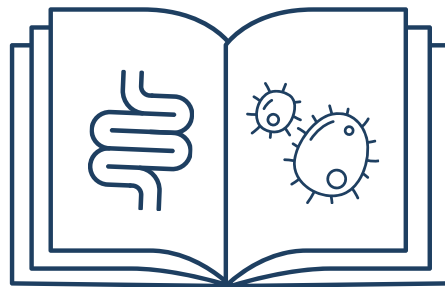


Yakult

Science for Health

The Gut Glossary



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Gut

Term	Definition
Alpha-Diversity	Describes the species richness (number) or distribution (evenness) within a microbial sample. Alpha-diversity measures can be seen as a summary statistic of a single population (within-sample diversity). [1]
Beta-Diversity	Describes the differentiation between species communities i.e., the difference in number of species in two different ecosystems. In other words, beta-diversity measures are estimates of similarity or dissimilarity between populations. [1]
Commensal bacteria	The microbial community normally residing in or on the human (or animal) host that performs important functions and helps to maintain health. [2]
Dietary fibre	Carbohydrate polymers with three or more monomeric units, which are neither digested nor absorbed in the small intestine and therefore reach the large intestine, where they can be broken down by bacteria. [3]
Dysbiosis	An imbalance in bacterial composition, changes in bacterial metabolic activities, or changes in bacterial distribution within the gut. [4]
Fermented Food	Foods made through desired microbial growth and enzymatic conversions of food components. [5]
Functional gastrointestinal disorders (FGIDs)	Several variable combinations of chronic or recurrent gastrointestinal (GI) symptoms that do not have an identified underlying pathophysiology. [6]
Gastrointestinal tract	The complete digestive tube running through the body from mouth to anus. [2]

Gut

Term	Definition
Gut health	Defined by the absence of gastrointestinal symptoms (e.g., abdominal pain, diarrhoea) and disease (e.g., inflammatory bowel disease, colon cancer), as well as an absence of other unfavourable local conditions including increased intestinal permeability, mucosal inflammation, or deficiency (or even excess) of short-chain fatty acids. [7]
Gut microbiome	The whole environment and the genetic make-up of the human microbiota (i.e., the microbes, their collective genetic material present and the by-products that they produce). [8]
Gut microbiota	The population of microorganisms that live on or in the human body - including bacteria, archaea, yeast and viruses. [8]
Gut-brain axis	The bidirectional communication between the central and the enteric nervous system, linking emotional and cognitive centres of the brain with peripheral intestinal functions. [9]
Irritable bowel syndrome (IBS)	A group of symptoms that occur together without any clear aetiology, including repeated pain in the abdomen and changes in bowel movements, which may be diarrhoea, constipation, or both. With IBS, symptoms can be present without any visible signs of damage or disease in the digestive tract. [10]
Live biotherapeutic products (LBPs)	A biological product that: 1) contains live organisms, such as bacteria; 2) is applicable to the prevention, treatment, or cure of a disease or condition of human beings; 3) is not a vaccine. [11]
Metabolome	All the metabolic outputs of human metabolism and that of our resident bacterial microbiota. [12]

Gut

Term	Definition
Microbes	The microorganisms that live on or in the human body e.g., bacteria, fungi, viruses, archaea, phages. [13]
Pathobionts	Any potentially pathological organism which, under normal circumstances, lives as a non-harming symbiont. [14]
Postbiotics	A preparation of inanimate microorganisms and/or their components that confers a health benefit on the host. [15]
Prebiotics	Substrates that are selectively utilised by host microorganisms conferring a health benefit. [16]
Probiotics	Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host. [17]
Short-chain fatty acids	A subset of fatty acids that are produced by the gut microbiota during the fermentation of partially and nondigestible polysaccharides. For example, butyrate, acetate and propionate. [18]
Symbionts	These are organisms of different species that have a mutually beneficial relation. For example, humans have a mutualistic relationship with the bacterium <i>Bacteroides</i> which reside in the intestinal tract. [19]
Symbiosis / Eubiosis:	A relationship or interaction between two different organisms that share a similar habitat e.g., humans have evolved intimate symbiotic relationships with a consortium of gut microbes. [20]
Synbiotics	A mixture comprising live microorganisms and substrate(s) selectively utilised by host microorganisms that confers a health benefit on the host. [21]

Microbiology

Term	Definition
Case-control study design	This is a type of observational study where participants are selected based on their outcome status. Thus, some participants have the outcome of interest (referred to as cases), whereas others do not have the outcome of interest (referred to as controls). The investigator then assesses the exposure in both these groups. [22]
Cohort study design	A type of observational study design where the participants do not have the outcome of interest to begin with. They are selected based on the exposure status of the individual. They are then followed over time to evaluate for the occurrence of the outcome of interest. [23]
Colony forming units (CFUs)	The number of live bacteria in the product capable of growing into bacterial colonies on a suitable agar plate. CFUs can be specified per g, ml, or serving. [2]
Cross-sectional study design	A type of observational study design where the outcome and the exposures are measured in the participants at the same time. Unlike in case-control studies or cohort studies, the participants are selected based on the inclusion and exclusion criteria set for the study. Once participants have been selected, the investigator follows the study to assess the exposure and the outcomes. [24]
Crossover study design	In a crossover study design, two or more treatments (e.g., drugs, procedures) are provided to subjects at different time periods, and the sequence of treatments is randomised for each subject. [25]
Culturomics	Method allowing the description of the microbial composition by high-throughput cell culture. [26]

Microbiology

Term	Definition
<i>Ex vivo</i>	Refers to experimentation or measurements done in or on tissue from an organism in an external environment with minimal alteration of natural conditions. [27]
Faecal microbiota transplantation (FMT)	The administration of a solution of faecal matter from a donor into the intestinal tract of a recipient in order to directly change the recipient's gut microbial composition and confer a health benefit. [28]
Genus	A principal taxonomic category that ranks above species and below family. [29]
<i>In vitro</i>	<i>In vitro</i> (i.e., 'within glass') studies are conducted using components of an organism that have been isolated from their usual biological surroundings, such as microorganisms, cells, or biological molecules. [30]
Parallel study design	A type of clinical study in which two or more groups of participants receive different interventions. [31]
Randomised controlled trials (RCTs)	A trial in which subjects are randomly assigned to one of two groups: the experimental group receiving the intervention that is being tested, and the comparison/control group receiving an alternative (conventional) treatment'. [32]
Strain specificity	(In the context of probiotics) each probiotic strain possess their own distinct characteristics which may influence the safety, efficacy, and benefits of the strain. [33]
Taxonomy	The science of categorising living organisms into classification schemes based on a set of formal rules, the nomenclature. Taxonomy uses markers which can be genetic, phenotypic or morphological in nature. [2]

Regulatory

Term	Definition
EFSA	The European Food Safety Authority provides independent scientific advice on food-related risks. [34]
EMA	The European Medicines Agency protects and promotes human and animal health by evaluating and monitoring medicines within the European Union (EU) and the European Economic Area (EEA). [35]
FDA	Food and Drug Administration is responsible for protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices; and by ensuring the safety of our nation's food supply, cosmetics, and products that emit radiation. [36]
FSA	The Food Standards Agency is an independent government department working to protect public health and consumers' wider interests in relation to food in England, Wales and Northern Ireland. [37]
QPS	Qualified Presumption of Safety status is the result of a pre-assessment that covers safety concerns for humans, animals and the environment. During this process, experts assess the taxonomic identity of the microorganism, the related body of knowledge and potential safety concerns. [38]

Study Day 2023

Term	Definition
Enteric nervous system (ENS)	The largest component of the autonomic nervous system and is uniquely equipped with intrinsic microcircuits that enable it to orchestrate gastrointestinal function independently of central nervous system (CNS) input i.e., the 'second brain'. [39]
Genitourinary syndrome of menopause (GSM)	A new term that describes various menopausal symptoms and signs including not only genital symptoms (dryness, burning, and irritation), and sexual symptoms (lack of lubrication, discomfort or pain, and impaired function), but also urinary symptoms (urgency, dysuria, and recurrent urinary tract infections). [40]
Holobiont concept	The idea is that a host and its associated microorganisms must be considered as an integrated unit in order to understand many biological and ecological features. [41]
Hypothalamic-pituitary-adrenal axis (HPA-axis)	A complex system of neuroendocrine pathways and feedback loops that function to maintain physiological homeostasis. [42]
Metabonomics	A systems approach for studying <i>in vivo</i> metabolic profiles, which promises to provide information on drug toxicity, disease processes and gene function at several stages in the discovery-and-development process. Metabonomics is now frequently referred to as metabolomics. [43]
Metagenomics	The direct genetic analysis of genomes contained within an environmental sample (typically microbes). [44]

Study Day 2023

Term	Definition
Neuroplasticity	The ability of the nervous system to change its activity in response to intrinsic or extrinsic stimuli by reorganising its structure, functions, or connections after injuries, such as a stroke or traumatic brain injury (TBI). [45]
Neurotransmitters	Endogenous chemicals that allow neurons to communicate with each other throughout the body. They enable the brain to provide a variety of functions, through the process of chemical synaptic transmission. These endogenous chemicals are integral in shaping everyday life and functions. [46]
Oestrobolome	The aggregate of enteric bacterial genes whose products are capable of metabolising oestrogens. [47]
Psychobiotics	Probiotics that confer mental health benefits to the host when ingested in a particular quantity through interaction with commensal gut bacteria. [48]
Vasomotor symptoms	Commonly called hot flashes or flushes and night sweats, and are the menopausal symptoms for which women seek treatment during menopause most often. They are a temperature dysfunction which occur due to changes in gonadal hormones. [49]

Study Day 2023

Abbreviation	Definition
HAGC	Health associated gene clusters
LAB	Lactic acid bacteria

Prebiotics

FOS	Fructooligosaccharides
GOS	Galactooligosaccharides
MOS	Mannan oligosaccharide
XOS	Xylooligosaccharides

References

- [1] Andermann et al. (2022). *Front Plant Sci*, 13, p.839407.
- [2] Yakult Science for Health. Skill Series 1: Colony Forming Units. 2022. Available online [here](#).
- [3] Yakult Science for Health. Your Guide to Fibre. 1: 2020. Available online [here](#).
- [4] DeGruttola, et al. (2016). *Inflamm Bowel Dis*, 22(5): 1137-1150.
- [5] Marco et al. (2021) *Nat Rev Gastroenterol Hepatol* 18:196–208.
- [6] Corazziari (2004). *Best Prac Res Clin Gastroenterol*, 18(4): 613-631.
- [7] Staudacher et al. (2021). *Lancet Gastroenterol Hepatol*. 1;6(4):269.
- [8] Yakult Science for Health. Your Guide to The Gut Microbiota. 1: 2020. Available online [here](#).
- [9] Carabotti et al. (2015). *Ann Gastroenterol*, 28(2): 203.
- [10] Longstreth (2005). *Clin J Gastroenterol*, 34(2): 173-187.
- [11] US Food and Drug Administration. (2016). Early Clinical Trials with Live Biotherapeutic Products: Chemistry, Manufacturing, and Control Information. Available online [here](#).
- [12] Beecher, C.W., 2003. Boston, MA: Springer US.
- [13] Yakult Science for Health. Your Guide to The Gut Microbiota. 1: April 2020.
- [14] Van de Wijkert et al. (2020). *Front Cell Infect Microbiol*, 10, p.129.
- [15] Salminen et al. (2021). *Nat Rev Gastroenterol Hepatol*, 18(9): 649-667.
- [16] Gibson et al. (2017) *Nat Rev Gastroenterol Hepatol* 14:491–502.
- [17] Hill et al. (2014) *Nat Rev Gastroenterol Hepatol* 11(8): 506-514.
- [18] Tan et al. (2014). *Adv. Immunol*, 121: 91-119.
- [19] Hayles. (2007). *PMLA* 122(5): 1603-1608.
- [20] Li et al. (2008). *Proc Natl Acad Sci USA*, 105(6): 2117-2122.
- [21] Swanson et al. (2020) *Nat Rev Gastroenterol Hepatol* 17: 687-701.

References

- [22] Setia. (2016). Indian J Dermatol, 61(2): 146.
- [23] Setia. (2016). Indian J Dermatol, 61(1): 21-25.
- [24] Setia. (2016). Indian J Dermatol, 61(3): 261-264.
- [25] Lim et al. (2021). Korean J Anesthesiol, 74(4):293-299.
- [26] Greub. (2012). Clin Microbiol Infect, 18(12):1157-1159.
- [27] Gowing et al. (2017). Prog Brain Res, 230: 99-132.
- [28] Gupta et al. (2016). Therap Adv Gastroenterol, 9(2):229-239.
- [29] Yakult Science for Health. Skill Series 1: Bacterial Taxonomy. 2022. Available online [here](#).
- [30] Westreich et al. (2010). Epidemiol (Cambridge, Mass), 21(1): 152.
- [31] Nair. (2019) Indian Dermatol Online J, 10(2):193.
- [32] Kendall. (2003). Emerg Med J 20(2):164-168.
- [33] McFarland et al. (2018). Front. Med, 5:124.
- [34] European Food Safety Authority. EFSA Overview. Available online [here](#).
- [35] European Medicines Agency. EMA Overview. Available online [here](#).
- [36] U.S. Food and Drug Administration. Available online [here](#).
- [37] Food Standards Agency. Available online [here](#).
- [38] European Food Safety Authority. Qualified presumption of safety (QPS). Available online [here](#).
- [39] Rao et al. (2016). Nat Rev Gastroenterol Hepatol, 13(9):517-528.
- [40] Kim et al. (2015). J Menopausal Med 21(2):65-71.
- [41] Moran et al. (2015). PLoS Biol, 13(12):1002311.
- [42] Sheng et al. (2021). Front Behav Neurosci, 14:256.
- [43] Nicholson et al. (2008). Nature, 455(7216):1054-1056.

References

[44] Thomas et al. (2012). *Microb Inform Exp*, 2:1-12.

[45] Puderbaugh et al. (2023). Neuroplasticity. In StatPearls [Internet]. StatPearls Publishing.

[46] Rizo, J., 2018. *Prot Sci*, 27(8):1364-1391.

[47] Plottel et al. (2011). *Cell Host Microbe*, 10(4):324-335.

[48] Del Toro-Barbosa et al. (2020). *Nutrients*, 12(12):3896.

[49] Deecher et al. (2007). *Arch Womens Ment Health*, 10:247-257.