

An Introduction to Nutrition and Health

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1. Course description & outline

Course description

Nutrition is a key determinant of human health – and food production is among the main drivers of global environmental change. It is estimated that globally around 800 million people are undernourished, and while more than two billion have overweight or obesity. Moreover, a substantial part of the global population consumes suboptimal diets which increase the risk for diet-related diseases such as diabetes mellitus, cardiovascular disease and cancer, making unhealthy diets one of the most important modifiable risk factors for premature death and disease. At the same time, the global food system is responsible for between a quarter and a third of global greenhouse gas emissions, and is the most important driving force behind deforestation, biodiversity and habitat loss, land degradation and depletion of freshwater supplies worldwide - processes that in turn pose new challenges to food security. This course provides an overview of basic concepts, methods, insights, facts and skills to understand and address these challenges.

Course outline

1. Introduction: A spotlight on nutrition and health
2. Basics of human nutrition: nutrients, food groups and dietary patterns
3. Links between nutrition and health: malnutrition and beyond
4. Defining healthy diets: dietary guidelines and how they are developed
5. Diets around the world and the global nutrition transition
6. Determinants of diets: food environments and food systems
7. Policies for supporting healthy and sustainable diets

2. Learning objectives

At the end of the course, participants will be able to...

1. ... explain the basics of human nutrition and its relevance for human health.
2. ... assess the relevance of key nutrients, food groups and dietary patterns for human health.
3. ... explain the influence of different forms of malnutrition (including undernutrition, micronutrient deficiencies, overnutrition and unhealthy diets) on human health.
4. ... describe key elements of current evidence-based dietary recommendations, and how they are derived.
5. ... explain how diets have changed in the course of the global nutrition transition.
6. ... understand how the food system impacts the environment, and how key sustainability challenges can be addressed.
7. ... define and explain the relevance of food environments and food systems.
8. ... assess the potential impact and the limitations of policies for supporting healthy and sustainable diets.
9. ... understand the role of cities in promoting healthy diets.

3. Recommended readings

The references listed below can be used to prepare for and follow up on the course. To get the most out of the course, it is recommended to read at least some of the core reading before the start of the course. The online sources listed below are also highly recommended.

All fulltexts can be downloaded using this link:

www.dropbox.com/scl/fo/05xg3g7gfh8eq08ssl1t/AG8RcTxcyCb2gQ7r0184xX8?rlkey=gunwf3n1651pyucp9j3wk1cvs&dl=0

Core readings:

- Tilman D, Clark M: **Global diets link environmental sustainability and human health**. Nature 2014; 515: 518-22.
- Mozaffarian D: **Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity**. Circulation 2016; 133: 187-225.
- FAO and WHO 2019: **Sustainable healthy diets: Guiding principles**. Online: www.fao.org/3/ca6640en/ca6640en.pdf [last accessed February 1, 2022]
- von Philipsborn P, Geffert K, Klinger C, Hebestreit A, Stratil J, Rehfues EA: **Nutrition policies in Germany: a systematic assessment with the Food Environment Policy Index**. Public health nutrition 2021: 1-10.
- de Waal A: **Ending mass atrocity and ending famine**. The Lancet; 386(10003):1528-9.
- von Philipsborn P: **Scientific evidence in nutrition policy**. ErnahrungsUmschau 2022, 69:10-17.
- Renner B, Arens-Azevedo U, Watzl B, Richter M, Virmani K, Linseisen J: **DGE position statement on a more sustainable diet**. ErnahrungsUmschau 2021, 68:144-154.

Further readings:

- Mozaffarian D, Rosenberg I, Uauy R: **History of modern nutrition science—implications for current research, dietary guidelines, and food policy.** BMJ 2018, 361:k2392.
- Popkin BM, Corvalan C, Grummer-Strawn LM: **Dynamics of the double burden of malnutrition and the changing nutrition reality.** The Lancet 2020; 395: 65-74.
- Willett W, Rockström J, Loken B, et al.: **Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems.** The Lancet 2019; 393: 447-92.
- Branca F, Lartey A, Oenema S, Aguayo V, Stordalen GA, Richardson R, Arvelo M, Afshin A: **Transforming the food system to fight non-communicable diseases.** BMJ 2019, 364:l296.
- Rutter H, Savona N, Glonti K, Bibby J, Cummins S, Finegood DT, Greaves F, Harper L, Hawe P, Moore L, et al: **The need for a complex systems model of evidence for public health.** The Lancet 2017, 390:2602-2604.
- Gluckman PD, Hanson M, Zimmet P, Forrester T: **Losing the War Against Obesity: The Need for a Developmental Perspective.** Science Translational Medicine 2011, 3:93cm19-93cm19.
- Godfray HCJ, Aveyard P, Garnett T, Hall JW, Key TJ, Lorimer J, Pierrehumbert RT, Scarborough P, Springmann M, Jebb SA: **Meat consumption, health, and the environment.** Science 2018, 361:eaam5324.

Online resources:

- Ritchie H, Rosado P, Roser M: **Environmental Impacts of Food Production.** Online: <https://ourworldindata.org/environmental-impacts-of-food>
- Hasell J, Roser M: **Famines.** Online: <https://ourworldindata.org/famines>
- Ritchie H, Rosado P, Roser M: **Hunger and Undernourishment.** Online: <https://ourworldindata.org/hunger-and-overnourishment>

4. Course programme

Day 1

| Time | Topic |
|-------------|--|
| 9:00-9:15 | Welcome and overview on the course |
| 9:15-9:50 | Introduction: A spotlight on nutrition, health, and the global food system |
| 9:50-10:00 | <i>Coffee break</i> |
| 10:00-10:50 | Basics of human nutrition: nutrients, food groups and dietary patterns |
| 10:50-11:00 | <i>Active break</i> |
| 11:00-12:00 | Links between nutrition and health: malnutrition and beyond |
| 12:00-13:00 | <i>Lunch break</i> |
| 13:00-13:50 | Defining healthy diets: dietary guidelines and how they are developed |
| 13:50-14:00 | <i>Active break</i> |
| 14:00-15:00 | Food, diets, and environmental sustainability |

Day 2

| Time | Topic |
|-------------|---|
| 9:00-9:50 | Diets around the world and the global nutrition transition |
| 9:50-10:00 | <i>Coffee break</i> |
| 10:00-10:50 | The social determinants of dietary intake: food environments and food systems |
| 10:50-11:00 | <i>Active break</i> |
| 11:00-12:00 | Policies for healthy and sustainable diets |
| 12:00-13:00 | <i>Lunch break</i> |
| 13:00-14:00 | The role of cities in supporting healthy and sustainable diets |

5. Contact

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