



International Institute
of Naturopathy

Education with Vision

Distance Learning
Program
**Integrative Nutrition
and Health Consultant**

Module 3

Dear Participant

Welcome to Module 3

This third module represents another big step on your way to becoming a consultant for holistic health. It is divided into two broader subject areas: the body's acid-base balance, which is extremely important to our health, and the very comprehensive subject of nutrition. Hence, a lot of exciting information awaits you! 😊

The following is a sneak peak of the topics covered in the third module:

Acid-Base Balance

In what ways do altered pH values affect our health? Rheumatism, arthritis, osteoporosis, heart attacks, and cancer – are these possible consequences of a severe acidosis?

Connective Tissue

How do nutrients reach the cells? In what way can we compare our bodies to an aquarium?

Homeostasis

What does this term mean with regard to our health? Which factors influence homeostasis?

Metabolism

How do our bodies metabolize glucose, fat, amino acids, iron, arachidonic acid, and calcium?

Nutrition

What exactly do our bodies need to maintain their vital functions?

Carbohydrates

What happens to the carbohydrates during digestion? What is the connection between the consumption of sugar and strong cravings? Are dietary fibers healthy or harmful?

Fats

How important are fats for our health? Is butter healthier than spread? Which part do the trans-fatty acids play?

Proteins

Which functions do proteins have within the body? How do animal and vegetable proteins differ from each other? What is the biological value of proteins?

We hope you will enjoy the reading and learning process. Keep up your enthusiasm!

Your International Institute for Naturopathy

Trial Module

9. What are the advantages of an anabolic diet?

Metabolism

10. What are the disadvantages of an anabolic diet and other low-carb diets?

11. Which holistic methods encourage the metabolism?

12. Which other methods can additionally reduce weight?

1

Fats

1.1. What are Fats?

Fats (triglycerides) include the fats within our food and the fats within our body. Fats that are liquid at room temperature are called oils. Fats are a subgroup of the so-called *lipids*, which is the collective term for various natural substances that have one thing in common: They are *not* soluble in water but only in organic solvents like hexane.

Among others, the following element groups are considered to be lipids:

- **Cholesterol**
- **Fatty acids** are the components of natural fats (triglycerides) that also exist independently within the body.
- **Phospholipids** contain a high percentage of polyunsaturated fatty acids and are the main component of the cell membranes (besides the phospholipids, the *sphingolipids* and *glycolipids* also play a part in constructing the cell membrane; however, they won't be discussed in detail here). Lecithin is also one of the phospholipids.
- **Fats (triglycerides)**, also known as triacylglyceride or neutral fats, consist of a glycerine molecule¹⁴ and three fatty acids (see picture on p. 137). These fatty acids may be saturated or unsaturated. Triglycerides are the storage fats of animals.

The fats in our food (e.g., vegetable oils, animal fats, butter, meat fat, milk fat) also consist largely of triglycerides. However, triglycerides aren't just ingested directly with our food; they can also be produced by the body itself – from carbohydrates (if eaten excessively) and alcohol. If a blood test shows high triglyceride levels, it is (like high cholesterol levels) part of a lipid metabolic disorder. High triglyceride levels may indicate various health problems such as diabetes, obesity, and thyroid gland dysfunction, which are usually always based on serious dietary mistakes.

14. Glycerine is an older name for what is nowadays also known as "glycerol". Here, we will continue to use the term "glycerine".

2 Fatty Acids

Fatty acids are either longer or shorter carbon chains, whose one end is connected to an acid group.

Fatty acids can be categorized into the following three groups:

- Saturated fatty acids
- Monounsaturated fatty acids
- Polyunsaturated fatty acids

Depending on their structure, unsaturated fatty acids can be separated again into cis and trans fatty acids. However, natural fatty acids are almost always structured as a cis configuration. In contrast, trans fatty acids occur during the industrial processing of, e.g., margarine, crisps, biscuits, and chocolate spread, but they are also contained in small doses within fish, dairy, and meat products (the topic of trans fatty acids will be discussed in detail later on).

Saturated Fatty Acids (SFAs)

Saturated fatty acids occur primarily in animal products, such as butter, milk, cream, cheese, sausage, bacon, meat, lard, and tallow. The only vegetable exceptions are palm oil and coconut oil.

Monounsaturated Fatty Acids (MUFAs)

The best-known example of monounsaturated fatty acids is olive oil. Still, MUFAs also exist in other vegetable oils, nuts and seeds, as well as in dairy products (butter, cheese) and some meat products. MUFAs are also the essential fatty acids in avocados.

Polyunsaturated Fatty Acids (PUFAs)

Polyunsaturated fatty acids can be found primarily in plant-based foods, such as in vegetable oils like sunflower oil, thistle oil, soybean oil, wheat germ oil, sesame oil, linseed oil, and hemp oil. They also occur naturally in nuts, seeds, and fatty seafood, as well as in fruits and vegetables and (depending on the quality) meat and dairy products.

2.1. Difference between Saturated and Unsaturated Fatty Acids

Animal fats contain primarily saturated fatty acids (with the exception of seafood, which contains saturated fatty acids as well as an equally large number of polyunsaturated fatty acids), whereas vegetable fats consist largely of unsaturated fatty acids (with the exception of coconut and palm oil, which consist almost exclusively of saturated fatty acids).

However, what do the terms *saturated* and *unsaturated* actually mean? Whether a fatty acid is saturated or unsaturated depends on its chemical configuration: Fatty acids are organic acids. "Organic" here means that the respective substance is a carbon compound. Fatty acids are thus chains of carbon atoms connected to each other, usually depicted as a kind of zigzag line, whose edges represent the single carbon atoms (see picture on p. 140). If these atoms are only connected by single bonds (in the figure, represented as single lines), these fatty acids are called *saturated*. However, if at least one of these links is a double bond (double line), the

substance is known as an *unsaturated* fatty acid. Fatty acids with only one double bond are called monounsaturated fatty acids; fatty acids with more than one double bond are called polyunsaturated fatty acids.

Types of fatty acids

saturated
(no double bond)



monounsaturated
(one double bond)



polyunsaturated
(multiple double bonds)



Cis- and trans fatty acids

cis fatty acid



trans fatty acid



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