



<b>Module</b>	<b>Nutrition Meets Technology</b>
<b>Code</b>	MSLS_FNH-3
<b>Degree Program</b>	Master of Science in Life Sciences (MSLS)
<b>ECTS Credits</b>	5
<b>Workload</b>	150 h: 75 h contact, 75 h self-study
<b>Module Coordinator</b>	<p><b>Name</b> Daniel Heine</p> <p><b>Phone</b> +41 31 910 29 72</p> <p><b>Email</b> <a href="mailto:daniel.heine@bfh.ch">daniel.heine@bfh.ch</a></p> <p><b>Address</b> Bern University of Applied Sciences, School of Agricultural, Forest, and Food Sciences, Laenggasse 85, 3052 Zollikofen, Switzerland</p>
<b>Lecturers</b>	<ul style="list-style-type: none"> <li>• Dr. Katrin Kopf-Bolan (BFH-HAFL)</li> <li>• Dr. Christoph Denkel (BFH-HAFL)</li> <li>• Daniel Heine (BFH-HAFL)</li> <li>• Markus Vaihinger (BFH-HAFL)</li> <li>• Dr. Michael Beyrer (HES-SO Sion)</li> <li>• External experts</li> </ul>
<b>Entry Requirements</b>	<p>General understanding of the following aspects is helpful:</p> <ul style="list-style-type: none"> <li>• Processing of food</li> <li>• Composition of food products</li> <li>• Food chemistry</li> <li>• Nutritional aspects of food</li> <li>• Basics in Physiology</li> </ul>
<b>Learning Outcomes and Competences</b>	<p>After completing the module students should be able to:</p> <ul style="list-style-type: none"> <li>• Explain how food processing can affect physiology</li> <li>• Analyze how different processing technologies affect the nutritional value of a product – and how to improve processes regarding nutritional quality</li> <li>• Suggest processing techniques for bioactive nutrients</li> <li>• Identify processing technologies that go in line with consumer needs and trends</li> </ul>
<b>Module Content</b>	<p>The module focuses on the influence of food processing on nutritional aspects of food including following main aspects:</p> <ol style="list-style-type: none"> <li>a. Introduction: Consumer Science as driving force - Summary of needs concerning healthy food – trends, nutritional value</li> <li>b. Processing technologies and their influence on nutritional value (e.g. thermal processing, freezing/chilling, high hydrostatic pressure treatment, pulsed electrical fields technology, fermentation, spraydrying) <ul style="list-style-type: none"> <li>=&gt; preserving of healthy ingredients</li> <li>=&gt; decrease of harmful substances (e.g. acrylamide, nitrosamine)</li> </ul> </li> <li>c. Processing of bioactive nutrients <ul style="list-style-type: none"> <li>⇒ extraction, adsorption, separation</li> </ul> </li> <li>d. Processing targeted physiological effects <ul style="list-style-type: none"> <li>Bioavailability of nutrients</li> <li>Consumer-tailored food</li> </ul> </li> </ol>

	<p>=&gt; increased tolerance (lactose-free, low allergic, gluten-free)  =&gt; low-fat, low-sugar, low-salt  =&gt; influencing food structure in regard to nutrition for the elderly – food printing  =&gt; trend to personalized food – omics technologies  =&gt; micro- and nano-particles in food and perception  =&gt; technologies of restructuring food fibres / meat imitation/ structuring of raw vegetable materials  e. practical demonstration (pilot plant): processing of protein powder (concentration, membrane filtration, spray drying) – effects on nutrition</p>
<b>Teaching / Learning Methods</b>	<ul style="list-style-type: none"> <li>• Blend of lectures, teamwork, practical exercises</li> <li>• Contact hours: <ul style="list-style-type: none"> <li>○ Lectures about: 50%</li> <li>○ Exercises and supervised group work: 35%</li> <li>○ Written exam and presentation: 15%</li> </ul> </li> <li>• Self-study: <ul style="list-style-type: none"> <li>○ Pre-reading: 5 % (depending on pre-knowledge)</li> <li>○ Assignment for self-study in between course-days: 45%</li> <li>○ Presentation: 50 %</li> </ul> </li> </ul>
<b>Assessment of Learning Outcome</b>	<p>Assessment consists of:</p> <ul style="list-style-type: none"> <li>• Presentation (45%)</li> <li>• Written exam (55%)</li> </ul>
<b>Bibliography</b>	<ul style="list-style-type: none"> <li>• Simpson BK, 2012. Food biochemistry and food processing (2nd ed.). Wiley-Blackwell, Ames, Iowa</li> <li>• Clark S, 2014. Food processing. Principles and applications (2 ed.). Wiley Blackwell, Chichester</li> <li>• Recommendations will be given prior start of module</li> </ul>
<b>Language</b>	English
<b>Last Update</b>	14.03.2022 / Daniel Heine