rather, through their complexity and their symbiotic chemical effects. Only the combination of their macro- and micronutrients, their mixtures of carbohydrates, fats and proteins, along with minerals, vitamins and phytonutrients make foods the source of energy and building blocks for the human body, enabling the organism to absorb and optimally utilize the nutrients.

Table 1.1: An overview of the groups of nutrients

Macronutrients	Carbohydrates
	Fats
	Proteins
Micronutrients	Vitamins (organic)
	Minerals (inorganic): Macrominerals/trace elements
Other nutritional elements	Phytonutrients
	Fibre

Dancing Requires Energy

Dancing is strenuous. The muscles work, the heart rate increases, the breathing quickens, and the nervous system is working at its peak. All these processes require energy. Yet the human organism cannot produce energy on its own. The only provision of energy for the body comes from feeding it. A body without food is like a car without gasoline – nothing works. And just as the tank in the car holds a reserve of power for the next trip, the human body also has its systems for storing energy for later use. That makes sense; without it, we would have to spend the whole day eating.

The body has two different systems for storing excess energy. Carbohydrates are stored in the form of glycogen; both in the

liver and directly in the muscles themselves. This has its advantages, for it guarantees that the energy required to dance can be provided right where it is needed – in the muscles. Yet, unfortunately, the capacitiy for storing glycogen is rather limited, so the body has to rely on another way to store reserves for larger amounts of energy: adipose tissue – also known as body fat. If excess food is transformed into fat, it can be stored almost indefinitely for later uses. Body fat is our largest reserve of energy.

The body can extract energy directly from the digested food, or from its stored energy reserves. In both cases, energy is provided according to the same pattern. Energy is created by dividing the complex nutrients from ingested or stored food into smaller and smaller building blocks – a process also called 'oxidation'. The body then uses the energy according to its needs; either for physical or mental activities, or simply for metabolic purpose. This is necessary because even when we rest, there are innumerable chemical processes taking place and our tissues are continually being restructured. When additional demands are made of the body, whether through exercising, because of an injury, or through physical growth, the body's needs increase. For the necessary restructuring and growth processes, further energy and building blocks must be provided. If stored reserves are empty and energy cannot be provided quickly enough through the intake of food, the body tries to economize its energy; then important repairs are left undone and tissues are broken down.

Under normal conditions, the body follows clear guidelines. Energy that is needed quickly comes from the use of carbohydrates, and fat burning provides energy for slower or more long-term energy use. To use energy stored in proteins is rare. Only when there are no other reserves left and the body faces an extreme emergency, does the body break down its structural proteins.

Providing Energy – Oxygen Is the Key

Everyone knows that life needs oxygen. Yet what is less well known is that oxygen determines how and in what quantity the body produces its energy. The transformation of nutrients into energy takes place through two methods in the body: either by using oxygen – aerobic respiration, or without oxygen – anaerobic respiration. The type of strain on the body, its duration and the intensity, determine which of the two metabolic pathways will be used.

Low-intensity work over a longer period of time with a sufficient amount of oxygen in supply are the prerequisites for *aerobic* energy production. Slowly, in a complex process and in the presence of oxygen, carbohydrates, and – if the strain on the body lasts longer – fat will be burned to produce energy. The human body can easily deal with the accumulating waste products: water is excreted through the kidneys and carbon dioxide is exhaled from the lungs. This allows the muscles to work for a long time with less fatigue. Yet in dance, the body often faces other conditions: given the high-intensity workout and the short energy peaks required in numerous dance styles, the aerobic respiration process reacts too slowly and thus is of limited use.

This is when the body resorts to *anaerobic* energy production. This process can step in when the body quickly needs a large amount of energy but circulation and respiration cannot deliver oxygen fast enough. Unfortunately, this quick provision of energy cannot last long as its fuel runs out rapidly. The body can only store carbohydrates, which serve as the bodily fuel

in this case, in relatively small quantities. The amount of stored carbohydrates, the so-called glycogen, will determine how long the body can perform adequately at this high level. After 60 to 90 minutes of intensive work, these reserves are empty. In addition, lactic acid, which results from anaerobic respiration, makes it harder for the muscles to maintain their workload; after just a short time, the performance drops. The muscles, after accumulating lactic acid, become tired and heavy, thus limiting the time they can work under intensive strain.

Energy from carbohydrates:

Carbohydrates are all-rounders. They can be used for aerobic or anaerobic energy production. For quick energy with high peaks of performance, the body prefers to use carbohydrates.

Energy from fats:

When using fats, the body produces almost twice the amount of energy compared with when it uses carbohydrates. But the burning of fats can only take place in the presence of sufficient oxygen and at a lower level of performance intensity. In addition, it takes a while for the fat-burning process to get started. Only after about 30 minutes of an easy workout does fat start to get used in energy production. As a primary source of energy for the body, fats are evidently not efficient enough.

Energy from protein:

The main task of protein is to provide building blocks for the body; not to produce energy. Only in emergencies, when there are not enough carbohydrates or fat reserves on hand, will protein be broken down to produce energy. This, however, is not very efficient, as the body needs more oxygen in order to burn protein than for the use of carbohydrates or fats.

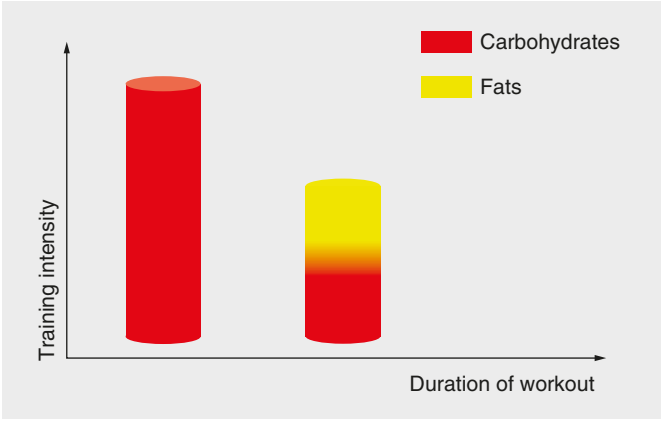


Diagram 1.1: The influence of training intensity and duration on the source of energy used

Digestion – from Food to Metabolism

'Digestion begins in the mouth' is certainly correct from the perspective of nutritional medicine. But don't we really start deciding what will be digested whilst we are out shopping or when we choose a recipe? Consciously or subconsciously, this is when we choose what nutrients we will give to our body, what substances we will be digesting and metabolizing.

When looking at our anatomy, it becomes obvious that, strictly speaking, our whole digestive tract is one long tube of muscles beginning in the mouth and ending with the rectum. On its way through the body, it forms the oesophagus, which runs through the thorax to the diaphragm and on, through to the abdomen. Below the diaphragm, on the left side, the oesophagus widens into a half-moon shape: the stomach. From there, this muscular tube winds through numerous curves. First, as the small intestine, it fills up most of the abdomen. Then, as the large intestine, it continues and frames the small intestine in an upside-down U,

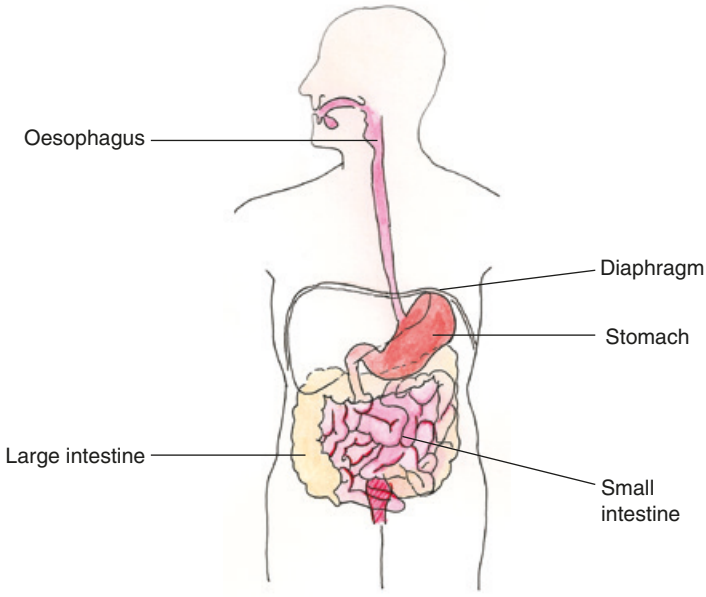


Diagram 1.2: The digestive tract: a muscular tube running through the body

before it ends at the rectum. Thanks to the ring-shaped form of their muscles' fibres, the stomach and intestinal walls can deal with transporting the digesting food – or bolus.

The process of digestion begins with the first bite. The goal in the mouth is to break down the food into the smallest possible chunks in order to facilitate the work of the stomach and intestines. Breaking down the food is mainly the responsibility of the teeth: every bite should be thoroughly chewed so that the food is prepared well for transporting to the stomach. At the same time, enzymes in the saliva will begin to break down complex carbohydrates into simple sugar molecules (see p. 13). Who does not recognize the sweet taste of bread or chips when chewed intensively and kept in the mouth for a long time?